

**OCC EXHIBIT NO. \_\_\_\_\_**

**BEFORE  
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of the Dayton	)	
Power and Light Company for an Increase in	)	Case No. 15-1830-EL-AIR
Electric Distribution Rates.	)	
In the Matter of the Application of the Dayton	)	
Power and Light Company for Approval to Change	)	Case No. 15-1831-EL-AAM
Accounting Methods.	)	
In the Matter of the Application of the Dayton	)	Case No. 15-1832-EL-ATA
Power and Light Company for Tariff Approval.	)	

**DIRECT TESTIMONY  
OF  
DANIEL J. DUANN, Ph.D.**

**On Behalf of  
The Office of the Ohio Consumers' Counsel**  
*65 East State St., 7th Floor  
Columbus, Ohio 43215*

**April 11, 2018**

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1    **I.       INTRODUCTION**

2

3    ***Q1.    PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION.***

4    ***A1.***    My name is Daniel J. Duann. My business address is 65 East State Street, 7th  
5           Floor, Columbus, Ohio, 43215. I am a Principal Regulatory Analyst with the  
6           Office of the Ohio Consumers' Counsel ("OCC").

7

8    ***Q2.    PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND***  
9           ***EDUCATIONAL BACKGROUND.***

10   ***A2.***    I joined OCC in January 2008 as a Senior Regulatory Analyst. I was promoted to  
11           my current position in November 2011. My primary responsibility is to assist  
12           OCC by participating in various regulatory proceedings before the PUCO. These  
13           proceedings include rate cases, cost of capital, alternative regulation, fuel cost  
14           recovery, and other types of cases filed by Ohio's electric, gas, and water utilities.

15

16           Prior to the OCC, I was a Utility Examiner II in the Forecasting Section of the  
17           Ohio Division of Energy, Ohio Department of Development, from 1983 to 1985.

18           The Forecasting Section was later transferred to the Public Utilities Commission  
19           of Ohio ("PUCO"). From 1985 to 1986, I was an Economist with the Center of

20           Health Policy Research at the American Medical Association in Chicago. In late  
21           1986, I joined the Illinois Commerce Commission as a Senior Economist at its

22           Policy Analysis and Research Division. From 1987 to 1995, I was employed as a

23           Senior Institute Economist at the National Regulatory Research Institute

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1 ("NRRI") at The Ohio State University. NRRI has been a policy research center  
2 funded by state public utilities commissions since 1976. NRRI is currently  
3 located in Silver Spring, Maryland and is no longer a part of The Ohio State  
4 University. My work at NRRI involved research, authoring publications, and  
5 public services in many areas of utility regulation and energy policy. I was an  
6 independent consultant from 1996 to 2007.

7

8 I received my Ph.D. degree in Public Policy Analysis from the Wharton School,  
9 University of Pennsylvania. I also have an M.S. degree in Energy Management  
10 and Policy from the University of Pennsylvania, and an M.A. degree in  
11 Economics from the University of Kansas. I completed my undergraduate study  
12 in Business Administration at the National Taiwan University, Taiwan, Republic  
13 of China. I have been a Certified Rate of Return Analyst by the Society of Utility  
14 and Regulatory Financial Analysts since 2011.

15

16 ***Q3. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY OR TESTIFIED***  
17 ***BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO?***

18 ***A3.*** Yes. I have submitted expert testimony or testified on behalf of the OCC before  
19 the PUCO in a number of cases. A list of these cases is included in Attachment  
20 DJD-1.

1   ***Q4. HAVE YOU PREVIOUSLY TESTIFIED BEFORE OTHER REGULATORY***  
2   ***AGENCIES AND LEGISLATURES?***

3   ***A4.***   Yes. I have testified before the Illinois Commerce Commission and the  
4           California Legislature on the restructuring and deregulation of electric utilities.

5

6   ***II. PURPOSE AND RECOMMENDATIONS***

7

8   ***Q5. WHAT IS THE PURPOSE OF YOUR TESTIMONY?***

9   ***A5.***   The purpose of my testimony is to explain and support OCC's position regarding  
10           a reasonable rate of return and related issues for The Dayton Power and Light  
11           Company ("DP&L" or "Utility") in its current application for an increase in its  
12           distribution rates.<sup>1</sup> I will explain and support four OCC objections (Objections 6  
13           through 9)<sup>2</sup> to the Staff Report.<sup>3</sup> Based on these objections, I propose three  
14           adjustments to the return on equity ("ROE" or "cost of common equity") and rate  
15           of return ("ROR") recommendations in the Staff Report. I also support the use of  
16           a revised Gross Revenue Conversion Factor proposed by another OCC witness,  
17           Michael L. Brosch.<sup>4</sup> In addition, I will explain why the ROE and ROR proposed

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<sup>1</sup> *In re Application of The Dayton Power and Light Company for an Increase in Elec. Distribution Rates*, Case No. 15-1830-EL-AIR et al., (the "Rate Case"), Application of The Dayton Power and Light Company (Nov. 10, 2015), (the "Application").

<sup>2</sup> Rate Case, Objections to the PUCO Staff's Report of Investigation (Apr. 11, 2018), ("OCC Objections").

<sup>3</sup> Rate Case, The PUCO Staff's Report of Investigation (Mar. 12, 2018), ("Staff Report").

<sup>4</sup> See Rate Case, Direct Testimony of Michael L. Brosch (Apr. 11, 2018).

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1 by DP&L are unreasonable and should not be used in establishing rates paid by  
2 DP&L's customers.

3 **Q6. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

4 **A6.** I recommend that the PUCO adopt OCC's objections and proposed adjustments to  
5 the Staff Report. Specifically, I recommend that the PUCO:

- 6 (1) Adopt an equity risk premium of six percent (instead of 9.55%  
7 proposed in the Staff Report) for the Capital Asset Pricing Model  
8 ("CAPM") analysis in estimating DP&L's return on equity (OCC  
9 Objection 6);
- 10 (2) Remove the added allowance of 0.02017 to the baseline ROE for  
11 generic equity issuance and other costs proposed in the Staff  
12 Report (Objection 7); and
- 13 (3) Adopt a return on equity of 8.55% and a rate of return of 6.84%<sup>5</sup>  
14 (instead of those ROEs and RORs proposed in the Staff Report or  
15 by DP&L) in this proceeding (Objection 8). The calculation of  
16 OCC's recommended rate of return is shown in Table 1.

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<sup>5</sup> 6.84% = (0.5248 \* 5.29%) + (0.4752 \* 8.55%). In other words, this OCC-recommended rate of return assumes the same capital structure and cost of long-term debt used in the Staff Report.

**Table 1  
OCC's Recommended Rate of Return**

	<b>% of Total</b>	<b>Cost Rate (%)</b>	<b>Weighted Cost (%)</b>
<b>Long Term Debt</b>	<b>52.48%</b>	<b>5.29%</b>	<b>2.78%</b>
<b>Common Equity</b>	<b>47.52%</b>	<b>8.55%</b>	<b>4.06%</b>
<b>Total Capital</b>	<b>100%</b>		<b>6.84%</b>

**III. SUMMARY OF RATE OF RETURN ANALYSIS IN THE STAFF REPORT**

***Q7. PLEASE SUMMARIZE THE RATE OF RETURN ANALYSIS IN THE STAFF REPORT.***

**A7.** The Staff Report applied both CAPM and Discounted Cash Flow (“DCF”) analysis to five publicly-traded companies with comparable business and financial risk to those of AES Corporation, the parent of DP&L.<sup>6</sup> The Staff Report estimated DP&L’s ROEs to be 9.808% under CAPM and 9.989% under DCF.<sup>7</sup> The Staff Report then calculated the average of the CAPM and DCF results and assumed a one-hundred basis point range of uncertainty and derived a baseline ROE range of 9.39% to 10.39%. The Staff Report added an additional allowance of 0.02017 to the baseline ROE for some generic and hypothetical equity issuance

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<sup>6</sup> Staff Report at 18. The five companies selected are Alliant Energy (LNT), Pinnacle West (PNW), Scana Corp. (SCG), Sampra Energy (SRE), and WEC Energy Group (WEC).

<sup>7</sup> Staff Report at 19.

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and other costs.<sup>8</sup> The final recommended range of ROE in the Staff Report was 9.59% to 10.61%.

In calculating its recommended rate of return, the Staff Report created a hypothetical capital structure of 52.48% debt and 47.52% common equity and adopted a hypothetical long-term debt cost of 5.29% that was originally proposed by DP&L.<sup>9</sup> Based on these parameters, the Staff Report recommended a range of 7.33% to 7.82% for the rate of return applicable to DP&L in this proceeding. The rate of return and return on equity as proposed in the Staff Report are summarized in Table 2.

**Table 2  
Staff Report's Recommended Rate of Return**

	<b>% of Total</b>	<b>Cost Rate (%)</b>	<b>Weighted Cost (%)</b>
<b>Long Term Debt</b>	<b>52.48%</b>	<b>5.29%</b>	<b>2.78%</b>
<b>Common Equity</b>	<b>47.52%</b>	<b>9.59% - 10.61%</b>	<b>4.56% - 5.04%</b>
<b>Total Capital</b>	<b>100%</b>		<b>7.33% - 7.82%</b>

***Q8. PLEASE COMMENT ON THE CAPITAL STRUCTURE AND COST OF LONG-TERM DEBT ADOPTED IN THE STAFF REPORT.***

***A8.*** Even though I typically use the actual capital structure and embedded cost of long-term debt of a regulated utility in calculating its rate of return, I do not object

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<sup>8</sup> *Id.* The detailed calculation of the adjustment factor of 1.02017 was shown in Schedule D-1.1, Page 1 of 1.

<sup>9</sup> See Staff Report, Schedule D-1, Page 1 of 1.



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1 to the use of a hypothetical capital structure and a hypothetical cost of long-term  
2 debt in the Staff Report. I have reviewed the capital structure and cost of debt of  
3 DP&L, DPL Inc., AES Corporation, and other regulated electric utilities. Based  
4 on this review and my years of experience as a regulatory economist, I believe the  
5 capital structure and cost of long-term debt proposed in the Staff Report for  
6 DP&L are not unreasonable for ratemaking purpose.

7  
8 ***Q9. PLEASE COMMENT ON THE AVERAGE “BETA” AND THE “RISK FREE***  
9 ***RATE” USED IN THE CAPM ANALYSIS OF THE STAFF REPORT.***

10 ***A9.*** I do not object to the Staff Report’s selection of the average “beta” of 0.76 in its  
11 CAPM analysis. According to the Staff Report, this average “beta” is calculated  
12 based on the Value Line betas of the five publicly-traded companies selected for  
13 the comparable group.<sup>10</sup> I do have concerns that these companies selected for the  
14 comparable group have business and financial risks more similar to those of AES  
15 Corporation as opposed to those of DP&L. These companies selected in the Staff  
16 Report, as largely competitive power generators, would tend to have more volatile  
17 earnings and consequently higher “beta” than those companies with similar  
18 business and financial risks to a regulated electric distribution utility such as  
19 DP&L. Nevertheless, I concluded that the average “beta” of 0.76 used in the  
20 CAPM analysis of the Staff Report is not unreasonable in this proceeding.

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<sup>10</sup> Staff Report at 19.

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1 I do not object to the selection of “Risk Free Rate” of 2.55%, either.<sup>11</sup> I am  
2 concerned about the use of the 2015 U.S. Treasury bond yields as a proxy for the  
3 Risk Free Rate because the 2015 financial and economic data may not necessarily  
4 represent the current (2017 to 2018) conditions of the financial market and the  
5 economy. However, the Staff Report is correct in using the actual, not the  
6 projected, yields of long-term US Treasury bonds to calculate the Risk Free Rate  
7 applicable in its CAPM analysis. The Staff Report used the average of the yields  
8 of 10-year and 30-year US Treasury bonds in calculating the Risk Free Rate.<sup>12</sup>  
9 This is a commonly-used method in calculating the Risk Free Rate for the CAPM  
10 analysis by financial analysts. This same definition and calculation of Risk Free  
11 Rate was also used in the Staff Reports of many previous rate cases in Ohio.  
12  
13 To further examine the validity of the Risk Free Rate of 2.55% adopted in the  
14 Staff Report, I reviewed the current yields (2017 to 2018) of the U.S. Treasury  
15 bonds compiled by the U.S. Department of the Treasury.<sup>13</sup> The actual daily yields  
16 of U.S. Treasury bonds are generally in the range of 2.30% to three percent for the  
17 period of January 1, 2017 to December 31, 2017. The daily yields data are  
18 included here as Attachment DJD-2. Based on my review, I concluded that the  
19 2.55% Risk Free Rate selected in the Staff Report, even though it was based on

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<sup>11</sup> Staff Report at 19 and Schedule D-1.3, Page 8 of 8.

<sup>12</sup> Staff Report at 19.

<sup>13</sup> <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2017>.

1 the 2015 financial data, was not unreasonable for use in the CAPM analysis of  
2 this proceeding.

3

4 ***Q10. PLEASE COMMENT ON THE DCF ANALYSIS IN THE STAFF REPORT.***

5 ***A10.*** I do not object to the method and results of the DCF analysis in the Staff Report.<sup>14</sup>

6 The DCF methodology used in the Staff Report is similar to those DCF analyses  
7 used in the Staff Reports of many previous rate cases in Ohio. As discussed  
8 above, I do have some concerns about the use of the 2015 financial and economic  
9 data and the selection of a comparable group of companies with financial and  
10 business risks similar to those of a competitive power generator such as AES  
11 Corporation. But I believe these concerns do not rise to the level to make the  
12 results of the DCF analysis in the Staff Report unreasonable.

13

14 **IV. OBJECTIONS AND PROPOSED ADJUSTMENTS TO THE STAFF**  
15 **REPORT**

16

17 ***Q11. WHAT ARE THE REGULATORY PRINCIPLES COMMONLY USED IN***  
18 ***SETTING A REASONABLE RATE OF RETURN FOR A REGULATED***  
19 ***UTILITY SUCH AS DP&L?***

20 ***A11.*** The regulatory principles in setting a reasonable rate of return and return on  
21 common equity for a regulated utility in the United States are well-established and

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<sup>14</sup> Staff Report at 19 and Schedule D-1.4, Page 7 of 7.

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1 recognized. Because I will refer to these regulatory principles frequently later in  
2 my testimony, they are summarized here. These regulatory principles include the  
3 following:

- 4 (1) The resulting rates (as set based on the authorized rate of return  
5 and return on equity) paid by the customers of the regulated utility  
6 should be just and reasonable;
- 7 (2) The regulated utility should have funds available to continue its  
8 normal course of business;
- 9 (3) The regulated utility should have access to capital (both equity and  
10 debt) at reasonable cost under current market conditions; and
- 11 (4) The shareholders of the regulated utility should be provided the  
12 opportunity (but not a guarantee) to earn a fair (but not excessive)  
13 return on their invested capital in comparison to other available  
14 similar investments.

15  
16 **OCC OBJECTION 6**

17  
18 ***Q12. PLEASE EXPLAIN OCC OBJECTION 6.***

19 ***A12.*** As discussed above, I do not object to the selection of the average “beta” of 0.76  
20 and the Risk Free Rate of 2.55% used in the CAMP analysis of the Staff Report.  
21 However, I do object to the selection of the “equity risk premium” of 9.55% used  
22 in the CAPM analysis of the Staff Report. The Staff Report did not explicitly use  
23 the word “equity risk premium” or “market risk premium” in describing its

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1 CAPM analysis. But it is clear from the CAPM formula used in the Staff Report  
2 that the 9.55% (calculated as the difference between 12.1% and 2.55% in the  
3 formula used) is the “equity risk premium” or “market risk premium” selected for  
4 the CAPM analysis.<sup>15</sup>

5  
6 This 9.55% equity risk premium used in the CAPM analysis of the Staff Report is  
7 overstated and unreasonable. This 9.55% equity risk premium should be reduced  
8 to be consistent with the commonly-accepted definition and methodology of  
9 “equity risk premium” used in the CAPM analysis and the established practices in  
10 many PUCO Staff Reports of previous electric and gas distribution rate cases in  
11 Ohio. This unreasonably high equity risk premium of 9.55%, if adopted by the  
12 PUCO, will unreasonably increase the authorized rate of return, the revenue  
13 requirement to be collected by DP&L, and the charges paid by DP&L’s  
14 customers.

15

16 ***Q13. WHY IS THE EQUITY RISK PREMIUM OF 9.55% USED IN THE STAFF***  
17 ***REPORT OVERSTATED AND UNREASONABLE?***

18 ***A13.*** In the CAPM analysis of the Staff Report, the risk premium of 9.55% was  
19 calculated as the difference between the annual total return of large company  
20 stocks from 1926 to 2014 (12.1%) and the U.S. Treasury bond yields of 2015  
21 (2.55%). In other words, the average U.S. Treasury bond yield of a single year

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<sup>15</sup> Staff Report at 19 and Schedule D-1.3, Page 8 of 8.

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1 (2015) is used as a proxy of the risk-free rate (or more correctly the “return on  
2 risk-free assets”) in determining the equity risk premium.

3 The Staff Report’s use of a single year government bond yield for a proxy of the  
4 “return on risk-free assets” or “risk-free rate” is inconsistent with the established  
5 definition and methodology of calculating the equity risk premium used in the  
6 CAPM analysis. This unusual method used in this particular Staff Report to  
7 calculate the 9.55% equity risk premium is also inconsistent with the  
8 methodology adopted in many Staff Reports of previous electric and gas  
9 distribution rate cases in Ohio.

10

11 A reasonable and commonly accepted proxy for the “return on risk-free assets” or  
12 “risk-free rate” in calculating the equity risk premium for CAPM analysis is the  
13 average annual total return of U.S. Treasury bond yields over an extended period  
14 of time. After all, the Staff Report used the annual total return of large company  
15 stocks over an extended period of time (1926 to 2014) as the “market risk rate.”<sup>16</sup>

16 Then the Staff Report should use the annual total return of government bonds  
17 over the same period of time (1926 to 2014) as the “return of risk-free assets” or  
18 “risk-free rate” in calculating the equity risk premium. It is unreasonable to  
19 compare the total return of large company stocks over an extended period of time  
20 with the yield of government bonds for a single year.

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<sup>16</sup> Staff Report at 19 and *Ibbotson SBBI 2015 Classic Yearbook*, Table 2.1, Morningstar Inc., Chicago, Illinois 2015.

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1 DP&L's own witness, Dr. Roger A. Morin, did not use this atypical method used  
2 in the Staff Report in calculating the equity risk premium. He adopted the widely  
3 accepted definition and methodology of calculating the equity risk premium or  
4 "market risk premium" as the difference between the annual returns of investing  
5 in common equity versus investing in risk-free assets such as long-term  
6 government bonds. Dr. Morin proposed an equity risk premium (or Market Risk  
7 Premium used in his testimony) of 7.2% in his CAPM analysis in this case<sup>17</sup>. It is  
8 far less than the 9.55% equity risk premium proposed in the Staff Report.

9  
10 The calculation of equity risk premium as the difference between the expected  
11 annual total returns investing in common equity versus investing in risk-free  
12 assets such as government bonds over an extended period of time has also been  
13 accepted and adopted in most (if not all) past PUCO Staff Reports of electric and  
14 gas distribution rate cases. One of those cases is the Duke electric distribution  
15 rate case, PUCO Case No. 17-0032-EL-AIR et al. pending before the PUCO.<sup>18</sup> In  
16 the Staff Report of that Duke electric rate case, an equity risk premium of seven  
17 percent was proposed in the Staff Report for its CAPM analysis. The Staff Report  
18 in that case indicated that the equity risk premium used in the CAPM analysis was  
19 calculated as the "derived spread of arithmetic means total returns between large

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<sup>17</sup> Rate Case, Direct Testimony of Dr. Roger A. Morin (November 30, 2015) at 37.

<sup>18</sup> PUCO Case No. 17-0032-EL-AIR et al. Staff Report (September 26, 2017) at 18.

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company stocks (12.1%) and long-term government bonds (i.e., ‘risk free return;’  
5.1%).”<sup>19</sup>

The Staff Report in this proceeding does not explain why it uses this atypical,  
untested, and flawed method of calculating the equity risk premium.

A summary of the equity premium proposed by OCC, the Staff Report, and the  
regulated utilities in recent Ohio electric and gas distribution rate cases is  
provided in Table 3. It is clear from Table 3 that the 9.55% equity risk premium  
proposed in the Staff Report of this case is an outlier. It is overstated and  
unreasonably high in light of the equity risk premiums that have been  
recommended in recent electric and gas rate cases in Ohio.

**Table 3  
Equity Risk Premium Proposed by Utility, PUCO Staff Report, and OCC  
In Recent Ohio Electric and Gas Rate Cases**

Case No.	Utility	Proposed Equity Risk Premium		
		OCC	Staff Report	Utility
15-1830-EL-AIR	DP&L	6%	9.55%	7.2%
Electric Distribution Case				
17-0032-EL-AIR	Duke	6%	7%	7%
12-1682-EL-AIR	Duke	4.9%	5.7%	7.7%
07-0551-EL-AIR	Ohio Edison	4.6% -6.5%	6.5%	6.5% -8%
Gas Distribution Case				
12-1685-GA-AIR	Duke	4.9%	5.7%	7.7%
08-0072-GA-AIR	Columbia	4.57%	6.5%	5.25%
07-0829-GA-AIR	East Ohio Gas	4.65%	6.5%	6.5% - 8%
07-0589-GA-AIR	Duke	4.6% - 6.5%	6.5%	7.4%
07-1080-GA-AIR	Vectren	5.7% - 6.4%	6.5%	6.92%

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<sup>19</sup> *Id.*



1   ***Q14. WHAT IS YOUR RECOMMENDED EQUITY RISK PREMIUM FOR THE***  
2           ***CAPM ANALYSIS IN ESTIMATING THE RETURN ON EQUITY OF DP&L***  
3           ***IN THIS PROCEEDING?***

4   ***A14.*** I have reviewed recent financial data regarding the long-term market returns of  
5           different classes of assets (equity, government bonds, and corporate bonds) for the  
6           period of 1926 through the end of 2016. Based on the results compiled in the  
7           *Duff & Phelps 2017 SBBI Yearbook* (which is a re-named update to the *Ibbotson*  
8           *SBBI 2015 Classical Yearbook* cited in the Staff Report), I would recommend an  
9           equity risk premium of six percent to be used for the CAPM analysis in estimating  
10          the return on equity of DP&L at this time. This recommendation is based largely  
11          on a comparison of the arithmetic mean of the annual total return of 12% for  
12          Large-Cap Stocks and of six percent for long-term government bonds for the  
13          period of 1926 to 2016.<sup>20</sup> This recommendation is also consistent with my  
14          understanding of the equity risk premium proposed by other financial analysts in  
15          recent proceedings involved the estimation of return on equity and rate of return  
16          before the PUCO.

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<sup>20</sup> *Duff & Phelps 2017 SBBI Yearbook* at 2-6, Exhibit 2.3, John Wiley & Sons, Inc. Hoboken, New Jersey, 2017. Page 2-5 to 2-7 is included here as Attachment DJD-3.

1   **OCC OBJECTION 7**

2

3   ***Q15. PLEASE EXPLAIN OCC OBJECTION 7.***

4   ***A15.*** The Staff Report proposed an added allowance of 0.02017 applicable to the  
5       estimated baseline ROE to account for hypothetical equity issuance and other  
6       costs.<sup>21</sup> This proposed added allowance of 0.02017 is based on a generic equity  
7       issuance and other costs allowance of 3.5% proposed in the Staff Report and  
8       DP&L's external funding ratio calculated from the retained earnings and common  
9       equity data filed by DP&L.<sup>22</sup> By including this additional allowance, the Staff  
10      Report increased the recommended ROE from a range of 9.39% to 10.39% to a  
11      range of 9.59% to 10.61%. I do not support this added allowance to the estimated  
12      baseline ROE for hypothetical and generic equity issuance and other costs as  
13      proposed in the Staff Report. This added allowance to the estimated baseline  
14      ROE in the Staff Report is unnecessary and unreasonable. This added allowance,  
15      if adopted by the PUCO, will unreasonably increase the authorized rate of return,  
16      the revenue requirement to be collected by DP&L, and the charges paid by  
17      DP&L's customers.

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<sup>21</sup> Staff Report at 19.

<sup>22</sup> Staff Report, Schedule D-1.1, Page 1 of 1.

**Q16. WHY IS THIS ADDED ALLOWANCE FOR EQUITY ISSUANCE AND  
OTHER COSTS TO THE ESTIMATED BASELINE ROE  
UNREASONABLE?**

**A16.** First, even if an adjustment for equity issuance and other costs were allowed, there is no actual cost basis to support an added allowance factor of 0.02017 to the estimated baseline return on equity. There is no demonstration in the Staff Report or in the Application that DP&L is likely to incur the 3.5% equity issuance and other costs in the near future or the magnitude of these costs. In this proceeding, the PUCO Staff simply uses a generic “addor” of 3.5% as a proxy for the estimated or hypothetical amount of equity issuance and other costs.

Second, and more importantly, the added allowance for equity issuance and other costs to an estimated baseline ROE is contrary to established regulatory principles of setting a reasonable rate of return for a regulated utility. The addition of this allowance to the baseline ROE reflects a mischaracterization of the purpose and function of setting a reasonable ROE for a regulated utility.

