DEPARTMENT OF REVENUE

Date: May 1, 2023
From: Jon Klockziem, Director – Property Tax Division
Subject: Final 2023 Capitalization Rate Study

The Property Tax Division of the Minnesota Department of Revenue is responsible for estimating the market value of utility, pipeline, and railroad operating property, as of January 2 each year. We complete a Capitalization Rate Study annually and use the capitalization rates published in the study to help determine the unitary value of state assessed property.

We posted the 2023 Draft Capitalization Rate Study on March 3, 2023, and welcomed comments until March 31, 2023. We appreciate the thoughtful comments we received.

Who can I contact with questions?

If you have questions about this final study, contact the State Assessed Property Section at sa.property@state.mn.us.

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2023 Capitalization Rate Study

Assessment Year 2023

Property Tax Division
Minnesota Department of Revenue
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Introduction

The Minnesota Department of Revenue determines the estimated market value[1] for utility, pipeline, and railroad operating property as of January 2 each year. The department determines the unit value of the entire system[2] to estimate the market value of these properties.

For each market segment, this study derives:

- A yield capitalization rate (yield rate)
- A direct capitalization rate (direct rate)
- An implied growth rate
- A short-term growth rate
- A long-term growth rate
- An implied inflation rate

The market segments are:

- Electric
- Gas distribution
- Gas transmission pipeline
- Fluid transportation pipeline
- Railroad

The department's Property Tax Division determines the unit value of these systems, in part, with the income capitalization approach to valuation. This approach measures the present value of the anticipated future benefits of property ownership. There are two methods of income capitalization: direct and yield capitalization.[3]

- **Direct capitalization** converts an estimate of a single year's net operating income expectancy into an indication of value for the subject property using the direct rate. This conversion is based on the market-observed relationship between an income level and market value.
- **Yield capitalization** calculates the net present value of the anticipated future income by discounting cash flows using the yield rate.

Under the income capitalization approach, yield capitalization models use yield rates and direct capitalization models use direct rates.

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1 Minnesota Statutes, section 272.03, subdivision 8 defines market value as, "the usual selling price at the place where the property to which the term is applied shall be at the time of assessment; being the price which could be obtained at a private sale or auction sale, if it is determined by the assessor that the price from the auction sale represents an arm's length transaction. The price obtained at a forced sale shall not be considered."

2 Minnesota Rules, Chapter 8100.0100, subpart 16 defines unit value as, "the value of the entire system of a utility company taken as a whole without regard to the value of its component parts." Minnesota Rules, Chapter 8106.0100, subpart 20 defines unit value as, "the value of the system of a railroad company taken as a whole without any regard to the value of its component parts."

3 Appraisal Institute (2013). The Appraisal of Real Estate, 14th Edition, Page 46

Both the yield and direct rates are calculated using the band of investment method. This method considers equity and debt financing and is a combination of the weighted rates for each, as shown in this table:

	Capital Structure	×	Market Rate	=	Weighted Rate
Debt	50%	×	6%	=	3%
Equity	50%	×	10%	=	5%
Combined Rate				=	**8%**

We estimate the market cost of capital for each market segment, under Minnesota Rules 8100 and 8106.

Summary of Rates Derived from this Study

Market Segments	Yield Rate	Direct Rate	Implied Growth Rate [4]	Short-Term Growth Rate [5]	Long-Term Real Growth Rate [6]	Long-Term Implied Inflation Rate [7]
Electric	8.00%	5.56%	2.44%	6.00%	1.70%	2.00%
Gas Distribution	7.83%	5.53%	2.30%	6.00%	1.70%	2.00%
Gas Transmission Pipeline	9.10%	5.83%	3.27%	8.15%	1.70%	2.00%
Fluid Transportation Pipeline	9.09%	8.40%	0.69%	6.33%	1.70%	2.00%
Railroad	9.64%	5.57%	4.07%	10.0%	1.70%	2.00%

Yield Rates for Each Market Segment Over the Past Five Years

Market Segments Yield Rates	2023 AY	2022 AY	2021 AY	2020 AY	2019 AY
Electric	8.00%	6.34%	6.34%	6.40%	7.20%
Gas Distribution	7.83%	6.46%	6.63%	7.07%	7.37%
Gas Transmission Pipeline	9.10%	9.38%	9.82%	12.11%	12.14%
Fluid Transportation Pipeline	9.09%	9.88%	10.13%	10.87%	12.45%
Railroad	9.64%	8.81%	9.08%	11.13%	10.73%

[4] This is the difference between the yield rate and the direct rate for each market segment.

[5] See the short-term growth rate section in this narrative.

[6] This is the estimated long-term real growth rate of the United States Economy, explained in further detail in the Growth section of this narrative.

[7] See the Inflation Section in this narrative.

Updates

Changes Made Since Draft Study

We initially provided this study as a draft version on March 3, 2023, with a comment period through March 31, 2023, for the public. We provide a summary of the comments we received and our responses in the Public Comments on Draft Study section of this document.

Since the draft version was published, we updated the Study after further review of information, and as data became available:

- South Jersey Industries (SJI) is no longer publicly traded after being acquired by Infrastructure Investments Fund (IIF) as of February 2022. Therefore, SJI is removed as a guideline company in the gas distribution market segment.[8]
- MGE Energy Inc. (MGEE) is removed as a guideline company in the electric and gas distribution market segments. There is less publicly available information for MGEE than all other guideline companies used in the Study.
- We updated the capital structure for the fluid transportation pipeline market segment from 42% on the debt component and 58% on the equity component, to now 41% on the debt component and 59% on the equity component. More reliance was placed on the mean as opposed to the median capital structure for the guideline companies in the fluid transportation pipeline market segment.
- Corrected error found on OGE Energy's (OGE) long-term debt, which impacted the capital structure of the electric market segment. In the Draft Study the long-term debt for OGE was $354,800,000, this was corrected to $3,548,000,000 as listed in the company's Value Line report.
- We added market-to-book ratio analysis for the guideline companies in each market segment. (Pages 28 – 29, Appendices A, B, C, D, & E).

As a result of comments provided during the comment period:

- We added Pembina Pipeline Corporation as a guideline company to the gas transmission market segments.
- We updated the risk-free rate in the Capital Asset Pricing Models (CAPM). In the Draft Study we used the 30-year U.S. Treasury Coupon Bond Yield of 3.88%. For the Final Study we used the 20-year U.S. Treasury Coupon Bond Yield of 4.06%.
- We removed any weight placed on three-stage DGM for all market segments' cost of equity reconciliation.

[8] South Jersey Industries. February 24, 2022. "South Jersey Industries, Inc. Enters into Agreement to be Acquired by the Infrastructure Investments Fund".

- We updated the selected beta for the fluid pipeline market segment. In the Draft Study we relied on the median beta of the guideline companies. In the Final Study we used the mean beta of the guideline companies.
- We updated the capital structure for the railroad market segment from 20% on the debt component and 80% on the equity component, to now 19% on the debt component and 81% on the equity component. More reliance was placed on the mean as opposed to the median capital structure for the guideline companies.

Market News

Electric Market Segment

As provided by Value Line Investment Survey, "Stocks in the electric utility industry have been among the worst-performing sectors of the S&P 500 the past few months, but have rebounded as of late."

"Through the first nine months of 2022, utilities were among the best-performing segments, highlighted by high dividend yields and the constancy of electric utilities. However, all but one equity covered in the Electric Utility (Central) Industry declined considerably in value since our last review in September."

"Almost all of the equities in the Electric Utility Industry have been hit hard over the past three months. Utilities have long served as a strong, consistent investment to conservative accounts due to Above Average Safety ranks, and high dividend yields. As of late, however, utility stocks have lost appeal as interest rates continue to increase. Income-oriented investors are becoming more attracted to 'risk-free', climbing bond yields versus investing in individual equities."[9]

Gas Distribution Market Segment

As provided by Value Line Investment Survey, "Stocks in Value Line's Natural Gas Utility Industry have been under pressure since our last report came out in late August. We believe these price movements are attributable to a variety of factors, which include climbing interest rates (more detail below), uncertainty surrounding the domestic economy, and company-specific developments. Even at recent diminished quotations, long-term recovery potential for a number of these stocks is nothing to write home about, dampening total return possibilities."[10]

Gas Transmission Pipeline Market Segment

As provided by Value Line Investment Survey, "Oil/Gas Distribution Industry stocks have generally benefited from higher pricing over the past three months. Though there remains the possibility of a worldwide recession in the coming quarters, demand for natural gas and its transportation will likely hold up better than other portions of the economy. This will be driven by demand for natural gas as a power source domestically and abroad. Demand for liquefied natural gas in Europe should also increase if Russian natural gas is further sanctioned. Capital buildouts have potential headwinds, including a

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[9] Hodgsikson, Zachary J (2022). Electric Utility (Central Industry). Value Line Investment Survey.

[10] Harris, Frederick, III (2022). Natural Gas Utility. Value Line Investment Survey.

tougher regulatory environment and higher interest rates, which should make existing assets more valuable. Cash flow has accelerated in the space, and a larger portion is being utilized on shareholder-friendly initiatives. Dividend payouts have generally increased, including one at World Fuel Services. Dividend yields are also often well above the Value Line median. Meantime, risks are varied due to differing operations and capital structures. Corporate philosophies have diverged here, causing some to pay off debt aggressively while others return more to shareholders through increased dividends and stock buybacks. This group offers equities that meet a wide array of investment objectives."[11]

Fluid Transportation Pipeline Market Segment

As provided by Value Line Investment Survey, "Shares of companies in the Pipeline Master Limited Partnership (MLP) Industry have held up relatively well in 2022. This has coincided with favorable overall demand conditions for the products and services offered by the industry. Moreover, the major factors that underpin the appeal of MLPs, which offer various advantages to investors, are likely to remain prevalent over the long term."[12]

Railroad Market Segment

As provided by Value Line Investment Survey, "The Railroad Industry continues to face challenges. Demand has picked up since the summer, but total combined traffic remains down 2.5% through the end of October due to weaker international trade. On the cost front, railroads remain in the midst of negotiations with a number of labor unions (more below). Railroads have also experienced service-related problems, but have made some improvements. The stocks in the equipment, leasing, and manufacturing sectors have appreciated in value since our August review. There is some optimism that bookings and deliveries will rise, given the tightness in the market and more railcars coming out of storage of late. Lease pricing continues to improve, but the overall growth rate has slowed."[13]

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[11] Seibert, John, III. (2022). Oil/Gas Distribution Industry. Value Line Investment Survey.

[12] Silva, Dominic. (2022). Pipeline MLPs. Value Line Investment Survey.

[13] Collins, Michael. (2022). Railroad Industry. Value Line Investment Survey.

Yield Capitalization Rate (Yield Rate)

Key – Variables in Equations	
Y_0	Yield Rate for Current Assessment Period
NCF	Net Cash Flows
NCF_1	Net Cash Flows for Next Period
n	nth Period
g	Expected long-term growth rate in net cash flows
NOI	Net Operating Income

The yield capitalization model is based on the premise that the value of a property is equal to the present value of all anticipated future benefits.[14] Yield capitalization calculates the present value of the anticipated future income by discounting cash flows using the yield rate (Y_0).

The present value of future benefits as of the assessment date is what the current owner would give up by selling the property and what the new owner would receive by purchasing the property.

Discounted cash flows is the most sophisticated form of yield capitalization. We use it when explicit forecasts of anticipated net cash flows (NCF) are available and when the rate of change in the cash flows is not constant.

Net cash flows equal net operating income plus non-cash expenses minus capital expenditures minus change in working capital. Net operating income is an after-tax accounting income before any deductions for interest or dividends.

$$\text{Value} = NCF_1 / (1+Y_0)^1 + NCF_2 / (1+Y_0)^2 + NCF_3 / (1+Y_0)^3 + \ldots + NCF_n / (1+Y_0)^n$$

Because explicit forecasts of anticipated cash flows are generally not made into perpetuity, after the period of explicit forecasts, the assumption is made that the growth rate in anticipated cash flows will be stable. The next step, reversion, applies a long-term growth rate to the cash flows in perpetuity, after the period of explicitly forecasted cash flows.

This formula shows three periods of explicit forecasts of anticipated cash flows followed by the reversion.

$$\text{Value} = NCF_1 / (1+Y_0)^1 + NCF_2 / (1+Y_0)^2 + NCF_3 / (1+Y_0)^3 + ((NCF_3 * (1+g)/ (Y_0-g)) / (1+Y_0)^3)$$

We use **stable growth yield capitalization** when explicit forecasts of anticipated net cash flows are not available or when the anticipated growth in net cash flows is stable. This model is a simplified, but mathematically identical, model to the discounted cash flows model when the anticipated growth rate (g) is constant.

$$\text{Value} = NCF_1 / (Y_0 - g)^1$$

The **zero percent stable growth yield capitalization model** assumes that the constant growth rate is 0%. This means that the income will remain the same over time.

[14] Western States Association of Tax Administrators, (2009). Appraisal Handbook – Unit Valuation of Centrally Assessed Properties, Page III-13

Value = NCF_1 / $(Y_0 – 0\%)^1$

If the net cash flows will be equal to the net operating income (NOI), meaning depreciation will be equal to capital expenditures; the formula can be simplified to:

Value = NOI_1 / $(Y_0 – 0\%)^1$

This model assumes 0% growth into perpetuity.

Guideline Companies

The department selects guideline companies by reviewing the Standard Industrial Classification Code and market segments listed by Value Line Investment Survey. We use the Value Line survey because it is a well-respected, widely used publication.

Value Line classifies companies into 100 unique industries and groupings based on their operations, products, customers, and competitors. Value Line constantly evaluates every company tracked in the survey to make sure they are in the proper sector.[15]

We reviewed companies in the following Value Line industries as possible guideline companies in our market segments:

Value Line's Industry	Department's Market Segment
Electric Utility (Central, East, and West)	Electric
Natural Gas Utility	Gas Distribution
Pipeline MLPs, Natural Gas Diversified, Oil/Gas Distribution	Fluid Transportation Pipeline or Gas Transmission Pipeline
Railroad	Railroad

We reviewed possible guideline companies to compare their market segments to the companies doing business in Minnesota. We exclude companies that underwent a merger or acquisition in the previous calendar year and companies that have announced an upcoming merger or acquisition during the current year, unless we determine that those companies are still reflective of the subject companies.

Guideline Companies

We updated the list of guideline companies for this study each year, depending on mergers and acquisitions, market activities, and other factors. We summarized this year's changes below. For details on the companies reviewed for each segment, see Guideline Company Selection (page G-1).

Electric Market Segment

We removed MGE Energy Inc. (MGEE) as a guideline company for the lack of publicly available information.

15 Severo Nieves, (9 March 2016). Value Line Institutional Services, Institutional Sales & Marketing, Analyst, email

Gas Distribution Market Segment
We removed South Jersey Industries as a guideline company as it is no longer publicly traded.[16]

We removed MGE Energy Inc. (MGEE) as a guideline company for the lack of publicly available information.

Gas Transmission Pipeline Market Segment
We added Pembina Pipeline Corporation as a guideline company given its similarity to the other companies included as guideline companies.

Fluid Transportation Pipeline Market Segment
We removed Phillips 66 Partners L.P. as a guideline company as it is no longer publicly traded.[17]

Railroad Market Segment
We did not make any changes to the guideline companies in the railroad market segment.

Market Rate of Equity

We used the capital asset pricing model (CAPM) and dividend growth model (DGM) to determine the market rate of equity for each market segment. We also considered the build-up model.

We selected the market rate of equity for each market segment after considering seven different CAPMs, seven different empirical capital asset pricing models (ECAPMs), and three different DGMs. The models allowed us to establish a range of acceptability.

In the past, regulated companies have asked us to consider the allowed return on equity set by regulators. While regulators establish a maximum allowed rate of return for a specific company, we estimate the cost of equity for each market segment.

Capital Asset Pricing Model (CAPM)

The CAPM is based on the theory that all investors will independently optimize their portfolios. The expected return on an asset is related to its risk. We used this model to determine the market rate of equity. For the risk-free rate in the CAPM, we use the U.S. Treasury 20-year coupon bond yield. We also use a market-specific beta calculated with data from the Value Line Investment Survey.

The CAPM is based on the following assumptions, according to Shannon Pratt and Roger Grabowski [18]:

1. Investors are risk averse.
2. Rational investors seek to hold efficient portfolios (portfolios that are fully diversified).
3. All investors have identical investment time horizons (expected holding periods).

[16] South Jersey Industries. February 24, 2022. "South Jersey Industries, Inc. Enters into Agreement to be Acquired by the Infrastructure Investments Fund".

[17] https://www.phillips66.com/partners/, accessed 2/3/2023

[18] Pratt, Shannon and Grabowski, Roger, (2010). *Cost of Capital Applications and Examples,* 4th Ed., Page 113

4. All investors have identical expectations about such variables as expected rates of return and how discount rates are generated.
5. There are no transaction costs.
6. There are no investment-related taxes, but there may be corporate income taxes.
7. The rate received from lending money is the same as the cost of borrowing money.
8. The market has perfect divisibility and liquidity (investors can readily buy or sell any desired fractional interest).

Risk-Free Rate

The risk-free rate reflects the actual market conditions as of the January 2, 2023, property assessment date. We used a risk-free rate of 4.06% for this study.[19] This rate includes inflation expectations.[20, 21]

"Low interest rates are not a short-term aberration, but part of a long-term trend," Ben Bernanke noted during his term as Federal Reserve chair. The Fed, he added, is keeping the interest rates low, only in a very narrow sense: "The [Federal Reserve's] ability to affect real rates of return, especially longer-term real rates, is transitory and limited."[22]

While serving as vice chair of the Federal Reserve, Stanley Fischer said, "The actual federal funds rate has to be so low for the Fed to meet its objectives suggests that the equilibrium interest rate –that is, the federal funds rate that will prevail in the longer run, once cyclical and other transitory factors have played out—has fallen." In addition, "…changes in factors over which the Federal Reserve has little influence—such as technological innovation and demographics—are important factors contributing to both short- and long-term interest rates being so low at present." [23]

Corporate finance and equity valuation expert Dr. Aswath Damodaran also addressed this topic: "There is only one rate that the Federal Reserve sets, and it is the Fed Funds rate. It is the rate at which banks trade funds that they hold at the Federal Reserve, with each other. … [I]nterest rates in the U.S. (and Europe) have been low because inflation has been non-existent and real growth has been anemic."[24]

In another publication, Damodaran notes: "In the long term, the real riskless rate will converge on the real growth rate of the economy and the nominal riskless rate will approach the nominal growth rate of

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19 The daily observations rate for 20-year U.S. Treasury coupon bonds was 4.06% as of January 3, 2023.

20 Preparing for AICPA's Valuation Principles Examination Review (2016). Page 4-6.

21 Pratt, Shannon and Grabowski, Roger, (2010). Cost of Capital Applications and Examples, 4th Ed., Pages 96-97

22 Bernanke, Ben. (30 March 2015). "Why are interest rates so low?" Retrieved from http://www.brookings.edu/blogs/ben-bernanke/posts/2015/03/30-why-interest-rates-so-low.

23 Fischer, Stanley (17 October 2016). *Why Are Interest Rates So Low? Causes and Implications*. Live Speech at Economics Club of New York, New York. Retrieved from https://www.wsj.com/livecoverage/federal-reserve-september-2017

24 Damodaran, A. (4 September 2015). "The Fed, interest rates, and stock prices: fighting the fear factor." Retrieved from http://aswathdamodaran.blogspot.com/2015/09/the-fed-interest-rates-and-stock-prices.html.

the economy.… A simple rule of thumb on the stable growth rate is that it should not exceed the riskless rate used in the valuation”.[25]

Some company representatives have previously suggested that the risk-free rate used in the capital asset pricing model is arbitrarily low due to actions of the Federal Reserve, and that we should normalize to a higher risk-free rate. According to the Federal Reserve website, “the Federal Reserve controls three tools of monetary policy – open market operations, the discount rate, and reserve requirements.”[26] Using the three tools, the Federal Reserve influences the demand for, and supply of, balances that depository institutions hold at Federal Reserve Banks and in this way alters the federal funds rate.[27]

According to Thornton, “the Fed’s ability to control interest rates is exaggerated for the simple reason that historically the effect of policy actions on the total supply of credit has been too small to have a significant effect on the level of the structure of interest rates.”[28] According to Fama, “The evidence says that Fed actions with respect to its target rate TF have little effect on long-term interest rates, and there is substantial uncertainty about the extent of Fed control of short-term rates.”[29]

Beta

The beta[30] selected for each market segment indicates the segment’s systematic risk relative to the market. The betas for each guideline company come from the Value Line Investment Survey. Value Line derives its beta coefficient from regression analysis of the weekly percentage changes in the price of a stock and weekly percentage changes in the New York Stock Exchange Composite Index over a period of five years. Value Line adjusts betas to account for their long-term tendency to converge toward one.[31] The adjusted betas are based on the theory that, over time, there is a tendency on the part of betas of all companies to move toward one. Firms that survive in the market tend to increase in size

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[25] Damodaran, A. Chapter 2, Intrinsic Valuation, Page 32, Retrieved from http://people.stern.nyu.edu/adamodar/pdfiles/DSV2/Ch2.pdf

[26] Board of Governors of the Federal Reserve System. March 20, 2019. Federal Open Market Committee. Retrieved March 21, 2019 from https://www.federalreserve.gov/monetarypolicy/fomc.htm

[27] Board of Governors of the Federal Reserve System. January 30, 2019. Federal Open Market Committee. Retrieved January 31, 2019 from https://www.federalreserve.gov/monetarypolicy/fomc.htm

[28] Thorton, D. (2014). Monetary policy: Why money matters (and interest rates don’t). *Journal of Macroeconomics.* Volume 40. Pages 202-213. Retrieved January 31, 2019 from http://dx.doi.org/10.1016/j.jmacro.2013.12.005

[29] Fama, Eugene F., Does the Fed Control Interest Rates? (June 29, 2013). The Review of Asset Pricing Studies, Forthcoming; Chicago Booth Research Paper No. 12-23; Fama-Miller Working Paper. Retrieved January 31, 2019 from: https://ssrn.com/abstract=2124039

[30] “Beta is the measure of sensitivity of a stock’s return to the return on the market portfolio.” (p. 340) Brealey, Myers, & Marcus (2009) *Fundamentals of Corporate Finance* 6th ed. McGraw-Hill/Irwan, New York, New York. ISBN 978-0-07-338230.

[31] Value Line. (2012). Using Beta. Retrieved January 27, 2021 from https://www.valueline.com/Tools/Educational_Articles/Stocks/Using_Beta.aspx#.YBG5ZDSSmUk

over time, become more diversified and have more assets in place, producing cash flows. All of these factors push betas towards one.[32]

We used the Hamada formula to analyze the effects of un-levering and re-levering guideline companies' betas for the selected capital structure for each market segment, with one exception. [33]

First, we unlevered the beta for each guideline company using the company-specific components:

Unlevered beta = Levered beta / [1 + (1 – Tax Rate) x (Debt / Equity)].

Next, we re-levered the beta for each guideline company using the average tax rate and the selected capital structure for the market segment:

Re-levered beta = Unlevered Beta x [1 + (1 – Tax Rate) x (Debt / Equity)].[34]

See each market segment's Beta Analysis page in the appendices for more information on how we arrived at the indicated beta.

Equity Risk Premium

The equity risk premium, as defined by Pratt and Grabowski, is the extra return over the expected yield on risk-free securities that investors expect to receive from an investment in a diversified portfolio of common stocks.[35] Bradford Cornell has a similar definition for the equity risk premium, noting it is the difference between the return on common stock and the return on government securities.[36] The equity risk premium should reflect what investors think the risk premium will be going forward.

As provided by Damodaran, "Broadly speaking, there are two ways of estimating equity risk premiums, with the first being a historical premium estimated by looking at the difference between past returns on stocks and the risk-free investment and the second being a forward looking estimate, where you back out from stock prices what investors are building in as an expected return on stocks in the future."[37]

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32 Damodaran, A. (n.d.). Estimating Risk Parameters. Retrieved January 27, 2021 from http://people.stern.nyu.edu/adamodar/pdfiles/papers/beta.pdf

33 Guideline companies in the Fluid Transportation Pipeline market segment are limited partnerships and the income tax liability is "passed-through" to the shareholders. Therefore, the Hamada formula, which includes a component for income taxes is not applicable.

34 Pratt, Shannon and Grabowski, Roger, (2010). *Cost of Capital Applications and Examples,* 4th Ed., Pages 188-189

35 Pratt, Shannon and Grabowski, Roger, (2010). *Cost of Capital Applications and Examples,* 4th Ed., Pages 115-116

36 Cornell, Bradford, (1999). *The Equity Risk Premium,* Page 18

37 Damodaran, Aswath, Dr. (April 2016). *The Cost of Capital: The Swiss Army Knife of Finance*, Page 11. Retrieved from http://people.stern.nyu.edu/adamodar/pdfiles/papers/costofcapital.pdf

As provided by Pratt and Grabowski, "There is no one universally accepted method for estimate the ERP [equity risk premium].[38] A wide variety of premiums are used in practice and recommended by academics and financial advisors." We reviewed a few different calculations of the equity risk premium:

Three-Stage Ex Ante (3.56%)
This is a forward-looking CAPM model that uses a three-stage dividend growth model of the S&P 500 to estimate the equity risk premium.[39] According to Ibbotson, "One of the advantages of a three-stage discounted cash flow model is that it fits with the life cycle theories in regard to company growth." [40] In the three-stage model:

1. The first stage uses the short-term growth estimate of the S&P 500
2. The second stage applies a linear decline in the growth rate until reaching the long-term expected growth rate of the U.S. economy
3. The third stage uses the long-term expected growth rate of the U.S. economy

We received suggestions for completing a single-stage ex ante calculation. Applying the short-term growth rate (11.06%)[41] to a single-stage model would imply that the S&P 500 will continue to grow at 11.06% in perpetuity. A single-stage ex ante calculation should not use a short-term growth rate, rather a long-term, sustainable growth rate. Financial theory suggests that the sustainable growth rate used in a single-stage model cannot exceed the long-term growth rate of the economy as a whole. Therefore, we did not complete a single-stage ex ante calculation.

