COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF	**)**	
COLUMBIA GAS OF KENTUCKY, INC.	**)**	
FOR AN ADJUSTMENT OF RATES;	**)**	
APPROVAL OF DEPRECIATION STUDY;	**)**	**CASE NO. 2021-00183**
APPROVAL OF TARIFF REVISIONS;	**)**	
ISSUANCE OF A CERTIFICATE OF	**)**	
PUBLIC CONVENIENCE AND NECESSITY;	**)**	
AND OTHER RELIEF	**)**	

DIRECT TESTIMONY

AND EXHIBITS

OF

RICHARD A. BAUDINO

ON BEHALF OF

THE KENTUCKY OFFICE OF THE ATTORNEY GENERAL

J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA

SEPTEMBER 8, 2021

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DIRECT TESTIMONY OF RICHARD A. BAUDINO

I. QUALIFICATIONS AND SUMMARY

Q. Please state your name and business address.

A. My name is Richard A. Baudino. My business address is J. Kennedy and Associates, Inc. (“Kennedy and Associates”), 570 Colonial Park Drive, Suite 305, Roswell, Georgia 30075.

Q. What is your occupation and by whom are you employed?

A. I am a consultant with Kennedy and Associates.

Q. Please describe your education and professional experience.

A. I received my Master of Arts degree with a major in Economics and a minor in Statistics from New Mexico State University in 1982. I also received my Bachelor of Arts Degree with majors in Economics and English from New Mexico State in 1979.

I began my professional career with the New Mexico Public Service Commission Staff in October 1982 and was employed there as a Utility Economist. During my employment with the Staff, my responsibilities included the analysis of a broad range of issues in the ratemaking field. Areas in which I testified included cost of service, rate of return, rate design, revenue requirements, analysis of sale/leasebacks of generating plants, utility finance issues, and generating plant phase-ins.

In October 1989, I joined the utility consulting firm of Kennedy and Associates as a Senior Consultant where my duties and responsibilities covered substantially the same areas as those during my tenure with the New Mexico Public Service Commission Staff. I became Manager in July 1992 and was named Director of Consulting in January 1995. Currently, I am a consultant with Kennedy and Associates.

Exhibit RAB-1 summarizes my expert testimony experience.

Q. On whose behalf are you testifying?

A. I am submitting Direct Testimony on behalf of the Kentucky Office of the Attorney General ("KYOAG").

Q. What is the purpose of your Direct Testimony?

A. The purpose of my Direct Testimony is to address the investor required return on equity ("ROE") for the regulated gas operations of Columbia Gas of Kentucky, Inc. ("CGKY" or "Company"). I will also address the Company's cost of long-term debt and capital structure. Finally, I will respond to the Direct Testimony and ROE recommendation of CGKY witness Mr. Vincent Rea.

Q. Please summarize your conclusions and recommendations.

A. I recommend that the Commission authorize an allowed ROE for CGKY of 9.10%. My recommendation is based on a ROE range of 8.40% to 9.40%. My recommended range is based on the results of a discounted cash flow ("DCF") analysis applied to a proxy group of seven regulated gas distribution companies, the same gas proxy group employed by Mr. Rea. I also performed Capital Asset Pricing Model ("CAPM") analyses using both historical and forecasted risk premiums. The CAPM results are lower than my DCF results in this case, which further confirms the reasonableness of my DCF estimates. A 9.10% allowed ROE is reasonable given the low-risk nature of CGKY's regulated gas business and is consistent with investor expectations and requirements in the current economic environment of low interest rates.

I also recommend a cost of long-term debt of 4.37%, a reduction in CGKY's requested cost of debt of 4.56%. CGKY included forecasted issuances of long-term debt that had overstated coupon rates. Updated information provided by the Company in discovery showed a lower and more reasonable coupon rate for the debt issue that occurred in June 2021. I further explain why the Commission should use this lower actual cost of debt for the three other future debt issuances that the Company projected to occur later this year and in 2022.

Based on CGKY's historical use of short-term debt, I also recommend to the Commission that a higher amount of short-term debt be included in the Company's capital structure for purposes of its requested future test year. The percentage of short-term debt should be increased from CGKY's requested 3.11% to 4.00%. This percentage is more in accordance with the Company's four-year and five year averages of short-term debt. In connection with the higher short-term debt amount, I also recommend that CGKY's common equity ratio be reduced from its requested level of 52.64% to 51.75%.

Including the aforementioned recommendations, the KYOAG's recommended weighted cost of capital is 6.69%.

In Section IV, I will respond to the testimony and ROE recommendation of Mr. Rea. I will demonstrate that his recommended ROE of 10.55% for CGKY significantly overstates the investor required return for lower risk regulated gas utilities and is inconsistent with today's low interest rate environment. Although the Company is seeking a ROE of 10.30%, which is the lower end of Mr. Rea's recommended range of ROE results, this request is also unreasonable and excessive. The ROE range recommended by Mr. Rea would harm Kentucky ratepayers and contribute to an inflated revenue requirement.

II. REVIEW OF ECONOMIC AND FINANCIAL CONDITIONS

Q. What are the main guidelines to which you adhere in estimating the cost of equity?

A. Generally speaking, the estimated cost of equity should be comparable to the returns of other firms with similar risk structures and should be sufficient for the firm to attract capital. These are the basic standards set out by the United States Supreme Court in *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) and *Bluefield W.W. & Improv. Co. v. Public Service Comm'n*, 262 U.S. 679 (1922).

From an economist's perspective, the notion of "opportunity cost" plays a vital role in estimating the ROE. One measures the opportunity cost of an investment equal to what one would have obtained in the next best alternative. For example, let us suppose that an investor decides to purchase the stock of a publicly-traded regulated gas utility. That investor will make the decision based on the expectation of dividend payments and perhaps some appreciation in the stock's value over time; however, that investor's opportunity cost is measured by what she or he could have invested in as the next best alternative. That alternative could have been another utility stock, a utility bond, a mutual fund, a money market fund, or any other number of investment vehicles.

The key determinant in deciding whether to invest, however, is based on comparative levels of risk. Our hypothetical investor would not invest in a particular regulated gas utility stock if it offered a return lower than other investments of similar risk. The opportunity cost simply would not justify such an investment. Thus, the task for the rate of return analyst is to estimate a return that is equal to the return being offered by other risk-comparable firms.

Q. Does the level of interest rates affect the allowed ROE for regulated utilities?

A. Yes. The common stock of regulated utilities is considered to be interest rate sensitive. This means that the cost of equity for regulated utilities tends to rise and fall with changes in interest rates. For example, as interest rates rise, the cost of equity will also rise, and vice versa when interest rates fall. This relationship is due in large part to the capital-intensive nature of the utility industry, which relies heavily on both debt and equity to finance its regulated investments.

Q. Before you continue, please provide a brief explanation of how the Federal Reserve Board ("Fed") uses interest rates to affect conditions in the financial markets.

A. Generally, the Fed uses monetary policy to implement certain economic goals. The Fed explained its monetary policy as follows:

> Monetary policy in the United States comprises the Federal Reserve's actions and communications to promote maximum employment, stable prices, and moderate long-term interest rates--the three economic goals the Congress has instructed the Federal Reserve to pursue.[1]

One of the Fed's primary tools for conducting monetary policy is setting the federal funds rate. The federal funds rate is the interest rate set by the Fed that banks and credit unions charge each other for overnight loans of reserve balances. Traditionally the federal funds rate directly influences short-term interest rates,

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1 https://www.federalreserve.gov/monetarypolicy.htm such as the Treasury bill rate and interest rates on savings and checking accounts. The federal funds rate has a more indirect effect on long-term interest rates, such as the 30-Year Treasury bond and private and corporate long-term debt. Long-term interest rates are set more by market forces that influence the supply and demand of loanable funds.

Q. Describe the trend in interest rates over the last 10 or so years.

A. Since 2007 and 2008, the overall trend in interest rates in the U.S. and the world economy has been lower and this trend continued into 2020 - 2021 as governments and central banks instituted programs in response to the economic shocks brought about by the Covid-19 pandemic. The trend of lower interest rates was precipitated by the 2007 financial crisis and severe recession that followed in December 2007. In response to this economic crisis, the Fed undertook a series of steps to stabilize the economy, ease credit conditions, and lower unemployment and interest rates. These steps are commonly known as Quantitative Easing ("QE") and were implemented in three distinct stages: QE1, QE2, and QE3. The Fed's stated purpose of QE was "to support the liquidity of financial institutions and foster improved conditions in financial markets."[2]

Figure 1 below presents a graph that tracks the 30-Year Treasury bond yield and the Mergent average utility bond yield. The time period covered is January 2008 through July 2021.

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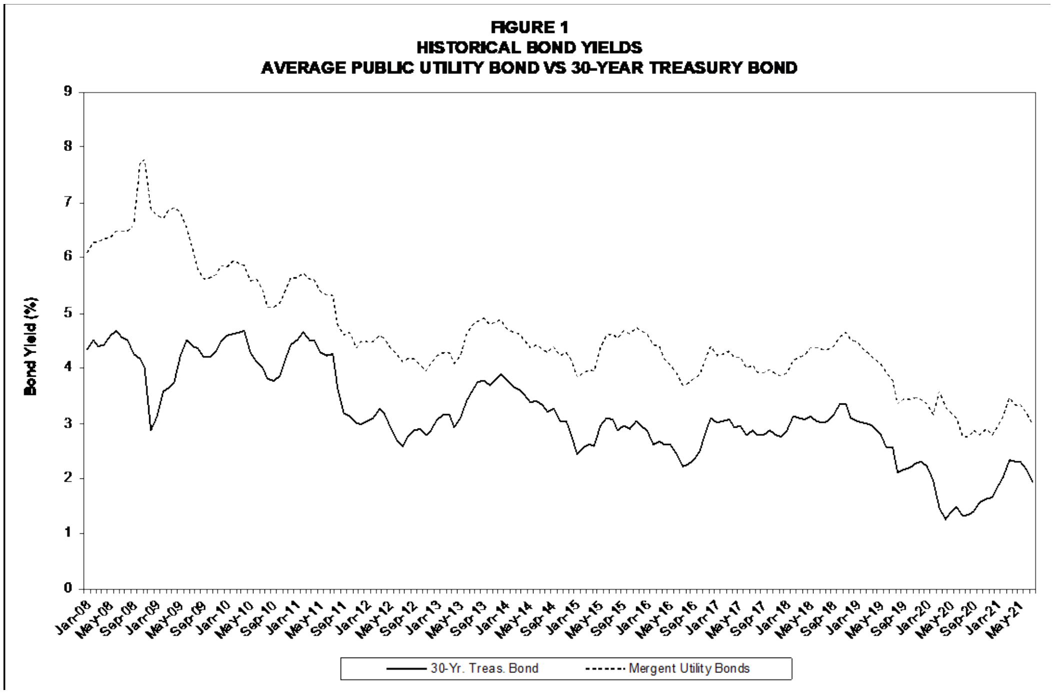
[2] https://www.federalreserve.gov/monetarypolicy/bst_crisisresponse.htm



We can see from the graph in Figure 1 that since 2008, the trend in long-term bond yields has been lower. In January 2008, the yield on the 30-Year Treasury bond was 4.33% and the yield on the average public utility bond was 6.08%. As of July 2021, the 30-Year Treasury yield was 1.94% and the Mergent average utility bond yield was 2.99%. Long-term bond yields remained low through August, with the Moody's average public utility bond yield at 3.01% and the 30-Year Treasury yield at 1.94%.[3]

Q. Please summarize recent Fed actions with respect to monetary policy that led to lower interest rates in 2019 and 2020.

[3] Yields as of August 26, 2021 from Moody's Credit Trends and the web site of the Board of Governors of the Federal Reserve System.

A. In 2019, the Fed lowered the federal funds rate three times. On March 3, 2020, and March 15, 2020, the Fed again lowered the federal funds rate in response to mounting concerns associated with the spread of the coronavirus worldwide and the associated lockdowns of the economy. The Fed lowered the federal funds rate to 0% in March 2020. Beginning in March 2020, the Fed also announced a broad array of expansive new actions to support credit and financial markets and assistance to businesses and households. The Board of Governors of the Fed system established a new resource on its web site that contains the Fed's ongoing response to the COVID-19 pandemic.[4]

On July 28, 2021, the Fed issued its most recent statement regarding its continued support of the U.S. economy and on maintaining the federal funds rate near 0%. The following quotes were drawn from that statement:

> With progress on vaccinations and strong policy support, indicators of economic activity and employment have continued to strengthen. The sectors most adversely affected by the pandemic have shown improvement but have not fully recovered. Inflation has risen, largely reflecting transitory factors. Overall financial conditions remain accommodative, in part reflecting policy measures to support the economy and the flow of credit to U.S. households and businesses.
>
> The path of the economy continues to depend on the course of the virus. Progress on vaccinations will likely continue to reduce the effects of the public health crisis on the economy, but risks to the economic outlook remain.
>
> The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. With inflation having run persistently below this longer-run goal, the Committee will aim to achieve inflation

[4] For more information on the Fed's response to COVID-19, please see: https://www.federalreserve.gov/covid-19.htm

> moderately above 2 percent for some time so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent. The Committee expects to maintain an accommodative stance of monetary policy until these outcomes are achieved. The Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and expects it will be appropriate to maintain this target range until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time. Last December, the Committee indicated that it would continue to increase its holdings of Treasury securities by at least $80 billion per month and of agency mortgage-backed securities by at least $40 billion per month until substantial further progress has been made toward its maximum employment and price stability goals. Since then, the economy has made progress toward these goals, and the Committee will continue to assess progress in coming meetings. These asset purchases help foster smooth market functioning and accommodative financial conditions, thereby supporting the flow of credit to households and businesses.

The Fed's statement indicates that its stance will be accommodative in the near term, which means that short-term interest rates will be kept low to assist economic recovery, even though inflation may rise above the Fed's target long-term goal of 2.0% in the near term.

Q. Could you show in more detail the course of Treasury and utility bond yields since the beginning of 2020?

A. Table 1 presents the yields on 30-Year Treasury and the Mergent average utility bond from January 2020 through July 2021. The data in Table 1 were taken from Figure 1 in order to more clearly show the course of long-term interest rates since the beginning of the pandemic in 2020.

TABLE 1
30-Year Treasury and
Avg. Utility Bond Yields
January 2020 - June 2021

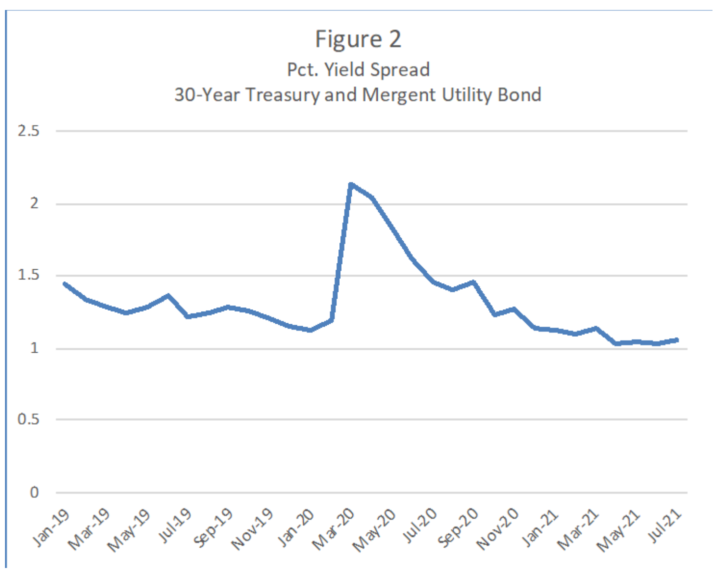
	30-Year Treasury	Avg. Public Utility
Jan-20	2.22	3.34
Feb-20	1.97	3.16
Mar-20	1.46	3.59
Apr-20	1.27	3.31
May-20	1.38	3.22
Jun-20	1.49	3.10
Jul-20	1.31	2.77
Aug-20	1.36	2.76
Sep-20	1.42	2.88
Oct-20	1.57	2.80
Nov-20	1.62	2.89
Dec-20	1.67	2.80
Jan-21	1.82	2.94
Feb-21	2.04	3.13
Mar-21	2.34	3.48
Apr-21	2.30	3.33
May-21	2.32	3.36
Jun-21	2.16	3.19
Jul-21	1.94	2.99

Table 1 shows that in March 2020 there was a sharp divergence in the yields of Treasury and utility bond yields. The 30-Year Treasury declined substantially from 1.97% in February to 1.27% in April. Alternatively, utility bond yields went in the opposite direction, increasing from 3.16% in February to 3.59% in March, then declined through August. Both Treasury and utility bond yields increased from August 2020 through May 2021, then pulled back slightly in June and July of 2021.

