

BEFORE THE CORPORATION COMMISSION OF OKLAHOMA

APPLICATION OF PUBLIC SERVICE)
COMPANY OF OKLAHOMA, AN)
OKLAHOMA CORPORATION, FOR)
AN ADJUSTMENT IN ITS RATES AND)
CHARGES AND THE ELECTRIC)
SERVICE RULES, REGULATIONS AND)
CONDITIONS OF SERVICE FOR)
ELECTRIC SERVICE IN THE STATE)
OF OKLAHOMA)

CAUSE NO. PUD 201700151

FILED
SEP 21 2017

COURT CLERK'S OFFICE - OKC
CORPORATION COMMISSION
OF OKLAHOMA

DIRECT TESTIMONY AND EXHIBITS

OF

DAVID C. PARCELL

ON BEHALF OF

**OKLAHOMA INDUSTRIAL ENERGY CONSUMERS
AND
WAL-MART STORES EAST, LP AND
SAM'S EAST, INC.
(COLLECTIVELY WAL-MART)**

**IN RESPONSE TO THE DIRECT TESTIMONY OF PSO WITNESSES
MICHAEL J. VILBERT AND PAULINE M. AHERN**

SEPTEMBER 21, 2017

TABLE OF CONTENTS

	<u>PAGE</u>
I. <u>INTRODUCTION</u>	1
II. <u>RECOMMENDATIONS AND SUMMARY</u>	2
III. <u>ECONOMIC/LEGAL PRINCIPLES AND METHODOLOGIES</u>	3
IV. <u>GENERAL ECONOMIC CONDITIONS</u>	6
V. <u>PSO'S OPERATIONS AND RISKS</u>	11
VI. <u>CAPITAL STRUCTURE AND COST OF DEBT</u>	17
VII. <u>SELECTION OF PROXY GROUPS</u>	20
VIII. <u>DISCOUNTED CASH FLOW ANALYSIS</u>	21
IX. <u>CAPITAL ASSET PRICING MODEL ANALYSIS</u>	25
X. <u>COMPARABLE EARNINGS ANALYSIS</u>	28
XI. <u>RETURN ON EQUITY RECOMMENDATIONS</u>	31
XII. <u>TOTAL COST OF CAPITAL</u>	32
XIII. <u>COMMENTS ON COMPANY TESTIMONY</u>	33

1 **Q. HAVE YOU PREPARED SCHEDULES IN SUPPORT OF YOUR TESTIMONY?**

2 A. Yes, I have prepared one exhibit, labeled Schedule 1 through Schedule 12,
3 attached to my testimony. These schedules were prepared either by me or under my
4 direction. The information contained in this exhibit is correct to the best of my
5 knowledge and belief.

6
7 **II. RECOMMENDATIONS AND SUMMARY**

8
9 **Q. WHAT ARE YOUR RECOMMENDATIONS IN THIS PROCEEDING?**

10 A. My overall COC recommendations for PSO are shown on Schedule 1 and can be
11 summarized as follows:

	<u>Percent</u>	<u>Cost</u>	<u>Return</u>
Long-Term Debt	51.49%	4.60%	2.37%
Common Equity	48.51%	9.00%	4.37%
Total	100.00%		6.73%

12
13
14
15
16 **Q. PLEASE SUMMARIZE YOUR ANALYSES AND CONCLUSIONS.**

17 A. This proceeding is concerned with PSO's regulated electric utility operations in
18 Oklahoma. My analyses are concerned with the Company's total COC. The first step in
19 performing these analyses is the development of the appropriate capital structure. PSO
20 proposes to use its "Adjusted" December 31, 2016 capital structure. I have also used the
21 adjusted test period capital structure of PSO in my analyses.

22 The second step in a COC calculation is a determination of the embedded cost
23 rate of long-term debt. I have used the December 31, 2016 test period cost rate for long-
24 term debt (4.60 percent) of PSO.

25 The third step in the COC calculation is the estimation of the cost of common
26 equity ("ROE"). I have employed three recognized methodologies to estimate the ROE
27 for PSO. Each of these methodologies is applied to a group of proxy utilities similar to
28 PSO/AEP and the Electric Sample used by PSO witness Michael J. Vilbert. These three
29 methodologies and my findings are:

30
31

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31

<u>Methodology</u>	
Discounted Cash Flow (DCF)	8.5%
Capital Asset Pricing Model (CAPM)	6.4%
Comparable Earnings (CE)	9.5%

My recommendation for PSO focuses on the results of the DCF and CE analyses.

Combining these three steps into weighted cost of capital results in an overall rate of return of 6.73 percent (which incorporates a ROE of 9.0 percent).

III. ECONOMIC/LEGAL PRINCIPLES AND METHODOLOGIES

Q. WHAT ARE THE PRIMARY ECONOMIC AND REGULATORY PRINCIPLES THAT ESTABLISH THE STANDARDS FOR DETERMINING A FAIR RATE OF RETURN FOR A REGULATED UTILITY?

A. Public utility rates are normally established in a manner designed to allow the recovery of their costs, including capital costs. This is frequently referred to as “cost of service” ratemaking. Rates for regulated public utilities traditionally have been primarily established using the “rate base – rate of return” concept. Under this method, utilities are allowed to recover a level of operating expenses, taxes, and depreciation deemed reasonable for rate-setting purposes, and are granted an opportunity to earn a fair rate of return on the assets utilized (i.e., rate base) in providing service to their customers.

The rate base is derived from the asset side of the utility’s balance sheet as a dollar amount and the rate of return is developed from the liabilities/owners’ equity side of the balance sheet as a percentage. Thus, the revenue impact of the COC is derived by multiplying the rate base by the rate of return, including income taxes.

The rate of return is developed from the COC which is estimated by weighting the capital structure components (i.e., debt, preferred stock, and common equity) by their percentages in the capital structure and multiplying these values by their cost rates. This is also known as the weighted COC.

Technically, “fair rate of return” is a regulatory and accounting concept that refers to an *ex post facto* (after the fact) earned return on an asset base while the COC is an economic and financial concept which refers to an *ex ante facto* (before the fact)

1 expected, or required, return on a capital base. In regulatory proceedings, however, the
2 two terms are often used interchangeably, and I have equated the two concepts in my
3 testimony.

4 From an economic standpoint, a fair rate of return is normally interpreted to mean
5 that an efficient and economically managed utility will be able to maintain its financial
6 integrity, attract capital, and establish comparable returns for similar risk investments.
7 These concepts are derived from economic and financial theory and are generally
8 implemented using financial models and economic concepts.

9 With regard to the regulatory standards, my testimony is based on my
10 understanding that two United States Supreme Court decisions provide the controlling
11 standards for a fair rate of return. The first decision is *Bluefield Water Works and*
12 *Improvement Co. v. Public Serv. Comm'n of West Virginia*, 262 U.S. 679 (1923). In this
13 decision, the Court stated:

14 The annual rate that will constitute just compensation depends upon many
15 circumstances and must be determined by the exercise of fair and
16 enlightened judgment, having regard to all relevant facts. A public utility
17 is entitled to such rates as will permit it to earn a return on the value of the
18 property which it employs for the convenience of the public equal to that
19 generally being made at the same time and in the same general part of the
20 country on investments in other business undertakings which are attended
21 by corresponding risks and uncertainties; but it has no constitutional right
22 to profits such as are realized or anticipated in highly profitable enterprises
23 or speculative ventures. The return should be reasonably sufficient to
24 assure confidence in the financial soundness of the utility, and should be
25 adequate, under efficient and economical management, to maintain and
26 support its credit and enable it to raise the money necessary for the proper
27 discharge of its public duties. A rate of return may be reasonable at one
28 time, and become too high or too low by changes affecting opportunities
29 for investment, the money market, and business conditions generally.

30
31 It is generally understood that the *Bluefield* decision established the following
32 standards for a fair rate of return: comparable earnings, financial integrity, and capital
33 attraction. It also noted that required returns change over time, and there is an underlying
34 assumption that the utility be operated efficiently.

35 The second decision is *Federal Power Comm'n v. Hope Natural Gas Co.*, 320
36 U.S. 591 (1942). In that decision, the Court stated:

1 The rate-making process under the [Natural Gas] Act, i.e., the fixing of
2 'just and reasonable' rates, involves a balancing of the investor and
3 consumer interests. . . . From the investor or company point of view it is
4 important that there be enough revenue not only for operating expenses
5 but also for the capital costs of the business. These include service on the
6 debt and dividends on the stock. By this standard the return to the equity
7 owner should be commensurate with returns on investments in other
8 enterprises having corresponding risks. That return, moreover, should be
9 sufficient to assure confidence in the financial integrity of the enterprise,
10 so as to maintain its credit and to attract capital.
11

12 The three economic and financial parameters in the *Bluefield* and *Hope* decisions
13 – CE, financial integrity, and capital attraction – reflect the economic criteria
14 encompassed in the “opportunity cost” principle of economics. The opportunity-cost
15 principle provides that a utility and its investors should be afforded an opportunity (not a
16 guarantee) to earn a return commensurate with returns they could expect to achieve on
17 investments of similar risk. The opportunity-cost principle is consistent with the
18 fundamental premise on which regulation rests, namely, that it is intended to act as a
19 surrogate for competition.
20

21 **Q. HOW CAN THE BLUEFIELD AND HOPE PARAMETERS BE EMPLOYED TO**
22 **ESTIMATE THE COC FOR A UTILITY?**

23 A. Neither the courts nor economic/financial theory has developed exact and
24 mechanical procedures for precisely determining the COC. This is the case because the
25 COC is an opportunity cost and is prospective-looking which dictates that it must be
26 estimated. However, there are several useful models that can be employed to assist in
27 estimating the ROE, which is the capital structure item that is the most difficult to
28 determine. These include the DCF, CAPM, CE and risk premium (“RP”) methods. I
29 have not directly employed a RP model in my analyses although, as discussed later, my
30 CAPM analysis is a form of the RP methodology. I describe each of these methodologies
31 in more detail later in my testimony.
32
33

1 **IV. GENERAL ECONOMIC CONDITIONS**

2

3 **Q. ARE ECONOMIC AND FINANCIAL CONDITIONS IMPORTANT IN**
4 **DETERMINING THE COSTS OF CAPITAL FOR A PUBLIC UTILITY?**

5 A. Yes. The costs of capital for both fixed-cost (debt and preferred stock)
6 components and common equity are determined in part by current and prospective
7 economic and financial conditions. At any given time, each of the following factors has
8 an influence on the costs of capital:

- 9 • The level of economic activity (*i.e.*, growth rate of the economy);
- 10 • The stage of the business cycle (*i.e.*, recession, expansion, or transition);
- 11 • The level of inflation;
- 12 • The level and trend of interest rates; and,
- 13 • Current and expected economic conditions.

14 My understanding is that this position is consistent with the *Bluefield* decision that
15 noted “[a] rate of return may be reasonable at one time and become too high or too low
16 by changes affecting opportunities for investment, the money market, and business
17 conditions generally.”¹

18

19 **Q. WHAT INDICATORS OF ECONOMIC AND FINANCIAL ACTIVITY DID YOU**
20 **EVALUATE IN YOUR ANALYSES?**

21 A. I examined several sets of economic statistics from 1975 to the present. I chose
22 this time period because it permits the evaluation of economic conditions over four full
23 business cycles plus the current cycle allowing for an assessment of changes in long-term
24 trends. Consideration of economic/financial conditions over a relatively long period of
25 time allows me to assess how such conditions have had impacts on the level and trends of

¹ *Bluefield*, 262 U.S. at 693.

1 the costs of capital. This period also approximates the beginning and continuation of
2 active rate case activities by public utilities that generally began in the mid-1970s.

3 A business cycle is commonly defined as a complete period of expansion
4 (recovery and growth) and contraction (recession). A full business cycle is a useful and
5 convenient period over which to measure levels and trends in long-term capital costs
6 because it incorporates the cyclical (*i.e.*, stage of business cycle) influences and, thus,
7 permits a comparison of structural (or long-term) trends.

8
9 **Q. PLEASE DESCRIBE THE TIMEFRAMES OF THE FOUR PRIOR BUSINESS**
10 **CYCLES AND THE CURRENT CYCLE.**

11 A. The four prior complete cycles and current cycle cover the following periods:
12

<u>Business Cycle</u>	<u>Expansion Cycle</u>	<u>Contraction Period</u>
1975-1982	Mar. 1975-July 1981	Aug. 1981-Oct. 1982
1982-1991	Nov. 1982-July 1990	Aug. 1990-Mar. 1991
1991-2001	Mar. 1991-Mar. 2001	Apr. 2001-Nov. 2001
2001-2009	Nov. 2001-Nov. 2007	Dec. 2007-June 2009
Current	July 2009 -	

Source: The National Bureau of Economic Research, "U.S. Business
Cycle Expansions and Contractions."²

13
14 **Q. DO YOU HAVE ANY GENERAL OBSERVATIONS CONCERNING THE**
15 **RECENT TRENDS IN ECONOMIC CONDITIONS AND THEIR IMPACT ON**
16 **CAPITAL COSTS OVER THIS BROAD PERIOD?**

17 A. Yes, I do. From the early 1980s until the end of 2007, the United States economy
18 enjoyed general prosperity and stability. This period was characterized by longer
19 economic expansions, relatively tame contractions, low and declining inflation, and
20 declining interest rates and other capital costs.

21 However, in 2008 and 2009, the economy declined significantly, initially as a
22 result of the 2007 collapse of the "sub-prime" mortgage market and the related liquidity
23 crisis in the financial sector of the economy. Subsequently, this financial crisis
24 intensified with a more broad-based decline initially based on a substantial increase in
25 petroleum prices and a dramatic decline in the U.S. financial sector, culminating with the

² <http://www.nber.org/cycles/cyclesmain.html>.

1 collapse and/or bailouts of a significant number of well-known institutions such as Bear
2 Stearns, Lehman Brothers, Merrill Lynch, Freddie Mac, Fannie Mae, AIG and Wachovia.
3 The recession also witnessed the demise of national companies such as Circuit City and
4 the bankruptcies of automotive manufacturers Chrysler and General Motors.

5 This decline has been described as the worst financial crisis since the Great
6 Depression and has been referred to as the “Great Recession.” Beginning in 2008, the
7 U.S. and other governments implemented unprecedented actions to attempt to correct or
8 minimize the scope and effects of this recession.

9 The recession reached its low point in mid-2009, when the economy began to
10 expand again, although at a slow and uneven rate. However, the length and severity of
11 the recession, as well as a relatively slow and uneven recovery, indicate that the impacts
12 of the recession have been and will be felt for an extended period of time.

13
14 **Q. PLEASE DESCRIBE RECENT AND CURRENT ECONOMIC AND FINANCIAL**
15 **CONDITIONS AND THEIR IMPACT ON THE COSTS OF CAPITAL.**

16 A. One impact of the Great Recession has been a reduction in actual and expected
17 investment returns and a corresponding reduction in capital costs. This decline is
18 evidenced by a decline in both short-term and long-term interest rates and the
19 expectations of investors and is reflected in cost of equity model results (such as DCF,
20 CAPM and CE). Regulatory agencies throughout the U.S. have recognized the decline in
21 capital costs by authorizing lower returns on equity for regulated utilities in each of the
22 last several years.³

23 Schedule 2 shows several sets of relevant economic and financial statistics for the
24 cited time periods. Page 1 contains general macroeconomic statistics, page 2 shows
25 interest rates, and page 3 contains equity market statistics.

26 Page 1 shows that in 2007 the economy stalled and subsequently entered a
27 significant decline, as indicated by the lower growth rate in real (*i.e.*, adjusted for
28 inflation) Gross Domestic Product (“GDP”), lower levels of industrial production, and an
29 increase in the unemployment rate. This recession lasted until mid-2009, making it a
30 longer-than-normal recession, as well as a much deeper recession. Since then, economic

³ Regulatory Research Associates, “Regulatory Focus.” January 18, 2017.

1 growth has been somewhat erratic and the economy has grown slower than in prior
2 expansions.

3 Page 1 also shows the rate of inflation. As reflected in the Consumer Price Index
4 (“CPI”), inflation rose significantly during the 1975-1982 business cycle and reached
5 double-digit levels in 1979-1980. The rate of inflation has declined substantially since
6 1981. Since 2008, the CPI has been 3 percent or lower, with both 2014 and 2015 being
7 below 1 percent and 2016 being 2.1 percent. It is thus apparent that the rate of inflation
8 has generally been declining over the past several business cycles. Recent and current
9 levels of inflation are at the lowest levels of the past 35 years, which is reflective of lower
10 capital costs.⁴

11
12 **Q. WHAT HAVE BEEN THE TRENDS IN INTEREST RATES OVER THE FOUR**
13 **PRIOR BUSINESS CYCLES AND AT THE CURRENT TIME?**

14 A. Page 2 shows several series of interest rates. Both short-term and long-term rates
15 rose sharply to record levels in 1975-1981 when the inflation rate was high. Interest rates
16 have declined substantially in conjunction with the corresponding declines in inflation
17 since the early 1980’s.

18 From 2008 to late 2015, the Federal Reserve System (“Federal Reserve”)
19 maintained the Federal Funds rate (*i.e.*, short-term interest rate) at 0.25 percent, an all-
20 time low. The Federal Reserve has subsequently raised the Federal Funds rate on four
21 occasions between December of 2015 and June of 2017. The Federal Reserve also
22 purchased U.S. Treasury securities to stimulate the economy.⁵

23 As seen on page 2, since 2013 both U.S. and corporate bond yields declined to
24 their lowest levels in the past four business cycles and in more than 35 years. Even with
25 the “tapering” and eventual ending of the Federal Reserve’s Quantitative Easing program,
26 as well as the Federal Reserve’s raising of the Federal Funds rate, interest rates have

⁴ The rate of inflation is one component of interest rate expectations of investors, who generally expect to receive a return in excess of the rate of inflation. Thus, a lower rate of inflation has a downward impact on interest rates and other capital costs.

⁵ This is referred to as Quantitative Easing which was comprised of three “rounds”. In “round” 3, known as QE3, the Federal Reserve initially purchased some \$85 billion of U.S. Treasury Securities per month in order to stimulate the economy. The Federal Reserve eventually “tapered” its purchase of U.S. Treasury securities through October 2014, at which time Quantitative Easing ended.

1 remained low. Currently, both government and utility long-term lending rates remain
2 near historically low levels, again reflective of lower capital costs.

3
4 **Q. WHAT DOES SCHEDULE 2 SHOW FOR TRENDS OF COMMON SHARE**
5 **PRICES?**

6 A. Page 3 shows several series of common stock prices and ratios. These indicate
7 that stock prices were essentially stagnant during the high inflation/high interest rate
8 environment of the late 1970s and early 1980s. The 1983-1991 business cycle and the
9 more recent cycles witnessed a significant upward trend in stock prices. The beginning
10 of the recent financial crisis saw stock prices decline precipitously as stock prices in 2008
11 and early 2009 were down significantly from peak 2007 levels, reflecting the
12 financial/economic crisis. Beginning in the second quarter of 2009, prices recovered
13 substantially and ultimately reached and exceeded the levels achieved prior to the
14 “crash.” On the other hand, recent equity markets have been somewhat volatile.

15
16 **Q. WHAT CONCLUSIONS DO YOU DRAW FROM YOUR DISCUSSION OF**
17 **ECONOMIC AND FINANCIAL CONDITIONS?**

18 A. Recent economic and financial circumstances have differed from any that have
19 prevailed since at least the 1930s. In conjunction with the Great Recession, there was a
20 decline in capital costs and returns which significantly reduced the value of most
21 retirement accounts, investment portfolios and other assets. One significant aspect of this
22 has been a decline in investor expectations of returns⁶ even with the return of stock prices
23 to levels achieved prior to the “crash.”⁷ This is evident in several ways: (1) lower interest
24 rates on bank deposits; (2) lower interest rates on U.S. Treasury and utility bonds; and (3)
25 lower authorized utility ROEs by regulatory commissions. Finally, as noted above,
26 utility bond interest rates are currently at levels below those prevailing prior to the
27 financial crisis of late 2008 to early 2009 and are near the lowest levels in the past 35
28 years. Even with the increase in long-term rates in late 2016, utility bond yields still

⁶ See, e.g., Kiplinger’s Personal Finance, “Investors Brace for Smaller Gains, Focus on Long-Term,” August 30, 2015.