Damodaran (5.94%)
This is an implied equity risk premium as calculated by Damodaran, Professor of Finance at the Stern School of Business at New York University.[42] Dr. Damodaran estimates the implied equity premium using the current level of index, the expected dividends on stock, and the expected growth rate in earnings. He estimated the expected growth rate for years 1960 to 1985 using historical growth rates. For 1985 onwards, he uses the Zacks Investment Research consensus estimate of growth for the stocks in the S&P 500.[43]

The CFO Survey (4.62%)
This survey is issued by Duke University's Fuqua School of Business and the Federal Reserve Banks of Richmond and Atlanta. It was fielded from November 8 to November 19, 2021. The

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38 Pratt, Shannon and Grabowski, Roger, (2010). *Cost of Capital Applications and Examples,* 4th Ed., Page 113

39 See Appendix F for this calculation.

40 Ibbotson, *SBBI 2013 valuation yearbook.* Page 51

41 S&P 500 Earnings and Estimate Report dated February 2, 2023, https://www.spglobal.com/spdji/en/indices/equity/sp-500/#overview

42 Damodaran, Aswath (2022). Implied Equity Risk Premium on January 5, 2023. Retrieved on January 27, 2023 from http://pages.stern.nyu.edu/~adamodar/

43 Damodaran, A. Variables used in Data Set. http://people.stern.nyu.edu/adamodar/New_Home_Page/datafile/variable.htm

annual survey polls CFOs of both public and private companies around the globe. According to the survey results indicate that respondents of the survey expect that the average annual S&P 500 return will be 8.5% over the next ten years.[44] This is paired with the annual yield on 10-year Treasury Bonds of 3.88%.[45] Graham & Harvey also published a paper regarding The CFO Survey. They state, "The hurdle rates are significantly higher than the cost of capital implied by the market risk premium estimates." "Given capital constraints, firms often impose a higher hurdle rate on their investment. For example, to allocate capital to an investment that promises a projected return exactly at a firm's WACC [weighted average cost of capital] is equivalent to accepting a zero net present value project."[46]

Fernandez, Garcia, and Acin (5.6%)
This is a forward-looking equity risk premium based on surveys of finance and economics professors, analysts and managers of companies and their opinion of the required market risk premium in different countries, performed annually.[47]

Business Valuation Resources, Historical, Arithmetic Mean (6.28%)
Business Valuation Resources provides a historical equity risk premium calculated using an arithmetic mean of the S&P 500 average annual less the 20-year Treasury bond average annual return for the period of 1928 to present. Sourced from the Center for Research in Security Prices.[48]

Business Valuation Resources, Historical, Geometric Mean (5.01%)
Business Valuation Resources provides a historical equity risk premium calculated using a geometric mean of the S&P 500 average annual less the 20-year Treasury bond average annual return for the period of 1928 to present. Sourced from the Center for Research in Security Prices.[49]

Geometric Versus Arithmetic Averages
The arithmetic rate of return is a simple average of annual returns. The geometric rate of return considers cash flows generated during the security's holding period to be reinvested at the

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44 The CFO Survey (2022). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

45 The daily observations rate for 10-year U.S. Treasury coupon bonds was 3.88% as of December 31, 2022.

46 Graham, J. R., and Harvey, C. R. (28 March 2018). *The Equity Risk Premium in 2018*. SSRN Electronic Journal. doi:10.2139/ssrn.3155709

47 Fernandez, P., Garcia T., and Acín, J. F. (May 2022). *Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022:* SSRN Electronic Journal. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

48 Business Valuation Resources. (2023). *Cost of Capital Platform.* Historical Equity Risk Premium (20-Year T-Bond) – for Period 1928-2022), Arithmetic Average. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

49 Business Valuation Resources. (2023). *Cost of Capital Platform.* Historical Equity Risk Premium (20-Year T-Bond) – for Period 1928-2022), Geometric Average. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

security's required rate of return. In general, the lower the returns, the greater is the disparity between the two averages.[50] As provided by Damodaran, "the geometric mean is more appropriate if you are using the Treasury bond rate as your risk-free rate, have a long time horizon and want to estimate the expected return over that long time horizon."[51] A study by Jacquier, Kane, and Marcus analyzed the arithmetic and geometric returns and found that, "unbiased estimates of future portfolio value require that the current value be compounded forward at a weighted average of the arithmetic and geometric rates." They continue, "As the horizon approaches the length of the estimate period, the weight on the geometric average approaches 1. For even longer horizons, both the geometric and arithmetic average forecasts will be upwardly biased."[52]

This formula calculates the market rate of equity using the capital asset pricing model (CAPM).

Market Rate of Equity for Market Segment = $(RP_e \times \beta) + R_f$

Key – Variables in Equations	
RP_e	Equity risk premium
R_f	Risk-free rate
β	Beta

Damodaran commented on the use of a historical risk premium versus an implied risk premium early in 2018:

> While it is tempting to continue to dissect last year's numbers, it is healthier to turn our attention to the future. It is why I have increasingly moved away from using historical risk premiums, like the 4.77% premium that I computed by looking at the 1928-2017 return table, and towards implied equity risk premiums, where I back out what investors are demanding as a premium for investing in stocks by looking at how much they pay for stocks and what they expect to generate as cash flows. (Think of it as an IRR for stocks, analogous to the yield to maturity on a bond). At the start of 2018, putting this approach into play, I estimated an equity risk premium of 5.08% for the S&P 500. [53]

Empirical Capital Asset Pricing Model

The empirical capital asset pricing model (ECAPM) is a modification of the CAPM. The ECAPM applies 25% weight to the equity risk premium component and 75% weight to the beta times the equity risk premium component. This reduces the sensitivity of the cost of equity estimate to changes in the beta coefficient.

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[50] Hirt, G., Block, S., & Basu, S. (2006). Investment Planning for Financial Professionals. McGraw-Hill, New York, New York. ISBN 0-07-132721-5

[51] Damodaran, A. Discussion Issues and Derivations. Retrieved January 27, 2021 from http://people.stern.nyu.edu/adamodar/New_Home_Page/AppldCF/derivn/ch4deriv.html

[52] Jacquier, E., Kane, A., & Marcus, A. (2003). Geometric or Arithmetic Mean: A Reconsideration. *Financial Analysts Journal, 59*(6), 46–53. Retrieved January 27, 2021 from https://doi.org/10.2469/faj.v59.n6.2574

[53] Damodaran, A. January 2018 Data Update 2: The Buoyancy of US Equities. January 9, 2018. https://aswathdamodaran.blogspot.com/2018/01/january-2017-data-update-2-buoyancy-of.html

According to Steven Kihm, Andrew Satchwell, and Peter Cappers, the model "mutes the sensitivity of the cost of equity estimate to changes in the beta coefficient, consistent with the adjustment suggested by the empirical research."[54]

This formula calculates the market rate of equity using the ECAPM.

$$\text{Market Rate of Equity for Market Segment} = (RP_e \times \beta \times 75\%) + (RP_e \times 25\%) + R_f$$

We completed ECAPM models for each market segment, using the equity risk premiums described in the Capital Asset Pricing Model section.

Key – Variables in Equations	
RP_e	Equity risk premium
R_f	Risk-free rate
RP_U	Market segment specific risk premium (unsystematic)

Dividend Growth Model (DGM)

We also used the DGM to determine the market rate of equity. It is based on the theory that the prices paid for a share of stock reflect the investors' discounted present value of future expected earnings.[55] The DGM is a widely used method and is also called the Discounted Cash Flows (DCF) model or Gordon growth model.

Theoretically, the growth estimate in the DGM is the estimated growth in dividends, which are cash flows to equity shareholders after reinvestment. Dividend growth estimates may track earnings growth estimates. However, companies may change dividend payment policies drastically, resulting in large differences between earnings growth estimates and dividend growth estimates.

A consensus based on substantial academic literature indicates analysts' expectations of earnings take account of all the information provided by more formulaic forecasting rules and incorporate other information as well. "Based on these findings, the most common solution is to assume that the dividend payout rate remains effectively constant and to use analyst forecasts of earnings growth as a proxy for the growth rate of dividends."[56]

Another issue that leads us to question the usefulness and reliability of the dividend growth rate in this model is the trend for U.S. companies to include stock buybacks in their dividend payment policies. We discuss this in detail in the Stock Buybacks section.

Key – Variables in Equations	
DY	Dividend Yield
DG	Dividend Growth
EG	Earnings Growth

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54 Kihm, Steven; Satchwell, Andrew; and Cappers, Peter. *The Financial Impacts of Declining Investment Opportunities on Electric Utility Shareholders,* Electricity Markets & Policy Group, Technical Brief, Page 20

55 Western States Association of Tax Administrators (2009). *Appraisal Handbook – Unit Valuation of Centrally Assessed Properties*, Page III-20

56 Cornell, Bradford, (1999). *The Equity Risk Premium,* Page 105

The formula uses dividend yield (DY), which is next year's expected dividends per share divided by the current market price per share of stock, plus an estimate of growth. We reviewed both dividend and earnings growth models.

Dividend Growth (DG), analysts' estimates of dividend growth is used in the model:

Market Rate of Equity for Market Segment = DY + DG

Earnings Growth (EG), analysts' estimates of earnings growth is used in the model:

Market Rate of Equity for Market Segment = DY + EG

Another formulaic expression of the dividend growth model is:

$K_E = D_1 / P_0 + G_1$

In this expression, we estimate the cost of equity by taking the dividend yield (expected dividends in the next period divided by the recent stock price) plus expected growth. This model is the same model as the simplified discounted cash flows income model that we referred to as the stable growth yield capitalization, mentioned previously. The stable growth yield capitalization formula is:

$\text{Value} = NCF_1 / (Y_0 - g)$.

Instead of solving for value as the stable growth yield capitalization model does, the DGM solves for cost of equity.

Value Line Investment Survey provides analysts' estimates of change in earnings and dividends from 2017-2019 to 2023-2025. We use these growth rates in the dividend growth model for each market segment.[57]

See each market segment's Dividend Growth Model page in the appendices for more information on how we derived the indicated rate.

K_E	Cost of Equity
D_1	Expected Dividends
P_0	Recent Stock Price
G_1	Projected 5-year Growth Rate
Y_0	Yield Rate for Current Assessment Period
g	Stable Growth
NCF_1	Net Cash Flows for Next Period

The growth rate used in this single-stage DGM is a short-term growth rate, which is typically much higher than the growth rate of the U.S. economy. We use this to calculate value of a company into perpetuity. It is not possible for a company to grow at a growth rate higher than the U.S. economy in the long-term. According to Damodaran, "the amount of cash that U.S. companies are returning to

[57] In previous studies, Value Line did not provide sufficient data for earnings or dividend growth rates for guideline companies for the Gas Transmission Pipeline and Fluid Transportation Pipeline market segment. The department used other investment survey estimates. Starting with the 2020 study, Value Line has had sufficient data for these market segments, so the department is using Value Line data.

stockholders is unstainable, given the earnings and expectations of growth."[58] Pratt and Grabowski also state, "Long-term growth rates exceeding the real growth in GDP (Gross Domestic Product) plus inflation are generally not sustainable."[59]

In a recent article published by Cornell and Gerger, "Long-term growth rates play a central role in all discounted cash flow models. This is true whether the goal is to estimate the value of a company or to estimate the cost of equity. It is well recognized as a matter of mathematics, although not always incorporated in practice, that the long-term expected growth cannot exceed the growth rate of the aggregate economy. What is less widely appreciated is that as an empirical matter the long-term growth rates for existing companies, that is companies that are being appraised or whose cost of equity is being estimated, are almost certain to be less than the growth rate of the aggregate economy."

Cornell and Gerger's article goes on to say, "The bottom line is that when employing a DCF model to value a company, or when using the dividend growth model to estimate the cost of equity capital, the growth rate of the economy should be thought of as a ceiling, not a floor on long-term growth in earnings and dividends. In the long run, existing companies fade and new enterprises account for much of the growth in aggregate earnings and profits. Therefore, although the short- or medium-term expected growth rates for an existing company may be relatively high, in very few instances is it reasonable to assume that the long-run growth rate for an existing company will match the long-run growth rate of GDP." [60]

Two-Stage Dividend Growth Model

We completed a two-stage dividend growth model (two-stage DGM) to account for the short-term growth estimates available. Unlike the model discussed in the previous section, the two-stage DGM assumes that growth is not constant. This allows the us to use analysts' short-term growth estimates, a transition period where the short-term growth estimates adjust to the long-term, sustainable growth estimate, and then a period of long-term sustainable growth.

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[58] Damodaran, A. January 2017 Data Update 9: Dividends and Buybacks Damodaran, February 6, 2017. http://aswathdamodaran.blogspot.com/2017/02/january-2017-data-update-9-dividends.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+blogspot%2FpHUuM+%28Musings+on+Markets%29

[59] Pratt, Shannon and Grabowski, Roger, (2010). *Cost of Capital Applications and Examples,* 4th Ed., Page 681

[60] Cornell, Bradford; Gerger, Richard, (2022). Long-term Growth Rates in Discounted Cash Flow Models. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4047338

David Parcell (2010) provides the following multi-stage DGM formula in The Cost of Capital – A Practitioner's Guide, published by the Society of Utility and Regulatory Financial Analysts:

$$K_E = (DY \text{ x } (1+.5(G)) + 0.67(G_1) + 0.33(g)$$

Key – Variables in Equations	
K_E	Cost of Equity
DY	Dividend Yield
G_1	Projected 5-year Growth Rate
G	Average of G_1 and g
g	Stable Growth

Three-Stage Dividend Growth Model

Beginning with the 2021 Study, we completed a three-stage dividend growth model (three-stage DGM) to account for the short-term growth estimates available. This model uses the analysts' short-term growth estimates for a period of five years, a period of 10 years where the short-term growth reverts to the long-term sustainable growth, and a period of 15 years, where the dividends are grown at the long-term sustainable growth rate of the U.S. economy. We then calculate a reversion. We use the internal rate of return function utilizing the calculated, expected dividends and the current price of the stock.

This model is similar to the three-stage dividend growth model we use to calculate the ex-ante equity risk premium used in the capital asset pricing models.

The market segment appendices include a detailed calculation of the three-stage dividend growth model for each guideline company.

Stock Buybacks

A company's net income represents income that the company can reinvest or distribute to its owners.[61] Dividends are often considered the primary approach for publicly traded firms to return cash or assets to their shareholders. However, companies can also return cash to their stockholders through stock buybacks – buying back outstanding stock in the firm and reduce the number of shares outstanding.[62]

Because a company cannot act as its own shareholder, it absorbs repurchased shares, reducing the number of outstanding shares on the market. This increases the relative ownership stake of each investor because there are fewer shares, or claims, on the company earnings.

The amount of cash that U.S. companies have been returning to stockholders is unsustainable, given the earnings and expectations of growth. In 2015 and 2016, the companies in the S&P 500 returned more than 100% of earnings to investors.[63] As provided by Sanders and Schumer (2019), "between 2008 and 2017, 466 of the S&P 500 companies spent around $4 trillion on stock buybacks, equal to 53 percent of

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[61] Keown, Arthur; Martin, John; and Petty, J., (2014). *Foundations of Finance: The Logic and Practice of Financial Management*, 8th Ed., Page 53

[62] Damodaran, Aswath, Dr. (2015). *Applied Corporate Finance*, 4th Ed., Page 439

[63] Damodaran, Aswath, Dr. (2017, February 06). January 2017 Data Update 9: Dividends and Buybacks. Retrieved February 06, 2017, from http://aswathdamodaran.blogspot.com/2017/02/january-2017-data-update-9-dividends.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A%2Bblogspot%2FpHUuM%2B%28Musings%2Bon%2BMarkets%29

profits. An additional 40 percent of corporate profits went to dividends."[64] Another article notes, "U.S. companies have spent $1 trillion this year on buying back their own stock – a record figure reached three weeks before year's end."[65] In 2019, the S&P 500 paid an aggregate $485.48 billion to shareholders, up 6.4% from 2018, and marks the eight consecutive year of record payments.[66] The S&P 500 Index spent $806 billion in stock buybacks in 2018 and $370 billion in repurchases during the first half of 2019.[67] Debt-funded repurchases reached a record level of 34% of the total in 2017 with most repurchases funded with cash in 2018.[68]

Given the trend of U.S. companies to include stock buybacks in their dividend payment policies, we question the reliability of the expected dividends and expected dividend growth rate inputs of the DGM.

Build-Up Model

The build-up model is another model used to estimate the market rate of equity. Some view this as a version of the CAPM without specifically incorporating systematic risk.[69] The CAPM assumes that the risk premium portion of a security's expected return is a function of that security's systematic risk.[70]

An investor can diversify their portfolio to remove unsystematic risk (market segment-specific risk). Systematic risk (market risk) is the risk related to an investment return that cannot be eliminated through diversification.[71]

In the build-up model, the market rate of equity for the market segment equals the risk-free rate plus the equity risk premium plus the risk specific to the market segment for unsystematic risk.

$$\text{Market rate of equity for Market Segment} = R_f + RP_e + RP_u$$

64 Schumer, C., & Sanders, B. (2019). Schumer and Sanders: Limit Corporate Stock Buybacks. *The New York Times.* Retrieved February 11, 2019 from https://www.nytimes.com/2019/02/03/opinion/chuck-schumer-bernie-sanders.html

65 Ivanova, I. (2018). U.S. companies spent record $1 trillion buying back own stock this year. *CBS News*. Retrieved February 11, 2019 from https://www.cbsnews.com/news/copmanies-spent-record-1-trillion-buying-back-their-own-stock-this-year/

66 Badkar, M. (2020). S&P 500 companies paid #485.4bn in dividends last year. *Financial Times*. Retrieved January 8, 2020 from https://www.ft.com/content/69aa638e-3164-11ea-9703-eea0cae3f0de

67 Lazonikc, W., Sakinc, M. E., & Hopkins, M. (2020). Why stock buybacks are dangerous for the economy. *Harvard Business Review.* Retrieved January 8, 2020 from https://hbr.org/2020/01/why-stock-buybacks-are-dangerous-for-the-economy

68 Calderone, G. (2019). Debt-financed share buybacks dwindle to lowest level since 2009. *Bloomberg.* Retrieved January 8, 2020 from https://www.bloomberg.com/news/articles/2019-01-27/debt-financed-share-buybacks-dwindle-to-lowest-level-since-2009

69 Pratt, Shannon and Grabowski, Roger, *Cost of Capital Applications and Examples,* 4th Ed., Page 102 (2010)

70 Ibid, p. 105

71 Keown, Arthur; Martin, John; and Petty, J., *Foundations of Finance: The Logic and Practice of Financial Management*, 8th Ed., (2014). Page 195

When the inputs are not available for the CAPM, one can use the Build-Up Model. We were able to complete the CAPM for each market segment and did not need to resort to using the Build-Up Model.

Market Rate of Debt

The department used the Corporate Bond Yield Averages for Public Utility Bonds from Mergent Bond Record to estimate the market rate of debt for each company used as a guideline company for the Electric, and Gas Distribution market segments. The department used the Corporate Bond Yield Averages for Industrial Bonds from Mergent Bond Record to estimate the market rate of debt for each company used as a guideline company for the Gas Transmission Pipeline, Fluid Transportation Pipeline, and Railroad market segments.

See each market segment's Indexed Rate of Debt page for more information on how the department arrived at the indicated rate of debt.

Market Rate of Preferred Stock

Preferred stock makes up a minimal percentage of the capital structure for all market segments. The amount of capital structure attributable to preferred stock was not materially significant and was not included in indicated capital structure for each market segment.

Direct Capitalization Rate (Direct Rate)

Appraisers use direct capitalization to convert an estimate of a single year's net operating income expectancy into an indication of value in one direct step.[72]

The direct rate (D_0) is an expression of the market observed relationship between price and income.

To indicate the market value (value), apply the market observed direct rate to the net operating income (NOI) of the property.

$$\text{Value} = NOI_1 / D_0$$

We used the same guideline companies in the yield rate and the direct rate. See the Guideline Companies section for more information.

Key – Variables in Equations	
D_0	Direct Rate
NOI_1	Net Operating Income for the next year
Value	Market Value

We used the same method for the debt component in the direct rate as in the Market Rate of Debt section, used for the yield rate. See the Market Rate of Debt section for more information.

Equity Component

We used an inverse of the Price to Earnings Ratio (P/E Ratio) to estimate the equity component of the direct rate. For this estimate, we used the P/E Ratio as calculated by Value Line Investment Survey; if the P/E Ratio was not calculated, we used the Trailing P/E Ratio as calculated by Value Line. We

[72] Western States Association of Tax Administrators (2009). Appraisal Handbook – Unit Valuation of Centrally Assessed Properties, Page III-8

selected the P/E ratio most indicative of the market segment data. The inverse of the selected ratio is the equity component of the direct rate.

See each market segment's Direct Equity Component page in the appendices for more information on how we arrived at the indicated equity component.

Flotation Costs

Flotation costs are costs incurred when a company issues a new security, including fees to an investment banker, legal fees, accounting, and other out of pocket expenses. The market-determined opportunity cost of capital is not affected by the flotation costs of a particular firm.[73] The correct procedure for the economic analysis of flotation costs does not alter the weighted average cost of capital.[74]

The yield rates and direct rates in this study are market derived, using market data. Unlike determining allowable rates of return in rate cases, the recovery of previously incurred costs is not added to the yield rates or direct rates used for estimating market value. The yield rate and direct rate are not recovery mechanisms for the costs of doing business.

Dr. Richard Simonds stated in his paper published in the Journal of Property Tax Assessment & Administration, "When capitalizing net operating income in the income approach, a flotation-cost adjustment cannot be applied to the cost of capital. Advocates of an adjustment may be confusing the concept of the allowed rate of return on invested capital in a rate-regulated environment with the concept of the market-determined opportunity cost of capital."[75]

Thomas Copeland and Fred Weston find that adjusting for flotation costs in the rate of return is incorrect because it implicitly adjusts the opportunity cost of funds supplied to the firm. The true market-determined opportunity cost is unaffected by the flotation costs of a particular firm.[76]

We do not make flotation cost adjustments to the yield rate or direct rate in this study.

Company-Specific Risk

The department does not include adjustment for company-specific risks, such as a size premium adjustment for a specific company.

We do not include size premium adjustments based on the guideline companies' average market capitalization size; we do not find this to be generally accepted practice. Damodaran points out several reasons why a size adjustment to the CAPM is not appropriate, concluding that the empirical evidence is

[73] Western States Association of Tax Administrators, (2009). Appraisal Handbook – Unit Valuation of Centrally Assessed Properties, Page III-31

[74] Copeland, Thomas E., and Weston, Fred J. (1988). Financial Theory and Corporate Policy (3rd Ed.). Addison-Wesley Publishing Company.

[75] Simonds, Richard R., Dr. (2006). "Income Capitalization, Flotation Costs, and the Cost of Capital." Journal of Property Tax Assessment & Administration, Volume 3, Issue 4.

[76] Copeland and Weston. *Financial Theory and Corporate Policy* (3rd Ed.). Page 534

not as conclusive as it was initially thought to be.[77] He also finds that forward-looking risk premiums are yielding no premiums for small cap (market capitalization) stocks and much of the additional risk is either diversifiable or double counted.[78]

Eugene Fama and Kenneth French analyzed size premiums of companies that move to different market capitalizations and found, "the size premium is almost entirely a result of the extreme positive returns of small-cap (market capitalization) stocks that move to a big-cap (market capitalization) portfolio from one year to the next."[79]

Similarly, the equity risk premium surveys by Graham and Harvey find no evidence that the weighted average cost of capital is larger for smaller firms.[80]

Illiquidity

We do not adjust capitalization rates for illiquidity. As the Appraisal Institute explains:

> A discount rate reflects the relationship between income and the value that a market will attribute to that income. The financial and economic concepts implicitly in a discount rate are complex and have been the subject of significant analysis for more than a century. Although four key components can be identified within a discount rate – the safe rate plus considerations of illiquidity, management, and various risks – a discount rate that is constructed by adding allowances for these components can be misleading and inaccurate.[81]

Growth

The growth rate is important because it affects the yield model, explained in the Yield Capitalization Rate section. Minnesota Rules 8100 and 8106 imply a zero percent growth yield model. If the assumption that income streams remain equal over time is incorrect, this model may not accurately reflect the market value of the company.

For a company with a changing income streams, a discounted cash flows model or stable growth yield model may be better at estimating the value for the company under review. The discounted cash flows model uses explicit forecasts of anticipated net cash flows for each period. These inputs can be estimated by the department if they are not provided by the company.

77 Damodaran, Aswath, Dr. "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2011 Edition." Retrieved from: http://people.stern.nyu.edu/adamodar/pdfiles/papers/ERP2011.pdf

78 Damodaran, Aswath, Dr. (11 April 2015). "The small cap premium: Where is the beef?" Retrieved from: http://aswathdamodaran.blogspot.com/2015/04/the-small-cap-premium-fact-fiction-and.html.

79 Fama, Eugene F. and French, Kenneth R. (2007). "Migration." Financial Analysts Journal, Volume 63, Number 3. CFA Institute.