It is interesting to note that long-term bond yields in June and July 2021 are at roughly the same levels in January 2020, before the pandemic and associated economic shutdowns hit the U.S. economy.

Q. You just mentioned that the yields in Treasury bonds and utility bonds went in different directions early in 2020. Please illustrate and further explain this occurrence.

A. Figure 2 below presents the percentage yield spread between 30-Year Treasury bonds and the Mergent average utility bond from January 2020 through July 2021. Figure 2 shows that the yield spread in January 2020 was 1.12%, meaning that the average utility bond yield was 121 basis points higher than the 30-Year Treasury bond yield. The yield spread then spiked up to 2.13% in March and 2.03% in April. The yield spread then declined from May 2020 and finished July 2021 at 1.05%. The behavior of the monthly yield spreads depicted in Figure 2 suggests that the market's perception of the relative risk of regulated utility bonds increased sharply in March and April of 2020, but has subsided significantly since then.



Q. What are the expectations for inflation and interest rates going forward?

A. The Federal Reserve Bank of Philadelphia publishes the *Survey of Professional Forecasters* ("Survey"), in which a panel of 36 forecasters provides projections for a number of economic variables, including growth in Gross Domestic Product, inflation, unemployment, and short-term and long-term interest rates. The edition for the second quarter was released on May 14, 2021. This most recent edition of the Survey stated the following:

> The U.S. economy looks stronger now than it did three months ago, according to 36 forecasters surveyed by the Federal Reserve Bank of Philadelphia. The panel predicts real GDP will grow at an annual rate of 7.9 percent this quarter, up 2.9 percentage points from the prediction in the last survey. Over the next three quarters, the panelists also see a stronger rebound in output growth than they predicted previously. Using the annual-average over annual-average computation, the forecasters expect real GDP to grow at an annual rate of 6.3 percent in 2021 and 4.3 percent in 2022. The projections for 2021 and 2022 are up from 4.5 percent and 3.7 percent, respectively, in the last survey.[5]

Other economic variables were forecasted as follows:

- Consumer Price Index ("CPI") inflation: expected to average 3.0% for 2021 and 2.3% for 2022 and 2023.
- 10-Year Treasury bond yield increasing from 1.7% in 2021 to 2.1% in 2022, 2.3% in 2023, and 2.5% in 2024.
- Over the next 10 years, the forecasters expected CPI inflation to average 2.30%.
- A declining unemployment rate of 5.5% for 2021, 4.4% for 2022, and 3.9% for 2023.[6]

The Federal Reserve also issued recent economic projections on June 16, 2021. Key data forecasts from the Fed are as follows:

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[5] https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/spf-q2-2021
[6] https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/spf-q2-2021

- PCE (Personal consumption expenditures) inflation rate of 3.4% for 2021, 2.1% for 2022, and 2.2% for 2023, with longer run inflation at 2.0%.
- Unemployment rate of 4.5% for 2021, 3.8% for 2022, and 3.5% for 2023. Longer run unemployment rate of 4.0%.
- Growth in real GDP of 7.0% for 2021, 3.3% for 2022, and 2.4% for 2023. Longer run growth rate of 1.8%.[7]

I conclude from these economic forecasts that the consensus is continued economic recovery from the economic shutdowns related to the pandemic, declining unemployment, and a moderate increase in inflation in the near term.

Q. Please provide the Commission with some additional background information regarding market volatility since January 2020 through July 2021.

A. A widely used measure of market volatility is the Chicago Board Options Exchange ("CBOE") Volatility Index ("VIX"), also called the "fear index" or "fear gauge." Basically, the VIX measures the market's expectations for volatility over the next 30-day period. The higher the VIX, the greater the expectation of volatility and market risk. Figure 3 presents the VIX from February 1, 2020 through August 26, 2021. The data was downloaded from the CBOE web site.

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[7] https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20210616.pdf

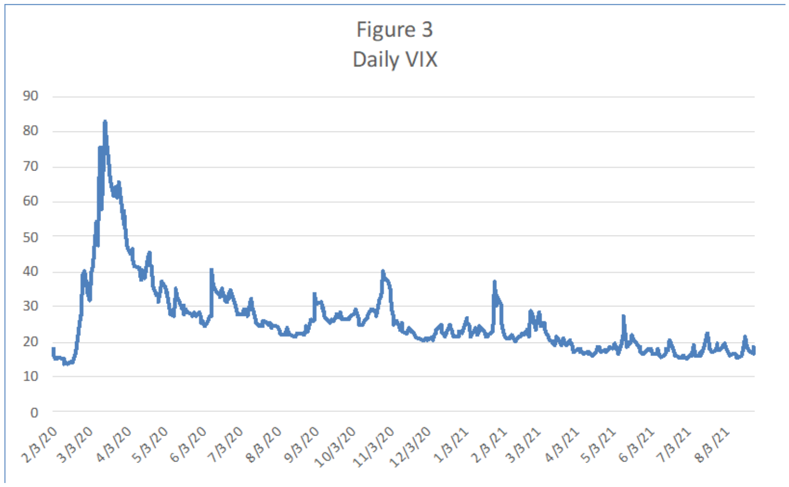

Figure 3 shows that the VIX was much lower at the beginning of February 2020 (17.97), shot up to a high of 82.69 on March 16, then generally declined through the year and the first half of 2021, with the VIX at 18.84 on August 26, 2021. The average VIX for the months of June and July 2021 were 16.96 and 17.60, respectively. Figure 3 shows us that stock market volatility has declined substantially since the March - April 2020 period and is comparable to the daily average for 2019, which was 15.39.

Q. How does the investment community regard the gas distribution utility industry as a whole?

A. The August 27, 2021 Value Line report on the gas distribution industry made the following statement:

> A number of stocks in Value Line's Natural Gas Utility Industry have been rangebound since our last report a few months ago. But that comes as no surprise, given that historical price movements of this typically defensive sector have tended to be on the steady side. It's also important to state that the primary attraction here is these equities' reliable, healthy levels of dividend income (which are adequately covered by corporate profits). Consider, too, that at recent quotations there are standouts for capital appreciation potential during the 2024-2026 period, enhancing total return possibilities.

I conclude from Value Line's statements that the natural gas distribution sector provides a consistent stream of income to investors with relatively stable earnings, making these companies lower risk than the overall stock market.

III. DETERMINATION OF FAIR RATE OF RETURN

Q. Please describe the methods you employed in estimating a fair rate of return for the regulated gas operations of CGKY.

A. I employed a DCF analysis using a proxy group of seven regulated gas distribution utilities. My DCF analysis is my standard constant growth form of the model that employs growth rate forecasts from the following three sources: dividend and earnings growth from Value Line, and earnings growth from Yahoo! Finance, and Zacks. I also employed CAPM analyses using both historical and forward-looking data. Although I did not rely on the CAPM for my recommended ROE of 9.10% for CGKY, the CAPM provides an alternative approach to estimating the ROE for the Company, albeit a less reliable one. In this case, the CAPM results were generally below the DCF results.

DCF Model

Q. Please describe the basic DCF approach.

A. The basic DCF approach is rooted in valuation theory. It is based on the premise that the value of a financial asset is determined by its ability to generate future net cash flows. In the case of a common stock, those future cash flows generally take the form of dividends and appreciation in stock price. The value of the stock to investors is the discounted present value of future cash flows. The general equation then is:

$$V = \frac{R}{(1+r)} + \frac{R}{(1+r)^2} + \frac{R}{(1+r)^3} + \cdots \frac{R}{(1+r)^n}$$

Where: *V = asset value*
R = yearly cash flows
r = discount rate

This is no different from determining the value of any asset from an economic point of view; however, the commonly employed DCF model makes certain simplifying assumptions. One is that the stream of income from the equity share is assumed to be perpetual; that is, there is no salvage or residual value at the end of some maturity date (as is the case with a bond). Another important assumption is that financial markets are reasonably efficient; that is, they correctly evaluate the cash flows relative to the appropriate discount rate, thus rendering the stock price efficient relative to other alternatives. Finally, the model I typically employ also assumes a constant growth rate in dividends. The fundamental relationship employed in the DCF method is described by the formula:

$$k = {}^{D_1}/_{P_0} + g$$

Where: D_1 *= the next period dividend*
P_0 *= current stock price*
g = expected growth rate
k = investor-required return

Using this formula, it is apparent that “k” must reflect the investors’ expected return. Use of the DCF method to determine an investor-required return is complicated by the need to express investors’ expectations relative to dividends, earnings, and book value over an infinite time horizon. Financial theory suggests that stockholders purchase common stock on the assumption that there will be some change in the rate of dividend payments over time. We assume that the rate of growth in dividends is constant over the assumed time horizon, but the model could easily handle varying growth rates if we knew what they were. Finally, the relevant time frame is prospective rather than retrospective.

Q. What was your first step in conducting your DCF analysis for CGKY?

A. My first step was to construct a proxy group of companies with a risk profile that is reasonably similar to the Company. CGKY is a subsidiary of NiSource and, as such, does not have publicly traded stock. Thus, one cannot estimate a DCF cost of equity on the Company directly. Instead, one must estimate the ROE for a reliable proxy group of companies.

Q. Please describe your approach for selecting a proxy group of companies.

A. For purposes of this case, I chose to rely on the proxy group of gas distribution utilities that CGKY witness Rea used for his analysis. Mr. Rea described the criteria he used to select companies for his Gas LDC group on pages 21 through 22 of his Direct Testimony. Mr. Rea's criteria for group selection are reasonable and I will adopt his gas utility proxy group for purposes of this case.

Q. What was your first step in determining the DCF return on equity for the proxy group?

A. I first determined the current dividend yield, D_1/P_0, from the basic equation. My general practice is to use six months as the most reasonable period over which to estimate the dividend yield. The six-month period I used covered the months from March through August 2021. I obtained historical prices and dividends from

Yahoo! Finance. The annualized dividend divided by the average monthly price represents the average dividend yield for each month in the period.

The resulting average dividend yield for the proxy group is 3.48%. These calculations are shown in Exhibit RAB-2.

Q. Having established the average dividend yield, how did you determine the investors' expected growth rate for the proxy group?

A. The investors' expected growth rate, in theory, correctly forecasts the constant rate of growth in dividends. The dividend growth rate is a function of earnings growth and the payout ratio, neither of which is known precisely for the future. We refer to a perpetual growth rate since the DCF model has no arbitrary cut-off point. We must estimate the investors' expected growth rate because there is no way to know with absolute certainty what investors expect the growth rate to be in the short term, much less in perpetuity.

For my analysis in this proceeding, I used three major sources of analysts' forecasts for growth: Value Line, Zacks, and Yahoo! Finance. This is the method I typically use for estimating growth for my DCF calculations.

Q. Please briefly describe Value Line, Zacks, and Yahoo! Finance.

A. Value Line is a widely used and respected source of investor information that covers approximately 1,700 companies in its Standard Edition and several thousand in its Plus Edition. It is updated quarterly and probably represents the most comprehensive of all investment information services. It provides both historical and forecasted information on a number of important data elements. Value Line neither participates in financial markets as a broker nor works for the utility industry in any capacity of which I am aware.

Zacks gathers opinions from a variety of analysts on earnings growth forecasts for numerous firms including regulated gas utilities. The estimates of the analysts responding are combined to produce consensus average estimates of earnings growth. I obtained Zacks' earnings growth forecasts from its web site. Like Zacks, Yahoo! Finance also compiles and reports consensus analysts' forecasts of earnings growth. I also obtained these estimates from Yahoo! Finance's web site.

Q. Why did you rely on analysts' forecasts in your analysis?

A. ROE analysis is a forward-looking process. Five-year or ten-year historical growth rates may not accurately represent investor expectations for future dividend growth. Analysts' forecasts for earnings and dividend growth provide better proxies for the expected growth component in the DCF model than historical growth rates. Analysts' forecasts are also widely available to investors and one can reasonably assume that they influence investor expectations.

Q. Please explain how you used analysts' dividend and earnings growth forecasts in your constant growth DCF analysis.

Q. Columns (1) through (4) of Exhibit RAB-3, page 1, shows the forecasted dividend and earnings growth rates from Value Line and the earnings growth forecasts from Zacks and Yahoo! Finance for the companies in the proxy group. It is important to include dividend growth forecasts in the DCF model since the model calls for forecasted cash flows and Value Line is the only source of which I am aware that forecasts dividend growth.

Q. How did you proceed to determine the DCF ROE for the proxy group?

A. To estimate the expected dividend yield (D_1), the current dividend yield must be moved forward in time to account for dividend increases over the next twelve months. I estimated the expected dividend yield by multiplying the current dividend yield by one plus one-half the expected growth rate.

Exhibit RAB-3, page 2, presents my standard method of calculating dividend yields, growth rates, and return on equity for the proxy group of companies. The proxy group DCF ROE section shows the application of each of four growth rates to the current proxy group dividend yield of 3.48% to calculate the expected dividend yield. I then added the expected growth rates to the expected dividend yield. My DCF ROE was calculated using two different methods. Method 1 uses the average growth rates for the group shown on page 1 of Exhibit RAB-3 and Method 2 utilizes the median growth rates shown on that page.

Q. What are the results of your constant growth DCF model?

A. For Method 1 (average growth rates), the results range from 8.42% to10.81%, with the average of these results being 9.49%. For Method 2 (median growth rates), the results range from 8.05% to 10.60%, with the average of these results being 9.20%[8].

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[8] Refer to Exhibit RAB-3, page 2, for these results.

Capital Asset Pricing Model

Q. Briefly summarize the CAPM approach.

A. The theory underlying the CAPM approach is that investors, through diversified portfolios, may combine assets to minimize the total risk of the portfolio. Diversification allows investors to diversify away all risks specific to a particular company and be left only with market risk that affects all companies. Thus, the CAPM theory identifies two types of risks for a security: company-specific risk and market risk. Company-specific risk includes such events as strikes, management errors, marketing failures, lawsuits, and other events that are unique to a particular firm. Market risk includes inflation, business cycles, war, variations in interest rates, and changes in consumer confidence. Market risk tends to affect all stocks and cannot be diversified away. The idea behind the CAPM is that diversified investors are rewarded with returns based on market risk.

Within the CAPM framework, the expected return on a security is equal to the risk-free rate of return plus a risk premium that is proportional to the security's market, or non-diversifiable, risk. Beta is the factor that reflects the inherent market risk of a security and measures the volatility of a particular security relative to the overall market for securities. For example, a stock with a beta of 1.0 indicates that if the market rises by 15%, that stock will also rise by 15%. This stock moves in tandem with movements in the overall market. Stocks with a beta of 0.5 will only rise or fall 50% as much as the overall market. So with an increase in the market of 15%, this stock will only rise 7.5%. Stocks with betas greater than 1.0 will rise and fall more than the overall market. Thus, beta is the measure of the relative risk of individual securities vis-à-vis the market.

Based on the foregoing discussion, the equation for determining the return for a security in the CAPM framework is:

$$K = Rf + \beta(MRP)$$

Where: *K* = *Required Return on equity*
Rf = *Risk-free rate*
MRP = *Market risk premium*
β = *Beta*

This equation tells us about the risk/return relationship posited by the CAPM. Investors are risk averse and will only accept higher risk if they expect to receive higher returns. These returns can be determined in relation to a stock's beta and the market risk premium ("MRP"). The general level of risk aversion in the economy determines the MRP. If the risk-free rate of return is 3.0% and the required return on the total market is 15%, then the risk premium is 12%. Any stock's risk premium can be determined by multiplying its beta by the MRP. Its total return may then be estimated by adding the risk-free rate to that risk premium. Stocks with betas greater than 1.0 are considered riskier than the overall market and will have higher required returns. Conversely, stocks with betas less than 1.0 will have required returns lower than the market as a whole.