The purpose of setting a reasonable return on equity and a reasonable rate of return for a regulated utility is not to authorize a regulated utility to collect from customers previously incurred costs associated with issuing equity. The purpose of an authorized ROE is to provide the investors an opportunity to earn a currently-determined return on invested capital that is comparable to the returns that can be earned by the investors from alternative investments with similar risk.

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1       The equity issuance and other costs that might have occurred, if any, are already  
2       reflected in the market prices of common stock, per share earnings and dividend  
3       projections, and any other market factors of those electric utilities selected in the  
4       proxy group for estimating the ROE of DP&L. There is no need to make an  
5       additional equity issuance and other costs allowance as proposed in the Staff  
6       Report.

7

8       ***Q17. WHAT DO YOU RECOMMEND REGARDING THIS ADDED ALLOWANCE***  
9       ***FOR EQUITY ISSUANCE AND OTHER COSTS TO THE ESTIMATED***  
10       ***BASELINE ROE IN THIS PROCEEDING?***

11       ***A17.*** I recommend that the PUCO not adopt this added allowance to the estimated  
12       baseline ROE for the hypothetical and generic equity issuance and other costs.

13

14       **OCC OBJECTION 18**

15

16       ***Q18. PLEASE EXPLAIN OCC OBJECTION 8.***

17       ***A18.*** The Staff Report recommended a range of ROE of 9.59% to 10.61% and a range  
18       of ROR of 7.33% to 7.82%.<sup>23</sup> Based on the recommended ranges, the midpoint  
19       ROE would be 10.10% and the midpoint ROR 7.58%. I object to the  
20       recommended range of ROE and ROR in the Staff Report. As discussed above,  
21       both the ROE and ROR recommended in the Staff Report were derived from

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<sup>23</sup> Staff Report, 18-19.

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1       unreasonable data and methodology, particularly the use of an unreasonably high  
2       equity risk premium and an added allowance for unsubstantiated equity issuance  
3       and other costs.

4  
5       In addition, the rate of return and return on equity recommended in the Staff  
6       Report were considerably higher than the average rate of return and return on  
7       equity authorized for electric distribution utilities nationwide in recent years. For  
8       example, the average ROE authorized for the 12 delivery-only electric utilities  
9       (similar to DP&L) in rate cases decided nationwide in 2016 was 9.31%.<sup>24</sup> The  
10      average ROE authorized for the 14 delivery-only electric utilities in rate case  
11      decided in 2017 was 9.43%.<sup>25</sup> The average authorized ROEs for distribution-only  
12      cases decided in 2016 and 2017 are lower than the low bound (9.59%) of the  
13      recommended range of ROE in the Staff Report.

14  
15      Similarly, the average authorized rate of return for distribution-only electric  
16      utilities in cases decided in 2016 was 7.39%<sup>26</sup> and 7.31% for cases decided in  
17      2017.<sup>27</sup> They were below or slightly above the low bound (7.33%) of the  
18      recommended range of ROR in the Staff Report. The average authorized rate of

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<sup>24</sup> Regulatory Research Associates, *Regulatory Focus: Major Rate Case Decisions – January-December 2016* at 6 (January 18, 2017) (Attachment DJD-4).

<sup>25</sup> Regulatory Research Associates, *Regulatory Focus: Major Rate Case Decisions 2017* (January 30, 2018) at 7 (Attachment DJD-5).

<sup>26</sup> Attachment DJD-4 at 8-9.

<sup>27</sup> Attachment DJD-5 at 9-11.

1 return for all 48 electric utilities rate cases decided in 2017 was even lower at  
2 7.18%.<sup>28</sup>

3

4 ***Q19. WHY SHOULD THE PUCO CONSIDER THE AVERAGE RETURN ON***  
5 ***EQUITY AND RATE OF RETURN AUTHORIZED FOR DELIVERY-ONLY***  
6 ***ELECTRIC UTILITIES IN RECENT YEARS IN DECIDING THE RATE OF***  
7 ***RETURN FOR DP&L IN THIS PROCEEDING?***

8 ***A19.*** As discussed above, one of the basic principles in setting a reasonable return on  
9 equity and rate of return for a regulated utility is to set an ROE or an ROR so that  
10 an ordinary investor could earn a return from investing in this regulated utility  
11 comparable to the returns he or she expects to earn from other investments with  
12 similar risk. If such a comparable ROE or ROR is authorized by the regulatory  
13 agency, the regulated utility, in this case DP&L, will be afforded an opportunity  
14 to attract capital at reasonable terms, to maintain its financial integrity, and to  
15 have funds available to conduct its regular business of providing utility services.  
16 In this respect, the average ROE and ROR authorized in recent years in Ohio and  
17 other jurisdictions for delivery-only electric utilities will be an important and  
18 useful “yardstick” in determining if any proposed ROE or ROR by the parties is  
19 reasonable for setting the rates charged by DP&L.

20

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<sup>28</sup> Attachment DJD-5 at 6.

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1       The PUCO has expressed a similar view regarding the consideration of the  
2       average reported ROE and ROR for comparable utilities in the past. For example,  
3       in its Opinion and Order approving an electric security plan for AEP Ohio, the  
4       PUCO stated:

5                "We agree with Walmart and OCC that AEP Ohio's requested  
6                ROE is too high, as gauged by comparison with the average  
7                reported ROE for comparable utilities since 2012 (Walmart Ex.1 at  
8                9-10)."<sup>29</sup>

9  
10       Furthermore, financial analysts have advocated in the past the use of authorized  
11       ROEs of comparable utilities in setting a reasonable return on equity for a  
12       regulated utility. Indeed, DP&L's own witness, Dr. Roger A. Morin, used this  
13       approach in Duke Energy Ohio's last electric distribution case (PUCO Case No.  
14       12-1682-EL-AIR et al.):

15               I believe that Staff's recommended ROE range of 8.82% - 9.84%  
16               with a midpoint of 9.33% lies outside the zone of currently  
17               authorized rates of return for electric utilities in the United States.  
18               Currently allowed returns, while certainly not a precise indication  
19               of any individual company's cost of equity capital, are nevertheless  
20               important determinants of investor growth perceptions and  
21               investor-expected returns. They also serve to provide some

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<sup>29</sup> PUCO Case No. 13-2385-EL-SSO, Opinion & Order, 84 (Feb. 25, 2015).

perspective on the validity and reasonableness of Staff's  
recommendation.<sup>30</sup>

Finally, based on my own knowledge and experience as a regulatory economist, I believe the average ROEs and RORs authorized for distribution-only electric utilities in rate cases decided in recent years in Ohio and other jurisdictions can and should be considered by the PUCO in evaluating if the proposed ROE and ROR for DP&L in the Staff Report is reasonable.

***Q20. WHAT IS THE AVERAGE RETURN ON EQUITY AND RATE OF RETURN  
AUTHORIZED FOR DELIVERY-ONLY ELECTRIC UTILITIES  
NATIONWIDE IN RECENT YEARS?***

***A20.*** The average ROEs authorized for distribution-only electric utilities (similar to DP&L) within the last five years, as compiled and reported in a lead utility industry publication, were all below 9.59% (the low bound of the range of ROE recommended in the Staff Report). See Table 4.

**Table 4  
Average and Median ROEs Authorized for  
Distribution-Only Electric Utility (2013 -2017)<sup>31</sup>**

Year	Average ROE (%)	Median ROE (%)	Number of Observations
2013	9.41	9.36	9
2014	9.50	9.55	13

<sup>30</sup> PUCO Case No. 12-1682-EL-AIR, Supplemental Direct Testimony of Dr. Roger A. Morin at 3 (Feb. 19, 2013).

<sup>31</sup> See Attachment DJD-5, 7.



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2015	9.23	9.07	6
2016	9.31	9.33	12
2017	9.43	9.55	14

More specifically, the return on equity and rate of return authorized for distribution-only electric utilities for the 12 rate cases decided in 2016 are summarized in Table 5.<sup>32</sup> These individual cases are arranged according to the dates the cases were decided. A review of Table 5 would indicate that all the authorized ROEs in delivery-only electric rate cases decided in 2016 were lower than the midpoint ROE of 10.10% recommended in the Staff Report. Similarly, the rate of return authorized for the distribution-only electric utilities in those cases decided in 2016 (with the exception of one rate case) were below or at the midpoint (7.58%) of the range of rate of return recommended in the Staff Report. In five out of a total of 12 cases, the ROR is even lower than the low bound (7.33%) of the recommended range of rate of return in the Staff Report.

**Table 5  
Distribution-Only Electric Utility Decisions in 2016**

<b>Date</b>	<b>Company</b>	<b>State</b>	<b>ROE authorized (%)</b>	<b>ROR authorized (%)</b>
4/29/2016	Fitchburg Gas and Electric	MA	9.80	8.46
6/3/2016	Baltimore Gas and Electric	MD	9.75	7.28
6/15/2016	New York State Electric and Gas	NY	9.00	6.68
6/15/2016	Rochester Gas and Electric	NY	9.00	7.55
8/24/2016	Atlantic City Electric	NJ	9.75	7.64
9/30/2016	Massachusetts Electric	MA	9.90	7.58

<sup>32</sup> See Attachment DJD-4, 8-9.

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11/15/16	Potomac Electric Power	MD	9.55	7.49
12/6/2016	Commonwealth Edison	IL	8.64	6.71
12/6/2016	Ameren Illinois	IL	8.64	7.28
12/12/2016	Jersey Central Power & Light	NJ	9.60	7.47
12/14/2016	United Illuminating Company	CT	9.10	7.08
12/19/2016	Emera Maine	ME	9.00	7.45
<b>Average</b>			<b>9.31</b>	<b>7.39</b>

1  
2 A summary of the rate of return and return on equity of the 14 rate cases for  
3 distribution-only electric utilities decided in 2017 is provided in Table 6.<sup>33</sup> A  
4 review of Table 6 would indicate that all the authorized ROEs in distribution-only  
5 rate cases decided in 2017 were below the midpoint ROE (10.10%) of the range  
6 recommended in the Staff Report. For a large majority of the cases (ten out of a  
7 total of 14), the authorized ROEs were near or below the low bound (9.59%) of  
8 the ROE range recommended in the Staff Report. A review of the ROR  
9 authorized in cases decided in 2017 would indicate a similar result.

**Table 6  
Distribution-Only Electric Utility Decisions in 2017**

<b>Date</b>	<b>Company</b>	<b>State</b>	<b>ROE authorized (%)</b>	<b>ROR authorized (%)</b>
1/24/2017	Consolidated Edison Co. of NY	NY	9.00	6.82
2/15/2017	Delmarva Power & Light Company	MD	9.60	6.74
2/22/2017	Rockland Electric Company	NJ	9.60	7.47
4/12/2017	Liberty Utilities (Granite State Electric)	NH	9.40	7.64
4/20/2017	Unitil Energy Systems, Inc.	NH	9.50	8.34
5/23/2017	Delmarva Power & Light Company	DE	9.70	--

<sup>33</sup> Attachment DJD-5, 9-11.

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7/24/2017	Potomac Electric Power Company	DC	9.50	7.46
9/22/2017	Atlantic City Electric Company	NJ	9.60	7.60
9/28/2017	Oncor Electric Delivery Company LLC	TX	9.80	7.44
10/20/2017	Potomac Electric Power Company	MD	9.50	7.43
11/30/2017	NSTAR Electric Company	MA	10.00	7.33
11/30/2017	Western Massachusetts Electric Company	MA	10.00	7.26
12/6/2017	Ameren Illinois Company	IL	8.40	7.04
12/6/2017	Commonwealth Edison Company	IL	8.40	6.47
<b>Average</b>			<b>9.43</b>	<b>7.31</b>

***Q21. HAS DP&L DEMONSTRATED ANY DISTINCT AND ADDITIONAL FINANCIAL AND BUSINESS RISKS THAT JUSTIFY A HIGHER RETURN ON EQUITY OR RATE OF RETURN THAN THOSE AUTHORIZED NATIONWIDE IN RECENT YEARS?***

***A21.*** No. I am not aware of any unusual and additional financial and business risks associated with DP&L at this time that differentiate it from the U.S. electric utilities as a group. DP&L has not demonstrated that it currently has significantly higher business and financial risks than the average electric distribution utilities to justify a higher authorized rate of return or return on equity. To the contrary, given the favorable riders and subsidies approved by the PUCO in DP&L's current Electric Security Plan ("ESP")<sup>34</sup> and the positive effects on DP&L's credit and financial positions from the approved ESP,<sup>35</sup> DP&L's authorized rate of

<sup>34</sup> PUCO Case No. 16-395-EL-SSO et al., Opinion and Order (October 20, 2017).

<sup>35</sup> See, for example, Moody's Investor Service, *Rating Action: Moody's affirms ratings of DPL and DP&L; changes outlooks to positive* (October 31m 2017).

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1 return and return on common equity to be decided in this rate case should be on  
2 the lower end of the returns authorized for electric utilities nationwide in recent  
3 years.

4  
5 Specifically, in the current ESP, DP&L has started collecting a so-called  
6 Distribution Modernization Rider (“DMR”) of approximately \$105 million per  
7 year for three years since November 1, 2017.<sup>36</sup> With PUCO approval, the DMR  
8 can be extended for an additional two years with the amount of DMR to be  
9 determined. The revenues collected through DMR are essentially free money to  
10 DP&L because the rider does not support local distribution costs. That is, DMR  
11 revenues are not required to be tied to any underlying cost incurred by DP&L.  
12 There is no requirement that DP&L needs to make any capital expenditure or to  
13 incur operating expense in order to collect the DMR. The DMR is a material cash  
14 infusion to DP&L and ultimately DPL, Inc. It is clear the DP&L’s financial  
15 position, which is already reasonably healthy before the collection of DMR, has  
16 been further enhanced by the ESP approved in 2017. There is no justification for  
17 the PUCO to authorize a rate of return and return on equity that are significantly  
18 higher than those being authorized in recent electric rate cases nationwide.

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<sup>36</sup> PUCO Case No. 16-395-EL-SSO et al., Opinion and Order at 5-7.

1   **OCC OBJECTION 9**

2

3   ***Q22. PLEASE EXPLAIN OCC OBJECTION 9.***

4   **A22.** I object to the Staff Report's proposed ranges of rate of return (7.33% to 7.82%)  
5           and return on equity (9.59% to 10.61%) because they are misleading and they  
6           understate the ROR and ROE that DP&L would be allowed to earn under the  
7           proposed revenue requirement. In calculating the Revenue Deficiency, Revenue  
8           Increase Recommended, and Revenue Requirements, the Staff Report used a  
9           Gross Revenue Conversion factor of 1.549732.<sup>37</sup> This Gross Revenue Conversion  
10          Factor of 1.549732 is, in turn, based on the gross-up of a 35% Federal Income  
11          Tax, Ohio Municipal Income Tax, and Commercial Activities Tax.<sup>38</sup> As  
12          recommended by OCC witness Brosch, a revised Gross Revenue Conversion  
13          Factor of 1.275097, which properly reflect the lower Federal Income Tax of 21%  
14          that has been in effect since January 1, 2018 should be used in grossing-up the  
15          Revenue Requirements for DP&L. By not using the appropriate Gross Revenue  
16          Conversion Factor, the Staff Report presents a Revenue Requirement or  
17          Recommended Revenue Increase that is overstated even at the ROR and ROE  
18          proposed in the Staff Report. An overstated Revenue Requirement or  
19          Recommended Revenue Increase, even at the Staff Report's proposed ROR and  
20          ROE, will in turn allow DP&L to earn a significantly higher rate of return than the  
21          range of 7.33% to 7.82% indicated in the Staff Report.

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<sup>37</sup> Staff Report, Schedule A-1, Page 1 of 1.

<sup>38</sup> Staff Report, Schedule A-2, Page 1 of 1.

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1 My calculation, as detailed later in my testimony, would indicate that the Staff  
2 Report's Recommended Revenue Increase (based on a Gross Revenue  
3 Conversion Factor of 1.549772) would allow DP&L to effectively earn an after-  
4 tax rate of return of 8.91% to 9.21% and a return on equity of 12.90% to 13.54%.

5

6 ***Q23. PLEASE EXPLAIN WHY THE USE OF A GROSS REVENUE***  
7 ***CONVERSION FACTOR OF 1.549732 IN THE STAFF REPORT WILL***  
8 ***ALLOW DP&L TO EARN A MUCH HIGHER RATE OF RETURN AND***  
9 ***RETURN ON EQUITY THAN THOSE INDICATED IN THE STAFF***  
10 ***REPORT.***

11 ***A23.*** I will use the same data contained in Schedule A-1 of the Staff Report to illustrate  
12 the effects of using a Gross Revenue Conversion Factor of 1.549732 on the  
13 allowed rate of return that can actually be earned by DP&L. I will use the same  
14 Rate Base, Requested (or Proposed) Rate of Return, and Revenue Requirements  
15 proposed in the Staff Report Schedule A-1 for my analysis. However, this does  
16 not mean that I support or agree with those items proposed in the Staff Report.  
17 All the proposed adjustments by OCC in this proceeding, other than those related  
18 to rate of return and return on equity, are addressed by other OCC witness.

19

20 Based on a Rate Base of \$642,828,367 and a proposed rate of return of 7.33% (the  
21 lower bound of the ROR range in the Staff Report), the Required Operating  
22 Income will be \$47,119,319.

23 
$$\$47,119,319 = \$642,828,367 * 7.33\%$$

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1 Using a Gross Revenue Conversion Factor of 1.549732, the Revenue for Required  
2 Operating Income (excluding the revenue required to cover the operating and  
3 maintenance, and other expenses that do not require gross-up) will be  
4 \$73,022,316.

5 
$$\$73,022,316 = \$47,119,319 * 1.549732$$

6 This amount is equal to the Revenue Increase recommended in Schedule A-1 plus  
7 the grossed-up of Current Operating Income.

8 
$$\$73,022,316 = \$23,230,037 + (\$32,129,607 * 1.549732)$$

9 However, with a revised Gross Revenue Conversion Factor of 1.275097, the  
10 Required Operating Income that being supported by the Revenue Requirement of  
11 \$73,022,316 will be \$57,268,049 (instead of \$47,119,319 in the Staff Report).

12 
$$\$57,268,049 = \$73,022,316 / 1.275097$$

13 In other words, using the Revenue Requirements proposed in the Staff Report,  
14 DP&L will actually earn a much higher operating income after deducting the  
15 provisions for a lower federal income taxes and other tax-related expenses.

16 The Rate of Return corresponding to the Operating Income of \$57,268,049 will be  
17 8.91% (instead of 7.33% presented in the Staff Report).

18 
$$8.91\% = \$57,268,049 / \$642,828,367$$

19 Assuming the same capital structure (52.48% of long-term debt and 47.52%  
20 equity) and cost of long-term debt (5.29%), the Return on Equity corresponding to  
21 the Rate of Return of 8.91% will be 12.90%.

22 
$$12.90\% = (8.91\% - (0.5248 * 5.29\%)) / 0.4752$$

1 ***Q24. PLEASE SUMMARIZE YOUR ANALYSIS OF THE INCREASE IN***  
2 ***ALLOWED RATE OF RETURN AND RETURN ON EQUITY OF DP&L***  
3 ***RESULTING FROM THE STAFF REPORT'S FAILURE OF USING AN***  
4 ***ACCURATE GROSS REVENUE CONVERSION FACTOR.***

5 ***A24.*** By applying the same methodology, I described above, I can calculate the “real”  
6 or “effective” allowed Rate of Return and Return on Equity for DP&L based on  
7 the revenue requirements and recommended revenue increases presented in the  
8 Staff Report. In summary, by not adopting a revised Gross Revenue Conversion  
9 Factor of 1.275097 (as recommended by OCC) in calculating the Revenue  
10 Requirements or the Recommended Revenue Increase, the Staff Report is actually  
11 recommending a much higher range of Rate of return (8.91% to 9.50% with a  
12 midpoint of 9.21%) for DP&L. Similarly, the Staff Report is actually  
13 recommending a much higher range of Return on Equity (12.90% to 14.10% with  
14 a midpoint of 13.54%) than the ROE range of 9.59% to 10.61% represented in the  
15 Staff Report. See Table 7.



**Table 7**  
**Effects of Not Revising Gross Revenue Conversion Factor**  
**On Staff Report's Proposed Rate of Return and Return on Equity**

Line	Item	Staff Proposed Rate of Return		
		Lower Bound	Upper Bound	Midpoint
1				
2	Rate Base	\$642,828,367	\$642,828,367	\$642,828,367
3	<b>Rate of Return Presented in Staff Report</b>	<b>7.33%</b>	<b>7.82%</b>	<b>7.58%</b>
4	Corresponding Return on Equity in the Staff Report	9.59%	10.61%	10.10%
5	Required Operating Income (Line 2 * Line 3)	\$47,119,319	\$50,269,178	\$48,726,390
6	Gross Revenue Conversion Factor in the Staff Report	1.549732	1.549732	1.549732
7	Revenue for Required Operating Income (Line 5 * Line 6)	\$73,022,317	\$77,903,754	\$75,512,846
8	Revised (Effective) Gross Revenue Conversion Factor	1.275097	1.275097	1.275097
9	Revised (Effective) Operating Income (Line 7 / Line 8)	\$57,268,049	\$61,096,336	\$59,221,256
10	<b>Revised (Effective) Rate of Return (Line 9 /Line 2)</b>	<b>8.91%</b>	<b>9.50%</b>	<b>9.21%</b>
11	Revised (Effective) Return on Equity	12.90%	14.15%	13.54%

***Q25. IS IT REASONABLE TO ALLOW DP&L TO HAVE SUCH A HIGH RATE OF RETURN AND RETURN ON EQUITY?***

***A25.*** No. The “real” or “effective” rate of return and return on equity resulting from not updating the Gross Revenue Conversion Factor, as shown in Table 7, are even

1 more overstated and unreasonable than those ROR and ROE presented in the Staff  
2 Report. There is simply no valid reason for the PUCO to authorize such a high  
3 rate of return or return on equity for DP&L when the average ROR authorized for  
4 distribution-only electric utilities was approximately 7.31% nationwide in 2017  
5 and the average ROE was approximately 9.43%.

6

7 ***Q26. IS THE REVISION OF THE GROSS REVENUE CONVERSION FACTOR***  
8 ***THE ONLY ADJUSTMENTS RELATED TO THE REDUCTION IN***  
9 ***FEDERAL INCOME TAX IN CALCULATING THE REVENUE***  
10 ***REQUIREMENT FOR DP&L IN THIS PROCEEDING?***

11 **A26.** No. First of all, I am not the OCC witness addressing the calculation of a  
12 reasonable revenue requirement for DP&L in my testimony. Other OCC  
13 witnesses will address all the adjustments, other than rate of return, proposed by  
14 OCC in this proceeding. Based on their analysis, I understand there are several  
15 additional adjustments related to the reduction in federal corporate income tax  
16 rate from 35% to 21%.

17

18 **V. OCC'S PROPOSED RATE OF RETURN**

19

20 ***Q27. PLEASE SUMMARIZE OCC'S PROPOSED ADJUSTMENTS TO THE***  
21 ***RATE OF RETURN ANALYSIS IN THE STAFF REPORT.***

22 **A27.** Based on the OCC objections discussed above, I propose three adjustments (two  
23 addressing issues related to the data and methodology used and one on the overall

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1 rate of return recommendation) to the rate of return analysis in the Staff Report.

2 These OCC-proposed adjustments are:

- 3 (1) To adopt an “equity risk premium” of six percent for the CAPM  
4 analysis;
- 5 (2) To remove the added allowance of 0.02017 to the baseline ROE for  
6 generic equity issuance and other costs; and
- 7 (3) To adopt a return on equity of 8.55% and a rate of return of 6.84%  
8 for DP&L’s electric distribution services in this proceeding.

9

10 ***Q28. PLEASE EXPLAIN OCC’S RECOMMENDED RETURN ON EQUITY AND***  
11 ***RATE OF RETURN.***

12 ***A28.*** As discussed earlier, I accept the capital structure, the costs of long-term debt, and  
13 the results of the DCF model proposed in the Staff Report. If my proposed  
14 adjustment to the equity risk premium is adopted, the CAPM-derived ROE would  
15 be reduced from 9.808% to 7.11%.

16 
$$7.11\% = 2.55\% + (0.76 * 6.00\%).$$

17 The estimated baseline return on equity would be 8.55%, which is the average of  
18 the CAPM result (7.11%) and DCF result (9.989%).

19 
$$8.55\% = (0.5 * 7.11\%) + (0.5 * 9.989\%).$$

20 If my proposed elimination of the added allowance for the equity issuance and  
21 related costs is accepted, the OCC-proposed baseline ROE would not change and  
22 stay at 8.55%.

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1 By using the same capital structure (52.48% debt and 47.52% equity) and the cost  
2 of long-term debt (5.29%), the overall rate of return recommended by OCC for  
3 DP&L would be 6.84%.

4 
$$6.84\% = (0.5248 * 5.29\%) + (0.4752 * 8.55\%).$$

5

6 This OCC-proposed rate of return of 6.84%, in combination the proposed  
7 adjustment to the Gross Revenue Conversion Factor and other revenue  
8 requirement adjustments proposed by other OCC witnesses, will ensure that the  
9 customers of DP&L will be paying a just and reasonable rate for electric  
10 distribution services. This OCC-proposed rate of return of 6.84% will also be  
11 sufficient for DP&L to maintain its financial integrity and its ability to attract  
12 capital for its regulated business operation. The investors and lenders of DP&L  
13 will be fairly compensated for providing the funds.