80 Graham, J. R., and Harvey, C. R. (28 March 2018). The Equity Risk Premium in 2018. SSRN Electronic Journal. doi:10.2139/ssrn.3155709

81 Appraisal Institute (2013). The Appraisal of Real Estate, 14th Edition, Page 458

The direct rate is the relationship between an estimate of a single year's net operating income and the value of the property, while the yield rate converts income from future periods into present value. The implied growth rate is the difference between the yield rate and the direct rate. The Western States Association of Tax Administrators Appraisal Handbook states, "direct capitalization is not affected by the appraiser's view of the future income."[82] In addition, Unit Valuation Insights states, "The direct capitalization rate is typically calculated as the yield capitalization rate minus an expected long-term growth rate."[83]

Short-Term Growth Rate

We reviewed short-term growth rates from several sources to derive an estimate of a short-term growth rate for each market segment.

Zacks Investment Research provides industry growth estimates for the next five years, by industry. We downloaded this data on January 4-5, 2023.

Electric	Gas Distribution	Gas Transmission Pipeline	Fluid Transportation Pipeline	Railroad
6.0%	6.1%	6.5%	7.0%	9.6%

We compared the median short-term growth rates for each market segment from CFRA (from S&P NetAdvantage), Value Line Investment Survey, Yahoo! Finance, and Zacks Investment Research.

Source	CFRA[84]	Value Line Earnings[85]	Value Line Dividends[86]	Yahoo! Finance[87]	Zacks[88]
Electric	6.0%	6.0%	6.0%	5.91%	6.0%
Gas Distribution	8.0%	6.5%	5.25%	6.0%	5.2%

[82] Ibid., Page III-9

[83] Schweihs, Robert P. & Reilly, Robert F. (Spring 2014). Unit Valuation Insights, Issues Related to the Unit Valuation Principle, Page 77

[84] CFRA (as downloaded from S&P NetAdvantage) three-year projected earnings per share compound annual growth rate. CFRA stock reports dated January 4, 2023.

[85] Value Line Investment Survey provides estimated growth rates for dividends and earnings 2019-2021 to 2025-2027. Value Line tear sheets are dated October 21, 2022 to December 9, 2022.

[86] Value Line Investment Survey provides estimated growth rates for dividends and earnings 2019-2021 to 2025-2027. Value Line tear sheets are dated October 21, 2022 to December 9, 2022.

[87] Yahoo! Finance growth estimates, next five years (per annum) downloaded on January 3, 2023.

[88] Zacks Investment Research provides expected earnings per share growth (3-5 years). Data downloaded January 4-5, 2023.

Gas Transmission Pipeline	14.0%	11.50%	4.5%	3.7%	4.0%
Fluid Transportation Pipeline	8.5%	8%	4.5%	5.45%	5.60%
Railroad	7.0%	10.0%	9.5%	10.0%	11.2%

The median short-term growth rate for each market segment from the above sources is:

Electric	Gas Distribution	Gas Transmission Pipeline	Fluid Transportation Pipeline	Railroad
6.0%	6.0%	8.15%	6.33%	10.0%

This evidence indicates that there is significant short-term growth in each market segment; though the amount of short-term growth can vary widely between different analyst's forecasts.

Long-Term Growth Rate

We reviewed long-term growth rates from several sources to derive an estimate of long-term growth for the economy. "Since no firm can grow forever at a rate higher than the growth rate of the economy in which it operates, the constant growth rate cannot be greater than the overall growth rate of the economy."[89] These sources indicate varying rates of growth in the U.S. economy over the long-term:

- The Federal Reserve Bank projects their "longer run" estimate of change in U.S. real Gross Domestic Product (GDP) at 1.8%[90].
- The World Bank forecasts U.S. GDP will grow 0.5% in 2023, and 1.6% in 2024.[91]
- Trading Economics projects the U.S. GDP annual growth rate to trend around 1.9% in 2025.[92]
- The Economist Intelligence Unit forecasts U.S. real GDP will grow 1.5% from 2021 to 2050.[93]

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89 Damodaran, Aswath, Dr. (n.d.) The Stable Growth Rate, http://pages.stern.nyu.edu/~adamodar/New_Home_Page/valquestions/stablegrowthrate.htm

90 Board of Governors of the Federal Reserve System, Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy. December 2022 Retrieved January 27, 2023 from https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20221214.pdf

91 World Bank Group Flagship Report, Global Economic Prospects. January 2023. Page 4. Retrieved January 27, 2023 from http://www.worldbank.org/en/publication/global-economic-prospects

92 Trading Economics, United States Full Year GDP Growth Rate Forecast. Retrieved February 6, 2023 from https://tradingeconomics.com/united-states/full-year-gdp-growth

93 The Economist Intelligence Unit. July 21, 2022. Retrieved January 27, 2023 from http://country.eiu.com/article.aspx?articleid=1652314548&Country=United+States&topic=Economy&subtopic=Long-term+outlook&subsubtopic=Summary

- The Congressional Budget Office projects that real GDP will grow by 3.1% in 2022 and grow 2.2% in 2023 and 1.5% in 2024. The CBO projects that real GDP will grow at an annual average of 1.5% from 2025 to 2026, and 1.7% from 2027 to 2032.[94]

After considering the above sources, we find the indicated long-term real growth rate of the U.S. economy to be 1.7%.

Inflation

Inflation makes future income less valuable than today's income. Inflation is the percentage change in the value of the Wholesale Price Index (WPI) on a year-to-year basis. It effectively measures the change in the prices of a basket of goods and services in a year.[95]

According to Arthur Keown, John Martin, and J. William Petty, "investors require nominal (or quoted) rate of interest that exceeds the inflation rate or else their realized real return will be negative."[96] According to Damodaran, "An inflation-indexed Treasury security does not offer a guaranteed nominal return to buyers, but instead provides a guaranteed real return."[97]

According to Cornell, "inflation is not considered explicitly when using the equity risk premium to forecast long-run future stock returns because it is already included in the interest rates that go into the calculation."[98] Cornell continues, "When investors invest, their goal is to increase future consumption. Consequently, the success of an investment is measured not in nominal dollars but real dollars… investors are concerned with real returns, defined as the percent increase in purchasing power, not nominal returns."[99]

The U.S. Treasury issues inflation-indexed securities. Comparing the inflation-indexed securities to the non-inflation indexed securities, one can calculate the inflation rate. Using the 10-year, 20-year, and 30-year securities, we calculated the inflation rates as of January 3, 2023.[100]

	10-Year	20-Year	30-Year
Calculated Inflation	2.26%	2.50%	2.27%

[94] Congressional Budget Office. (May 2022). An Overview of the Economic Outlook: 2022 to 2032. Retrieved February 2, 2023 from https://www.cbo.gov/publication/58147

[95] http://economictimes.indiatimes.com/definition/inflation

[96] Keown, Arthur; Martin, John; and Petty, J. William, (2014). *Foundations of Finance: The Logic and Practice of Financial Management*, 8th Ed., Page 35

[97] Damodaran, Aswath, Dr. (2015). Applied Corporate Finance, 4th Ed., Page 90

[98] Cornell, Bradford, (1999). *The Equity Risk Premium,* Page 29

[99] Ibid. Page 31

[100] Difference between inflation-indexed and non-inflation indexed securities for 10-year, 20-year, and 30-year daily rates as of January 3, 2023. Retrieved January 27, 2023 from www.federalreserve.gov

An Overview of the Economic Outlook: 2022 to 2032, published by the Congressional Budget Office (CBO), estimates that inflation for personal consumption expenditures will change from year to year by 5.1% in 2022, 2.7% in 2023, 2.2% in 2024, 2.0% from 2025 to 2026, and 2.0% from 2027 to 2032.[101]

The Federal Reserve Board members and the Federal Reserve Bank presidents estimated the longer-run personal consumption expenditures inflation rate at 2%.[102]

We used the expected, longer-run personal consumption expenditures inflation rate of 2% as the estimate of inflation for this study.

Given the indicated long-term real growth rate of 1.7% and the expected inflation rate of 2.0%, we estimated the long-term growth rate at 3.7%.[103]

Market to Book Ratios

We analyzed market-to-book ratios of publicly traded stock and debt securities, by market segment. This analysis indicates how the market perceives the value of these assets relative to the book value. A market-to-book ratio below one indicates that there may be obsolescence affecting that market segment; a ratio over one would indicate that there is no obsolescence. The analysis for each market segment indicated no obsolescence.

See each market segment's Calculation of Market to Book Ratios page for more information.

Public Comments on Draft Study

The department posted the Draft 2023 Capitalization Rate Study on our website (www.revenue.state.mn.us) on March 3, 2023. We accepted comments through March 31, 2023. We appreciate the thoughtful responses we received. Your opinions and feedback are important and we carefully considered every comment.

This section summarizes some of the comments we received on the Draft Study and our responses:

101 Congressional Budget Office. (May 2022). to the Overview of the Economic Outlook: 2022 to 2032. Retrieved February 2, 2022 from https://www.cbo.gov/publication/58147

102 Board of Governors of the Federal Reserve System, Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy. December 2022 Retrieved January 31, 2023 from https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20221214.htm

103 As provided by Pratt & Grabowski, "Long-term growth rates exceeding the real growth in GDP plus inflation are generally not sustainable" (p. 1195). Pratt, Shannon and Grabowski, Roger, (2014). *Cost of Capital Applications and Examples,* 5th Ed.

Aggregated Written Public Comments by Section

General

1. Multiple commenters noted that they expected to see higher overall yield rates year-over-year given that there is a higher risk-free rate, short term growth rates, higher betas, higher debt rates, and other market observations that would lead to a higher overall yield rate.
2. Commenters observed that department's overall yield rate was well below other states' yield rates.
3. One commenter noted that the capital structure for the Railroad Market Segment should rely on the mean as opposed to the median for the five guideline companies. This would result with 82% weight placed on the equity component, and 18% weight on the debt component. The commenter noted that the department stated that they placed equal reliance on the mean and median when determining the capital structure; however, when rounded the outcome should have been 19% on the debt component and 81% on the equity component.

Response

1. The department recognizes that year-over-year, the risk-free rate is higher, along with the debt rate for all market segments. There are other market data points that may lead to a higher yield rate year-over-year for some market segments as well, all things equal. This year we decided to not to place weight on the Single-Stage and Two-Stage DGMs, which is a change from prior studies. As we stated in the Draft Study, the growth assumptions in the Single-Stage and Two-Stage DGMs do not match the growth assumptions used in income model provided in Minnesota Rules 8100 and 8106. This change lowered the cost of equity estimate and the overall yield rate for each market segment even though other market data points on their own may lead to a higher overall yield rate year-over-year. The market observations noted by commenters and their influences to the overall yield rate are inherently contained within our models and calculations throughout the study.
2. Our capitalization rate study is independent from any other state or industry study. While we do find it useful to review other capitalization rate studies, we find it problematic to use other studies as a benchmark or test to the overall yield rate we concluded. There are too many assumptions, differences in law (state to state), among many other influences to each states' or industries' studies to warrant their use as a benchmark or test in the way suggested.
3. We agree with the commenter that the average of the mean and median should have resulted with 19% on the debt component and 81% on the equity component. As a result, the railroad market segment's capital structure has been updated accordingly. Also, we decided to continue with using an average of the mean and median of the railroad capital structure for the sake of consistency across each market segment.

Guideline Companies

1. One commenter requested that DTE Energy Company be removed as a guideline company in the electric market segment as they would not meet FERC's proxy group requirements. This requirement being, "the inclusion of companies that pay dividends and have neither made nor announced a dividend cut during the six-month study". The commenter notes that DTE Energy Company reduced their dividend payout from $3.88 in 2021 to $3.61 in 2022.

2. One commenter recommends that we include Energy Transfer LP, Enterprise Products Partners LP, and Pembina Pipeline Corporation in the gas transmission pipeline market segment guideline companies. The commenter noted that while these companies have a mix of fluid and storage assets along with their natural gas transmission, that should not disqualify them from inclusion in the Study.
3. One commenter stated that the department should consider Cheniere Energy Partners, Energy Transfer LP, Enterprise Products, National Fuel Gas, and Pembina Pipeline as guideline companies in the gas transmission pipeline market segment. The commenter noted that the gas transmission industry operates at a national level, and therefore should not limit the guideline company selection to the Midwest region. Additionally, the commentor stated that the department hasn't identified any reason why MLPs should not be considered.
4. One commenter suggests that Enterprise Products Partners LP be added as a guideline company for the fluid pipeline market segment.

Response

1. We do not depend on FERC's proxy group requirements to determine or help develop own our criteria for determining which guideline companies we use for our study. We do not believe DTE Energy Company should be removed from our guideline company selection for the reason they lowered their dividend payout. See the Guideline Company section for more information on how we select guideline companies to use for each market segment.
2. Pembina Pipeline Corporation was not originally included a gas transmission pipeline guideline company as their gas transmission operations are a smaller percentage of their overall business. However, we agree that their mix of business operations is not dissimilar to other companies included as guideline companies in the gas transmission pipeline market segment, therefore Pembina Pipeline Corporation is added as a guideline company in the Final Study. We have excluded MLPs from our gas transmission pipeline guideline companies given that there are no gas transmission companies that are MLPs, or subsidiaries of, in Minnesota.
3. For the reasons stated above, we have added Pembina Pipeline Corporation to the gas transmission pipeline market segment. According to Value Line, National Fuel Gas Company's gas pipeline, storage, and gathering makes up only 14% of their overall business, and therefore not included. Lastly, we intend for our guideline company selection to most closely represent the companies that operate in Minnesota. The gas transmission companies that operate in Minnesota are not MLPs or subsidiaries of MLPs.
4. Enterprise Products Partners LP operates oil pipeline property; however, according to Value Line, this makes up less than a quarter of their overall business. For this reason, we are not adding Enterprise Products Partners LP to the fluid transportation pipeline market segment.

Debt Rate

1. One commenter mentioned that the debt rate for the railroad market segment should reflect the increase in bond yields from the previous calendar year and select a cost of debt of 5.61% instead of 5.48%.

Response

1. The department selected an indicated cost of debt for the railroad market segment by relying equally on the mean and median of the guideline companies. The same was done for all market segments.

Dividend Growth Model

1. One commenter suggests that the long-term growth rate of 3.7% used in the Three-Stage DGM is too low. The commenter noted that the historic annual return of the S&P 500 over the last 20 or 30 years is 9% and therefore the long-term growth rate should be closer to 9% as well.
2. One commenter stated that multistage DGM models understate equity rates because they assume required returns will decline in the future. The commentor noted that this is not the case by showing that 2022 S&P Monthly Bond Yield's are higher the longer the maturity, and further comparing that the same pattern would be true for long-term equity rates.
3. Multiple commenters mentioned that the cost of equity estimate using the DGM should not yield a lower rate that the cost of debt as an investor would simply choose the less-riskier higher yield debt over the equity investment of lower return.
4. One commenter stated that the Three-Stage DGM is intended for newer industries experiencing high growth and lower dividend payout ratios as opposed to regulated utilities with low growth and higher payout ratios.
5. One commenter mentioned that the growth assumptions in this model are unrealistically low for the Fluid Transportation market segment.
6. Multiple commenters noted that DGM and CAPM Three Stage Ex-Ante models should account for the fact that investors would require higher dividend payout ratios when/if the long-term growth rates become lower.
7. One commenter mentioned that the model fails to offset assumed declining growth in earnings and dividends with higher dividend yields. Investors will demand higher returns on invested capital in the future with an ever-increasing risk in operating a fluid pipeline system.
8. One commenter requested more explanation for the change in giving more reliance on the three-stage DGM.
9. Multiple commenters suggest that if the department uses a DGM, that they only place weight on the single or two-stage DGM.
10. Multiple commenters expressed concern for the extreme change in weightings applied to the cost of equity models year over year, most notably the Three-Stage DGM.
11. One commenter challenges the department's assumption that an individual company cannot outgrow the US economy over time. The commenter points states that under a share repurchase program, the earnings per share can grow faster than the US economy forever. The commenter provides an example to show this by looking at the growth rate of a railroad company from 2001 to 2021 and comparing it US GDP growth to the same 20-year window.
12. One commenter mentioned that long-term growth estimates used in the Three-Stage DGM are subjective, as well as the time periods used in each stage. For this reason, the other DGM models warrant consideration.

Response

We appreciate the thoughtful feedback received on the Dividend Growth Model. In order to give us adequate time to consider and analyze this feedback, we have decided to remove any weight on this model for this assessment year for all market segments. We will consider this model in next year's study giving full consideration to the comments above.

CAPM

1. One commenter suggested the use of a 20-year U.S. Treasury coupon bond for the risk-free-rate in the CAPM, instead of the 30-year U.S. Treasury coupon bond. The reason for this suggestion is that the riskless portion of the equity risk premium derived by Business Valuation Resources is based on a 10-year U.S. Treasury or the 20-year U.S. Treasury.
2. One commenter suggested we use the income return of a Treasury security should be used in the equity risk premium (ERP) calculation as opposed to the total return of a Treasury security. The commenter stated the income return represents the truly riskless portion of the return on the bond. However, the ERP estimate used by Business Valuation Resources uses the total return instead of the income return of the U.S. Treasury bond.
3. One commenter stated that there should less reliance on the CAPM models for the fluid pipeline market segment as the beta tends to be biased low. The commenter states that due to the structure of MLPs, units tend to trade less frequently than corporate shares that are generally owned and traded by a broader set of investors. The different trading patterns for MLP companies results in beta estimates biased on the low side resulting in understated returns for MLP companies when using the CAPM. At a minimum, 80% weight should be applied to the single-stage DGM for the fluid pipeline industry when estimating the cost of equity.

Response

1. We agree with the commenters suggestion to use the 20-year U.S. Treasury Coupon Bond Yield, as opposed to the 30-year U.S. Treasury Coupon Bond Yield to match the ERP estimate from Business Valuation Resources. The 30-year rate of 3.88% is replaced with the 20-year 4.06% rate for all market segments' CAPM models. Our source for these rates is listed in the CAPM calculation pages of each market segment.
2. As provided by Business Valuation Resources, the concept of the equity risk premium is the extra return that investors earn by owning risky stocks over the return by owning a risk-free asset. On this topic, Business Valuation Resources states, "If one measures historical returns annually, then observe the actual return of stocks and the actual return of a risk-free asset for each year. The return measures are what investors actually earned that year and the measures are objected. Then determine the difference between the two returns for each year. To determine the average annual extra return of risky stocks over a risk-free asset, then sum the annual return differences across all years and divided by the number of years. Moreover, using only a portion of the actual return of a risk-free asset (e.g., excluding the capital appreciation portion) is an incomplete measure of what investors actually earned. If one is basing their analysis on object observation, then observe what investors actually earn in total by holding an asset. Doing anything else introduces some degree of subjectivity. The data shows that long-term government bonds have capital appreciation returns close to zero over the long run."[104]

[104] Business Valuation Resources. Cost of Capital Professional Frequently Asked Questions (FAQs) webpage: https://www.bvresources.com/products/faqs/cost-of-capital-professional

3. We do not believe that there should be less reliance on fluid pipeline's CAPMs relative to other market segments. However, to address the commenters concern about a misrepresenting beta for the fluid pipeline industry, we have decided to use the mean versus the median of the guideline companies. The median beta was used in the draft study, and was 1.10, versus the mean which was 1.15.

Other Cost of Equity Models

1. One commenter stated that the department should consider a Plowback model (a.k.a. Retention Growth model). The commenter stated that it is a similar model to the department's DGMs but calculates a market growth factor based on a company's long-term outlook for return on equity and retention ratio which is added to the Dividend Yield to develop a cost of equity.

Response

1. The department has decided not to complete this model. The growth rate used in the recommended model reflects growth rates higher than the analysts' estimates of short-term growth for earnings and dividends for the applicable market segment. This high growth rate does not match the assumptions of the zero percent stable growth model we use in the valuations.

Flotation Costs

Multiple commenters opined that the department should include an adjustment to the yield rate for flotation costs.

Response

The department does not include an adjustment for flotation costs. See the Flotation Costs section for a detailed discussion.

Illiquidity

Some commenters opined that the department should make adjustments for illiquidity to the cost of equity.

Response

The department does not adjust capitalization rates for illiquidity. See the Illiquidity section for a detailed discussion.

Questions?

If you have questions about the 2023 Capitalization Rate Study, contact us at sa.property@state.mn.us.

Appendix A - Electric

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	39.00%	5.57%	2.17%
Common Equity	61.00%	9.56%	5.83%
Yield Rate			**8.00%**

Electric Yield Rate	**8.00%**

Capital Structure

Company	Value of Long-Term Debt	Value of Preferred Equity	Value of Common Equity	Total Market Value	% Long-Term Debt	% Preferred Equity	% Common Equity
ALLETE Inc.	1,653,000,000	-	3,792,118,987	5,445,118,987	30.36%	0.00%	69.64%
Alliant Energy Corp	7,570,000,000	-	14,001,997,677	21,571,997,677	35.09%	0.00%	64.91%
Ameren Corp	13,577,000,000	129,000,000	22,734,439,542	36,440,439,542	37.26%	0.35%	62.39%
American Electric Power Co Inc.	33,647,000,000	-	48,930,099,419	82,577,099,419	40.75%	0.00%	59.25%
Black Hills Corp	4,129,700,000	-	4,247,762,397	8,377,462,397	49.30%	0.00%	50.70%
CenterPoint Energy Inc.	13,435,000,000	790,000,000	19,427,469,573	33,652,469,573	39.92%	2.35%	57.73%
CMS Energy Corp	12,685,000,000	224,000,000	17,647,297,402	30,556,297,402	41.51%	0.73%	57.75%
DTE Energy Company	17,442,000,000	-	22,338,451,562	39,780,451,562	43.85%	0.00%	56.15%
Evergy Inc	9,197,200,000	-	13,471,490,436	22,668,690,436	40.57%	0.00%	59.43%
Northwestern Corp	2,530,400,000	-	2,778,304,474	5,308,704,474	47.67%	0.00%	52.33%
OGE Energy Corp	3,548,000,000	-	7,958,056,212	11,506,056,212	30.84%	0.00%	69.16%
Otter Tail Corp	823,800,000	-	2,390,449,264	3,214,249,264	25.63%	0.00%	74.37%
WEC Energy Group	14,910,700,000	30,400,000	30,767,484,154	45,708,584,154	32.62%	0.07%	67.31%
Xcel Energy Inc.	23,205,000,000	-	32,934,347,979	56,139,347,979	41.33%	0.00%	58.67%

	% Long-Term Debt	% Preferred Equity	% Common Equity
Mean	38.33%	0.25%	61.41%
Median	40.25%	0.00%	59.34%
Indicated Industry Capital Structure	**39.00%**		**61.00%**

We placed approximately equal reliance on the mean and median when selecting the indicated capital structure for the market segment.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
ALLETE Inc.	Baa1	5.57%
Alliant Energy Corp	Baa2	5.57%
Ameren Corp	Baa1	5.57%
American Electric Power Co Inc.	Baa2	5.57%
Black Hills Corp	Baa2	5.57%
CenterPoint Energy Inc.	Baa2	5.57%
CMS Energy Corp	Baa2	5.57%
DTE Energy Company	Baa2	5.57%
Northwestern Corp	Baa2	5.57%
OGE Energy Corp	Baa1	5.57%
Otter Tail Corp	Baa2	5.57%
WEC Energy Group	Baa1	5.57%
Xcel Energy Inc.	Baa1	5.57%

Mean	5.57%
Median	5.57%
Mode	5.57%

Indicated Rate of Debt	**5.57%**

Public Utility Bond Yield Averages from Mergent Bond Record, January 2023 Edition

Public Utility Bond Averages, December 2022

Mergent	S&P	Dec. Yield Avg.
Aaa, Aa1, Aa2 Aa3	AAA, AA+, AA, AA-	5.06%
A1, A2, A3	A+, A, A-	5.28%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.57%

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	7.03%
CAPM - Damodaran	9.29%
CAPM - The CFO Survey	8.13%
CAPM - Fernandez, Banuls, and Acin	8.99%
CAPM - Ex Post (BVR Historical, Arithmetic)	9.59%
CAPM - Ex Post (BVR Historical, Geometric)	8.47%
Empirical CAPM - Ex Ante, Three Stage	7.14%
Empirical CAPM - Damodaran	9.47%
Empirical CAPM - The CFO Survey	8.26%
Empirical CAPM - Fernandez, Banuls, and Acin	9.16%
Empirical CAPM - Ex Post (BVR Historical, Arithmetic)	9.77%
Empirical CAPM - Ex Post (BVR Historical, Geometric)	8.62%
DGM - Dividend Growth	9.15%
DGM - Earnings Growth	9.35%
DGM - Two-Stage	8.63%
DGM - Three-Stage	5.51%
Indicated Rate of Equity	**9.56%**

We established a range of acceptability for the cost of equity with all available models. We considered all of the data and placed more reliance on the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium, and the Damodaran CAPM.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	39.00%	5.57%	2.17%
Equity Component	61.00%	5.56%	3.39%
Direct Rate			**5.56%**

Direct Rate	**5.56%**

Yield Rate	8.00%
Direct Rate	5.56%
Implied Industry Growth Rate	**2.44%**

Capital Asset Pricing Model (CAPM)

(ERP x β) + RFR = Indicated Equity Rate

	Equity Risk Premium (ERP)	x Industry Beta (β)	= Industry Risk Premium	+ Risk-Free Rate[1] (RFR)	Indicated Equity Rate
Three Stage Ex Ante[2]	3.38%	0.88	2.97%	4.06%	7.03%
Dr. Damodaran ERP[3]	5.94%	0.88	5.23%	4.06%	9.29%
The CFO Survey[4]	4.62%	0.88	4.07%	4.06%	8.13%
Fernandez, Banuls and Acin[5]	5.60%	0.88	4.93%	4.06%	8.99%
BVR - Historical, Arithmetic Mean[6]	6.28%	0.88	5.53%	4.06%	9.59%
BVR - Historical, Geometric Mean[7]	5.01%	0.88	4.41%	4.06%	8.47%

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Empirical Capital Asset Pricing Model (ECAPM)

(ERP x β x .75) + (ERP x .25) + RFR = Indicated Equity Rate

Model	Equity Risk Premium (ERP)	Industry Beta (β)	Weighted Industry Risk Premium (weighted at 75%)	Weighted Equity Risk Premium (weighted at 25%)	Risk-Free Rate (RFR)[1]	Indicated Equity Rate
Three Stage Ex Ante[2]	3.38%	0.88	2.23%	0.85%	4.06%	**7.14%**
Dr. Damodaran ERP[3]	5.94%	0.88	3.92%	1.49%	4.06%	**9.47%**
The CFO Survey[4]	4.62%	0.88	3.05%	1.16%	4.06%	**8.26%**
Fernandez, Banuls and Acin[5]	5.60%	0.88	3.70%	1.40%	4.06%	**9.16%**
BVR - Historical, Arithmetic Mean[6]	6.28%	0.88	4.14%	1.57%	4.06%	**9.77%**
BVR - Historical, Geometric Mean[7]	5.01%	0.88	3.31%	1.25%	4.06%	**8.62%**

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Single-Stage Dividend Growth Model

Company	Current Dividend Yield (DY)	Projected Short-term EPS Growth Rate (EG)	Projected Short-term Dividend Growth Rate (DG)	Cost of Equity Earnings Growth DY + EG	Cost of Equity Dividend Growth DY + DG
ALLETE Inc.	3.90%	6.00%	3.50%	9.90%	7.40%
Alliant Energy Corp	3.20%	6.00%	6.00%	9.20%	9.20%
Ameren Corp	2.80%	6.50%	7.00%	9.30%	9.80%
American Electric Power Co Inc.	3.50%	6.50%	6.00%	10.00%	9.50%
Black Hills Corp	3.60%	6.00%	5.50%	9.60%	9.10%
CenterPoint Energy	2.30%	6.50%	2.50%	8.80%	4.80%
CMS Energy Corp	3.00%	6.50%	6.00%	9.50%	9.00%
DTE Energy Company	3.30%	4.50%	3.00%	7.80%	6.30%
Evergy Inc.	4.20%	7.50%	7.00%	11.70%	11.20%
Northwestern Corp	5.20%	2.50%	2.00%	7.70%	7.20%
OGE Energy Corp	4.20%	6.50%	3.00%	10.70%	7.20%
Otter Tail Corp	2.90%	4.50%	7.00%	7.40%	9.90%
WEC Energy Group	3.00%	6.00%	7.00%	9.00%	10.00%
Xcel Energy Inc.	3.40%	6.00%	6.50%	9.40%	9.90%
Mean	3.46%	5.82%	5.14%	9.29%	8.61%
Median	3.35%	6.00%	6.00%	9.35%	9.15%

DGM - Dividend Growth, Indicated Rate	**9.15%**
DGM - Earnings Growth, Indicated Rate	**9.35%**

We placed more reliance on the median to arrive at the indicated rates for DGM - Earnings Growth and DGM - Dividend Growth.