Q. In general, are there concerns regarding the use of the CAPM in estimating the ROE?

A. Yes. There is some controversy surrounding the use of the CAPM and its accuracy regarding expected returns. There is substantial evidence that beta is not the primary factor for determining the risk of a security. For example, Value Line's "Safety Rank" is a measure of total risk, not its calculated beta coefficient. Dr. Burton Malkiel, author of *A Random Walk Down Wall Street* noted the following in his best-selling book on investing:

> Second, as Professor Richard Roll of UCLA has argued, we must keep in mind that it is very difficult (indeed probably impossible) to measure beta with any degree of precision. The S&P 500 Index is not "the market." The Total Stock Market contains many thousands of additional stocks in the United States and thousands more in foreign countries. Moreover, the total market includes bonds, real estate, commodities, and assets of all sorts, including one of the most important assets any of us has - the human capital built up by education, work, and life experience. Depending on exactly how you measure "the market" you can obtain very different beta values.[9]

Pratt and Grabowski also stated the following with respect to the CAPM:

> Even though the capital asset pricing model (CAPM) is the most widely used method of estimating the cost of equity capital, the accuracy and predictive power of beta as the sole measure of risk have increasingly come under attack. As a result, alternative measures of risk have been proposed and tested. That is, despite its wide adoption, academics and practitioners alike have questioned the usefulness of CAPM in accurately estimating the cost of equity capital and the use of beta as a reliable measure of risk. [10]

As a practical matter, there is substantial judgment involved in estimating the required market return and MRP. In theory, the CAPM requires an estimate of the return on the total market for investments, including stocks, bonds, real estate, etc. It is nearly impossible for the analyst to estimate such a broad-based return. Often

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[9] *A Random Walk Down Wall Street*, Burton G. Malkiel, page 218, 2019 edition.

[10] *Cost of Capital*, Shannon Pratt and Roger Grabowski, 5th Edition, page 288, published by Wiley.

in utility cases, a market return is estimated using the S&P 500. However, as Dr. Malkiel pointed out, this is a limited source of information with respect to estimating the investor's required return for all investments. In practice, the total market return estimate faces significant limitations to its estimation and, ultimately, its usefulness in quantifying the investor required ROE.

In the final analysis, a considerable amount of judgment must be employed in determining the market return and expected risk premium elements of the CAPM equation. The analyst's application of judgment can significantly influence the results obtained from the CAPM. My past experience with the CAPM indicates that it is prudent to use a wide variety of data in estimating investor-required returns. Of course, the range of results may also be wide, indicating the difficulty in obtaining a reliable estimate from the CAPM.

Q. How did you estimate the market return and MRP of the CAPM?

A. I used two approaches to estimate the MRP portion of the CAPM equation. One approach uses the expected return on the market and is forward-looking. The other approach employs an historical risk premium based on actual stock and bond returns from 1926 through 2020.

Q. Please describe your forward-looking approach to estimating the MRP.

A. The first source I used was the Value Line Investment Analyzer Plus Edition for August 27, 2021. The Value Line Investment Analyzer provides a summary statistical report detailing, among other things, forecasted total annual return over the next 3 to 5 years. I present Value Line's projected annual returns on page 2 of Exhibit RAB-4. I included median and average projected annual return, resulting in a range of 9.00% to 9.84%. The average of these market returns is 9.42%.

Q. Please continue with your market return analysis.

A. I also considered a supplemental check to the Value Line projected market return estimates. Duff and Phelps compiled a study of historical returns on the stock market in its *Cost of Capital Navigator: U.S. Cost of Capital Module*, which is part of its Cost of Capital Navigator subscription service. Some analysts employ this historical data to estimate the MRP of stocks over the risk-free rate. The assumption is that a risk premium calculated over a long period of time is reflective of investor expectations going forward. Exhibit RAB-5 presents the calculation of the market returns and MRPs using the historical data from Duff and Phelps.

Q. Please explain how this historical risk premium is calculated.

A. Exhibit RAB-5 shows the arithmetic average of yearly historical stock market returns over the historical period from 1926 – 2020. The average annual income return for the 20-year Treasury bond is subtracted from these historical stock returns to obtain the historical MRP of stock returns over long-term Treasury bond income returns. The resulting historical MRP is 7.30%.

Q. Did you add an additional measure of the historical risk premium in this case?

A. Yes. Duff and Phelps reported the results of a study by Dr. Roger Ibbotson and Dr. Peng Chen indicating that the historical risk premium of stock returns over long-term government bond returns has been significantly influenced upward by substantial growth in the price/earnings ("P/E") ratio.[11] Duff and Phelps noted that this growth in the P/E ratio for stocks was subtracted out of the historical risk premium to arrive at an adjusted "supply side" historical arithmetic MRP. The most recent "supply side" historical MRP is 6.00%, which I have also included in Exhibit RAB-5.

Q. How did you determine the risk-free rate?

A. I used two different measures for the risk-free rate. The first measure is the average 30-year Treasury bond yield for the six-month period from February through July, 2021. This represents a current measure of the risk-free rate based on actual current Treasury yields, which is 2.18%.

The second measure comes from Duff and Phelps' most recent "normalized" risk-free rate of April 2021. Duff and Phelps developed this normalized risk-free rate using its measure of the "real risk free rate" and expected inflation. The Duff and Phelps normalized risk-free rate is 2.5%.

Q. Please summarize your calculated MRP estimates with the forward-looking data from Value Line and the historical Duff and Phelps equity risk premiums.

A. My MRPs from Exhibit RAB-4 and Exhibit RAB-5 are as follows:

- Forward-looking risk premiums 6.92% - 7.24%
- Historical risk premium 6.00% - 7.30%

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[11] *2019 Cost of Capital: Annual U.S. Guidance and Examples,* Duff and Phelps, Cost of Capital Navigator, Chapter 3, pp. 45 - 47.

By way of comparison, Duff and Phelps currently recommends a market equity risk premium of 5.5% that, combined with its normalized risk-free rate of 2.5%, resulted in a base U.S. cost of capital estimate of 8.0%. Based on this comparison, my range of equity risk premium estimates are certainly not overly conservative or understated.

Q. How did you determine the value for beta?

A. I obtained the betas for the companies in the proxy group from most recent Value Line reports. The average of the Value Line betas for the proxy group is 0.90.

Q. Please summarize the CAPM results.

A. For my forward-looking CAPM ROE estimates, the CAPM results range from 8.70% to 8.73%.[12] Using historical risk premiums, the CAPM results range from 7.58% to 9.07%.[13]

<u>Recommended ROE and Weighted Cost of Capital</u>

Q. Please summarize the cost of equity results for your DCF and CAPM analyses.

A. Table 2 summarizes my ROE results using the DCF and CAPM for the proxy group of companies.

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[12] Refer to Exhibit RAB-4, page 1.

[13] Refer to Exhibit RAB-5.

TABLE 2
SUMMARY OF ROE ESTIMATES

DCF Methodology	
Average Growth Rates	
- High	10.81%
- Low	8.42%
- Average	9.49%
Median Growth Rates:	
- High	10.60%
- Low	8.05%
- Average	9.20%
CAPM Methodology	
Forward-lookng Market Return:	
- Current 30-Year Treasury	8.70%
- D&P Normalized Risk-free Rate	8.73%
Historical Risk Premium:	
- Current 30-Year Treasury	7.58% - 8.75%
- D&P Normalized Risk-free Rate	7.90% - 9.07%

Q. What is your recommended ROE range for CGKY?

A. I recommend that the KPSC adopt a ROE range of 8.40% - 9.40% for the gas distribution operations of CGKY. My recommended ROE for the Company is 9.10%. At this point in time, the average ROE results using the Value Line earnings growth estimates appear to be inflated by two unsustainable double digit earnings growth estimates (10.0% and 11.5%). In this case, I based my recommended ROE range on the average Value Line dividend growth ROE and the consensus analysts' forecasted ROE results. The average of median ROE results also supports my recommendation, only being 10 basis points higher. In addition, if the average Value Line earnings growth ROE of 10.81% is omitted from the Method 1 calculations, the resulting average ROE is 9.06%. Finally, my recommended ROE exceeds all of the CAPM results at this time.

Q. Do you agree with CGKY's requested cost of long-term debt?

A. No. According to the Direct Testimony of CGKY witness Rea, page 50, he calculated a cost of long-term debt for the future test period of 4.56%. This cost included forecasted issues of long-term debt in 2021 and 2022 with expected debt cost rates of 3.90% and 4.00%, respectively. According to Mr. Rea, these future debt issuances are expected to be made on an intercompany basis to NiSource, CGKY's parent company.

In its First Request for Information, No. 38, the KYOAG requested that CGKY provide the basis for Mr. Rea's forecasted debt cost rates of 3.90% and 4.00% and to provide the actual cost of the debt issues for 2021 when issued. The Company responded that the actual cost of debt for the June 2021 issue was 3.272%, substantially below the 3.90% cost rate included in Mr. Rea's calculated cost of long-term debt in Attachment VVR-6.

Q. What is your recommendation with respect to the treatment of the forecasted debt issues included in the Company's capital structure?

A. I recommend that the actual debt cost rate of 3.272% for the June 2021 issuance be used for the remaining issues of forecasted long-term debt in 2021 and 2022. We cannot be sure what will happen to interest rates from now through 2022 and the 3.90% and 4.00% coupon rates are speculative at best. The 3.272% actual cost rate is certain, supportable, and reasonable to use through 2022. Using 3.272% for all forecasted issuances results in a cost of long-term debt of 4.37%. I have provided the calculations in my Exhibit RAB-6 and these calculations are based on the spreadsheet provided by the Company in response to the Staff's Second Set, No. 2-26, Attachment A.

Further, I recommend that CGKY update the cost of its September 2021 forecasted bond issuance in its Rebuttal Testimony if it is available.

Q. Do you agree with the amount of short-term debt that Mr. Rea included in the Company's proposed capital structure for the test year ended December 2022?

A. No. Historically CGKY has utilized a greater percentage of short-term debt in its capital structure than the 3.11% amount included by Mr. Rea in his ratemaking capital structure shown in Attachment VVR-5. Exhibit RAB-7 includes historical capital structure information from the Company's response to AG 1-040, Attachment AL. This response provided CGKY's historical 13-month average capital structures from 2015 through 2020. The 4-year average percentage of short-term debt was 4.15% and the 5-year average percentage was 3.88%.

Q. What is your recommendation for the amount of short-term debt to be included in CGKY's capital structure in this case?

A. Given the past history of CGKY's usage of short-term debt, I recommend that the Commission impute a percentage of 4.0% for short-term debt in the Company's capital structure for ratemaking purposes. My recommendation falls between the 4-year and 5-year average percentage of short-term debt actually used by the Company. Short-term debt is the lowest cost source of financing for the Company and an economical alternative for Kentucky ratepayers. I reduced the Company's requested equity ratio in order to increase the amount of short-term debt in the capital structure.

Q. Do you agree with CGKY's requested 1.40% cost of short-term debt?

A. No. The Company's requested cost of short-term debt is based on a 1-month LIBOR forward rate of 0.3173% and a revolver Eurodollar BBB+ spread of 1.075%. Adding these two components together resulted in the 1.40% (rounded) projected cost of short-term debt of 1.40%. According to CGKY's response to Staff 2-004, Attachment A, CGKY forecasted the 1-month LIBOR using data from Bloomberg as of March 29, 2021. The average forward LIBOR consisted of forward rates from 12/31/2021 through12/31/2022.

The current 1-month LIBOR is substantially lower than the forecasted LIBOR used by the Company. As of September 2, 2021 the current 1-month LIBOR is only 0.083% according to MarketWatch and the Wall Street Journal. MarketWatch noted that the 52-week range for the 1-month LIBOR was 0.07263% - 0.15863%.

The current LIBOR indicates that the Company's forward 1-month LIBOR is excessive and should be lowered. I recommend that the Commission utilize a LIBOR of 0.10%, which is the current LIBOR rounded up to the nearest tenth of a percent. Combined with the credit spread of 1.075%, I recommend a short-term cost of debt of 1.175%.

Q. What is your recommended weighted cost of capital for CGKY?

A. I recommend a weighted cost of capital of 6.69%. Table 3 below presents the details of the KYOAG weighted cost of capital.

TABLE 3

KYOAG Recommended Weighted Cost of Capital

	Pct.	Cost	Weighted Cost
Long-term Debt	44.25%	4.370%	1.93%
Short-term Debt	4.00%	1.175%	0.05%
Common Equity	51.75%	9.100%	4.71%
Total	100.00%		6.69%

<u>ROE Recommendation for Safety Modification and Replacement Program</u>

Q. Briefly describe the Company's Safety Modification and Replacement Program ("SMRP") Rider.

A. CGKY witness Roy provided a brief history on the SMRP beginning on page 46 of his Direct Testimony. The SMRP grew out of the Accelerated Main Replacement Program ("AMRP") that was approved by the Commission in Case No. 2009-00141. The AMRP transitioned to the SMRP in order to include additional safety enhancements that the Company identified in its Safety Management System. The Commission approved this transition in Case No. 2019-00257.

The SMRP Rider, like the AMRP before it, enables CGKY to include qualifying investments for collection though the rider, with yearly filings that are approved by the Commission. This treatment enables the Company to collect the costs of these investments without filing yearly full rate cases. Investments included in the SMRP

Rider are allowed to earn a return based on CGKY's approved weighted cost of capital.

Q. Should the Commission consider reducing the allowed ROE on investments included in the SMRP rider compared to the overall allowed ROE?

A. Yes. The Commission has recently applied a lower ROE to the capital costs being recovered in automatic adjustment mechanisms like CGKY's SMRP Rider. For example, in Case No. 2020-00061, the Commission approved a lower ROE for Louisville Gas and Electric Company ("LG&E") based on lower capital costs as well as lower risk of capital cost recovery through its Environmental Cost Recovery ("ECR") rider. The Commission's final Order in that proceeding, dated September 29, 2020, stated the following on page 20:

> The cost of equity is affected by the risk of shareholders not adequately recovering their investment, the risk associated with recovering the investment later than desired, and the risk from the shareholder receiving less than comparable investments. To reduce shareholder risk, utilities can recover specified expenditures, such as environmental expenditures, with more certainty and without filing a general rate case through specific riders. With a rider, since a return is guaranteed and the time line of recovery is known and ordinarily not meaningfully delayed, the required return is less than the ROE associated with a rate case as the risk involved is decreased and most lag associated with recovery is eliminated. According to the S&P Global Report for Major Rate Case Decisions - January - June 2020, after removing ROE premiums, limited rider ROEs are 43 basis points below the January - June 2020 vertically integrated ROE average of 9.67 percent.

Likewise in its Orders in Case Nos. 2020-00349 and 2020-00350 dated June 30, 2021, the Commission once again approved a lower ROE for the ECR riders for LG&E and Kentucky Utilities Co. ("KU"). In its Orders in these cases the

Commission (1) lowered the stipulated ROE from 9.55% to 9.425% and (2) approved the lower stipulated ROE applicable to the ECR of 9.35%.[14]

Finally, in its Order dated January 13, 2021 in Case No. 2020-00174 the Commission approved a 9.30% ROE for Kentucky Power Company and a 9.10% ROE for its ECR rider.[15]

Q. How much of a reduction in the allowed ROE should the Commission apply to the SMRP Rider?

A. Based on the Commission's past Orders, I recommend the Commission consider a reduction in the range of 10 - 20 basis points, or 0.10% - 0.20% to its allowed ROE in the case. If the Commission accepts my recommended ROE of 9.10%, then the ROE applied to the SMRP Rider would be in the range of 8.90% - 9.00%.

IV. RESPONSE TO COLUMBIA GAS OF KENTUCKY ROE TESTIMONY

Q. Please summarize your conclusions with respect to Mr. Rea's ROE recommendation.

A. Mr. Rea's recommended ROE range of 10.30% - 10.80% substantially overstates the investor required ROE for a lower risk gas distribution utility like CGKY. Based on his recommended range, Mr. Rea explained on page 4 that his recommended ROE is 10.55%, although the Company is requesting 10.30% in this case. Both 10.30% and

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[14] Refer to the Commission's discussion on pp. 19 - 23 of its Orders in Case No. 2020-00349 and pp. 21 - 26 in Case No. 2020-00350.

[15] See pp. 26 - 28 and pp. 40 - 51 of the Commission's Order.

10.55% should be rejected by the Commission. I will demonstrate subsequently how Mr. Rea's analyses systematically inflated his DCF, CAPM, and risk premium results.