14

15

16 **VI. COMMENTS ON DP&L'S RATE OF RETURN PROPOSAL**

17

18 ***Q29. PLEASE SUMMARIZE DP&L'S PROPOSED RETURN ON EQUITY AND***  
19 ***RATE OF RETURN IN THIS PROCEEDING.***

20 ***A29.*** DP&L proposed a capital structure consisted of 47.80% long-term debt, 50.00%  
21 common equity, and 2.20% preferred equity.<sup>39</sup> It also proposed a cost of long-

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<sup>39</sup> Rate Case, Direct Testimony of Jeffrey K. MacKay at 5 (November 30, 2015).

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1 term debt of 5.29%<sup>40</sup> and 10.50% as the cost of common equity.<sup>41</sup> The overall  
2 rate of return proposed by DP&L was 7.86%.<sup>42</sup>

3

4 ***Q30. IS DP&L'S PROPOSED RETURN ON EQUITY OF 10.50% REASONABLE***  
5 ***IN THIS PROCEEDING?***

6 ***A30.*** No. The return on equity (or cost of common equity) of 10.50% as proposed by  
7 DP&L is unreasonable. The PUCO should not adopt this ROE proposed by  
8 DP&L. This proposed ROE of 10.50% was developed using biased data and an  
9 unreasonable financial methodologies. Specifically, they include the use of  
10 forecasted yields of U.S. Treasury bonds of 4.5% as the risk-free return,<sup>43</sup> the use  
11 of an overstated equity risk premium of 7.2%,<sup>44</sup> the bias of favoring results of  
12 high estimated ROE,<sup>45</sup> and the inclusion of a generic and unsubstantiated flotation  
13 cost adjustment.<sup>46</sup> This proposed ROE of 10.50% also far exceeded those ROE  
14 authorized for delivery-only electric distribution utilities in rate cases decided in  
15 recent years in Ohio and other jurisdictions.  
16

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<sup>40</sup> *Id.* at 11-12.

<sup>41</sup> *Id.* at 8.

<sup>42</sup> *Id.* at 7.

<sup>43</sup> Rate Case, Direct Testimony of Roger A. Morin, Ph.D. at 31-36(November 30, 2015).

<sup>44</sup> *Id.* at 37-43.

<sup>45</sup> *Id.* at 57-58.

<sup>46</sup> *Id.* at 52-57.

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1 In my objections to the Staff Report, I have discussed the reasons for the selection  
2 of a reasonable equity risk premium of six percent and the exclusion of an added  
3 allowance for equity issuance and other costs. I will not repeat my comments on  
4 the unreasonableness of these two items as proposed by DP&L. My comments on  
5 DP&L's rate of return proposal (in particular its proposed return on equity) will  
6 focus on Dr. Morin's use of forecasted government bond yields as the return on  
7 risk-free assets (or risk-free rate) in his CAMP analysis. The use of a 4.5% risk-  
8 free return by Dr. Morin in his testimony significantly inflated the results of his  
9 CAPM analysis. This, in turn, resulted in an overstated and unreasonable  
10 estimate of ROE for DP&L, resulting in unwarranted charges to consumers.

11  
12 ***Q31. PLEASE EXPLAIN WHY DR. MORIN'S USE OF FORECASTED YIELDS***  
13 ***OF U.S. TREASURY BONDS IN DERIVING HIS RISK-FREE RATE IN***  
14 ***THE CAPM ANALYSIS IS UNREASONABLE?***

15 ***A31.*** The risk-free rate used in the CAPM analysis is typically derived from the current  
16 yields (or interest rates) of long-term (usually from ten-year maturity to 30-year  
17 maturity) United States Treasury bonds. These United States Treasury bonds are  
18 not risk free in absolute terms, but they generally carry the highest bond ratings  
19 and are considered to be very low risk. The current yields of these government  
20 bonds are considered by financial analysts as a good proxy for risk-free return.  
21 They are also regularly published in financial publications and widely available.

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1 The risk-free return of 4.5% used by Dr. Morin is based on the forecasted yield on  
2 30-year treasury bonds of the Global Insight and Value Line.<sup>47</sup> This estimated  
3 risk-free return of 4.5% used Dr. Morin in his CAPM analysis is overstated and  
4 unreasonable for various reasons. First, this DP&L-proposed risk-free rate of  
5 4.5% is not supported by current financial market conditions. As discussed  
6 earlier, I have reviewed the daily yields of the U.S. Treasury bonds from January  
7 3, 2017 through December 31, 2017 as compiled by the U.S. Department of the  
8 Treasury. At this time, the actual current yields of U.S. Treasury bonds are  
9 consistently below three percent and considerably lower than the 4.5% relied  
10 upon by DP&L in proposing its return on equity.

11  
12 Second, Dr. Morin's exclusive use of the yields of 30-year U.S. Treasury bonds  
13 without considering the yields of bonds with a shorter maturity would  
14 unnecessarily overstate the risk-free return. This is because the yield on a bond  
15 with a longer maturity is almost always higher than the yield on a bond with a  
16 shorter maturity. It is more reasonable to consider the yields of U.S. Treasury  
17 bonds with different maturities in estimating a risk-free return for the CAPM  
18 analysis. For example, in the last Duke electric distribution rate case (PUCO  
19 Case No. 12-1682-EL-AIR), the PUCO Staff Report used the actual yields of the  
20 10-year and 30-year treasury bonds in estimating the risk-free return.<sup>48</sup> The  
21 resulting risk-free return in that case was 2.255%. The PUCO Staff has

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<sup>47</sup> *Id.* at 33.

<sup>48</sup> PUCO Case No. 12-1682-EL-AIR, Staff Report at 17 (Jan. 4, 2013).

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1 consistently used the average actual yields from the U.S. Treasury bonds with  
2 different maturity as a proxy for the risk-free return used in the CAPM analysis.

3  
4 Third, the forecasted yields (or interest rates) are subjective and have turned out to  
5 be wrong frequently especially over a longer forecasting period. I have seen a  
6 number of forecasts (or testimonies) that were predicting or supporting a rising  
7 and sometimes much higher interest rates into the future. They all turned out to  
8 be wrong. For example, in the 2012 Duke electric distribution rate I cited above,  
9 Duke's witness in that case, Dr. Morin, who now is DP&L's witness in this rate  
10 case, indicated that he relied on "the forecast yields on 30-year US Treasury  
11 bonds from three prominent sources: Global Insight, Value Line, and Consensus  
12 Economics Inc." in developing his risk-free return in that case.<sup>49</sup> Dr. Morin  
13 further proclaimed that<sup>50</sup>:

14 "The average 30-year long-term bond yield forecast from the three  
15 sources is 3.6% in 2014, 4.3% in 2015, 5.0% in 2016, and 5.4% in  
16 2017. The average over the 2015-2017 periods is 4.6%, which also  
17 matches the Global Insight 2015 forecast."

18  
19 In that Duke Rate case, Dr. Morin himself concluded: "The average 30-year long-  
20 term bond yield forecast of 4.7% is a reasonable estimate of the risk-free rate for

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<sup>49</sup> See PUCO Case No. 12-1682-EL-AIR, Supplemental Direct Testimony of Roger A. Morin, Ph.D. at 9-10 (Feb. 19, 2013).

<sup>50</sup> *Id.*



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purpose of a forward-looking CAPM analysis.”<sup>51</sup> It is not surprising that these forecasted yields from the three “prominent” sources were way off from the actual yields of the U.S. Treasury 30-year bonds during the 2014 to 2017 period. The actual yields were much lower than those forecasted yields. A comparison of the actual yields with the forecasted yields as reported by Dr. Morin in his 2013 testimony is shown in Table 8. Interestingly, it turned out the average actual yields of the ten-year and 30-year U.S. Treasury bonds of 2.255% used by the PUCO Staff as the risk-free return in that case were much more accurate than the forecasted yields cited in Dr. Morin’s 2013 testimony.

**Table 8  
A Comparison of Forecasted and Actual Yields of 30-Year Treasury Bonds  
(2014 to 2017)**

		<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<b>Forecasted Yield cited by Dr. Morin in Duke Rate Case</b>	Global Insight	4.1	4.6	5.3	5.4
	Value Line	3.4	4.0	4.5	
	Consensus Economics Inc.	3.4	4.4	5.1	5.4
	<b>Average</b>	<b>3.6</b>	<b>4.3</b>	<b>5.0</b>	<b>5.4</b>
<b>Actual Yield Reported by U.S. Department of Treasury</b>	Highest	3.92	3.22	3.19	2.93
	Lowest	2.74	2.25	2.14	2.37
	<b>Average</b>	<b>3.33</b>	<b>2.74</b>	<b>2.67</b>	<b>2.65</b>

In summary, I believe a risk-free return to be used in a CAPM should be based on the current actual market yields rather than any forecasted yields. The use of forecasted yields of U.S. Treasury bonds is probably just a cover to introduce a

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<sup>51</sup> PUCO Case No. 12-1682-EL-AIR, Direct Testimony of Roger A. Morin, Ph.D. at 34 (July 20, 2012).

1           subjective and higher than reasonable risk-free rate to increase the estimated  
2           return on equity.

3

4   **VII. CONCLUSION**

5

6   ***Q32. PLEASE SUMMARIZE OCC'S RECOMMENDATION ON THE RETURN***  
7       ***ON EQUITY AND RATE OF RETURN FOR DP&L IN THIS PROCEEDING.***

8   **A32.** I recommend the PUCO adopt OCC's objections and proposed adjustments  
9           regarding the "equity risk premium" used in the CAPM analysis and the added  
10          allowance to estimated baseline ROE for equity issuance and other costs. If the  
11          PUCO adopts OCC's proposed adjustments, a reasonable return on equity for  
12          Duke should be no higher than 8.55%. The resulting rate of return should be no  
13          higher than 6.84%.

14

15   ***Q33. DOES THIS CONCLUDE YOUR TESTIMONY?***

16   **A33.** Yes. However, I reserve the right to supplement my testimony in the event that  
17          additional testimony is filed, or if new information or data in connection with this  
18          proceeding becomes available.

## **CERTIFICATE OF SERVICE**

I hereby certify that a true copy of the foregoing *Direct Testimony of Daniel J. Duann, Ph.D. on Behalf of the Office of the Ohio Consumers' Counsel* was served via electronic transmission to the persons listed below on this 11th day of April 2018.

/s/ Christopher Healey

Christopher Healey  
Assistant Consumers' Counsel

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**Daniel J. Duann, Ph.D.**  
**List of Testimonies Filed Before PUCO**

1. *Application of The Dayton Power and Light Company for Approval of Its Electric Security Plan*, Case No. 08-1094-EL-SSO (January 26, 2009).
2. *Application of Ohio American Water Company to Increase Its Rates for Water and Sewer Service Provided to Its Entire Service Area*, Case No. 09-391-WS-AIR (January 4, 2010).
3. *Application of Aqua Ohio, Inc. for Authority to Increase its Rates and Charges in its Masury Division*, Case No. 09-560-WW-AIR (February 22, 2010).
4. *Application of Aqua Ohio, Inc. for Authority to increase its Rates and Charges in its Lake Erie Division*, Case No. 09-1044-WW-AIR (June 21, 2010).
5. *In the Matter of the Fuel Adjustment Clauses for Columbus Southern Power Company and Ohio Power Company*, Case Nos. 09-872-EL-FAC and 09-873-EL-FAC (August 16, 2010).
6. *In the Matter of the Application of Columbus Southern Power Company for Approval of an Electric Security Plan; an Amendment to its Corporate Separation Plan; and the Sale or Transfer of Certain Generating Asset (Remand)*, Case Nos. 08-917-EL-SSO et al (June 30, 2011).
7. *In the Matter of the Application of The East Ohio Gas Company d/b/a Dominion East Ohio for Approval of Tariffs to Modify and further Accelerate its Pipeline Infrastructure Replacement Program and to Recover the Associated Costs et al.*, Case Nos. 11-2401-GA-ALT and 08-169-GA-ALT (July 15, 2011).
8. *In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to 4928.143, Ohio Rev. Code in the Form of an Electric Security Plan (ESP)*, Case Nos. 11-346-EL-SSO, et al (July 25, 2011).
9. *In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company for Authority to Merge and Related Approval (ESP Stipulation)*, Case Nos. 10-2376-EL-UNC, et al (September 27, 2011).
10. *In the Matter of the 2010 Annual Filing of Columbus Southern Power Company and Ohio Power Company Required by Rule 4901:1-35-10, Ohio Administrative Code*, Case Nos. 11-4571-EL-UNC and 11-4572-EL-UNC (October 12, 2011).
11. *In the Matter of the Application of Ohio American Water Company to Increase Its Rates for Water and Sewer Service Provided to Its Entire Service Area*, Case No. 11-4161-WS-AIR (March 1, 2012).

12. *In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to 4928.143, Ohio Rev. Code in the Form of an Electric Security Plan (Modified ESP), Case Nos. 11-346-EL-SSO, et al (May 4, 2012).*
13. *In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company For Authority to Establish a Standard Service Offer Pursuant to R.C. § 4928.143 in the Form Of an Electric Security Plan, Case No. 12-1230-EL-SSO (May 21, 2012).*
14. *In the Matter of the Application of Duke Energy Ohio, Inc., for an Increase in Electric Distribution Rates, et al. Case Nos. 12-1682-EL-AIR (February 19, 2013).*
15. *In the Matter of the Application of Duke Energy Ohio, Inc., for an Increase in Gas Rates, Case Nos. 12-1685-GA-AIR, et al (February 25, 2013).*
16. *In the Matter of the Application of Dayton Power & Light Company for Authority to Establish a Standard Service Offer in the Form Of an Electric Security Plan Pursuant to R.C. 4928.143, Case No. 12-426-EL-SSO et al. (March 1, 2013).*
17. *In the Matter of the Application of The Dayton Power and Light Company for Authority to Recover of Certain Storm-related Service Restoration Costs, Case Nos. 12-3062-EL-RDR, et al. (January 31, 2014).*
18. *In the Matter of the Application of The Dayton Power and Light Company for Authority to Recover of Certain Storm-related Service Restoration Costs, Case Nos. 12-3062-EL-RDR, et al. (May 23, 2014).*
19. *In the Matter of the Application of Aqua Ohio, Inc. to Increase Its Rates and Charges for Its Waterworks Service, Case No. 13-2124-WW-AIR (August 4, 2014).*
20. *In the Matter of the Application Seeking Approval of Ohio Power Company's Proposal to Enter into an Affiliate Power Purchase Agreement for Inclusion in the Power Purchase Agreement Ride, Case No. 14-1693-EL-RDR, et al. (September 11, 2015).*
21. *In the matter of the Application of Duke Energy Ohio, Inc. for Approval of an Alternative Rate Plan Pursuant to R.C. 4929.05, Revised Code, for an Accelerated Service Line Replacement Program, Case No. 14-1622-GA-ALT (November 6, 2015).*
22. *In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company for Authority to Establish a Standard Service Offer Pursuant to R.C. 4928.141 in the Form of an Electric Security Plan, Case No. 14-1297-EL-SSO (June 22, 2016).*

23. *In the Matter of the Application of Ohio Power Company for Administration of the Significantly Excessive Earnings Test for 2014 Under Section 4928.143 (F), Revised Code, and Rule 4901:1-35-10, Ohio Administration Code.* 15-1022-EL-UNC et al. (August 15, 2016).
24. *In the Matter of the Application of Ohio Power Company for Administration of the Significantly Excessive Earnings Test for 2014 Under Section 4928.143 (F), Revised Code, and Rule 4901:1-35-10, Ohio Administration Code.* 15-1022-EL-UNC et al. (September 19, 2016).
25. *In the Matter of the Commission Review of the Capacity Charges of Ohio Power Company and Columbus Southern Power Company.* 10-2929-EL-UNC et al. (October 18, 2016).
26. *In the Matter of the Application of Aqua Ohio, Inc. for Authority to Increase Its Rates and Charges for Its Waterworks Service.* 16-907-WW-AIR (December 19, 2016).
27. *In the Matter of the Application of Columbia Gas of Ohio, Inc. for Approval of an Alternative Form of Regulation.* 16-2422-GA-ALT (September 28, 2017).

**Daily Treasury Yield Curve Rates (%)**

Date	1 Mo	3 Mo	6 Mo	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
1/3/2017	0.52	0.53	0.65	0.89	1.22	1.5	1.94	2.26	2.45	2.78	3.04
1/4/2017	0.49	0.53	0.63	0.87	1.24	1.5	1.94	2.26	2.46	2.78	3.05
1/5/2017	0.51	0.52	0.62	0.83	1.17	1.43	1.86	2.18	2.37	2.69	2.96
1/6/2017	0.5	0.53	0.61	0.85	1.22	1.5	1.92	2.23	2.42	2.73	3
1/9/2017	0.5	0.5	0.6	0.82	1.21	1.47	1.89	2.18	2.38	2.69	2.97
1/10/2017	0.51	0.52	0.6	0.82	1.19	1.47	1.89	2.18	2.38	2.69	2.97
1/11/2017	0.51	0.52	0.6	0.82	1.2	1.47	1.89	2.18	2.38	2.68	2.96
1/12/2017	0.52	0.52	0.59	0.81	1.18	1.45	1.87	2.17	2.36	2.68	3.01
1/13/2017	0.52	0.53	0.61	0.82	1.21	1.48	1.9	2.2	2.4	2.71	2.99
1/17/2017	0.52	0.55	0.62	0.8	1.17	1.42	1.84	2.14	2.33	2.66	2.93
1/18/2017	0.48	0.53	0.63	0.82	1.23	1.51	1.93	2.24	2.42	2.74	3
1/19/2017	0.47	0.52	0.62	0.83	1.25	1.53	1.97	2.28	2.47	2.77	3.04
1/20/2017	0.46	0.5	0.62	0.82	1.2	1.5	1.95	2.28	2.48	2.79	3.05
1/23/2017	0.46	0.51	0.59	0.79	1.16	1.43	1.88	2.19	2.41	2.72	2.99
1/24/2017	0.5	0.51	0.62	0.81	1.21	1.49	1.94	2.27	2.47	2.78	3.05
1/25/2017	0.48	0.5	0.61	0.82	1.23	1.52	1.99	2.33	2.53	2.84	3.1
1/26/2017	0.49	0.51	0.62	0.82	1.21	1.49	1.95	2.3	2.51	2.82	3.08
1/27/2017	0.49	0.52	0.63	0.82	1.22	1.48	1.94	2.28	2.49	2.8	3.06
1/30/2017	0.49	0.51	0.63	0.81	1.22	1.48	1.94	2.28	2.49	2.82	3.08
1/31/2017	0.5	0.52	0.64	0.84	1.19	1.46	1.9	2.24	2.45	2.78	3.05
2/1/2017	0.5	0.51	0.65	0.83	1.22	1.49	1.93	2.27	2.48	2.8	3.08
2/2/2017	0.5	0.52	0.64	0.84	1.21	1.48	1.92	2.27	2.48	2.8	3.09
2/3/2017	0.49	0.51	0.63	0.82	1.21	1.49	1.93	2.27	2.49	2.82	3.11
2/6/2017	0.48	0.53	0.62	0.79	1.16	1.43	1.86	2.19	2.42	2.76	3.05
2/7/2017	0.51	0.53	0.63	0.8	1.16	1.43	1.85	2.17	2.4	2.74	3.02
2/8/2017	0.52	0.54	0.63	0.79	1.15	1.4	1.81	2.14	2.34	2.68	2.96
2/9/2017	0.51	0.54	0.64	0.8	1.2	1.46	1.88	2.2	2.4	2.74	3.02
2/10/2017	0.51	0.55	0.64	0.81	1.2	1.47	1.89	2.22	2.41	2.75	3.01
2/13/2017	0.5	0.52	0.63	0.82	1.2	1.48	1.92	2.24	2.43	2.77	3.03
2/14/2017	0.51	0.54	0.66	0.84	1.25	1.53	1.98	2.29	2.47	2.81	3.07
2/15/2017	0.53	0.54	0.67	0.86	1.27	1.57	2.01	2.33	2.51	2.84	3.09
2/16/2017	0.51	0.53	0.66	0.82	1.22	1.5	1.95	2.26	2.45	2.8	3.05
2/17/2017	0.5	0.53	0.66	0.82	1.21	1.48	1.92	2.23	2.42	2.78	3.03
2/21/2017	0.49	0.53	0.69	0.83	1.22	1.5	1.93	2.24	2.43	2.78	3.04
2/22/2017	0.47	0.52	0.68	0.82	1.22	1.49	1.92	2.23	2.42	2.78	3.04
2/23/2017	0.39	0.51	0.66	0.81	1.18	1.44	1.87	2.2	2.38	2.75	3.02
2/24/2017	0.4	0.52	0.65	0.8	1.12	1.38	1.8	2.12	2.31	2.69	2.95
2/27/2017	0.44	0.5	0.68	0.81	1.2	1.46	1.87	2.18	2.36	2.72	2.98
2/28/2017	0.4	0.53	0.69	0.88	1.22	1.49	1.89	2.19	2.36	2.7	2.97
3/1/2017	0.46	0.63	0.79	0.92	1.29	1.57	1.99	2.29	2.46	2.81	3.06
3/2/2017	0.52	0.67	0.84	0.98	1.32	1.6	2.03	2.32	2.49	2.84	3.09
3/3/2017	0.56	0.71	0.84	0.98	1.32	1.59	2.02	2.32	2.49	2.83	3.08
3/6/2017	0.56	0.74	0.83	0.97	1.31	1.6	2.02	2.32	2.49	2.84	3.1
3/7/2017	0.55	0.76	0.87	1.02	1.32	1.62	2.05	2.34	2.52	2.85	3.11
3/8/2017	0.54	0.73	0.86	1.03	1.36	1.65	2.08	2.38	2.57	2.89	3.15
3/9/2017	0.5	0.73	0.88	1.04	1.37	1.67	2.13	2.43	2.6	2.94	3.19
3/10/2017	0.6	0.75	0.89	1.03	1.36	1.66	2.11	2.4	2.58	2.94	3.16
3/13/2017	0.69	0.79	0.93	1.06	1.4	1.69	2.14	2.43	2.62	2.97	3.2
3/14/2017	0.77	0.78	0.93	1.06	1.4	1.68	2.13	2.42	2.6	2.94	3.17
3/15/2017	0.71	0.73	0.89	1.02	1.33	1.59	2.02	2.31	2.51	2.87	3.11
3/16/2017	0.68	0.73	0.89	1.01	1.35	1.63	2.05	2.34	2.53	2.89	3.14
3/17/2017	0.71	0.73	0.87	1	1.33	1.6	2.03	2.31	2.5	2.86	3.11
3/20/2017	0.7	0.76	0.89	1.01	1.3	1.57	2	2.28	2.47	2.83	3.08
3/21/2017	0.76	0.77	0.91	1	1.27	1.54	1.96	2.24	2.43	2.79	3.04
3/22/2017	0.74	0.77	0.9	0.99	1.27	1.52	1.95	2.22	2.4	2.76	3.02
3/23/2017	0.73	0.76	0.9	0.99	1.26	1.52	1.95	2.23	2.41	2.76	3.02
3/24/2017	0.73	0.78	0.89	1	1.26	1.52	1.93	2.22	2.4	2.74	3