⁷ See e.g., Vanguard News & Perspectives. “Stabilization, Not Stagnation: Expect Modest Returns,” March 30, 2017, www.personal.vanguard.com/us/insights/artical/infographic-stabilization-032017.

1 remain well below the levels prevailing at the beginning of 2016. Furthermore, long-
2 term rates in 2017 have decreased, notwithstanding the Fed's increase in short-term rates.

3
4 **Q. HOW DO THESE ECONOMIC/FINANCIAL CONDITIONS IMPACT THE**
5 **DETERMINATION OF A RETURN ON EQUITY FOR REGULATED**
6 **UTILITIES?**

7 A. The costs of capital for regulated utilities have declined in recent years. For
8 example, the current interest costs that utilities pay on new debt remain near the low point
9 of the last several decades. In addition, the results of the traditional cost of equity models
10 (*i.e.*, DCF, CAPM and CE) are lower than was the case prior to the Great Recession. In
11 light of this, it is not surprising that the average equity returns authorized by state
12 regulatory agencies have declined and continue to decline through 2016, as follows:⁸

13

<u>Year</u>	<u>Electric</u>	<u>Natural Gas</u>
2007	10.31%	10.22%
2008	10.37%	10.39%
2009	10.52%	10.22%
2010	10.29%	10.15%
2011	10.19%	9.91%
2012	10.01%	9.93%
2013	9.81%	9.68%
2014	9.75%	9.78%
2015	9.60%	9.60%
2016	9.60%	9.49%

14
15 **V. PSO'S OPERATIONS AND RISKS**

16
17 **Q. PLEASE SUMMARIZE PSO AND ITS OPERATIONS.**

18 A. PSO is a public utility that generates, transmits, and distributes electric energy to
19 some 548,000 retail customers in eastern and southwestern Oklahoma. PSO also is
20 involved in supplying and marketing electric power at wholesale to other electric
21 companies, municipalities, rural electric cooperatives and other market participants.⁹

⁸ Regulatory Research Associates, "Regulatory Focus", January 18, 2017, General Rate Cases.

⁹ AEP/PSO 2016 Form 10-K, page 2.

1 PSO is a subsidiary of AEP and accounts for about 11 percent of AEP's system retail
2 revenues.¹⁰

3
4 **Q. PLEASE DESCRIBE AEP.**

5 A. AEP is a holding company whose subsidiaries include PSO. Other major utility
6 subsidiaries of AEP are: AEP Texas, Appalachian Power Co., Indiana Michigan Power
7 Co., Kentucky Power Co., Kingsport Power Co., Ohio Power Co., Southwestern Electric
8 Power Co, and Wheeling Power Co. AEP acquired the former Central and South West
9 Corporation in 2000, which substantially increased its size and geographic operations,
10 including PSO. AEP is one of the largest electric utility holding companies in the United
11 States.

12
13 **Q. WHAT ARE THE CURRENT BOND RATINGS OF PSO AND AEP?**

14 A. The present senior unsecured bond ratings are as follows:

	<u>PSO</u>	<u>AEP</u>
Moody's	A3	Baa1
Standard & Poor's	A-	BBB+
Fitch	BBB+	BBB+

15
16 **Q. WHAT HAVE BEEN THE TRENDS IN PSO'S AND AEP'S BOND RATINGS?**

17 A. This is shown on Schedule 3, which indicates that PSO had triple B or higher
18 ratings since at least 2011. Standard & Poor's upgraded PSO's ratings to BBB+ in 2016,
19 subsequent to the Company's last rate proceeding. In addition, in February of 2017,
20 Standard & Poor's upgraded both PSO's and AEP's ratings to A-.

21
22 **Q. WHY WAS PSO RECENTLY UPGRADED BY STANDARD & POOR'S?**

23 A. As noted above, Standard & Poor's upgraded PSO, as well as AEP and other AEP
24 subsidiaries, on February 2, 2017.¹¹ In this report, S&P stated:

25
26

¹⁰ AEP/PSO 2016 Form 10-K, page 4.

¹¹ Standard & Poor's Global Research, "Research Update: American Electric Power Co. Inc. And
Subsidiaries Upgraded to 'A-', Off Watch; Outlook Stable."

1 Overview

- 2 • American Electric Power Co. Inc, (AEP) completed the sale of 5,200
3 megawatts (MW) of merchant generation capacity raising about \$1.6
4 billion in after-tax proceeds. **Divesting the high-risk assets improves**
5 **AEP's credit profile that will now be dominated by regulated utilities.**
- 6 • We are raising our issuer credit ratings on AEP and all its utility
7 subsidiaries – Appalachian Power Co., Indiana Michigan Power Co.,
8 Kentucky Power Co., Ohio Power Co., Public Service Co. of Oklahoma,
9 Southwestern Electric Power Co., AEP Texas Inc., AEP Transmission Co.
10 LLC, and Wheeling Power Co. – to 'A-' from 'BBB+'. At the same time,
11 we are removing the ratings from CreditWatch, where we placed them
12 with positive implications on Sept. 16, 2016. The outlook is stable.
- 13 • **The stable outlook on AEP and its subsidiaries reflects the company's**
14 **improved business risk profile that now benefits from a**
15 **preponderance of regulated utility operations**, expectations that non-
16 utility operations will remain in modest part of AEP, and that the
17 company's financial profile will remain robust, with funds from operations
18 (FFO) to debt of about 18% on a consistent basis.

19 [Emphasis added]

20

21 It is apparent that S&P upgraded PSO and AEP as a result of AEP's divesting of
22 non-regulated "high-risk assets" (i.e., merchant generation capacity) and subsequently
23 focusing its activities on its less-risky regulated utilities. It follows the PSO's and AEP's
24 recent historic ratings were previously negatively impacted by these high-risk
25 nonregulated assets.

26 It is also noteworthy that Value Line recently upgraded AEP's "Safety" rank to
27 "1" (highest) and its "Financial Strength" to "A+" as a result of the asset sale. Value
28 Line stated:¹²

29 "This reflects AEP's lower risk as it exits the nonregulated
30 generating business."

¹² Value Line, March 17, 2017 report on AEP.

1 These rating agency and research advisory reports indicate that PSO, as well as
2 other AEP utility subsidiaries, have had their historic risk assessments negatively
3 impacted by AEP's nonregulated activities. On the other hand, as these entities have
4 divested their higher-risk non-regulated operations and focused on low-risk regulated
5 operations, their perceived risks have correspondingly declined.
6

7 **Q. DOES PSO HAVE ACCESS TO ANY REGULATORY MECHANISMS THAT**
8 **HAVE THE EFFECT OF ENHANCING THE RECOVERY OF ITS**
9 **INVESTMENTS AND COSTS?**

10 A. Yes. PSO has several existing and proposed regulatory mechanisms that are
11 beneficial to the Company's recovery of investments and expenses. According to PSO's
12 response to OIEC 2-10, PSO has some twelve riders in place that collected approximately
13 \$196 million in revenues (non-fuel) during the test year. Revenues collected pursuant to
14 these riders comprise approximately 33 percent of PSO's Oklahoma jurisdictional
15 revenues (as set forth in Schedule M-1 of PSO's Application package). Furthermore,
16 when including fuel FCA revenues, revenues collected pursuant to these riders and PSO's
17 FCA comprise approximately 63 percent of PSO's Oklahoma jurisdictional total revenues
18 (as set forth in Schedule M-1 of its Application package).
19

20 **Q. HAVE THE RATING AGENCIES COMMENTED ON THE RISK-REDUCING**
21 **NATURE OF REGULATORY MECHANISMS?**

22 A. Yes, they have. For example, a report by Moody's Investors Service, dated June
23 13, 2010 and titled "Cost Recovery Provisions Key to Investor Owned Utility Ratings
24 and Credit Quality," cited the risk-reducing nature of regulatory mechanisms. In this
25 report, Moody's noted:
26

27 Some regulators believe that mechanisms like automatic
28 adjustment clauses materially reduce the business and operating
29 risk of a utility, providing justification for a relatively low allowed
30 return on equity. We believe this is one of several reasons why
31 both allowed and requested ROEs have trended downward over the
32 last two decades.
33

1 Moody's views automatic adjustment clauses, the most common of
2 which is for fuel and purchased power, the largest component of
3 utility operating expenses, as supportive of utility credit quality
4 and important in reducing a utility's cash flow volatility, liquidity
5 requirements, and credit risk.
6

7 Moody's, in fact, upgraded the bulk of the entire U.S. investor-owned utility industry in
8 early 2014, largely due to regulators' increasing use of regulatory mechanisms and the
9 resulting improvement of utilities' finances. Moody's noted, in a February 3, 2014
10 Sector Comment titled "US Utility Sector Upgrades Driven by Stable and Transparent
11 Regulatory Frameworks":

12
13 We recently upgraded most US investor-owned utilities and many
14 of their holding companies due to our view that the US regulatory
15 environment has improved over the past several years. Most of the
16 companies placed on review for upgrade in November 2014 were
17 upgraded in late January 2014, and most by one notch.
18

19
20 US regulated utilities appear financially secure, thanks to their
21 suite of transparent and timely cost and investment recovery
22 mechanisms. When compared with other regulatory environments
23 in developed countries, the overall regulatory environment for US
24 utilities has steadily improved over the past few years and is
25 expected to remain supportive and constructive for at least the next
26 3-5 years.
27

28 Supportive regulatory frameworks

29
30 Over the past few years, the US regulatory environment has been
31 very supportive of utilities. We think this is partly a function of
32 regulators acknowledging that their utility infrastructure needs a
33 material amount of an ongoing investment for maintenance,
34 refurbishment and renovation purposes.
35

36 37 Stable and predictable financial profile

38
39 A transparent suite of timely recovery mechanisms help utilities
40 generate stable and predictable revenues and cash flows, which can
41 support a material amount of leverage.
42

1 Q. HAS MOODY'S FURTHER COMMENTED ON THE IMPACT OF
2 REGULATORY MECHANISMS AND REDUCED RISK/LOWER AUTHORIZED
3 ROEs FOR UTILITIES?

4 A. Yes. In a March 10, 2015 Sector In-Depth report titled "Lower Authorized
5 Equity Returns Will Not Hurt Near-Term Credit Profiles", Moody's stated:

6
7 The credit profiles of US regulated utilities will remain intact over
8 the next few years despite our expectation that regulators will
9 continue to trim the sector's profitability by lowering its authorized
10 returns on equity (ROE). Persistently low interest rates and a
11 comprehensive suite of cost recovery mechanisms ensure a lower
12 business risk profile for utilities, prompting regulators to scrutinize
13 their profitability, which is defined as the ratio of net income to
14 book equity.
15

16 Q. HAS MOODY'S ALSO SPECIFICALLY CITED PSO'S REGULATORY
17 MECHANISMS AS BEING FAVORABLE TO THE COMPANY'S RISKS AND
18 CREDIT ATTRIBUTES?

19 A. Yes. In a February 2, 2017 Credit Opinion on PSO, Moody's stated:

20
21 **Detailed Rating Considerations**
22
23 Reasonably supportive regulatory environment
24
25 PSO operates under a reasonably credit-supportive regulatory
26 framework overseen by the Oklahoma Corporation Commission
27 (OCC). Rate cases are based on historical test periods but may be
28 adjusted for certain known-and-measurable changes. The OCC is
29 required to issue a decision within 6 months of a utility-initiated
30 general rate case filing and interim rates are permitted to go into
31 effect if a rate case is not decided within 6 months.
32
33 OCC's regulatory framework offers a fuel adjustment clause
34 (FAC) which allows PSO to true up fuel cost annually when costs
35 have significantly changed or the under or over recovered balance
36 exceeds \$50 million. OCC staff reviews and approves changes to
37 PSO's fuel factors. Also, Oklahoma's statutes permit a cash return
38 on construction work in progress (CWIP) for environmental and
39 transmission expenditures. The OCC has approved the use of

riders to facilitate recovery of certain costs, including storm-related costs.

Q. SHOULD THIS RISK REDUCTION BE REFLECTED IN A LOWER ROE FOR PSO?

A. Yes. As noted above, PSO's riders reflect a significant and increasing portion of its revenues, which are recognized by the rating agencies and others as reflecting a transfer of the Company's risks from its shareholders to its ratepayers. Given the risk reduction to PSO resulting from its various riders, I recommend that no more than the mid-point of the cost of equity developed in my cost of equity analysis be approved in setting the Company's ROE.

VI. CAPITAL STRUCTURE AND COST OF DEBT

Q. WHAT IS THE IMPORTANCE OF DETERMINING A PROPER CAPITAL STRUCTURE IN A REGULATORY FRAMEWORK?

A. A utility's capital structure is important because the concept of rate base – rate of return regulation requires the capital structure to be utilized in estimating the total cost of capital. Within this framework, it is proper to ascertain whether the utility's capital structure is appropriate relative to its level of business risk and relative to other utilities.

As discussed in Section III of my testimony, the purpose of determining the proper capital structure for a utility is to ascertain its capital costs. The rate base – rate of return concept recognizes the assets employed in providing utility services and provides for a return on these assets by identifying the liabilities (mainly long-term debt) and common equity (and their respective cost rates) used to finance the assets. In this process, the rate base is derived from the asset side of the balance sheet and the cost of capital is derived from the liabilities/owners' equity side of the balance sheet. The inherent assumption in this procedure is that the dollar values of the capital structure and the rate base are approximately equal and the former is utilized to finance the latter.

The common equity ratio (i.e., the percentage of common equity in the capital structure) is the capital structure item that normally receives the most attention. This is the case because common equity: (1) usually commands the highest cost rate; (2)

1 generates associated income tax liabilities; and (3) causes the most controversy since its
2 cost cannot be precisely determined.

3
4 **Q. WHAT ARE THE HISTORIC CAPITAL STRUCTURE RATIOS OF PSO?**

5 A. I have examined the historic (2012-2016) capital structure ratios of PSO and AEP,
6 which are shown on Schedule 4. The common equity ratios (i.e., common equity as
7 percentage of the sum of common equity and debt) have been:

8

	PSO		AEP	
	<u>Including S-T Debt</u>	<u>Excluding S-T Debt</u>	<u>Including S-T Debt</u>	<u>Excluding S-T Debt</u>
2012	49.0%	49.0%	44.8%	46.1%
2013	47.6%	48.5%	45.6%	46.6%
2014	46.2%	49.6%	45.6%	47.3%
2015	46.5%	46.5%	46.7%	47.7%
2016	47.5%	48.5%	44.0%	46.0%

9
10 This indicates that PSO has had an equity ratio (excluding short-term debt) that
11 has generally been in a range of 46 percent to 50 percent over the past five years. The
12 AEP capital structure has generally contained a lower equity ratio than that of PSO.

13
14 **Q. HOW DO THESE CAPITAL STRUCTURES COMPARE TO THOSE OF**
15 **INVESTOR-OWNED ELECTRIC AND COMBINATION UTILITIES?**

16 A. Schedule 5 shows the common equity ratios (excluding short-term debt in
17 capitalization) for the groups of proxy electric and combination electric/gas utilities used
18 in developing my ROE models and related conclusions. These are:

19

	<u>Period</u>	<u>Average</u>	<u>Median</u>
Parcell Proxy Group	2012-2016	50.4%	49.9%
	2020-2022	48.6%	50.5%
Vilbert Electric Sample	2012-2016	49.9%	50.1%
	2020-2022	48.9%	48.8%

20
21 These equity ratios are similar to those of PSO.

1 **Q. WHAT HAVE BEEN THE AVERAGE COMMON EQUITY RATIOS ADOPTED**
2 **BY U.S. STATE REGULATORY AGENCIES IN RECENT YEARS?**

3 A. Over the past several years, the average common equity ratios cited in U.S. state
4 regulatory electric rate proceedings have been:¹³

5

2012	50.69%
2013	49.25%
2014	50.28%
2015	49.54%
2016	48.91%

6

7 These are also similar to those of PSO.

8

9 **Q. WHAT CAPITAL STRUCTURE HAS PSO REQUESTED IN THIS**
10 **PROCEEDING?**

11 A. PSO proposes a capital structure comprised as follows:¹⁴

12

	<u>Percent</u>
Long-Term Debt	51.49%
Common Equity	48.51%

13

14 This reflects the adjusted December 31, 2016 test year capital structure of PSO contained
15 in Schedule F-1 of the Company's filing.

16

17 **Q. WHAT CAPITAL STRUCTURE DO YOU PROPOSE TO USE IN THESE**
18 **PROCEEDINGS?**

19 A. I have also used the proposed capital structure for the purposes of this proceeding.
20 As I have shown above, an equity ratio of about 48 percent is similar to the "industry
21 norm" as is shown on Schedule 5.

22

23 **Q. WHAT IS THE COST RATE OF DEBT IN PSO'S APPLICATION?**

¹³ Regulatory Research Associates, "Regulatory Focus", January 18, 2017.

¹⁴ Schedule F-1 of Company Filing.

1 A. PSO's application incorporates the adjusted test year long-term debt cost rate
2 (4.60%). I use this long-term debt cost in my COC analyses.

3
4 **Q. CAN THE ROE BE DETERMINED WITH THE SAME DEGREE OF**
5 **PRECISION AS THE COST OF DEBT?**

6 A. No. The cost rate of debt is largely determined by interest payments, issue prices,
7 and related expenses. The ROE, on the other hand, cannot be precisely quantified,
8 primarily because this cost is an opportunity cost. As mentioned previously, there are
9 several models that can be employed to estimate the ROE. Three of the primary methods
10 – DCF, CAPM, and CE – are developed in the following sections of my testimony.

11
12 **VII. SELECTION OF PROXY GROUPS**

13
14 **Q. HOW HAVE YOU ESTIMATED THE ROE FOR PSO?**

15 A. PSO is not a publicly-traded company. Consequently, it is not possible to directly
16 apply ROE models to this company. PSO's parent, AEP is publicly-traded. However, in
17 COC analyses, it is customary to analyze groups of comparison, or "proxy," companies
18 as a substitute for PSO to determine its ROE.

19 I have accordingly selected two groups for comparison to PSO and AEP. I
20 selected one group of electric and combination gas/electric utilities similar to PSO and
21 AEP using the criteria listed on Schedule 6. These criteria are as follows:

- 22 (1) Market cap of \$20 billion or greater;
23 (2) Common equity ratio 40% or greater;
24 (3) Value Line Safety rank of 1 or 2;
25 (4) Standard & Poor's ("S&P") stock ranking of A or B;
26 (5) S&P and/or Moody's bond ratings of BBB or A;
27 (6) Currently pays dividends; and
28 (7) Not currently involved in a major merger or acquisition.

29 In addition, I have conducted studies of the cost of equity for the Electric Sample
30 that was selected by PSO witness Michael J. Vilbert.

31

1 **Q. PLEASE EXPLAIN WHY YOU ARE USING TWO PROXY GROUPS IN YOUR**
2 **COST OF EQUITY ANALYSES.**

3 A. It has long been my practice to develop my own independently determined proxy
4 group and to also conduct cost of equity analyses on the utility witness' proxy group. My
5 conclusions and recommendations, in turn, are based upon my review of the results of
6 both proxy groups.