Q. How did Mr. Rea develop his recommended ROE range for CGKY?

A. Mr. Rea employed three proxy groups in his analyses and applied the following models to each group: the DCF model, the traditional CAPM, the CAPM with a size adjustment, the Empirical CAPM ("ECAPM"), and the risk premium model. The cost of equity using these models is summarized on page 8, Table VVR-1 of Mr. Rea's Direct Testimony. Table VVR-2 on page 9 of his Direct Testimony further summarizes his results using the median and the mean. For the DCF, the median and mean results ranged from 10.54% - 10.64%. For the CAPM, the median and mean results ranged from 10.49% - 10.55%. For the risk premium model, the mean and median results ranged from 10.33% - 10.44%. From these measures of central tendency, Mr. Rea concluded that a reasonable range of results is 10.30% - 10.80%.

Q. Before you provide more detailed analyses of Mr. Rea's ROE methodologies, how does his recommended ROE range compare to recent authorized ROEs from regulatory commissions?

A. Mr. Rea's recommended ROE range is grossly in excess of recently authorized commission ROEs. Mr. Rea's recommended range also exceeds recent authorized ROEs from the KPSC as well as CGKY's authorized 9.50% ROE that was granted by the Commission for the Company's AMRP and for its allowance for funds used during construction ("AFUDC") rate in Case No. 2016-00162.

Q. Provide additional information with respect to the Commission's allowed 9.50% ROE for CGKY's AMRP and AFUDC rate.

A. In it Order Case No. 2016-00162[16], the Commission approved a stipulation that reflected a unanimous resolution of the issues in that case. One term of the stipulation was an agreed upon 9.8% ROE applicable to the Company's AFUDC rate and to its AMRP. The Commission rejected the 9.80% ROE and instead approved a ROE of 9.50%. In so doing, the Commission reasoning was as follows:

> In light of the record developed in this case, as well as the sustained downward trend in gas utility ROE awards as exhibited by the Regulatory Research Associates report introduced at the public hearing in this matter, the Commission finds a 9.8 percent ROE to be an unnecessarily high level to compensate investors for the risk in investing in Columbia's AMRP on an ongoing basis. (Commission Order, page 8)

> While not relying on the specific ROE awards summarized by the RRA report, the Commission takes notice of the simple fact that the quarterly average ROE awards for gas utilities did not rise above 9.5 percent in the first three quarters of 2016. Therefore, irrespective of the agreement by the parties that a 9.8 percent ROE is appropriate for Columbia's AMRP, the Commission finds no basis for use of that ROE for cost recovery. The controlling statute for the AMRP, KRS 278.509, provides that " . .. the commission may allow recovery of costs for investment in natural gas pipeline programs which are not recovered in the existing rates of a regulated utility. No recovery shall be allowed unless the costs shall have been deemed by the commission to be fair, just and reasonable." Similarly, base rates that are established to recover the cost of AFUDC must be "fair, just and reasonable" under KRS 278.030(1). The Commission finds the fair, just and reasonable ROE for Columbia's AMRP and its calculation of AFUDC, which reflect current economic conditions and investor expectations, to be 9.5 percent. (Commission Order, page 9)

I was the ROE expert for the KYOAG and submitted Direct Testimony and exhibits in that proceeding. In that case, the six-month average yield on the 20-Year Treasury Bond ending July 2016 was 2.13% and the yield on the Mergent average

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[16] Order entered December 22, 2016, Case No. 2016-00162.

utility bond yield as of July 2016 was 3.70%.[17] Compared to July 2016, the current Mergent average public utility bond yield is significantly lower so far in 2021, ranging from 2.94% - 3.48% during the year so far. With utility bond yields much lower now than in 2016, one should not expect utility ROEs to have increased since that time. This makes Mr. Rea's recommended 10.55% ROE highly inconsistent with the reasoning in the Commission's Order in CGKY's last rate case as well as the general level of interest rates currently.

Q. Are you aware of recent allowed ROEs from the Commission?

A. Yes. I mentioned ROEs recently allowed by the Commission in the section on the allowed ROE for the SMRP. I note that in Case No. 2020-00350 the Commission's Order of a 9.425% ROE for LG&E included both electric and gas operations. Other recent Commission ordered ROEs include:

- Kentucky Power, Case No. 2020-00174. The Commission ordered a ROE of 9.30% for Kentucky Power Company. It is my understanding that Kentucky Power filed an appeal of the Commission Order, which included ROE as one of the issues.
- Duke Energy Kentucky, Case No. 2019-00271. The Commission ordered a 9.25% ROE for Duke Energy Kentucky.

These two cases involved electric utility operations, but they indicate the general level and direction of the Commission's recent ROE awards.

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[17] Baudino Direct Testimony and Exhibits, Case No. 2016-00162, page 4 and Exhibit ___(RAB-5), page 2 of 2.

Q. What are the recent ROE allowed by regulatory commissions generally?

A. Mr. Rea cited the document entitled *RRA Regulatory Focus, Major Rate Case Decisions - January - December 2020* in footnote 15 on page 33 of his Direct Testimony. According to this document, which the Company provided under confidential seal in response to AG 1-040 (Attachment AJ), the average commission allowed ROE in fully litigated gas distribution rate cases was [redacted] in 2019 and [redacted] in 2020. Once again, these ROEs are substantially lower than Mr. Rea's recommendations and underscore the unreasonableness of his recommendation.

Please note that I do not recommend that the Commission authorize an ROE for CGKY based on the average allowed ROEs from other commissions around the country. Instead, the Commission should base its ROE decision on the analyses presented in this case. I am including the average commission-allowed ROE information here as additional information for the Commission to consider and because the Commission cited Regulatory Research Associates in its Order in 2016-00162.

<u>Proxy Groups</u>

Q. Briefly describe the proxy groups used by Mr. Rea in his ROE analyses.

A. Mr. Rea utilized three proxy groups in his ROE analyses. He began the discussion of his gas utility proxy group (Gas LDC Group) selection process on page 21 of his Direct Testimony. I reviewed Mr. Rea's selection criteria and the resulting proxy group of gas distribution companies is reasonable. Thus, I used this gas proxy group for my ROE analyses in this case. Mr. Rea concluded on pages 29 and 30 of his Direct Testimony that CGKY's risk is "slightly higher" than the Gas LDC Group, but not significantly higher to warrant a further upward adjustment to the group's indicated cost of equity.

On page 30 of his Direct Testimony, Mr. Rea explained that he also considered two other proxy groups. The Combination Utility Group consists of nine combination electric and gas companies and the Non-Regulated Group consists of twelve unregulated companies.

Q. Please comment on the Combination Utility Group employed by Mr. Rea.

A. According to Mr. Rea, the Combination Utility Group derives only 30% of its revenues from regulated gas utility operations. Thus, the Combination Utility Group will have a risk profile that reflects mostly regulated electric utility operations, rather than regulated gas operations. As such, it could only be considered a very rough complement to the gas distribution proxy group that Mr. Rea and I both employed. In this case, I recommend that the Commission rely on the gas proxy group that Mr. Rea and I included in our ROE analyses and not on the results of the Combination Utility Group.

Q. Should the Commission rely on Mr. Rea's Non-Regulated Group in evaluating the required ROE for CGKY?

A. No. Mr. Rea's inclusion of unregulated non-utility companies as an additional method of evaluating the fair rate of return for CGKY is inappropriate and should be rejected by the Commission.

Utilities have protected markets, e.g. service territories, and may increase the prices they charge in the face of falling demand or loss of customers. This is contrary to competitive, unregulated companies who often lower their prices when demand for their products decline. Obviously, the non-utility companies face risks that lower risk regulated gas utilities like CGKY do not face. As a consequence, non-utility companies will have higher required returns from their shareholders. Mr. Rea's DCF results for the Non-Regulated Group bear this out. The median results for the Non-Regulated Group range from 9.8% - 15.9% using projected growth rates according to Mr. Rea's Attachment VVR-9, page 1 of 6. Average results for the group range from 10.0% - 12.6%. This range would have been even higher if Mr. Rea hadn't excluded what he considered to be certain high-end results. The DCF ROE results he excluded ranged from 21.5% - 54.6%. Both the average and median ranges are far above the DCF results I obtained for the gas proxy group. This underscores my point that investors expect higher ROEs for these unregulated companies than they do for regulated gas utilities like CGKY. The Commission should reject the use of the Non-Regulated Group.

Q. For purposes of this case, then, will you focus your evaluation of Mr. Rea's ROE analyses on the Gas LDC Group?

A. Yes.

<u>**DCF Analyses**</u>

Q. Please comment on Mr. Rea's DCF analyses.

A. Mr. Rea presented the results of his DCF analyses in Table VVR-6, page 61, of his Direct Testimony. Mr. Rea placed the greatest emphasis on the results using consensus analysts' growth estimates. These results ranged from 7.20% - 11.60%, with Mr. Rea settling on a so-called "unadjusted" DCF estimate of 9.70%. Mr. Rea then added adjustments that he characterized as "required" to the unadjusted DCF estimate. He added a flotation cost adjustment that added 3 basis points and a financial risk adjustment that added 81 basis points, or 0.81%, resulting in an indicated DCF estimate of 10.54%.

Mr. Rea discussed the leverage adjustment in Appendix C of his Direct Testimony. In Mr. Rea's view, this adjustment accounts for the financial risk difference between market value and book value capital structures.[18]

Q. Is Mr. Rea's leverage adjustment of 0.81% to his DCF result appropriate?

A. No. Mr. Rea's leverage adjustment is inappropriate, inflates his recommended DCF result, and should be rejected by the Commission.

First, setting the allowed cost of capital for ratemaking purposes properly utilizes book values of common equity, preferred stock, and long-term debt. The actual book values of capitalization support the utility's investment in plant in service. With respect to the allowed return on common equity, commissions utilize market returns on book value in order to fairly compensate the equity investor for the use

[18] Rea Direct Testimony at page 60, lines 4-7.

of his or her capital. Market-based returns are used for common equity because, unlike debt, there is no contractual cost for common equity. Thus, the return on equity must be determined using current market data, and then applied to the percentage of equity in the capital structure based on book value.

It is inappropriate to inflate market-based ROE calculations from the DCF with the leverage adjustment Mr. Rea proposed. Market prices can deviate from book value for any number of reasons. For example, investors may expect utilities to earn more than their required rate of return on equity, which would cause an increase in market stock prices above book value per share. In uncertain times, investors may view regulated utilities as safe investments, causing a flight to quality and thereby bidding up stock prices. Further, in the current low interest rate environment investors likely find the higher dividend yields of relatively lower risk utility stocks attractive alternatives to bonds.

Market based cost of equity estimates applied to the book value of equity is the appropriate means in setting a fair rate of return on invested capital for a regulated utility. Results from the DCF should not be adjusted upward to account for or to prop up high market-to-book ratios, as Mr. Rea has done in this case.

In addition, it is highly doubtful that investors would take the complicated and circuitous route to measuring their required returns on equity that Mr. Rea proposed in his Direct Testimony. Instead, it is much more likely that investors would take a more direct approach and use market data on stock prices and expected growth to estimate a DCF return on equity.

Finally, I would note that bond rating agencies and securities analysts do not assess a utility company's risk based on the market value of its capital structure, but on the book value of its common equity. It is reasonable to assume that investors assess capital structure risk in the same manner. Mr. Rea provided no evidence that investors assess financial risk for regulated utility companies based on the market value of common equity.

Q. Should the Commission allow an adjustment for flotation costs in this proceeding?

A. No. A flotation cost adjustment attempts to recognize and collect the costs of issuing common stock. Such costs typically include legal, accounting, and printing costs as well as broker fees and discounts. However, it is likely that flotation costs are already accounted for in current stock prices and that adding an adjustment for flotation costs is double counting. A DCF model using current stock prices should already account for investor expectations regarding the collection of flotation costs. Multiplying the dividend yield by a 4% flotation cost adjustment, for example, essentially assumes that the current stock price is wrong and that it must be adjusted downward to increase the dividend yield and the resulting cost of equity. This is not an appropriate assumption regarding investor expectations or current stock prices. Stock prices most likely already account for flotation costs, to the extent that such costs are even considered by investors.

Q. Please comment on Mr. Rea's DCF results for the Gas LDC Group.

A. First, I agree with Mr. Rea's emphasis on analysts' forecasts for the growth component of the DCF model. However, Mr. Rea should have also considered Value Line's dividend growth forecast as well. Dividends are the cash flows actually received by investors and with Value Line being a trusted source of information, I believe that it is reasonable to consider Value Line's projection of dividend growth as well.

Second, I recommend that the Commission rely on my DCF results that have updated information on stock prices and analysts' forecasts for the gas proxy group.

Third, Mr. Rea relied on a process that eliminates so-called outlier results as explained in his Appendix B of his Direct Testimony. His approach is based on practices established by the Federal Energy Regulatory Commission for both "low-end" and "high end" outliers. However, Mr. Rea's methodology still allowed inclusion of excessively high ROE results of 13.0% and 15.6% from Value Line's projected earnings growth estimates, according to Attachment VVR-7, page 1 of 8. Normally, the median result from a DCF ROE analysis, which uses the ROE result in the middle of the range for the group, can mitigate the impact of both high-end and low-end results and that is the approach I took in this case.

<u>CAPM and ECAPM</u>

Q. What was the basis for Mr. Rea's risk-free rate in his CAPM analyses?

A. On page 73 of his Direct Testimony, Mr. Rea testified that he considered interest rate forecasts from *Blue Chip Financial Forecasts* and utilized 2.94% as a proxy for the prospective risk-free rate.

Q. Should Mr. Rea have also considered current yields on 30-Year Treasury Bonds in his CAPM/ECAPM analyses?

A. Yes. Current interest rates provide tangible evidence of investor preferences and required returns for Treasury securities. Moreover, securities markets are efficient and most likely reflect investors' expectations about future interest rates. As Dr. Morin pointed out in *New Regulatory Finance:*

> A considerable body of empirical evidence indicates that U.S. capital markets are efficient with respect to a broad set of information, including historical and publicly available information.[19]

Dr. Morin also noted the following:

> There is extensive literature concerning the prediction of interest rates. From this evidence, it appears that the no-change model of interest rates frequently provides the most accurate forecasts of future interest rates while at other times, the experts are more accurate. Naïve extrapolations of current interest rates frequently outperform published forecasts. The literature suggests that on balance, the bond market is very efficient in that it is difficult to consistently forecast interest rates with greater accuracy than a no-change model. The latter model provides similar, and in some cases, superior accuracy than professional forecasts.[20]

It is important to realize that investor expectations of changes in future interest rates, if any, are likely already embodied in current securities prices, which include

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[19] Morin, Roger A., *New Regulatory Finance*, Public Utilities Reports, Inc. (2006) at 279.

[20] Morin, Roger A., *New Regulatory Finance, Public Utilities Reports, Inc. (2006)* at 172.

debt securities and stock prices. Current interest rates provide tangible and verifiable market evidence of investor return requirements today and these are the interest rates and bond yields that should be used in both the CAPM and in the bond yield plus risk premium analyses. To the extent that investors give forecasted interest rates any weight at all, they are likely already incorporated in current securities prices.

The recent 6-month average of 2.18% on 30-year Treasury Bonds is substantially lower than the 2.94% forecasted yield used by Mr. Rea. It is clear that this forecasted Treasury Bond yield contributed to the inflated CAPM results that he presented.

Q. How did Mr. Rea estimate the expected RP for his CAPM/ECAPM analyses?

A. Mr. Rea used both historical and prospective measures to estimate the risk premium for the CAPM/ECAPM methods. The prospective measures included DCF analyses applied to the S&P 500 and the Value Line 1,700 stock universe of companies. The historical measure he used was based on the historical return data from the *2021 SBBI Yearbook.*

Regarding the prospective measures, Mr. Rea estimated the DCF return on the S&P 500 using the constant growth approach, with an average growth rate of 12.32%, resulting in an estimated market return of 13.93%. The resulting MRP using this approach is 10.99% (13.93% less the risk-free rate of 2.94%). Applying this MRP to the CAPM equation using Mr. Rea's unlevered beta of 0.969, and his projected risk-free rate of 2.94% results in the following CAPM ROE:

$$CAPM\ ROE = 2.94\% + (.969 * 10.99\%) = 13.59\%$$

Mr. Rea's CAPM result using his projected S&P 500 MRP is so far out of line with recently allowed ROEs that I described earlier that it should be rejected out of hand. Moreover, if we added his proposed size adjustment of 0.75%, which I will address later, the CAPM ROE would be 14.34%. I note once again that I do not recommend that the Commission base its ROE determination on the allowed returns in other regulatory jurisdictions. Rather, I cited allowed returns as a rough benchmark by which the Commission can judge the reasonableness of Mr. Rea's CAPM result and how excessive it is compared to recent experience. Indeed, CAPM results of 13.59% and 14.34% are clearly unreasonable and I recommend they be rejected by the Commission.