3/27/2017	0.73	0.78	0.91	1	1.27	1.51	1.93	2.2	2.38	2.73	2.98
3/28/2017	0.75	0.78	0.92	1.03	1.3	1.56	1.97	2.25	2.42	2.77	3.02
3/29/2017	0.76	0.78	0.92	1.04	1.26	1.53	1.93	2.21	2.39	2.74	2.99
3/30/2017	0.75	0.78	0.91	1.03	1.28	1.55	1.96	2.25	2.42	2.78	3.03
3/31/2017	0.74	0.76	0.91	1.03	1.27	1.5	1.93	2.22	2.4	2.76	3.02
4/3/2017	0.73	0.79	0.92	1.02	1.24	1.47	1.88	2.16	2.35	2.71	2.98
4/4/2017	0.77	0.79	0.92	1.03	1.25	1.47	1.88	2.16	2.36	2.72	2.99
4/5/2017	0.77	0.8	0.93	1.03	1.24	1.44	1.85	2.14	2.34	2.71	2.98
4/6/2017	0.78	0.79	0.94	1.05	1.24	1.45	1.87	2.15	2.34	2.72	2.99
4/7/2017	0.77	0.82	0.95	1.08	1.29	1.52	1.92	2.2	2.38	2.74	3
4/10/2017	0.77	0.82	0.97	1.07	1.29	1.52	1.91	2.18	2.37	2.72	2.99
4/11/2017	0.74	0.82	0.94	1.05	1.24	1.45	1.84	2.11	2.32	2.67	2.93
4/12/2017	0.77	0.81	0.95	1.04	1.24	1.44	1.81	2.09	2.28	2.65	2.92
4/13/2017	0.76	0.81	0.94	1.03	1.21	1.4	1.77	2.05	2.24	2.62	2.89
4/17/2017	0.76	0.83	0.94	1.04	1.21	1.42	1.79	2.07	2.26	2.65	2.92
4/18/2017	0.76	0.82	0.94	1.02	1.18	1.35	1.71	1.98	2.18	2.56	2.84
4/19/2017	0.75	0.81	0.94	1.02	1.19	1.38	1.74	2.02	2.21	2.59	2.87
4/20/2017	0.73	0.79	0.93	1.01	1.21	1.41	1.78	2.06	2.24	2.61	2.89
4/21/2017	0.72	0.79	0.92	0.99	1.2	1.4	1.77	2.05	2.24	2.61	2.89
4/24/2017	0.74	0.81	0.96	1.03	1.25	1.44	1.81	2.09	2.28	2.65	2.93
4/25/2017	0.73	0.82	0.98	1.09	1.29	1.49	1.87	2.15	2.35	2.71	2.99
4/26/2017	0.74	0.83	0.99	1.07	1.28	1.46	1.84	2.12	2.32	2.69	2.97
4/27/2017	0.7	0.81	0.98	1.06	1.25	1.44	1.81	2.1	2.3	2.68	2.96
4/28/2017	0.68	0.8	0.99	1.07	1.28	1.45	1.81	2.1	2.29	2.67	2.96
5/1/2017	0.67	0.83	0.98	1.09	1.28	1.48	1.84	2.13	2.33	2.71	3
5/2/2017	0.72	0.82	0.99	1.08	1.27	1.45	1.81	2.09	2.29	2.68	2.97
5/3/2017	0.73	0.85	1	1.1	1.3	1.5	1.86	2.14	2.33	2.7	2.97
5/4/2017	0.71	0.86	1	1.11	1.32	1.51	1.88	2.17	2.36	2.73	3
5/5/2017	0.71	0.9	1.01	1.1	1.32	1.52	1.89	2.17	2.36	2.73	2.99
5/8/2017	0.73	0.91	1.02	1.12	1.33	1.53	1.91	2.19	2.39	2.76	3.02
5/9/2017	0.74	0.91	1.04	1.14	1.37	1.57	1.94	2.22	2.42	2.79	3.04
5/10/2017	0.71	0.9	1.04	1.13	1.35	1.56	1.94	2.22	2.41	2.79	3.03
5/11/2017	0.68	0.89	1.04	1.13	1.35	1.55	1.93	2.2	2.39	2.78	3.03
5/12/2017	0.69	0.88	1.03	1.11	1.29	1.49	1.85	2.13	2.33	2.74	2.98
5/15/2017	0.73	0.9	1.02	1.11	1.31	1.49	1.86	2.14	2.34	2.76	3
5/16/2017	0.72	0.9	1.04	1.11	1.29	1.48	1.86	2.13	2.33	2.74	2.99
5/17/2017	0.72	0.9	1	1.08	1.26	1.42	1.76	2.03	2.22	2.65	2.91
5/18/2017	0.73	0.93	1.02	1.09	1.27	1.44	1.78	2.04	2.23	2.64	2.9
5/19/2017	0.71	0.92	1.03	1.1	1.28	1.45	1.79	2.05	2.23	2.63	2.9
5/22/2017	0.7	0.93	1.05	1.12	1.29	1.45	1.8	2.06	2.25	2.64	2.91
5/23/2017	0.76	0.92	1.08	1.14	1.31	1.49	1.84	2.1	2.29	2.68	2.95
5/24/2017	0.76	0.93	1.07	1.18	1.29	1.46	1.79	2.07	2.26	2.65	2.92
5/25/2017	0.72	0.94	1.08	1.16	1.3	1.46	1.78	2.06	2.25	2.65	2.92
5/26/2017	0.75	0.94	1.08	1.17	1.3	1.46	1.79	2.06	2.25	2.65	2.92
5/30/2017	0.77	0.93	1.07	1.16	1.28	1.44	1.76	2.02	2.21	2.61	2.88
5/31/2017	0.86	0.98	1.08	1.17	1.28	1.44	1.75	2.02	2.21	2.6	2.87
6/1/2017	0.82	0.98	1.07	1.16	1.28	1.45	1.76	2.02	2.21	2.6	2.87
6/2/2017	0.82	0.98	1.06	1.16	1.28	1.42	1.71	1.96	2.15	2.53	2.8
6/5/2017	0.83	0.96	1.06	1.16	1.32	1.45	1.74	1.99	2.18	2.56	2.84
6/6/2017	0.83	0.97	1.08	1.16	1.3	1.42	1.71	1.95	2.14	2.53	2.81
6/7/2017	0.84	1	1.09	1.17	1.32	1.45	1.74	1.99	2.18	2.56	2.84
6/8/2017	0.8	1.01	1.11	1.19	1.33	1.47	1.75	2	2.19	2.57	2.85
6/9/2017	0.8	1.01	1.13	1.2	1.35	1.5	1.77	2.02	2.21	2.59	2.86
6/12/2017	0.82	0.98	1.09	1.19	1.35	1.5	1.78	2.02	2.21	2.59	2.86
6/13/2017	0.89	1	1.12	1.22	1.38	1.51	1.79	2.02	2.21	2.6	2.87
6/14/2017	0.9	1.01	1.12	1.2	1.35	1.48	1.74	1.96	2.15	2.53	2.79
6/15/2017	0.86	1.02	1.13	1.21	1.35	1.49	1.76	1.98	2.16	2.52	2.78
6/16/2017	0.85	1.03	1.13	1.21	1.32	1.48	1.75	1.97	2.16	2.52	2.78
6/19/2017	0.85	1.02	1.13	1.22	1.36	1.52	1.8	2.02	2.19	2.53	2.79
6/20/2017	0.88	1.01	1.14	1.22	1.36	1.5	1.77	1.99	2.16	2.49	2.74
6/21/2017	0.85	0.99	1.12	1.22	1.36	1.5	1.78	2	2.16	2.48	2.73



6/22/2017	0.8	0.96	1.1	1.22	1.34	1.48	1.76	1.98	2.15	2.47	2.72
6/23/2017	0.76	0.97	1.1	1.21	1.34	1.48	1.77	1.98	2.15	2.48	2.71
6/26/2017	0.81	0.99	1.1	1.2	1.36	1.48	1.77	1.97	2.14	2.46	2.7
6/27/2017	0.89	1	1.13	1.22	1.38	1.53	1.83	2.04	2.21	2.52	2.75
6/28/2017	0.89	1.02	1.12	1.21	1.34	1.51	1.81	2.05	2.22	2.55	2.77
6/29/2017	0.88	1.04	1.14	1.23	1.38	1.53	1.85	2.1	2.27	2.59	2.82
6/30/2017	0.84	1.03	1.14	1.24	1.38	1.55	1.89	2.14	2.31	2.61	2.84
7/3/2017	0.96	1.06	1.13	1.24	1.41	1.6	1.93	2.19	2.35	2.65	2.86
7/5/2017	0.97	1.05	1.15	1.24	1.41	1.59	1.92	2.17	2.33	2.63	2.85
7/6/2017	0.95	1.04	1.14	1.23	1.4	1.6	1.94	2.21	2.37	2.68	2.9
7/7/2017	0.94	1.05	1.14	1.22	1.4	1.6	1.95	2.22	2.39	2.71	2.93
7/10/2017	0.95	1.04	1.13	1.23	1.4	1.59	1.93	2.2	2.38	2.7	2.93
7/11/2017	0.97	1.05	1.14	1.2	1.37	1.57	1.92	2.18	2.37	2.69	2.92
7/12/2017	0.94	1.05	1.13	1.21	1.35	1.53	1.88	2.14	2.33	2.65	2.89
7/13/2017	0.95	1.05	1.14	1.23	1.37	1.55	1.89	2.16	2.35	2.69	2.92
7/14/2017	0.93	1.04	1.12	1.22	1.35	1.54	1.87	2.13	2.33	2.67	2.91
7/17/2017	0.95	1.07	1.1	1.22	1.36	1.53	1.86	2.12	2.31	2.65	2.89
7/18/2017	0.95	1.07	1.11	1.19	1.36	1.52	1.82	2.08	2.27	2.61	2.85
7/19/2017	0.99	1.11	1.12	1.23	1.37	1.52	1.83	2.09	2.27	2.61	2.85
7/20/2017	1	1.15	1.12	1.22	1.37	1.51	1.82	2.08	2.27	2.6	2.83
7/21/2017	1	1.16	1.1	1.22	1.36	1.5	1.81	2.05	2.24	2.57	2.81
7/24/2017	1	1.17	1.12	1.23	1.37	1.53	1.83	2.07	2.26	2.59	2.83
7/25/2017	0.96	1.18	1.15	1.24	1.4	1.56	1.9	2.15	2.33	2.67	2.91
7/26/2017	1.02	1.13	1.14	1.23	1.36	1.5	1.83	2.09	2.29	2.65	2.89
7/27/2017	1.01	1.11	1.13	1.22	1.36	1.52	1.84	2.12	2.32	2.68	2.93
7/28/2017	1	1.08	1.13	1.22	1.34	1.51	1.83	2.1	2.3	2.65	2.89
7/31/2017	1	1.07	1.13	1.23	1.34	1.51	1.84	2.11	2.3	2.66	2.89
8/1/2017	1	1.08	1.15	1.22	1.34	1.5	1.8	2.07	2.26	2.61	2.86
8/2/2017	1.02	1.08	1.15	1.24	1.36	1.52	1.82	2.08	2.27	2.6	2.85
8/3/2017	1	1.08	1.13	1.22	1.34	1.49	1.79	2.05	2.24	2.56	2.81
8/4/2017	1	1.08	1.14	1.23	1.36	1.51	1.82	2.08	2.27	2.61	2.84
8/7/2017	0.99	1.02	1.14	1.22	1.36	1.52	1.81	2.07	2.26	2.6	2.84
8/8/2017	1	1.06	1.16	1.24	1.36	1.53	1.84	2.1	2.29	2.63	2.86
8/9/2017	1.01	1.06	1.15	1.21	1.33	1.5	1.81	2.06	2.24	2.59	2.82
8/10/2017	1.02	1.05	1.14	1.22	1.33	1.49	1.78	2.03	2.2	2.55	2.79
8/11/2017	0.99	1.03	1.14	1.21	1.3	1.43	1.74	2	2.19	2.55	2.79
8/14/2017	0.95	1.02	1.13	1.23	1.33	1.48	1.77	2.04	2.22	2.57	2.81
8/15/2017	0.97	1.04	1.16	1.23	1.35	1.51	1.83	2.09	2.27	2.6	2.84
8/16/2017	0.97	1.02	1.13	1.24	1.33	1.49	1.79	2.04	2.23	2.58	2.81
8/17/2017	0.95	1	1.11	1.24	1.32	1.46	1.76	2.01	2.19	2.54	2.78
8/18/2017	0.97	1.02	1.13	1.24	1.33	1.47	1.77	2.01	2.19	2.54	2.78
8/21/2017	0.95	1	1.11	1.23	1.32	1.46	1.76	2	2.18	2.52	2.77
8/22/2017	0.93	1	1.13	1.24	1.33	1.48	1.8	2.04	2.22	2.55	2.79
8/23/2017	0.98	1	1.11	1.22	1.32	1.45	1.76	1.99	2.17	2.51	2.75
8/24/2017	0.98	1.02	1.11	1.23	1.33	1.47	1.78	2.01	2.19	2.53	2.77
8/25/2017	0.99	1.03	1.11	1.23	1.35	1.47	1.77	2	2.17	2.51	2.75
8/28/2017	0.99	0.98	1.12	1.24	1.33	1.46	1.74	1.99	2.16	2.51	2.76
8/29/2017	0.96	1.03	1.13	1.23	1.33	1.43	1.7	1.96	2.13	2.48	2.74
8/30/2017	0.96	1.03	1.11	1.23	1.33	1.44	1.72	1.97	2.15	2.49	2.75
8/31/2017	0.95	1.01	1.08	1.23	1.33	1.44	1.7	1.95	2.12	2.47	2.73
9/1/2017	0.96	1.02	1.1	1.24	1.35	1.46	1.73	1.99	2.16	2.51	2.77
9/5/2017	1.3	1.03	1.13	1.23	1.3	1.4	1.65	1.9	2.07	2.43	2.69
9/6/2017	1.04	1.07	1.17	1.24	1.3	1.42	1.69	1.93	2.1	2.46	2.72
9/7/2017	0.98	1.05	1.15	1.21	1.27	1.38	1.63	1.88	2.05	2.4	2.66
9/8/2017	0.96	1.04	1.14	1.22	1.27	1.39	1.64	1.89	2.06	2.41	2.67
9/11/2017	0.97	1.05	1.16	1.24	1.32	1.44	1.71	1.96	2.14	2.49	2.75
9/12/2017	0.99	1.03	1.16	1.27	1.33	1.46	1.75	1.99	2.17	2.52	2.78
9/13/2017	0.99	1.04	1.16	1.27	1.35	1.48	1.78	2.01	2.2	2.53	2.79
9/14/2017	0.99	1.05	1.17	1.28	1.37	1.5	1.79	2.01	2.2	2.52	2.77
9/15/2017	0.98	1.05	1.17	1.3	1.39	1.53	1.81	2.04	2.2	2.52	2.77
9/18/2017	0.96	1.05	1.18	1.3	1.4	1.54	1.83	2.06	2.23	2.56	2.8

9/19/2017	0.97	1.04	1.19	1.31	1.4	1.55	1.84	2.07	2.24	2.57	2.81
9/20/2017	0.98	1.04	1.2	1.32	1.45	1.6	1.89	2.12	2.28	2.59	2.82
9/21/2017	0.99	1.04	1.19	1.31	1.45	1.59	1.89	2.11	2.27	2.57	2.8
9/22/2017	0.97	1.03	1.19	1.3	1.46	1.58	1.88	2.1	2.26	2.57	2.8
9/25/2017	0.97	1.05	1.19	1.3	1.44	1.56	1.85	2.07	2.22	2.53	2.76
9/26/2017	0.96	1.06	1.19	1.31	1.45	1.57	1.87	2.08	2.24	2.54	2.78
9/27/2017	0.99	1.07	1.2	1.33	1.47	1.6	1.91	2.14	2.31	2.62	2.86
9/28/2017	0.97	1.06	1.18	1.31	1.45	1.59	1.89	2.13	2.31	2.63	2.87
9/29/2017	0.96	1.06	1.2	1.31	1.47	1.62	1.92	2.16	2.33	2.63	2.86
10/2/2017	0.95	1.01	1.22	1.31	1.49	1.63	1.94	2.17	2.34	2.64	2.87
10/3/2017	1.01	1.07	1.21	1.32	1.47	1.62	1.92	2.15	2.33	2.63	2.87
10/4/2017	1	1.08	1.21	1.33	1.47	1.62	1.92	2.15	2.33	2.64	2.87
10/5/2017	1.02	1.07	1.21	1.35	1.49	1.63	1.94	2.17	2.35	2.65	2.89
10/6/2017	1.03	1.07	1.22	1.35	1.54	1.66	1.97	2.2	2.37	2.68	2.91
10/10/2017	1.03	1.08	1.26	1.42	1.51	1.64	1.95	2.18	2.35	2.65	2.88
10/11/2017	1.04	1.1	1.25	1.4	1.51	1.66	1.95	2.17	2.35	2.64	2.88
10/12/2017	0.99	1.09	1.27	1.41	1.51	1.66	1.95	2.16	2.33	2.62	2.86
10/13/2017	0.97	1.09	1.26	1.39	1.51	1.64	1.91	2.12	2.28	2.58	2.81
10/16/2017	0.97	1.1	1.24	1.42	1.54	1.68	1.95	2.15	2.3	2.58	2.82
10/17/2017	0.99	1.09	1.25	1.41	1.54	1.69	1.97	2.15	2.3	2.58	2.8
10/18/2017	0.99	1.09	1.24	1.42	1.59	1.7	1.99	2.19	2.34	2.62	2.85
10/19/2017	0.99	1.1	1.25	1.41	1.58	1.69	1.98	2.18	2.33	2.6	2.83
10/20/2017	0.99	1.11	1.27	1.43	1.6	1.72	2.03	2.24	2.39	2.67	2.89
10/23/2017	1	1.09	1.25	1.42	1.58	1.7	2.01	2.22	2.38	2.66	2.89
10/24/2017	1	1.12	1.27	1.43	1.6	1.73	2.05	2.26	2.42	2.7	2.92
10/25/2017	1.01	1.12	1.27	1.43	1.61	1.74	2.06	2.28	2.44	2.72	2.95
10/26/2017	0.99	1.11	1.29	1.43	1.63	1.76	2.07	2.3	2.46	2.74	2.96
10/27/2017	0.98	1.1	1.28	1.42	1.59	1.73	2.03	2.26	2.42	2.71	2.93
10/30/2017	0.97	1.12	1.24	1.42	1.58	1.71	2	2.22	2.37	2.66	2.88
10/31/2017	0.99	1.15	1.28	1.43	1.6	1.73	2.01	2.23	2.38	2.66	2.88
11/1/2017	1.06	1.18	1.3	1.46	1.61	1.74	2.01	2.22	2.37	2.63	2.85
11/2/2017	1.02	1.17	1.29	1.46	1.61	1.73	2	2.21	2.35	2.61	2.83
11/3/2017	1.02	1.18	1.31	1.49	1.63	1.74	1.99	2.19	2.34	2.59	2.82
11/6/2017	1.03	1.19	1.3	1.5	1.61	1.73	1.99	2.17	2.32	2.58	2.8
11/7/2017	1.05	1.22	1.33	1.49	1.63	1.75	1.99	2.17	2.32	2.56	2.77
11/8/2017	1.05	1.23	1.35	1.53	1.65	1.77	2.01	2.19	2.32	2.57	2.79
11/9/2017	1.07	1.24	1.36	1.53	1.63	1.75	2.01	2.2	2.33	2.59	2.81
11/10/2017	1.06	1.23	1.37	1.54	1.67	1.79	2.06	2.27	2.4	2.67	2.88
11/13/2017	1.07	1.24	1.37	1.55	1.7	1.82	2.08	2.27	2.4	2.67	2.87
11/14/2017	1.06	1.26	1.4	1.55	1.68	1.81	2.06	2.26	2.38	2.64	2.84
11/15/2017	1.08	1.25	1.39	1.55	1.68	1.79	2.04	2.21	2.33	2.58	2.77
11/16/2017	1.08	1.27	1.42	1.59	1.72	1.83	2.07	2.25	2.37	2.62	2.81
11/17/2017	1.08	1.29	1.42	1.6	1.73	1.83	2.06	2.23	2.35	2.59	2.78
11/20/2017	1.09	1.3	1.46	1.62	1.77	1.86	2.09	2.26	2.37	2.6	2.78
11/21/2017	1.15	1.3	1.45	1.62	1.77	1.88	2.11	2.27	2.36	2.58	2.76
11/22/2017	1.16	1.29	1.45	1.61	1.74	1.84	2.05	2.22	2.32	2.57	2.75
11/24/2017	1.14	1.29	1.45	1.61	1.75	1.85	2.07	2.23	2.34	2.58	2.76
11/27/2017	1.15	1.27	1.41	1.62	1.74	1.84	2.06	2.21	2.32	2.57	2.76
11/28/2017	1.16	1.3	1.46	1.61	1.75	1.85	2.07	2.24	2.34	2.58	2.77
11/29/2017	1.17	1.29	1.45	1.61	1.78	1.86	2.09	2.27	2.37	2.62	2.81
11/30/2017	1.14	1.27	1.44	1.62	1.78	1.9	2.14	2.31	2.42	2.65	2.83
12/1/2017	1.14	1.27	1.45	1.62	1.78	1.9	2.13	2.28	2.37	2.58	2.76
12/4/2017	1.16	1.29	1.45	1.66	1.8	1.93	2.15	2.29	2.37	2.58	2.77
12/5/2017	1.21	1.3	1.48	1.64	1.83	1.94	2.15	2.28	2.36	2.55	2.73
12/6/2017	1.18	1.3	1.48	1.68	1.78	1.92	2.11	2.25	2.33	2.53	2.71
12/7/2017	1.16	1.29	1.47	1.67	1.8	1.92	2.14	2.29	2.37	2.58	2.76
12/8/2017	1.14	1.28	1.45	1.65	1.8	1.92	2.14	2.29	2.38	2.59	2.77
12/11/2017	1.18	1.33	1.47	1.69	1.82	1.95	2.16	2.3	2.39	2.59	2.77
12/12/2017	1.26	1.34	1.49	1.7	1.83	1.95	2.18	2.32	2.4	2.6	2.79
12/13/2017	1.22	1.3	1.47	1.68	1.79	1.9	2.12	2.26	2.36	2.56	2.74
12/14/2017	1.21	1.32	1.48	1.7	1.82	1.92	2.14	2.27	2.35	2.53	2.71

12/15/2017	1.24	1.31	1.48	1.71	1.84	1.95	2.16	2.28	2.35	2.52	2.68
12/18/2017	1.26	1.38	1.51	1.7	1.84	1.94	2.17	2.3	2.39	2.57	2.74
12/19/2017	1.25	1.37	1.51	1.71	1.87	1.97	2.23	2.37	2.46	2.66	2.82
12/20/2017	1.22	1.38	1.51	1.72	1.87	1.98	2.24	2.4	2.49	2.71	2.88
12/21/2017	1.21	1.35	1.54	1.73	1.89	2.01	2.26	2.39	2.48	2.68	2.84
12/22/2017	1.15	1.33	1.54	1.73	1.91	2.01	2.26	2.4	2.48	2.68	2.83
12/26/2017	1.24	1.47	1.52	1.75	1.92	2.02	2.25	2.38	2.47	2.66	2.82
12/27/2017	1.18	1.44	1.53	1.75	1.89	1.99	2.22	2.34	2.42	2.59	2.75
12/28/2017	1.19	1.39	1.54	1.76	1.91	2	2.23	2.36	2.43	2.6	2.75
12/29/2017	1.28	1.39	1.53	1.76	1.89	1.98	2.2	2.33	2.4	2.58	2.74
<b>Average</b>	<b>0.85</b>	<b>0.95</b>	<b>1.07</b>	<b>1.20</b>	<b>1.40</b>	<b>1.58</b>	<b>1.91</b>	<b>2.16</b>	<b>2.33</b>	<b>2.65</b>	<b>2.89</b>

**Sources:** <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2017>

# **2017** SBBI Yearbook

## Stocks, Bonds, Bills, and Inflation

U.S. Capital Markets Performance by Asset Class 1926–2016  
Duff & Phelps

Property of  
Ohio Consumers' Counsel  
State of Ohio  
10 W. Broad St. Ste. 1800  
Columbus, Ohio 43215

**WILEY**

## Patterns in Treasury Bill Returns

During the late 1920s and early 1930s, Treasury bill returns were just above zero. (These returns were observed during a largely deflationary period.) Beginning in late 1941, the government kept Treasury bill yields low despite high inflation rates. Treasury bills closely tracked inflation after March 1951, when Treasury bill yields were deregulated in the U.S. Treasury/Federal Reserve Accord. This tracking relationship has weakened since 1973. From 1974 to 1980, Treasury bill returns were generally lower than inflation rates. From 1981 to 2008, real returns on Treasury bills have been positive, with the exception of 2002–2005. Real Treasury bill returns have been negative from 2009 to 2016.

## Federal Reserve Operating Procedure Changes

The disparity between performance and volatility for the periods prior to and after October 1979 can be attributed to the Federal Reserve's new operating procedures. Prior to this date, the Fed used the federal funds rate as an operating target. Subsequently, the Fed de-emphasized this rate as an operating target and, instead, began to focus on the manipulation of the money supply (through non-borrowed reserves). As a result, the federal funds rate underwent much greater volatility, thereby bringing about greater volatility in Treasury returns. In the fall of 1982, however, the Federal Reserve again changed the policy procedures regarding its monetary policy. The Fed abandoned its new monetary controls and returned to a strategy of preventing excessive volatility in interest rates. Volatility in Treasury bill returns from the fall of 1979 through the fall of 1982 was significantly greater than that which has occurred since.