Notes:

Dividend Yield and growth rates provided by Value Line

Two-Stage Dividend Growth Model

K_E = (DY x (1+ 0.5(G))) + 0.67(G1) +0.33(g)

K_E Cost of Equity
DY Dividend Yield
G_1 Short-term Growth Estimate
g Stable Growth
G Average Growth Rate

Company	**DY** Dividend Yield	**G1** Short-term Growth Estimate	**g** Stable Growth	**G** Average Growth Rate	**K_E** Cost of Equity
ALLETE Inc.	3.90%	6.00%	3.70%	4.85%	9.24%
Alliant Energy Corp	3.20%	6.00%	3.70%	4.85%	8.52%
Ameren Corp	2.80%	6.50%	3.70%	5.10%	8.45%
American Electric Power Co Inc.	3.50%	6.50%	3.70%	5.10%	9.17%
Black Hills Corp	3.60%	6.00%	3.70%	4.85%	8.93%
CenterPoint Energy Inc.	2.30%	6.50%	3.70%	5.10%	7.93%
CMS Energy Corp	3.00%	6.50%	3.70%	5.10%	8.65%
DTE Energy Company	3.30%	4.50%	3.70%	4.10%	7.60%
Evergy Inc.	4.20%	7.50%	3.70%	5.60%	10.56%
Northwestern Corp	5.20%	2.50%	3.70%	3.10%	8.18%
OGE Energy Corp	4.20%	6.50%	3.70%	5.10%	9.88%
Otter Tail Corp	2.90%	4.50%	3.70%	4.10%	7.20%
WEC Energy Group	3.00%	6.00%	3.70%	4.85%	8.31%
Xcel Energy Inc.	3.40%	6.00%	3.70%	4.85%	8.72%

Mean	8.67%
Median	8.59%
Two-Stage DGM, Indicated Rate	**8.63%**

We placed equal reliance on the mean and median when selecting the indicated rate.

Notes:

Dividend Yield provided by Value Line
Growth Estimates, Next 5 Years for Earnings provided Value Line
Stable growth rate is the nominal growth rate determined in the Capitalization Rate Study Narrative (indicated long-term growth rate of the U.S. economy of 1.7% plus the expected inflation rate of 2.0%).

Three-Stage Dividend Growth Model

Start Price - recent price from Value Line
Expected dividends - estimated dividends from Value Line
Stage one growth - projected earnings growth rate from Value Line
Stage two growth - reversion to long-term growth rate
Stage three growth - long-term growth rate developed in Study (3.70%)

Company	Year	ALLETE Inc.		Alliant Energy Corp		Ameren Corp		American Electric Power Co Inc.		Black Hills Corp		CenterPoint Energy Inc.		CMS Energy Corp		DTE Energy Company		Evergy Inc.		Northwestern Corp		OGE Energy Corp		Otter Tail Corp		WEC Energy Group		Xcel Energy Inc.	
Start Price	2022		-66.34		-55.78		-87.94		-95.22		-65.27		-30.86		-60.8		-115.3		-58.69		-49.48		-39.75		-57.42		-97.54		-60.21
Expected Dividends	2023		2.70		1.81		2.52		3.35		2.53		0.77		1.94		3.84		2.48		2.56		1.70		1.76		3.11		2.08
Stage One Growth	2024	6.00%	2.86	6.00%	1.92	6.50%	2.68	6.50%	3.57	6.00%	2.68	6.50%	0.82	6.50%	2.07	4.50%	4.01	7.50%	2.67	2.50%	2.62	6.50%	1.81	4.50%	1.84	6.00%	3.30	6.00%	2.20
Stage One Growth	2025	6.00%	3.03	6.00%	2.03	6.50%	2.86	6.50%	3.80	6.00%	2.84	6.50%	0.87	6.50%	2.20	4.50%	4.19	7.50%	2.87	2.50%	2.69	6.50%	1.93	4.50%	1.92	6.00%	3.49	6.00%	2.34
Stage One Growth	2026	6.00%	3.22	6.00%	2.16	6.50%	3.04	6.50%	4.05	6.00%	3.01	6.50%	0.93	6.50%	2.34	4.50%	4.38	7.50%	3.08	2.50%	2.76	6.50%	2.05	4.50%	2.01	6.00%	3.70	6.00%	2.48
Stage One Growth	2027	6.00%	3.41	6.00%	2.29	6.50%	3.24	6.50%	4.31	6.00%	3.19	6.50%	0.99	6.50%	2.50	4.50%	4.58	7.50%	3.31	2.50%	2.83	6.50%	2.19	4.50%	2.10	6.00%	3.93	6.00%	2.63
Stage Two Growth	2028	5.79%	3.61	5.79%	2.42	6.25%	3.44	6.25%	4.58	5.79%	3.38	6.25%	1.05	6.25%	2.65	4.43%	4.78	7.15%	3.55	2.61%	2.90	6.25%	2.32	4.43%	2.19	5.79%	4.15	5.79%	2.78
Stage Two Growth	2029	5.58%	3.81	5.58%	2.55	5.99%	3.65	5.99%	4.85	5.58%	3.57	5.99%	1.12	5.99%	2.81	4.35%	4.99	6.81%	3.79	2.72%	2.98	5.99%	2.46	4.35%	2.29	5.58%	4.39	5.58%	2.93
Stage Two Growth	2030	5.37%	4.01	5.37%	2.69	5.74%	3.86	5.74%	5.13	5.37%	3.76	5.74%	1.18	5.74%	2.97	4.28%	5.20	6.46%	4.04	2.83%	3.06	5.74%	2.60	4.28%	2.39	5.37%	4.62	5.37%	3.09
Stage Two Growth	2031	5.16%	4.22	5.16%	2.83	5.48%	4.07	5.48%	5.41	5.16%	3.95	5.48%	1.24	5.48%	3.13	4.21%	5.42	6.12%	4.28	2.94%	3.15	5.48%	2.75	4.21%	2.49	5.16%	4.86	5.16%	3.25
Stage Two Growth	2032	4.95%	4.43	4.95%	2.97	5.23%	4.28	5.23%	5.70	4.95%	4.15	5.23%	1.31	5.23%	3.30	4.14%	5.65	5.77%	4.53	3.05%	3.25	5.23%	2.89	4.14%	2.59	4.95%	5.10	4.95%	3.41
Stage Two Growth	2033	4.75%	4.64	4.75%	3.11	4.97%	4.50	4.97%	5.98	4.75%	4.35	4.97%	1.37	4.97%	3.46	4.06%	5.88	5.43%	4.78	3.15%	3.35	4.97%	3.03	4.06%	2.69	4.75%	5.34	4.75%	3.57
Stage Two Growth	2034	4.54%	4.85	4.54%	3.25	4.72%	4.71	4.72%	6.26	4.54%	4.54	4.72%	1.44	4.72%	3.63	3.99%	6.11	5.08%	5.02	3.26%	3.46	4.72%	3.18	3.99%	2.80	4.54%	5.59	4.54%	3.74
Stage Two Growth	2035	4.33%	5.06	4.33%	3.39	4.46%	4.92	4.46%	6.54	4.33%	4.74	4.46%	1.50	4.46%	3.79	3.92%	6.35	4.74%	5.26	3.37%	3.58	4.46%	3.32	3.92%	2.91	4.33%	5.83	4.33%	3.90
Stage Two Growth	2036	4.12%	5.27	4.12%	3.53	4.21%	5.13	4.21%	6.82	4.12%	4.94	4.21%	1.57	4.21%	3.95	3.85%	6.59	4.39%	5.49	3.48%	3.70	4.21%	3.46	3.85%	3.02	4.12%	6.07	4.12%	4.06
Stage Two Growth	2037	3.91%	5.47	3.91%	3.67	3.95%	5.33	3.95%	7.09	3.91%	5.13	3.95%	1.63	3.95%	4.10	3.77%	6.84	4.05%	5.71	3.59%	3.83	3.95%	3.60	3.77%	3.14	3.91%	6.30	3.91%	4.22
Stage Three Growth	2038	3.70%	5.68	3.70%	3.80	3.70%	5.53	3.70%	7.35	3.70%	5.32	3.70%	1.69	3.70%	4.26	3.70%	7.10	3.70%	5.92	3.70%	3.98	3.70%	3.73	3.70%	3.25	3.70%	6.54	3.70%	4.37
Stage Three Growth	2039	3.70%	5.89	3.70%	3.94	3.70%	5.73	3.70%	7.62	3.70%	5.51	3.70%	1.75	3.70%	4.41	3.70%	7.36	3.70%	6.14	3.70%	4.12	3.70%	3.87	3.70%	3.37	3.70%	6.78	3.70%	4.53
Stage Three Growth	2040	3.70%	6.10	3.70%	4.09	3.70%	5.94	3.70%	7.90	3.70%	5.72	3.70%	1.82	3.70%	4.58	3.70%	7.63	3.70%	6.37	3.70%	4.28	3.70%	4.01	3.70%	3.50	3.70%	7.03	3.70%	4.70
Stage Three Growth	2041	3.70%	6.33	3.70%	4.24	3.70%	6.16	3.70%	8.19	3.70%	5.93	3.70%	1.88	3.70%	4.75	3.70%	7.91	3.70%	6.60	3.70%	4.43	3.70%	4.16	3.70%	3.63	3.70%	7.29	3.70%	4.88
Stage Three Growth	2042	3.70%	6.56	3.70%	4.40	3.70%	6.39	3.70%	8.50	3.70%	6.15	3.70%	1.95	3.70%	4.92	3.70%	8.21	3.70%	6.85	3.70%	4.60	3.70%	4.31	3.70%	3.76	3.70%	7.56	3.70%	5.06
Stage Three Growth	2043	3.70%	6.81	3.70%	4.56	3.70%	6.63	3.70%	8.81	3.70%	6.38	3.70%	2.03	3.70%	5.10	3.70%	8.51	3.70%	7.10	3.70%	4.77	3.70%	4.47	3.70%	3.90	3.70%	7.84	3.70%	5.24
Stage Three Growth	2044	3.70%	7.06	3.70%	4.73	3.70%	6.87	3.70%	9.14	3.70%	6.61	3.70%	2.10	3.70%	5.29	3.70%	8.83	3.70%	7.36	3.70%	4.94	3.70%	4.64	3.70%	4.04	3.70%	8.13	3.70%	5.44
Stage Three Growth	2045	3.70%	7.32	3.70%	4.91	3.70%	7.13	3.70%	9.48	3.70%	6.86	3.70%	2.18	3.70%	5.49	3.70%	9.15	3.70%	7.63	3.70%	5.13	3.70%	4.81	3.70%	4.19	3.70%	8.43	3.70%	5.64
Stage Three Growth	2046	3.70%	7.59	3.70%	5.09	3.70%	7.39	3.70%	9.83	3.70%	7.11	3.70%	2.26	3.70%	5.69	3.70%	9.49	3.70%	7.92	3.70%	5.32	3.70%	4.99	3.70%	4.35	3.70%	8.74	3.70%	5.85
Stage Three Growth	2047	3.70%	7.87	3.70%	5.28	3.70%	7.67	3.70%	10.19	3.70%	7.37	3.70%	2.34	3.70%	5.90	3.70%	9.84	3.70%	8.21	3.70%	5.51	3.70%	5.17	3.70%	4.51	3.70%	9.07	3.70%	6.06
Stage Three Growth	2048	3.70%	8.16	3.70%	5.47	3.70%	7.95	3.70%	10.57	3.70%	7.65	3.70%	2.43	3.70%	6.12	3.70%	10.21	3.70%	8.51	3.70%	5.72	3.70%	5.36	3.70%	4.68	3.70%	9.40	3.70%	6.29
Stage Three Growth	2049	3.70%	8.46	3.70%	5.67	3.70%	8.24	3.70%	10.96	3.70%	7.93	3.70%	2.52	3.70%	6.35	3.70%	10.58	3.70%	8.83	3.70%	5.93	3.70%	5.56	3.70%	4.85	3.70%	9.75	3.70%	6.52
Stage Three Growth	2050	3.70%	8.78	3.70%	5.88	3.70%	8.55	3.70%	11.36	3.70%	8.22	3.70%	2.61	3.70%	6.58	3.70%	10.98	3.70%	9.16	3.70%	6.15	3.70%	5.77	3.70%	5.03	3.70%	10.11	3.70%	6.76
Stage Three Growth	2051	3.70%	9.10	3.70%	6.10	3.70%	8.86	3.70%	11.78	3.70%	8.53	3.70%	2.71	3.70%	6.82	3.70%	11.38	3.70%	9.49	3.70%	6.38	3.70%	5.98	3.70%	5.22	3.70%	10.48	3.70%	7.01
Reversion	2052		30.22		36.83		65.67		53.18		32.50		26.82		39.41		82.89		20.93		20.83		15.54		45.62		65.98		36.26
Implied Cost of Equity			**6.34%**		**5.23%**		**4.89%**		**5.75%**		**6.07%**		**4.43%**		**5.31%**		**4.92%**		**7.18%**		**6.37%**		**6.84%**		**4.62%**		**5.16%**		**5.51%**

Mean	5.62%
Median	5.41%
Selected Three-Stage DGM Cost of Equity	**5.51%**

Reversion Calculation:

	ALLETE Inc.	Alliant Energy Corp	Ameren Corp	American Electric Power Co Inc.	Black Hills Corp	CenterPoint Energy Inc.	CMS Energy Corp	DTE Energy Company	Evergy Inc.	Northwestern Corp	OGE Energy Corp	Otter Tail Corp	WEC Energy Group	Xcel Energy Inc.
A. Last period's exp. dividends with growth	9.44	6.33	9.19	12.22	8.84	2.81	7.08	11.80	9.85	6.61	6.20	5.41	10.87	7.27
B. Cost of equity, less long-term real growth	4.64%	3.53%	3.19%	4.05%	4.37%	2.73%	3.61%	3.22%	5.48%	4.67%	5.14%	2.92%	3.46%	3.81%
C. A / B	203.3	179.0	288.3	301.4	202.2	102.8	196.0	367.0	179.6	141.5	120.7	185.1	314.0	191.0
D. C / ((1 + Cost of Equity) ^ Last Period +1)	30.22	36.83	65.67	53.18	32.50	26.82	39.41	82.89	20.93	20.83	15.54	45.62	65.98	36.26

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
ALLETE Inc.	17.7
Alliant Energy Corp	20.3
Ameren Corp	20.8
American Electric Power Co Inc.	18.6
Black Hills Corp	15.8
CenterPoint Energy Inc.	21.3
CMS Energy Corp	20.3
DTE Energy Company	17.1
Evergy Inc	16.4
Northwestern Corp	14.5
OGE Energy Corp	18.0
Otter Tail Corp	10.3
WEC Energy Group	21.9
Xcel Energy Inc.	18.8
Mean	18.0
Median	18.3
Selected Price to Earnings (P/E) Ratio	18.0
Indicated Equity Component of the Direct Rate	**5.56%**

We placed the most reliance on the mean price to earnings ratio.

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Beta Analysis

Company	Beta
ALLETE Inc.	0.90
Alliant Energy Corp	0.85
Ameren Corp	0.85
American Electric Power Co Inc.	0.75
Black Hills Corp	0.95
CenterPoint Energy Inc.	1.10
CMS Energy Corp	0.80
DTE Energy Company	0.95
Evergy Inc	0.90
Northwestern Corp	0.90
OGE Energy Corp	1.00
Otter Tail Corp	0.85
WEC Energy Group	0.80
Xcel Energy Inc.	0.80
Beta Mean	0.89
Beta Median	0.88
Unlevered and Relevered Mean*	0.89
Indicated Beta	**0.88**

We considered the mean, median, and unlevered/relevered mean. We placed more reliance on the median when selecting the indicated beta.

Notes:

*See the Unlevering Relevering Beta page for the calculation

Unlevering/Relevering Betas

Unlevering of Betas					
Company	*Value Line* **Actual Income Tax Rate**	*From Capital Structure Page* **Actual Debt in Capital Structure**	*Structure Page* **Actual Equity in Capital Structure**	*Value Line* **Levered Beta (Published)**	*Formula* **Unlevered Beta**
ALLETE Inc.	NMF	30.36%	69.64%	0.90	N/A
Alliant Energy Corp	4.00%	35.09%	64.91%	0.85	0.56
Ameren Corp	12.00%	37.26%	62.39%	0.85	0.56
American Electric Power Co Inc.	7.00%	40.75%	59.25%	0.75	0.46
Black Hills Corp	8.50%	49.30%	50.70%	0.95	0.5
CenterPoint Energy Inc.	20.00%	39.92%	57.73%	1.10	0.71
CMS Energy Corp	11.00%	41.51%	57.75%	0.80	0.49
DTE Energy Company	5.00%	43.85%	56.15%	0.95	0.55
Evergy Inc	9.00%	40.57%	59.43%	0.90	0.56
Northwestern Corp	1.50%	47.67%	52.33%	0.90	0.47
OGE Energy Corp	12.00%	30.84%	69.16%	1.00	0.72
Otter Tail Corp	20.00%	25.63%	74.37%	0.85	0.67
WEC Energy Group	19.00%	32.62%	67.31%	0.80	0.57
Xcel Energy Inc.	NMF	41.33%	58.67%	0.80	N/A
			Average	**0.89**	

Relevering of Betas				
Company	*Formula* **Composite Income Tax Rate**	*From Capital Structure Page* **Industry Debt in Capital Structure**	*From Capital Structure* **Industry Equity in Capital**	*Formula* **Levered Beta**
ALLETE Inc.	10.75%	39.00%	61.00%	N/A
Alliant Energy Corp	10.75%	39.00%	61.00%	0.88
Ameren Corp	10.75%	39.00%	61.00%	0.88
American Electric Power Co Inc.	10.75%	39.00%	61.00%	0.72
Black Hills Corp	10.75%	39.00%	61.00%	0.79
CenterPoint Energy Inc.	10.75%	39.00%	61.00%	1.12
CMS Energy Corp	10.75%	39.00%	61.00%	0.77
DTE Energy Company	10.75%	39.00%	61.00%	0.86
Evergy Inc	10.75%	39.00%	61.00%	0.88
Northwestern Corp	10.75%	39.00%	61.00%	0.74
OGE Energy Corp	10.75%	39.00%	61.00%	1.13
Otter Tail Corp	10.75%	39.00%	61.00%	1.05
WEC Energy Group	10.75%	39.00%	61.00%	0.90
Xcel Energy Inc.	10.75%	39.00%	61.00%	N/A
			Average	**0.89**

Notes:

Uses the Hamada Formula

Unlevered Beta = Levered Beta / [1 + (1 - Tax Rate) x (Debt/Equity))], using company-specific components

Relevered Beta = Unlevered Beta [1 + (1 - Tax Rate) x (Debt/Equity)], Using industry components for Tax Rate, Debt, and Equi

Calculation of Market to Book Ratios for the Electric Market Segment

- December 31, 2022 calendar year information for the January 2, 2023 Assessment
- A market to book ratio over one would be an indication of no obsolescence.
- Market Value estimates for Common Equity are from Value Line. Market Value Estimates for Long-Term Debt are from the company's 10-K.
- Book Value amounts are from the company's 10-K.