Q. Why is Mr. Rea's projected MRP for the S&P 500 so high?

A. The problem with Mr. Rea's projected MRP for the S&P 500 stems from his overstated expected growth rate 12.32%. According to Mr. Rea's Attachment VVR-11, page 2 of 6, this growth rate was derived from Bloomberg and Yahoo! Finance earnings growth rate forecasts. These earnings growth rates are unsustainably high in that they vastly exceed both the historical capital appreciation for the S&P 500 as well as historical and projected GDP growth rates. Duff and Phelps' historical analysis shows that the arithmetic average capital appreciation for the S&P 500 was 8.0% for the historical period 1926 - 2020.[21] Geometric, or compound growth was 6.20%. This historical experience stands in stark contrast to Mr. Rea's growth rate of 12.32%.

This inflated growth rate is not supportable when one further considers both historical and forecasted GDP growth for the U.S. Based on data from the Bureau of Economic Analysis, U.S. Department of Commerce, I calculated that the compound yearly growth rate for U.S. GDP from 1929 - 2020 was 6.0%. Note how this growth nearly matched the historical compound growth rate for capital appreciation for the S&P 500. Regarding forecasts, the Fed’s projections that I referenced in Section II of my testimony called for longer-run real GDP growth of 1.8% and PCE inflation of 2.0%. This translates into forecasted nominal GDP of roughly 3.80%. The July 2021 *Update to the Economic Outlook: 2021 to 2031* from the Congressional Budget Office (“CBO”) shows forecasted nominal GDP to grow at a yearly rate of 3.40% - 3.70% from 2024 to 2031. If we assume forecasted long run GDP growth of around 4.0%, then it is highly unlikely that the market growth rate of 12.32% is sustainable over the long run.

In *Cost of Capital*, Pratt and Grabowski noted the following with respect to growth rates that significantly exceed growth in GDP:

> The growth rate assumed in calculating the terminal value is a compound growth rate *in perpetuity*, which is a very long time. At a growth rate of 20% compounded annually, the company's revenues would soon exceed the gross domestic product

21 *Summary Statistics of Annual Total Returns, Income Returns, and Capital Appreciation Returns of Basic U.S. Asset Classes*, 1926 - 2020, Cost of Capital Navigator: U.S. Cost of Capital Module

> (GDP) of the United States and eventually that of the world. Long-term growth rates exceeding the real growth in GDP plus inflation are generally not sustainable. Most analysts use more conservative growth rates in calculating the terminal value. Generally, the long-term growth rate only applies to the existing enterprise or core business net cash flows, consistent with the net cash flow projections in the discounted cash flow method ... [22]

Since the constant growth DCF requires a sustainable long-run growth rate, Mr. Rea's inflated projected market return and MRP estimate is erroneous and should be rejected.

Q. Are there other sources of which you are aware that suggest Mr. Rea's projected S&P 500 MRP of 10.99% estimate is unreasonably high?

A. Yes. In the authoritative corporate finance textbook by Brealey, Myers, and Allen the authors stated "Brealey, Myers, and Allen have no official position on the issue, but we believe that a range of 5 to 8 percent is reasonable for the risk premium in the United States."[23]

As I cited earlier in my Direct Testimony, Duff and Phelps currently recommends a MRP of 5.5%, a risk free rate of 2.5%, and an overall U. S. cost of equity of 8.0%. These sources underscore how much Mr. Rea's recommended projected S&P 500 MRP, and his CAPM results in general, are overstated. Mr. Rea and I both relied on Duff & Phelps *Cost of Capital Navigator* in our analyses, yet Mr. Rea did not consider its currently recommended MRP of 5.5% in his analysis.

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[22] *Cost of Capital*, Shannon Pratt and Roger Grabowski, Fifth Edition, page 1195, published by Wiley.

[23] Richard A. Brealey, Stewart C. Myers, and Paul Allen, *Principles of Corporate Finance*, page 154; McGraw-Hill/Irwin, 8th Edition, 2006.

Q. On page 78 of his Direct Testimony, Mr. Rea demonstrated how he applied the Hamada equation to "re-lever" the Value Line betas for his Gas LDC Group, his Combination Utility Group, and his Non-Regulated Group. What is your recommendation regarding Mr. Rea's proposed re-levered Value Line betas?

A. The Commission should reject Mr. Rea's reformulated beta estimate. The appropriate beta to use in the CAPM is one that investors expect based on a stock's relative price movements with the overall market. Mr. Rea introduced a highly questionable adjustment to published Value Line betas based on differences between market and book value capital structures. His claim that a leveraged beta should be used in the CAPM for ratemaking purposes is erroneous. He provided no evidence that investors in utility company stocks use the calculation of a re-levered beta he presented in his testimony. It is more reasonable to assume that, to the extent investors rely on the CAPM model, they likely rely on widely published beta estimates from Value Line and other sources. Mr. Rea's re-levered beta calculation increased the published Value Line beta for the Gas LDC Group from 0.89 to 0.969, an increase of 8.90%, and further served to overstate his CAPM results.

Q. Beginning on page 80 of his Direct Testimony, Mr. Rea explained why, in his opinion, a size adjustment is required in the CAPM. Please address Mr. Rea's testimony on this point.

A. The data that Mr. Rea relied on to make this adjustment came from the Duff and Phelps *Cost of Capital Navigator*. Mr. Rea calculated a size premium of 0.75% associated with the smaller size of the Gas LDC Group. This size premium is based on the Decile 4 group from the Duff and Phelps study on size premiums, which is a subset of companies with market capitalization similar to the Gas LDC Group.

The problem with Mr. Rea's approach is that the Decile 4 group of companies contains many smaller and more risky unregulated companies. Moreover, this Decile 4 group had an average beta of 1.13 - 1.20 depending on the calculation method used by Duff and Phelps. These betas are far greater than the average gas utility proxy group betas, which average 0.90 in my CAPM analyses. The beta comparison indicates that the many unregulated companies in Decile 4 are riskier than regulated gas distribution utilities like CGKY. There is no evidence to suggest that the size premium recommended by Mr. Rea applies to regulated gas utility companies. I recommend that the Commission reject Mr. Rea's small size adjustment of 0.75% in the CAPM.

Q. Please address Mr. Rea's use of the ECAPM, which he introduced on page 81 of his Direct Testimony.

A. The ECAPM is designed to account for the possibility that the CAPM understates the ROE for companies with betas less than 1.0. Mr. Rea applied an ECAPM formula included in *New Regulatory Finance* by Dr. Roger Morin, which is set forth on page 82 of his Direct Testimony.

The argument that an adjustment factor is needed to “correct” the CAPM results for companies with betas less than 1.0 is further evidence of the lack of accuracy inherent in the CAPM itself and with beta in particular, as I pointed out in Section III of my Direct Testimony. The ECAPM adjustment also suggests that published betas by such sources as Value Line are incorrect and that investors should not rely on them in formulating their estimates using the CAPM. Finally, although Mr. Rea cited the source of the ECAPM formula he used, he provided no evidence that investors favor this version of the ECAPM over the standard CAPM.

Risk Premium Analyses

Q. Before you address the specifics of Mr. Rea's risk premium ("RP") analyses, do you have any general comments regarding the risk premium method of estimating the investor required ROE for regulated utilities?

A. Yes. The bond yield plus risk premium approach is imprecise and can only provide very general guidance on the current authorized ROE for a regulated gas utility. Historical risk premiums can change substantially over time based on investor preferences and market conditions. As such, this approach is a "blunt instrument," if you will, for estimating the ROE in regulated proceedings. In my view, a properly formulated DCF model using current stock prices and growth forecasts is far more reliable and accurate than the bond yield plus risk premium model that relies on an historical analysis of risk premiums.

Q. Please generally describe the RP approach to estimating the investor required ROE.

A. The RP approach applies the fundamental premise that investing in a bond is less risky than investing in common stock and that common shareholders will require a premium over bond yields to compensate for the additional risk. Common shareholders will be paid dividends only after contractual debt service obligations and preferred dividends are met. This is also true in the event a company is liquidated, a scenario in which bond holders will be paid first and if any funds are left after that, common shareholder will be paid. Due to the inherent additional risks common shareholders face compared to bond holders, there will be an additional risk premium demanded by common shareholders for investing in the common stock of any company. The RP method, then, attempts to quantify that additional risk premium for stocks returns over bond returns.

Q. Please summarize and describe Mr. Rea's approach to estimating the RP ROE.

A. Mr. Rea began his discussion of the RP approach beginning on page 84 of his Direct Testimony. With respect to the Gas LDC Group, Mr. Rea used a prospective bond yield of 4.35%. Mr. Rea began with a forecasted Aaa rated corporate bond yield of 3.67% from *Blue Chip Financial Forecasts.* He then added credit spreads to reflect the difference between the forecasted Aaa bond yield and the yield on an A-/A3 rated public utility bond. The additional credit spreads are shown on page 1 of Attachment VVR-12, page 1.

Mr. Rea then estimated risk premiums using both a total market approach and a public utility index approach. Both of these approaches used historical and forecasted data. Regarding the total market approach, Mr. Rea employed the same prospective market return data that he used in his CAPM analyses. He also used historical returns from the *SBBI 2021 Yearbook.* Subtracting the total historical return for long-term corporate bonds (6.50%) from the total historical return on large company stocks (12.20%) resulted in a historical RP of 5.70%. Using the prospective return on the market of 11.28% and subtracting the forecasted Aaa bond yield of 3.67% resulted in a RP of 7.61%. Mr. Rea averaged these two RPs, resulting in an average RP of 6.65%. He then multiplied his re-levered beta for the Gas LDC Group from his CAPM analysis, 0.969, by the RP of 6.65% and obtained the adjusted RP applicable to the Gas LDC Group of 6.44%.

Mr. Rea began his discussion of his public utility index approach on page 94 of his Direct Testimony. The historical RP was based on historical returns for the S&P 500 Utilities Index and historical yields for long-term A-rated utility bonds. The resulting RP was 4.55%. For his currently implied RP analysis, Mr. Rea used the expected return on the S&P 500 Utilities Index of 9.35% less recent yields on A-rated utility bonds of 3.00%, with a resulting RP of 6.35%. The average of the two RPs was 5.45%.

Mr. Rea testified on page 95 of his Direct Testimony that he placed equal emphasis on the total market and public utility index approaches, concluding that a RP of 5.95% is reasonable for the Gas LDC Group. Adding this RP to the forecasted bond yield for the Gas LDC Group resulted in a RP ROE of 10.30%. Mr. Rea then added 3 basis points for a flotation cost adjustment, resulting in a 10.33% RP ROE for the Gas LDC Group.

Q. Should Mr. Rea have considered current utility bond yields for his RP analyses?

A. Yes, definitely, and for the same reasons I described in my response to Mr. Rea's CAPM approach. The current Mergent average utility bond yield was 2.99% as of July 2021, which is 136 basis points (1.36%) lower than the prospective yield developed by Mr. Rea. Relying on interest rate forecasts is risky and can result in an excessive cost of capital for ratepayers. This is underscored by the forecasted June 2021 bond yield of 3.90% that Mr. Rea used in his cost of debt calculations. The actual cost of that issue was 3.272%, substantially lower than Mr. Rea's erroneous forecast.

Q. Did you prepare an adjusted RP ROE estimate using current bond yields?

A. Yes. Exhibit RAB-8 presents an adjusted RP ROE estimate using Mr. Rea's total market approach and current long-term bond yields. I began with the data Mr. Rea presented on Attachment VVR-12, page 4 of 10, and made the following adjustments:

- I excluded Mr. Rea's projected market return on the S&P 500 of 13.93%. I explained earlier in my testimony why this projected market return is overstated and unreasonable. I included Mr. Rea's projected return for the Value Line 1,700 stock universe of 8.63%, shown on Line 5 of Exhibit RAB-8.
- I included the July 2021 yield on the Aaa rated corporate bond of 2.57% from the Mergent Bond Record on Line 6.
- I included the Value Line average beta of 0.90 for the Value Line gas proxy group from my CAPM analyses. I explained earlier in my testimony why Mr. Rea's re-levered beta for the gas proxy group is overstated.
- I included the July 2021 Mergent average public utility bond yield of 2.99% on line 11, replacing Mr. Rea's inflated projected utility bond yield of 4.35%

After these adjustments, the total market approach RP ROE is 8.28%.

Additionally, replacing Mr. Rea's forecasted utility bond yield of 4.35% with the July 2021 bond yield from Mergent results in the following public utility index RP ROE:

RP ROE = 2.99% + 5.45% RP = 8.44%

Replacing Mr. Rea's greatly overstated 4.35% gas utility bond yield with a current bond yield and eliminating the excessive S&P 500 Utilities DCF return resulted in much lower RP ROE estimates that are consistent with the lower end of my recommended ROE range.

Q. Does this complete your Direct Testimony?

A. Yes.

AFFIDAVIT

STATE OF GEORGIA)

COUNTY OF FULTON)

RICHARD A. BAUDINO, being duly sworn, deposes and states: that the attached is his sworn testimony and that the statements contained are true and correct to the best of his knowledge, information and belief.

Richard A. Baudino

Richard A. Baudino

Sworn to and subscribed before me on this 8th day of September 2021.

Jessica K. Inman

Notary Public

JESSICA K INMAN
NOTARY PUBLIC
MY COMMISSION EXPIRES JULY 31, 2023
CHEROKEE COUNTY, GEORGIA

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF	**)**	
COLUMBIA GAS OF KENTUCKY, INC.	**)**	
FOR AN ADJUSTMENT OF RATES;	**)**	
APPROVAL OF DEPRECIATION STUDY;	**)**	**CASE NO. 2021-00183**
APPROVAL OF TARIFF REVISIONS;	**)**	
ISSUANCE OF A CERTIFICATE OF	**)**	
PUBLIC CONVENIENCE AND NECESSITY;	**)**	
AND OTHER RELIEF	**)**	

EXHIBITS

OF

RICHARD A. BAUDINO

ON BEHALF OF

THE KENTUCKY OFFICE OF THE ATTORNEY GENERAL

J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA

SEPTEMBER 8, 2021

RESUME OF RICHARD A. BAUDINO

EDUCATION

New Mexico State University, M.A.
Major in Economics
Minor in Statistics

New Mexico State University, B.A.
Economics
English

Thirty-nine years of experience in utility ratemaking and the application of principles of economics to the regulation of electric, gas, and water utilities. Broad based experience in revenue requirement analysis, cost of capital, rate of return, cost and revenue allocation, and rate design.

REGULATORY TESTIMONY

Preparation and presentation of expert testimony in the areas of:

Cost of Capital for Electric, Gas and Water Companies
Electric, Gas, and Water Utility Cost Allocation and Rate Design
Revenue Requirements
Gas and Electric industry restructuring and competition
Fuel cost auditing
Ratemaking Treatment of Generating Plant Sale/Leasebacks

RESUME OF RICHARD A. BAUDINO

EXPERIENCE

1989 to Present: **Kennedy and Associates: Director of Consulting, Consultant** - Responsible for consulting assignments in revenue requirements, rate design, cost of capital, economic analysis of generation alternatives, electric and gas industry restructuring/competition and water utility issues.

1982 to 1989: **New Mexico Public Service Commission Staff: Utility Economist** - Responsible for preparation of analysis and expert testimony in the areas of rate of return, cost allocation, rate design, finance, phase-in of electric generating plants, and sale/leaseback transactions.