## Inflation

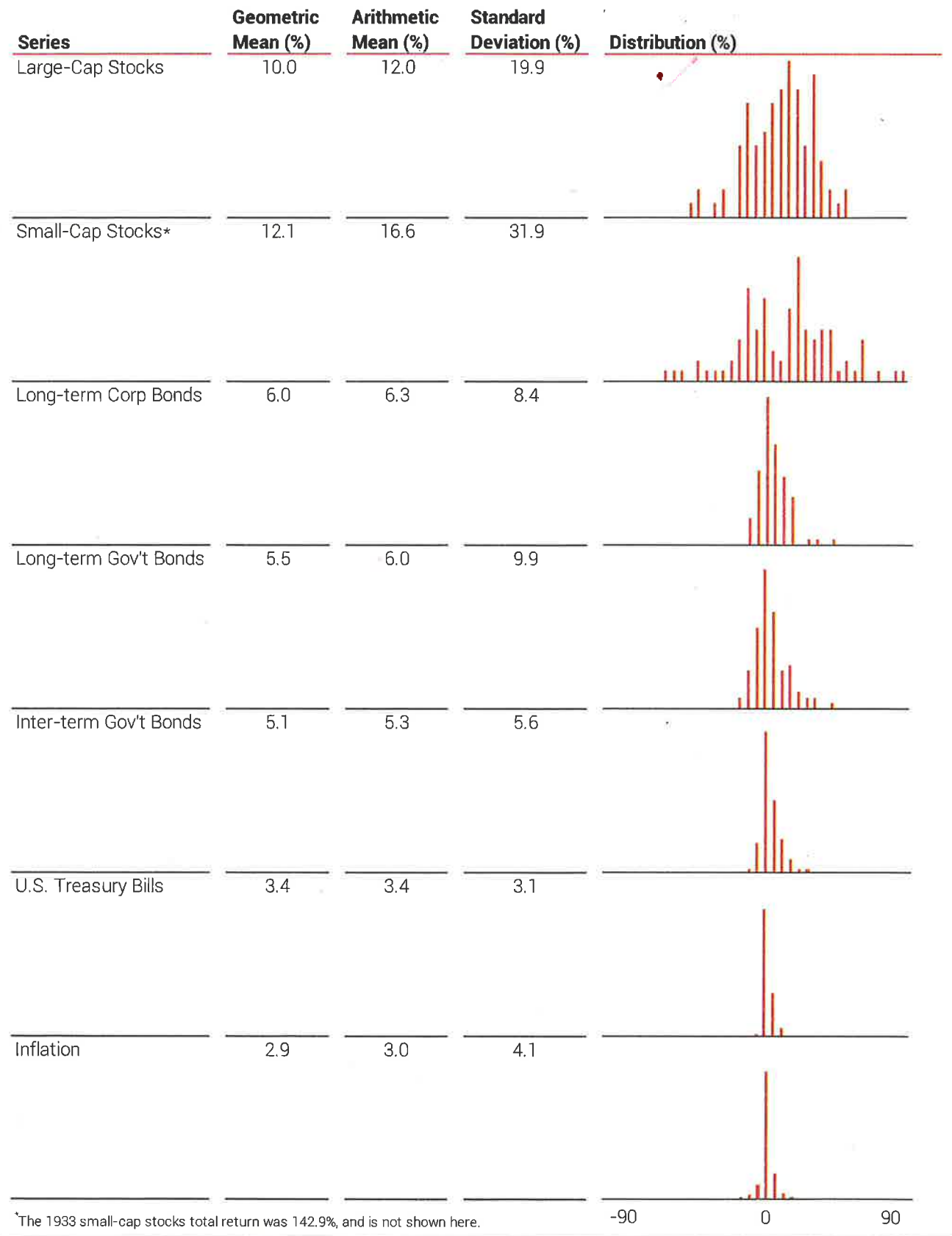
The compound annual inflation rate over 1926–2016 was 2.9%. The inflation index, initiated at \$1.00 at year end 1925, grew to \$13.47 by year-end 2016. It is interesting to note that the entire increase occurred during the postwar period (specifically, after April 1945).

The years 1926–1933 were generally *deflationary* in nature, and consumer prices did not rise back to their 1926 levels until April 1945. After a brief postwar spurt of inflation (in 1946 and 1947, inflation was 18.2% and 9.0%, respectively), prices rose slowly over most of the 1950s and 1960s. Then, in the 1970s, inflation reached a pace unprecedented in peacetime, peaking at 13.3% in 1979. The 1980s saw a reversion to more moderate, though still substantial, inflation rates averaging about 5% annually. Inflation rates continued to decline in the 1990s with a compound annual rate of 2.9%. Since 2000, inflation has been even milder, with a compound average rate of about 2.1%.

## Summary Statistics of Total Returns

Exhibit 2.3 presents summary statistics of the annual total returns on each asset class over the entire 91-year period of 1926–2016. The data presented in these exhibits are described in detail in Chapters 3 and 6.

**Exhibit 2.3:** Basic Series, Summary Statistics of Annual Total Returns (%)  
1926–2016



Note that in Exhibit 2.3, the arithmetic mean returns are higher than the geometric mean returns.<sup>22</sup> The difference between these two means is related to the standard deviation, or variability, of the series (see Chapter 6).

The "skylines", or histograms, in Exhibit 2.3 show the frequency distribution of returns for each asset class. The height of the skylines shows the number of years in the 1926–2016 period that had a return in that range. The histograms are shown in 5% increments (from -90% to 90%) to fully display the spectrum of returns as seen over the last 90 years, especially in stocks.

Riskier assets, such as large- and small-cap stocks, have spread-out skylines, reflecting the broad distribution of returns from very poor to very good. Less-risky assets, such as bonds, have narrow skylines that resemble a single tall building, indicating the tightness of the distribution around the mean of the series. The histogram for Treasury bills is one-sided, lying almost entirely to the right of the vertical line representing a zero return; that is, Treasury bills almost never experienced negative returns on a yearly basis over the 1926–2016 period (the only negative year was 1938). The inflation skyline shows both positive and negative annual rates. Although a few deflationary months and quarters have occurred recently, the last negative annual inflation rate occurred in 1954.

### **Appreciation, Income, and Reinvestment Returns**

Exhibit 2.4 provides further detail on the returns of large-cap stocks, long-term government bonds, and intermediate-term government bonds. Total annual returns are shown as the sum of three components: capital appreciation returns, income returns, and reinvestment returns. The capital appreciation and income components are explained in Chapter 3. The third component, reinvestment return, reflects monthly income reinvested in the total return index in subsequent months in the year. Thus, for a single month the reinvestment return is zero, but over a longer period of time it is nonzero. Because the returns in Exhibit 2.4 are annual, reinvestment return is relevant.

The annual total return formed by compounding the monthly total returns does not equal the sum of the annual capital appreciation and income components; the difference is reinvestment return. A simple example illustrates this point. In 1995, an "up" year on a total return basis, the total annual return on large-cap stocks was 37.58%. The annual capital appreciation was 34.11% and the annual income return was 3.04%, totaling 37.15%. The remaining 0.43% (37.58% minus 37.15%) of the 1995 total return came from the reinvestment of dividends in the market. For more information on calculating annual total and income returns, see Chapter 5.

Monthly income and capital appreciation returns for large-cap stocks are presented at the back of this book in Appendix A-2 and Appendix A-3, respectively. Monthly income and capital appreciation returns are presented for long-term government bonds in Appendix A-7 and Appendix A-8; and for intermediate-term government bonds in Appendix A-11 and Appendix A-12.

<sup>22</sup> At the 2-decimal level, Treasury Bills' annual geometric mean and arithmetic mean as measured over the 91-year period 1926–2016 are 3.38% and 3.43%, respectively.



# REGULATORY FOCUS

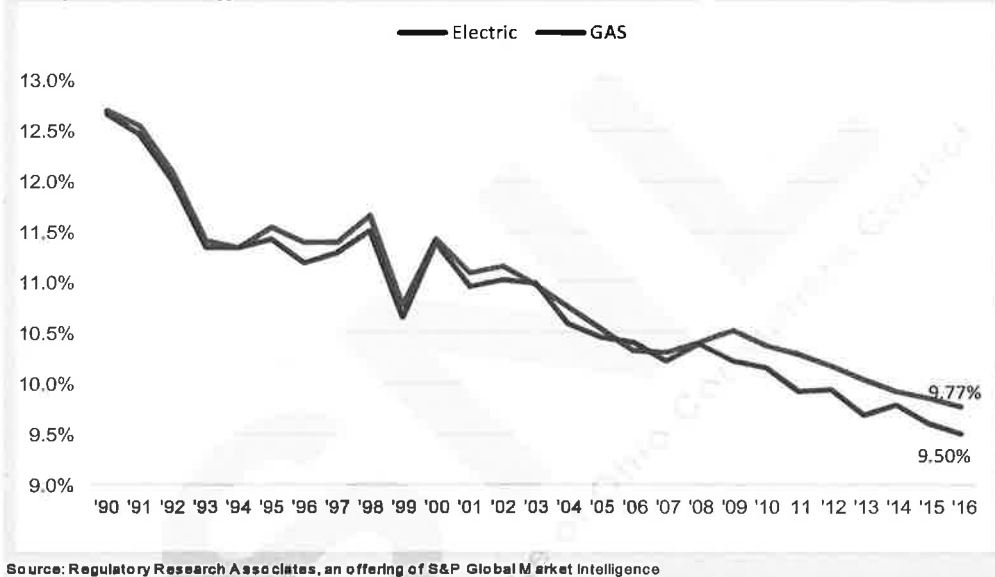
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January 18, 2017

## MAJOR RATE CASE DECISIONS — JANUARY-DECEMBER 2016

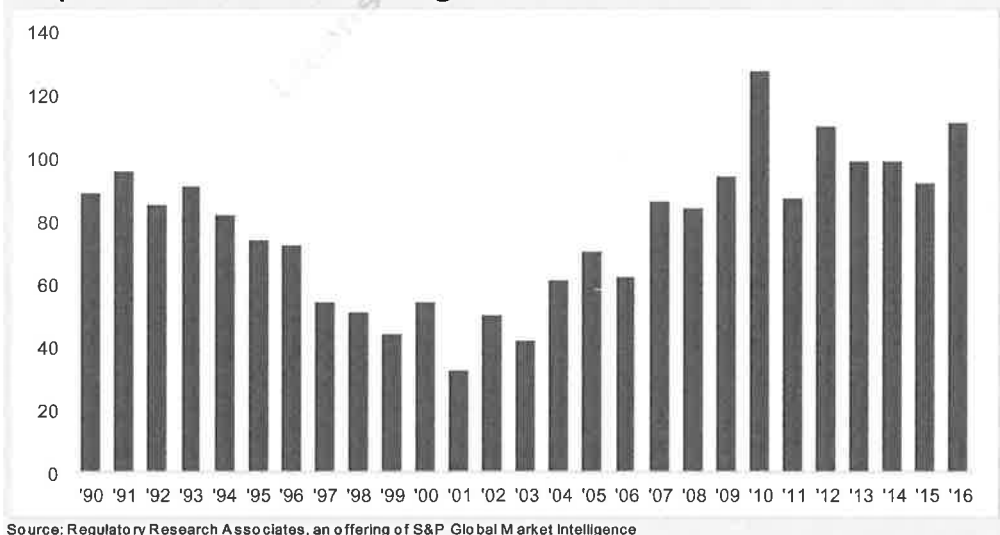
The average ROE authorized electric utilities was 9.77% in rate cases decided in 2016, compared to 9.85% in 2015. There were 42 electric ROE determinations in 2016, versus 30 in 2015. This data includes several limited issue rider cases; excluding these cases from the data, the average authorized ROE was 9.6% in rate cases decided in 2016, the same as in 2015. RRA notes that this differential in electric authorized ROEs is largely driven by Virginia statutes that authorize the State Corporation Commission to approve ROE premiums of up to 200 basis points for certain generation projects (see the [Virginia Commission Profile](#)). The average ROE authorized gas utilities was 9.5% in 2016 versus 9.6% in 2015. There were 24 gas cases that included an ROE determination in 2016, versus 16 in 2015.

**Graph 1: Average authorized ROEs — electric and gas rate decisions**



As shown in Graph 2 below, after reaching a low in the early-2000s, the number of rate case decisions for energy companies has generally increased over the last several years, peaking in 2010 at more than 125 cases.

**Graph 2: Volume of electric and gas rate case decisions**

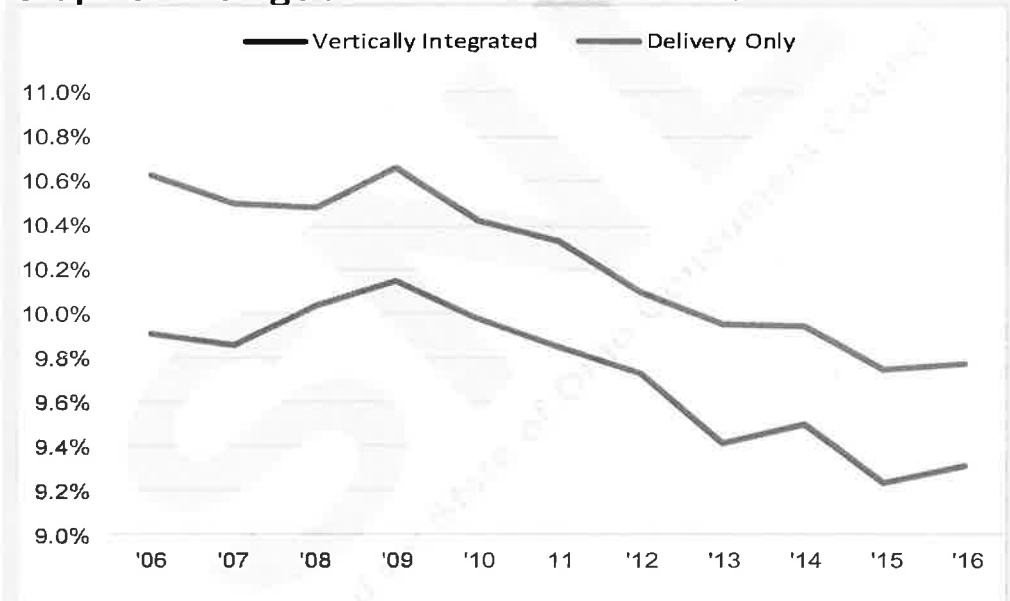




Since 2010, the number of rate cases has moderated somewhat but has been 90 or more in the last five calendar years. There were 111 electric and gas rate cases resolved in 2016, 92 in 2015, 99 in both 2014 and 2013, and 110 in 2012, and this level of rate case activity remains robust compared to the late 1990s/early 2000s. Increased costs associated with environmental compliance, including possible CO<sub>2</sub> reduction mandates, generation and delivery infrastructure upgrades and expansion, renewable generation mandates and employee benefits argue for the continuation of an active rate case agenda over the next few years. In addition, if the Federal Reserve continues its policy initiated in December 2015 to gradually raise the federal funds rate, utilities eventually would face higher capital costs and would need to initiate rate cases to reflect the higher capital costs in rates. However, the magnitude and pace of any additional Federal Reserve action to raise the federal funds rate is quite uncertain.

Included in tables on pages 6 and 7 of this report are comparisons, since 2006, of average authorized ROEs by settled versus fully litigated cases, general rate cases versus limited issues rider proceedings and vertically integrated cases versus delivery only cases. For both electric and gas cases, no pattern exists in average annual authorized ROEs in cases that were settled versus those that were fully litigated. In some years, the average authorized ROE was higher for fully litigated cases, in others it was higher for settled cases, and in a few years the authorized ROE was similar for fully litigated versus settled cases. Regarding electric cases that involve limited issue riders, over the last several years the annual average authorized ROEs in these cases was typically at least 100 basis points higher than in general rate cases, driven by the ROE premiums authorized in Virginia. Limited issue rider cases in which an ROE is determined have had extremely limited use in the gas industry. Comparing electric vertically integrated cases versus delivery only proceedings, RRA finds that the annual average authorized ROEs in vertically integrated cases are from roughly 40 to 70 basis points higher than in delivery only cases, arguably reflecting the increased risk associated with generation assets.

**Graph 3: Average authorized electric ROEs**



Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

We note that this report utilizes the simple mean for the return averages. In addition, the average equity returns indicated in this report reflect the cases decided in the specified time periods and are not necessarily representative of the returns actually earned by utilities industry wide.

As a result of electric industry restructuring, certain states unbundled electric rates and implemented retail competition for generation. Commissions in those states now have jurisdiction only over the revenue requirement and return parameters for delivery operations, which we footnote in our chronology beginning on page 8, thus complicating historical data comparability. We note that from 2008 through 2015, interest rates declined significantly, and average authorized ROEs have declined modestly. We also note the increased utilization of limited issue rider proceedings that allow utilities to recover certain costs outside of a general rate case and typically incorporate previously-determined return parameters.

The table on page 4 shows the average ROE authorized in major electric and gas rate decisions annually since 1990, and by quarter since 2013, followed by the number of observations in each period. The tables on page 5 indicate the composite electric and gas industry data for all major cases summarized annually since 2002 and by quarter for the past eight quarters. The individual electric and gas cases decided in 2016 are listed on pages 8-13, with the decision date shown first, followed by the company name, the abbreviation for the state

issuing the decision, the authorized rate of return, or ROR, ROE, and percentage of common equity in the adopted capital structure. Next we indicate the month and year in which the adopted test year ended, whether the commission utilized an average or a year-end rate base, and the amount of the permanent rate change authorized. The dollar amounts represent the permanent rate change ordered at the time decisions were rendered. Fuel adjustment clause rate changes are not reflected in this study.

The table below tracks the average equity return authorized for all electric and gas rate cases combined, by year, for the last 27 years. As the table indicates, since 1990 authorized ROEs have generally trended downward, reflecting the significant decline in interest rates and capital costs that has occurred over this time frame. The combined average equity returns authorized for electric and gas utilities in each of the years 1990 through 2016, and the number of observations for each year are as follows:

### Composite Electric and Gas Average Annual Authorized ROEs: 1990 — 2016

Year	Average ROE (%)	Observations	Year	Average ROE (%)	Observations
1990	12.69	(75)	2004	10.67	(39)
1991	12.51	(80)	2005	10.50	(55)
1992	12.06	(77)	2006	10.39	(42)
1993	11.37	(77)	2007	10.30	(76)
1994	11.34	(59)	2008	10.42	(67)
1995	11.51	(49)	2009	10.36	(68)
1996	11.29	(42)	2010	10.28	(100)
1997	11.34	(24)	2011	10.21	(59)
1998	11.59	(20)	2012	10.08	(93)
1999	10.74	(29)	2013	9.92	(71)
2000	11.41	(24)	2014	9.86	(63)
2001	11.05	(25)	2015	9.76	(46)
2002	11.10	(43)	2016	9.67	(66)
2003	10.98	(47)			

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

*Please Note: Historical data provided in this report may not match data provided on RRA's website due to certain differences in presentation, including the treatment of cases that were withdrawn or dismissed.*

Dennis Spurduto

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January 18, 2017

### Average Equity Returns Authorized January 1990 - December 2016

Year	Period	Electric Utilities		Gas Utilities	
		ROE %	(# Cases)	ROE %	(# Cases)
1990	Full Year	12.70	(44)	12.67	(31)
1991	Full Year	12.55	(45)	12.46	(35)
1992	Full Year	12.09	(48)	12.01	(29)
1993	Full Year	11.41	(32)	11.35	(45)
1994	Full Year	11.34	(31)	11.35	(28)
1995	Full Year	11.55	(33)	11.43	(16)
1996	Full Year	11.39	(22)	11.19	(20)
1997	Full Year	11.40	(11)	11.29	(13)
1998	Full Year	11.66	(10)	11.51	(10)
1999	Full Year	10.77	(20)	10.66	(9)
2000	Full Year	11.43	(12)	11.39	(12)
2001	Full Year	11.09	(18)	10.95	(7)
2002	Full Year	11.16	(22)	11.03	(21)
2003	Full Year	10.97	(22)	10.99	(25)
2004	Full Year	10.75	(19)	10.59	(20)
2005	Full Year	10.54	(29)	10.46	(26)
2006	Full Year	10.32	(26)	10.40	(15)
2007	Full Year	10.30	(38)	10.22	(35)
2008	Full Year	10.41	(37)	10.39	(32)
2009	Full Year	10.52	(40)	10.22	(30)
2010	Full Year	10.37	(61)	10.15	(39)
2011	Full Year	10.29	(42)	9.92	(16)
2012	Full Year	10.17	(58)	9.94	(35)
	1st Quarter	10.28	(14)	9.57	(3)
	2nd Quarter	9.84	(7)	9.47	(6)
	3rd Quarter	10.06	(7)	9.60	(1)
	4th Quarter	9.91	(21)	9.83	(11)
	Full Year	10.03	(49)	9.68	(21)
2013	1st Quarter	10.23	(8)	9.54	(6)
	2nd Quarter	9.83	(5)	9.84	(8)
	3rd Quarter	9.87	(12)	9.45	(6)
	4th Quarter	9.78	(13)	10.28	(6)
	Full Year	9.91	(38)	9.78	(26)
2014	1st Quarter	10.37	(9)	9.47	(3)
	2nd Quarter	9.73	(7)	9.43	(3)
	3rd Quarter	9.40	(2)	9.75	(1)
	4th Quarter	9.62	(12)	9.68	(9)
	Full Year	9.85	(30)	9.60	(16)
2015	1st Quarter	10.29	(9)	9.48	(6)
	2nd Quarter	9.60	(7)	9.42	(6)
	3rd Quarter	9.76	(8)	9.47	(4)
	4th Quarter	9.57	(18)	9.60	(8)
	Full Year	9.77	(42)	9.50	(24)
2016	Full Year	9.77	(42)	9.50	(24)

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

RRA-REGULATORY FOCUS

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January 18, 2017

### Electric Utilities--Summary Table

	Period	ROR %	(# Cases)	ROE %	(# Cases)	Cap. Struc.	(# Cases)	\$ Mil.	(# Cases)
2002	Full Year	8.72	(20)	11.16	(22)	46.27	(19)	-475.4	(24)
2003	Full Year	8.86	(20)	10.97	(22)	49.41	(19)	313.8	(12)
2004	Full Year	8.44	(18)	10.75	(19)	46.84	(17)	1,091.5	(30)
2005	Full Year	8.30	(26)	10.54	(29)	46.73	(27)	1,373.7	(36)
2006	Full Year	8.32	(26)	10.32	(26)	48.54	(25)	1,318.1	(39)
2007	Full Year	8.18	(37)	10.30	(38)	47.88	(36)	1,405.7	(43)
2008	Full Year	8.21	(39)	10.41	(37)	47.94	(36)	2,823.2	(44)
2009	Full Year	8.24	(40)	10.52	(40)	48.57	(39)	4,191.7	(58)
2010	Full Year	8.01	(62)	10.37	(61)	48.63	(57)	4,921.9	(78)
2011	Full Year	8.00	(43)	10.29	(42)	48.26	(42)	2,595.1	(56)
2012	Full Year	7.95	(51)	10.17	(58)	50.69	(52)	3,080.7	(69)
2013	Full Year	7.66	(45)	10.03	(49)	49.25	(43)	3,328.6	(61)
2014	Full Year	7.60	(32)	9.91	(38)	50.28	(35)	2,053.7	(51)
	1st Quarter	7.74	(10)	10.37	(9)	51.91	(9)	203.6	(11)
	2nd Quarter	7.04	(9)	9.73	(7)	47.83	(6)	819.5	(17)
	3rd Quarter	7.85	(3)	9.40	(2)	51.08	(3)	379.6	(5)
	4th Quarter	7.22	(13)	9.62	(12)	48.24	(12)	488.7	(19)
2015	Full Year	7.38	(35)	9.85	(30)	49.54	(30)	1,891.5	(52)
	1st Quarter	7.03	(9)	10.29	(9)	46.06	(9)	311.2	(12)
	2nd Quarter	7.42	(7)	9.60	(7)	49.91	(7)	117.7	(9)
	3rd Quarter	7.23	(8)	9.76	(8)	49.11	(8)	499.1	(13)
	4th Quarter	7.38	(17)	9.57	(18)	49.93	(17)	1,421.4	(23)
2016	Full Year	7.28	(41)	9.77	(42)	48.91	(41)	2,349.4	(57)

### Gas Utilities--Summary Table

	Period	ROR %	(# Cases)	ROE %	(# Cases)	Cap. Struc.	(# Cases)	\$ Mil.	(# Cases)
2002	Full Year	8.80	(20)	11.03	(21)	48.29	(18)	303.6	(26)
2003	Full Year	8.75	(22)	10.99	(25)	49.93	(22)	260.1	(30)
2004	Full Year	8.34	(21)	10.59	(20)	45.90	(20)	303.5	(31)
2005	Full Year	8.25	(29)	10.46	(26)	48.66	(24)	458.4	(34)
2006	Full Year	8.44	(17)	10.40	(15)	47.24	(16)	392.5	(23)
2007	Full Year	8.11	(31)	10.22	(35)	48.47	(28)	645.3	(43)
2008	Full Year	8.49	(33)	10.39	(32)	50.35	(32)	700.0	(40)
2009	Full Year	8.15	(29)	10.22	(30)	48.49	(29)	438.6	(36)
2010	Full Year	7.99	(40)	10.15	(39)	48.70	(40)	776.5	(50)
2011	Full Year	8.09	(18)	9.92	(16)	52.49	(14)	367.0	(31)
2012	Full Year	7.98	(30)	9.94	(35)	51.13	(32)	264.0	(41)
2013	Full Year	7.39	(20)	9.68	(21)	50.60	(20)	494.9	(38)
2014	Full Year	7.65	(27)	9.78	(26)	51.11	(28)	529.2	(48)
	1st Quarter	6.41	(2)	9.47	(3)	50.41	(2)	168.9	(9)
	2nd Quarter	7.29	(3)	9.43	(3)	50.71	(3)	34.9	(8)
	3rd Quarter	7.35	(1)	9.75	(1)	42.01	(1)	103.9	(8)
	4th Quarter	7.54	(10)	9.68	(9)	50.40	(10)	186.5	(15)
2015	Full Year	7.34	(16)	9.60	(16)	49.93	(16)	494.1	(40)
	1st Quarter	7.12	(6)	9.48	(6)	50.83	(6)	120.2	(11)
	2nd Quarter	7.38	(6)	9.42	(6)	50.01	(6)	276.3	(16)
	3rd Quarter	6.59	(5)	9.47	(4)	48.44	(4)	106.3	(8)
	4th Quarter	6.71	(7)	9.60	(8)	48.74	(7)	733.1	(19)
2016	Full Year	6.95	(24)	9.50	(24)	49.56	(23)	1,235.9	(54)