7
8 **VIII. DISCOUNTED CASH FLOW ANALYSIS**

9
10 **Q. WHAT IS THE THEORY AND METHODOLOGICAL BASIS OF THE DCF**
11 **MODEL?**

12 A. The DCF model is one of the oldest and most commonly used models for
13 estimating the ROE for public utilities.¹⁵ The DCF model is based on the "dividend
14 discount model" of financial theory, which maintains that the value (price) of any
15 security or commodity is the discounted present value of all future cash flows. The most
16 common variant of the DCF model assumes that dividends are expected to grow at a
17 constant rate (the "constant growth" or "Gordon DCF model"). In this framework, the
18 ROE is derived from the following formula:

$$K = \frac{D}{P} + g$$

19
20 where: P = current price

21 D = current dividend rate

22 K = discount rate (cost of capital)

23 g = constant rate of expected growth

24 This formula essentially recognizes that the return expected or required by
25 investors is comprised of two factors: the dividend yield (current income) and expected
26 growth in dividends (future income).

27
28 **Q. PLEASE EXPLAIN HOW YOU EMPLOY THE DCF MODEL.**

¹⁵ Certain regulatory commissions (e.g., Federal Energy Regulatory Commission) rely primarily on the DCF methodology in determining the ROE for public utilities.

1 A. I use the constant growth DCF model. In doing so, I combine the current
2 dividend yield for each of the proxy utility stocks described in the previous section with
3 several indicators of expected dividend growth.
4

5 **Q. HOW DID YOU DERIVE THE DIVIDEND YIELD COMPONENT OF THE DCF**
6 **EQUATION?**

7 A. Several methods can be used to calculate the dividend yield component. These
8 methods generally differ in the manner in which the dividend rate is employed (i.e.,
9 current versus future dividends, or annual versus quarterly compounding variant). I use a
10 version of the quarterly compounding variant, which is expressed as follows:

$$\text{Yield} = \frac{D_0(1 + 0.5g)}{P_0}$$

11
12 This dividend yield component recognizes the timing of dividend payments and dividend
13 increases.

14 The P_0 in my yield calculation is the average of the high and low stock price for
15 each proxy company for the most recent three month period (June-August 2017). The D_0
16 is the current annualized dividend rate for each proxy company.
17

18 **Q. HOW DO YOU ESTIMATE THE DIVIDEND GROWTH COMPONENT OF THE**
19 **DCF EQUATION?**

20 A. The DCF model's dividend growth rate component is usually the most crucial and
21 controversial element involved in using this methodology. The objective of estimating
22 the dividend growth component is to reflect the growth expected by investors that is
23 embodied in the price (and yield) of a company's stock. As such, it is important to
24 recognize that individual investors have different expectations and consider alternative
25 indicators in deriving their expectations. This is evidenced by the fact that every
26 investment decision resulting in the purchase of a particular stock is matched by another
27 investment decision to sell that stock.

28 A wide array of indicators exists for estimating investors' growth expectations.
29 As a result, it is evident that investors do not always use one single indicator of growth.
30 It therefore is necessary to consider alternative dividend growth indicators in deriving the

1 growth component of the DCF model. I have considered five indicators of growth in my
2 DCF analyses. These are:

- 3
- 4 1. Years 2012-2016 (5-year average) earnings retention, or fundamental
5 growth (per Value Line);
- 6 2. Five-year average of historic growth in earnings per share (EPS),
7 dividends per share (DPS), and book value per share (BVPS) (per Value
8 Line);
- 9 3. Years 2017, 2018 and 2020-2022 projections of earnings retention growth
10 (per Value Line);
- 11 4. Years 2014-2016 to 2020-2022 projections of EPS, DPS, and BVPS (per
12 Value Line); and
- 13 5. Five-year projections of EPS growth (per First Call).
- 14

15 I believe this combination of growth indicators is a representative and appropriate
16 set with which to begin the process of estimating investor expectations of dividend
17 growth for the groups of proxy companies. I also believe that these growth indicators
18 reflect the types of information that investors consider in making their investment
19 decisions. As I indicated previously, investors have an array of information available to
20 them, all of which would be expected to have some impact on their decision-making
21 process.

22

23 **Q. PLEASE DESCRIBE YOUR DCF CALCULATIONS.**

24 A. Schedule 7 presents my DCF analysis. Page 1 shows the calculation of the “raw”
25 (i.e., prior to adjustment for growth) dividend yield for each proxy company. Pages 2
26 and 3 of Schedule 7 show the growth rates for the groups of proxy companies. Page 4
27 shows the DCF calculations, which are presented on several bases: mean, median, low
28 and high values. These results can be summarized as follows:

	Mean	Median	Mean Low ¹⁶	Mean High ¹⁷	Median Low ¹⁸	Median High ¹⁹
Parcell Proxy Group	7.8%	7.7%	7.2%	8.4%	7.0%	8.5%
Vilbert Electric Sample	7.8%	7.6%	7.1%	8.4%	7.0%	8.3%

1

2

3

4

5

6

7

Q. WHAT DO YOU CONCLUDE FROM YOUR DCF ANALYSES?

8

A. The DCF rates resulting from the analysis of the proxy groups fall into a wide range between 7.0 percent and 8.5 percent. The highest DCF rates are 8.3 percent to 8.5 percent.

9

10

11

I believe a range of 8.3 percent to 8.5 percent (8.4 percent mid-point) represents the current DCF-derived ROE for the proxy groups. This range includes the highest DCF rates and exceeds the low and mean/median DCF rates.

12

13

14

I focus on the higher DCF results since recent financial conditions have had the effect of driving many of the DCF results to low levels relative to those of recent years. Had I used the average of the DCF results, my recommendation would have been lower. As such, my recommendation can be viewed as conservative.

15

16

17

18

19

Q. PSO WITNESS VILBERT PERFORMS A MULTI-STAGE DCF ANALYSIS IN HIS DIRECT TESTIMONY. HAVE YOU PREPARED A MULTI-STAGE DCF?

20

21

A. No. I have not. The logic for a multi-stage DCF analysis suggests that, in the long-run, growth for a utility cannot exceed the growth rate for the U.S. economy, usually measured by the expected growth rate in Gross Domestic Product ("GDP"). In general, multi-stage DCF analyses use a short-term growth rate (using various historic and near-term growth rates) and a long-term growth rate (i.e., GDP growth).

22

23

24

25

¹⁶ Using the lowest mean growth rate.
¹⁷ Using only the highest mean growth rate.
¹⁸ Using the lowest median growth rate.
¹⁹ Using only the highest median growth rate.

1 Current projections of long-term growth in GDPs such as those used by the
2 Federal Energy Regulatory Commission ("FERC") in its multi-stage DCF methodology,
3 are about 4.3 percent.²⁰ In the current proceeding, PSE Vilbert uses a long-term GDP
4 growth rate of 4.2 percent.²¹

5 Comparing a long-term growth rate of 4.3% to the various short-term (i.e., 5-year
6 historic and 5-year projected) in my Schedule 7, it is apparent that the two sets of growth
7 rates are not significantly different. As a result, it is apparent that implementation of a
8 multi-stage DCF analysis would not produce a higher ROE result than is the case for a
9 constant growth DCF analysis.

10
11 **IX. CAPITAL ASSET PRICING MODEL ANALYSIS**

12
13 **Q. PLEASE DESCRIBE THE THEORY AND METHODOLOGICAL BASIS OF**
14 **THE CAPM.**

15 A. CAPM was developed in the 1960s and 1970s as an extension of modern portfolio
16 theory (MPT), which studies the relationships among risk, diversification, and expected
17 returns. The CAPM describes and measures the relationship between a security's
18 investment risk and its market rate of return.

19
20 **Q. HOW IS THE CAPM DERIVED?**

21 A. The general form of the CAPM is:

$$K = R_f + \beta(R_m - R_f)$$

22
23
24 where: K = cost of equity
25 R_f = risk free rate
26 R_m = return on market
27 β = beta
28 R_m-R_f = market risk premium

²⁰ For example, the FERC used a GDP growth rate of 4.3% in the most recent Opinion No. 551.

²¹ Direct Testimony of Michael J. Vilbert, Appendix C, page 32.

1 The CAPM is a variant of the Risk Premium (“RP”) method. RP methodologies
2 generally focus on the historic and/or expected future differential between various
3 measures of stocks and debt returns, which is then applied to current levels of debt to
4 estimate the ROE. I believe the CAPM is generally superior to the simple RP method
5 because the CAPM specifically recognizes the risk of a particular company or industry
6 (i.e., beta), whereas the simple RP method assumes the same ROE for all companies
7 exhibiting similar bond ratings or other characteristics.
8

9 **Q. WHAT DO YOU USE FOR THE RISK-FREE RATE?**

10 A. The first input of the CAPM is the risk-free rate (R_f). The risk-free rate reflects
11 the level of return that can be achieved without accepting any risk.

12 In CAPM applications, the risk-free rate is generally recognized by use of U.S.
13 Treasury securities. Two general types of U.S. Treasury securities are often utilized as
14 the R_f component, short-term U.S. Treasury bills and long-term U.S. Treasury bonds.

15 I have performed CAPM calculations using the three-month average yield (June-
16 August 2017) for 20-year U.S. Treasury bonds. I use the yields on long-term Treasury
17 bonds since this matches the long-term perspective of ROE analyses. Over this three-
18 month period, these bonds had an average yield of 2.58 percent.
19

20 **Q. WHAT IS BETA AND WHAT BETAS DO YOU EMPLOY IN YOUR CAPM?**

21 A. Beta is a measure of the relative volatility (and thus risk) of a particular stock in
22 relation to the overall market. Betas less than 1.0 are considered less risky than the
23 market, whereas betas greater than 1.0 are reflective of more risk. Utility stocks
24 traditionally have had betas below 1.0. I utilize the most recent Value Line betas for each
25 company in the proxy groups.
26

27 **Q. HOW DO YOU ESTIMATE THE MARKET RISK PREMIUM COMPONENT?**

28 A. The market risk premium component ($R_m - R_f$) represents the investor-expected
29 premium of common stocks over the risk-free rate, or long-term government bonds. For
30 the purpose of estimating the market risk premium, I considered alternative measures of
31 returns of the S&P 500 (a broad-based group of large U.S. companies) and 20-year U.S.

1 Treasury bonds (i.e., same timeframe as employed in the Duff & Phelps source used to
2 develop risk premiums).

3 First, I compared the actual annual returns on equity of the S&P 500 with the
4 actual annual income returns of U.S. Treasury bonds. Schedule 8 shows the ROE for the
5 S&P 500 group for the period 1978-2016. Schedule 8 also indicates the annual income
6 returns on 20-year U.S. Treasury bonds and the annual differentials (i.e. risk premiums)
7 between the S&P 500 and U.S. Treasury 20-year bonds. Based upon these returns, I
8 conclude that the risk premium from this analysis is 7.0 percent.

9 I next considered the total returns (i.e., dividends/interest plus capital
10 gains/losses) for the S&P 500 group as well as for long-term government bonds, as
11 tabulated by Duff & Phelps²² (formerly Morningstar and Ibbotson²³), using both
12 arithmetic and geometric means. I considered the total returns for the entire 1926-2016
13 period reported by this source, which are as follows:
14

	<u>S&P 500</u>	<u>L-T Gov't Bonds</u>	<u>Risk Premium</u>
Arithmetic	12.0%	6.0%	6.0%
Geometric	10.0%	5.5%	4.5%

15
16 I conclude from this analysis that the expected risk premium is about 5.8 percent
17 (i.e., the average of all three risk premiums: 7.0 percent from Schedule 8; 6.0 percent
18 arithmetic and 4.5 percent geometric from Duff & Phelps). I believe that a combination
19 of arithmetic and geometric means is appropriate since investors have access to both
20 types of means²⁴ and presumably, both types are reflected in investment decisions and
21 thus, stock prices and the ROE.
22

23 **Q. WHAT ARE YOUR CAPM RESULTS?**

24 A. Schedule 9 shows my CAPM calculations. The results are:

	<u>Mean</u>	<u>Median</u>
Parcell Proxy Group	6.2%	6.1%
Vilbert Electric Sample	6.7%	6.6%

²² Duff & Phelps, "2017 SBBI Yearbook."

²³ Morningstar, "Ibbotson SBBI 2015 Classic Yearbook."

²⁴ For example, Value Line uses compound (i.e., geometric) growth rates in its projections. In addition, mutual funds report growth rates on a compound basis.

1 **Q. WHAT IS YOUR CONCLUSION CONCERNING THE CAPM ROE?**

2 A. The CAPM results collectively indicate a ROE of 6.1 percent to 6.7 percent for
3 the groups of proxy utilities. I conclude that an appropriate CAPM ROE estimation for
4 PSO is 6.1 percent to 6.7 percent.

5

6 **X. COMPARABLE EARNINGS ANALYSIS**

7

8 **Q. PLEASE DESCRIBE THE BASIS OF THE CE METHODOLOGY.**

9 A. The CE method is derived from the “corresponding risk” concept discussed in the
10 *Bluefield* and *Hope* cases, and thus based upon the economic concept of opportunity cost.
11 The CE method examines historic and projected ROEs for similar-risk utility companies,
12 along with the acceptance of the ROEs by investors in terms of market-to-book ratios
13 (“M/B”). As previously noted, the ROE is an opportunity cost: the prospective return
14 available to investors from alternative investments of similar risk.

15 The CE method is designed to measure the returns expected to be earned on the
16 original cost book value of similar risk enterprises. Thus, it provides a direct measure of
17 the fair return, since it translates into practice the competitive principle upon which
18 regulation rests.

19 The CE method normally examines the experienced and/or projected return on
20 book common equity. The logic for examining returns on book equity follows from the
21 use of original cost rate base regulation for public utilities, which uses a utility’s book
22 common equity to determine the cost of capital. This cost of capital is, in turn, used as
23 the fair rate of return, which is then applied (multiplied) to the book value of rate base to
24 establish the dollar level of capital costs to be recovered by the utility. This technique is
25 thus consistent with the rate base-rate of return methodology used to set utility rates.

26

27 **Q. HOW DO YOU APPLY THE CE METHODOLOGY IN YOUR ANALYSIS OF**
28 **PSO’S ROE?**

29 A. I apply the CE methodology by examining realized ROEs for the groups of proxy
30 utilities, as well as unregulated companies, and evaluating investor acceptance of these
31 returns by reference to the resulting market-to-book ratios (“M/Bs”). In this manner it is

1 possible to assess the degree to which a given level of return equates to the COC. It is
2 generally recognized for utilities that an M/B of greater than one (i.e., 100 percent)
3 reflects a situation where a company is able to attract new equity capital without dilution
4 (i.e., above book value). As a result, one objective of a fair cost of equity is the
5 maintenance of stock prices at or above book value. There is no regulatory obligation to
6 set rates designed to maintain an M/B significantly above one.

7 I further note that my CE analysis is based upon market data (through the use of
8 M/Bs) and is thus essentially a market test. As a result, my CE analysis is not subject to
9 the criticisms occasionally made by some who maintain that past earned returns do not
10 represent the cost of capital. In addition, my CE analysis also uses prospective returns
11 and thus is not backward looking.

12
13 **Q. IS YOUR CE ANALYSIS BASED UPON AN ASSUMPTION THAT ROEs ARE**
14 **THE ONLY FACTOR INFLUENCING STOCK PRICES AND M/Bs?**

15 A. No, it does not. I do not assume that earned ROEs are the sole determinant of
16 M/Bs. Rather, I demonstrate that M/Bs are important to public utilities and they
17 correspondingly reflect investors' assessment of the value of utility stocks relative to their
18 respective book value, which is the basis on which their rates are established by
19 regulatory commissions.

20
21 **Q. WHAT TIME PERIODS DO YOU EXAMINE IN YOUR CE ANALYSIS?**

22 A. My CE analysis considers the experienced ROEs of the proxy groups of utilities
23 for the period 2002-2016 (i.e., the last fifteen years). The CE analysis requires that I
24 examine a relatively long period of time in order to determine trends in earnings over at
25 least a full business cycle. Further, in estimating a fair level of return for a future period,
26 it is important to examine earnings over a diverse period of time in order to avoid any
27 undue influence from unusual or abnormal conditions that may occur in a single year or
28 shorter period. Therefore, in forming my judgment of the current cost of equity, I
29 focused on two periods: 2009-2016 (the current business cycle) and 2002-2008 (the most
30 recent business cycle). I have also considered projected ROEs for 2017, 2018 and 2020-
31 2022.

1 **Q. PLEASE DESCRIBE YOUR CE ANALYSIS.**

2 A. Schedules 10 and 11 contain summaries of experienced ROEs and M/Bs for three
3 groups of companies, while Schedule 12 presents a risk comparison of utilities versus
4 unregulated firms.

5 Schedule 10 shows the ROEs and M/Bs for the groups of proxy utilities. These
6 can be summarized as follows:

	<u>Parcell Proxy Group</u>	<u>Vilbert Electric Sample</u>
Historic ROE		
Mean	10.3-11.0%	10.4-11.6%
Median	10.1-11.0%	10.0-11.1%
Historic M/B		
Mean	155-159%	161-167%
Median	150-155%	150-160%
Prospective ROE		
Mean	10.1-10.6%	10.4-11.1%
Median	10.5%	10.0-10.5%

7

8 These results indicate that historic ROEs of 10.0 percent to 11.6 percent have
9 been adequate to produce M/Bs of 150 percent to 167 percent for the groups of utilities.
10 Furthermore, projected returns on equity for 2017, 2018 and 2020-2022 are within a
11 range of 10.0 percent to 11.1 percent for the utility groups. These relate to 2016 M/Bs of
12 175 percent or greater.

13

14 **Q. DO YOU ALSO REVIEW THE EARNINGS OF UNREGULATED FIRMS?**

15 A. Yes. As an alternative, I also examine the S&P's 500 Composite group. This is a
16 well-recognized group of firms that is widely utilized in the investment community and is
17 indicative of the competitive sector of the economy. Schedule 11 presents the earned
18 ROEs and M/Bs for the S&P 500 group over the past fifteen years (i.e., 2002-2016). As
19 this attachment shows, over the two business cycle periods, this group's average ROEs
20 ranged from 12.4 percent to 13.3 percent, with average M/Bs ranging between 233
21 percent and 275 percent.

22

23 **Q. HOW CAN THE ABOVE INFORMATION BE USED TO ESTIMATE PSO'S**
24 **ROE?**

1 A. The recent ROEs of the proxy utilities and the S&P 500 group can be viewed as
2 an indication of the level of return realized and expected in the regulated and competitive
3 sectors of the economy. In order to apply these returns to the ROE for the proxy utilities,
4 however, it is necessary to compare the risk levels of the utilities and the competitive
5 companies. I do this in Schedule 12, which compares several risk indicators for the S&P
6 500 group and the utility groups. The information in this schedule indicates that the S&P
7 500 group is more risky than the utility proxy groups.

8

9 **Q. WHAT ROE IS INDICATED BY YOUR CE ANALYSIS?**

10 A. Based on recent ROEs and M/Bs, my CE analysis indicates that the ROE for the
11 proxy utilities is no more than 9.0 percent to 10.0 percent (9.5 percent mid-point).
12 Recent ROEs of 10.0 percent to 11.6 percent have resulted in M/Bs of 150 percent and
13 over. Prospective ROEs of 10.0 percent to 11.1 percent have been accompanied by M/Bs
14 over 175 percent. As a result, it is apparent that authorized returns below this level would
15 continue to result in M/Bs of well above 100 percent. As I noted earlier, the fact that
16 M/Bs substantially exceed 100 percent indicates that historic and prospective ROEs of
17 9.5 percent reflect earning levels that are well above the actual cost of equity for those
18 regulated companies. I also note that a company whose stock sells above book value can
19 attract capital in a way that enhances the book value of existing stockholders, thus
20 creating a favorable environment for financial integrity.

21

22 **XI. RETURN ON EQUITY RECOMMENDATION**

23

24 **Q. PLEASE SUMMARIZE THE RESULTS OF YOUR THREE ROE ANALYSES.**

25 A. My three ROE analyses produced the following:

	<u>Mid-Point</u>	<u>Range</u>
DCF	8.4%	8.3-8.5%
CAPM	6.4%	6.1-6.7%
CE	9.5%	9.0-10.0%

26

27 These results indicate an overall broad range of 6.1 percent to 10.0 percent, which
28 focuses on the respective individual model results. Using mid-point values, the range is

1 6.4 percent to 9.5 percent. I conclude that a ROE range of 8.5 percent to 9.5 percent is
2 appropriate for the proxy companies, with a mid-point of 9.0 percent being the
3 appropriate ROE for PSO. This range includes the upper-end of my DCF results and the
4 mid-point of my CE results. As stated above, my specific ROE recommendation is 9.0
5 percent.