CLIENTS SERVED

Regulatory Commissions

Louisiana Public Service Commission
Georgia Public Service Commission
New Mexico Public Service Commission

Other Clients and Client Groups

Ad Hoc Committee for a Competitive Electric Supply System
Air Products and Chemicals, Inc.
Arkansas Electric Energy Consumers
Arkansas Gas Consumers
AK Steel
Armco Steel Company, L.P.
Aqua Large Users Group
Assn. of Business Advocating Tariff Equity
Atmos Cities Steering Committee
Canadian Federation of Independent Businesses
CF&I Steel, L.P.
Cities of Midland, McAllen, and Colorado City
Cities Served by Texas-New Mexico Power Co.
Cities Served by AEP Texas
City of New York
Climax Molybdenum Company
Connecticut Industrial Energy Consumers
Crescent City Power Users Group
Cripple Creek & Victor Gold Mining Co.
Dearborn Industrial Generation, LLC
General Electric Company
Holcim (U.S.) Inc.
IBM Corporation
Industrial Energy Consumers
Kentucky Industrial Utility Consumers
Kentucky Office of the Attorney General
Lexington-Fayette Urban County Government
Large Electric Consumers Organization
Newport Steel
North Carolina Attorney General's Office
Northwest Arkansas Gas Consumers
Maryland Energy Group
Occidental Chemical
PSI Industrial Group
Large Power Intervenors (Minnesota)
Tyson Foods
West Virginia Energy Users Group
The Commercial Group
Wisconsin Industrial Energy Group
South Florida Hospital and Health Care Assn.
PP&L Industrial Customer Alliance
Philadelphia Area Industrial Energy Users Gp.
Philadelphia Large Users Group
West Penn Power Intervenors
Duquesne Industrial Intervenors
Met-Ed Industrial Users Gp.
Penelec Industrial Customer Alliance
Penn Power Users Group
Columbia Industrial Intervenors
U.S. Steel & Univ. of Pittsburg Medical Ctr.
Multiple Intervenors
Maine Office of Public Advocate
Missouri Office of Public Counsel
University of Massachusetts - Amherst
WCF Hospital Utility Alliance
West Travis County Public Utility Agency
Steering Committee of Cities Served by Oncor
Utah Office of Consumer Services
Healthcare Council of the National Capital Area
Vermont Department of Public Service
Texas Industrial Energy Consumers

Expert Testimony Appearances
of
Richard A. Baudino
As of September 2021

Date	Case	Jurisdict.	Party	Utility	Subject
10/83	1803, 1817	NM	New Mexico Public Service Commission	Southwestern Electric Coop.	Rate design.
11/84	1833	NM	New Mexico Public Service Commission Palo Verde	El Paso Electric Co.	Service contract approval, rate design, performance standards for nuclear generating system
1983	1835	NM	New Mexico Public Service Commission	Public Service Co. of NM	Rate design.
1984	1848	NM	New Mexico Public Service Commission	Sangre de Cristo Water Co.	Rate design.
02/85	1906	NM	New Mexico Public Service Commission	Southwestern Public Service Co.	Rate of return.
09/85	1907	NM	New Mexico Public Service Commission	Jornada Water Co.	Rate of return.
11/85	1957	NM	New Mexico Public Service Commission	Southwestern Public Service Co.	Rate of return.
04/86	2009	NM	New Mexico Public Service Commission	El Paso Electric Co.	Phase-in plan, treatment of sale/leaseback expense.
06/86	2032	NM	New Mexico Public Service Commission	El Paso Electric Co.	Sale/leaseback approval.
09/86	2033	NM	New Mexico Public Service Commission	El Paso Electric Co.	Order to show cause, PVNGS audit.
02/87	2074	NM	New Mexico Public Service Commission	El Paso Electric Co.	Diversification.
05/87	2089	NM	New Mexico Public Service Commission	El Paso Electric Co.	Fuel factor adjustment.
08/87	2092	NM	New Mexico Public Service Commission	El Paso Electric Co.	Rate design.
10/87	2146	NM	New Mexico Public Service Commission	Public Service Co. of New Mexico	Financial effects of restructuring, reorganization.
07/88	2162	NM	New Mexico Public Service Commission	El Paso Electric Co.	Revenue requirements, rate design, rate of return.

**Expert Testimony Appearances
of
Richard A. Baudino
As of September 2021**

Date	Case	Jurisdict.	Party	Utility	Subject
01/89	2194	NM	New Mexico Public Service Commission	Plains Electric G&T Cooperative	Economic development.
1/89	2253	NM	New Mexico Public Service Commission	Plains Electric G&T Cooperative	Financing.
08/89	2259	NM	New Mexico Public Service Commission	Homestead Water Co.	Rate of return, rate design.
10/89	2262	NM	New Mexico Public Service Commission	Public Service Co. of New Mexico	Rate of return.
09/89	2269	NM	New Mexico Public Service Commission	Ruidoso Natural Gas Co.	Rate of return, expense from affiliated interest.
12/89	89-208-TF	AR	Arkansas Electric Energy Consumers	Arkansas Power & Light Co.	Rider M-33.
01/90	U-17282	LA	Louisiana Public Service Commission	Gulf States Utilities	Cost of equity.
09/90	90-158	KY	Kentucky Industrial Utility Consumers	Louisville Gas & Electric Co.	Cost of equity.
09/90	90-004-U	AR	Northwest Arkansas Gas Consumers	Arkansas Western Gas Co.	Cost of equity, transportation rate.
12/90	U-17282 Phase IV	LA	Louisiana Public Service Commission	Gulf States Utilities	Cost of equity.
04/91	91-037-U	AR	Northwest Arkansas Gas Consumers	Arkansas Western Gas Co.	Transportation rates.
12/91	91-410-EL-AIR	OH	Air Products & Chemicals, Inc., Armco Steel Co., General Electric Co., Industrial Energy Consumers	Cincinnati Gas & Electric Co.	Cost of equity.
05/92	910890-EI	FL	Occidental Chemical Corp.	Florida Power Corp.	Cost of equity, rate of return.
09/92	92-032-U	AR	Arkansas Gas Consumers	Arkansas Louisiana Gas Co.	Cost of equity, rate of return, cost-of-service.
09/92	39314	ID	Industrial Consumers for Fair Utility Rates	Indiana Michigan Power Co.	Cost of equity, rate of return.

**Expert Testimony Appearances
of
Richard A. Baudino
As of September 2021**

Date	Case	Jurisdict.	Party	Utility	Subject
09/92	92-009-U	AR	Tyson Foods	General Waterworks	Cost allocation, rate design.
01/93	92-346	KY	Newport Steel Co.	Union Light, Heat & Power Co.	Cost allocation.
01/93	39498	IN	PSI Industrial Group	PSI Energy	Refund allocation.
01/93	U-10105	MI	Association of Businesses Advocating Tariff Equality (ABATE)	Michigan Consolidated Gas Co.	Return on equity.
04/93	92-1464-EL-AIR	OH	Air Products and Chemicals, Inc., Armco Steel Co., Industrial Energy Consumers	Cincinnati Gas & Electric Co.	Return on equity.
09/93	93-189-U	AR	Arkansas Gas Consumers	Arkansas Louisiana Gas Co.	Transportation service terms and conditions.
09/93	93-081-U	AR	Arkansas Gas Consumers	Arkansas Louisiana Gas Co.	Cost-of-service, transportation rates, rate supplements; return on equity; revenue requirements.
12/93	U-17735	LA	Louisiana Public Service Commission Staff	Cajun Electric Power Cooperative	Historical reviews; evaluation of economic studies.
03/94	10320	KY	Kentucky Industrial Utility Customers	Louisville Gas & Electric Co.	Trimble County CWIP revenue refund.
4/94	E-015/ GR-94-001	MN	Large Power Intervenors	Minnesota Power Co.	Evaluation of the cost of equity, capital structure, and rate of return.
5/94	R-00942993	PA	PG&W Industrial Intervenors	Pennsylvania Gas & Water Co.	Analysis of recovery of transition costs.
5/94	R-00943001	PA	Columbia Industrial Intervenors	Columbia Gas of Pennsylvania charge proposals.	Evaluation of cost allocation, rate design, rate plan, and carrying
7/94	R-00942986	PA	Armco, Inc., West Penn Power Industrial Intervenors	West Penn Power Co.	Return on equity and rate of return.
7/94	94-0035-E-42T	WV	West Virginia Energy Users' Group	Monongahela Power Co.	Return on equity and rate of return.

**Expert Testimony Appearances
of
Richard A. Baudino
As of September 2021**

Date	Case	Jurisdict.	Party	Utility	Subject
8/94	8652	MD	Westvaco Corp. Co.	Potomac Edison	Return on equity and rate of return.
9/94	930357-C	AR	West Central Arkansas Gas Consumers	Arkansas Oklahoma Gas Corp.	Evaluation of transportation service.
9/94	U-19904	LA	Louisiana Public Service Commission	Gulf States Utilities	Return on equity.
9/94	8629	MD	Maryland Industrial Group	Baltimore Gas & Electric Co.	Transition costs.
11/94	94-175-U	AR	Arkansas Gas Consumers	Arkla, Inc.	Cost-of-service, rate design, rate of return.
3/95	RP94-343-000	FERC	Arkansas Gas Consumers	NorAm Gas Transmission	Rate of return.
4/95	R-00943271	PA	PP&L Industrial Customer Alliance	Pennsylvania Power & Light Co.	Return on equity.
6/95	U-10755	MI	Association of Businesses Advocating Tariff Equity	Consumers Power Co.	Revenue requirements.
7/95	8697	MD	Maryland Industrial Group	Baltimore Gas & Electric Co.	Cost allocation and rate design.
8/95	95-254-TF U-2811	AR	Tyson Foods, Inc.	Southwest Arkansas Electric Cooperative	Refund allocation.
10/95	ER95-1042 -000	FERC	Louisiana Public Service Commission	Systems Energy Resources, Inc.	Return on Equity.
11/95	I-940032	PA	Industrial Energy Consumers of Pennsylvania	State-wide - all utilities	Investigation into Electric Power Competition.
5/96	96-030-U	AR	Northwest Arkansas Gas Consumers	Arkansas Western Gas Co.	Revenue requirements, rate of return and cost of service.
7/96	8725	MD	Maryland Industrial Group	Baltimore Gas & Electric Co.,Potomac Electric Power Co. and Constellation Energy Corp.	Return on Equity.
7/96	U-21496	LA	Louisiana Public Service Commission	Central Louisiana Electric Co.	Return on equity, rate of return.
9/96	U-22092	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Return on equity.

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1/97	RP96-199-000	FERC	The Industrial Gas Users Conference	Mississippi River Transmission Corp.	Revenue requirements, rate of return and cost of service.
3/97	96-420-U	AR	West Central Arkansas Gas Corp.	Arkansas Oklahoma Gas Corp.	Revenue requirements, rate of return, cost of service and rate design.
7/97	U-11220	MI	Association of Business Advocating Tariff Equity	Michigan Gas Co. and Southeastern Michigan Gas Co.	Transportation Balancing Provisions.
7/97	R-00973944	PA	Pennsylvania American Water Large Users Group	Pennsylvania-American Water Co.	Rate of return, cost of service, revenue requirements.
3/98	8390-U	GA	Georgia Natural Gas Group and the Georgia Textile Manufacturers Assoc.	Atlanta Gas Light	Rate of return, restructuring issues, unbundling, rate design issues.
7/98	R-00984280	PA	PG Energy, Inc. Intervenors	PGE Industrial	Cost allocation.
8/98	U-17735	LA	Louisiana Public Service Commission	Cajun Electric Power Cooperative	Revenue requirements.
10/98	97-596	ME	Maine Office of the Public Advocate	Bangor Hydro-Electric Co.	Return on equity, rate of return.
10/98	U-23327	LA	Louisiana Public Service Commission	SWEPCO, CSW and AEP	Analysis of proposed merger.
12/98	98-577	ME	Maine Office of the Public Advocate	Maine Public Service Co.	Return on equity, rate of return.
12/98	U-23358	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Return on equity, rate of return.
3/99	98-426	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Co	Return on equity.
3/99	99-082	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co.	Return on equity.
4/99	R-984554	PA	T. W. Phillips Users Group	T. W. Phillips Gas and Oil Co.	Allocation of purchased gas costs.
6/99	R-0099462	PA	Columbia Industrial Intervenors	Columbia Gas of Pennsylvania	Balancing charges.
10/99	U-24182	LA	Louisiana Public Service Commission	Entergy Gulf States,Inc.	Cost of debt.

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10/99	R-00994782	PA	Peoples Industrial Intervenors	Peoples Natural Gas Co.	Restructuring issues.
10/99	R-00994781	PA	Columbia Industrial Intervenors	Columbia Gas of Pennsylvania	Restructuring, balancing charges, rate flexing, alternate fuel.
01/00	R-00994786	PA	UGI Industrial Intervenors	UGI Utilities, Inc.	Universal service costs, balancing, penalty charges, capacity Assignment.
01/00	8829	MD	Maryland Industrial Gr.	Baltimore Gas & Electric Co.	Revenue requirements, cost allocation, rate design.
02/00	R-00994788	PA	Penn Fuel Transportation	PFG Gas, Inc., and	Tariff charges, balancing provisions.
05/00	U-17735	LA	Louisiana Public Service Comm.	Louisiana Electric Cooperative	Rate restructuring.
07/00	2000-080	KY	Kentucky Industrial Utility Consumers	Louisville Gas and Electric Co.	Cost allocation.
07/00	U-21453 U-20925 (SC), U-22092 (SC) (Subdocket E)	LA	Louisiana Public Service Commission	Southwestern Electric Power Co.	Stranded cost analysis.
09/00	R-00005654	PA	Philadelphia Industrial And Commercial Gas Users Group.	Philadelphia Gas Works	Interim relief analysis.
10/00	U-21453 U-20925 (SC), U-22092 (SC) (Subdocket B)	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Restructuring, Business Separation Plan.
11/00	R-00005277 (Rebuttal)	PA	Penn Fuel Transportation Customers	PFG Gas, Inc. and North Penn Gas Co.	Cost allocation issues.
12/00	U-24993	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Return on equity.
03/01	U-22092	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Stranded cost analysis.
04/01	U-21453 U-20925 (SC), U-22092 (SC) (Subdocket B) (Addressing Contested Issues)	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Restructuring issues.
04/01	R-00006042	PA	Philadelphia Industrial and Commercial Gas Users Group	Philadelphia Gas Works	Revenue requirements, cost allocation and tariff issues.

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11/01	U-25687	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Return on equity.
03/02	14311-U	GA	Georgia Public Service Commission	Atlanta Gas Light	Capital structure.
08/02	2002-00145	KY	Kentucky Industrial Utility Customers	Columbia Gas of Kentucky	Revenue requirements.
09/02	M-00021612	PA	Philadelphia Industrial And Commercial Gas Users Group	Philadelphia Gas Works	Transportation rates, terms, and conditions.
01/03	2002-00169	KY	Kentucky Industrial Utility Customers	Kentucky Power	Return on equity.
02/03	02S-594E	CO	Cripple Creek & Victor Gold Mining Company	Aquila Networks – WPC	Return on equity.
04/03	U-26527	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Return on equity.
10/03	CV020495AB	GA	The Landings Assn., Inc.	Utilities Inc. of GA	Revenue requirement & overcharge refund
03/04	2003-00433	KY	Kentucky Industrial Utility Customers	Louisville Gas & Electric	Return on equity, Cost allocation & rate design
03/04	2003-00434	KY	Kentucky Industrial Utility Customers	Kentucky Utilities	Return on equity
4/04	04S-035E	CO	Cripple Creek & Victor Gold Mining Company, Goodrich Corp., Holcim (U.S.) Inc., and The Trane Co.	Aquila Networks – WPC	Return on equity.
9/04	U-23327, Subdocket B	LA	Louisiana Public Service Commission	Southwestern Electric Power Company	Fuel cost review
10/04	U-23327 Subdocket A	LA	Louisiana Public Service Commission	Southwestern Electric Power Company	Return on Equity
06/05	050045-EI	FL	South Florida Hospital and Health Care Assoc.	Florida Power & Light Co.	Return on equity
08/05	9036	MD	Maryland Industrial Group	Baltimore Gas & Electric Co.	Revenue requirement, cost allocation, rate design, Tariff issues.
01/06	2005-0034	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Co.	Return on equity.