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

## Electric Average Authorized ROEs: 2006 — 2016

### Settled versus Fully Litigated Cases

Year	All Cases		Settled Cases		Fully Litigated Cases	
	ROE %	(# Cases)	ROE %	(# Cases)	ROE %	(# Cases)
2006	10.32	(26)	10.26	(11)	10.37	(15)
2007	10.30	(38)	10.42	(14)	10.23	(24)
2008	10.41	(37)	10.43	(17)	10.39	(20)
2009	10.52	(40)	10.64	(16)	10.45	(24)
2010	10.37	(61)	10.39	(34)	10.35	(27)
2011	10.29	(42)	10.12	(16)	10.39	(26)
2012	10.17	(58)	10.06	(29)	10.28	(29)
2013	10.03	(49)	10.12	(32)	9.85	(17)
2014	9.91	(38)	9.73	(17)	10.05	(21)
2015	9.85	(30)	10.07	(14)	9.66	(16)
2016	9.77	(42)	9.80	(17)	9.74	(25)

### General Rate Cases versus Limited Issue Riders

Year	All Cases		General Rate Cases		Limited Issue Riders	
	ROE %	(# Cases)	ROE %	(# Cases)	ROE %	(# Cases)
2006	10.32	(26)	10.34	(25)	9.80	(1)
2007	10.30	(38)	10.31	(37)	9.90	(1)
2008	10.41	(37)	10.37	(35)	11.11	(2)
2009	10.52	(40)	10.52	(38)	10.55	(2)
2010	10.37	(61)	10.29	(58)	11.87	(3)
2011	10.29	(42)	10.19	(40)	12.30	(2)
2012	10.17	(58)	10.01	(52)	11.57	(6)
2013	10.03	(49)	9.81	(42)	11.34	(7)
2014	9.91	(38)	9.75	(33)	10.96	(5)
2015	9.85	(30)	9.60	(24)	10.87	(6)
2016	9.77	(42)	9.60	(32)	10.31	(10)

### Vertically Integrated Cases versus Delivery Only Cases

Year	All Cases		Vertically Integrated Cases		Delivery Only Cases	
	ROE %	(# Cases)	ROE %	(# Cases)	ROE %	(# Cases)
2006	10.32	(26)	10.63	(15)	9.91	(10)
2007	10.30	(38)	10.50	(26)	9.86	(11)
2008	10.41	(37)	10.48	(26)	10.04	(9)
2009	10.52	(40)	10.66	(28)	10.15	(10)
2010	10.37	(61)	10.42	(41)	9.98	(17)
2011	10.29	(42)	10.33	(28)	9.85	(12)
2012	10.17	(58)	10.10	(39)	9.73	(13)
2013	10.03	(49)	9.95	(31)	9.41	(11)
2014	9.91	(38)	9.94	(19)	9.50	(14)
2015	9.85	(30)	9.75	(17)	9.23	(7)
2016	9.77	(42)	9.77	(20)	9.31	(12)

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

## Gas Average Authorized ROEs: 2006 — 2016

### Settled versus Fully Litigated Cases

Year	All Cases		Settled Cases		Fully Litigated Cases	
	ROE %	(# Cases)	ROE %	(# Cases)	ROE %	(# Cases)
2006	10.40	(15)	10.26	(7)	10.53	(8)
2007	10.22	(35)	10.24	(22)	10.20	(13)
2008	10.39	(32)	10.34	(20)	10.47	(12)
2009	10.22	(30)	10.43	(13)	10.05	(17)
2010	10.15	(39)	10.30	(12)	10.08	(27)
2011	9.92	(16)	10.08	(8)	9.76	(8)
2012	9.94	(35)	9.99	(14)	9.92	(21)
2013	9.68	(21)	9.80	(9)	9.59	(12)
2014	9.78	(26)	9.51	(11)	9.98	(15)
2015	9.60	(16)	9.60	(11)	9.58	(5)
2016	9.50	(24)	9.43	(14)	9.61	(10)

### General Rate Cases versus Limited Issue Riders

Year	All Cases		General Rate Cases		Limited Issue Riders	
	ROE %	(# Cases)	ROE %	(# Cases)	ROE %	(# Cases)
2006	10.40	(15)	10.40	(15)	—	(0)
2007	10.22	(35)	10.22	(35)	—	(0)
2008	10.39	(32)	10.39	(32)	—	(0)
2009	10.22	(30)	10.22	(30)	—	(0)
2010	10.15	(39)	10.15	(39)	—	(0)
2011	9.92	(16)	9.91	(15)	10.00	(1)
2012	9.94	(35)	9.93	(34)	10.40	(1)
2013	9.68	(21)	9.68	(21)	—	(0)
2014	9.78	(26)	9.78	(26)	—	(0)
2015	9.60	(16)	9.60	(16)	—	(0)
2016	9.50	(24)	9.49	(23)	9.70	(1)

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

## Electric Utility Decisions

Date	Company	State	ROR %	ROE %	Common Equity as % of Capital	Test Year	Rate Base	Amt. \$ Mil. Footnotes
1/5/16	MDU Resources Group	ND	7.95	10.50	50.27	12/16	—	15.1 (B,LIR,1)
1/6/16	Avista Corporation	WA	7.29	9.50	48.50	9/14	—	-8.1 (B)
1/28/16	Northern Indiana-- Public Service Co.	IN	—	—	—	—	—	0.0 (LIR,2)
2/2/16	Kentucky Utilities Company	VA	—	—	—	12/14	—	5.5 (B)
2/23/16	Entergy Arkansas	AR	4.52	9.75	28.46	3/15	—	219.7 (B,*)
2/29/16	Virginia Electric and Power Company	VA	7.90	11.60	49.99	3/17	Average	21.0 (LIR,3)
2/29/16	Virginia Electric and Power Company	VA	7.40	10.60	49.99	3/17	Average	-9.3 (LIR,4)
2/29/16	Virginia Electric and Power Company	VA	7.40	10.60	49.99	3/17	Average	6.6 (LIR,5)
2/29/16	Virginia Electric and Power Company	VA	7.40	10.60	49.99	3/17	Average	-16.8 (LIR,6)
3/16/16	Indianapolis Power & Light Company	IN	6.51	9.85	37.33	6/14	Year-end	29.6 (*)
3/25/16	MDU Resources Group	MT	—	—	—	12/14	—	7.4 (B,Z)
3/29/16	Virginia Electric and Power Company	VA	6.90	9.60	49.99	3/17	Average	40.4 (LIR,7)
2016	1ST QUARTER: AVERAGES/TOTAL OBSERVATIONS		7.03 9	10.29 9	46.06 9			311.2 12
4/29/16	Fitchburg Gas and Electric Light Co.	MA	8.46	9.80	52.17	12/14	Year-end	2.1 (D)
6/3/16	Baltimore Gas and Electric Company	MD	7.28	9.75	51.90	11/15	Average	44.1 (D,R)
6/8/16	El Paso Electric Company	NM	7.67	9.48	49.29	12/14	Year-end	1.1
6/15/16	New York State Electric & Gas Corp.	NY	6.68	9.00	48.00	4/17	Average	29.6 (B,D,Z,8)
6/15/16	Rochester Gas and Electric Corp.	NY	7.55	9.00	48.00	4/17	Average	3.0 (B,D,Z,8)
6/23/16	San Diego Gas & Electric Co.	CA	—	—	—	12/16	Average	3.0 (B,Z,9)
6/30/16	Appalachian Power Company	WV	—	—	—	—	—	55.1 (B,LIR,10)
6/30/16	Virginia Electric and Power Company	VA	7.40	10.60	49.99	8/17	Average	-25.7 (LIR,11)
6/30/16	Virginia Electric and Power Company	VA	6.90	9.60	49.99	8/17	Average	5.4 (LIR,12)
2016	2ND QUARTER: AVERAGES/TOTAL OBSERVATIONS		7.42 7	9.60 7	49.91 7			117.7 9
7/18/16	Northern Indiana Public Service Co.	IN	6.74	9.98	47.42	3/15	Year-end	72.5 (B,*)
8/9/16	Kingsport Power Company	TN	6.18	9.85	40.25	12/17	Average	8.6 (B)
8/10/16	Southwestern Public Service Co.	NM	—	—	—	—	—	23.5 (B)
8/10/16	Empire District Electric Company	MO	—	—	—	6/15	—	20.4 (B)
8/18/16	El Paso Electric Company	TX	—	—	—	3/15	—	40.7 (I,B)
8/18/16	UNS Electric, Inc.	AZ	7.22	9.50	52.83	12/14	Year-end	15.1
8/22/16	Virginia Electric and Power Company	VA	—	—	—	8/17	—	21.3 (LIR, B,13)
8/24/16	Atlantic City Electric Company	NJ	7.64	9.75	49.48	12/15	Year-end	45.0 (D,B)

## Electric Utility Decisions (continued)

Date	Company	State	ROR %	ROE %	Common Equity as % of Capital	Test Year	Rate Base	Amt. \$ Mil. Footnotes
9/1/16	PacifiCorp	WA	7.30	9.50	49.10	6/15	Year-end	13.7 (Z)
9/8/16	Upper Peninsula Power Company	MI	7.47	10.00	53.49	12/16	Average	4.6 (I,*)
9/28/16	Public Service Co. of New Mexico	NM	7.71	9.58	49.61	9/16	Average	61.2
9/28/16	KCP&L Greater Missouri Operations	MO	—	—	—	—	—	3.0 (B)
9/30/16	Massachusetts Electric Company	MA	7.58	9.90	50.70	6/15	Year-end	169.7 (D)
<b>2016 3RD QUARTER: AVERAGES/TOTAL OBSERVATIONS</b>			<b>7.23</b>	<b>9.76</b>	<b>49.11</b>			<b>499.3</b>
			<b>8</b>	<b>8</b>	<b>8</b>			<b>13</b>
10/6/16	Appalachian Power Company	VA	—	9.40	—	—	—	— (LIR)
10/19/16	South Carolina Electric & Gas Co.	SC	8.24	—	51.35	6/16	Year-end	64.4 (LIR, 14)
10/26/16	Northern States Power Company - WI	WI	—	—	—	12/17	—	24.5 (15)
11/9/16	Madison Gas and Electric Company	WI	7.89	9.80	57.16	12/17	Average	-3.3
11/10/16	Public Service Company of Oklahoma	OK	6.94	9.50	44.00	1/15	Year-end	14.5
11/15/16	Potomac Electric Power Company	MD	7.49	9.55	49.55	12/15	Average	52.5 (D)
11/18/16	Wisconsin Power and Light Company	WI	7.91	10.00	52.20	12/18	Average	9.4 (B,Z)
11/29/16	Florida Power & Light Company	FL	—	10.55	—	12/18	—	811.0 (B,Z)
12/1/16	Liberty Utilities (CalPeco Electric) LLC	CA	7.51	10.00	52.50	12/16	Average	8.3 (B)
12/6/16	Commonwealth Edison Company	IL	6.71	8.64	45.62	12/15	Year-end	130.9 (D)
12/6/16	Ameren Illinois Company	IL	7.28	8.64	50.00	12/15	Year-end	-8.8 (D)
12/6/16	Entergy Arkansas, Inc.	AR	—	—	—	12/17	—	54.4 (B)
12/7/16	Duke Energy Progress, LLC	SC	7.21	10.10	53.00	12/15	Year-end	56.2 (B,Z)
12/9/16	Monongahela Power Company	WV	—	—	—	6/16	—	25.0 (B,LIR,16)
12/12/16	Jersey Central Power & Light Co.	NJ	7.47	9.60	45.00	6/16	Year-end	80.0 (B,D)
12/14/16	United Illuminating Company	CT	7.08	9.10	50.00	12/15	Average	57.4 (D,Z)
12/15/16	Avista Corporation	WA	—	—	—	—	—	0.0 (17)
12/19/16	Black Hills Colorado Electric Utility Co.	CO	7.43	9.37	52.39	12/15	Average	0.6
12/19/16	Emera Maine	ME	7.45	9.00	49.00	12/14	Average	3.0 (D,Hy)
12/20/16	Georgia Power Company	GA	—	—	—	12/17	—	— (LIR,W,18)
12/22/16	Sierra Pacific Power Company	NV	6.65	9.60	48.03	12/15	—	-2.9 (B)
12/22/16	Virginia Electric and Power Company	NC	7.37	9.90	51.75	12/15	Year-end	34.7 (B,I)
12/23/16	Hawaiian Electric Company, Inc.	HI	—	—	—	—	—	0.0 (19)
12/28/16	Avista Corporation	ID	7.58	9.50	50.00	12/15	Average	6.3 (B)
12/30/16	Appalachian Power Company	VA	7.30	10.00	47.22	12/17	Average	3.3 (B,LIR,20)
<b>2016 4TH QUARTER: AVERAGES/TOTAL OBSERVATIONS</b>			<b>7.38</b>	<b>9.57</b>	<b>49.93</b>			<b>1,421.4</b>
			<b>17</b>	<b>18</b>	<b>17</b>			<b>23</b>
<b>2016 FULL YEAR: AVERAGES/TOTAL OBSERVATIONS</b>			<b>7.28</b>	<b>9.77</b>	<b>48.91</b>			<b>2,349.6</b>
			<b>41</b>	<b>42</b>	<b>41</b>			<b>57</b>

Source: Regulatory Research Associates, an offering of S&amp;P Global Market Intelligence



RRA-REGULATORY FOCUS

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January 18, 2017

## Gas Utility Decisions

Date	Company	State	ROR %	ROE %	Common Equity as % of Capital	Test Year	Rate Base	Amt. \$ Mil. Footnotes
1/6/16	Oklahoma Natural Gas Company	OK	7.31	9.50	60.50	3/15	Year-end	30.0 (B)
1/6/16	Avista Corporation	WA	7.29	9.50	48.50	09/14	—	10.8 (B)
1/28/16	SourceGas Arkansas	AR	5.33	9.40	39.46	3/15	Year-end	8.0 (B,*)
2/10/16	Liberty Utilities (New England Nat. Gas)	MA	7.99	9.60	50.00	12/14	Year-end	7.8 (B)
2/16/16	Public Service Company of Colorado	CO	7.33	9.50	56.51	12/14	Average	39.2 (I,Z,R)
2/25/16	Black Hills Kansas Gas Utility Company	KS	—	—	—	10/15	Year-end	0.8 (LIR,21)
2/29/16	Avista Corporation	OR	7.46	9.40	50.00	12/16	Average	4.5
3/17/16	Atmos Energy Corporation	KS	—	—	—	3/15	—	2.2 (B)
3/30/16	Indiana Gas Company, Inc.	IN	—	—	—	6/15	Year-end	7.0 (LIR,22)
3/30/16	Northern Indiana Public Service Co.	IN	—	—	—	6/15	Year-end	7.6 (LIR,23)
3/30/16	Southern Indiana Gas and Electric Co.	IN	—	—	—	6/15	Year-end	2.3 (LIR,22)
2016	1ST QUARTER: AVERAGES/TOTAL OBSERVATIONS		7.12 6	9.48 6	50.83 6			120.2 11
4/21/16	Consumers Energy Company	MI	—	—	—	12/16	—	40.0 (I,B)
4/29/16	Fitchburg Gas and Electric Light Company	MA	8.46	9.80	52.17	12/14	Year-end	1.6
5/5/16	CenterPoint Energy Resources Corp.	MN	7.07	9.49	50.00	9/16	Average	27.5 (I)
5/11/16	Liberty Utilities (Midstates Nat. Gas)	MO	—	—	—	1/16	—	0.2 (LIR,24)
5/19/16	Delta Natural Gas Company	KY	—	—	—	12/15	Year-end	1.4 (LIR)
5/19/16	Laclede Gas Company	MO	—	—	—	2/16	Year-end	5.4 (LIR,25)
5/19/16	Missouri Gas Energy	MO	—	—	—	2/16	Year-end	3.6 (LIR,25)
6/1/16	Maine Natural Gas	ME	7.28	9.55	50.00	9/14	Average	2.5 (B,Z)
6/3/16	Baltimore Gas and Electric Company	MD	7.23	9.65	51.90	11/15	Average	47.9 (R)
6/15/16	New York State Electric & Gas Corporation	NY	6.68	9.00	48.00	4/17	Average	13.1 (B,Z,7)
6/15/16	Rochester Gas and Electric Corp.	NY	7.55	9.00	48.00	4/17	Average	8.8 (B,Z,7)
6/22/16	Northern Indiana Public Service Co.	IN	—	—	—	12/15	Year-end	6.7 (LIR,E,26)
6/23/16	San Diego Gas & Electric Co.	CA	—	—	—	12/16	Average	-1.6 (B,Z,27)
6/23/16	Southern California Gas Company	CA	—	—	—	12/16	Average	106.9 (B,Z,9)
6/29/16	Indiana Gas Company, Inc.	IN	—	—	—	12/15	Year-end	10.2 (LIR,28)
6/29/16	Southern Indiana Gas and Electric Co.	IN	—	—	—	12/15	Year-end	2.1 (LIR,28)
2016	2ND QUARTER: AVERAGES/TOTAL OBSERVATIONS		7.38 6	9.42 6	50.01 6			276.3 16

RRA-REGULATORY FOCUS

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January 18, 2017

## Gas Utility Decisions (continued)

Date	Company	State	ROR		Common Equity as % of Capital	Test Year	Rate Base	Amt. \$ Mil. Footnotes
			%	ROE %				
7/7/16	Cascade Natural Gas Corporation	WA	7.35	—	—	—	—	4.0 (B)
7/19/16	CenterPoint Energy Resources Corp.	OK	—	—	—	12/15	—	0.0 (B,29)
8/4/16	Atmos Energy Corporation	KY	—	—	—	5/17	—	0.5 (B)
8/22/16	Questar Gas Company	UT	—	—	—	—	—	— (30)
9/1/16	UGI Utilities, Inc.	PA	—	—	—	9/17	—	27.0 (B)
9/2/16	CenterPoint Energy Resources Corp.	AR	4.53	9.50	30.85	9/15	Year-end	14.2 (B,*)
9/23/16	New Jersey Natural Gas Company	NJ	6.90	9.75	52.50	6/16	Year-end	45.0 (B)
9/27/16	Texas Gas Service Company	TX	7.28	9.50	60.10	9/15	Year-end	8.8
9/29/16	Minnesota Energy Resources Corp.	MN	6.88	9.11	50.32	12/16	Average	6.8 (I,E)
2016	3RD QUARTER: AVERAGES/TOTAL OBSERVATIONS		6.59 5	9.47 4	48.44 4			106.3 8
10/26/16	Northern States Power Company - WI	WI	—	—	—	12/17	—	4.8 (15)
10/27/16	Columbia Gas of Maryland, Inc.	MD	—	—	—	4/16	—	3.7 (B)
10/27/16	Columbia Gas of Pennsylvania, Inc.	PA	—	—	—	12/17	—	35.0 (B)
10/28/16	Public Service Co. of North Carolina	NC	7.53	9.70	52.00	12/15	Year-end	19.1 (B)
11/9/16	Madison Gas and Electric Company	WI	—	9.80	—	12/17	—	3.1
11/14/16	Atmos Energy Corporation	KY	—	—	—	9/17	Year-end	5.0 (LIR,31)
11/15/16	Texas Gas Service Company	TX	—	—	—	12/15	—	6.8 (B)
11/18/16	Wisconsin Power and Light Company	WI	7.84	10.00	52.20	12/18	Average	9.4 (B,Z)
11/23/16	Baltimore Gas and Electric Company	MD	—	—	—	12/18	Average	6.1 (B,Z,LIR,32)
11/29/16	Kansas Gas Service Company	KS	—	—	—	—	—	15.5 (B)
12/1/16	Pacific Gas and Electric Company	CA	—	—	—	12/15	Average	100.0 (Tr,I, 33)
12/9/16	DTE Gas Company	MI	5.76	10.10	38.65	10/17	Average	122.3 (I,*)
12/14/16	Columbia Gas of Maryland, Inc.	MD	7.53	9.70	54.29	12/17	Average	1.2 (LIR,32)
12/15/16	KeySpan Gas East Corporation	NY	6.42	9.00	48.00	12/17	Average	112.0 (B,34)
12/15/16	Brooklyn Union Gas Company	NY	6.15	9.00	48.00	12/17	Average	272.1 (B,35)
12/15/16	Avista Corporation	WA	—	—	—	—	—	0.0 (17)
12/20/16	Columbia Gas of Virginia, Inc.	VA	—	—	—	12/17	Average	1.3 (LIR,36)
12/22/16	Columbia Gas of Kentucky, Inc.	KY	—	—	—	—	—	18.1 (B)
12/22/16	Sierra Pacific Power Company	NV	5.75	9.50	48.03	12/15	—	-2.4 (B)
2016	4TH QUARTER: AVERAGES/TOTAL OBSERVATIONS		6.71 7	9.60 8	48.74 7			733.1 19
2016	FULL YEAR: AVERAGES/TOTAL OBSERVATIONS		6.95 24	9.50 24	49.56 23			1,235.9 54

Source: Regulatory Research Associates, an offering of S&amp;P Global Market Intelligence

FOOTNOTES

- A- Average  
B- Order followed stipulation or settlement by the parties. Decision particulars not necessarily precedent-setting or specifically adopted by the regulatory body.  
CWIP- Construction work in progress  
D- Applies to electric delivery only  
DCt Date certain rate base valuation  
E- Estimated  
F- Return on fair value rate base  
Hy- Hypothetical capital structure utilized  
I- Interim rates implemented prior to the issuance of final order, normally under bond and subject to refund.  
LIR Limited-issue rider proceeding  
M- "Make-whole" rate change based on return on equity or overall return authorized in previous case.  
R- Revised  
Te- Temporary rates implemented prior to the issuance of final order.  
Tr- Applies to transmission service  
U- Double leverage capital structure utilized.  
W- Case withdrawn  
YE- Year-end  
Z- Rate change implemented in multiple steps.  
\* Capital structure includes cost-free items or tax credit balances at the overall rate of return.
- (1) Rate increase approved in renewable resource cost recovery rider.  
(2) Case represents the company's transmission, distribution, and storage system improvement charge, or TDSIC rate adjustment mechanism. The case was dismissed by the Commission, with no rate change authorized.  
(3) Proceeding determines the revenue requirement for Rider B, which is the mechanism through which the company recovers costs associated with its plan to convert the Altavista, Hopewell, and Southampton Power Stations to burn biomass fuels.  
(4) Represents rate decrease associated with the company's Rider R proceeding, which is the mechanism through which the company recovers the investment in the Bear Garden generating facility.  
(5) This proceeding determines the revenue requirement for Rider S, which recognizes in rates the company's investment in the Virginia City Hybrid Energy Center.  
(6) Decrease authorized through a surcharge, Rider W, which reflects in rates investment in the Warren County Power Station.  
(7) Proceeding involves a new gas-fired generation facility, the Greenville County project, and creation of a new rider mechanism, Rider GV, to reflect the related revenue requirement in rates.  
(8) Rate increase effective 5/1/16; additional increases to be effective 5/1/17 and 5/1/18.  
(9) Settlement adopted with modifications. Rate increase effective retroactive to 1/1/16; additional increases to be effective 1/1/17 and 1/1/18.  
(10) Represents the company's joint expanded net energy cost, or ENEC, proceeding.  
(11) Represents rate decrease associated with the company's Rider BW proceeding, which is the mechanism through which the company recovers the investment in its Brunswick County Power Station.  
(12) Represents the rate increase associated with the company's Rider US-2, which is the mechanism through which the company recovers the revenue requirement associated with three new solar generation facilities.  
(13) Case involves the company's request to establish Rider U for recovery of investment and costs associated with a project to underground certain distribution lines.  
(14) The present case involves South Carolina Electric & Gas' request for a cash return on incremental V.C. Summer Units 2 and 3 construction work in progress (CWIP) and incorporates the 10.5% return on equity that was authorized in September 2015 for use in the Summer CWIP-related proceedings beginning in 2016.  
(15) The rate case is for the limited purpose of recovering anticipated increases in: generation and transmission fixed charges and fuel and purchased power expenses related to the interchange agreement with affiliate NSP-Minnesota; and, rate base investment.