6
7 **Q. IT APPEARS THAT YOUR CAPM RESULTS ARE LESS THAN YOUR DCF**
8 **AND CE RESULTS. DOES THIS IMPLY THAT THE CAPM RESULTS**
9 **SHOULD NOT BE CONSIDERED IN DETERMINING THE COST OF EQUITY**
10 **FOR PSO?**

11 A. No. It is apparent that the CAPM results are less than the DCF and CE results.
12 There are two reasons for the lower CAPM results. First, risk premiums are lower
13 currently than was the case in prior years. This is the result of lower equity returns that
14 have been experienced over the past several years. This is also reflective of a decline in
15 investor expectations of equity returns and risk premiums. Second, the level of interest
16 rates on U.S. Treasury bonds (i.e., the risk free rate) has been lower in recent years. This
17 is partially the result of the actions of the Federal Reserve System to stimulate the
18 economy. This also impacts investor expectations of returns in a negative fashion. I note
19 that, initially, investors may have believed that the decline in Treasury yields was a
20 temporary factor that would soon be replaced by a rise in interest rates. However, this
21 has not been the case as interest rates have remained low and continued to decline for the
22 past seven-plus years. As a result, it cannot be maintained that low interest rates (and low
23 CAPM results) are temporary and do not reflect investor expectations. Consequently, the
24 CAPM results should be considered as one factor in determining the cost of equity for
25 PSO.

26
27 **XII. TOTAL COST OF CAPITAL**

28
29 **Q. WHAT IS THE TOTAL COC FOR PSO?**

1 A. Schedule 1 reflects the total COC for PSO using PSO's proposed capital structure
 2 and embedded cost of debt, as well as my ROE recommendations. The resulting COC is
 3 a range of 6.49 percent to 6.98 percent (mid-point of 6.73 percent).
 4

5 **XIII. COMMENTS ON THE COMPANY'S TESTIMONY**

6
 7 **Q. WHAT COC HAS PSO REQUESTED IN ITS APPLICATION?**

8 A. The Company's filing requests a total COC of 7.22 percent, which incorporates a
 9 ROE of 10.0 percent. The 10.0 percent requested ROE is developed in the testimony of
 10 PSO witness Michael J. Vilbert, which is in the mid-point of his recommended range of
 11 9.75 percent to 10.25 percent.
 12

13 **Q. WHAT IS THE BASIS FOR DR. VILBERT'S COST OF EQUITY RANGE?**

14 A. Dr. Vilbert's ROE recommendation is derived from two sets of models: DCF and
 15 risk-positioning (CAPM).

16 Dr. Vilbert's DCF conclusions are as follows:²⁵

Simple DCF	10.5%
Multi-Stage DCF	9.2%

17
 18 Dr. Vilbert's CAPM conclusions are as follows:²⁶

<u>Estimated Return on Equity</u>	<u>Scenario 1</u>	<u>Scenario 2</u>
	(1)	(2)
Financial Risk Adjusted Method		
CAPM	9.9%	10.4%
ECAPM (a = 0.5%)	10.0%	10.6%
ECAPM (a = 1.5%)	10.4%	10.9%
Hamada Adjustment Without Taxes		
CAPM	9.3%	9.9%
ECAPM (a = 0.5%)	9.4%	10.0%
ECAPM (a = 1.5%)	9.6%	10.2%
Hamada Adjustment With Taxes		
CAPM	9.1%	9.7%
ECAPM (a = 0.5%)	9.3%	9.8%
ECAPM (a = 1.5%)	9.5%	10.0%

19

²⁵ Direct Testimony of Michael J. Vilbert, Page 39, Table 4.

²⁶ Direct Testimony of Michael J. Vilbert, Page 48, Table 7.

1 **Q. HOW DOES DR. VILBERT DERIVE HIS 10.5 PERCENT SIMPLE DCF COST**
2 **RATE?**

3 A. Dr. Vilbert's Simple DCF method is comprised of three steps. First, he combines
4 each Electric Sample company's dividend yield (most recent dividend divided by average
5 stock price over period March 13, 2017 to March 31, 2017)²⁷ with its respective growth
6 rate in terms of EPS forecasts.²⁸ This results in an average DCF cost rate for his Electric
7 Sample of 8.8 percent.²⁹ I note that is generally consistent with my DCF results.
8 Secondly, Dr. Vilbert "adjusts" each Electric Sample company's DCF result to a
9 "weighted after-tax cost of capital," which considers the market value of each company's
10 common equity to market value rate, preferred stock (if company employs any) to market
11 value ratio, and debt to market value ratio. This process results in an average weighted
12 After-Tax cost of capital for his Electric Sample of 6.5 percent.³⁰ Finally, Dr. Vilbert
13 converts this 6.5 percent After-Tax cost of capital using PSO's "Regulatory % Debt"
14 (51.5%), "Representative Cost of BBB rated debt (4.6%), PSO's "Representative Income
15 Tax Rate" (38.9%) and PSO's "Regulatory % Equity (48.5%) to derive a 10.5 percent
16 simple DCF for PSO.³¹

17
18 **Q. DO YOU AGREE WITH DR. VILBERT'S ADJUSTMENTS TO THE ELECTRIC**
19 **SAMPLE COMPANIES' DCF COSTS?**

20 A. No, I do not. This approach is, to say the least, unorthodox. I personally have
21 never seen any other cost of capital witness propose such an approach. I am also not
22 aware of any regulatory commission that has adopted this or a similar approach.

23 Dr. Vilbert's DCF adjustment procedure is inappropriate and results in a
24 significantly inflated cost of equity for PSO. In developing his 6.5 percent "Overall
25 Weighted After-Tax Cost of Capital", Dr. Vilbert uses the market value of common
26 equity, not the traditional book value of common equity that is universally used to
27 determine the weighted cost of equity for public utilities. Then he compounds his
28 erroneous procedure by "converting" this 6.5 percent cost of capital to PSO's cost of

27 Schedule MJV-6.

28 Schedule MJV-5.

29 Schedule MJV-6.

30 Schedule MJV-7.

31 Schedule MJV-8.

1 equity (i.e., 10.5 percent) by using PSO's "Regulatory % Equity" which is book value.
 2 Implicit in Dr. Vilbert's analysis is that PSO has more financial risk than the Electric
 3 Sample since PSO's regulatory equity (48.5 percent) is less than the Electric Sample's
 4 market value equity percentage (i.e., average of 62 percent)³². This comparison is both
 5 incorrect and misleading. As I indicated on Schedule 5, the recent average and median
 6 book value of his Electric Group is about 49 percent, which is not meaningfully different
 7 from PSO's 48.5 percent common equity ratio.

8 It should be apparent that PSO is not more risky than the Electric Sample. This is
 9 demonstrated by the following comparisons:

Indicator	Electric Sample	Pub. Ser. OK
S&P Bond Ratings		
AA	1	
A	10	A
BBB	17	
Moody's Bond Ratings		
A3	4	A3
Baa1	7	
Baa2	3	
Baa3	1	
2016 Book Value Common Equity %	49.2%	48.5%
Cost of Long-Term Debt	4.4%	4.6%

11 Since PSO is not more risky than the Electric Sample, on average, it follows that
 12 its cost of equity should not be substantially greater (i.e., 10.5 percent versus 8.8 percent).
 13 Yet this is what Dr. Vilbert's DCF analysis suggests.

14
 15
 16 **Q. HOW DOES DR. VILBERT DERIVE HIS MULTI-STAGE DCF COST RATE?**

17 A. Dr. Vilbert's multi-stage DCF essentially combines the individual Electric Sample
 18 companies' growth rates (as used in the Simple DCF) with a 4.2 percent "GDP Long-
 19 Term Growth Rate". The average DCF cost of equity for his group is 7.8 percent.³³ He

³² As shown on schedule MJV-7.

³³ Schedule MJV-6.

1 then performs the same set of adjustments, as used in his Simple DCF, to derive his
2 recommended 9.2 percent multi-stage DCF.³⁴

3 For the same reasons cited in my response to Dr. Vilbert's Simple DCF, I also
4 disagree with his multi-stage DCF analyses.

5
6 **Q. HOW DOES DR. VILBERT DERIVE HIS CAPM RESULTS?**

7 A. Each of Dr. Vilbert's various CAPM methodologies use the following inputs:

8
9 Risk-Free Rate – 3.4% - Forecast rate on 20-year Treasury Bonds³⁵

10 Beta – Value Line betas for each company³⁶

11 Market Risk Premium – 6.9% and 7.9% - Duff & Phelps arithmetic
12 average³⁷

13
14 **Q. DO YOU DISAGREE WITH ANY OF THESE INPUTS?**

15 A. Yes, I do. I disagree with Dr. Vilbert's risk-free rate and his market risk
16 premium.

17
18 **Q. WHY DO YOU DISAGREE WITH DR. VILBERT'S RISK-FREE RATE?**

19 A. Dr. Vilbert's proposed 3.4 percent risk-free rate reflects his perception of the
20 expected or forecasted yield on 20-year U.S. Treasury Bonds. I disagree with the use of
21 forecasted interest rates as the risk-free rate.

22
23 **Q. WHY DO YOU DISAGREE WITH DR. VILBERT'S USE OF FORECASTED
24 INTEREST RATE AS THE RISK-FREE RATE IN A CAPM CONTEXT?**

25 A. It is proper to use the current (i.e., actual) yield as the risk-free rate in a CAPM
26 context. This is the case since the current yield is known and measurable and reflects
27 investors' collective assessment of all known capital market conditions. Prospective
28 interest rates, in contrast, are not measurable and not achievable. For example, if the

³⁴ Schedule MJV-8.

³⁵ Vilbert Testimony, page 40, lines 14-19.

³⁶ Vilbert Testimony, pages 43-44.

³⁷ Vilbert Testimony, page 42, lines 18-22.

1 current yield on 20-year U.S. Treasury Bonds is about 2.6 percent, this reflects the rate
2 that investors can actually receive on their investment. Investors cannot receive a
3 prospective yield on their investments since such a yield is not actual but rather
4 speculative.

5 Use of the current risk-free rate in a CAPM context is similar to using the current
6 yield in a DCF context. Analysts do not use prospective stock prices as the basis for the
7 dividend yield in a DCF analysis, as use of prospective stock prices is speculative. Use
8 of current stock prices is appropriate, as are used by Dr. Vilbert. Likewise, current levels
9 of interest rates reflect all current information (i.e., the efficient market hypothesis) and
10 should be used as the risk-free rate in the CAPM. In addition, actual yields, not projected
11 yields, are used by Dr. Vilbert in the development of his proposed risk premium. Note
12 that current yields on U.S. Treasury 20-year bonds are about 2.6 percent, well below the
13 3.4 percent proposed by Dr. Vilbert.

14
15 **Q. WHY DO YOU DISAGREE WITH DR. VILBERT'S MARKET RISK PREMIUM**
16 **COMPONENT?**

17 A. Dr. Vilbert's risk premium is partially derived from the 1926-2015 Duff & Phelps
18 (formerly Morningstar/Ibbotson) study (cited previously) showing a 6.9 percent
19 differential between common stocks and the "income component" of U.S. Treasury
20 bonds.

21 I disagree with Dr. Vilbert since he improperly used "income returns" from the
22 Duff & Phelps study rather than "total returns." What Dr. Vilbert did was compare the
23 differential between total returns for common stocks (i.e., dividends and capital gains)
24 and only income returns for Treasury bonds. As such, he has ignored the capital gains
25 component of the Treasury bonds return. As I indicated in my earlier testimony, the
26 differential between total returns of common stocks and Treasury bonds is 6.0 percent. In
27 addition, Dr. Vilbert's use of the Duff & Phelps study only used half of the reported data
28 (arithmetic means) and ignored the other half of the reported data (geometric means). I
29 discussed this issue earlier in my testimony.

30
31 **Q. PLEASE DESCRIBE DR. VILBERT'S "EMPIRICAL" CAPM ANALYSIS.**

1 A. Dr. Vilbert also employs what he describes as an “empirical” CAPM analysis.
2 This form of the CAPM assumes that beta for an industry understates the industry’s
3 volatility; therefore, risk is understated.³⁸

4 The use of an empirical CAPM overstates the cost of equity for companies with
5 betas below that of the market. What the empirical CAPM actually does is inflate the
6 CAPM cost for the selected company or industry by performing additional adjustments to
7 betas that are already adjusted by Value Line. This essentially creates a hypothetical beta
8 and CAPM result which is not appropriate for PSO or for other utilities.

9

10 **Q. DR. VILBERT CITES “PSO-SPECIFIC RISKS” IN HIS TESTIMONY. DO YOU**
11 **HAVE ANY RESPONSE TO THIS ASSERTION?**

12 A. Yes, I do. Dr. Vilbert cites “significant regulatory risk in the form of regulatory
13 lag and cost disallowance.”³⁹ This is not unique to PSO. Any utility that utilizes a
14 historic test period is, to some extent, subject to regulatory lag. In addition, the
15 identification of improper costs, and the related disallowance of such costs, is a function
16 of the regulatory process (as well as that of competition for unregulated firms).

17 Furthermore, these factors, as well as many other factors, are considered by rating
18 agencies in the assignment of credit ratings. I note that PSO’s single-A credit ratings are
19 among the higher ratings for electric utilities. As a result, it is apparent that PSO’s
20 “specific risks” are less than those of the typical utility.

21

22 **Q. DR. VILBERT MAINTAINS THAT PSO HAS HIGHER RISK RELATIVE TO**
23 **HIS ELECTRIC SAMPLE.⁴⁰ DO YOU AGREE WITH THIS ASSERTION?**

24 A. No, I do not. Nor do the rating agencies. As is shown on my Schedule 6, PSO
25 has single-A credit ratings. In contrast, of the 28 utilities in Dr. Vilbert’s Electric
26 Sample, 18 have lower ratings by Moody’s and 17 have lower ratings by S&P. Only 2
27 have higher ratings by Moody’s and only 2 have higher ratings by S&P.

28

³⁸ Direct Testimony of Michael J. Vilbert, Page 45, Lines 19-21.

³⁹ Direct Testimony of Michael J. Vilbert, page 11, lines 20-24.

⁴⁰ Direct Testimony of Michael J. Vilbert, page 34, lines 7-9.

1 **Q. HAVE YOU REVIEWED THE DIRECT TESTIMONY OF PSO WITNESS**
2 **PAULEEN M. AHERN?**

3 A. Yes, I have. Ms. Ahern “has not prepared cost of capital studies and is not
4 offering a specific cost of equity recommendation in this proceeding.”⁴¹ She is offering
5 testimony on the following topics:

6
7 General ratemaking theory,
8 General principles of a fair rate of return,
9 Risk and its relationship to return/the cost of capital,
10 Impact of regulatory policy on a utility’s cost of capital, and
11 Comparison of the returns of regulated and non-regulated companies of similar
12 risk.

13
14 **Q. WHAT ASPECTS OF MS. AHERN’S TESTIMONY DO YOU WISH TO**
15 **RESPOND TO?**

16 A. My primary concern with Ms. Ahern’s testimony is the last factor cited above –
17 the comparison of regulated utility and non-price regulated (competitive) common equity
18 returns. Ms. Ahern maintains that the projected ROEs and “market returns” are higher
19 for a group of eleven non-regulated companies that she has chosen as being of similar
20 risk to electric utilities, relative to electric utilities.⁴²

21 Ms. Ahern observes that the projected ROEs for the non-regulated group is 26.6
22 percent, relative to the projected ROE for the electric sample of 11.1 percent. Based on
23 this, she concludes “In my opinion, the difference between the projected returns for the
24 two samples is due to the fact that returns on book common equity for utilities such as the
25 Electric Sample, face downward pressure because they are a function of regulatory
26 returns on common equity with competitive firms not facing such downward pressure.”⁴³

27
28 **Q. DO YOU AGREE WITH MS. AHERN’S COMPARISONS AND CONCLUSIONS?**

⁴¹ Response to OIEC 3-4.

⁴² Testimony of Pauline M. Ahern, page 24, lines 8-16.

⁴³ Testimony of Pauline M. Ahern, page 21, lines 1-7.

1 A. No, I do not. I note that the projected ROEs for her non-regulated sample (i.e.,
2 26.6 percent) are significantly higher than the actual ROEs of the broad-based S&P 500
3 group that I show on my Schedule 11. The S&P 500 group has earned actual ROEs of
4 13.3 percent or less over the past two business cycles. The S&P 500 has not earned as
5 high a ROE as 15 percent in any year since 2007. Thus, I regard Ms. Ahern's 26.6
6 percent projected ROEs to not be representative to even non-regulated firms, and hardly
7 to electric utilities.

8 In addition, her conclusion that electric utility ROEs are subject to "downward
9 pressure" is misleading. It may well be true that the regulatory process lowers the
10 likelihood that utilities will earn excessive returns, and rightfully so, while giving the
11 utilities the opportunity to earn fair returns. However, this is not tantamount to placing
12 "downward pressure" on utility ROEs.

13

14 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

15 A. Yes, it does.

AFFIDAVIT OF DAVID C. PARCELL

STATE OF VIRGINIA)

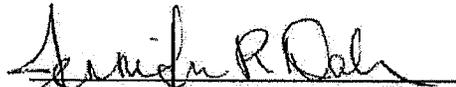
CITY OF HENRICO)

On the 19th day of September, 2017, before me appeared David C. Parcell, to me personally known, who, being by me first duly sworn, states that he is a Principal at Technical Associates, Inc. and acknowledges that he has read the above and foregoing document and believes that the statements therein are true and correct to the best of his information, knowledge and belief.



David C. Parcell

Subscribed and sworn to before me this 19th day of September, 2017.



Notary Public

My Commission expires:

10/31/2018



BACKGROUND AND EXPERIENCE PROFILE
DAVID C. PARCELL, MBA, CRRA
PRESIDENT/SENIOR ECONOMIST

EDUCATION

1985	M.B.A., Virginia Commonwealth University
1970	M.A., Economics, Virginia Polytechnic Institute and State University, (Virginia Tech)
1969	B.A., Economics, Virginia Polytechnic Institute and State University, (Virginia Tech)

POSITIONS

Present	Principal, Technical Associates, Inc.
2007-2016	President, Technical Associates, Inc.
1995-2007	Executive Vice President and Senior Economist, Technical Associates, Inc.
1993-1995	Vice President and Senior Economist, C. W. Amos of Virginia
1972-1993	Vice President and Senior Economist, Technical Associates, Inc.
1969-1972	Research Economist, Technical Associates, Inc.
1968-1969	Research Associate, Department of Economics, Virginia Polytechnic Institute and State University

ACADEMIC HONORS

Omicron Delta Epsilon - Honor Society in Economics
Beta Gamma Sigma - National Scholastic Honor Society of Business Administration
Alpha Iota Delta - National Decision Sciences Honorary Society
Phi Kappa Phi - Scholastic Honor Society

PROFESSIONAL DESIGNATIONS

Certified Rate of Return Analyst - Founding Member

RELEVANT EXPERIENCE

Financial Economics -- Advised and assisted many Virginia banks and savings and loan associations on organizational and regulatory matters. Testified approximately 25 times before the Virginia State Corporation Commission and the Regional Administrator of National Banks on matters related to branching and organization for banks, savings and loan associations, and consumer finance companies. Advised financial institutions on interest rate structure and loan maturity. Testified before Virginia State Corporation Commission on maximum rates for consumer finance companies.

Testified before several committees and subcommittees of Virginia General Assembly on numerous banking matters.

Clients have included First National Bank of Rocky Mount, Patrick Henry National Bank, Peoples Bank of Danville, Blue Ridge Bank, Bank of Essex, and Signet Bank.