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03/06	05-1278-E-PC-PW-42T	WV	West Virginia Energy Users Group	Appalachian Power Company	Return on equity.
04/06	U-25116 Commission	LA	Louisiana Public Service	Entergy Louisiana, LLC	Transmission Issues
07/06	U-23327 Commission	LA	Louisiana Public Service	Southwestern Electric Power Company	Return on equity, Service quality
08/06	ER-2006-0314	MO	Missouri Office of the Public Counsel	Kansas City Power & Light Co.	Return on equity, Weighted cost of capital
08/06	06S-234EG	CO	CF&I Steel, L.P. & Climax Molybdenum	Public Service Company of Colorado	Return on equity, Weighted cost of capital
01/07	06-0960-E-42T Users Group	WV	West Virginia Energy	Monongahela Power & Potomac Edison	Return on Equity
01/07	43112	AK	AK Steel, Inc.	Vectren South, Inc.	Cost allocation, rate design
05/07	2006-661	ME	Maine Office of the Public Advocate	Bangor Hydro-Electric	Return on equity, weighted cost of capital.
09/07	07-07-01	CT	Connecticut Industrial Energy Consumers	Connecticut Light & Power	Return on equity, weighted cost of capital
10/07	05-UR-103	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Electric Power Co.	Return on equity
11/07	29797	LA	Louisiana Public Service Commission	Cleco Power :LLC & Southwestern Electric Power	Lignite Pricing, support of settlement
01/08	07-551-EL-AIR	OH	Ohio Energy Group	Ohio Edison, Cleveland Electric, Toledo Edison	Return on equity
03/08	07-0585, 07-0585, 07-0587, 07-0588, 07-0589, 07-0590, (consol.)	IL	The Commercial Group	Ameren	Cost allocation, rate design
04/08	07-0566	IL	The Commercial Group	Commonwealth Edison	Cost allocation, rate design
06/08	R-2008-2011621	PA	Columbia Industrial Intervenors	Columbia Gas of PA	Cost and revenue allocation, Tariff issues
07/08	R-2008-2028394	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy	Cost and revenue allocation, Tariff issues

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07/08	R-2008-2039634	PA	PPL Gas Large Users Group	PPL Gas	Retainage, LUFG Pct.
08/08	6680-UR-116	WI	Wisconsin Industrial Energy Group	Wisconsin P&L	Cost of Equity
08/08	6690-UR-119	WI	Wisconsin Industrial Energy Group	Wisconsin PS	Cost of Equity
09/08	ER-2008-0318	MO	The Commercial Group	AmerenUE	Cost and revenue allocation
10/08	R-2008-2029325	PA	U.S. Steel & Univ. of Pittsburgh Med. Ctr.	Equitable Gas Co.	Cost and revenue allocation
10/08	08-G-0609	NY	Multiple Intervenors	Niagara Mohawk Power	Cost and Revenue allocation
12/08	27800-U	GA	Georgia Public Service Commission	Georgia Power Company	CWIP/AFUDC issues, Review financial projections
03/09	ER08-1056	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Capital Structure
04/09	E002/GR-08-1065	MN	The Commercial Group	Northern States Power	Cost and revenue allocation and rate design
05/09	08-0532	IL	The Commercial Group	Commonwealth Edison	Cost and revenue allocation
07/09	080677-EI	FL	South Florida Hospital and Health Care Association	Florida Power & Light	Cost of equity, capital structure, Cost of short-term debt
07/09	U-30975	LA	Louisiana Public Service Commission	Cleco LLC, Southwestern Public Service Co.	Lignite mine purchase
10/09	4220-UR-116	WI	Wisconsin Industrial Energy Group	Northern States Power	Class cost of service, rate design
10/09	M-2009-2123945	PA	PP&L Industrial Customer Alliance	PPL Electric Utilities	Smart Meter Plan cost allocation
10/09	M-2009-2123944	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy Company	Smart Meter Plan cost allocation
10/09	M-2009-2123951	PA	West Penn Power Industrial Intervenors	West Penn Power	Smart Meter Plan cost allocation
11/09	M-2009-2123948	PA	Duquesne Industrial Intervenors	Duquesne Light Company	Smart Meter Plan cost allocation
11/09	M-2009-2123950	PA	Met-Ed Industrial Users Group Penelec Industrial Customer Alliance, Penn Power Users Group	Metropolitan Edison, Pennsylvania Electric Co., Pennsylvania Power Co.	Smart Meter Plan cost allocation

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03/10	09-1352-E-42T	WV	West Virginia Energy Users Group	Monongahela Power	Return on equity, rate of return Potomac Edison
03/10	E015/GR-09-1151	MN	Large Power Intervenors	Minnesota Power	Return on equity, rate of return
04/10	2009-00459	KY	Kentucky Industrial Utility Consumers	Kentucky Power	Return on equity
04/10	2009-00548 2009-00549	KY	Kentucky Industrial Utility Consumers	Louisville Gas and Electric, Kentucky Utilities	Return on equity.
05/10	10-0261-E-GI	WV	West Virginia Energy Users Group	Appalachian Power Co./ Wheeling Power Co.	EE/DR Cost Recovery, Allocation, & Rate Design
05/10	R-2009-2149262	PA	Columbia Industrial Intervenors	Columbia Gas of PA	Class cost of service & cost allocation
06/10	2010-00036	KY	Lexington-Fayette Urban County Government	Kentucky American Water Company	Return on equity, rate of return, revenue requirements
06/10	R-2010-2161694	PA	PP&L Industrial Customer Alliance	PPL Electric Utilities	Rate design, cost allocation
07/10	R-2010-2161575	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy Co.	Return on equity
07/10	R-2010-2161592	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy Co.	Cost and revenue allocation
07/10	9230	MD	Maryland Energy Group	Baltimore Gas and Electric	Electric and gas cost and revenue allocation; return on equity
09/10	10-70	MA	University of Massachusetts-Amherst	Western Massachusetts Electric Co.	Cost allocation and rate design
10/10	R-2010-2179522	PA	Duquesne Industrial Intervenors	Duquesne Light Company	Cost and revenue allocation, rate design
11/10	P-2010-2158084	PA	West Penn Power Industrial Intervenors	West Penn Power Co.	Transmission rate design
11/10	10-0699-E-42T	WV	West Virginia Energy Users Group	Appalachian Power Co. & Wheeling Power Co.	Return on equity, rate of Return
11/10	10-0467	IL	The Commercial Group	Commonwealth Edison	Cost and revenue allocation and rate design
04/11	R-2010-2214415	PA	Central Pen Gas Large Users Group	UGI Central Penn Gas, Inc.	Tariff issues, revenue allocation
07/11	R-2011-2239263	PA	Philadelphia Area Energy Users Group	PECO Energy	Retainage rate

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08/11	R-2011-2232243	PA	AK Steel	Pennsylvania-American Water Company	Rate Design
08/11	11AL-151G	CO	Climax Molybdenum	PS of Colorado	Cost allocation
09/11	11-G-0280	NY	Multiple Intervenors	Corning Natural Gas Co.	Cost and revenue allocation
10/11	4220-UR-117	WI	Wisconsin Industrial Energy Group	Northern States Power	Cost and revenue allocation, rate design
02/12	11AL-947E	CO	Climax Molybdenum, CF&I Steel	Public Service Company of Colorado	Return on equity, weighted cost of capital
07/12	120015-EI	FL	South Florida Hospitals and Health Care Association	Florida Power and Light Co,	Return on equity, weighted cost of capital
07/12	12-0613-E-PC	WV	West Virginia Energy Users Group	American Electric Power/APCo	Special rate proposal for Century Aluminum
07/12	R-2012-2290597	PA	PP&L Industrial Customer Alliance	PPL Electric Utilities Corp.	Cost allocation
09/12	05-UR-106	WI	Wisconsin Industrial Energy Group	Wisconsin Electric Power Co.	Class cost of service, cost and revenue allocation, rate design
09/12	2012-00221 2012-00222	KY	Kentucky Industrial Utility Consumers	Louisville Gas and Electric, Kentucky Utilities	Return on equity.
10/12	9299	MD	Maryland Energy Group	Baltimore Gas & Electric	Cost and revenue allocation, rate design Cost of equity, weighted cost of capital
10/12	4220-UR-118	WI	Wisconsin Industrial Energy Group	Northern States Power Company	Class cost of service, cost and revenue allocation, rate design
10/12	473-13-0199	TX	Steering Committee of Cities Served by Oncor	Cross Texas Transmission, LLC	Return on equity, capital structure
01/13	R-2012-2321748 et al.	PA	Columbia Industrial Intervenors	Columbia Gas of Pennsylvania	Cost and revenue allocation
02/13	12AL-1052E	CO	Cripple Creek & Victor Gold Mining, Holcim (US) Inc.	Black Hills/Colorado Electric Utility Company	Cost and revenue allocations
06/13	8009	VT	IBM Corporation	Vermont Gas Systems	Cost and revenue allocation, rate design
07/13	130040-EI	FL	WCF Hospital Utility Alliance	Tampa Electric Co.	Return on equity, rate of return
08/13	9326	MD	Maryland Energy Group	Baltimore Gas and Electric	Cost and revenue allocation, rate design, special rider

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08/13	P-2012-2325034	PA	PP&L Industrial Customer Alliance	PPL Electric Utilities, Corp.	Distribution System Improvement Charge
09/13	4220-UR-119	WI	Wisconsin Industrial Energy Group	Northern States Power Co.	Class cost of service, cost and revenue allocation, rate design
11/13	13-1325-E-PC	WV	West Virginia Energy Users Group	American Electric Power/APCo	Special rate proposal, Felman Production
06/14	R-2014-2406274	PA	Columbia Industrial Intervenors	Columbia Gas of Pennsylvania	Cost and revenue allocation, rate design
08/14	05-UR-107	WI	Wisconsin Industrial Energy Group	Wisconsin Electric Power Co.	Cost and revenue allocation, rate design
10/14	ER13-1508 et al.	FERC	Louisiana Public Service Comm.	Entergy Services, Inc.	Return on equity
11/14	14AL-0660E	CO	Climax Molybdenum Co. and CFI Steel, LP	Public Service Co. of Colorado	Return on equity, weighted cost of capital
11/14	R-2014-2428742	PA	AK Steel	West Penn Power Company	Cost and revenue allocation
12/14	42866	TX	West Travis Co. Public Utility Agency	Travis County Municipal Utility District No. 12	Response to complain of monopoly power
3/15	2014-00371 2014-00372	KY	Kentucky Industrial Utility Customers	Louisville Gas & Electric, Kentucky Utilities	Return on equity, cost of debt, weighted cost of capital
3/15	2014-00396	KY	Kentucky Industrial Utility Customers	Kentucky Power Co.	Return on equity, weighted cost of capital
6/15	15-0003-G-42T	WV	West Virginia Energy Users Gp.	Mountaineer Gas Co.	Cost and revenue allocation, Infrastructure Replacement Program
9/15	15-0676-W-42T	WV	West Virginia Energy Users Gp.	West Virginia-American Water Company	Appropriate test year, Historical vs. Future
9/15	15-1256-G-390P	WV	West Virginia Energy Users Gp.	Mountaineer Gas Co.	Rate design for Infrastructure Replacement and Expansion Program
10/15	4220-UR-121	WI	Wisconsin Industrial Energy Gp.	Northern States Power Co.	Class cost of service, cost and revenue allocation, rate design
12/15	15-1600-G-390P	WV	West Virginia Energy Users Gp.	Dominion Hope	Rate design and allocation for Pipeline Replacement & Expansion Prog.
12/15	45188	TX	Steering Committee of Cities Served by Oncor	Oncor Electric Delivery Co.	Ring-fence protections for cost of capital

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2/16	9406	MD	Maryland Energy Group	Baltimore Gas & Electric	Cost and revenue allocation, rate design, proposed Rider 5
3/16	39971	GA	GA Public Service Comm. Staff	Southern Company / AGL Resources	Credit quality and service quality issues
04/16	2015-00343	KY	Kentucky Office of the Attorney General	Atmos Energy	Cost of equity, cost of short-term debt, capital structure
05/16	16-G-0058 16-G-0059	NY	City of New York	Brooklyn Union Gas Co., KeySpan Gas East Corp.	Cost and revenue allocation, rate design, service quality issues
06/16	16-0073-E-C	WV	Constellium Rolled Products Ravenswood, LLC	Appalachian Power Co.	Complaint; security deposit
07/16	9418	MD	Healthcare Council of the National Capital Area	Potomac Electric Power Co.	Cost of equity, cost of service, Cost and revenue allocation
07/16	160021-EI	FL	South Florida Hospital and Health Care Association	Florida Power and Light Co.	Return on equity, cost of debt, capital structure
07/16	16-057-01	UT	Utah Office of Consumer Svcs.	Dominion Resources, Questar Gas Co.	Credit quality and service quality issues
08/16	8710	VT	Vermont Dept. of Public Service	Vermont Gas Systems	Return on equity, cost of debt, cost of capital
08/16	R-2016-2537359	PA	AK Steel Corp.	West Penn Power Co.	Cost and revenue allocation
09/16	2016-00162	KY	Kentucky Office of the Attorney General	Columbia Gas of Ky.	Return on equity, cost of short-term debt
09/16	16-0550-W-P	WV	West Va. Energy Users Gp.	West Va. American Water Co.	Infrastructure Replacement Program Surcharge
01/17	46238	TX	Steering Committee of Cities Served by Oncor	Oncor Electric Delivery Co.	Ring fencing and other conditions for acquisition, service quality and reliability
02/17	45414	TX	Cities of Midland, McAllen, and Colorado City	Sharyland Utilities, LP and Sharyland Dist. and Transmission Services, LLC	Return on equity
02/17	2016-00370 2016-00371	KY	Kentucky Industrial Utility Customers	Louisville Gas & Electric, Kentucky Utilities	Return on equity, cost of debt, weighted cost of capital
03/17	10580	TX	Atmos Cities Steering Committee	Atmos Pipeline Texas	Return on equity, capital structure, weighted cost of capital
03/17	R-3867-2013	Quebec, Canada	Canadian Federation of Independent Businesses	Gaz Metro	Marginal Cost of Service Study

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05/17	R-2017-2586783	PA	Philadelphia Industrial and Commercial Gas Users Gp.	Philadelphia Gas Works	Cost and revenue allocation, rate design, Interruptible tariffs
08/17	R-2017-2595853	PA	AK Steel	Pennsylvania American Water Co.	Cost and revenue allocation, rate design
8/17	17-3112-INV	VT	Vt. Dept. of Pubic Service	Green Mountain Power	Return on equity, cost of debt, weighted cost of capital
9/17	4220-UR-123	WI	Wisconsin Industrial Energy Group	Northern States Power	Cost and revenue allocation, rate design
10/17	2017-00179	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Co.	Return on equity, cost of short-term debt
12/17	2017-00321	KY	Office of the Attorney General	Duke Energy Kentucky, Inc.	Return on equity
1/18	2017-00349	KY	Office of the Attorney General	Atmos Energy	Return on equity, cost of debt, weighted cost of capital
5/18	Fiscal Years 2019-2021 Rates	PA	Philadelphia Large Users Group	Philadelphia Water Department	Cost and revenue allocation
8/18	18-0974-TF	VT	Vt. Dept. of Public Service	Green Mountain Power	Return on equity, cost of debt, weighted cost of capital
8/18	48401	TX	Cities Served by Texas-New Mexico Power Company	Texas-New Mexico Power Co.	Return on equity, capital structure
8/18	18-05-16	CT	Connecticut Industrial Energy Consumers	Connecticut Natural Gas Co.	Cost and revenue allocation
9/18	9484	MD	Maryland Energy Group	Baltimore Gas & Electric	Cost and revenue allocation, rate design
9/18	2017-370-E	SC	South Carolina Office of Regulatory Staff	South Carolina Electric & Gas, Dominion Resources, SCANA	Return on equity, service quality standards, credit quality conditions
10/18	18-1115-G-390P	WV	West Va. Energy Users Group	Mountaineer Gas Company	Customer protections for Infrastructure Replacement and Expansion Program
12/18	R-2018-3003558, R-2018-3003561	PA	Aqua Large Users Group	Aqua Pennsylvania, Inc.	Cost and revenue allocation
02/19	UD-18-07	CCNO	Crescent City Power Users' Gp.	Entergy New Orleans, LLC	Return on equity, Reliability Incentive Mechanism, other proposed riders
03/19	2018-00358	KY	Office of the Attorney General	Kentucky American Water Co.	Return on equity, Qualified Infrastructure Program rider
05/19	19-E-0065 19-G-0066	NY	City of New York	Consolidated Edison Co.	Cost and revenue allocation, rate design, tariff issues, fast-charging station incentives