Market to Book Ratio for Equity

Company	Market Value of Common Equity from Value Line	Book Value of Common Equity from 10-K	Market to Book Ratio	Source
ALLETE Inc.	3,792,118,987	2,691,900,000	1.41	ALLETE, Inc. 2022 10-K, p. 69
Alliant Energy Corp	14,001,997,677	6,276,000,000	2.23	Alliant Energy Corp. 2022 10-K, p. 45
Ameren Corp	22,734,439,542	10,637,000,000	2.14	Ameren Corp. 2022 10-K, p. 89
American Electric Power Co Inc.	48,930,099,419	23,893,400,000	2.05	American Electric Power Co. 2022 10-K, p. 136
Black Hills Corp	4,247,762,397	2,994,913,000	1.42	Black Hills Corp. 2022 10-K, p. 63
CenterPoint Energy Inc.	19,427,469,573	10,042,000,000	1.93	CenterPoint Energy Inc. 2022 10-K, p. 84
CMS Energy Corp	17,647,297,402	7,015,000,000	2.52	CMS Energy Corp. 2022 10-K, p. 95
DTE Energy Company	22,338,451,562	10,397,000,000	2.15	DTE Energy Co. 2022 10-K, p. 59
Evergy Inc.	13,471,490,436	9,483,700,000	1.42	Evergy Inc. 2022 10-K, p. 77
Northwestern Corp	2,778,304,474	2,665,183,000	1.04	NorthWestern Corp. 2022 10-K, p. F-9
OGE Energy Corp	7,958,056,212	4,413,400,000	1.80	OGE Energy Corp. 2022 10-K, p. 46
Otter Tail Corp	2,390,449,264	1,217,317,000	1.96	Otter Tail Corp. 2022 10-K, p. 41
WEC Energy Group	30,767,484,154	11,376,900,000	2.70	WEC Energy Group. 2022 10-K, p. 86
Xcel Energy Inc.	32,934,347,979	16,675,000,000	1.98	Xcel Energy Inc. 2022 10-K, p. 51
		Average	**1.91**	

Market to Book Ratio for Debt

Company	Market Value of Long-Term Debt from 10-K	Book Value of Long-Term Debt from 10-K	Market to Book Ratio	Source
ALLETE Inc.	1,782,700,000	1,929,100,000	0.92	ALLETE, Inc. 2022 10-K, p. 97
Alliant Energy Corp	7,339,000,000	8,076,000,000	0.91	Alliant Energy Corp. 2022 10-K, p. 90
Ameren Corp	12,453,000,000	14,025,000,000	0.89	Ameren Corp. 2022 10-K, p. 133
American Electric Power Co Inc.	31,767,100,000	35,622,600,000	0.89	American Elec Power Co. 2022 10-K, p. 342
Black Hills Corp	3,760,848,000	4,132,340,000	0.91	Black Hills Corp. 2022 10-K, p. 92
CenterPoint Energy Inc.	14,990,000,000	16,338,000,000	0.92	CenterPoint Energy Inc. 2022 10-K, p. 143
CMS Energy Corp	12,384,000,000	14,212,000,000	0.87	CMS Energy Corp. 2022 10-K, p. 130
DTE Energy Company	15,993,000,000	17,978,000,000	0.89	DTE Energy Co. 2022 10-K, p. 109
Evergy Inc.	15,211,100,000	17,208,300,000	0.88	Evergy Inc. 2022 10-K, p. 138
Northwestern Corp	2,316,700,000	2,618,882,000	0.88	NorthWestern Corp. 2022 10-K, p. F-23
OGE Energy Corp	4,161,000,000	4,548,600,000	0.91	OGE Energy Corp. 2022 10-K, p. 78
Otter Tail Corp	689,819,000	823,821,000	0.84	Otter Tail Corp. 2022 10-K, p. 78
WEC Energy Group	13,921,300,000	15,464,200,000	0.90	WEC Energy Group. 2022 10-K, p. 128
Xcel Energy Inc.	20,897,000,000	23,964,000,000	0.87	Xcel Energy Inc. 2022 10-K, p. 69
		Average	**0.89**	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	61.00%	1.91	1.17
Long-term Debt	39.00%	0.89	0.35
			1.52

Appendix B - Gas Distribution

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	41.00%	5.53%	2.27%
Common Equity	59.00%	9.42%	5.56%
Yield Rate			**7.83%**

Gas Distribution Yield Rate	**7.83%**

Capital Structure

Company	Value of Long-Term Debt	Value of Preferred Equity	Value of Common Equity	Total Market Value	% Long-Term Debt	% Preferred Equity	% Common Equity
Atmos Energy Corp	5,759,200,000	-	15,462,253,697	21,221,453,697	27.14%	0.00%	72.86%
Black Hills Corp	4,129,700,000	-	4,247,762,397	8,377,462,397	49.30%	0.00%	50.70%
CenterPoint Energy Inc.	13,435,000,000	790,000,000	19,427,469,573	33,652,469,573	39.92%	2.35%	57.73%
CMS Energy Corp	12,685,000,000	224,000,000	17,647,297,402	30,556,297,402	41.51%	0.73%	57.75%
New Jersey Resources Corp	2,524,600,000	-	4,277,351,402	6,801,951,402	37.12%	0.00%	62.88%
NiSource Inc.	9,521,200,000	1,547,000,000	10,462,020,650	21,530,220,650	44.22%	7.19%	48.59%
Northwest Natural Gas	1,287,000,000	-	1,666,859,156	2,953,859,156	43.57%	0.00%	56.43%
ONE Gas Inc	2,429,100,000	-	4,410,870,203	6,839,970,203	35.51%	0.00%	64.49%
Southwest Gas Holdings Inc.	5,866,000,000	-	4,314,138,558	10,180,138,558	57.62%	0.00%	42.38%
Spire Inc / Laclede Group Inc.	3,207,900,000	242,000,000	3,650,872,640	7,100,772,640	45.18%	3.41%	51.42%
WEC Energy Group	14,910,700,000	30,400,000	30,767,484,154	45,708,584,154	32.62%	0.07%	67.31%
				Mean	41.25%	1.25%	57.50%
				Median	41.51%	0.00%	57.73%

Indicated Industry Capital Structure	**41.00%**		**59.00%**

We placed approximately equal reliance on the mean and median when selecting the indicated capital structure for the market segment.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
Atmos Energy Corp	A1	5.28%
Black Hills Corp	Baa2	5.57%
CenterPoint Energy Inc.	Baa2	5.57%
CMS Energy Corp	Baa2	5.57%
New Jersey Resources Corp	A1	5.28%
NiSource Inc.	Baa2	5.57%
Northwest Natural Gas	Baa1	5.57%
ONE Gas Inc	A3	5.28%
Southwest Gas Holdings Inc.	Baa2	5.57%
Spire Inc / Laclede Group Inc.	Baa2	5.57%
WEC Energy Group	Baa1	5.57%

Mean	5.49%
Median	5.57%
Mode	5.57%

Indicated Rate of Debt	**5.53%**

We placed equal reliance on the mean and median when selecting the indicated rate of debt.

Public Utility Bond Yield Averages from Mergent Bond Record, January 2023 Edition

Public Utility Bond Averages, December 2022

Mergent	S&P	Dec. Yield Avg.
Aaa, Aa1, Aa2 Aa3	AAA, AA+, AA, AA-	5.06%
A1, A2, A3	A+, A, A-	5.28%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.57%

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	6.97%
CAPM - Damodaran	9.17%
CAPM - The CFO Survey	8.03%
CAPM - Fernandez, Banuls, and Acin	8.88%
CAPM - Ex Post (BVR Historical, Arithmetic)	9.46%
CAPM - Ex Post (BVR Historical, Geometric)	8.37%
Empirical CAPM - Ex Ante, Three Stage	7.09%
Empirical CAPM - Damodaran	9.38%
Empirical CAPM - Graham and Harvey	8.19%
Empirical CAPM - Fernandez, Banuls, and Acin	9.07%
Empirical CAPM - Ex Post (BVR Historical, Arithmetic)	9.68%
Empirical CAPM - Ex Post (BVR Historical, Geometric)	8.54%
DGM - Dividend Growth	8.74%
DGM - Earnings Growth	10.13%
DGM - Two-Stage	9.22%
DGM - Three-Stage	5.70%
Indicated Rate of Equity	**9.42%**

We established a range of acceptability for the cost of equity with all available models. We considered all of the data and placed more reliance on the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium, and the Damodaran CAPM.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	41.00%	5.53%	2.27%
Equity Component	59.00%	5.52%	3.26%
Direct Rate			**5.53%**

Direct Rate	**5.53%**

Yield Rate	7.83%
Direct Rate	5.53%
Implied Industry Growth Rate	**2.30%**

Capital Asset Pricing Model (CAPM)

(ERP x β) + RFR = Indicated Equity Rate

	Equity Risk Premium (ERP)	x Industry Beta (β)	= Industry Risk Premium	+ Risk-Free Rate[1] (RFR)	Indicated Equity Rate
Three Stage Ex Ante[2]	3.38%	0.86	2.91%	4.06%	6.97%
Dr. Damodaran ERP[3]	5.94%	0.86	5.11%	4.06%	9.17%
The CFO Survey[4]	4.62%	0.86	3.97%	4.06%	8.03%
Fernandez, Banuls and Acin[5]	5.60%	0.86	4.82%	4.06%	8.88%
BVR - Historical, Arithmetic Mean[6]	6.28%	0.86	5.40%	4.06%	9.46%
BVR - Historical, Geometric Mean[7]	5.01%	0.86	4.31%	4.06%	8.37%

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Empirical Capital Asset Pricing Model (ECAPM)

(ERP x β x .75) + (ERP x .25) + RFR = Indicated Equity Rate

Model	Equity Risk Premium (ERP)	Industry Beta (β)	Weighted Industry Risk Premium (weighted at 75%)	Weighted Equity Risk Premium (weighted at 25%)	Risk-Free Rate (RFR)[1]	Indicated Equity Rate
Three Stage Ex Ante[4]	3.38%	0.86	2.18%	0.85%	4.06%	**7.09%**
Dr. Damodaran ERP[5]	5.94%	0.86	3.83%	1.49%	4.06%	**9.38%**
The CFO Survey[7]	4.62%	0.86	2.98%	1.16%	4.06%	**8.19%**
Fernandez, Banuls and Acin[8]	5.60%	0.86	3.61%	1.40%	4.06%	**9.07%**
BVR - Historical, Arithmetic Mean[9]	6.28%	0.86	4.05%	1.57%	4.06%	**9.68%**
BVR - Historical, Geometric Mean[10]	5.01%	0.86	3.23%	1.25%	4.06%	**8.54%**

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Single-Stage Dividend Growth Model

Company	Current Dividend Yield (DY)	Projected Short-term EPS Growth Rate (EG)	Projected Short-term Dividend Growth Rate (DG)	Cost of Equity Earnings Growth DY + EG	Cost of Equity Dividend Growth DY + DG
Atmos Energy Corp	2.70%	7.50%	7.00%	10.20%	9.70%
Black Hills Corp	3.60%	6.00%	5.50%	9.60%	9.10%
CenterPoint Energy	2.30%	6.50%	2.50%	8.80%	4.80%
CMS Energy Corp	3.00%	6.50%	6.00%	9.50%	9.00%
New Jersey Resources Corp	3.50%	5.00%	5.00%	8.50%	8.50%
NiSource Inc.	3.80%	9.50%	4.50%	13.30%	8.30%
Northwest Natural Gas	4.10%	6.50%	0.50%	10.60%	4.60%
ONE Gas Inc	3.20%	6.50%	6.50%	9.70%	9.70%
Southwest Gas Holdings Inc.	3.90%	10.00%	5.50%	13.90%	9.40%
Spire Inc / Laclede Group Inc.	4.10%	9.00%	5.00%	13.10%	9.10%
WEC Energy Group	3.00%	6.00%	7.00%	9.00%	10.00%
Mean	3.38%	7.18%	5.00%	10.56%	8.38%
Median	3.50%	6.50%	5.50%	9.70%	9.10%

DGM - Dividend Growth, Indicated Rate	**8.74%**
DGM - Earnings Growth, Indicated Rate	**10.13%**

We placed equal reliance on the mean and median to arrive at the indicated rates for DGM - Earnings Growth and DGM - Dividend Growth.

Notes:

Dividend Yield and growth rates provided by Value Line

MGE Energy Inc. is excluded from the DGM calculation as the company does not have short-term growth estimates publiched in their Value Line tearsheet.

Two-Stage Dividend Growth Model

K_E = (DY x (1+ 0.5(G))) + 0.67(G1) +0.33(g)

K_E Cost of Equity
DY Dividend Yield
G_1 Short-term Growth Estimate
g Stable Growth
G Average Growth Rate

Company	**DY** Dividend Yield	**G1** Short-term Growth Estimate	**g** Stable Growth	**G** Average Growth Rate	**K_E** Cost of Equity
Atmos Energy Corp	2.70%	7.50%	3.70%	5.60%	9.02%
Black Hills Corp	3.60%	6.00%	3.70%	4.85%	8.93%
CenterPoint Energy Inc.	2.30%	6.50%	3.70%	5.10%	7.93%
CMS Energy Corp	3.00%	6.50%	3.70%	5.10%	8.65%
New Jersey Resources Corp	3.50%	5.00%	3.70%	4.35%	8.15%
NiSource Inc.	3.80%	9.50%	3.70%	6.60%	11.51%
Northwest Natural Gas	4.10%	6.50%	3.70%	5.10%	9.78%
ONE Gas Inc	3.20%	6.50%	3.70%	5.10%	8.86%
Southwest Gas Holdings Inc.	3.90%	10.00%	3.70%	6.85%	11.95%
Spire Inc / Laclede Group Inc.	4.10%	9.00%	3.70%	6.35%	11.48%
WEC Energy Group	3.00%	6.00%	3.70%	4.85%	8.31%

Mean	9.51%
Median	8.93%

Two-Stage DGM, Indicated Rate	**9.22%**

We placed equal reliance on the mean and median when selecting the indicated rate.

Notes:

Dividend Yield provided by Value Line

Growth Estimates, Next 5 Years for Earnings provided Value Line

Stable growth rate is the nominal growth rate determined in the Capitalization Rate Study Narrative (indicated long-term growth rate of the U.S. economy of 1.7% plus the expected inflation rate of 2.0%).

Three-Stage Dividend Growth Model

Start Price - recent price from Value Line
Expected dividends - estimated dividends from Value Line
Stage one growth - projected earnings growth rate from Value Line
Stage two growth - reversion to long-term growth rate
Stage three growth - long-term growth rate developed in Study (3.70%)

Company	Year	Atmos Energy Corp		Black Hills Corp		CenterPoint Energy Inc.		CMS Energy Corp		New Jersey Resources Corp		NiSource Inc.		Northwest Natural Gas Co		ONE Gas Inc		Southwest Gas Holdings Inc.		Spire Inc / Laclede Group Inc.		WEC Energy Group	
Start Price	2022		-110.5		-65.27		-30.86		-60.8		-44.45		-25.76		-47.49		-81.47		-63.38		-69.55		-97.54
Expected Dividends	2023		2.96		2.53		0.77		1.94		1.55		0.98		1.94		2.64		2.60		2.88		3.11
Stage One Growth	2024	7.50%	3.18	6.00%	2.68	6.50%	0.82	6.50%	2.07	5.00%	1.63	9.50%	1.07	6.50%	2.07	6.50%	2.81	10.00%	2.86	9.00%	3.14	6.00%	3.30
Stage One Growth	2025	7.50%	3.42	6.00%	2.84	6.50%	0.87	6.50%	2.20	5.00%	1.71	9.50%	1.18	6.50%	2.20	6.50%	2.99	10.00%	3.15	9.00%	3.42	6.00%	3.49
Stage One Growth	2026	7.50%	3.68	6.00%	3.01	6.50%	0.93	6.50%	2.34	5.00%	1.79	9.50%	1.29	6.50%	2.34	6.50%	3.19	10.00%	3.46	9.00%	3.73	6.00%	3.70
Stage One Growth	2027	7.50%	3.95	6.00%	3.19	6.50%	0.99	6.50%	2.50	5.00%	1.88	9.50%	1.41	6.50%	2.50	6.50%	3.40	10.00%	3.81	9.00%	4.07	6.00%	3.93
Stage Two Growth	2028	7.15%	4.24	5.79%	3.38	6.25%	1.05	6.25%	2.65	4.88%	1.98	8.97%	1.54	6.25%	2.65	6.25%	3.61	9.43%	4.17	8.52%	4.41	5.79%	4.15
Stage Two Growth	2029	6.81%	4.52	5.58%	3.57	5.99%	1.12	5.99%	2.81	4.76%	2.07	8.45%	1.66	5.99%	2.81	5.99%	3.82	8.85%	4.53	8.04%	4.77	5.58%	4.39
Stage Two Growth	2030	6.46%	4.82	5.37%	3.76	5.74%	1.18	5.74%	2.97	4.65%	2.17	7.92%	1.80	5.74%	2.97	5.74%	4.04	8.28%	4.91	7.55%	5.13	5.37%	4.62
Stage Two Growth	2031	6.12%	5.11	5.16%	3.95	5.48%	1.24	5.48%	3.13	4.53%	2.26	7.39%	1.93	5.48%	3.13	5.48%	4.27	7.71%	5.29	7.07%	5.49	5.16%	4.86
Stage Two Growth	2032	5.77%	5.41	4.95%	4.15	5.23%	1.31	5.23%	3.30	4.41%	2.36	6.86%	2.06	5.23%	3.30	5.23%	4.49	7.14%	5.67	6.59%	5.85	4.95%	5.10
Stage Two Growth	2033	5.43%	5.70	4.75%	4.35	4.97%	1.37	4.97%	3.46	4.29%	2.47	6.34%	2.19	4.97%	3.46	4.97%	4.71	6.56%	6.04	6.11%	6.21	4.75%	5.34
Stage Two Growth	2034	5.08%	5.99	4.54%	4.54	4.72%	1.44	4.72%	3.63	4.17%	2.57	5.81%	2.32	4.72%	3.63	4.72%	4.93	5.99%	6.40	5.63%	6.56	4.54%	5.59
Stage Two Growth	2035	4.74%	6.27	4.33%	4.74	4.46%	1.50	4.46%	3.79	4.05%	2.67	5.28%	2.44	4.46%	3.79	4.46%	5.15	5.42%	6.75	5.15%	6.89	4.33%	5.83
Stage Two Growth	2036	4.39%	6.55	4.12%	4.94	4.21%	1.57	4.21%	3.95	3.94%	2.78	4.75%	2.56	4.21%	3.95	4.21%	5.37	4.85%	7.07	4.66%	7.22	4.12%	6.07
Stage Two Growth	2037	4.05%	6.81	3.91%	5.13	3.95%	1.63	3.95%	4.10	3.82%	2.88	4.23%	2.67	3.95%	4.10	3.95%	5.58	4.27%	7.38	4.18%	7.52	3.91%	6.30
Stage Three Growth	2038	3.70%	7.07	3.70%	5.32	3.70%	1.69	3.70%	4.26	3.70%	2.99	3.70%	2.77	3.70%	4.26	3.70%	5.79	3.70%	7.65	3.70%	7.80	3.70%	6.54
Stage Three Growth	2039	3.70%	7.33	3.70%	5.51	3.70%	1.75	3.70%	4.41	3.70%	3.10	3.70%	2.87	3.70%	4.41	3.70%	6.00	3.70%	7.93	3.70%	8.08	3.70%	6.78
Stage Three Growth	2040	3.70%	7.60	3.70%	5.72	3.70%	1.82	3.70%	4.58	3.70%	3.22	3.70%	2.97	3.70%	4.58	3.70%	6.23	3.70%	8.22	3.70%	8.38	3.70%	7.03
Stage Three Growth	2041	3.70%	7.88	3.70%	5.93	3.70%	1.88	3.70%	4.75	3.70%	3.34	3.70%	3.08	3.70%	4.75	3.70%	6.46	3.70%	8.53	3.70%	8.69	3.70%	7.29
Stage Three Growth	2042	3.70%	8.17	3.70%	6.15	3.70%	1.95	3.70%	4.92	3.70%	3.46	3.70%	3.20	3.70%	4.92	3.70%	6.70	3.70%	8.84	3.70%	9.02	3.70%	7.56
Stage Three Growth	2043	3.70%	8.47	3.70%	6.38	3.70%	2.03	3.70%	5.10	3.70%	3.59	3.70%	3.32	3.70%	5.10	3.70%	6.94	3.70%	9.17	3.70%	9.35	3.70%	7.84
Stage Three Growth	2044	3.70%	8.79	3.70%	6.61	3.70%	2.10	3.70%	5.29	3.70%	3.72	3.70%	3.44	3.70%	5.29	3.70%	7.20	3.70%	9.51	3.70%	9.70	3.70%	8.13
Stage Three Growth	2045	3.70%	9.11	3.70%	6.86	3.70%	2.18	3.70%	5.49	3.70%	3.86	3.70%	3.57	3.70%	5.49	3.70%	7.47	3.70%	9.86	3.70%	10.05	3.70%	8.43
Stage Three Growth	2046	3.70%	9.45	3.70%	7.11	3.70%	2.26	3.70%	5.69	3.70%	4.00	3.70%	3.70	3.70%	5.69	3.70%	7.74	3.70%	10.23	3.70%	10.43	3.70%	8.74
Stage Three Growth	2047	3.70%	9.80	3.70%	7.37	3.70%	2.34	3.70%	5.90	3.70%	4.15	3.70%	3.83	3.70%	5.90	3.70%	8.03	3.70%	10.61	3.70%	10.81	3.70%	9.07
Stage Three Growth	2048	3.70%	10.16	3.70%	7.65	3.70%	2.43	3.70%	6.12	3.70%	4.30	3.70%	3.98	3.70%	6.12	3.70%	8.33	3.70%	11.00	3.70%	11.21	3.70%	9.40

Stage Three Growth	2049	3.70%	10.54	3.70%	7.93	3.70%	2.52	3.70%	6.35	3.70%	4.46	3.70%	4.12	3.70%	6.35	3.70%	8.64	3.70%	11.41	3.70%	11.63	3.70%	9.75
Stage Three Growth	2050	3.70%	10.93	3.70%	8.22	3.70%	2.61	3.70%	6.58	3.70%	4.63	3.70%	4.28	3.70%	6.58	3.70%	8.95	3.70%	11.83	3.70%	12.06	3.70%	10.11
Stage Three Growth	2051	3.70%	11.33	3.70%	8.53	3.70%	2.71	3.70%	6.82	3.70%	4.80	3.70%	4.43	3.70%	6.82	3.70%	9.29	3.70%	12.27	3.70%	12.50	3.70%	10.48
Reversion	2052		83.27		32.50		26.82		39.41		28.83		9.02		20.33		51.64		17.84		21.65		65.98
Implied Cost of Equity			**4.90%**		**6.07%**		**4.43%**		**5.31%**		**5.24%**		**7.35%**		**6.56%**		**5.38%**		**8.09%**		**7.70%**		**5.16%**

Mean	6.02%
Median	5.38%
Selected Three-Stage DGM Cost of Equity	**5.70%**

Reversion Calculation:

A. Last period's exp. dividends with growth	11.75	8.84	2.81	7.08	4.97	4.60	7.08	9.63	12.72	12.97	10.87
B. CoE, less long-term real GDP growth	3.20%	4.37%	2.73%	3.61%	3.54%	5.65%	4.86%	3.68%	6.39%	6.00%	3.46%
C. A / B	367.0	202.2	102.8	196.0	140.5	81.4	145.7	261.9	199.0	216.0	314.0
D. C / ((1 + Cost of Equity) ^ Last Period + 1)	83.27	32.50	26.82	39.41	28.83	9.02	20.33	51.64	17.84	21.65	65.98

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Atmos Energy Corp	18.5
Black Hills Corp	15.8
CenterPoint Energy Inc.	21.3
CMS Energy Corp	20.3
New Jersey Resources Corp	17.2
NiSource Inc.	16.5
Northwest Natural Gas	17.6
ONE Gas Inc	19.8
Southwest Gas Holdings Inc.	14.5
Spire Inc / Laclede Group Inc.	15.8
WEC Energy Group	21.9
Mean	18.1
Median	17.6
Selected Price to Earnings (P/E) Ratio	18.1
Indicated Equity Component of the Direct Rate	**5.52%**

We placed the most reliance on the mean price to earnings ratio.

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Beta Analysis

Company	Beta
Atmos Energy Corp	0.80
Black Hills Corp	0.95
CenterPoint Energy Inc.	1.10
CMS Energy Corp	0.80
New Jersey Resources Corp	0.95
NiSource Inc.	0.85
Northwest Natural Gas	0.80
ONE Gas Inc	0.80
Southwest Gas Holdings Inc.	0.90
Spire Inc / Laclede Group Inc.	0.85
WEC Energy Group	0.80
Beta Mean	0.87
Beta Median	0.85
Unlevered and Relevered Mean*	0.86
Indicated Beta	**0.86**

We considered the mean, median, and unlevered/relevered mean. We placed equal reliance on the median and mean when selecting the indicated beta.

Notes:

*See the Unlevering Relevering Beta page for the calculation

Unlevering/Relevering Betas

Unlevering of Betas					
Company	*Value Line* **Actual Income Tax Rate**	*From Capital Structure Page* **Actual Debt in Capital Structure**	*From Capital Structure Page* **Actual Equity in Capital Structure**	*Value Line* **Levered Beta (Published)**	*Formula* **Unlevered Beta**
Atmos Energy Corp	9.10%	27.14%	72.86%	0.80	0.6
Black Hills Corp	8.50%	49.30%	50.70%	0.95	0.5
CenterPoint Energy Inc.	20.00%	39.92%	57.73%	1.10	0.71
CMS Energy Corp	11.00%	41.51%	57.75%	0.80	0.49
New Jersey Resources Corp	10.50%	37.12%	62.88%	0.95	0.62
NiSource Inc.	19.00%	44.22%	48.59%	0.85	0.49
Northwest Natural Gas	21.00%	43.57%	56.43%	0.80	0.5
ONE Gas Inc	17.50%	35.51%	64.49%	0.80	0.55
Southwest Gas Holdings Inc.	21.00%	57.62%	42.38%	0.90	0.43
Spire Inc / Laclede Group Inc.	21.10%	45.18%	51.42%	0.85	0.5
WEC Energy Group	19.00%	32.62%	67.31%	0.80	0.57
			Average	**0.87**	

Relevering of Betas				
Company	*Formula* **Composite Income Tax Rate**	*From Capital Structure Page* **Industry Debt in Capital Structure**	*From Capital Structure Page* **Industry Equity in Capital Structure**	*Formula* **Levered Beta**
Atmos Energy Corp	16.15%	41.00%	59.00%	0.95
Black Hills Corp	16.15%	41.00%	59.00%	0.79
CenterPoint Energy Inc.	16.15%	41.00%	59.00%	1.12
CMS Energy Corp	16.15%	41.00%	59.00%	0.78
New Jersey Resources Corp	16.15%	41.00%	59.00%	0.98
NiSource Inc.	16.15%	41.00%	59.00%	0.78
Northwest Natural Gas	16.15%	41.00%	59.00%	0.79
ONE Gas Inc	16.15%	41.00%	59.00%	0.87
Southwest Gas Holdings Inc.	16.15%	41.00%	59.00%	0.68
Spire Inc / Laclede Group Inc.	16.15%	41.00%	59.00%	0.79
WEC Energy Group	16.15%	41.00%	59.00%	0.90
			Average	**0.86**

Notes:

Uses the Hamada Formula

Unlevered Beta = Levered Beta / [1 + (1 - Tax Rate) x (Debt/Equity))], using company-specific components

Relevered Beta = Unlevered Beta [1 + (1 - Tax Rate) x (Debt/Equity)], Using industry components for Tax Rate, Debt, and Equity

Calculation of Market to Book Ratios for the Gas Distribution Market Segment

- December 31, 2022 calendar year information for the January 2, 2023 Assessment
- A market to book ratio over one would be an indication of no obsolescence.
- Market Value estimates for Common Equity are from Value Line. Market Value Estimates for Long-Term Debt are from the company's 10-K.
- Book Value amounts are from the company's 10-K.