Published articles in law reviews and other periodicals on structure and regulation of banking/financial services industry.

Utility Economics -- Performed numerous financial studies of regulated public utilities. Testified in over 550 cases before some fifty state and federal regulatory agencies.

Prepared numerous rate of return studies incorporating cost of equity determination based on DCF, CAPM, comparable earnings and other models. Developed procedures for identifying differential risk characteristics by nuclear construction and other factors.

Conducted studies with respect to cost of service and indexing for determining utility rates, the development of annual review procedures for regulatory control of utilities, fuel and power plant cost recovery adjustment clauses, power supply agreements among affiliates, utility franchise fees, and use of short-term debt in capital structure.

Presented expert testimony before federal regulatory agencies Federal Energy Regulatory Commission, Federal Power Commission, and National Energy Board (Canada), state regulatory agencies in Alabama, Alaska, Arizona, Arkansas, California, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Ontario (Canada), Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, West Virginia, Washington, Wisconsin, U.S. Virgin Islands, and Yukon Territory (Canada).

Published articles in law reviews and other periodicals on the theory and purpose of regulation and other regulatory subjects.

Clients served include state regulatory agencies in Alaska, Arizona, Delaware, Georgia, Mississippi, Missouri, New Hampshire, North Carolina, Ontario (Canada), South Carolina, U.S. Virgin Islands, Virginia and Washington; consumer advocates and attorneys general in Alabama, Arizona, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Maryland, Nevada, New Jersey, New Mexico, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, and West Virginia; federal agencies including Defense Communications Agency, the Department of Energy, Department of the Navy, and General Services Administration; and various organizations such as Bath Iron Works, Illinois Citizens' Utility Board, Illinois Governor's Office of Consumer Services, Illinois Small Business Utility Advocate, Wisconsin's Environmental Decade, Wisconsin's Citizens Utility Board, Old Dominion Electric Cooperative, and industrial customers.

Insurance Economics -- Conducted analyses of the relationship between the investment income earned by insurance companies on their portfolios and the premiums charged for insurance. Analyzed impact of diversification on financial strength of Blue Cross/Blue Shield Plans in Virginia.

Conducted studies of profitability and cost of capital for property/casualty insurance industry. Evaluated risk of and required return on surplus for various lines of insurance business.

Presented expert testimony before Virginia State Corporation Commission concerning cost of capital and expected gains from investment portfolio. Testified before insurance bureaus of Maine, Massachusetts, New Jersey, North Carolina, Rhode Island, South Carolina and Vermont concerning cost of equity for insurance companies.

Prepared cost of capital and investment income return analyses for numerous insurance companies concerning several lines of insurance business. Analyses used by Virginia Bureau of Insurance for purposes of setting rates.

Special Studies -- Conducted analyses which evaluated the financial and economic implications of legislative and administrative changes. Subject matter of analyses include returnable bottles, retail beer sales, wine sales regulations, taxi-cab taxation, and bank regulation. Testified before several Virginia General Assembly subcommittees.

Testified before Virginia ABC Commission concerning economic impact of mixed beverage license.

Clients include Virginia Beer Wholesalers, Wine Institute, Virginia Retail Merchants Association, and Virginia Taxicab Association.

Franchise, Merger & Anti-Trust Economics -- Conducted studies on competitive impact on market structures due to joint ventures, mergers, franchising and other business restructuring. Analyzed the costs and benefits to parties involved in mergers. Testified in federal courts and before banking and other regulatory bodies concerning the structure and performance of markets, as well as on the impact of restrictive practices.

Clients served include Dominion Bankshares, asphalt contractors, and law firms.

Transportation Economics -- Conducted cost of capital studies to assess profitability of oil pipelines, trucks, taxicabs and railroads. Analyses have been presented before the Federal Energy Regulatory Commission and Alaska Pipeline Commission in rate proceedings. Served as a consultant to the Rail Services Planning Office on the reorganization of rail services in the U.S.

Economic Loss Analyses -- Testified in federal courts, state courts, and other adjudicative forums regarding the economic loss sustained through personal and business injury whether due to bodily harm, discrimination, non-performance, or anticompetitive practices. Testified on economic loss to a commercial bank resulting from publication of adverse information concerning solvency.

Testimony has been presented on behalf of private individuals and business firms.

MEMBERSHIPS

American Economic Association
Virginia Association of Economists
Richmond Society of Financial Analysts
Financial Analysts Federation
Society of Utility and Regulatory Financial Analysts
 Board of Directors 1992-2000
 Secretary/Treasurer 1994-1998
 President 1998-2000

RESEARCH ACTIVITY

Books and Major Research Reports

"Stock Price As An Indicator of Performance," Master of Arts Thesis, Virginia Tech, 1970

"Revision of the Property and Casualty Insurance Ratemaking Process Under Prior Approval in the Commonwealth of Virginia," prepared for the Bureau of Insurance of the Virginia State Corporation Commission, with Charles Schotta and Michael J. Ileo, 1971

"An analysis of the Virginia Consumer Finance Industry to Determine the Need for Restructuring the Rate and Size Ceilings on Small Loans in Virginia and the Process by which They are Governed," prepared for the Virginia Consumer Finance Association, with Michael J. Ileo, 1973

State Banks and the State Corporation Commission: A Historical Review, Technical Associates, Inc., 1974

"A Study of the Implications of the Sale of Wine by the Virginia Department of Alcoholic Beverage Control", prepared for the Virginia Wine Wholesalers Association, Virginia Retail Merchants Association, Virginia Food Dealers Association, Virginia Association of Chain Drugstores, Southland Corporation, and the Wine Institute, 1983.

"Performance and Diversification of the Blue Cross/Blue Shield Plans in Virginia: An Operational Review", prepared for the Bureau of Insurance of the Virginia State Corporation Commission, with Michael J. Ileo and Alexander F. Skirpan, 1988.

The Cost of Capital - A Practitioners' Guide, Society of Utility and Regulatory Financial Analysts, 2010 (previous editions in 1991, 1992, 1993, 1994, 1995 and 1997).

Papers Presented and Articles Published

"The Differential Effect of Bank Structure on the Transmission of Open Market Operations," Western Economic Association Meeting, with Charles Schotta, 1971

"The Economic Objectives of Regulation: The Trend in Virginia," (with Michael J. Ileo), William and Mary Law Review, Vol. 14, No. 2, 1973

"Evolution of the Virginia Banking Structure, 1962-1974: The Effects of the Buck-Holland Bill", (with Michael J. Ileo), William and Mary Law Review, Vol. 16, No. 3, 1975

"Banking Structure and Statewide Branching: The Potential for Virginia", William and Mary Law Review, Vol. 18, No. 1, 1976

"Bank Expansion and Electronic Banking: Virginia Banking Structure Changes Past, Present, and Future," William and Mary Business Review," Vol. 1, No. 2, 1976

"Electronic Banking - Wave of the Future?" (with James R. Marchand), Journal of Management and Business Consulting, Vol. 1, No. 1, 1976

"The Pricing of Electricity" (with James R. Marchand), Journal of Management and Business Consulting, Vol. 1, No. 2, 1976

"The Public Interest - Bank and Savings and Loan Expansion in Virginia" (with Richard D. Rogers), University of Richmond Law Review, Vol. 11, No. 3, 1977

"When Is It In the 'Public Interest' to Authorize a New Bank?", University of Richmond Law Review, Vol. 13, No. 3, 1979

"Banking Deregulation and Its Implications on the Virginia Banking Structure," William and Mary Business Review, Vol. 5, No. 1, 1983

"The Impact of Reciprocal Interstate Banking Statutes on The Performance of Virginia Bank Stocks", with William B. Harrison, Virginia Social Science Journal, Vol. 23, 1988

"The Financial Performance of New Banks in Virginia", Virginia Social Science Journal, Vol. 24, 1989

"Identifying and Managing Community Bank Performance After Deregulation", with William B. Harrison, Journal of Managerial Issues, Vol. II, No. 2, Summer 1990

"The Flotation Cost Adjustment To Utility Cost of Common Equity - Theory, Measurement and Implementation," presented at Twenty-Fifth Financial Forum, National Society of Rate of Return Analysts, Philadelphia, Pennsylvania, April 28, 1993.

Biography of Myon Edison Bristow, Dictionary of Virginia Biography, Volume 2, 2001.

**PUBLIC SERVICE COMPANY OF OKLAHOMA
TOTAL COST OF CAPITAL**

Capital Item	Amount Outstanding 1/	Percent	Cost Rate			Weighted Cost		
Long-Term Debt	\$1,285,441,033	51.49%	4.60%	1/		2.37%		
Common Equity	\$1,210,818,508	48.51%	8.50%	9.00%	9.50%	4.12%	4.37%	4.61%
Total Capital	\$2,496,259,541	100.00%				6.49%	6.73% (Mid-Point)	6.98%

1/ Schedule F-1 of Company Filing.

ECONOMIC INDICATORS

Period	Real GDP * Growth	Industrial Production Growth	Unemploy- ment Rate	Consumer Price Index
1975 - 1982 Cycle				
1975	-0.2%	-8.9%	8.5%	7.0%
1976	5.4%	7.9%	7.7%	4.8%
1977	4.6%	7.6%	7.1%	6.8%
1978	5.6%	5.5%	6.1%	9.0%
1979	3.2%	3.0%	5.8%	13.3%
1980	-0.2%	-2.6%	7.1%	12.4%
1981	2.6%	1.3%	7.6%	8.9%
1982	-1.9%	-5.2%	9.7%	3.8%
1983 - 1991 Cycle				
1983	4.6%	2.7%	9.6%	3.8%
1984	7.3%	8.9%	7.5%	3.9%
1985	4.2%	1.2%	7.2%	3.8%
1986	3.5%	1.0%	7.0%	1.1%
1987	3.5%	5.2%	6.2%	4.4%
1988	4.2%	5.2%	5.5%	4.4%
1989	3.7%	0.9%	5.3%	4.6%
1990	1.9%	1.0%	5.6%	6.1%
1991	-0.1%	-1.5%	6.8%	3.1%
1992 - 2001 Cycle				
1992	3.6%	2.9%	7.5%	2.9%
1993	2.7%	3.3%	6.9%	2.7%
1994	4.0%	5.2%	6.1%	2.7%
1995	2.7%	4.7%	5.6%	2.5%
1996	3.8%	4.5%	5.4%	3.3%
1997	4.5%	7.2%	4.9%	1.7%
1998	4.5%	5.8%	4.5%	1.6%
1999	4.7%	4.4%	4.2%	2.7%
2000	4.1%	3.9%	4.0%	3.4%
2001	1.0%	-3.1%	4.7%	1.6%
2002 - 2009				
2002	1.8%	0.3%	5.8%	2.4%
2003	2.8%	1.2%	6.0%	1.9%
2004	3.8%	2.6%	5.5%	3.3%
2005	3.3%	3.3%	5.1%	3.4%
2006	2.7%	2.2%	4.6%	2.5%
2007	1.8%	2.5%	4.6%	4.1%
2008	-0.3%	-3.5%	5.8%	0.1%
2009	-2.8%	-11.5%	9.3%	2.7%
Current Cycle				
2010	2.5%	5.5%	9.6%	1.5%
2011	1.6%	3.1%	8.9%	3.0%
2012	2.2%	2.9%	8.1%	1.7%
2013	1.7%	2.0%	7.4%	1.5%
2014	2.6%	3.1%	6.2%	0.8%
2015	2.9%	-0.7%	5.3%	0.7%
2016	1.5%	-1.2%	4.9%	2.1%
2017				
Q1	1.2%	0.6%	4.7%	1.6%
Q2	3.0%	2.1%	4.4%	0.3%

* GDP = Gross Domestic Product.

Note that certain series of data are periodically revised.

Sources: Council of Economic Advisors, Economic Indicators, various issues, certain earlier year data from sources used by this publication.

INTEREST RATES

Period	Prime Rate	U.S. Treasury T Bills 3 Months	U.S. Treasury T Bonds 10 Year	Utility Bonds Aa	Utility Bonds A	Utility Bonds Baa
1975 - 1982 Cycle						
1975	7.86%	5.84%	7.99%	9.44%	10.09%	10.96%
1976	6.84%	4.99%	7.61%	8.92%	9.29%	9.82%
1977	6.83%	5.27%	7.42%	8.43%	8.61%	9.06%
1978	9.06%	7.22%	8.41%	9.10%	9.29%	9.62%
1979	12.67%	10.04%	9.44%	10.22%	10.49%	10.96%
1980	15.27%	11.51%	11.46%	13.00%	13.34%	13.95%
1981	18.89%	14.03%	13.93%	15.30%	15.95%	16.60%
1982	14.86%	10.69%	13.00%	14.79%	15.86%	16.45%
1983 - 1991 Cycle						
1983	10.79%	8.63%	11.10%	12.83%	13.66%	14.20%
1984	12.04%	9.58%	12.44%	13.66%	14.03%	14.53%
1985	9.93%	7.48%	10.62%	12.06%	12.47%	12.96%
1986	8.33%	5.98%	7.68%	9.30%	9.58%	10.00%
1987	8.21%	5.82%	8.39%	9.77%	10.10%	10.53%
1988	9.32%	6.69%	8.85%	10.26%	10.49%	11.00%
1989	10.87%	8.12%	8.49%	9.56%	9.77%	9.97%
1990	10.01%	7.51%	8.55%	9.65%	9.86%	10.06%
1991	8.46%	5.42%	7.86%	9.09%	9.36%	9.55%
1992 - 2001 Cycle						
1992	6.25%	3.45%	7.01%	8.55%	8.69%	8.86%
1993	6.00%	3.02%	5.87%	7.44%	7.59%	7.91%
1994	7.15%	4.29%	7.09%	8.21%	8.31%	8.63%
1995	8.83%	5.51%	6.57%	7.77%	7.89%	8.29%
1996	8.27%	5.02%	6.44%	7.57%	7.75%	8.16%
1997	8.44%	5.07%	6.35%	7.54%	7.60%	7.95%
1998	8.35%	4.81%	5.26%	6.91%	7.04%	7.26%
1999	8.00%	4.66%	5.65%	7.51%	7.62%	7.88%
2000	9.23%	5.85%	6.03%	8.06%	8.24%	8.36%
2001	6.91%	3.44%	5.02%	7.59%	7.78%	8.02%
2002 - 2009						
2002	4.67%	1.62%	4.61%	7.19%	7.37%	8.02%
2003	4.12%	1.02%	4.01%	6.40%	6.58%	6.84%
2004	4.34%	1.38%	4.27%	6.04%	6.16%	6.40%
2005	6.19%	3.16%	4.29%	5.44%	5.65%	5.93%
2006	7.96%	4.73%	4.80%	5.84%	6.07%	6.32%
2007	8.05%	4.41%	4.63%	5.94%	6.07%	6.33%
2008	5.09%	1.48%	3.66%	6.18%	6.53%	7.25%
2009	3.25%	0.16%	3.26%	5.75%	6.04%	7.06%
Current Cycle						
2010	3.25%	0.14%	3.22%	5.24%	5.46%	5.96%
2011	3.25%	0.06%	2.78%	4.78%	5.04%	5.57%
2012	3.25%	0.09%	1.80%	3.83%	4.13%	4.86%
2013	3.25%	0.06%	2.35%	4.24%	4.47%	4.98%
2014	3.25%	0.03%	2.54%	4.19%	4.28%	4.80%
2015	3.26%	0.06%	2.14%	4.00%	4.12%	5.03%
2016	3.51%	0.33%	1.84%	3.73%	3.93%	4.69%
2017						
Jan	3.75%	0.52%	2.43%	3.96%	4.14%	4.62%
Feb	3.75%	0.53%	2.42%	3.99%	4.18%	4.58%
Mar	4.00%	0.72%	2.48%	4.04%	4.23%	4.62%
Apr	4.00%	0.81%	2.30%	3.93%	4.12%	4.51%
May	4.00%	0.89%	2.30%	3.94%	4.12%	4.50%
Jun	4.25%	0.99%	2.19%	3.77%	3.94%	4.32%
Jul	4.25%	1.08%	2.32%	3.82%	3.99%	4.36%
Aug	4.25%	1.03%	2.21%	3.67%	3.86%	4.23%

Sources: Council of Economic Advisors, Economic Indicators, various issues, Mergent Bond Record.

STOCK PRICE INDICATORS

Period	S&P Composite	NASDAQ Composite	Dow Jones Industrials	S&P D/P	S&P E/P
1975 - 1982 Cycle					
1975			802.49	4.31%	9.15%
1976			974.92	3.77%	8.90%
1977			894.63	4.62%	10.79%
1978			820.23	5.28%	12.03%
1979			844.40	5.47%	13.46%
1980			891.41	5.26%	12.86%
1981			932.92	5.20%	11.96%
1982			844.36	5.81%	11.60%
1983 - 1991 Cycle					
1983			1,190.34	4.40%	8.03%
1984			1,178.48	4.64%	10.02%
1985			1,328.23	4.25%	8.12%
1986			1,792.76	3.49%	6.09%
1987			2,275.99	3.08%	5.48%
1988	265.79		2,060.82	3.64%	8.01%
1989	322.84		2,508.91	3.45%	7.42%
1990	334.59		2,678.94	3.61%	6.47%
1991	376.18	491.69	2,929.33	3.24%	4.79%
1992 - 2001 Cycle					
1992	415.74	599.26	3,284.29	2.99%	4.22%
1993	451.41	715.16	3,522.06	2.78%	4.46%
1994	460.33	751.65	3,793.77	2.82%	5.83%
1995	541.64	925.19	4,493.76	2.56%	6.09%
1996	670.83	1,164.96	5,742.89	2.19%	5.24%
1997	872.72	1,469.49	7,441.15	1.77%	4.57%
1998	1,085.50	1,794.91	8,625.52	1.49%	3.46%
1999	1,327.33	2,728.15	10,464.88	1.25%	3.17%
2000	1,427.22	2,783.67	10,734.90	1.15%	3.63%
2001	1,194.18	2,035.00	10,189.13	1.32%	2.95%
2002 - 2009					
2002	993.94	1,539.73	9,226.43	1.61%	2.92%
2003	965.23	1,647.17	8,993.59	1.77%	3.84%
2004	1,130.65	1,986.53	10,317.39	1.72%	4.89%
2005	1,207.23	2,099.32	10,547.67	1.83%	5.36%
2006	1,310.46	2,263.41	11,408.67	1.87%	5.78%
2007	1,476.66	2,577.12	13,169.98	1.86%	5.29%
2008	1,220.89	2,162.46	11,252.61	2.37%	3.54%
2009	946.73	1,841.03	8,876.15	2.40%	1.86%
Current Cycle					
2010	1,139.31	2,347.70	10,662.80	1.98%	6.04%
2011	1,268.89	2,680.42	11,966.36	2.05%	6.77%
2012	1,379.56	2,965.77	12,967.08	2.24%	6.20%
2013	1,462.51	3,537.69	14,999.67	2.14%	5.57%
2014	1,930.67	4,374.31	16,773.99	2.04%	5.25%
2015	2,061.20	4,943.49	17,590.61	2.10%	4.59%
2016	2,092.39	4,982.49	17,908.08	2.19%	4.17%
2017					
Q1	2,389.68	6,099.65	20,904.22	2.05%	4.24%
Q2	2,396.22	6,087.11	20,979.77	2.02%	4.29%

Note: this source did not publish the S&P Composite prior to 1989 and the NASDAQ prior to 1991.

Sources: Council of Economic Advisors, Economic Indicators, various issues.

Exhibit DCP-1
Schedule 3

**HISTORY OF CREDIT RATINGS
SENIOR UNSECURED DEBT**

Year	Public Service Co. of Oklahoma			American Electric Power Co.		
	Moody's	S&P	Fitch	Moody's	S&P	Fitch
2012	Baa1	BBB	BBB+	Baa2	BBB	BBB
2013	Baa1	BBB	BBB+	Baa2	BBB-	BBB
2014	A3	BBB	BBB+	Baa1	BBB-	BBB+
2015	A3	BBB		Baa1	BBB-	
2016	A3	BBB+		Baa1	BBB	
2017	A3	A-	BBB+	Baa1	BBB+	BBB+

Source: Response to OIEC 2-5.