FOOTNOTES (continued)

- (16) Case is a consolidated expanded net energy cost proceeding for Monongahela Power and affiliate Potomac Edison.
- (17) Rate increase rejected by commission.
- (18) As a result of the commission's adoption of a settlement in another proceeding, the company withdrew its rate increase request in this proceeding, and no rate change was implemented.
- (19) No change in base rates was sought by the company, and on 12/23/16, the commission issued an order closing this docket.
- (20) Case involves the company's G-RAC rider mechanism that addresses its investment in the Dresden Generating Plant, and establishes the revenue requirement for the rider to become effective 1/1/17.
- (21) Case involves the company's gas system reliability surcharge, or GSRS, rider and reflects investments made from July 1, 2014 through Oct. 31, 2015.
- (22) Case involves company's "compliance and system improvement adjustment" mechanism, and includes compliance-related investments made between Jan. 1 and June 30, 2015, and certain other investments made between July 1, 2014 and June 30, 2015.
- (23) Case establishes the rates to be charged to customers under the company's transmission, distribution and storage system improvement charge rate adjustment mechanism, and reflects investments made between July 1, 2014 and June 30, 2015.
- (24) Case involves the company's infrastructure system replacement surcharge rider and reflects incremental investments made from 6/1/15 through 1/31/16.
- (25) Case involves the company's infrastructure system replacement surcharge rider and reflects incremental investments made from 9/1/15 through 2/29/16.
- (26) Case establishes the rates to be charged to customers under the company's transmission, distribution and storage system improvement charge rate adjustment mechanism, and reflects investments made between 7/1/15 and 12/31/15.
- (27) Settlement adopted with modifications. Rate decrease effective retroactive to 1/1/16; rate increases to be effective 1/1/17 and 1/1/18.
- (28) Case involves company's "compliance and system improvement adjustment" mechanism, and includes compliance-related investments made between 7/1/15 and 12/31/15.
- (29) Case involves the company's performance based ratemaking plan.
- (30) On 8/22/16, the PSC approved the company's petition to withdraw the rate increase request, effectively closing the case. The request to withdraw the filing comported with provisions of a settlement filed in the Questar/Dominion Resources merger proceeding.
- (31) Case is an annual update to the company's pipe replacement program rider.
- (32) Case involves the company's strategic infrastructure development and enhancement, or STRIDE, rider.
- (33) Case involves the company's gas transmission and storage operations. The decision also authorized attrition rate increases of \$246 million for 2016, \$64 million for 2017 and \$105 million for 2018.
- (34) Adopted joint proposal provides for the company to implement a \$112 million rate increase effective 1/1/17, a \$19.6 million rate increase effective 1/1/18, and a \$27 million rate increase effective 1/1/19.
- (35) Adopted joint proposal provides for the company to implement a \$272.1 million rate increase effective 1/1/17, a \$41 million rate increase effective 1/1/18, and a \$48.9 million rate increase effective 1/1/19.
- (36) Case involves the company's investments under the Steps to Advance Virginia's Energy Plan.

Dennis Spurduto

# RRA Regulatory Focus

## Major Rate Case Decisions 2017

Rate case activity was brisk in 2017. The average ROE authorized electric utilities was 9.74% in rate cases decided in 2017, a record low, albeit marginally below 9.77% in 2016. There were 53 electric ROE determinations in 2017, versus 42 in 2016. This data includes several limited issue rider cases; excluding these cases from the data, the average authorized ROE was 9.68% in rate cases decided in 2017, marginally up from 9.6% in 2016. The differential in electric authorized ROEs is largely driven by Virginia statutes that authorize the State Corporation Commission to approve ROE premiums of up to 200 basis points for certain generation projects (see the [Virginia Commission Profile](#)).

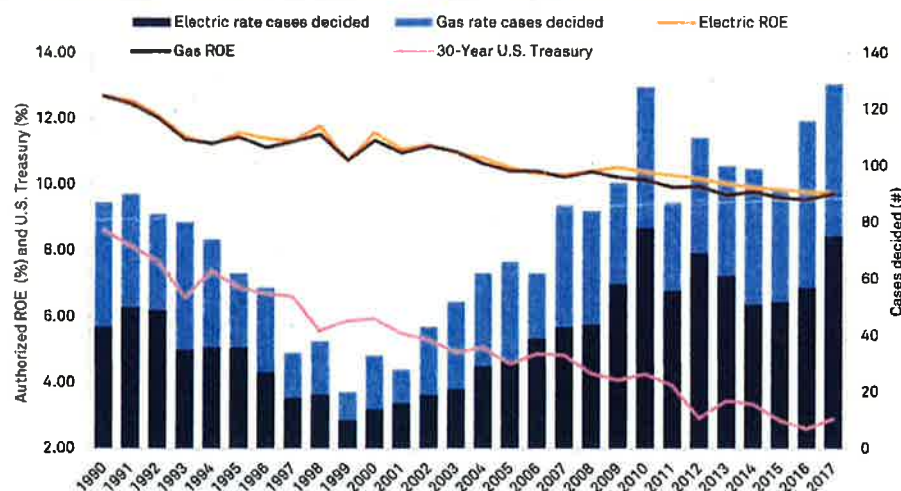
For vertically-integrated electric utilities, the average ROE authorized was 9.8% in 2017, versus 9.77% in 2016. For electric distribution utilities, the average ROE authorized was 9.43% in 2017, versus 9.31% in 2016.

The average ROE authorized gas utilities was 9.72% in 2017 versus 9.54% in 2016. There were 24 gas cases that included an ROE determination in 2017, versus 26 in 2016. RRA notes that the 2017 data includes an 11.88% ROE determination for an Alaska utility. Absent this "outlier," the 2017 gas ROE average is 9.63%.

In 2017, the median authorized ROE for all electric utilities was 9.6%, versus 9.75% in 2016. For gas utilities, the median authorized ROE in 2017 was 9.6%, versus 9.5% in 2016.

Over the last several years, the persistently low interest rate environment has put a downward pressure on authorized ROEs. As shown in the graph below, the annual average ROE has generally declined since 1990 and has been below 10% for electrics since 2014, and below 10% for gas utilities since 2011. In addition, after reaching a low in 1999, the number of rate case decisions for energy companies has generally increased over the last several years, peaking in 2010 and again in 2017.

**Average electric and gas authorized ROEs and number of rate cases**



Data compiled Jan. 29, 2018.

Sources: Regulatory Research Associates, an offering of S&P Global Market Intelligence; U.S. Treasury

There were 129 electric and gas rate cases resolved in 2017, 116 in 2016, 92 in 2015, 99 in 2014, 100 in 2013, and 110 in 2012, and this level of rate case activity remains robust compared to the late 1990s/early 2000s. Increased costs associated with environmental compliance, generation and delivery infrastructure upgrades and expansion, renewable generation mandates and

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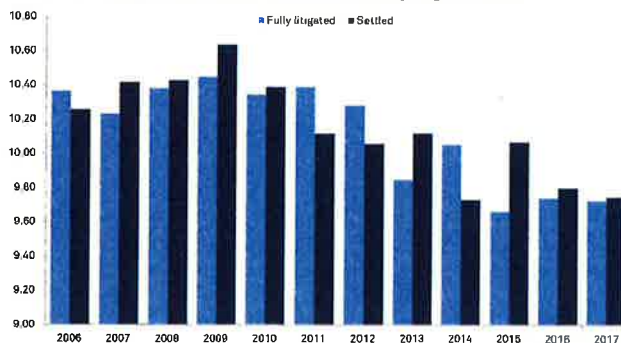
## Regulatory Focus: Major Rate Case Decisions

employee benefits argue for the continuation of an active rate case agenda over the next few years.

In addition, if the Federal Reserve continues its policy initiated in December 2015 to gradually raise the federal funds rate, utilities eventually would face higher capital costs and would need to initiate rate cases to reflect the higher capital costs in rates. Since the December 2015 hike, the Fed has increased the federal funds an additional four times, the latest hike in December 2017 to a target range of 1.25% to 1.5%. The Fed expects to continue to raise rates gradually in 2018 as the U.S. economy, including labor markets, remain strong. An increase in the rate of price inflation would point to additional Fed tightening, but a significant weakening in the economy would likely cause the Fed to reconsider further interest rate hikes. Also, higher interest rates and borrowing costs would increase the U.S. budget deficit, which is already quite significant, and is expected to further increase due to the enactment in December 2017 of tax reform legislation.

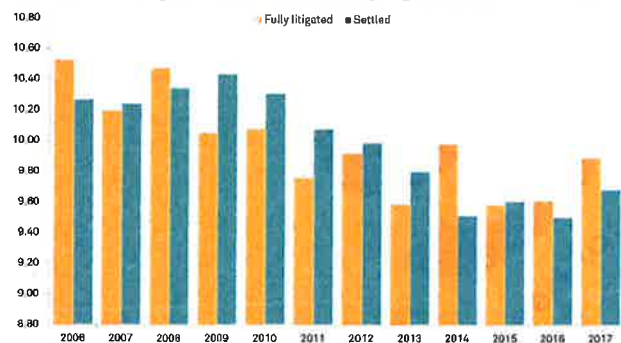
Included in tables on pages 7 and 8 of this report are comparisons, since 2006, of average authorized ROEs by settled versus fully litigated cases, general rate cases versus limited issue rider proceedings and vertically integrated cases versus delivery only cases.

Average authorized electric ROEs, settled versus fully litigated cases



Data compiled Jan. 29, 2018.  
Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

Average authorized gas ROEs, settled versus fully litigated cases



Data compiled Jan. 29, 2018.  
Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

The simple mean is utilized for the return averages. In addition, the average equity returns indicated in this report reflect the cases decided in the specified time periods and are not necessarily representative of the returns actually earned by utilities industry wide.

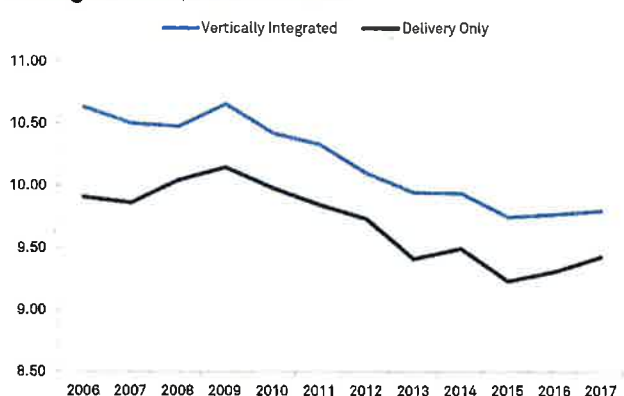
As a result of electric industry restructuring, certain states unbundled electric rates and implemented retail competition for generation. Commissions in those states now have jurisdiction only over the revenue requirement and return parameters for delivery operations, which we footnote in our chronology

As shown in the graphs and tables, for both electric and gas cases, no pattern exists in average annual authorized ROEs in cases that were settled versus those that were fully litigated. In some years, the average authorized ROE was higher for fully litigated cases, in others it was higher for settled cases, and in a few years the authorized ROE was similar for fully litigated versus settled cases.

Regarding electric cases that involve limited issue riders, over the last several years the annual average authorized ROEs in these cases was typically at least 70 basis points higher than in general rate cases, driven by the ROE premiums authorized in Virginia. Limited issue rider cases in which an ROE is determined have had extremely limited use in the gas industry.

Comparing electric vertically integrated cases versus delivery only proceedings, RRA finds that the annual average authorized ROEs in vertically integrated cases typically are from roughly 40 to 70 basis points higher than in delivery only cases, arguably reflecting the increased risk associated with generation assets.

Average authorized electric ROEs



Data compiled Jan. 29, 2018.  
Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

## Regulatory Focus: Major Rate Case Decisions

beginning on page 9, thus complicating historical data comparability. From 2008 through 2015, interest rates declined significantly, and average authorized ROEs have declined modestly. Also, limited issue rider proceedings that allow utilities to recover certain costs outside of a general rate case and typically incorporate previously determined return parameters have been increasingly utilized.

The table on page 5 shows the average ROE authorized in major electric and gas rate decisions annually since 1990, and by quarter since 2014, followed by the number of observations in each period. The tables on page 6 indicate the composite electric and gas industry data for all major cases summarized annually since 2003 and by quarter for the past eight quarters. The individual electric and gas cases decided in 2017 are listed on pages 9-13, with the decision date shown first, followed by the company name, the abbreviation for the state issuing the decision, the authorized rate of return, or ROR, ROE, and percentage of common equity in the adopted capital structure. Next, we indicate the month and year in which the adopted test year ended, whether the commission utilized an average or a year end rate base, and the amount of the permanent rate change authorized. The dollar amounts represent the permanent rate change ordered at the time decisions were rendered. Fuel adjustment clause rate changes are not reflected in this study.

The table and graph below track the average and median equity return authorized for all electric and gas rate cases combined, by year, for the last 28 years. As the table indicates, since 1990 authorized ROEs have generally trended downward, reflecting the significant decline in interest rates and capital costs that has occurred over this time frame. The combined average and median equity returns authorized for electric and gas utilities in each of the years 1990 through 2017, and the number of observations for each year are presented in the accompanying tables.

## Composite electric and gas annual authorized ROEs: 1990 — 2017

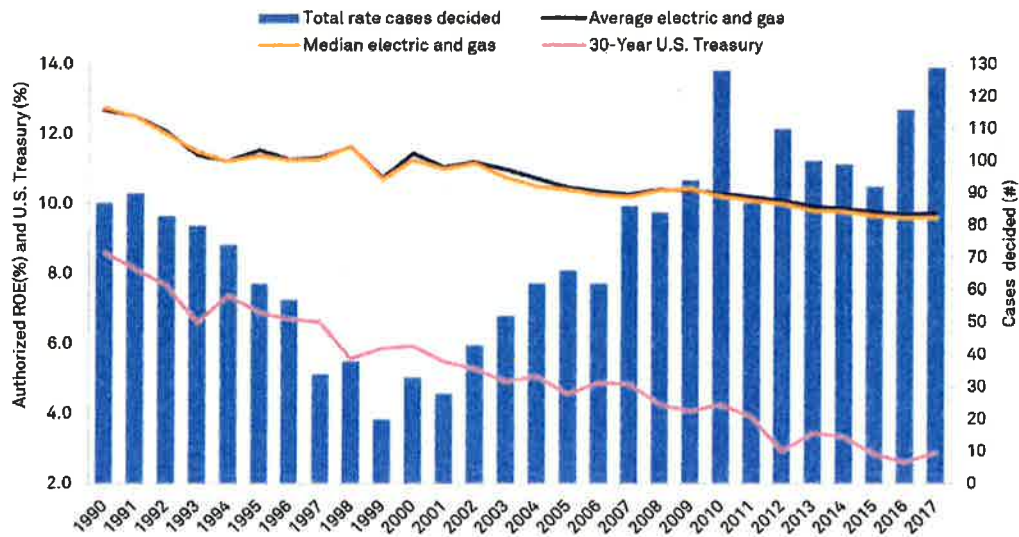
Year	Average ROE (%)	Median ROE (%)	No. of Observations	Year	Average ROE (%)	Median ROE (%)	No. of Observations
1990	12.69	12.75	71	2004	10.72	10.50	43
1991	12.50	12.50	73	2005	10.46	10.40	50
1992	12.06	12.00	73	2006	10.35	10.25	41
1993	11.40	11.50	68	2007	10.26	10.20	73
1994	11.23	11.22	52	2008	10.40	10.39	69
1995	11.53	11.38	41	2009	10.39	10.43	70
1996	11.26	11.25	35	2010	10.28	10.22	100
1997	11.31	11.28	22	2011	10.19	10.10	58
1998	11.64	11.65	20	2012	10.09	10.00	93
1999	10.73	10.70	12	2013	9.92	9.80	70
2000	11.44	11.25	22	2014	9.86	9.78	64
2001	11.04	11.00	20	2015	9.76	9.65	46
2002	11.19	11.16	33	2016	9.68	9.60	68
2003	10.98	10.75	45	2017	9.73	9.60	77

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence.



Regulatory Focus: Major Rate Case Decisions

Composite electric and gas authorized ROEs and number of rate cases



Data compiled Jan. 29, 2018.

Sources: Regulatory Research Associates, an offering of S&P Global Market Intelligence; U.S. Treasury

**Please Note:** In an effort to align data presented in this report with data available in S&P Global Market Intelligence's online data base, earlier historical data provided in previous reports may not match historical data in this report due to certain differences in presentation, including the treatment of cases that were withdrawn or dismissed.

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Regulatory Focus: Major Rate Case Decisions

**ROEs authorized January 1990 - December 2017**

Year	Period	Electric utilities			Gas utilities		
		Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations
1990	Full year	12.70	12.77	38	12.68	12.75	33
1991	Full year	12.54	12.50	42	12.45	12.50	31
1992	Full year	12.09	12.00	45	12.02	12.00	28
1993	Full year	11.46	11.50	28	11.37	11.50	40
1994	Full year	11.21	11.13	28	11.24	11.27	24
1995	Full year	11.58	11.45	28	11.44	11.30	13
1996	Full year	11.40	11.25	18	11.12	11.25	17
1997	Full year	11.33	11.58	10	11.30	11.25	12
1998	Full year	11.77	12.00	10	11.51	11.40	10
1999	Full year	10.72	10.75	6	10.74	10.65	6
2000	Full year	11.58	11.50	9	11.34	11.16	13
2001	Full year	11.07	11.00	15	10.96	11.00	5
2002	Full year	11.21	11.28	14	11.17	11.00	19
2003	Full year	10.96	10.75	20	10.99	11.00	25
2004	Full year	10.81	10.70	21	10.63	10.50	22
2005	Full year	10.51	10.35	24	10.41	10.40	26
2006	Full year	10.32	10.23	26	10.40	10.50	15
2007	Full year	10.30	10.20	38	10.22	10.20	35
2008	Full year	10.41	10.30	37	10.39	10.45	32
2009	Full year	10.52	10.50	40	10.22	10.26	30
2010	Full year	10.37	10.30	61	10.15	10.10	39
2011	Full year	10.29	10.17	42	9.92	10.03	16
2012	Full year	10.17	10.08	58	9.94	10.00	35
2013	Full year	10.03	9.95	49	9.68	9.72	21
2014	1st quarter	10.23	9.86	8	9.54	9.60	6
	2nd quarter	9.83	9.70	5	9.84	9.95	8
	3rd quarter	9.87	9.78	12	9.45	9.33	6
	4th quarter	9.78	9.80	13	10.28	10.20	6
	Full year	9.91	9.78	38	9.78	9.78	26
2015	1st quarter	10.37	9.83	9	9.47	9.05	3
	2nd quarter	9.73	9.60	7	9.43	9.50	3
	3rd quarter	9.40	9.40	2	9.75	9.75	1
	4th quarter	9.62	9.55	12	9.68	9.75	9
	Full year	9.85	9.65	30	9.60	9.68	16
2016	1st quarter	10.29	10.50	9	9.48	9.50	6
	2nd quarter	9.60	9.60	7	9.42	9.52	6
	3rd quarter	9.76	9.80	8	9.47	9.50	4
	4th quarter	9.57	9.58	18	9.68	9.73	10
	Full year	9.77	9.75	42	9.54	9.50	26
2017	1st quarter	9.87	9.60	15	9.60	9.25	3
	2nd quarter	9.63	9.50	14	9.47	9.60	7
	3rd quarter	9.66	9.60	5	10.14	9.90	6
	4th quarter	9.73	9.60	19	9.68	9.55	8
	Full year	9.74	9.60	53	9.72	9.60	24

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

Regulatory Focus: Major Rate Case Decisions

Electric utilities — summary table

	Period	ROR (%)	Number of observations	ROE (%)	Number of observations	Capital structure	Number of observations	\$M	Number of observations
2003	Full year	9.08	18	10.96	20	49.32	18	312.9	21
2004	Full year	8.71	20	10.81	21	46.96	19	1,806.3	29
2005	Full year	8.44	23	10.51	24	47.34	23	936.1	31
2006	Full year	8.32	28	10.32	26	48.54	25	1,318.1	39
2007	Full year	8.18	37	10.30	38	47.88	36	1,405.7	43
2008	Full year	8.21	39	10.41	37	47.94	36	2,823.2	44
2009	Full year	8.24	40	10.52	40	48.57	39	4,191.7	58
2010	Full year	8.01	62	10.37	61	48.63	57	4,921.9	78
2011	Full year	8.00	43	10.29	42	48.26	42	2,595.1	56
2012	Full year	7.95	51	10.17	58	50.69	52	3,080.7	69
2013	Full year	7.66	45	10.03	49	49.25	43	3,328.6	81
2014	Full year	7.60	32	9.91	38	50.28	35	2,053.7	51
2015	Full year	7.38	35	9.85	30	49.54	30	1,891.5	52
	1st quarter	7.03	9	10.29	9	46.06	9	311.2	12
	2nd quarter	7.42	7	9.60	7	49.91	7	117.7	9
	3rd quarter	7.23	8	9.76	8	49.11	8	499.3	13
	4th quarter	7.38	17	9.57	18	49.93	17	1,403.9	23
2016	Full year	7.28	41	9.77	42	48.91	41	2,332.1	57
	1st quarter	6.97	15	9.87	15	47.95	15	1,015.8	23
	2nd quarter	7.11	9	9.63	14	48.77	9	597.0	19
	3rd quarter	7.43	5	9.66	5	49.63	5	558.6	10
	4th quarter	7.32	19	9.73	19	49.51	19	593.8	23
2017	Full year	7.18	48	9.74	53	48.74	48	2,765.2	75

Gas utilities — summary table

	Period	ROR (%)	Number of observations	ROE (%)	Number of observations	Capital structure	Number of observations	\$M	Number of observations
2003	Full year	8.75	22	10.99	25	49.93	22	260.1	30
2004	Full year	8.34	21	10.59	20	45.90	20	303.5	31
2005	Full year	8.25	29	10.46	26	48.66	24	458.4	34
2006	Full year	8.44	17	10.40	15	47.24	16	392.5	23
2007	Full year	8.11	31	10.22	35	48.47	28	645.3	43
2008	Full year	8.49	33	10.39	32	50.35	32	700.0	40
2009	Full year	8.15	29	10.22	30	48.49	29	438.6	36
2010	Full year	7.99	40	10.15	39	48.70	40	776.5	50
2011	Full year	8.09	18	9.92	16	52.49	14	367.0	31
2012	Full year	7.98	30	9.94	35	51.13	32	264.0	41
2013	Full year	7.43	21	9.68	21	50.60	20	498.7	39
2014	Full year	7.65	27	9.78	26	51.11	28	529.2	48
2015	Full year	7.34	16	9.60	16	49.93	16	494.1	40
	1st quarter	7.12	6	9.48	6	50.83	6	120.2	11
	2nd quarter	7.38	6	9.42	6	50.01	6	276.3	16
	3rd quarter	6.59	5	9.47	4	48.44	4	106.3	8
	4th quarter	7.11	11	9.68	10	50.27	10	761.1	24
2016	Full year	7.08	28	9.54	26	50.06	26	1,263.9	59
	1st quarter	7.20	2	9.60	3	51.57	3	71.0	9
	2nd quarter	7.27	5	9.47	7	49.15	5	85.2	13
	3rd quarter	7.07	8	10.14	6	48.58	7	128.6	17
	4th quarter	7.43	9	9.68	8	52.30	9	130.8	15
2017	Full year	7.26	24	9.72	24	49.88	24	415.6	54

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

## Regulatory Focus: Major Rate Case Decisions

## Electric authorized ROEs: 2006 — 2017

## Settled versus fully litigated cases

Year	All cases			Settled cases			Fully litigated cases		
	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations
2006	10.32	10.23	26	10.26	10.25	11	10.37	10.12	15
2007	10.30	10.20	38	10.42	10.33	14	10.23	10.15	24
2008	10.41	10.30	37	10.43	10.25	17	10.39	10.54	20
2009	10.52	10.50	40	10.64	10.62	16	10.45	10.50	24
2010	10.37	10.30	61	10.39	10.30	34	10.35	10.10	27
2011	10.29	10.17	42	10.12	10.07	16	10.39	10.25	26
2012	10.17	10.08	58	10.06	10.00	29	10.28	10.25	29
2013	10.03	9.95	49	10.12	9.98	32	9.85	9.75	17
2014	9.91	9.78	38	9.73	9.75	17	10.05	9.83	21
2015	9.85	9.65	30	10.07	9.72	14	9.66	9.62	16
2016	9.77	9.75	42	9.80	9.85	17	9.74	9.60	25
2017	9.74	9.60	53	9.75	9.60	29	9.73	9.55	24

## General rate cases versus limited issue riders

Year	All cases			General rate cases			Limited issue riders		
	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations
2006	10.32	10.23	26	10.34	10.25	25	9.80	9.80	1
2007	10.30	10.20	38	10.32	10.23	36	9.90	9.90	1
2008	10.41	10.30	37	10.37	10.30	35	11.11	11.11	2
2009	10.52	10.50	40	10.52	10.50	38	10.55	10.55	2
2010	10.37	10.30	61	10.29	10.26	58	11.87	12.30	3
2011	10.29	10.17	42	10.19	10.14	40	12.30	12.30	2
2012	10.17	10.08	58	10.02	10.00	51	11.57	11.40	6
2013	10.03	9.95	49	9.82	9.82	40	11.34	11.40	7
2014	9.91	9.78	38	9.76	9.75	32	10.96	11.00	5
2015	9.85	9.65	30	9.60	9.53	23	10.87	11.00	6
2016	9.77	9.75	42	9.60	9.60	32	10.31	10.55	10
2017	9.74	9.60	53	9.68	9.60	42	10.01	9.95	10

## Vertically integrated cases versus delivery only cases

Year	All cases			Vertically integrated cases			Delivery only cases		
	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations
2006	10.32	10.23	26	10.63	10.54	15	9.91	10.03	10
2007	10.30	10.20	38	10.50	10.45	26	9.86	9.98	10
2008	10.41	10.30	37	10.48	10.47	26	10.04	10.25	9
2009	10.52	10.50	40	10.66	10.66	28	10.15	10.30	10
2010	10.37	10.30	61	10.42	10.40	41	9.98	10.00	17
2011	10.29	10.17	42	10.33	10.20	28	9.85	10.00	12
2012	10.17	10.08	58	10.10	10.20	39	9.73	9.73	12
2013	10.03	9.95	49	9.95	10.00	31	9.41	9.36	9
2014	9.91	9.78	38	9.94	9.90	19	9.50	9.55	13
2015	9.85	9.65	30	9.75	9.70	17	9.23	9.07	6
2016	9.77	9.75	42	9.77	9.78	20	9.31	9.33	12
2017	9.74	9.60	53	9.80	9.65	28	9.43	9.55	14

Source: Regulatory Research Associates, an offering of S&amp;P Global Market Intelligence