Market to Book Ratio for Equity

Company	Market Value of Common Equity from Value Line	Book Value of Common Equity from 10-K	Market to Book Ratio	Source	Fiscal Year End
Atmos Energy Corp	15,462,253,697	9,419,091,000	1.64	Atmos Energy Corp. 2022 10-K, p. 38	9/30/2022
Black Hills Corp	4,247,762,397	2,994,913,000	1.42	Black Hills Corp. 2022 10-K, p. 63	
CenterPoint Energy Inc.	19,427,469,573	10,042,000,000	1.93	CenterPoint Energy Inc. 2022 10-K, p. 84	
CMS Energy Corp	17,647,297,402	7,015,000,000	2.52	CMS Energy Corp. 2022 10-K, p. 95	
New Jersey Resources Corp	4,277,351,402	1,817,210,000	2.35	New Jersey Resources. 2022 10-K, p. 72	9/30/2022
NiSource Inc.	10,462,020,650	7,575,400,000	1.38	NiSource Inc. 2022 10-K, p. 61	
Northwest Natural Gas	1,666,859,156	1,191,082,000	1.40	Northwest Natural Gas 2022 10-K, p. 86	
ONE Gas Inc	4,410,870,203	2,584,426,000	1.71	One Gas Inc. 2022 10-K, p. 45	
Southwest Gas Holdings Inc.	4,314,138,558	3,058,759,000	1.41	Southwest Gas Holdings 2022 10-K, p. 22	
Spire Inc / Laclede Group Inc.	3,650,872,640	2,818,500,000	1.30	Spire Inc. 2022 10-K, p. 59	
WEC Energy Group	30,767,484,154	11,376,900,000	2.70	WEC Energy Group. 2022 10-K, p. 86	
		Average	**1.80**		

Market to Book Ratio for Debt

Company	Market Value of Long-Term Debt from 10-K	Book Value of Long-Term Debt from 10-K	Market to Book Ratio	Source	Fiscal Year End
Atmos Energy Corp	7,960,000,000	6,918,843,000	1.15	Atmos Energy Corp. 2022 10-K, p. 84	9/30/2022
Black Hills Corp	3,760,848,000	4,132,340,000	0.91	Black Hills Corp. 2022 10-K, p. 92	
CenterPoint Energy Inc.	14,990,000,000	16,338,000,000	0.92	CenterPoint Energy Inc. 2022 10-K, p. 143	
CMS Energy Corp	12,384,000,000	14,212,000,000	0.87	CMS Energy Corp. 2022 10-K, p. 130	

New Jersey Resources Corp	966,968,000	1,070,000,000	0.9	New Jersey Resources. 2022 10-K, p. 101	9/30/2022
NiSource Inc.	8,479,400,000	9,553,600,000	0.89	NiSource Inc. 2022 10-K, p. 109	
Northwest Natural Gas	944,383,000	1,125,877,000	0.84	Northwest Natural Gas 2022 10-K, p. 111	
ONE Gas Inc	2,500,000,000	2,700,000,000	0.93	One Gas Inc. 2022 10-K, p. 59	
Southwest Gas Holdings Inc.	2,748,591,000	4,403,299,000	0.62	Southwest Gas Holdings 2022 10-K, p. 55-56	
Spire Inc / Laclede Group Inc.	2,851,800,000	3,239,700,000	0.88	Spire Inc. 2022 10-K, p. 90	
WEC Energy Group	13,921,300,000	15,464,200,000	0.90	WEC Energy Group. 2022 10-K, p. 128	
		Average	**0.89**		

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	59.00%	1.80	1.06
Long-term Debt	41.00%	0.89	0.36
			1.42

Appendix C - Gas Transmission Pipeline

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	36.00%	5.61%	2.02%
Common Equity	64.00%	11.06%	7.08%
Yield Rate			**9.10%**

Gas Transmission Pipeline Yield Rate	**9.10%**

Capital Structure

Company	Value of Long-Term Debt	Value of Preferred Equity	Value of Common Equity	Total Market Value	% Long-Term Debt	% Preferred Equity	% Common Equity
Enbridge Inc.	74,000,000,000	5,800,000,000	108,226,591,745	188,026,591,745	39.36%	3.08%	57.56%
Kinder Morgan Inc.	29,100,000,000	-	41,650,660,576	70,750,660,576	41.13%	0.00%	58.87%
ONEOK Inc.	11,950,700,000	-	28,774,888,348	40,725,588,348	29.34%	0.00%	70.66%
TC Energy Corp	37,617,500,000	-	47,978,920,000	85,596,420,000	43.95%	0.00%	56.05%
Williams Companies Inc.	22,530,000,000	-	41,143,335,992	63,673,335,992	35.38%	0.00%	64.62%
Pembina Pipeline Corp.	10,026,000,000	2,424,000,000	25,576,022,680	38,026,022,680	26.37%	6.37%	67.26%
				Mean	35.92%	1.58%	62.50%
				Median	37.37%	0.00%	61.74%
				Indicated Industry Capital Structure	**36.00%**	**0%**	**64.00%**

We placed approximately equal reliance on the mean and median when selecting the indicated capital structure for the market segment.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
Enbridge Inc.	Baa1	5.61%
Kinder Morgan Inc.	Baa2	5.61%
ONEOK Inc.	Baa3	5.61%
TC Energy Corp	Baa2	5.61%
Williams Companies Inc.	Baa2	5.61%
Pembina Pipeline Corp.	N/A	N/A

Mean	5.61%
Median	5.61%
Mode	5.61%

Indicated Rate of Debt	**5.61%**

Corporate Bond Yield Averages from Mergent Bond Record, January 2023 Edition

Industrial Bond Averages, December 2022

Mergent	S&P	Dec. Yield Avg.
Aaa	AAA	4.43%
Aa1, Aa2 Aa3	AA+, AA, AA-	4.48%
A1, A2, A3	A+, A, A-	4.94%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.61%

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	7.85%
CAPM - Damodaran	10.71%
CAPM - The CFO Survey	9.23%
CAPM - Fernandez, Banuls, and Acin	10.33%
CAPM - Ex Post (BVR Historical, Arithmetic)	11.09%
CAPM - Ex Post (BVR Historical, Geometric)	9.67%
Empirical CAPM - Ex Ante, Three Stage	7.74%
Empirical CAPM - Damodaran	10.53%
Empirical CAPM - Graham and Harvey	9.10%
Empirical CAPM - Fernandez, Banuls, and Acin	10.16%
Empirical CAPM - Ex Post (BVR Historical, Arithmetic)	10.91%
Empirical CAPM - Ex Post (BVR Historical, Geometric)	9.52%
DGM - Dividend Growth	10.35%
DGM - Earnings Growth	17.55%
DGM - Two-Stage	15.75%
DGM - Three-Stage	12.81%
Indicated Rate of Equity	**11.06%**

We established a range of acceptability for the cost of equity with all available models. We considered all of the data and placed more reliance on the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium, and the Damodaran CAPM.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	36.00%	5.61%	2.02%
Equity Component	64.00%	5.95%	3.81%
Direct Rate			**5.83%**

Direct Rate	**5.83%**

Yield Rate	9.10%
Direct Rate	5.83%
Implied Industry Growth Rate	**3.27%**

Capital Asset Pricing Model (CAPM)

(ERP x β) + RFR = Indicated Equity Rate

	Equity Risk Premium (ERP)	x Industry Beta (β)	= Industry Risk Premium	+ Risk-Free Rate[1] (RFR)	Indicated Equity Rate
Three Stage Ex Ante[2]	3.38%	1.12	3.79%	4.06%	7.85%
Dr. Damodaran ERP[3]	5.94%	1.12	6.65%	4.06%	10.71%
The CFO Survey[4]	4.62%	1.12	5.17%	4.06%	9.23%
Fernandez, Banuls and Acin[5]	5.60%	1.12	6.27%	4.06%	10.33%
BVR - Historical, Arithmetic Mean[6]	6.28%	1.12	7.03%	4.06%	11.09%
BVR - Historical, Geometric Mean[7]	5.01%	1.12	5.61%	4.06%	9.67%

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Empirical Capital Asset Pricing Model (ECAPM)

(ERP x β x .75) + (ERP x .25) + RFR = Indicated Equity Rate

Model	Equity Risk Premium (ERP)	Industry Beta (β)	Weighted Industry Risk Premium (weighted at 75%)	Weighted Equity Risk Premium (weighted at 25%)	Risk-Free Rate (RFR)	Indicated Equity Rate
Three Stage Ex Ante[4]	3.38%	1.12	2.84%	0.85%	4.06%	**7.74%**
Dr. Damodaran ERP[5]	5.94%	1.12	4.99%	1.49%	4.06%	**10.53%**
Duke CFO Global Business Outlook[7]	4.62%	1.12	3.88%	1.16%	4.06%	**9.10%**
Fernandez, Banuls and Acin[8]	5.60%	1.12	4.70%	1.40%	4.06%	**10.16%**
BVR - Historical, Arithmetic Mean[9]	6.28%	1.12	5.28%	1.57%	4.06%	**10.91%**
BVR - Historical, Geometric Mean[10]	5.01%	1.12	4.21%	1.25%	4.06%	**9.52%**

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Single-Stage Dividend Growth Model

Company	Current Dividend Yield (DY)	Projected Short-term EPS Growth Rate (EG)	Projected Short-term Dividend Growth Rate (DG)	Cost of Equity Earnings Growth DY + EG	Cost of Equity Dividend Growth DY + DG
Enbridge Inc.	6.60%	10.00%	3.00%	16.60%	9.60%
Kinder Morgan Inc.	6.00%	19.00%	6.50%	25.00%	12.50%
ONEOK Inc.	6.30%	11.50%	4.50%	17.80%	10.80%
TC Energy Corp	6.10%	8.00%	4.00%	14.10%	10.10%
Williams Companies Inc.	5.00%	12.00%	5.00%	17.00%	10.00%
Pembina Pipeline Corp.	5.60%	20.00%	4.00%	25.60%	9.60%
Mean	6.00%	12.10%	4.60%	18.10%	10.60%
Median	6.10%	11.50%	4.50%	17.00%	10.10%

DGM - Dividend Growth, Indicated Rate	**10.35%**
DGM - Earnings Growth, Indicated Rate	**17.55%**

We placed equal reliance on the mean and median to select the indicated rate.

Notes:

Dividend Yield and projected growth rates provided by Value Line.

Two-Stage Dividend Growth Model

K_E = (DY x (1+ 0.5(G))) + 0.67(G1) +0.33(g)

K_E Cost of Equity
DY Dividend Yield
G_1 Short-term Growth Estimate
g Stable Growth
G Average Growth Rate

Company	**DY** Dividend Yield	**G1** Short-term Growth Estimate	**g** Stable Growth	**G** Average Growth Rate	**K_E** Cost of Equity
Enbridge Inc.	6.60%	10.00%	3.70%	6.85%	14.75%
Kinder Morgan Inc.	6.00%	19.00%	3.70%	11.35%	20.29%
ONEOK Inc.	6.30%	11.50%	3.70%	7.60%	15.47%
TC Energy Corp	6.10%	8.00%	3.70%	5.85%	12.86%
Williams Companies Inc.	5.00%	12.00%	3.70%	7.85%	14.46%
Pembina Pipeline Corp.	5.60%	20.00%	3.70%	11.85%	20.55%

Mean	16.40%
Median	15.11%

Two-Stage DGM, Indicated Rate	**15.75%**

We placed equal reliance on the mean and median when selecting the indicated rate.

Notes:

Dividend Yield provided by Value Line

Growth Estimates, Next 5 Years for Earnings provided Value Line

Stable growth rate is the nominal growth rate determined in the Capitalization Rate Study Narrative (indicated long-term growth rate of the U.S. economy of 1.7% plus the expected inflation rate of 2.0%).

Three-Stage Dividend Growth Model

Start Price - recent price from Value Line
Expected dividends - estimated dividends from Value Line
Stage one growth - projected earnings growth rate from Value Line
Stage two growth - reversion to long-term growth rate
Stage three growth - long-term growth rate developed in Study (3.70%)

Company	Year	Enbridge Inc.		Kinder Morgan Inc.		ONEOK Inc.		TC Energy Corp		Williams Companies Inc.		Pembina Pipeline Corp.	
Start Price	2022		-53.45		-18.53		-64.38		-47.41		-33.77		-46.37
Expected Dividends	2023		3.55		1.15		4.05		2.90		1.76		2.70
Stage One Growth	2024	10.00%	3.91	19.00%	1.37	11.50%	4.52	8.00%	3.13	12.00%	1.97	20.00%	3.24
Stage One Growth	2025	10.00%	4.30	19.00%	1.63	11.50%	5.04	8.00%	3.38	12.00%	2.21	20.00%	3.89
Stage One Growth	2026	10.00%	4.73	19.00%	1.94	11.50%	5.61	8.00%	3.65	12.00%	2.47	20.00%	4.67
Stage One Growth	2027	10.00%	5.20	19.00%	2.31	11.50%	6.26	8.00%	3.95	12.00%	2.77	20.00%	5.60
Stage Two Growth	2028	9.43%	5.69	17.61%	2.71	10.79%	6.94	7.61%	4.25	11.25%	3.08	18.52%	6.64
Stage Two Growth	2029	8.85%	6.19	16.22%	3.15	10.08%	7.63	7.22%	4.55	10.49%	3.40	17.04%	7.77
Stage Two Growth	2030	8.28%	6.70	14.83%	3.62	9.37%	8.35	6.83%	4.86	9.74%	3.74	15.55%	8.97
Stage Two Growth	2031	7.71%	7.22	13.44%	4.11	8.66%	9.07	6.44%	5.18	8.98%	4.07	14.07%	10.24
Stage Two Growth	2032	7.14%	7.74	12.05%	4.60	7.95%	9.80	6.05%	5.49	8.23%	4.41	12.59%	11.53
Stage Two Growth	2033	6.56%	8.24	10.65%	5.09	7.25%	10.50	5.65%	5.80	7.47%	4.73	11.11%	12.81
Stage Two Growth	2034	5.99%	8.74	9.26%	5.56	6.54%	11.19	5.26%	6.10	6.72%	5.05	9.63%	14.04
Stage Two Growth	2035	5.42%	9.21	7.87%	6.00	5.83%	11.84	4.87%	6.40	5.96%	5.35	8.15%	15.18
Stage Two Growth	2036	4.85%	9.66	6.48%	6.39	5.12%	12.45	4.48%	6.69	5.21%	5.63	6.66%	16.19
Stage Two Growth	2037	4.27%	10.07	5.09%	6.71	4.41%	13.00	4.09%	6.96	4.45%	5.88	5.18%	17.03
Stage Three Growth	2038	3.70%	10.44	3.70%	6.96	3.70%	13.48	3.70%	7.22	3.70%	6.10	3.70%	17.66
Stage Three Growth	2039	3.70%	10.83	3.70%	7.22	3.70%	13.98	3.70%	7.49	3.70%	6.33	3.70%	18.32
Stage Three Growth	2040	3.70%	11.23	3.70%	7.49	3.70%	14.50	3.70%	7.76	3.70%	6.56	3.70%	18.99
Stage Three Growth	2041	3.70%	11.65	3.70%	7.76	3.70%	15.03	3.70%	8.05	3.70%	6.80	3.70%	19.70
Stage Three Growth	2042	3.70%	12.08	3.70%	8.05	3.70%	15.59	3.70%	8.35	3.70%	7.06	3.70%	20.43
Stage Three Growth	2043	3.70%	12.52	3.70%	8.35	3.70%	16.16	3.70%	8.66	3.70%	7.32	3.70%	21.18

Stage Three Growth	2044	3.70%	12.99	3.70%	8.66	3.70%	16.76	3.70%	8.98	3.70%	7.59	3.70%	21.97
Stage Three Growth	2045	3.70%	13.47	3.70%	8.98	3.70%	17.38	3.70%	9.31	3.70%	7.87	3.70%	22.78
Stage Three Growth	2046	3.70%	13.97	3.70%	9.31	3.70%	18.03	3.70%	9.66	3.70%	8.16	3.70%	23.62
Stage Three Growth	2047	3.70%	14.48	3.70%	9.66	3.70%	18.69	3.70%	10.01	3.70%	8.46	3.70%	24.50
Stage Three Growth	2048	3.70%	15.02	3.70%	10.01	3.70%	19.39	3.70%	10.38	3.70%	8.78	3.70%	25.40
Stage Three Growth	2049	3.70%	15.57	3.70%	10.38	3.70%	20.10	3.70%	10.77	3.70%	9.10	3.70%	26.34
Stage Three Growth	2050	3.70%	16.15	3.70%	10.77	3.70%	20.85	3.70%	11.17	3.70%	9.44	3.70%	27.32
Stage Three Growth	2051	3.70%	16.75	3.70%	11.17	3.70%	21.62	3.70%	11.58	3.70%	9.79	3.70%	28.33
Reversion	2052		4.63		0.63		5.32		6.63		4.24		1.67
Implied Cost of Equity			**12.22%**		**16.75%**		**12.53%**		**10.32%**		**11.03%**		**16.64%**

Mean	13.25%
Median	12.38%
Selected Three-Stage DGM Cost of Equity	**12.81%**

Reversion Calculation:

A. Last period's exp. dividends with growth	17.37	11.58	22.42	12.01	10.15	29.38
B. Cost of equity, less long-term real growth	10.52%	15.05%	10.83%	8.62%	9.33%	14.94%
C. A / B	165.1	77.0	206.9	139.3	108.7	196.7
D. C / ((1 + Cost of Equity) ^ Last Period + 1)	4.63	0.63	5.32	6.63	4.24	1.67

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Enbridge Inc.	18.2
Kinder Morgan Inc.	16.3
ONEOK Inc.	16.1
TC Energy Corp	17.2
Williams Companies Inc.	18.9
Pembina Pipeline Corp.	8.4
Mean	15.9
Median	16.8
Selected Price to Earnings (P/E) Ratio	16.8
Indicated Equity Component of the Direct Rate	**5.95%**

We placed more reliance on the median price to earnings ratio.

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Beta Analysis

Company	Beta
Enbridge Inc.	0.85
Kinder Morgan Inc.	1.15
ONEOK Inc.	1.45
TC Energy Corp	1.05
Williams Companies Inc.	1.15
Pembina Pipeline Corp.	1.05
Beta Mean	1.12
Beta Median	1.10
Unlevered and Relevered Mean*	1.12
Indicated Beta	**1.12**

We considered the mean, median, and unlevered/relevered mean. We placed more reliance on the mean when selecting the indicated beta.

Notes:

*See the Unlevering Relevering Beta page for the calculation

Comparing betas from Value Line for the 2022, 2021, 2020, and 2019 calendar years

	Betas			
Company	**2022 CY**	**2021 CY**	**2020 CY**	**2019 CY**
Enbridge Inc.	0.85	0.90	0.90	1.00
Kinder Morgan Inc.	1.15	1.15	1.25	1.35
ONEOK Inc.	1.45	1.50	1.60	1.50
TC Energy Corp (FKA TransCanada Corporation)	1.05	1.05	1.05	1.05
Williams Companies Inc.	1.15	1.20	1.45	1.90

Unlevering/Relevering Betas

Unlevering of Betas					
Company	*Value Line* **Actual Income Tax Rate**	*From Capital Structure Page* **Actual Debt in Capital Structure**	*From Capital Structure Page* **Actual Equity in Capital Structure**	*Value Line* **Levered Beta (Published)**	*Formula* **Unlevered Beta**
Enbridge Inc.	15.00%	39.36%	57.56%	0.85	0.54
Kinder Morgan Inc.	21.00%	41.13%	58.87%	1.15	0.74
ONEOK Inc.	21.00%	29.34%	70.66%	1.45	1.09
TC Energy Corp	22.00%	43.95%	56.05%	1.05	0.65
Williams Companies Inc.	23.00%	35.38%	64.62%	1.15	0.81
Pembina Pipeline Corp.	21.00%	26.37%	67.26%	1.05	0.8
			Average	**1.12**	

Relevering of Betas				
Company	*Formula* **Composite Income Tax Rate**	*From Capital Structure Page* **Industry Debt in Capital Structure**	*From Capital Structure Page* **Industry Equity in Capital Structure**	*Formula* **Levered Beta**
Enbridge Inc.	20.40%	36.00%	64.00%	0.78
Kinder Morgan Inc.	20.40%	36.00%	64.00%	1.07
ONEOK Inc.	20.40%	36.00%	64.00%	1.58
TC Energy Corp	20.40%	36.00%	64.00%	0.94
Williams Companies Inc.	20.40%	36.00%	64.00%	1.17
Pembina Pipeline Corp.	20.40%	36.00%	64.00%	1.16
			Average	**1.12**

Notes:

Uses the Hamada Formula

Unlevered Beta = Levered Beta / [1 + (1 - Tax Rate) x (Debt/Equity))], using company-specific components
Using company-specific components

Relevered Beta = Unlevered Beta [1 + (1 - Tax Rate) x (Debt/Equity)]
Using industry components for Tax Rate, Debt, and Equity

DEPARTMENT OF REVENUE

Calculation of Market to Book Ratios for the Gas Transmission Pipeline Market Segment

- December 31, 2022 calendar year information for the January 2, 2023 Assessment
- A market to book ratio over one would be an indication of no obsolescence.
- Market Value estimates for Common Equity are from Value Line. Market Value Estimates for Long-Term Debt are from the company's 10-K.
- Book Value amounts are from the company's 10-K.

Market to Book Ratio for Equity

Company	Market Value of Common Equity from Value Line	Book Value of Common Equity from 10-K	Market to Book Ratio	Source
Enbridge Inc.^	108,226,591,745	44,214,572,100	2.45	Enbridge Inc. 2022 10-K, p. 97 (CAD)
Kinder Morgan Inc.	41,650,660,576	30,742,000,000	1.35	Kinder Morgan Inc. 2022 10-K, p. 73
ONEOK Inc.	28,774,888,348	6,493,885,000	4.43	ONEOK Inc. 2022 10-K, p. 61
TC Energy Corp*	47,978,920,000	25,094,817,000	1.91	TC Energy Corp. 2022 Annual Report, p. 145
Williams Companies Inc.	41,143,335,992	11,485,000,000	3.58	Williams Companies 2022 10-K, p. 77
Pembina Pipeline Corp.	25,576,022,680	15,789,000,000	1.62	Pembina Pipeline Corp 10-K, p. 81
		Average	2.56	

Market to Book Ratio for Debt

Company	Market Value of Long-Term Debt from 10-K	Book Value of Long-Term Debt from 10-K	Market to Book Ratio	Source
Enbridge Inc.^	73,500,000,000	79,300,000,000	0.93	Enbridge Inc. 2022 10-K, p. 155 (CAD)
Kinder Morgan Inc.	30,070,000,000	31,788,000,000	0.95	Kinder Morgan Inc. 2022 10-K, p. 102
ONEOK Inc.	12,700,000,000	13,600,000,000	0.93	ONEOK Inc. 2022 10-K, p. 75
TC Energy Corp	48,920,000,000	52,038,000,000	0.94	TC Energy Corp. 2022 Annual Report, p. 145 (CAD)
Williams Companies Inc.	21,569,000,000	22,554,000,000	0.96	Williams Companies 2022 10-K, p. 121
Pembina Pipeline Corp.	9,590,000,000	10,600,000,000	0.90	Pembina Pipeline Corp 10-K, p 134
		Average	0.94	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	64.00%	2.56	1.64
Long-term Debt	36.00%	0.94	0.34
			1.98

Notes:

^Convert Enbridge Inc.'s Book Value of Common Equity from Canadian Dollars to U.S. Dollars.
Enbridge Inc.'s 10-K is in Canadian dollars. The Value Line Report is in USD.

59,887,000,000	CAD
0.7383	Exchange Rate
44,214,572,100	USD

*Convert TC Energy Corp.'s Book Value of Common Equity from Canadian Dollars to U.S. Dollars.
TC Energy Corp.'s Annual Report is in CAD. The Value Line Report is in USD.

33,990,000,000	CAD
0.7383	Exchange Rate
25,094,817,000	USD

Appendix D - Fluid Transportation Pipeline

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	41.00%	6.01%	2.46%
Common Equity	59.00%	11.24%	6.63%
Yield Rate			**9.09%**

Fluid Transportation Pipeline Yield Rate	**9.09%**

Capital Structure

Company	Value of Long-Term Debt	Value of Preferred Equity	Value of Common Equity	Total Market Value	% Long-Term Debt	% Preferred Equity	% Common Equity
Holly Energy Partners LP	1,593,800,000	-	2,379,604,583	3,973,404,583	40.11%	0.00%	59.89%
Magellan Midstream Partners LP	5,011,900,000	-	10,892,352,493	15,904,252,493	31.51%	0.00%	68.49%
MPLX LP	18,800,000,000	965,000,000	33,718,994,171	53,483,994,171	35.15%	1.80%	63.05%
NuStar Energy LP	3,068,100,000	-	1,746,265,634	4,814,365,634	63.73%	0.00%	36.27%
Plains All American Pipeline	7,986,000,000	2,292,000,000	8,540,608,738	18,818,608,738	42.44%	12.18%	45.38%

Mean	42.59%	2.80%	54.62%
Median	40.11%	0.00%	59.89%

Indicated Industry Capital Structure	**41.00%**		**59.00%**

We placed approximately equal reliance on the mean and median when selecting the indicated capital structure for the market segment.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate	
Holly Energy Partners LP	Ba2	7.60%	**
Magellan Midstream Partners LP	Baa1	5.61%	
MPLX LP	Baa2	5.61%	
NuStar Energy LP	Ba3	7.60%	**
Plains All American Pipeline	Baa3	5.61%	

Mean	6.41%
Median	5.61%
Mode	5.61%

Indicated Rate of Debt	**6.01%**

We placed equal reliance on the mean and median when selecting the indicated rate of debt.

Corporate Bond Yield Averages from Mergent Bond Record, January 2023 Edition

Public Utility Bond Averages, December 2022

Mergent	S&P	Dec. Yield Avg.
Aaa	AAA	4.43%
Aa1, Aa2 Aa3	AA+, AA, AA-	4.48%
A1, A2, A3	A+, A, A-	4.94%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.61%

** These companies are rated below the Mergent Bond Record Bond Yield Averages. We analyzed the Mergent Bond Record, January 2023 issue, for U.S. Corporate Bonds with the same debt rating. We determined the median Ba1, Ba2, and Ba3 yield to maturity is 7.60%.