**PUBLIC SERVICE COMPANY OF OKLAHOMA
CAPITAL STRUCTURE RATIOS
2012 -2016**

Year	Common Equity	Long-Term Debt	Short-Term Debt
2012	\$916,277,930	\$953,506,638	\$0
	49.0%	51.0%	0.0%
	49.0%	51.0%	
2013	\$944,589,970	\$1,003,104,301	\$36,771,867
	47.6%	50.5%	1.9%
	48.5%	51.5%	
2014	\$1,028,214,326	\$1,043,989,728	\$154,257,744
	46.2%	46.9%	6.9%
	49.6%	50.4%	
2015	\$1,119,986,871	\$1,288,779,079	\$0
	46.5%	53.5%	0.0%
	46.5%	53.5%	
2016	\$1,214,213,562	\$1,288,238,310	\$51,985,679
	47.5%	50.4%	2.0%
	48.5%	51.5%	

Source: Response to OIEC 2-4.

**AMERICAN ELECTRIC POWER COMPANY
CAPITAL STRUCTURE RATIOS
2012 -2016**

Year	Common Equity	Long-Term Debt	Short-Term Debt
2012	\$15,237,158,685 44.8% 46.1%	\$17,787,734,646 52.3% 53.9%	\$980,602,542 2.9%
2013	\$16,084,980,602 45.6% 46.6%	\$18,414,723,244 52.2% 53.4%	\$757,000,000 2.1%
2014	\$16,820,253,930 45.6% 47.3%	\$18,716,751,021 50.7% 52.7%	\$1,346,000,000 3.6%
2015	\$17,891,674,428 46.7% 47.7%	\$19,605,564,283 51.2% 52.3%	\$800,000,000 2.1%
2016	\$17,396,950,820 44.0% 46.0%	\$20,426,831,989 51.7% 54.0%	\$1,713,000,000 4.3%

Source: Response to OIEC 2-4.

**PROXY COMPANIES
COMMON EQUITY RATIOS
EXCLUDING SHORT-TERM DEBT**

Company	2012	2013	2014	2015	2016	Average	2020-2022
Parcell Proxy Group							
American Electric Power Co.	49.4%	48.9%	51.0%	50.2%	50.0%	49.9%	49.0%
Consolidated Edison Co.	54.1%	53.9%	52.0%	52.1%	49.2%	52.3%	52.0%
DTE Energy Co.	51.2%	52.3%	50.0%	49.8%	44.4%	49.5%	43.5%
Duke Energy Co.	52.9%	52.0%	52.3%	51.4%	47.4%	51.2%	42.5%
Edison International	46.2%	46.2%	47.2%	46.7%	49.2%	47.1%	47.0%
Eversource Energy	55.4%	54.8%	53.2%	53.6%	54.4%	54.3%	52.0%
NextEra Inc.	40.9%	42.9%	45.0%	45.8%	46.7%	44.3%	52.5%
PG&E Corp.	50.4%	52.5%	50.7%	50.4%	52.1%	51.2%	52.5%
Public Service Enterprise Group	61.7%	59.6%	59.6%	59.7%	54.7%	59.1%	50.5%
WEC Energy Group	48.0%	49.1%	51.2%	48.6%	49.3%	49.2%	51.0%
Xcel Energy Inc.	46.7%	46.7%	47.0%	45.9%	43.7%	46.0%	42.0%
Mean						50.4%	48.6%
Median						49.9%	50.5%
Vilbert Electric Sample							
ALLETE	56.3%	55.4%	55.8%	53.7%	58.0%	55.8%	61.0%
Alliant Energy	48.4%	50.8%	47.5%	51.4%	47.2%	49.1%	48.0%
American Electric Power Co.	49.4%	48.9%	51.0%	50.2%	50.0%	49.9%	49.0%
Ameren Corp.	49.4%	53.7%	51.7%	49.7%	51.3%	51.2%	50.5%
AVANGRID Inc.				76.9%	77.0%	77.0%	76.0%
CenterPoint Energy	34.0%	35.6%	36.2%	30.5%	31.5%	33.6%	34.5%
CMS Energy Corp.	31.6%	32.2%	31.0%	31.4%	32.6%	31.8%	35.5%
Consolidated Edison Co.	54.1%	53.9%	52.0%	52.1%	49.2%	52.3%	52.0%
Dominion Energy	38.2%	37.3%	34.6%	34.9%	32.6%	35.5%	29.5%
DTE Energy Co.	51.2%	52.3%	50.0%	49.8%	44.4%	49.5%	43.5%
Edison International	46.2%	46.2%	47.2%	46.7%	49.2%	47.1%	47.0%
El Paso Electric	45.2%	48.6%	46.5%	47.3%	47.3%	47.0%	48.5%
Entergy Corp.	42.9%	43.6%	43.8%	40.8%	35.5%	41.3%	37.0%
Eversource Energy	55.4%	54.8%	53.2%	53.6%	54.4%	54.3%	52.0%
IDACORP Inc.	54.5%	53.4%	54.7%	54.4%	55.2%	54.4%	57.5%
OGE Energy	49.3%	56.9%	54.1%	55.7%	58.9%	55.0%	48.0%
Otter Tail Corp.	54.4%	57.9%	53.5%	57.6%	57.0%	56.1%	59.0%
MGE Energy	61.8%	60.7%	62.5%	63.8%	65.4%	62.8%	65.0%
PG&E Corp	50.4%	52.5%	50.7%	50.4%	52.1%	51.2%	52.5%
Pinnacle West Capital	55.4%	60.0%	59.0%	57.0%	54.4%	57.2%	54.0%
PNM Resources	48.7%	49.7%	51.9%	45.5%	44.0%	48.0%	46.5%
Portland General	52.9%	48.7%	47.3%	52.2%	51.6%	50.5%	49.5%
PPL Corp.	35.9%	37.7%	42.0%	34.8%	35.7%	37.2%	41.5%
Public Service Enterprise Group	61.7%	59.6%	59.6%	59.7%	54.7%	59.1%	50.5%
SCANA Corp.	45.6%	46.4%	47.4%	48.1%	46.9%	46.9%	46.0%
Sempra Energy	46.7%	49.4%	48.2%	47.3%	47.3%	47.8%	40.0%
Vectren Corp.	49.6%	46.7%	53.3%	49.4%	52.7%	50.3%	54.5%
Xcel Energy Inc.	46.7%	46.7%	47.0%	45.9%	43.7%	46.0%	42.0%
Mean						49.9%	48.9%
Median						50.1%	48.8%

Source: Value Line Investment Survey.

**PROXY COMPANIES
CRITERIA FOR SELECTION**

Company	Market Capitalization (\$000)	Common Equity Ratio	Value Line Safety	S&P Stock Ranking	Moody's Bond Rating	S&P Bond Rating
American Electric Power Co. Public Service of Oklahoma	\$36,000,000	50.0%	1	B+	Baa1 A3	A- A-
Parcell Proxy Group	(\$20 billion Plus)	(over 40%)	(1 or 2)	(A or B)	(A or Baa)	(A or BBB)
Consolidated Edison Co.	\$26,000,000	49.2%	1	B+	A3	A-
DTE Energy Co.	\$20,000,000	44.4%	2	A-	Baa1	BBB+
Duke Energy Co.	\$61,000,000	47.4%	2	B	Baa1	A-
Edison International	\$25,000,000	49.2%	2	B	A3	BBB+
Eversource Energy	\$20,000,000	54.4%	1	A	Baa1	A
NextEra Inc.	\$69,000,000	46.7%	2	A	Baa1	A-
PG&E Corp.	\$34,000,000	52.1%	2	B	A3	BBB+
Public Service Enterprise Group	\$23,000,000	54.7%	1	B+	Baa1	BBB+
WEC Energy Group	\$21,000,000	49.3%	1	A	A3	A-
Xcel Energy Inc.	\$24,000,000	43.7%	1	A-	A3	A-
Vilbert Electric Sample						
ALLETE	\$4,000,000	58.0%	2	A-	A3	BBB+
Alliant Energy	\$9,900,000	47.2%	2	B+	Baa1	A-
American Electric Power Co.	\$36,000,000	50.0%	1	B+	Baa1	A-
Ameren Corp.	\$15,000,000	51.3%	2	B	Baa1	BBB+
AVANGRID Inc.	\$15,000,000	77.0%	2	NR	Baa1	BBB+
CenterPoint Energy	\$13,000,000	31.5%	3	B	Baa1	A-
CMS Energy Corp.	\$14,000,000	32.6%	2	A-	Baa1	BBB+
Consolidated Edison Co.	\$26,000,000	49.2%	1	B+	A3	A-
Dominion Energy	\$50,000,000	32.6%	2	B	Baa2	BBB+
DTE Energy Co.	\$20,000,000	44.4%	2	A-	Baa1	BBB+
Edison International	\$25,000,000	49.2%	2	B	A3	BBB+
El Paso Electric	\$2,100,000	47.3%	2	B	Baa1	BBB
Entergy Corp.	\$14,000,000	35.5%	3	B	Baa2	BBB+
Eversource Energy	\$20,000,000	54.4%	1	A	Baa1	A
IDACORP Inc.	\$4,200,000	55.2%	2	A	Baa1	BBB
OGE Energy	\$7,100,000	58.9%	2	A-	A3	A-
Otter Tail Corp.	\$1,700,000	57.0%	2	B	Baa2	BBB
MGE Energy	\$2,200,000	65.4%	1	A-	A1	AA-
PG&E Corp.	\$34,000,000	52.1%	2	B	A3	BBB+
Pinnacle West Capital	\$9,600,000	54.4%	1	A-	A3	A-
PNM Resources	\$3,000,000	44.0%	3	B	Baa3	BBB+
Portland General	\$4,000,000	51.6%	2	A-	A3	BBB
PPL Corp.	\$27,000,000	35.7%	2	B	Baa2	A-
Public Service Enterprise Group	\$23,000,000	54.7%	1	B+	Baa1	BBB+
SCANA Corp.	\$9,100,000	46.9%	2	A	Baa3	BBB+
Sempra Energy	\$28,000,000	47.3%	2	B+	Baa1	BBB+
Vectren Corp.	\$5,500,000	52.7%	2	B+	A2	A-
Xcel Energy Inc.	\$24,000,000	43.7%	1	A-	A3	A-

Sources: Value Line, S&P, Moody's.

**PROXY COMPANIES
DIVIDEND YIELD CALCULATIONS**

Company	Quarterly DPS	Annual DPS	Stock Price (June - August 2017)			Yield
			High	Low	Average	
Parceli Proxy Group						
American Electric Power Co.	\$0.590	\$2.36	\$74.29	\$68.11	\$71.20	3.31%
Consolidated Edison Co.	\$0.690	\$2.76	\$85.13	\$80.04	\$82.59	3.34%
DTE Energy Co.	\$0.825	\$3.30	\$112.58	\$104.19	\$108.39	3.04%
Duke Energy Co.	\$0.890	\$3.56	\$87.95	\$82.72	\$85.34	4.17%
Edison International	\$0.543	\$2.17	\$82.82	\$76.38	\$79.60	2.73%
Eversource Energy	\$0.475	\$1.90	\$63.67	\$59.56	\$61.62	3.08%
NextEra Inc.	\$0.983	\$3.93	\$151.28	\$138.00	\$144.64	2.72%
PG&E Corp.	\$0.530	\$2.12	\$70.58	\$64.84	\$67.71	3.13%
Public Service Enterprise Group	\$0.430	\$1.72	\$47.47	\$41.67	\$44.57	3.86%
WEC Energy Group	\$0.520	\$2.08	\$65.71	\$60.47	\$63.09	3.30%
Xcel Energy Inc.	\$0.360	\$1.44	\$49.70	\$45.18	\$47.44	3.04%
Mean						3.25%
Vilbert Electric Sample						
ALLETE	\$0.535	\$2.14	\$77.44	\$69.79	\$73.62	2.91%
Alliant Energy	\$0.315	\$1.26	\$42.23	\$39.36	\$40.80	3.09%
American Electric Power Co.	\$0.590	\$2.36	\$74.29	\$68.11	\$71.20	3.31%
Ameren Corp.	\$0.440	\$1.76	\$60.79	\$53.54	\$57.17	3.08%
AVANGRID Inc.	\$0.432	\$1.73	\$49.04	\$43.13	\$46.09	3.75%
CenterPoint Energy	\$0.268	\$1.07	\$30.12	\$26.98	\$28.55	3.75%
CMS Energy Corp.	\$0.333	\$1.33	\$48.91	\$45.34	\$47.13	2.82%
Consolidated Edison Co.	\$0.690	\$2.76	\$85.13	\$80.04	\$82.59	3.34%
Dominion Energy	\$0.755	\$3.02	\$81.65	\$75.40	\$78.53	3.85%
DTE Energy Co.	\$0.825	\$3.30	\$112.58	\$104.19	\$108.39	3.04%
Edison International	\$0.543	\$2.17	\$82.82	\$76.38	\$79.60	2.73%
El Paso Electric	\$0.335	\$1.34	\$55.65	\$50.25	\$52.95	2.53%
Entergy Corp.	\$0.870	\$3.48	\$80.61	\$74.83	\$77.72	4.48%
Eversource Energy	\$0.475	\$1.90	\$63.67	\$59.56	\$61.62	3.08%
IDACORP Inc.	\$0.550	\$2.20	\$90.67	\$83.46	\$87.07	2.53%
OGE Energy	\$0.303	\$1.21	\$37.25	\$33.95	\$35.60	3.40%
Otter Tail Corp.	\$0.320	\$1.28	\$42.35	\$38.75	\$40.55	3.16%
MGE Energy	\$0.323	\$1.29	\$68.70	\$61.80	\$65.25	1.98%
PG&E Corp.	\$0.530	\$2.12	\$70.58	\$64.84	\$67.71	3.13%
Pinnacle West Capital	\$0.655	\$2.62	\$90.87	\$83.95	\$87.41	3.00%
PNM Resources	\$0.243	\$0.97	\$42.95	\$37.23	\$40.09	2.42%
Portland General	\$0.340	\$1.36	\$48.06	\$44.20	\$46.13	2.95%
PPL Corp.	\$0.395	\$1.58	\$40.20	\$37.19	\$38.70	4.08%
Public Service Enterprise Group	\$0.430	\$1.72	\$47.47	\$41.67	\$44.57	3.86%
SCANA Corp.	\$0.613	\$2.45	\$71.28	\$59.34	\$65.31	3.75%
Sempra Energy	\$0.823	\$3.29	\$119.86	\$110.35	\$115.11	2.86%
Vectren Corp.	\$0.420	\$1.68	\$67.12	\$57.48	\$62.30	2.70%
Xcel Energy Inc.	\$0.360	\$1.44	\$49.70	\$45.18	\$47.44	3.04%
Mean						3.16%

**PROXY COMPANIES
RETENTION GROWTH RATES**

Company	2012	2013	2014	2015	2016	2012-16 Average	2017	2018	2020-22	2017 - 2020-22 Average
Parcell Proxy Group										
American Electric Power Co.	3.5%	3.7%	3.8%	3.9%	5.5%	4.1%	3.5%	3.5%	4.5%	3.8%
Consolidated Edison Co.	3.6%	3.6%	2.6%	3.5%	3.0%	3.3%	2.5%	3.0%	3.0%	2.8%
DTE Energy Co.	3.5%	2.7%	5.2%	3.4%	3.7%	3.7%	4.5%	4.0%	4.0%	4.2%
Duke Energy Co.	0.9%	1.5%	1.7%	1.5%	0.6%	1.2%	2.0%	2.0%	2.0%	2.0%
Edison International	11.4%	8.1%	8.8%	7.2%	5.6%	8.2%	5.5%	5.0%	5.5%	5.3%
Eversource Energy	1.6%	3.4%	3.5%	3.4%	3.5%	3.1%	3.5%	3.5%	4.5%	3.8%
NextEra Inc.	5.6%	5.2%	6.0%	6.1%	4.4%	5.5%	5.0%	4.5%	5.0%	4.8%
PG&E Corp.	1.0%	0.2%	3.9%	0.7%	2.8%	1.7%	4.5%	4.5%	3.5%	4.2%
Public Service Enterprise Group	4.8%	4.4%	6.3%	6.8%	4.6%	5.4%	5.0%	4.0%	4.5%	4.5%
WEC Energy Group	6.5%	5.9%	5.3%	2.1%	3.5%	4.7%	3.5%	3.5%	3.5%	3.5%
Xcel Energy Inc.	4.7%	4.5%	4.5%	4.3%	4.0%	4.4%	4.0%	4.0%	3.5%	3.8%
Mean						4.1%				3.9%
Vilbert Electric Sample										
ALLETE	2.3%	2.2%	2.5%	3.6%	2.8%	2.7%	3.0%	3.5%	4.0%	3.5%
Alliant Energy	3.9%	4.9%	4.3%	3.6%	2.8%	3.9%	4.0%	4.5%	5.0%	4.5%
American Electric Power Co.	3.5%	3.7%	3.8%	3.9%	5.5%	4.1%	3.5%	3.5%	4.5%	3.8%
Ameren Corp.	3.0%	1.9%	2.9%	2.5%	3.3%	2.7%	3.5%	3.5%	4.0%	3.7%
AVANGRID Inc.			3.4%	1.8%	1.4%	2.2%	1.0%	1.0%	1.5%	1.2%
CenterPoint Energy	5.5%	4.2%	4.5%	1.1%	0.0%	3.1%	4.0%	3.5%	4.0%	3.8%
CMS Energy Corp.	5.0%	5.2%	5.0%	5.2%	4.8%	5.0%	5.0%	5.0%	5.5%	5.2%
Consolidated Edison Co.	3.6%	3.6%	2.6%	3.5%	3.0%	3.3%	2.5%	3.0%	3.0%	2.8%
Dominion Energy	3.5%	4.2%	3.3%	2.9%	2.7%	3.3%	1.5%	2.0%	1.5%	1.7%
DTE Energy Co.	3.5%	2.7%	5.2%	3.4%	3.7%	3.7%	4.5%	4.0%	4.0%	4.2%
Edison International	11.4%	8.1%	8.8%	7.2%	5.6%	8.2%	5.5%	5.0%	5.5%	5.3%
El Paso Electric	6.3%	4.9%	4.8%	3.4%	4.4%	4.8%	4.0%	4.0%	4.0%	4.0%
Entergy Corp.	5.2%	3.0%	4.4%	4.8%	7.7%	5.0%	6.5%	2.5%	2.5%	3.8%
Eversource Energy	1.6%	3.4%	3.5%	3.4%	3.5%	3.1%	3.5%	3.5%	4.5%	3.8%
IDACORP Inc.	5.7%	5.6%	5.4%	4.8%	4.3%	5.2%	4.0%	4.0%	3.5%	3.8%
OGE Energy	7.2%	7.3%	6.5%	4.0%	3.3%	5.7%	4.0%	3.5%	3.5%	3.7%
Otter Tail Corp.	0.0%	1.2%	2.2%	2.0%	2.1%	1.5%	2.5%	2.5%	4.0%	3.0%
MGE Energy	4.9%	6.1%	6.4%	4.5%	4.7%	5.3%	4.5%	5.0%	6.5%	5.3%
PG&E Corp.	1.0%	0.2%	3.9%	0.7%	2.8%	1.7%	4.5%	4.5%	3.5%	4.2%
Pinnacle West Capital	4.1%	4.1%	3.5%	3.9%	3.5%	3.8%	3.5%	3.5%	4.0%	3.7%
PNM Resources	3.8%	3.7%	3.2%	4.1%	3.7%	3.7%	3.5%	3.5%	3.5%	3.5%
Portland General	3.5%	2.9%	4.6%	3.3%	3.5%	3.6%	3.5%	3.5%	4.0%	3.7%
PPL Corp.	6.7%	5.3%	4.5%	6.0%	8.8%	6.3%	3.0%	4.0%	4.0%	3.7%
Public Service Enterprise Group	4.8%	4.4%	6.3%	6.8%	4.6%	5.4%	5.0%	4.0%	4.5%	4.5%
SCANA Corp.	3.9%	4.1%	4.9%	4.3%	4.7%	4.4%	4.0%	4.0%	4.5%	4.2%
Sempra Energy	5.1%	4.1%	5.0%	5.8%	2.9%	4.6%	3.5%	3.5%	5.0%	4.0%
Vectren Corp.	2.9%	1.2%	2.9%	4.2%	4.4%	3.1%	4.5%	4.5%	5.0%	4.7%
Xcel Energy Inc.	4.7%	4.5%	4.5%	4.3%	4.0%	4.4%	4.0%	4.0%	3.5%	3.8%
Mean						4.1%				3.8%

Figures reported by Value Line as "Retained to Com Eq."