Regulatory Focus: Major Rate Case Decisions

**Gas average authorized ROEs: 2006 — 2017**

**Settled versus fully litigated cases**

Year	All cases			Settled cases			Fully litigated cases		
	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of Observations
2006	10.40	10.50	15	10.26	10.20	7	10.53	10.80	8
2007	10.22	10.20	35	10.24	10.18	22	10.20	10.40	13
2008	10.39	10.45	32	10.34	10.28	20	10.47	10.68	12
2009	10.22	10.26	30	10.43	10.40	13	10.05	10.15	17
2010	10.15	10.10	39	10.30	10.15	12	10.08	10.10	27
2011	9.92	10.03	16	10.08	10.08	8	9.76	9.80	8
2012	9.94	10.00	35	9.99	10.00	14	9.92	9.90	21
2013	9.68	9.72	21	9.80	9.80	9	9.59	9.60	12
2014	9.78	9.78	26	9.51	9.50	11	9.98	10.10	15
2015	9.60	9.68	16	9.60	9.60	11	9.58	9.80	5
2016	9.54	9.50	26	9.50	9.50	16	9.61	9.58	10
2017	9.72	9.60	24	9.68	9.60	17	9.89	9.50	7

**General rate cases versus limited issue riders**

Year	All cases			General rate cases			Limited issue riders		
	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations	Average ROE (%)	Median ROE (%)	Number of observations
2006	10.40	10.50	15	10.40	10.50	15	—	—	0
2007	10.22	10.20	35	10.22	10.20	35	—	—	0
2008	10.39	10.45	32	10.39	10.45	32	—	—	0
2009	10.22	10.26	30	10.22	10.26	30	—	—	0
2010	10.15	10.10	39	10.15	10.10	39	—	—	0
2011	9.92	10.03	16	9.91	10.05	15	10.00	10.00	1
2012	9.94	10.00	35	9.93	10.00	34	10.40	10.40	1
2013	9.68	9.72	21	9.68	9.72	21	—	—	0
2014	9.78	9.78	26	9.78	9.78	26	—	—	0
2015	9.60	9.68	16	9.60	9.68	16	—	—	0
2016	9.54	9.50	26	9.53	9.50	25	9.70	9.70	1
2017	9.72	9.60	24	9.72	9.60	24	—	—	0

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

## Regulatory Focus: Major Rate Case Decisions

## Electric utility decisions

Date	Company	State	ROR (%)	ROE (%)	Common equity as % of capital	Test year	Rate base	Amt. (\$M)	Footnotes
1/10/17	Empire District Electric Company	KS	—	—	—	—	—	—	(1)
1/12/17	Electric Transmission Texas	TX	6.39	9.60	40.00	12/16	Year-end	-46.2	(Tr,B)
1/17/17	Cross Texas Transmission	TX	—	—	—	—	—	-6.5	(Tr,B)
1/18/17	MDU Resources Group, Inc.	WY	7.25	9.45	50.99	12/15	Year-end	2.7	(B)
1/19/17	Metropolitan Edison Company	PA	—	—	—	12/17	—	90.5	(D,B)
1/19/17	Pennsylvania Electric Company	PA	—	—	—	12/17	—	94.6	(D,B)
1/19/17	Pennsylvania Power Company	PA	—	—	—	12/17	—	27.5	(D,B)
1/19/17	West Penn Power Company	PA	—	—	—	12/17	—	60.6	(D,B)
1/24/17	Consolidated Edison Co. of NY	NY	6.82	9.00	48.00	12/17	Average	194.5	(D,B)
1/25/17	Northern Indiana Public Service Co.	IN	—	—	—	4/16	Year-end	1.9	(LIR,B,2)
1/26/17	Southwestern Public Service Co.	TX	—	—	—	9/15	Year-end	35.2	(B)
1/31/17	DTE Electric Company	MI	5.55	10.10	37.49	7/17	Average	184.3	(I,*)
2/15/17	Delmarva Power & Light Company	MD	6.74	9.60	49.10	3/16	Average	38.3	(D)
2/22/17	Rockland Electric Company	NJ	7.47	9.60	49.70	12/16	Year-end	1.7	(D,B)
2/24/17	Indianapolis Power & Light Company	IN	—	—	—	—	—	—	(1)
2/24/17	Tucson Electric Power Company	AZ	7.04	9.75	50.03	6/15	Year-end	81.5	(B)
2/27/17	Virginia Electric and Power Company	VA	7.73	11.40	49.49	3/18	Average	-2.4	(LIR,3)
2/27/17	Virginia Electric and Power Company	VA	6.74	9.40	49.49	3/18	Average	41.4	(LIR,4)
2/27/17	Virginia Electric and Power Company	VA	7.24	10.40	49.49	3/18	Average	-2.2	(LIR,5)
2/27/17	Virginia Electric and Power Company	VA	7.24	10.40	49.49	3/18	Average	-8.5	(LIR,6)
2/27/17	Virginia Electric and Power Company	VA	7.24	10.40	49.49	3/18	Average	0.5	(LIR,7)
2/28/17	Consumers Energy Company	MI	5.94	10.10	40.75	8/17	Average	113.3	(I,*)
3/2/17	Otter Tail Power Company	MN	7.51	9.41	52.50	12/16	Average	12.3	(I)
3/8/17	Union Electric Company	MO	—	—	—	3/16	—	92.0	(B)
3/20/17	Oklahoma Gas and Electric Co.	OK	7.69	9.50	53.31	6/15	Year-end	8.8	(I)
<b>2017</b>	<b>1st quarter: averages/total</b>		<b>6.97</b>	<b>9.87</b>	<b>47.95</b>			<b>1,015.8</b>	
	<b>Observations</b>		<b>15</b>	<b>15</b>	<b>15</b>			<b>25</b>	
4/4/17	Gulf Power Company	FL	—	10.25	—	12/17	—	62.0	(B)
4/12/17	Liberty Utilities (Granite State Electric)	NH	7.64	9.40	50.00	12/15	—	3.8	(D,IB,Z)
4/19/17	Southwestern Public Service Company	NM	—	—	—	—	—	0.0	(8)
4/20/17	Unitil Energy Systems, Inc.	NH	8.34	9.50	50.97	12/15	—	4.1	(D,IB,Z)
5/3/17	Kansas City Power & Light Company	MO	7.43	9.50	49.20	12/15	Year-end	32.5	
5/11/17	Pacific Gas and Electric Company	CA	—	—	—	12/17	Average	91.0	(B,Z)
5/11/17	Appalachian Power Company	VA	—	—	—	6/18	Average	4.7	(B,LIR,9)
5/11/17	Northern States Power Company - MN	MN	7.08	9.20	52.50	12/19	Average	244.7	(B,I,Z)
5/18/17	Oklahoma Gas and Electric Company	AR	5.42	9.50	36.38	6/16	Year-end	7.1	(B,*)
5/23/17	Delmarva Power & Light Company	DE	—	9.70	—	12/15	—	31.5	(D,B,I)
5/31/17	Idaho Power Co.	ID	—	9.50	—	—	—	13.3	(B,LIR)

## Regulatory Focus: Major Rate Case Decisions

## Electric utility decisions

Date	Company	State	ROR (%)	ROE (%)	Common equity as % of capital	Test year	Rate base	Amt. (\$M)	Footnotes
6/1/17	Virginia Electric and Power Company	VA	6.74	9.40	49.49	8/18	—	-12.8	(LIR,10)
6/6/17	Kansas City Power & Light Company	KS	—	—	—	6/14	—	-3.6	(B,11)
6/8/17	Westar Energy, Inc.	KS	—	—	—	9/14	—	16.4	(B,11)
6/16/17	MDU Resources Group, Inc.	ND	7.36	9.65	51.40	12/17	Average	7.5	(B,I)
6/22/17	Kentucky Utilities Company	KY	—	9.70	—	—	—	51.6	(B,R)
6/22/17	Louisville Gas and Electric Company	KY	—	9.70	—	—	—	57.1	(B,R)
6/30/17	Virginia Electric and Power Company	VA	6.74	9.40	49.49	8/18	Average	4.2	(LIR,12)
6/30/17	Virginia Electric and Power Company	VA	7.24	10.40	49.49	8/18	Average	-18.0	(LIR,13)
<b>2017</b>	<b>2nd quarter: averages/total</b>		<b>7.11</b>	<b>9.63</b>	<b>48.77</b>			<b>597.0</b>	
	<b>Observations</b>		<b>9</b>	<b>14</b>	<b>9</b>			<b>19</b>	
7/17/17	Appalachian Power Company	VA	—	—	—	—	—	0.0	(LIR,14)
7/24/17	Potomac Electric Power Company	DC	7.46	9.50	49.14	3/16	Average	36.9	(D)
8/4/17	Maui Electric Company, Limited	HI	—	—	—	—	—	0.0	
8/10/17	Wisconsin Electric Power Company	WI	—	—	—	12/19	—	0.0	(B,Z)
8/10/17	Wisconsin Public Service Corporation	WI	—	—	—	12/19	—	0.0	(B,Z)
8/15/17	Arizona Public Service Company	AZ	7.85	10.00	55.80	12/15	Year-end	362.6	(B)
9/1/17	Virginia Electric and Power Company	VA	6.81	9.40	50.23	8/18	Average	1.0	(LIR,15)
9/22/17	Atlantic City Electric Company	NJ	7.60	9.60	50.47	7/17	Year-end	43.0	(B,D)
9/28/17	Sharyland Utilities, L.P.	TX	—	—	—	—	—	-3.0	(B,D)
9/28/17	Oncor Electric Delivery Company LLC	TX	7.44	9.80	42.50	12/16	Year-end	118.1	(B,D)
<b>2017</b>	<b>3rd quarter: averages/total</b>		<b>7.43</b>	<b>9.66</b>	<b>49.63</b>			<b>558.6</b>	
	<b>Observations</b>		<b>5</b>	<b>5</b>	<b>5</b>			<b>10</b>	
10/20/17	Potomac Electric Power Company	MD	7.43	9.50	50.15	4/17	Average	32.4	(D,R)
10/25/17	Duke Energy Florida, LLC	FL	—	—	—	—	—	200.0	(B,Z)
10/26/17	San Diego Gas & Electric Co.	CA	7.55	10.20	52.00	12/18	—	-13.1	(B,16)
10/26/17	Southern California Edison Company	CA	7.61	10.30	48.00	12/18	—	-73.0	(B,16)
10/26/17	Pacific Gas and Electric Company	CA	7.69	10.25	52.00	12/18	—	-120.0	(B,16,17)
10/31/17	Northern Indiana Public Service Company	IN	—	—	—	4/17	—	14.6	(LIR,18)
11/6/17	Tampa Electric Company	FL	—	10.25	—	—	—	0.0	(B,Z,19)
11/15/17	Alaska Electric Light and Power Company	AK	8.91	11.95	58.18	12/15	Average	3.4	(B, I)
11/30/17	NSTAR Electric Company	MA	7.33	10.00	53.34	6/16	Year-end	12.2	(D,Z,20)
11/30/17	Western Massachusetts Electric Company	MA	7.26	10.00	54.51	6/16	Year-end	24.8	(D,Z,20)
12/5/17	Puget Sound Energy, Inc.	WA	7.60	9.50	48.50	9/16	Average	106.4	(B)
12/6/17	Ameren Illinois Company	IL	7.04	8.40	50.00	12/16	Year-end	-16.4	(D)
12/6/17	Commonwealth Edison Company	IL	6.47	8.40	45.89	12/16	Year-end	99.2	(D)
12/7/17	Northern States Power Company - WI	WI	7.56	9.80	51.45	12/18	Average	9.4	
12/13/17	Entergy Arkansas, Inc.	AR	4.64	—	31.62	12/18	Average	113.4	(B,*)
12/14/17	Southwestern Electric Power Company	TX	7.18	9.60	48.46	6/16	Year-end	86.9	(I)
12/14/17	El Paso Electric Company	TX	7.73	9.65	48.35	9/16	—	14.5	(B,I)
12/18/17	Portland General Electric Company	OR	7.35	9.50	50.00	12/18	Year-end	15.9	(B)
12/20/17	Public Service Company of New Mexico	NM	7.23	9.58	49.61	12/18	Average	62.3	(B,R,Z)

## Regulatory Focus: Major Rate Case Decisions

## Electric utility decisions

Date	Company	State	ROR (%)	ROE (%)	Common equity as % of capital	Test year	Rate base	Amt. (\$M)	Footnotes
12/20/17	Southern Indiana Gas and Electric Company, Inc.	IN	—	—	—	4/17	Year-end	1.6	(LIR)
12/21/17	Green Mountain Power Corporation	VT	6.87	9.10	48.60	12/16	Average	31.9	(B)
12/28/17	Avista Corporation	ID	7.61	9.50	50.00	12/16	Year-end	17.4	(B,Z)
12/29/17	Nevada Power Company	NV	7.95	9.40	49.99	12/16	Year-end	-30.0	
<b>2017</b>	<b>4th quarter: averages/total</b>		<b>7.32</b>	<b>9.73</b>	<b>49.51</b>			<b>593.84</b>	
	<b>Observations</b>		<b>19</b>	<b>19</b>	<b>19</b>			<b>23</b>	
<b>2017</b>	<b>Full year: averages/total</b>		<b>7.18</b>	<b>9.74</b>	<b>48.74</b>			<b>2,765.2</b>	
	<b>Observations</b>		<b>48.00</b>	<b>53.00</b>	<b>48.00</b>			<b>77</b>	

Source: Regulatory Research Associates, an offering of S&amp;P Global Market Intelligence

## Gas utility decisions

Date	Company	State	ROR (%)	ROE (%)	Common equity as % of capital	Test year	Rate base	Amt. (\$M)	Footnotes
1/18/17	Missouri Gas Energy	MO	—	—	—	8/16	—	3.2	(LIR,21)
1/18/17	Spire Missouri	MO	—	—	—	8/16	—	4.5	(LIR,21)
1/24/17	Consolidated Edison Co. of NY	NY	6.82	9.00	48.00	12/17	Average	-5.3	(B)
1/25/17	Southern Indiana Gas and Electric Company, Inc.	IN	—	—	—	6/16	Year-end	1.9	(LIR)
1/25/17	Indiana Gas Company, Inc.	IN	—	—	—	6/16	Year-end	8.5	(LIR)
2/9/17	Atmos Energy Corporation	KS	—	—	—	—	—	0.8	(LIR,22)
2/21/17	Atlanta Gas Light Company	GA	—	10.55	51.00	—	—	20.4	(B,23)
3/1/17	Washington Gas Light Company	DC	7.57	9.25	55.70	9/15	Average	8.5	
3/17/17	Columbia Gas of Virginia, Inc.	VA	—	—	—	12/15	—	28.5	(B,I)
<b>2017</b>	<b>1st quarter: averages/total</b>		<b>7.20</b>	<b>9.60</b>	<b>51.57</b>			<b>71.0</b>	
	<b>Observations</b>		<b>2</b>	<b>3</b>	<b>3</b>			<b>9</b>	
4/11/17	Southwest Gas Corporation	AZ	7.42	9.50	51.70	11/15	Year-end	16.0	(B)
4/20/17	National Fuel Gas Distribution Corp.	NY	6.92	8.70	42.90	3/18	Average	5.9	
4/26/17	Spire Missouri	MO	—	—	—	2/17	—	3.0	(B,LIR,21)
4/26/17	Missouri Gas Energy	MO	—	—	—	2/17	—	3.0	(B,LIR,21)
4/27/17	Delta Natural Gas Company, Inc.	KY	—	—	—	12/16	Year-end	1.8	(LIR,24)
4/28/17	Intermountain Gas Company	ID	7.30	9.50	50.00	12/16	Average	5.3	
5/11/17	Pacific Gas and Electric Company	CA	—	—	—	12/17	Average	-3.0	(B,Z)
5/23/17	Black Hills Kansas Gas Utility Company	KS	—	—	—	12/16	Year-end	0.6	(LIR)
5/23/17	CenterPoint Energy Resources Corp.	TX	8.02	9.60	55.15	6/16	Year-end	16.5	(B)
6/6/17	Delmarva Power & Light Company	DE	—	9.70	—	12/15	—	4.9	(B,I)
6/22/17	Louisville Gas and Electric Company	KY	—	9.70	—	—	—	6.8	(B,R)
6/28/17	Northern Indiana Public Service Company	IN	—	—	—	12/16	Year-end	11.1	(LIR)
6/30/17	Pivotal Utility Holdings, Inc.	NJ	6.71	9.60	46.00	3/17	Year-end	13.3	(B)
<b>2017</b>	<b>2nd quarter: averages/total</b>		<b>7.27</b>	<b>9.47</b>	<b>49.15</b>			<b>85.2</b>	
	<b>Observations</b>		<b>5</b>	<b>7</b>	<b>5</b>			<b>13</b>	

## Regulatory Focus: Major Rate Case Decisions

## Gas utility decisions

Date	Company	State	ROR (%)	ROE (%)	Common equity as % of capital	Test year	Rate base	Amt. (\$M)	Footnotes
7/21/17	NorthWestern Corporation	MT	6.96	9.55	46.79	12/15	Average	5.1	(B,)
7/26/17	Southern Indiana Gas and Electric Company, Inc.	IN	—	—	—	12/16	Year-end	3.4	LIR
7/26/17	Indiana Gas Company, Inc.	IN	—	—	—	12/16	Year-end	9.2	LIR
7/31/17	Consumers Energy Company	MI	5.97	10.10	41.27	12/17	Average	29.2	(I,*)
8/9/17	Oklahoma Natural Gas Company	OK	—	—	—	12/16	—	0.0	(B,25)
8/10/17	Wisconsin Electric Power Company	WI	—	—	—	12/19	—	0.0	(B,Z)
8/10/17	Wisconsin Gas LLC	WI	—	—	—	12/19	—	0.0	(B,Z)
8/10/17	Wisconsin Public Service Corporation	WI	—	—	—	12/19	—	0.0	(B,Z)
8/21/17	Virginia Natural Gas, Inc.	VA	—	—	—	8/18	Average	2.9	(LIR,26)
8/31/17	UGI Penn Natural Gas, Inc.	PA	—	—	—	9/18	—	11.3	(B)
9/6/17	CenterPoint Energy Resources Corp.	AR	4.58	—	31.02	9/18	Year-end	7.6	(*,B)
9/8/17	Washington Gas Light Company	VA	—	—	—	11/17	—	34.0	(I,B)
9/13/17	Avista Corporation	OR	7.35	9.40	50.00	9/18	Average	3.5	(B,Z)
9/19/17	Columbia Gas of Maryland, Incorporated	MD	7.35	9.70	—	4/17	—	2.4	(B)
9/22/17	ENSTAR Natural Gas Company	AK	8.59	11.88	51.81	12/15	Average	5.8	(I)
9/27/17	South Carolina Electric & Gas Co.	SC	8.15	—	52.16	3/17	Year-end	8.6	(M)
9/27/17	Piedmont Natural Gas Company, Inc.	SC	7.60	10.20	53.00	3/17	Year-end	5.5	(B,27)
2017	3rd quarter: averages/total		7.07	10.14	46.58			128.6	
	Observations		8	6	7			17	
10/19/17	CenterPoint Energy Resources Corp.	OK	—	—	—	12/16	Year-end	2.2	
10/20/17	South Jersey Gas Company	NJ	6.80	9.60	52.50	8/17	Year-end	39.5	(B)
10/26/17	San Diego Gas & Electric Co.	CA	7.55	10.20	52.00	12/18	—	-2.0	(B,16)
10/27/17	Atmos Energy Corporation	KY	—	—	—	9/18	Year-end	10.6	(LIR)
10/30/17	Southern California Gas Company	CA	7.34	10.05	52.00	12/18	—	-35.1	(B,16)
11/16/17	Kansas Gas Service Company	KS	—	—	—	6/17	Year-end	2.9	(LIR)
11/21/17	Washington Gas Light Company	VA	7.35	9.50	59.63	12/18	Average	16.4	
12/5/17	Puget Sound Energy, Inc.	WA	7.60	9.50	48.50	9/17	Average	16.6	(B)
12/7/17	Northern States Power Company - WI	WI	7.56	9.80	51.45	12/18	Average	9.9	
12/13/17	Columbia Gas of Virginia, Incorporated	VA	—	—	—	12/18	—	3.2	(B,LIR)
12/13/17	Southern Connecticut Gas Company	CT	7.42	9.25	52.19	12/16	Average	11.2	(B,Z)
12/21/17	Virginia Natural Gas, Inc.	VA	—	—	—	9/16	—	34.1	(B,I)
12/22/17	Columbia Gas of Kentucky, Incorporated	KY	7.62	—	52.42	12/18	Year-end	4.5	(LIR)
12/28/17	Northern Indiana Public Service Company	IN	—	—	—	6/17	Year-end	14.6	(LIR)
12/28/17	Avista Corporation	ID	7.61	9.50	50.00	12/16	Year-end	2.3	(B,Z)
2017	4th quarter: averages/total		7.43	9.68	52.30			130.8	
	Observations		9	8	9			15	
2017	Averages/total		7.26	9.72	49.88			415.6	
	Observations		24	24	24			54	

Source: Regulatory Research Associates, an offering of S&amp;P Global Market Intelligence



## Regulatory Focus: Major Rate Case Decisions

### FOOTNOTES

- A- Average
- B- Order followed stipulation or settlement by the parties. Decision particulars not necessarily precedent-setting or specifically adopted by the regulatory body.
- CWIP- Construction work in progress
- D- Applies to electric delivery only
- DCt Date certain rate base valuation
- E- Estimated
- F- Return on fair value rate base
- Hy- Hypothetical capital structure utilized
- I- Interim rates implemented prior to the issuance of final order, normally under bond and subject to refund.
- LIR Limited-issue rider proceeding
- M- "Make-whole" rate change based on return on equity or overall return authorized in previous case.
- R- Revised
- Te- Temporary rates implemented prior to the issuance of final order.
- Tr- Applies to transmission service
- U- Double leverage capital structure utilized.
- YE- Year-end
- Z- Rate change implemented in multiple steps.
- \* Capital structure includes cost-free items or tax credit balances at the overall rate of return.
- (1) Case withdrawn by company.
- (2) Initial proceeding to establish the rates to be charged to customers under the company's transmission, distribution, and storage system improvement charge, or TDSIC, rate adjustment mechanism and reflects investments made between Jan. 1, 2016 and April 30, 2016.
- (3) Proceeding determines the revenue requirement for Rider B, which is the mechanism through which the company recovers costs associated with its plan to convert the Altavista, Hopewell and Southampton Power Stations to burn biomass fuels.
- (4) Proceeding determines the revenue requirement for Rider GV, which is the mechanism through which the company recovers the costs associated with the new gas fired generation facility, the Greensville County project.
- (5) Represents rate decrease associated with the company's Rider R proceeding, which is the mechanism through which the company recovers the investment in the Bear Garden generating facility.
- (6) This proceeding determines the revenue requirement for Rider S, which recognizes in rates the company's investment in the Virginia City Hybrid Energy Center.
- (7) Increase authorized through a surcharge, Rider W, which reflects in rates investment in the Warren County Power Station.
- (8) The commission rejected the company's rate case filing.
- (9) Case represents the company's RAC-EE rider, under which it recovers the costs and lost revenues associated with its energy efficiency programs.
- (10) Case represents the company's Rider DSM, which involves a consolidation of two riders related to the company's costs and investments in demand-side management and energy conservation programs.
- (11) Represents an "abbreviated" rate case.
- (12) Case involves Rider US-2, which pertains to the company's investment in three new solar generation facilities with a total capacity of 56 MW.
- (13) Case involves Rider BW, which relates to the company's investment in the Brunswick generating plant, which achieved commercial operation on 4/25/16.
- (14) Commission rejected the company's request for an accelerated vegetation management program and an associated rate adjustment mechanism.
- (15) Case involves Rider U, which pertains to the company's investment in projects to underground certain "at risk" distribution facilities.
- (16) Represents a company compliance filing establishing cost of capital parameters for 2018.
- (17) Rate decrease amounts represent combined electric and gas, as presented by the company.
- (18) Second proceeding to establish the rates to be charged to customers under the company's transmission, distribution and storage system improvement charge, or TDSIC, rate adjustment mechanism, and reflects investments made between May 1, 2016, and April 30, 2017.
- (19) Subject to certain adjustment provisions, the company's authorized ROE is to remain within a range of 9.25% to 11.25%, with a midpoint of 10.25%.
- (20) A five-year performance-based regulation plan was also adopted.
- (21) Case involves the company's infrastructure system replacement surcharge, or ISRS, rider.
- (22) Case involves the company's gas system reliability surcharge, or GSRS, rider.
- (23) In this proceeding, the commission adopted an alternative rate plan and authorized the first rate change.
- (24) Case involves the company's pipe replacement program rider.
- (25) Case involves the company's performance based ratemaking plan.
- (26) Case involves the company's Steps to Advance Virginia Energy rider.
- (27) Modified "make whole" rate change authorized.

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**4/11/2018 4:13:53 PM**

**in**

**Case No(s). 15-1830-EL-AIR, 15-1831-EL-AAM, 15-1832-EL-ATA**

Summary: Testimony Direct Testimony of Daniel J. Duann, Ph.D. on Behalf of The Office of the Ohio Consumers' Counsel electronically filed by Ms. Jamie Williams on behalf of Healey, Christopher Mr.