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	7.95%
CAPM - Damodaran	10.89%
CAPM - The CFO Survey	9.37%
CAPM - Fernandez, Banuls, and Acin	10.50%
CAPM - Ex Post (BVR Historical, Arithmetic)	11.28%
CAPM - Ex Post (BVR Historical, Geometric)	9.82%
Empirical CAPM - Ex Ante, Three Stage	7.82%
Empirical CAPM - Damodaran	10.67%
Empirical CAPM - Graham and Harvey	9.20%
Empirical CAPM - Fernandez, Banuls, and Acin	10.29%
Empirical CAPM - Ex Post (BVR Historical, Arithmetic)	11.05%
Empirical CAPM - Ex Post (BVR Historical, Geometric)	9.63%
DGM - Dividend Growth	14.60%
DGM - Earnings Growth	16.00%
DGM - Two-Stage	14.59%
DGM - Three-Stage	12.89%
Indicated Rate of Equity	**11.24%**

We established a range of acceptability for the cost of equity with all available models. We considered all of the data and placed more reliance on the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium, and the Damodaran CAPM.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	41.00%	6.01%	2.46%
Equity Component	59.00%	10.07%	5.94%
Direct Rate			**8.40%**

Direct Rate	**8.40%**

Yield Rate	9.09%
Direct Rate	8.40%
Implied Industry Growth Rate	**0.69%**

Capital Asset Pricing Model (CAPM)

(ERP x β) + RFR = Indicated Equity Rate

	Equity Risk Premium (ERP)	x Industry Beta (β)	= Industry Risk Premium	+ Risk-Free Rate[1] (RFR)	Indicated Equity Rate
Three Stage Ex Ante[2]	3.38%	1.15	3.89%	4.06%	7.95%
Dr. Damodaran ERP[3]	5.94%	1.15	6.83%	4.06%	10.89%
The CFO Survey[4]	4.62%	1.15	5.31%	4.06%	9.37%
Fernandez, Banuls and Acin[5]	5.60%	1.15	6.44%	4.06%	10.50%
BVR - Historical, Arithmetic Mean[6]	6.28%	1.15	7.22%	4.06%	11.28%
BVR - Historical, Geometric Mean[7]	5.01%	1.15	5.76%	4.06%	9.82%

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Empirical Capital Asset Pricing Model (ECAPM)

(ERP x β x .75) + (ERP x .25) + RFR = Indicated Equity Rate

Model	Equity Risk Premium (ERP)	Industry Beta (β)	Weighted Industry Risk Premium (weighted at 75%)	Weighted Equity Risk Premium (weighted at 25%)	Risk-Free Rate (RFR)	Indicated Equity Rate
Three Stage Ex Ante[2]	3.38%	1.15	2.92%	0.85%	4.06%	**7.82%**
Dr. Damodaran ERP[3]	5.94%	1.15	5.12%	1.49%	4.06%	**10.67%**
The CFO Survey[4]	4.62%	1.15	3.98%	1.16%	4.06%	**9.20%**
Fernandez, Banuls and Acin[5]	5.60%	1.15	4.83%	1.40%	4.06%	**10.29%**
BVR - Historical, Arithmetic Mean[6]	6.28%	1.15	5.42%	1.57%	4.06%	**11.05%**
BVR - Historical, Geometric Mean[7]	5.01%	1.15	4.32%	1.25%	4.06%	**9.63%**

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Single-Stage Dividend Growth Model

Company	Current Dividend Yield (DY)	Projected Short-term EPS Growth Rate (EG)	Projected Short-term Dividend Growth Rate (DG)	Cost of Equity Earnings Growth DY + EG	Cost of Equity Dividend Growth DY + DG
Holly Energy Partners LP	8.00%	8.00%	-3.50%	16.00%	4.50%
Magellan Midstream Partners LP	7.90%	7.00%	7.00%	14.90%	14.90%
MPLX LP	9.20%	9.00%	3.00%	18.20%	12.20%
NuStar Energy LP	10.10%	NMF	4.50%	N/A	14.60%
Plains All American Pipeline	8.70%	NMF	17.50%	N/A	26.20%
Mean	8.78%	8.00%	5.70%	16.37%	14.48%
Median	8.70%	8.00%	4.50%	16.00%	14.60%

DGM - Dividend Growth, Indicated Rate	**14.60%**
DGM - Earnings Growth, Indicated Rate	**16.00%**

We placed more reliance on the median to select the indicated rate.

Notes:

Dividend Yield and growth rates provided by Value Line

Did not NuStar Energy LP in the DGM - Earnings estimate.

Two-Stage Dividend Growth Model

$K_E = (DY \times (1+ 0.5(G))) + 0.67(G1) + 0.33(g)$

K_E Cost of Equity
DY Dividend Yield
G_1 Short-term Growth Estimate
g Stable Growth
G Average Growth Rate

Company	**DY** Dividend Yield	**G1** Short-term Growth Estimate	**g** Stable Growth	**G** Average Growth Rate	**K_E** Cost of Equity
Holly Energy Partners LP	7.40%	8.00%	3.70%	5.85%	14.20%
Magellan Midstream Partners LP	7.90%	7.00%	3.70%	5.35%	14.02%
MPLX LP	9.20%	9.00%	3.70%	6.35%	16.74%
NuStar Energy LP	10.10%	NMF	3.70%	3.70%	N/A
Plains All American Pipeline	8.70%	NMF	3.70%	3.70%	N/A

Mean	14.99%
Median	14.20%

Two-Stage DGM, Indicated Rate	**14.59%**

We placed equal reliance on the mean and median to select the indicated rate.

Notes:

Dividend Yield provided by Value Line

Growth Estimates, Next 5 Years for Earnings provided Value Line

Stable growth rate is the nominal growth rate determined in the Capitalization Rate Study Narrative (indicated long-term growth rate of the U.S. economy of 1.7% plus the expected inflation rate of 2.0%).

Three-Stage Dividend Growth Model

Start Price - recent price from Value Line
Expected dividends - estimated dividends from Value Line
Stage one growth - projected earnings growth rate from Value Line
Stage two growth - reversion to long-term growth rate
Stage three growth - long-term growth rate developed in Study (3.70%)

Company	Year	Holly Energy Partners LP		Magellan Midstream Partners LP		MPLX LP	
Start Price	2022		-18.82		-53.15		-33.61
Expected Dividends	2023		1.40		4.35		2.95
Stage One Growth	2024	8.00%	1.51	7.00%	4.65	9.00%	3.22
Stage One Growth	2025	8.00%	1.63	7.00%	4.98	9.00%	3.50
Stage One Growth	2026	8.00%	1.76	7.00%	5.33	9.00%	3.82
Stage One Growth	2027	8.00%	1.90	7.00%	5.70	9.00%	4.16
Stage Two Growth	2028	7.61%	2.05	6.70%	6.08	8.52%	4.52
Stage Two Growth	2029	7.22%	2.20	6.40%	6.47	8.04%	4.88
Stage Two Growth	2030	6.83%	2.35	6.10%	6.87	7.55%	5.25
Stage Two Growth	2031	6.44%	2.50	5.80%	7.27	7.07%	5.62
Stage Two Growth	2032	6.05%	2.65	5.50%	7.67	6.59%	5.99
Stage Two Growth	2033	5.65%	2.80	5.20%	8.06	6.11%	6.36
Stage Two Growth	2034	5.26%	2.95	4.90%	8.46	5.63%	6.72
Stage Two Growth	2035	4.87%	3.09	4.60%	8.85	5.15%	7.06
Stage Two Growth	2036	4.48%	3.23	4.30%	9.23	4.66%	7.39
Stage Two Growth	2037	4.09%	3.36	4.00%	9.60	4.18%	7.70
Stage Three Growth	2038	3.70%	3.49	3.70%	9.95	3.70%	7.99
Stage Three Growth	2039	3.70%	3.61	3.70%	10.32	3.70%	8.28
Stage Three Growth	2040	3.70%	3.75	3.70%	10.70	3.70%	8.59
Stage Three Growth	2041	3.70%	3.89	3.70%	11.10	3.70%	8.91
Stage Three Growth	2042	3.70%	4.03	3.70%	11.51	3.70%	9.23

Stage Three Growth	2043	3.70%	4.18	3.70%	11.94	3.70%	9.58
Stage Three Growth	2044	3.70%	4.33	3.70%	12.38	3.70%	9.93
Stage Three Growth	2045	3.70%	4.49	3.70%	12.84	3.70%	10.30
Stage Three Growth	2046	3.70%	4.66	3.70%	13.31	3.70%	10.68
Stage Three Growth	2047	3.70%	4.83	3.70%	13.80	3.70%	11.07
Stage Three Growth	2048	3.70%	5.01	3.70%	14.32	3.70%	11.48
Stage Three Growth	2049	3.70%	5.20	3.70%	14.84	3.70%	11.91
Stage Three Growth	2050	3.70%	5.39	3.70%	15.39	3.70%	12.35
Stage Three Growth	2051	3.70%	5.59	3.70%	15.96	3.70%	12.81
Reversion	2052		1.55		3.80		1.49
Implied Cost of Equity			**12.21%**		**12.63%**		**14.63%**

Mean	13.16%
Median	12.63%
Selected Three-Stage DGM Cost of Equity	**12.89%**

Reversion Calculation:

A. Last period's exp. dividends with growth	5.80	16.55	13.28
B. Cost of equity, less long-term real growth	10.51%	10.93%	12.93%
C. A / B	55.1	151.5	102.7
D. C / ((1 + Cost of Equity) ^ Last Period + 1)	1.55	3.80	1.49

Note:

NuStar Energy LP, and Plains All American's estimated earnings growth rate is NMF and therefore, we were not able to complete this analysis for the company.

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Holly Energy Partners LP	9.9
Magellan Midstream Partners LP	10.8
MPLX LP	6.8
NuStar Energy LP	14.4
Plains All American Pipeline	7.9
Mean	9.96
Median	9.90
Selected Price to Earnings (P/E) Ratio	9.93
Indicated Equity Component of the Direct Rate	**10.07%**

We placed equal reliance on the mean and median price to earnings ratio.

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Beta Analysis

Company	Beta
Holly Energy Partners LP	0.95
Magellan Midstream Partners LP	1.10
MPLX LP	1.00
NuStar Energy LP	1.25
Plains All American Pipeline	1.45
Beta Mean	1.15
Beta Median	1.10
Unlevered and Relevered Mean*	1.07
Indicated Beta	**1.15**

We considered the mean, median, and unlevered/relevered mean. We placed more reliance on the mean when selecting the indicated beta. We placed no reliance on the unlevered and relevered mean given the minimal tax rate applicable to the guideline companies. The Hamada formula used to unlever and relever betas relies on an income tax component, which these guideline companies do not have.

Notes:

*See the Unlevering Relevering Beta page for the calculation

Unlevering/Relevering Betas

Unlevering of Betas					
Company	*Value Line* **Actual Income Tax Rate**	*From Capital Structure Page* **Actual Debt in Capital Structure**	*From Capital Structure Page* **Actual Equity in Capital Structure**	*Value Line* **Levered Beta (Published)**	*Formula* **Unlevered Beta**
Holly Energy Partners LP	0.10%	40.11%	59.89%	0.95	0.57
Magellan Midstream Partners I	0.50%	31.51%	68.49%	1.10	0.75
MPLX LP	0.50%	35.15%	63.05%	1.00	0.64
NuStar Energy LP	2.00%	63.73%	36.27%	1.25	0.46
Plains All American Pipeline	1.00%	42.44%	45.38%	1.45	0.75
			Average	**1.15**	

Relevering of Betas				
Company	*Formula* **Composite Income Tax Rate**	*From Capital Structure Page* **Industry Debt in Capital Structure**	*From Capital Structure Page* **Industry Equity in Capital Structure**	*Formula* **Levered Beta**
Holly Energy Partners LP	0.82%	41.00%	59.00%	0.96
Magellan Midstream Partners I	0.82%	41.00%	59.00%	1.27
MPLX LP	0.82%	41.00%	59.00%	1.08
NuStar Energy LP	0.82%	41.00%	59.00%	0.78
Plains All American Pipeline	0.82%	41.00%	59.00%	1.27
			Average	**1.07**

Notes:

Uses the Hamada Formula

Unlevered Beta = Levered Beta / [1 + (1 - Tax Rate) x (Debt/Equity))], using company-specific components
Using company-specific components

Relevered Beta = Unlevered Beta [1 + (1 - Tax Rate) x (Debt/Equity)]
Using industry components for Tax Rate, Debt, and Equity

Calculation of Market to Book Ratios for the Fluid Transportation Market Segment

- December 31, 2022 calendar year information for the January 2, 2023 Assessment
- A market to book ratio over one would be an indication of no obsolescence.
- Market Value estimates for Common Equity are from Value Line. Market Value Estimates for Long-Term Debt are from the company's 10-K.
- Book Value amounts are from the company's 10-K.

Market to Book Ratio for Equity

Company	Market Value of Common Equity from Value Line	Book Value of Common Equity from 10-K	Market to Book Ratio	Source
Holly Energy Partners LP	2,379,604,583	857,126,000	2.78	Holly Energy Partners LP 2022 10-K, p. 58
Magellan Midstream Partners LP	10,892,352,493	1,684,900,000	6.46	Magellan Midstream Partners LP 2022 10-K, p. 58
MPLX LP	33,718,994,171	12,309,000,000	2.74	MPLX LP 2022 10-K, p. 78
NuStar Energy LP	1,746,265,634	902,316,000	1.94	NuStar Energy LP 2022 10-K, p. 54
Plains All American Pipeline	8,540,608,738	10,057,000,000	0.85	Plains All American Pipeline LP 2022 10-K, p. F-5
		Average	**2.95**	

Market to Book Ratio for Debt

Company	Market Value of Long-Term Debt from 10-K	Book Value of Long-Term Debt from 10-K	Market to Book Ratio	Source
Holly Energy Partners LP	852,658,000	888,334,000	0.96	Holly Energy Partners LP 2022 10-K, p. 96
Magellan Midstream Partners LP	4,232,500,000	5,015,000,000	0.84	Magellan Midstream Partners LP 2022 10-K, p. 96
MPLX LP	18,095,000,000	19,905,000,000	0.91	MPLX LP 2022 10-K, p. 104
NuStar Energy LP	3,169,664,000	3,242,289,000	0.98	NuStar Energy LP 2022 10-K, p. 79
Plains All American Pipeline	7,600,000,000	8,400,000,000	0.90	Plains All American Pipeline LP 2022 10-K, p. F-33
		Average	**0.92**	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	59.00%	2.95	1.74
Long-term Debt	41.00%	0.92	0.38
			2.12

Appendix E - Railroad

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	19.00%	5.48%	1.04%
Common Equity	81.00%	10.62%	8.60%
Yield Rate			**9.64%**

Yield Rate	**9.64%**

Capital Structure

Company	Value of Long-Term Debt	Value of Preferred Equity	Value of Common Equity	Total Market Value	% Long-Term Debt	% Preferred Equity	% Common Equity
Canadian National Railway	9,420,000,000	-	83,047,680,000	92,467,680,000	10.19%	0.00%	89.81%
Canadian Pacific Railway	13,924,000,000	-	71,586,900,000	85,510,900,000	16.28%	0.00%	83.72%
CSX Corporation	17,895,000,000	-	62,916,000,000	80,811,000,000	22.14%	0.00%	77.86%
Norfolk Southern Corp	14,463,000,000	-	54,551,694,009	69,014,694,009	20.96%	0.00%	79.04%
Union Pacific Corp	31,744,000,000	-	120,685,397,040	152,429,397,040	20.83%	0.00%	79.17%
				Mean	18.08%	0.00%	81.92%
				Median	20.83%	0.00%	79.17%
	Indicated Capital Structure				**19.00%**		**81.00%**

We placed approximately equal reliance on the mean and median when selecting the indicated capital structure for the market segment.

Notes:
Data downloaded from Value Line.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
Canadian National Railway	A2	4.94%
Canadian Pacific Railway	Baa2	5.61%
CSX Corporation	Baa1	5.61%
Norfolk Southern Corp	Baa1	5.61%
Union Pacific Corp	A3	4.94%

Mean	5.34%
Median	5.61%
Mode	5.61%

Indicated Rate of Debt	**5.48%**

We placed equal reliance on the mean and median when selecting the indicated rate of debt.

Corporate Bond Yield Averages from Mergent Bond Record, January 2023 Edition
Industrial Bond Averages, December 2022

Mergent	S&P	Dec. Yield Avg.
Aaa	AAA	4.43%
Aa1, Aa2 Aa3	AA+, AA, AA-	4.48%
A1, A2, A3	A+, A, A-	4.94%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.61%

Notes:

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	7.61%
CAPM - Damodaran	10.30%
CAPM - The CFO Survey	8.91%
CAPM - Fernandez, Banuls, and Acin	9.94%
CAPM - Ex Post (BVR Historical, Arithmetic)	10.65%
CAPM - Ex Post (BVR Historical, Geometric)	9.32%
Empirical CAPM - Ex Ante, Three Stage	7.57%
Empirical CAPM - Damodaran	10.22%
Empirical CAPM - Graham and Harvey	8.85%
Empirical CAPM - Fernandez, Banuls, and Acin	9.87%
Empirical CAPM - Ex Post (BVR Historical, Arithmetic)	10.58%
Empirical CAPM - Ex Post (BVR Historical, Geometric)	9.26%
DGM - Dividend Growth	10.92%
DGM - Earnings Growth	12.02%
DGM - Two-Stage	9.97%
DGM - Three-Stage	4.70%
Indicated Rate of Equity	**10.62%**

We established a range of acceptability for the cost of equity with all available models. We considered all of the data and placed more reliance on the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium, and the Damodaran CAPM.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	19.00%	5.48%	1.04%
Equity Component	81.00%	5.59%	4.53%
Direct Rate			**5.57%**

Direct Rate	**5.57%**

Yield Rate	9.64%
Direct Rate	5.57%
Implied Industry Growth Rate	**4.07%**

Capital Asset Pricing Model (CAPM)

(ERP x β) + RFR = Indicated Equity Rate

	Equity Risk Premium (ERP)	x Industry Beta (β)	= Industry Risk Premium	+ Risk-Free Rate[1] (RFR)	Indicated Equity Rate
Three Stage Ex Ante[2]	3.38%	1.05	3.55%	4.06%	7.61%
Dr. Damodaran ERP[3]	5.94%	1.05	6.24%	4.06%	10.30%
The CFO Survey[4]	4.62%	1.05	4.85%	4.06%	8.91%
Fernandez, Banuls and Acin[5]	5.60%	1.05	5.88%	4.06%	9.94%
BVR - Historical, Arithmetic Mean[6]	6.28%	1.05	6.59%	4.06%	10.65%
BVR - Historical, Geometric Mean[7]	5.01%	1.05	5.26%	4.06%	9.32%

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Empirical Capital Asset Pricing Model (ECAPM)

(ERP x β x .75) + (ERP x .25) + RFR = Indicated Equity Rate

Model	Equity Risk Premium (ERP)	Industry Beta (β)	Weighted Industry Risk Premium (weighted at 75%)	Weighted Equity Risk Premium (weighted at 25%)	Risk-Free Rate (RFR)	Indicated Equity Rate
Three Stage Ex Ante[2]	3.38%	1.05	2.66%	0.85%	4.06%	**7.57%**
Dr. Damodaran ERP[3]	5.94%	1.05	4.68%	1.49%	4.06%	**10.22%**
The CFO Survey[4]	4.62%	1.05	3.64%	1.16%	4.06%	**8.85%**
Fernandez, Banuls and Acin[5]	5.60%	1.05	4.41%	1.40%	4.06%	**9.87%**
BVR - Historical, Arithmetic Mean[6]	6.28%	1.05	4.95%	1.57%	4.06%	**10.58%**
BVR - Historical, Geometric Mean[7]	5.01%	1.05	3.95%	1.25%	4.06%	**9.26%**

Notes:

1 U.S. Treasury on January 3, 2023 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 27, 2023 from www.federalreserve.gov

2 Three Stage Dividend Growth Model, S&P 500. See Appendix F, Three Stage Ex Ante Calculation

3 Implied Equity Risk Premium on January 5, 2023 as determined by Dr. Aswath Damodaran; Retrieved January 27, 2023 fromhttp://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2022). Data & Results December 21, 2022. Mean average annual S&P return over next ten years (8.5%) less annual yield on 10-year Treasury Bonds (3.88%). Retrieved January 27, 2023 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia T., & Acin, J. F. (2022). Survey: Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022. SSRN Electronic Journal. Retrieved January 27, 2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990

6 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2023). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2023 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Single-Stage Dividend Growth Model

Company	Current Dividend Yield (DY)	Projected Short-term EPS Growth Rate (EG)	Projected Short-term Dividend Growth Rate (DG)	Cost of Equity Earnings Growth DY + EG	Cost of Equity Dividend Growth DY + DG
Canadian National Railway	1.90%	11.00%	10.00%	12.90%	11.90%
Canadian Pacific Railway	0.80%	10.00%	10.00%	10.80%	10.80%
CSX Corporation	1.30%	10.50%	9.50%	11.80%	10.80%
Norfolk Southern Corp	2.10%	10.00%	8.00%	12.10%	10.10%
Union Pacific Corp	2.60%	9.50%	9.00%	12.10%	11.60%
Mean	1.74%	10.20%	9.30%	11.94%	11.04%
Median	1.90%	10.00%	9.50%	12.10%	10.80%

DGM - Dividend Growth, Indicated Rate	**10.92%**
DGM - Earnings Growth, Indicated Rate	**12.02%**

We placed equal reliance on the mean and median to arrive at the indicated rates for DGM - Earnings Growth and DGM - Dividend Growth.

Notes:

Dividend Yield and growth rates provided by Value Line

Two-Stage Dividend Growth Model

K_E = (DY x (1+ 0.5(G))) + 0.67(G1) +0.33(g)

K_E Cost of Equity | **G_1** Short-term Growth Estimate
DY Dividend Yield | **g** Stable Growth | **G** Average Growth Rate

Company	**DY** Dividend Yield	**G1** Short-term Growth Estimate	**g** Stable Growth	**G** Average Growth Rate	**K_E** Cost of Equity
Canadian National Railway	1.90%	11.00%	3.70%	7.35%	10.56%
Canadian Pacific Railway	0.80%	10.00%	3.70%	6.85%	8.75%
CSX Corporation	1.30%	10.50%	3.70%	7.10%	9.60%
Norfolk Southern Corp	2.10%	10.00%	3.70%	6.85%	10.09%
Union Pacific Corp	2.60%	9.50%	3.70%	6.60%	10.27%

Mean	9.86%
Median	10.09%
Two-Stage DGM, Indicated Rate	**9.97%**

We placed equal reliance on the mean and median to select the indicated rate.

Notes:

Dividend Yield provided by Value Line

Growth Estimates, Next 5 Years for Earnings provided Value Line

Stable growth rate is the nominal growth rate determined in the Capitalization Rate Study Narrative (indicated long-term real growth rate of the U.S. economy of 1.7% plus the expected inflation rate of 2.0%).