Source: Value Line Investment Survey.

**PROXY COMPANIES
PER SHARE GROWTH RATES**

Company	Five-Year Historic Growth Rates				Est'd -14-'16 to '20-'22 Growth Rates			
	EPS	DPS	BVPS	Average	EPS	DPS	BVPS	Average
Parcell Proxy Group								
American Electric Power Co.	5.0%	4.5%	4.5%	4.7%	4.0%	5.0%	3.5%	4.2%
Consolidated Edison Co.	2.5%	2.0%	3.5%	2.7%	2.5%	3.0%	3.5%	3.0%
DTE Energy Co.	6.0%	5.5%	4.0%	5.2%	6.0%	7.0%	4.5%	5.8%
Duke Energy Co.	0.5%	2.5%	3.0%	2.0%	4.5%	4.5%	1.5%	3.5%
Edison International	5.0%	6.5%	2.5%	4.7%	4.0%	9.0%	4.0%	5.7%
Eversource Energy	6.0%	10.5%	8.5%	8.3%	6.5%	5.5%	4.0%	5.3%
NextEra Inc.	5.0%	9.0%	7.5%	7.2%	7.0%	9.5%	5.0%	7.2%
PG&E Corp.	-2.0%	1.0%	3.5%	0.8%	9.5%	7.5%	5.0%	7.3%
Public Service Enterprise Group	-0.5%	3.0%	6.0%	2.8%	1.0%	5.0%	3.5%	3.2%
WEC Energy Group	6.5%	16.0%	9.0%	10.5%	6.0%	6.0%	5.0%	5.7%
Xcel Energy Inc.	6.0%	5.0%	4.5%	5.2%	4.5%	6.0%	4.0%	4.8%
Mean				4.9%				5.1%
Vilbert Electric Sample								
ALLETE	7.0%	2.5%	6.0%	5.2%	6.0%	4.0%	5.0%	5.0%
Alliant Energy	6.5%	6.5%	4.5%	5.8%	6.0%	4.5%	4.0%	4.8%
American Electric Power Co.	5.0%	4.5%	4.5%	4.7%	4.0%	5.0%	3.5%	4.2%
Ameren Corp.	-1.5%	1.5%	-2.5%	neg	6.0%	4.5%	4.0%	4.8%
AVANGRID Inc.					nmf	nmf	nmf	nmf
CenterPoint Energy	1.0%	5.0%	2.0%	2.7%	6.0%	3.5%	2.0%	3.8%
CMS Energy Corp.	8.5%	11.5%	4.5%	8.2%	6.5%	6.5%	6.5%	6.5%
Consolidated Edison Co.	2.5%	2.0%	3.5%	2.7%	2.5%	3.0%	3.5%	3.0%
Dominion Energy	3.0%	7.0%	1.5%	3.8%	5.5%	8.5%	2.0%	5.3%
DTE Energy Co.	6.0%	5.5%	4.0%	5.2%	6.0%	7.0%	4.5%	5.8%
Edison International	5.0%	6.5%	2.5%	4.7%	4.0%	9.0%	4.0%	5.7%
El Paso Electric	2.0%		7.0%	4.5%	5.0%	7.0%	4.0%	5.3%
Entergy Corp.	-2.0%	1.0%	1.0%	0.0%	-3.5%	2.0%	0.5%	neg
Eversource Energy	6.0%	10.5%	8.5%	8.3%	6.5%	5.5%	4.0%	5.3%
IDACORP Inc.	5.5%	10.0%	5.5%	7.0%	3.5%	7.0%	4.0%	4.8%
OGE Energy	3.5%	7.5%	7.5%	6.2%	6.0%	9.0%	3.5%	6.2%
Otter Tail Corp.	25.0%	0.5%	-1.5%	8.0%	6.5%	2.0%	5.5%	4.7%
MGE Energy	6.0%	3.0%	5.5%	4.8%	7.0%	4.0%	5.0%	5.3%
PG&E Corp.	-2.0%	1.0%	3.5%	0.8%	9.5%	7.5%	5.0%	7.3%
Pinnacle West Capital	6.5%	3.0%	4.0%	4.5%	5.5%	5.0%	4.0%	4.8%
PNM Resources	13.5%	10.0%	2.5%	8.7%	9.0%	10.0%	3.5%	7.5%
Portland General	5.5%	3.0%	3.5%	4.0%	6.0%	6.0%	3.5%	5.2%
PPL Corp.	4.5%	1.5%		3.0%	nmf	3.5%	nmf	3.5%
Public Service Enterprise Group	-0.5%	3.0%	6.0%	2.8%	1.0%	5.0%	3.5%	3.2%
SCANA Corp.	6.0%	3.0%	5.5%	4.8%	4.0%	5.0%	3.5%	4.2%
Sempra Energy	1.0%	11.0%	5.0%	5.7%	8.0%	8.5%	3.0%	6.5%
Vectren Corp.	6.0%	2.5%	3.0%	3.8%	6.5%	4.5%	6.0%	5.7%
Xcel Energy Inc.	6.0%	5.0%	4.5%	5.2%	4.5%	6.0%	4.0%	4.8%
Mean				4.8%				5.1%

Source: Value Line Investment Survey.

PROXY COMPANIES
DCF COST RATES

Company	Adjusted Yield	Historic Retention Growth	Prospective Retention Growth	Historic Per Share Growth	Prospective Per Share Growth	First Call EPS Growth	Average Growth	DCF Rates
Parcell Proxy Group								
American Electric Power Co.	3.4%	4.1%	3.8%	4.7%	4.2%	2.9%	3.9%	7.3%
Consolidated Edison Co.	3.4%	3.3%	2.8%	2.7%	3.0%	4.0%	3.1%	6.5%
DTE Energy Co.	3.1%	3.7%	4.2%	5.2%	5.8%	4.6%	4.7%	7.8%
Duke Energy Co.	4.2%	1.2%	2.0%	2.0%	3.5%	2.7%	2.3%	6.5%
Edison International	2.8%	8.2%	5.3%	4.7%	5.7%	4.1%	5.6%	8.4%
Eversource Energy	3.2%	3.1%	3.8%	8.3%	5.3%	5.8%	5.3%	8.4%
NextEra Inc.	2.8%	5.5%	4.8%	7.2%	7.2%	7.3%	6.4%	9.2%
PG&E Corp.	3.2%	1.7%	4.2%	0.8%	7.3%	4.0%	3.6%	6.8%
Public Service Enterprise Group	3.9%	5.4%	4.5%	2.8%	3.2%	0.6%	3.3%	7.2%
WEC Energy Group	3.4%	4.7%	3.5%	10.5%	5.7%	5.6%	6.0%	9.4%
Xcel Energy Inc.	3.1%	4.4%	3.8%	5.2%	4.8%	na	4.6%	7.7%
Mean	3.3%	4.1%	3.9%	4.9%	5.1%	4.2%	4.4%	7.8%
Median	3.2%	4.1%	3.8%	4.7%	5.3%	4.1%	4.6%	7.7%
Composite - Mean		7.4%	7.2%	8.2%	8.4%	7.5%	7.8%	
Composite - Median		7.3%	7.0%	7.9%	8.5%	7.3%	7.7%	
Vilbert Electric Sample								
ALLETE	3.0%	2.7%	3.5%	5.2%	5.0%	5.0%	4.3%	7.2%
Alliant Energy	3.2%	3.9%	4.5%	5.8%	4.8%	6.9%	5.2%	8.4%
American Electric Power Co.	3.4%	4.1%	3.8%	4.7%	4.2%	2.9%	3.9%	7.3%
Ameren Corp.	3.1%	2.7%	3.7%	neg	4.8%	6.1%	4.3%	7.5%
AVANGRID Inc.	3.8%	2.2%	1.2%		nmf	9.0%	4.1%	7.9%
CenterPoint Energy	3.8%	3.1%	3.8%	2.7%	3.8%	6.9%	4.1%	7.9%
CMS Energy Corp.	2.9%	5.0%	5.2%	8.2%	6.5%	7.5%	6.5%	9.4%
Consolidated Edison Co.	3.4%	3.3%	2.8%	2.7%	3.0%	4.0%	3.1%	6.5%
Dominion Energy	3.9%	3.3%	1.7%	3.8%	5.3%	3.5%	3.5%	7.4%
DTE Energy Co.	3.1%	3.7%	4.2%	5.2%	5.8%	4.6%	4.7%	7.8%
Edison International	2.8%	8.2%	5.3%	4.7%	5.7%	4.1%	5.6%	8.4%
El Paso Electric	2.6%	4.8%	4.0%	4.5%	5.3%	6.5%	5.0%	7.6%
Entergy Corp.	4.5%	5.0%	3.8%	0.0%	neg	neg	3.0%	7.5%
Eversource Energy	3.2%	3.1%	3.8%	8.3%	5.3%	5.8%	5.3%	8.4%
IDACORP Inc.	2.6%	5.2%	3.8%	7.0%	4.8%	4.0%	5.0%	7.6%
OGE Energy	3.5%	5.7%	3.7%	6.2%	6.2%	6.3%	5.6%	9.1%
Otter Tail Corp.	3.2%	1.5%	3.0%	8.0%	4.7%	5.2%	4.5%	7.7%
MGE Energy	2.0%	5.3%	5.3%	4.8%	5.3%	4.0%	5.0%	7.0%
PG&E Corp.	3.2%	1.7%	4.2%	0.8%	7.3%	4.0%	3.6%	6.8%
Pinnacle West Capital	3.1%	3.8%	3.7%	4.5%	4.8%	5.9%	4.5%	7.6%
PNM Resources	2.5%	3.7%	3.5%	8.7%	7.5%	7.4%	6.1%	8.6%
Portland General	3.0%	3.6%	3.7%	4.0%	5.2%	4.9%	4.3%	7.3%
PPL Corp.	4.2%	6.3%	3.7%	3.0%	3.5%	0.0%	3.3%	7.4%
Public Service Enterprise Group	3.9%	5.4%	4.5%	2.8%	3.2%	0.6%	3.3%	7.2%
SCANA Corp.	3.8%	4.4%	4.2%	4.8%	4.2%	4.8%	4.5%	8.3%
Sempra Energy	2.9%	4.6%	4.0%	5.7%	6.5%	7.8%	5.7%	8.6%
Vectren Corp.	2.8%	3.1%	4.7%	3.8%	5.7%	5.5%	4.6%	7.3%
Xcel Energy Inc.	3.1%	4.4%	3.8%	5.2%	4.8%	na	4.6%	7.7%
Mean	3.2%	4.1%	3.8%	4.8%	5.1%	5.1%	4.5%	7.8%
Median	3.2%	3.9%	3.8%	4.8%	5.1%	5.1%	4.5%	7.6%
Composite - Mean		7.3%	7.1%	8.0%	8.4%	8.4%	7.8%	
Composite - Median		7.0%	7.0%	7.9%	8.2%	8.3%	7.7%	

Sources: previous pages of this schedule.

**STANDARD & POOR'S 500 COMPOSITE
20-YEAR U.S. TREASURY BOND YIELDS
RISK PREMIUMS**

Year	EPS	BVPS	ROE	20-Year T-Bond Yield	Risk Premium
1977		\$79.07			
1978	\$12.33	\$85.35	15.00%	7.90%	7.10%
1979	\$14.86	\$94.27	16.55%	8.86%	7.69%
1980	\$14.82	\$102.48	15.06%	9.97%	5.09%
1981	\$15.36	\$109.43	14.50%	11.55%	2.95%
1982	\$12.64	\$112.46	11.39%	13.50%	-2.11%
1983	\$14.03	\$116.93	12.23%	10.38%	1.85%
1984	\$16.64	\$122.47	13.90%	11.74%	2.16%
1985	\$14.61	\$125.20	11.80%	11.25%	0.55%
1986	\$14.48	\$126.82	11.49%	8.98%	2.51%
1987	\$17.50	\$134.07	13.42%	7.92%	5.50%
1988	\$23.75	\$141.32	17.25%	8.97%	8.28%
1989	\$22.87	\$147.26	15.85%	8.81%	7.04%
1990	\$21.73	\$153.01	14.47%	8.19%	6.28%
1991	\$16.29	\$158.85	10.45%	8.22%	2.23%
1992	\$18.86	\$149.74	12.22%	7.26%	4.96%
1993	\$21.89	\$180.88	13.24%	7.17%	6.07%
1994	\$30.60	\$193.06	16.37%	6.59%	9.78%
1995	\$33.96	\$216.51	16.58%	7.60%	8.98%
1996	\$38.73	\$237.08	17.08%	6.18%	10.90%
1997	\$39.72	\$249.52	16.33%	6.64%	9.69%
1998	\$37.71	\$266.40	14.62%	5.83%	8.79%
1999	\$48.17	\$290.68	17.29%	5.57%	11.72%
2000	\$50.00	\$325.80	16.22%	6.50%	9.72%
2001	\$24.70	\$338.37	7.44%	5.53%	1.91%
2002	\$27.59	\$321.72	8.36%	5.59%	2.77%
2003	\$48.73	\$367.17	14.15%	4.80%	9.35%
2004	\$58.55	\$414.75	14.98%	5.02%	9.96%
2005	\$69.93	\$453.06	16.12%	4.69%	11.43%
2006	\$81.51	\$504.39	17.03%	4.68%	12.35%
2007	\$66.17	\$529.59	12.80%	4.86%	7.94%
2008	\$14.88	\$451.37	3.03%	4.45%	-1.42%
2009	\$50.97	\$513.58	10.56%	3.47%	7.09%
2010	\$77.35	\$579.14	14.16%	4.25%	9.91%
2011	\$86.95	\$613.14	14.59%	3.82%	10.77%
2012	\$86.51	\$666.97	13.52%	2.46%	11.06%
2013	\$100.20	\$715.84	14.49%	2.88%	11.61%
2014	\$102.31	\$726.96	14.18%	3.41%	10.77%
2015	\$88.43	\$740.29	12.05%	2.47%	9.58%
2016	\$95.48	\$768.98	12.65%	2.30%	10.35%
Mean					7.00%

ROE = EPS divided by average of year-begin and year-end BVPS.

20-Year T-Bond Yield = income return on long-term U.S. Government Bonds.

Sources: Standard & Poor's, Duff & Phelps.

**PROXY COMPANIES
CAPM COST RATES**

Company	Risk-Free Rate	Beta	Risk Premium	CAPM Rates
Parcell Proxy Group				
American Electric Power Co.	2.58%	0.65	5.8%	6.4%
Consolidated Edison Co.	2.58%	0.50	5.8%	5.5%
DTE Energy Co.	2.58%	0.65	5.8%	6.4%
Duke Energy Co.	2.58%	0.60	5.8%	6.1%
Edison International	2.58%	0.60	5.8%	6.1%
Eversource Energy	2.58%	0.65	5.8%	6.1%
NextEra Inc.	2.58%	0.65	5.8%	6.4%
PG&E Corp.	2.58%	0.65	5.8%	6.4%
Public Service Enterprise Group	2.58%	0.70	5.8%	6.6%
WEC Energy Group	2.58%	0.60	5.8%	6.1%
Xcel Energy Inc.	2.58%	0.60	5.8%	6.1%
Mean				6.2%
Median				6.1%
Vilbert Electric Sample				
ALLETE	2.58%	0.75	5.8%	6.9%
Alliant Energy	2.58%	0.70	5.8%	6.6%
American Electric Power Co.	2.58%	0.65	5.8%	6.4%
Ameren Corp.	2.58%	0.65	5.8%	6.4%
AVANGRID Inc.	2.58%	nmf	5.8%	
CenterPoint Energy	2.58%	0.90	5.8%	7.8%
CMS Energy Corp.	2.58%	0.65	5.8%	6.4%
Consolidated Edison Co.	2.58%	0.50	5.8%	5.5%
DomInion Energy	2.58%	0.65	5.8%	6.4%
DTE Energy Co.	2.58%	0.65	5.8%	6.4%
Edison International	2.58%	0.60	5.8%	6.1%
El Paso Electric	2.58%	0.75	5.8%	6.9%
Entergy Corp.	2.58%	0.65	5.8%	6.4%
Eversource Energy	2.58%	0.65	5.8%	6.4%
IDACORP Inc.	2.58%	0.70	5.8%	6.6%
OGE Energy	2.58%	0.95	5.8%	8.1%
Otter Tail Corp.	2.58%	0.90	5.8%	7.8%
MGE Energy	2.58%	0.75	5.8%	6.9%
PG&E Corp	2.58%	0.65	5.8%	6.4%
Pinnacle West Capital	2.58%	0.65	5.8%	6.4%
PNM Resources	2.58%	0.75	5.8%	6.9%
Portland General	2.58%	0.70	5.8%	6.6%
PPL Corp.	2.58%	0.70	5.8%	6.6%
Public Service Enterprise Group	2.58%	0.70	5.8%	6.6%
SCANA Corp.	2.58%	0.65	5.8%	6.4%
Sempra Energy	2.58%	0.80	5.8%	7.2%
Vectren Corp.	2.58%	0.75	5.8%	6.9%
Xcel Energy Inc.	2.58%	0.60	5.8%	6.1%
Mean				6.7%
Median				6.6%

Sources: Value Line Investment Survey, Standard & Poor's, Federal Reserve.