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05/2019	19-0513-TF	VT	Vt. Dept. of Public Service	Vermont Gas Systems	Return on equity, capital structure
06/2019	5-TG-100	WI	Wisconsin Industrial Energy Group	WEPCO, Wisconsin Gas, Wisconsin PS	Transportation and balancing issues
07/2019	49494	TX	Cities Served by AEP Texas	AEP Texas, Inc.	Return on equity, capital structure
08/2019	19-G-0309 19-G-0310	NY	City of New York	Brooklyn Union Gas Co.., KeySpan Gas East Corp.	Cost and revenue allocation, rate design, tariff issues and modifications
08/2019	19-0316-G-42T	WV	West Virginia Energy Users Gp.	Mountaineer Gas Company	Cost and revenue allocation
8/2019	5-UR-109	WI	Wisconsin Industrial Energy Gp.	Wisconsin Electric Power Co., Wisconsin Gas, LLC	Cost Allocation, Class cost of service study
8/2019	6690-UR-126	WI	Wisconsin Industrial Energy Gp.	Wisconsin Public Service Corp.	Cost Allocation, Class cost of service study
9/2019	9610	MD	Maryland Energy Group	Baltimore Gas and Electric Co.	Cost and revenue allocation, rate design
12/2019	2019-00271	KY	Office of the Attorney General	Duke Energy Kentucky, Inc.	Return on equity
2/2020	49831	TX	Texas Industrial Energy Consumers	Southwestern Public Service Co.	Return on equity, capital structure, rate of return
2/2020	E-7. Sub 1214	NC	NC Attorney General's Office	Duke Energy Carolinas	Return on equity, capital structure, rate of return, economic conditions
2/2020	E-2. Sub 1219	NC	NC Attorney General's Office	Duke Energy Progress	Return on equity, capital structure, rate of return, economic conditions
5/2020	R-2019-3015162	PA	Industrial Energy Consumers of Pennsylvania	UGI Utilities, Inc.	Return on equity, cost of debt, revenue allocation, rate design
6/2020	20-G-0101	NY	Multiple Intervenors	Corning Natural Gas Corp.	Cost and revenue allocation
9/2020	R-2020-2019369	PA	AK Steel	Pennsylvania-American Water Company	Cost and revenue allocation, rate design
9/2020	20-035-04	UT	The Kroger Co.	Rocky Mountain Power	Cost and revenue allocation, rate design
10/2020	2020-00174	KY	Ky. Office of the Attorney General, Ky. Industrial Utility Customers	Kentucky Power Co.	Return on equity
3/2021	2020-00349	KY	Ky. Office of the Attorney General, Ky. Industrial Utility Customers	Kentucky Utilities Co.	Return on equity
3/2021	2020-00350	KY	Ky. Office of the Attorney General, Ky. Industrial Utility Customers	Louisville Gas and Electric Co.	Return on equity

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3/2021	20-0746-G-42T	WV	West Va. Energy Users Group	Dominion Energy West Va.	Cost and revenue allocation, cost of equity
4/2021	17-12-03RE11	CT	Connecticut Industrial Energy Consumers	PURA Investigation Into Distribution System Planning	Economic development rates
6/2021	U-20940	MI	Dearborn Industrial Generation, LLC	DTE Gas Company	Cost and revenue allocation, rate design
7/2021	21-0043-G-PC	WV	West Va. Energy Users Group	Mountaineer Gas Co., UGI Corporation	Hold harmless conditions for utility acquisition
07/2021	U-35441	LA	Louisiana Public Service Commission	Southwestern Electric Power Company	Return on equity, cost of capital, service quality
08/2021	51802	TX	Texas Industrial Energy Consumers	Southwestern Public Service Company	Return on equity
09/21	2021-00190	KY	Kentucky Office of the Attorney General	Duke Energy Kentucky, Inc.	Return on equity, cost of debt
09/21	2021-00183	KY	Kentucky Office of the Attorney General	Columbia Gas of Kentucky, Inc.	Return on equity, cost of debt, capital structure

PROXY GROUP
AVERAGE PRICE, DIVIDEND AND DIVIDEND YIELD

		Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21
Atmos Energy Corp.	High Price ($)	99.250	104.990	104.790	101.840	101.760	102.280
	Low Price ($)	85.590	97.080	96.840	95.670	95.210	96.520
	Avg. Price ($)	92.420	101.035	100.815	98.755	98.485	99.400
	Dividend ($)	0.625	0.625	0.625	0.625	0.625	0.625
	Mo. Avg. Div.	2.71%	2.47%	2.48%	2.53%	2.54%	2.52%
	6 mos. Avg.	2.54%					
New Jersey Resources	High Price ($)	42.570	43.410	43.940	44.410	40.970	39.520
	Low Price ($)	39.010	39.460	41.590	39.210	37.480	36.690
	Avg. Price ($)	40.790	41.435	42.765	41.810	39.225	38.105
	Dividend ($)	0.333	0.333	0.333	0.333	0.333	0.333
	Mo. Avg. Div.	3.26%	3.21%	3.11%	3.18%	3.39%	3.49%
	6 mos. Avg.	3.27%					
Northwest Natural Holding Co.	High Price ($)	54.270	56.750	56.110	55.700	54.010	54.480
	Low Price ($)	46.770	52.610	52.500	51.370	50.830	50.420
	Avg. Price ($)	50.520	54.680	54.305	53.535	52.420	52.450
	Dividend ($)	0.480	0.480	0.480	0.480	0.480	0.480
	Mo. Avg. Div.	3.80%	3.51%	3.54%	3.59%	3.66%	3.66%
	6 mos. Avg.	3.63%					
ONE Gas, Inc.	High Price ($)	77.700	81.900	81.550	78.960	75.930	75.320
	Low Price ($)	67.290	75.690	72.500	73.190	72.010	70.810
	Avg. Price ($)	72.495	78.795	77.025	76.075	73.970	73.065
	Dividend ($)	0.580	0.580	0.580	0.580	0.580	0.580
	Mo. Avg. Div.	3.20%	2.94%	3.01%	3.05%	3.14%	3.18%
	6 mos. Avg.	3.09%					
South Jersey Industries, Inc.	High Price ($)	29.240	25.470	26.870	27.990	26.720	25.910
	Low Price ($)	21.130	22.450	24.600	25.620	24.520	23.970
	Avg. Price ($)	25.185	23.960	25.735	26.805	25.620	24.940
	Dividend ($)	0.303	0.303	0.303	0.303	0.303	0.303
	Mo. Avg. Div.	4.81%	5.06%	4.71%	4.52%	4.73%	4.86%
	6 mos. Avg.	4.78%					
Southwest Gas Holdings, Inc.	High Price ($)	71.350	73.540	72.570	68.200	71.900	73.050
	Low Price ($)	61.770	67.610	65.290	62.540	64.630	67.790
	Avg. Price ($)	66.560	70.575	68.930	65.370	68.265	70.420
	Dividend ($)	0.570	0.570	0.595	0.595	0.595	0.595
	Mo. Avg. Div.	3.43%	3.23%	3.45%	3.64%	3.49%	3.38%
	6 mos. Avg.	3.44%					

PROXY GROUP
AVERAGE PRICE, DIVIDEND AND DIVIDEND YIELD

		Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21
Spire Inc.	High Price ($)	75.780	77.950	77.870	76.850	74.460	74.230
	Low Price ($)	65.790	72.700	71.480	69.770	68.700	66.140
	Avg. Price ($)	70.785	75.325	74.675	73.310	71.580	70.185
	Dividend ($)	0.650	0.650	0.650	0.650	0.650	0.650
	Mo. Avg. Div.	3.67%	3.45%	3.48%	3.55%	3.63%	3.70%
	6 mos. Avg.	3.58%					
Monthly Avg. Dividend Yield		3.55%	3.41%	3.40%	3.44%	3.51%	3.54%
6-month Avg. Dividend Yield		3.48%					

Source: Yahoo! Finance

PROXY GROUP
DCF Growth Rate Analysis

	Company	(1) Value Line DPS	(2) Value Line EPS	(3) Zacks	(4) Yahoo! Finance
1	Atmos Energy Corp.	7.50%	7.00%	7.40%	7.70%
2	New Jersey Resources	5.50%	2.00%	7.10%	6.00%
3	Northwest Natural Holding Co.	0.50%	5.50%	4.90%	5.50%
4	ONE Gas, Inc.	7.00%	6.50%	5.00%	5.00%
5	South Jersey Industries, Inc.	4.50%	11.50%	5.40%	4.80%
6	Southwest Gas Holdings, Inc.	4.50%	8.00%	5.50%	4.00%
7	Spire Inc.	4.50%	10.00%	5.50%	7.31%
	Averages	4.86%	7.21%	5.83%	5.76%
	Median	4.50%	7.00%	5.50%	5.50%

Sources: **Value Line Investment Survey, August 27, 2021**
Yahoo! Finance and Zacks growth rates retrieved August 26, 2021

PROXY GROUP
DCF RETURN ON EQUITY

	(1) Value Line Dividend Gr.	(2) Value Line Earnings Gr.	(3) Zack's Earning Gr.	(4) Yahoo! Earning Gr.	(5) Average of All Gr. Rates
Method 1:					
Dividend Yield	3.48%	3.48%	3.48%	3.48%	3.48%
Average Growth Rate	4.86%	7.21%	5.83%	5.76%	5.91%
Expected Div. Yield	3.56%	3.60%	3.58%	3.58%	3.58%
DCF Return on Equity	***8.42%***	***10.81%***	***9.41%***	***9.34%***	***9.49%***
Method 2:					
Dividend Yield	3.48%	3.48%	3.48%	3.48%	3.48%
Median Growth Rate	4.50%	7.00%	5.50%	5.50%	5.63%
Expected Div. Yield	3.55%	3.60%	3.57%	3.57%	3.57%
DCF Return on Equity	***8.05%***	***10.60%***	***9.07%***	***9.07%***	***9.20%***

PROXY GROUP
Capital Asset Pricing Model Analysis

30-Year Treasury Bond, Value Line Beta

Line No.		Value Line
1	Market Required Return Estimate	9.42%
2	Risk-free Rate of Return, 30-Year Treasury Bond	
3	Average of Last Six Months	2.18%
4	Risk Premium	
5	(Line 1 minus Line 3)	7.24%
6	Proxy Group Beta	0.90
7	Proxy Group Beta * Risk Premium	
8	(Line 5 * Line 6)	6.51%
9	CAPM Return on Equity	
10	(Line 3 plus Line 8)	8.70%

Duff and Phelps Normalized Risk-free Rate

1	Market Required Return Estimate	9.42%
2	Duff and Phelps Normalized Risk-free Rate	2.50%
3	Risk Premium	
4	(Line 1 minus Line 2)	6.92%
5	Proxy Group Beta	0.90
6	Proxy Group Beta * Risk Premium	
7	(Line 4 * Line 5)	6.23%
8	CAPM Return on Equity	
9	(Line 2 plus Line 7)	8.73%

PROXY GROUP
Capital Asset Pricing Model Analysis

Supporting Data for CAPM Analyses

30 Year Treasury Bond Data

	Avg. Yield
February-21	2.04%
March-21	2.34%
April-21	2.30%
May-21	2.32%
June-21	2.16%
Jul-21	1.94%
6 month average	2.18%

Source: www.federalreserve.gov

Comparison Group Betas:

	Value Line
Atmos Energy Corp.	0.80
New Jersey Resources	1.00
Northwest Natural Holding Co.	0.85
ONE Gas, Inc.	0.80
South Jersey Industries, Inc.	1.05
Southwest Gas Holdings, Inc.	0.95
Spire Inc.	0.85
Average	0.90

Source: Value Line Investment Survey

Value Line Market Return Data:

Value Line Projected 3-5 Yr.	
Median Annual Total Return	9.00%
Average Annual Total Return	9.84%
Average	9.42%

Source: Value Line Investment Analyzer,
August 27, 2021

PROXY GROUP
Capital Asset Pricing Model Analysis
Historic Market Premium

	Arithmetic Mean	Adjusted Arithmetic Mean
CAPM with Current 30-Year Treasury Yield		
Long-Term Annual Return on Stocks	12.20%	
Long-Term Annual Income Return on Long-Term Treas. Bonds	4.90%	
Historical Market Risk Premium	7.30%	6.00%
Proxy Group Beta, Value Line	0.90	0.90
Beta * Market Premium	6.57%	5.40%
Current 30-Year Treasury Bond Yield	2.18%	2.18%
CAPM Cost of Equity, Value Line Beta	**8.75%**	**7.58%**
CAPM with D&P Normalized Risk-Free Rate		
Historical Market Risk Premium	7.30%	6.00%
Proxy Group Beta, Value Line	0.90	0.90
Beta * Market Premium	6.57%	5.40%
D&P Normalized Risk-Free Rate	2.50%	2.50%
CAPM Cost of Equity, Normalized Risk-Free Rate	**9.07%**	**7.90%**

Source: Duff and Phelps Cost of Capital Navigator: U.S. Cost of Capital Module
Summary Statistics of Annual Total Returns, Income Returns, and Capital Appreciation Returns of Basic U.S. Asset Classes; Exhibit 3.6
1926 - 2020

COLUMBIA GAS OF KENTUCKY

KYOAG ADJUSTED COST OF LONG-TERM DEBT

Debt Instrument	Maturity Date	Interest Rate	Principal Value	Annual Interest Expense
5.9200% Notes, due January 5, 2026	1/5/26	5.9200%	12,375,000	732,600
6.0200% Notes, due December 16, 2030	12/16/30	6.0200%	10,000,000	602,000
5.7700% Notes, due January 7, 2043	1/7/43	5.7700%	20,000,000	1,154,000
6.2000% Notes, due December 23, 2043	12/23/43	6.2000%	20,000,000	1,240,000
4.4300% Notes, due December 16, 2044	12/16/44	4.4300%	5,000,000	221,500
3.8425% Notes, due September 30, 2046	9/30/46	3.8425%	31,000,000	1,191,175
4.6436% Notes, due December 31, 2048	12/31/48	4.6436%	13,000,000	603,668
3.7485% Notes, due December 31, 2049	12/31/49	3.7485%	15,000,000	562,275
3.1742% Notes, due June 30, 2050	6/30/50	3.1742%	12,000,000	380,904
3.9000% Notes, due June 30, 2051	6/30/51	3.2720%	22,000,000	719,840
3.9000% Notes, due September 30, 2051	9/30/51	3.2720%	22,000,000	719,840
4.0000% Notes, due March 31, 2052	3/31/52	3.2720%	11,076,923	362,437
4.0000% Notes, due June 30, 2052	6/30/52	3.2720%	3,692,308	120,812
Thirteen Month Average through December 31, 2022			$ 197,144,231	$ 8,611,051
		Cost of Long-Term Debt		4.37%

COLUMBIA GAS OF KENTUCKY
Historical 13-Month Capitalization

	2015		2016		2017	
	Amount	Ratio	Amount	Ratio	Amount	Ratio
Total Long-Term Debt	98,335,000	46.00%	97,950,385	44.04%	114,698,846	45.40%
Total Common Equity	115,438,776	54.00%	118,288,894	53.18%	129,304,686	51.18%
Total Permanent Capital	213,773,776	100.00%	216,239,279	97.22%	244,003,532	96.58%
Short-Term Debt	-	0.00%	6,181,924	2.78%	8,640,992	3.42%
Total Capitalization	213,773,776	100.00%	222,421,202	100.00%	252,644,524	100.00%

	2018		2019		2020	
	Amount	Ratio	Amount	Ratio	Amount	Ratio
Total Long-Term Debt	115,375,000	42.50%	128,528,846	42.27%	148,836,538	42.82%
Total Common Equity	144,528,545	53.24%	164,506,511	54.10%	180,372,309	51.90%
Total Permanent Capital	259,903,545	95.74%	293,035,357	96.37%	329,208,847	94.72%
Short-Term Debt	11,571,826	4.26%	11,046,402	3.63%	18,356,526	5.28%
Total Capitalization	271,475,370	100.00%	304,081,759	100.00%	347,565,374	100.00%

4-Year Average of Short-term Debt	4.15%
5-Year Average of Short-term Debt	3.88%

Source for capitalization amounts and percentages from CGKY response to AG 1-040, Attachment AL

Adjusted Rea Equity Risk Premium Model Using Total Market Approach

	Historical Equity Risk Premium	
1	Annual Total Returns for S&P 500 Composite Index,	12.20%
2	Arithmetic Average (1926-2020)	
	Annual Total Returns for Long-Term Corporate Bonds,	
3	Arithmetic Average (1926-2020)	6.50%
4	Historical Equity Risk Premium - Total Market (Line 1 minus Line 3)	5.70%
	Prospective Equity Risk Premium	
5	Prospective Value Line Annual Return	8.63%
6	July 2021 Aaa Rated Corporate Bond Yield - Mergent	2.57%
7	Prospective Equity Risk Premium - Total Market (Line 5 minus Line 6)	6.06%
8	Average Equity Risk Premium (Lines 4 and 7)	5.88%
9	Gas Proxy Group Beta	0.9000
10	Equity Risk Premium (with Gas Proxy Group Beta)	5.29%
11	Mergent Average Public Utility Bond Yield, July 2021	2.99%
12	Adjusted Risk Premium Cost of Equity (Line 10 plus Line 11)	8.28%