Yields on 20-Year U.S. Treasury Bonds

Month	Rate
June 2017	2.54%
July 2017	2.65%
Aug 2017	2.55%
Average	2.58%

PROXY COMPANIES
RATES OF RETURN ON AVERAGE COMMON EQUITY

Company	2002-08											2009-16		2017		2018		2020-22		
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average	2017	2018	Average	2020-22
Parcell Proxy Group																				
American Electric Power Co.	12.3%	12.4%	12.7%	11.5%	12.2%	11.7%	11.6%	11.0%	9.3%	10.7%	9.7%	9.9%	9.9%	10.1%	11.8%	12.1%	10.3%	10.0%	10.0%	11.0%
Consolidated Edison Co.	11.5%	10.0%	8.0%	10.3%	9.7%	10.9%	9.5%	8.7%	9.3%	9.3%	9.3%	9.5%	8.5%	9.3%	8.6%	10.6%	9.1%	8.5%	10.0%	8.5%
DTE Energy Co.	13.7%	9.7%	8.1%	10.3%	7.5%	7.7%	7.5%	6.7%	9.6%	9.1%	9.3%	8.6%	11.1%	7.3%	6.9%	9.7%	7.1%	7.5%	11.0%	10.5%
Duke Energy Co.	8.9%	0.6%	8.6%	9.5%	4.8%	6.4%	6.1%	6.8%	8.0%	8.0%	6.8%	6.6%	7.1%	7.1%	6.9%	6.4%	7.1%	7.5%	8.0%	8.5%
Edison International	15.4%	15.8%	3.5%	17.4%	14.9%	13.4%	13.4%	13.4%	10.9%	10.7%	10.2%	12.7%	13.5%	12.1%	11.0%	13.5%	12.0%	11.0%	11.0%	12.0%
Eversource Energy	6.4%	7.1%	5.1%	5.4%	4.5%	8.6%	9.8%	9.6%	4.9%	10.0%	7.3%	8.3%	8.3%	8.6%	8.9%	6.7%	8.2%	9.0%	9.0%	10.0%
Nextera Inc.	11.6%	13.5%	12.6%	11.1%	14.0%	12.9%	14.8%	13.3%	14.4%	13.7%	12.4%	12.2%	13.0%	12.9%	11.4%	12.9%	12.9%	12.5%	14.0%	14.0%
PG&E Corp.	neg	20.9%	13.8%	11.7%	13.2%	11.9%	12.8%	11.3%	10.0%	9.6%	6.9%	5.9%	9.5%	6.0%	8.2%	14.1%	8.4%	10.0%	10.0%	10.0%
Public Service Enterprise Group	19.9%	18.3%	12.8%	14.5%	12.2%	19.2%	19.5%	18.8%	16.9%	15.8%	11.7%	11.1%	12.7%	13.7%	10.9%	16.7%	13.9%	11.5%	11.0%	11.0%
WEC Energy Group	12.8%	11.8%	9.0%	11.6%	11.1%	11.1%	11.0%	10.8%	12.2%	13.0%	13.3%	13.6%	13.5%	10.0%	10.6%	11.2%	12.1%	10.5%	11.0%	11.0%
Xcel Energy Inc.	2.8%	10.0%	9.8%	9.1%	9.8%	9.3%	9.7%	9.5%	9.5%	10.1%	10.4%	10.2%	10.3%	10.2%	10.4%	8.6%	10.1%	10.5%	10.5%	10.5%
Mean	11.5%	11.8%	9.5%	11.2%	10.4%	11.2%	11.5%	10.9%	10.4%	10.9%	10.2%	9.9%	10.7%	9.9%	9.8%	11.0%	10.3%	10.2%	10.1%	10.8%
Median	12.0%	11.8%	9.0%	11.1%	11.1%	11.1%	11.0%	10.8%	9.6%	10.1%	9.7%	9.9%	10.3%	10.0%	10.4%	11.0%	10.1%	10.5%	10.5%	10.5%
Vilbert Electric Sample																				
ALLETE	5.7%	9.1%	8.5%	10.3%	9.4%	13.4%	11.4%	7.3%	8.2%	9.5%	8.7%	8.4%	8.6%	9.4%	9.3%	20.8%	8.7%	8.0%	8.5%	9.0%
Alliant Energy	12.3%	12.4%	12.7%	11.9%	12.2%	11.7%	11.6%	11.0%	10.8%	10.4%	11.1%	11.4%	11.5%	10.6%	9.9%	9.2%	10.4%	11.5%	12.0%	13.0%
American Electric Power Co.	10.8%	12.2%	10.0%	10.3%	8.5%	9.3%	8.6%	8.4%	8.5%	7.6%	8.0%	7.7%	8.8%	8.5%	9.3%	10.6%	8.4%	9.5%	10.0%	11.0%
Ameren Corp.	9.6%	26.1%	13.1%	17.3%	29.1%	21.1%	22.6%	16.0%	15.0%	14.6%	13.5%	12.3%	13.7%	11.6%	12.4%	20.8%	13.6%	16.5%	16.5%	16.5%
AVANGRID Inc.	neg	neg	7.5%	10.4%	6.2%	6.6%	12.1%	8.3%	11.8%	12.5%	12.7%	13.2%	13.2%	13.7%	13.5%	8.5%	12.4%	13.5%	13.5%	13.5%
CMS Energy Corp.	11.5%	10.0%	8.0%	10.2%	9.7%	10.9%	9.8%	8.7%	9.3%	9.3%	9.7%	9.5%	8.5%	9.3%	8.6%	10.0%	9.1%	8.5%	8.5%	8.5%
Consolidated Edison Co.	14.9%	12.0%	12.5%	14.3%	14.3%	12.2%	18.1%	14.7%	14.7%	15.5%	14.3%	16.1%	15.3%	15.6%	15.5%	13.4%	15.0%	13.5%	15.0%	19.0%
Dominion Energy	15.4%	15.8%	3.9%	17.4%	14.9%	13.4%	13.4%	10.9%	10.7%	13.0%	15.2%	12.7%	13.5%	12.1%	11.0%	9.2%	9.4%	11.0%	11.0%	12.0%
DTE Energy Co.	13.7%	9.7%	8.1%	10.2%	7.5%	7.7%	7.7%	8.7%	9.6%	9.1%	9.3%	8.6%	11.1%	9.3%	9.7%	9.3%	9.2%	10.0%	10.5%	10.5%
EI Paso Electric	6.3%	6.5%	6.3%	11.5%	14.1%	13.8%	15.0%	14.4%	14.3%	15.4%	11.7%	10.0%	10.5%	8.2%	11.0%	13.5%	12.0%	11.0%	11.0%	12.0%
Edison International	10.7%	10.1%	10.3%	11.5%	14.1%	13.8%	15.0%	14.4%	14.3%	15.4%	11.7%	10.0%	10.5%	10.8%	14.2%	12.3%	12.6%	14.0%	10.0%	9.5%
Eversource Energy	6.4%	7.1%	5.1%	5.4%	4.5%	8.6%	9.8%	9.6%	4.9%	10.0%	7.3%	8.3%	8.3%	8.6%	8.9%	6.7%	8.2%	9.0%	9.0%	10.0%
IDACORP Inc.	11.1%	13.2%	12.7%	12.5%	15.0%	14.7%	13.0%	12.9%	13.5%	14.0%	13.2%	10.1%	10.2%	9.7%	9.4%	7.3%	9.9%	9.0%	9.0%	10.0%
OGE Energy	15.2%	12.0%	10.8%	11.6%	10.4%	10.4%	5.9%	3.7%	2.1%	2.7%	6.9%	9.4%	10.3%	9.9%	10.0%	13.2%	12.5%	11.0%	11.0%	12.0%
Oter Tail Corp.	13.2%	12.5%	11.4%	9.4%	11.8%	12.1%	11.8%	11.3%	10.0%	11.3%	11.4%	12.5%	12.6%	10.6%	10.7%	11.7%	11.7%	10.5%	10.5%	12.0%
MGE Energy	8.6%	8.3%	8.2%	6.7%	9.2%	8.5%	6.1%	6.8%	9.3%	8.7%	6.8%	5.9%	9.5%	6.0%	8.2%	14.1%	8.4%	10.0%	10.0%	10.0%
Pinnacle West Capital	6.3%	6.7%	7.9%	8.6%	8.4%	3.4%	0.5%	3.1%	4.8%	5.8%	6.6%	6.9%	6.7%	7.6%	7.9%	6.0%	6.2%	8.0%	8.0%	8.0%
PNM Resources	23.6%	25.1%	18.3%	16.8%	18.4%	17.2%	17.2%	15.5%	14.5%	14.6%	14.2%	12.6%	11.8%	13.5%	19.1%	19.4%	13.6%	13.5%	14.0%	13.5%
Portland General	11.7%	12.4%	12.6%	12.4%	12.2%	19.2%	19.5%	18.8%	16.9%	15.8%	11.7%	11.1%	12.7%	13.2%	10.9%	16.7%	13.9%	11.5%	11.0%	11.0%
Public Service Enterprise Group	20.7%	19.4%	20.7%	16.1%	14.1%	13.7%	13.8%	10.9%	11.4%	10.9%	11.4%	10.2%	10.5%	11.1%	10.6%	11.8%	10.5%	10.0%	10.0%	11.0%
SCANA Corp.	13.3%	11.6%	9.9%	12.3%	9.5%	11.6%	9.9%	10.6%	9.4%	9.7%	10.6%	8.9%	10.5%	12.0%	12.7%	11.2%	10.5%	12.0%	12.0%	12.0%
Sempra Energy	2.8%	10.0%	9.8%	9.1%	9.8%	9.3%	9.7%	9.5%	9.5%	10.1%	10.4%	10.2%	10.3%	10.2%	10.4%	8.6%	10.1%	10.5%	10.5%	10.5%
Vectren Corp.	11.8%	12.7%	10.5%	11.2%	11.6%	11.7%	11.4%	10.0%	10.3%	10.7%	10.5%	10.2%	10.7%	10.4%	10.5%	11.6%	10.4%	10.4%	10.4%	11.1%
Xcel Energy Inc.	11.5%	12.0%	10.0%	11.0%	10.5%	11.6%	11.4%	9.5%	10.0%	10.2%	10.4%	9.9%	10.3%	10.2%	9.8%	11.1%	10.6%	10.5%	10.0%	10.5%
Mean	11.8%	12.7%	10.5%	11.2%	11.6%	11.7%	11.4%	10.0%	10.3%	10.7%	10.5%	10.2%	10.7%	10.4%	10.5%	11.6%	10.4%	10.4%	10.4%	11.1%
Median	11.5%	12.0%	10.0%	11.0%	10.5%	11.6%	11.4%	9.5%	10.0%	10.2%	10.4%	9.9%	10.3%	10.2%	9.8%	11.1%	10.6%	10.5%	10.0%	10.5%

Source: Calculations made from data contained in Value Line Investment Survey.

PROXY COMPANIES
MARKET-TO-BOOK RATIOS

Company	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average					
Parcell Proxy Group																																			
American Electric Power Co.	138%	124%	155%	165%	161%	190%	145%	117%	118%	128%	134%	145%	162%	166%	178%	154%	143%																		
Consolidated Edison Co.	146%	146%	143%	154%	149%	151%	123%	110%	124%	145%	150%	146%	143%	148%	159%	144%	140%																		
DTE Energy Co.	145%	142%	132%	140%	134%	143%	101%	91%	116%	121%	137%	153%	170%	173%	180%	134%	143%																		
Duke Energy Co.	174%	168%	139%	157%	153%	102%	102%	90%	101%	115%	120%	120%	136%	135%	136%	133%	119%																		
Edison International	117%	108%	153%	208%	194%	208%	169%	141%	111%	117%	146%	166%	177%	182%	191%	162%	149%																		
Eversource Energy	99%	95%	106%	108%	131%	163%	128%	114%	136%	150%	143%	141%	158%	158%	166%	119%	146%																		
Nextera Inc.	160%	167%	174%	201%	203%	249%	196%	170%	155%	157%	177%	201%	225%	220%	232%	193%	192%																		
PG&E Corp.	149%	203%	196%	179%	201%	203%	144%	148%	148%	145%	145%	143%	147%	161%	168%	183%	151%																		
Public Service Enterprise Group	178%	186%	191%	245%	267%	304%	250%	177%	176%	161%	154%	160%	163%	163%	164%	163%	163%																		
WEC Energy Group	129%	147%	156%	168%	182%	179%	153%	147%	171%	186%	213%	223%	249%	219%	209%	159%	202%																		
Xcel Energy Inc.	113%	113%	132%	139%	150%	154%	127%	121%	135%	143%	156%	157%	165%	171%	189%	133%	155%																		
Mean	140%	140%	152%	169%	175%	186%	147%	126%	136%	143%	157%	159%	172%	172%	179%	159%	155%																		
Median	144%	142%	153%	165%	161%	179%	144%	114%	135%	145%	146%	151%	162%	166%	178%	159%	150%																		
Vibert Electric Sample																																			
ALLETE	110%	97%	120%	131%	219%	195%	156%	113%	127%	138%	136%	152%	151%	146%	153%	241%	202%																		
Alliant Energy	136%	124%	155%	165%	161%	190%	145%	112%	118%	128%	147%	161%	169%	197%	196%	214%	131%																		
American Electric Power Co.	163%	162%	161%	172%	164%	159%	122%	83%	81%	92%	106%	125%	152%	149%	165%	158%	119%																		
Ameren Corp.	116%	142%	236%	329%	313%	330%	234%	187%	158%	210%	200%	223%	227%	213%	257%	241%	209%																		
AVANGRID Inc.	137%	80%	90%	125%	142%	177%	127%	117%	148%	170%	182%	218%	239%	254%	276%	215%	202%																		
CMS Energy Corp.	144%	146%	143%	154%	149%	151%	123%	116%	124%	145%	150%	144%	143%	148%	159%	144%	140%																		
Consolidated Edison Co.	138%	180%	196%	242%	239%	256%	239%	186%	207%	235%	272%	313%	362%	352%	327%	214%	282%																		
Domination Energy	145%	142%	132%	140%	134%	143%	101%	91%	116%	121%	137%	153%	170%	180%	180%	143%	143%																		
DTE Energy Co.	117%	108%	153%	205%	194%	208%	149%	101%	111%	117%	146%	166%	177%	182%	191%	163%	149%																		
Edison International	140%	120%	148%	176%	179%	179%	134%	102%	134%	164%	163%	161%	158%	152%	167%	154%	150%																		
El Paso Electric	114%	136%	156%	194%	211%	264%	229%	147%	144%	134%	133%	126%	139%	141%	152%	186%	145%																		
Eversource Energy	99%	95%	106%	108%	131%	163%	128%	114%	136%	150%	143%	141%	159%	158%	166%	119%	146%																		
Entergy Corp.	134%	112%	125%	122%	139%	132%	104%	94%	113%	119%	123%	136%	159%	158%	177%	124%	135%																		
IDACORP Inc.	147%	154%	178%	187%	205%	197%	145%	139%	180%	197%	204%	231%	228%	184%	170%	124%	135%																		
OGE Energy	245%	233%	207%	207%	191%	178%	167%	108%	120%	123%	152%	196%	196%	186%	207%	195%	161%																		
Otter Tail Corp.	149%	203%	196%	179%	203%	203%	148%	148%	148%	146%	145%	143%	147%	161%	168%	182%	151%																		
PG&E Corp.	116%	114%	130%	130%	125%	127%	100%	90%	113%	125%	141%	153%	147%	147%	161%	186%	182%																		
Pinnacle West Capital	95%	95%	124%	147%	134%	125%	72%	50%	68%	89%	105%	109%	147%	147%	168%	182%	151%																		
PNM Resources	253%	239%	230%	259%	153%	140%	101%	83%	97%	109%	117%	131%	145%	148%	156%	113%	103%																		
Portland General	178%	186%	191%	245%	261%	316%	288%	209%	180%	152%	155%	164%	168%	187%	246%	264%	183%																		
Public Service Enterprise Group	137%	158%	171%	179%	167%	304%	250%	177%	176%	161%	154%	151%	160%	163%	164%	163%	163%																		
SCANA Corp.	155%	172%	178%	186%	190%	194%	141%	121%	134%	135%	152%	154%	160%	158%	174%	159%	149%																		
Sempra Energy	174%	170%	175%	185%	179%	175%	157%	133%	142%	153%	160%	180%	216%	218%	222%	174%	178%																		
Vectren Corp.	113%	113%	132%	139%	150%	154%	127%	121%	135%	143%	156%	157%	165%	171%	189%	133%	155%																		
Xcel Energy Inc.	148%	147%	161%	181%	182%	192%	152%	124%	136%	145%	155%	168%	182%	181%	191%	167%	161%																		
Mean	140%	142%	156%	179%	178%	178%	144%	114%	134%	143%	152%	154%	162%	166%	176%	160%	150%																		
Median	140%	142%	156%	179%	178%	178%	144%	114%	134%	143%	152%	154%	162%	166%	176%	160%	150%																		

Source: Calculations made from data contained in Value Line Investment Survey.

**STANDARD AND POOR'S 500 COMPOSITE
RATES OF RETURN ON AVERAGE COMMON EQUITY
AND MARKET TO BOOK RATIOS**

Year	Return on Average Equity	Market-To- Book Ratio
2002	8.4%	295%
2003	14.2%	278%
2004	15.0%	291%
2005	16.1%	278%
2006	17.0%	277%
2007	12.8%	284%
2008	3.0%	224%
2009	10.6%	187%
2010	14.2%	208%
2011	14.6%	207%
2012	13.5%	214%
2013	14.5%	237%
2014	14.2%	268%
2015	12.1%	273%
2016	12.7%	271%
Averages:		
2002-2008	12.4%	275%
2009-2016	13.3%	233%

Source: Standard & Poor's.

**PROXY COMPANIES
RISK INDICATORS**

Company	Value Line Safety Rank	Value Line Beta	Value Line Financial Strength	S&P Stock Ranking		
Parcell Proxy Group						
American Electric Power Co.	1	0.65	A+	4.33	A-	3.67
Consolidated Edison Co.	1	0.50	A+	4.33	B+	3.33
DTE Energy Co.	2	0.65	B++	3.67	A-	3.67
Duke Energy Co.	2	0.60	A	4.00	B	3.00
Edison International	2	0.60	A	4.00	B	3.00
Eversource Energy	1	0.65	A	4.00	A-	3.67
NextEra Inc.	2	0.65	A	4.00	A	4.00
PG&E Corp.	2	0.65	B++	3.67	B	3.00
Public Service Enterprise Group	1	0.70	A++	4.67	B+	3.33
WEC Energy Group	1	0.60	A+	4.33	A	4.00
Xcel Energy Inc.	1	0.60	A+	4.55	A-	3.67
Mean	1.5	0.62	A	4.14	B+/A-	3.49
Vilbert Electric Sample						
ALLETE	2	0.75	A	4.00	A-	3.67
Alliant Energy	2	0.70	A	4.00	B+	3.33
American Electric Power Co.	1	0.65	A+	4.33	A-	3.67
Ameren Corp.	2	0.65	A	4.00	B	3.00
AVANGRID Inc.	2	nmf	B++	3.67	NR	
CenterPoint Energy	3	0.90	B+	3.33	B	3.00
CMS Energy Corp.	2	0.65	B++	3.67	B	3.00
Consolidated Edison Co.	1	0.50	A+	4.33	B+	3.33
Dominion Energy	2	0.65	B++	3.67	B	3.00
DTE Energy Co.	2	0.65	B++	3.67	A-	3.67
Edison International	2	0.60	A	4.00	B	3.00
El Paso Electric	2	0.75	B++	3.67	B	3.00
Entergy Corp.	3	0.65	B++	3.67	A-	3.67
Eversource Energy	1	0.65	A	4.00	A-	3.67
IDACORP Inc.	2	0.70	A	4.00	A	4.00
OGE Energy	2	0.95	A	4.00	A-	3.67
Otter Tail Corp.	2	0.90	A	4.00	B	3.00
MGE Energy	1	0.75	A	4.00	A-	3.67
PG&E Corp.	2	0.65	B++	3.67	B	3.00
Pinnacle West Capital	1	0.65	A+	4.33	B+	3.33
PNM Resources	3	0.75	B	3.00	B	3.00
Portland General	2	0.70	B++	3.67	NR	
PPL Corp.	2	0.70	B++	3.67	B+	3.33
Public Service Enterprise Group	1	0.70	A++	4.67	B+	3.33
SCANA Corp.	2	0.65	B++	3.67	A	4.00
Sempra Energy	2	0.80	A	4.00	B+	3.33
Vectren Corp.	2	0.75	A	4.00	B+	3.33
Xcel Energy Inc.	1	0.60	A+	4.55	A-	3.67
Mean	1.9	0.70	A	3.90	B+	3.37

Sources: Value Line Investment Survey, Standard & Poor's Stock Guide.

PROXY COMPANIES AND STANDARD & POOR'S 500 RISK INDICATORS

Group	Value Line Safety Rank	Value Line Beta	Value Line Financial Strength	S&P Stock Ranking
S&P 500	2.4	1.04	B++	B+
Parcell Proxy Group	1.5	0.62	A	B+/A-
Vilbert Electric Sample	1.9	0.70	A	B+

Sources: Value Line Investment Survey, Standard & Poor's Stock Guide.

Definitions:

Safety rankings are in a range of 1 to 5, with 1 representing the highest safety or lowest risk.

Beta reflects the variability of a particular stock, relative to the market as a whole. A stock with a beta of 1.0 moves in concert with the market; a stock with a beta below 1.0 is less variable than the market; and a stock with a beta above 1.0 is more variable than the market.

Financial strengths range from C to A++, with the latter representing the highest level.

Common stock rankings range from D to A+, with the latter representing the highest level.