Three-Stage Dividend Growth Model

Start Price - recent price from Value Line
Expected dividends - estimated dividends from Value Line
Stage one growth - projected earnings growth rate from Value Line
Stage two growth - reversion to long-term growth rate
Stage three growth - long-term growth rate developed in Study (3.70%)

Company	Year	Canadian National Railway		Canadian Pacific Railway		CSX Corporation		Norfolk Southern Corp		Union Pacific Corp	
Start Price	2022		-120.15		-77		-29.96		-235.63		-196.30
Expected Dividends	2023		2.50		0.72		0.44		5.40		5.60
Stage One Growth	2024	11.00%	2.78	10.00%	0.79	10.50%	0.49	10.00%	5.94	9.50%	6.13
Stage One Growth	2025	11.00%	3.08	10.00%	0.87	10.50%	0.54	10.00%	6.53	9.50%	6.71
Stage One Growth	2026	11.00%	3.42	10.00%	0.96	10.50%	0.59	10.00%	7.19	9.50%	7.35
Stage One Growth	2027	11.00%	3.80	10.00%	1.05	10.50%	0.66	10.00%	7.91	9.50%	8.05
Stage Two Growth	2028	10.34%	4.19	9.43%	1.15	9.88%	0.72	9.43%	8.65	8.97%	8.77
Stage Two Growth	2029	9.67%	4.59	8.85%	1.26	9.26%	0.79	8.85%	9.42	8.45%	9.51
Stage Two Growth	2030	9.01%	5.01	8.28%	1.36	8.65%	0.86	8.28%	10.20	7.92%	10.27
Stage Two Growth	2031	8.35%	5.42	7.71%	1.46	8.03%	0.92	7.71%	10.98	7.39%	11.03
Stage Two Growth	2032	7.68%	5.84	7.14%	1.57	7.41%	0.99	7.14%	11.77	6.86%	11.78
Stage Two Growth	2033	7.02%	6.25	6.56%	1.67	6.79%	1.06	6.56%	12.54	6.34%	12.53
Stage Two Growth	2034	6.35%	6.65	5.99%	1.77	6.17%	1.13	5.99%	13.29	5.81%	13.26
Stage Two Growth	2035	5.69%	7.03	5.42%	1.87	5.55%	1.19	5.42%	14.01	5.28%	13.96
Stage Two Growth	2036	5.03%	7.38	4.85%	1.96	4.94%	1.25	4.85%	14.69	4.75%	14.62
Stage Two Growth	2037	4.36%	7.70	4.27%	2.04	4.32%	1.30	4.27%	15.32	4.23%	15.24
Stage Three Growth	2038	3.70%	7.99	3.70%	2.12	3.70%	1.35	3.70%	15.88	3.70%	15.80
Stage Three Growth	2039	3.70%	8.28	3.70%	2.20	3.70%	1.40	3.70%	16.47	3.70%	16.39
Stage Three Growth	2040	3.70%	8.59	3.70%	2.28	3.70%	1.45	3.70%	17.08	3.70%	16.99
Stage Three Growth	2041	3.70%	8.91	3.70%	2.36	3.70%	1.50	3.70%	17.71	3.70%	17.62
Stage Three Growth	2042	3.70%	9.24	3.70%	2.45	3.70%	1.56	3.70%	18.37	3.70%	18.28

Stage Three Growth	2043	3.70%	9.58	3.70%	2.54	3.70%	1.62	3.70%	19.05	3.70%	18.95
Stage Three Growth	2044	3.70%	9.93	3.70%	2.63	3.70%	1.68	3.70%	19.75	3.70%	19.65
Stage Three Growth	2045	3.70%	10.30	3.70%	2.73	3.70%	1.74	3.70%	20.48	3.70%	20.38
Stage Three Growth	2046	3.70%	10.68	3.70%	2.83	3.70%	1.80	3.70%	21.24	3.70%	21.13
Stage Three Growth	2047	3.70%	11.08	3.70%	2.94	3.70%	1.87	3.70%	22.03	3.70%	21.92
Stage Three Growth	2048	3.70%	11.49	3.70%	3.05	3.70%	1.94	3.70%	22.84	3.70%	22.73
Stage Three Growth	2049	3.70%	11.91	3.70%	3.16	3.70%	2.01	3.70%	23.69	3.70%	23.57
Stage Three Growth	2050	3.70%	12.35	3.70%	3.28	3.70%	2.09	3.70%	24.56	3.70%	24.44
Stage Three Growth	2051	3.70%	12.81	3.70%	3.40	3.70%	2.16	3.70%	25.47	3.70%	25.34
Reversion	2052		94.69		103.74		32.61		178.31		115.14
Implied Cost of Equity			**4.89%**		**3.04%**		**3.84%**		**4.98%**		**5.74%**

Mean	4.50%
Median	4.89%
Selected Three-Stage DGM Cost of Equity	**4.70%**

Reversion Calculation:

A. Last period's exp. dividends with growth	13.28	3.52	2.24	26.42	26.28
B. Cost of equity, less long-term real growth	3.19%	1.34%	2.14%	3.28%	4.04%
C. A / B	416.1	262.6	104.9	804.9	650.1
D. C / ((1 + Cost of Equity) ^ Last Period + 1)	94.69	103.74	32.61	178.31	115.14

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Canadian National Railway	20.7
Canadian Pacific Railway	25.2
CSX Corporation	15.7
Norfolk Southern Corp	17.0
Union Pacific Corp	17.9
Mean	19.30
Median	17.90
Selected Price to Earnings (P/E) Ratio	17.90
Indicated Equity Component of the Direct Rate	**5.59%**

We placed the most reliance on the median price to earnings ratio.

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Beta Analysis

Company	Beta
Canadian National Railway	0.90
Canadian Pacific Railway	1.00
CSX Corporation	1.05
Norfolk Southern Corp	1.05
Union Pacific Corp	1.05
Beta Mean	1.01
Beta Median	1.05
Unlevered Relevered Beta Mean^	1.02
Indicated Beta	**1.05**

We considered the mean, median, and unlevered/relevered mean. We placed more reliance on the median when selecting the indicated beta.

Notes:

^See the Unlevering Relevering Beta page for the calculation

Unlevering/Relevering Betas

Unlevering of Betas					
Company	*Value Line* **Actual Income Tax Rate**	*From Capital Structure Page* **Actual Debt in Capital Structure**	*From Capital Structure Page* **Actual Equity in Capital Structure**	*Value Line* **Levered Beta (Published)**	*Formula* **Unlevered Beta**
Canadian National Railway	22.00%	10.19%	89.81%	0.90	0.83
Canadian Pacific Railway	21.00%	16.28%	83.72%	1.00	0.87
CSX Corporation	24.00%	22.14%	77.86%	1.05	0.86
Norfolk Southern Corp	23.00%	20.96%	79.04%	1.05	0.87
Union Pacific Corp	24.00%	20.83%	79.17%	1.05	0.88
			Average	**1.01**	

Relevering of Betas				
Company	*Formula* **Composite Income Tax Rate**	*From Capital Structure Page* **Industry Debt in Capital Structure**	*From Capital Structure Page* **Industry Equity in Capital Structure**	*Formula* **Levered Beta**
Canadian National Railway	22.80%	19.00%	81.00%	0.98
Canadian Pacific Railway	22.80%	19.00%	81.00%	1.03
CSX Corporation	22.80%	19.00%	81.00%	1.02
Norfolk Southern Corp	22.80%	19.00%	81.00%	1.03
Union Pacific Corp	22.80%	19.00%	81.00%	1.04
			Average	**1.02**

Notes:

Uses the Hamada Formula

Unlevered Beta = Levered Beta / [1 + (1 - Tax Rate) x (Debt/Equity))], using company-specific components
Using company-specific components

Relevered Beta = Unlevered Beta [1 + (1 - Tax Rate) x (Debt/Equity))]
Using industry components for Tax Rate, Debt, and Equity

Calculation of Market to Book Ratios for the Railroad Market Segment

- December 31, 2022 calendar year information for the January 2, 2023 Assessment
- A market to book ratio over one would be an indication of no obsolescence.
- Market value estimates for common equity from Value Line. Market and book value estimates for long-term debt and book value estimates for common equity from 10-K.

Market to Book Ratio for Equity

Company	Market Value of Common Equity from Value Line	Book Value of Common Equity from 10-K	Market to Book Ratio	Source
Canadian National Railway*	83,047,680,000	15,787,807,200	5.26	Canadian National Railway. 2022 Annual Report, p. 35
Canadian Pacific Railway**	71,586,900,000	28,709,533,800	2.49	Canadian Pacific Railway. 2022 Annual Report, p. 91
CSX Corporation	62,916,000,000	12,625,000,000	4.98	CSX Corporation. 2022 10-K, p. 50
Norfolk Southern Corp	54,551,694,009	12,733,000,000	4.28	Norfolk Southern. 2021 10-K, p. K41
Union Pacific Corp	120,685,397,040	12,163,000,000	9.92	Union Pacific Corporation. 2022 10-K, p. 45
		Average	**5.39**	

Market to Book Ratio for Debt

Company	Market Value of Long-Term Debt from 10-K	Book Value of Long-Term Debt from 10-K	Market to Book Ratio	Source
Canadian National Railway	14,137,000,000	15,419,000,000	0.92	Canadian National Railway. 2022 Annual Report, p. 115
Canadian Pacific Railway	17,720,000,000	19,651,000,000	0.90	Canadian Pacific Railway. 2022 Annual Report, p. 114
CSX Corporation	16,135,000,000	18,047,000,000	0.89	CSX Corporation. 2022 10-K, p. 100
Norfolk Southern Corp	13,846,000,000	15,082,000,000	0.92	Norfolk Southern. 2022 10-K, p. K51
Union Pacific Corp	28,100,000,000	33,300,000,000	0.84	Union Pacific Corporation. 2022 10-K, p. 66
		Average	**0.89**	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	81.00%	5.39	4.37
Long-term Debt	19.00%	0.89	0.17
			4.54

Note:

*Convert Canadian National Railway's Book Value of Common Equity from Canadian Dollars to U.S. Dollars. Canadian National Railway's Annual Report is in CAD. The Value Line Report is in USD.

21,384,000,000	CAD
0.7383	Exchange Rate
15,787,807,200	USD

**Convert Canadian Pacific Railway's Book Value of Common Equity from Canadian Dollars to U.S. Dollars. Canadian Pacific Railway's Annual Report is in CAD. The Value Line tear sheet is in USD.

38,886,000,000	CAD
0.7383	Exchange Rate
28,709,533,800	USD

Appendix F - Three Stage Ex Ante Calculation

Three Stage Ex Ante Equity Risk Premium Calculation

Implied Market Rate Range =	**7.01%**	**to**	**7.88%**

Mean	7.44%
Median	7.44%
Market Rate Used	**7.44%**
(Less) Risk-Free Rate	4.06%
Equals Equity Risk Premium	**3.38%**

Assumptions:

Stages	**Years**		**Growth**	**Model 1**					**Model 2**			
1st Stage	1-5 years		Constant @:	11.06%			*		13.55%			*
												Linear
2nd Stage	6-15 years		Linear from:	10.54%	to	5.30%		OR	10.54%	to	3.76%	*from*
				Real Growth**					Inflation^			*1st*
3rd Stage	15 years -perpetuity	GDP Growth:	Real and Inflation	1.50%		2.80%		+	2.26%	to	2.50%	*Stage*
												to 3rd
		GDP Growth^^:	Real + Inflation	5.30%				TO	3.76%			*Stage*

	Model 1	**Model 2**
Implied Market Return	7.88%	7.01%

Year	**Model 1**				**Model 2**			
	Starting Industry			S & P 500	Starting Industry			S & P 500
2022	Start Price†		$	(3,853.29)	Start Price†		$	(3,853.29)
2023	Expected Dividends††		$	69.10	Expected Dividends††		$	69.10
2024	1st Stage Growth Rates	11.06%	$	76.74	1st Stage Growth Rates	13.55%	$	78.46
2025		11.06%	$	85.23		13.55%	$	89.09
2026		11.06%	$	94.66		13.55%	$	101.17
2027		11.06%	$	105.13		13.55%	$	114.88
2028	2nd Stage Growth Rates	10.54%	$	116.20	2nd Stage Growth Rates	10.54%	$	126.98
2029		10.01%	$	127.84		9.86%	$	139.50
2030		9.49%	$	139.97		9.18%	$	152.30
2031		8.97%	$	152.52		8.50%	$	165.26
2032		8.44%	$	165.39		7.83%	$	178.19
2033		7.92%	$	178.49		7.15%	$	190.93
2034		7.39%	$	191.69		6.47%	$	203.28
2035		6.87%	$	204.86		5.79%	$	215.06
2036		6.35%	$	217.86		5.12%	$	226.06
2037		5.82%	$	230.55		4.44%	$	236.09
2038		5.30%	$	242.77		3.76%	$	244.96
2039		5.30%	$	255.63		3.76%	$	254.18
2040		5.30%	$	269.18		3.76%	$	263.73
2041		5.30%	$	283.45		3.76%	$	273.65
2042		5.30%	$	298.47		3.76%	$	283.94
2043		5.30%	$	314.29		3.76%	$	294.61
2044		5.30%	$	330.95		3.76%	$	305.69
2045		5.30%	$	348.49		3.76%	$	317.19
2046		5.30%	$	366.96		3.76%	$	329.11
2047		5.30%	$	386.40		3.76%	$	341.49
2048		5.30%	$	406.88		3.76%	$	354.33
2049		5.30%	$	428.45		3.76%	$	367.65
2050		5.30%	$	451.16		3.76%	$	381.47
2051		5.30%	$	475.07		3.76%	$	395.82
2052		5.30%	$	500.25		3.76%	$	410.70
2053		5.30%	$	526.76		3.76%	$	426.14
2054		5.30%	$	554.68		3.76%	$	442.16
2055		5.30%	$	584.08		3.76%	$	458.79
2056		5.30%	$	615.03		3.76%	$	476.04
2057		5.30%	$	647.63		3.76%	$	493.94
2058		5.30%	$	681.95		3.76%	$	512.51
2059		5.30%	$	718.10		3.76%	$	531.78
2060		5.30%	$	756.16		3.76%	$	551.78
2061		5.30%	$	796.23		3.76%	$	572.52
2062		5.30%	$	838.43		3.76%	$	594.05
2063		5.30%	$	882.87		3.76%	$	616.39
2064		5.30%	$	929.66		3.76%	$	639.56
2065		5.30%	$	978.93		3.76%	$	663.61
2066		5.30%	$	1,030.82		3.76%	$	688.56
2067		5.30%	$	1,085.45		3.76%	$	714.45
2068		5.30%	$	1,142.98		3.76%	$	741.31
2069		5.30%	$	1,203.56		3.76%	$	769.19
2070		5.30%	$	1,267.35		3.76%	$	798.11
2071		5.30%	$	1,334.51		3.76%	$	828.12
2072		5.30%	$	1,405.24		3.76%	$	859.26
2073		5.30%	$	1,479.72		3.76%	$	891.56

2074		5.30%	$	1,558.15		3.76%	$	925.09
2075		5.30%	$	1,640.73		3.76%	$	959.87
2076		5.30%	$	1,727.69		3.76%	$	995.96
2077		5.30%	$	1,819.25		3.76%	$	1,033.41
2078		5.30%	$	1,915.68		3.76%	$	1,072.27
2079		5.30%	$	2,017.21		3.76%	$	1,112.58
2080		5.30%	$	2,124.12		3.76%	$	1,154.42
2081		5.30%	$	2,236.70		3.76%	$	1,197.82
2082		5.30%	$	2,355.24		3.76%	$	1,242.86
2083		5.30%	$	2,480.07		3.76%	$	1,289.59
2084		5.30%	$	2,611.51		3.76%	$	1,338.08
2085		5.30%	$	2,749.92		3.76%	$	1,388.39
2086		5.30%	$	2,895.67		3.76%	$	1,440.60
2087	3rd Stage Growth Rates	5.30%	$	3,049.14	3rd Stage Growth Rates	3.76%	$	1,494.76
2088		5.30%	$	3,210.74		3.76%	$	1,550.96
2089		5.30%	$	3,380.91		3.76%	$	1,609.28
2090		5.30%	$	3,560.10		3.76%	$	1,669.79
2091		5.30%	$	3,748.79		3.76%	$	1,732.57
2092		5.30%	$	3,947.47		3.76%	$	1,797.72
2093		5.30%	$	4,156.69		3.76%	$	1,865.31
2094		5.30%	$	4,376.99		3.76%	$	1,935.45
2095		5.30%	$	4,608.97		3.76%	$	2,008.22
2096		5.30%	$	4,853.25		3.76%	$	2,083.73
2097		5.30%	$	5,110.47		3.76%	$	2,162.08
2098		5.30%	$	5,381.33		3.76%	$	2,243.37
2099		5.30%	$	5,666.54		3.76%	$	2,327.72
2100		5.30%	$	5,966.86		3.76%	$	2,415.25
2101		5.30%	$	6,283.11		3.76%	$	2,506.06
2102		5.30%	$	6,616.11		3.76%	$	2,600.29
2103		5.30%	$	6,966.77		3.76%	$	2,698.06
2104		5.30%	$	7,336.00		3.76%	$	2,799.51
2105		5.30%	$	7,724.81		3.76%	$	2,904.77
2106		5.30%	$	8,134.23		3.76%	$	3,013.99
2107		5.30%	$	8,565.34		3.76%	$	3,127.31
2108		5.30%	$	9,019.30		3.76%	$	3,244.90
2109		5.30%	$	9,497.33		3.76%	$	3,366.91
2110		5.30%	$	10,000.69		3.76%	$	3,493.50
2111		5.30%	$	10,530.72		3.76%	$	3,624.86
2112		5.30%	$	11,088.85		3.76%	$	3,761.15
2113		5.30%	$	11,676.56		3.76%	$	3,902.57
2114		5.30%	$	12,295.42		3.76%	$	4,049.31
2115		5.30%	$	12,947.07		3.76%	$	4,201.56
2116		5.30%	$	13,633.27		3.76%	$	4,359.54
2117		5.30%	$	14,355.83		3.76%	$	4,523.46
2118		5.30%	$	15,116.69		3.76%	$	4,693.54
2119		5.30%	$	15,917.88		3.76%	$	4,870.02
2120		5.30%	$	16,761.52		3.76%	$	5,053.13
2121		5.30%	$	17,649.88		3.76%	$	5,243.13
2122		5.30%	$	18,585.33		3.76%	$	5,440.27
2123		5.30%	$	19,570.35		3.76%	$	5,644.83
2124		5.30%	$	20,607.58		3.76%	$	5,857.07
2125		5.30%	$	21,699.78		3.76%	$	6,077.30
2126		5.30%	$	22,849.87		3.76%	$	6,305.80
2127		5.30%	$	24,060.91		3.76%	$	6,542.90
2128		5.30%	$	25,336.14		3.76%	$	6,788.92
2129		5.30%	$	26,678.96		3.76%	$	7,044.18
2130		5.30%	$	28,092.94		3.76%	$	7,309.04
2131		5.30%	$	29,581.87		3.76%	$	7,583.86
2132		5.30%	$	31,149.71		3.76%	$	7,869.01
2133		5.30%	$	32,800.64		3.76%	$	8,164.89
2134		5.30%	$	34,539.07		3.76%	$	8,471.89
2135		5.30%	$	36,369.65		3.76%	$	8,790.43
2136		5.30%	$	38,297.24		3.76%	$	9,120.95
2137		5.30%	$	40,326.99		3.76%	$	9,463.90
2138		Reversion``	$	89.60		Reversion``	$	62.51
	Implied Market Return			**7.88%**	**Implied Market Return**			**7.01%**

*S&P 500 Earnings and Estimate Report dated 2/6/2023, http://us.spindices.com/indices/equity/sp-500

**First Quarter 2023 Survey of Professional Forecasters - Philadelphia Federal Reserve Release Date 2/10/2023

^Inflation Range = Federal Reserve, Treasuries Inflation - Indexed

^^GDP Growth = Real growth + Inflation

† Start Price is the S&P 500 Index adjusted close on 1/3/2023, downloaded from Yahoo! Finance

††Expected Dividends downloaded from http://www.cmegroup.com/trading/equity-index/us-index/sp-500-quarterly-dividend-index.html, 2/22/2023

``Reversion Calculation:

A.	Last period's expected dividends, growth applied	42,464.32	9,819.74
B.	Implied Market Risk Premium Less Long-Term Growth	6.18%	5.31%
C.	A / B	687,596.7	184,992.0
D.	C / ((1 + Implied Market Risk Premium) ^ Last Period +1)	89.60	62.51

Appendix G – Guideline Company Selection

Section Contents

Note: The information below is verbatim from Value Line and the company's website.

Market Segment: Electric

Companies Included in the Electric Market Segment

ALLETE Inc.

Company Summary from Value Line:

ALLETE, Inc. is the parent of Minnesota Power, which supplies electricity to 146,000 customers in northeastern MN, & Superior Water, Light & Power in northwestern WI. Electric rev. breakdown: taconite mining/processing, 26%; paper/wood products, 9%; other industrial, 8%; residential, 13%; commercial, 13%; wholesale, 14%; other, 16%. ALLETE Clean Energy (ACE) owns renewable energy projects. Acq'd U.S. Water Services 2/15; sold it 3/19. Generating sources: coal, 28%; wind, 10%; other, 4%; purchased, 58%. Fuel costs: 40% of revs. '21 deprec. rate: 3.2%. Has 1,400 employees.

Additional Company Information from Website:

ALLETE (NYSE: ALE) is well-positioned as a reliable provider of competitively-priced energy in the upper Midwest, and invests in transmission infrastructure and other energy-centric businesses. ALLETE's Minnesota Power electric utility serves 145,000 residents, 15 municipalities and some of the nation's largest industrial customers. Other businesses include ALLETE Clean Energy, a developer of energy projects with limited environmental impact; Superior Water, Light and Power in Superior, Wisconsin; and ALLETE Renewable Resources, which operates and maintains wind generation facilities in North Dakota; and New Energy Equity, a leading developer of distributed solar energy projects.[1]

Why was the company included?

ALLETE Inc. is the parent company of Minnesota Power, which supplies electricity to customers. This company is similar to (and is one of) the electric companies that we are responsible for valuing. The company provides energy in the upper Midwest.

Alliant Energy Corp.

Company Summary from Value Line:

Alliant Energy Corporation (formerly Interstate Energy) is a holding company formed through the merger of WPL Holdings, IES Industries, and Interstate Power. Supplies electricity to 985,000 customers and gas to 425,000 customers in Wisconsin, Iowa, and Minnesota. Electric revenue by state: WI, 43%; IA, 56%; MN, 1%. Electric revenue: residential, 36%; commercial, 25%; industrial, 29%; wholesale, 8%; other, 2%. Generating sources: coal, 32%; gas, 32%; wind, 16%; other, 1%; purchased, 19%. Fuel costs: 25% of revs. '21 reported depreciation rates: 2.9%-6.1%. Has 3,300 employees.

Additional Company Information from Website:

At Alliant Energy, our purpose is to serve customers and build strong communities. We are focused on powering beyond the market challenges of today, while powering what's next in energy. Alliant Energy is a component of NASDAQ. Through its utility subsidiaries Interstate Power and Light Company and Wisconsin Power and Light Company, Alliant Energy provides regulated electric and natural gas service

[1] http://www.allete.com/OurBusinesses, accessed 2/3/2023

to approximately 985,000 electric and approximately 425,000 natural gas customers in the Midwest. Our corporate headquarters is located in Madison, Wisconsin. An additional general office is in Cedar Rapids, Iowa. We provide inclusive work environments, and are proud to be an Equal Opportunity Employer. We recognize and respect diversity. We appreciate the differences and perspectives a diverse culture brings to the work environment, the company and our customers.[2]

Why was the company included?
Alliant Energy Corp. supplies electricity, gas and other services to customers. Electric customers represent 70% of customers and gas customers represent 30% of customers. This company is similar to (and is one of) the electric companies that we are responsible for valuing. The company engages in providing energy in the upper Midwest.

Ameren Corporation
Company Summary from Value Line:
Ameren Corporation is a holding company formed through the merger of Union Electric and CIPSCO. Has 1.2 million electric and 127,000 gas customers in Missouri; 1.2 million electric and 813,000 gas customers in Illinois. Discontinued nonregulated power-generation operation in ’13. Electric revenue breakdown: residential, 49%; commercial, 34%; industrial, 8%; other, 9%. Generating sources: coal, 73%; nuclear, 11%; hydro & other, 9%; purchased, 7%. Fuel costs: 25% of revenues. ’21 reported deprec. rates: 3%-4%. Has 9,100 employees.

Additional Company Information from Website?
Ameren Corporation is a Fortune 500 company that trades on the New York Stock Exchange under the symbol AEE. It is the parent company of Ameren Illinois, based in Collinsville, Ill., and Ameren Missouri in St. Louis. Ameren Transmission Company, also based in St. Louis, designs and builds regional transmission projects. Ameren was created by the combination of three Illinois utilities (CIPSCO Incorporated, CILCO Inc. and Illinois Power Company) and Union Electric Company of St. Louis. The name comes from combining the words American and Energy. Employing more than 9,000 personnel, Ameren powers the quality of life for 2.4 million electric customers and more than 900,000 natural gas customers across a 64,000-square-mile area. Ameren Missouri ranks as the largest electric power provider in Missouri, and Ameren Illinois ranks as Illinois' third largest natural gas distribution operation in total number of customers. Ameren companies generate a net capacity of nearly 10,200 megawatts of electricity and own more than 7,500 circuit miles of transmission lines. Ameren's rates are some of the lowest in the nation.[3]

Why was the company included?
Ameren Corporation provides electric and gas to customers. Electric customers represent 72% of customers and gas customers represent 28% of customers. This company is similar to the electric companies that we are responsible for valuing. The company engages in providing energy in the Midwest.

American Electric Power Company Inc.
Company Summary from Value Line:
American Electric Power Company Inc. (AEP), through 10 operating utilities, serves 5.5 million

[2] https://www.alliantenergy.com/AboutAlliantEnergy/WhoWeAre, accessed 2/3/2023
[3] https://www.ameren.com/company/about-ameren, accessed 2/3/2023

customers in Arkansas, Kentucky, Indiana, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia, & West Virginia. Has a transmission subsidiary. Electric revenue breakdown: residential, 43%; commercial, 23%; industrial, 18%; wholesale, 10%; other, 6%. Sold commercial barge operation in ‘15.

Generating sources not available. Fuel costs: 33% of revenues. ’21 reported depreciation rates (utility): 2.6%-12.5%. Has 16,700 employees.

Additional Company Information from Website:
As one of the largest electric energy companies in the U.S., we power millions of homes and businesses. We’re working together with our customers and communities to create the future of energy. We’re listening, going beyond customers’ expectations and developing innovative solutions to build a future that is boundless for us all. We’re continually energized by our team members, their passions, and their drive to make a difference in the communities we serve.[4]

Why was the company included?
American Electric Power Company Inc. provides electricity to customers. This company is similar to the electric companies that we are responsible for valuing. The company engages in providing energy in the Midwest.

Black Hills Corporation
Company Summary from Value Line:
Black Hills Corporation is a holding company for Black Hills Energy, which serves 218,000 electric customers in CO, SD, WY and MT, and 1.1 million gas customers in NE, IA, KS, CO, WY, and AR. Has coal mining sub. Acq’d utility ops. from Aquila 7/08; SourceGas 2/16. Discontinued gas marketing in ’11; gas & oil E&P in ’17. Electric rev. breakdown: residential, 31%; commercial, 34%; industrial, 19%; other, 16%. Generating sources: coal, 34%; gas, 25%; wind, 11%; purchased, 30%. Fuel costs: 38% of revs. ’21 deprec. rate: 3.1%. Has 2,900 employees.

Additional Company Information from Website:
Black Hills Corporation is a customer focused, growth-oriented utility company with a tradition of exemplary service and a vision to be the energy partner of choice. Based in Rapid City, South Dakota, the company serves over 1.28 million electric and natural gas utility customers in more than 800 communities in Arkansas, Colorado, Iowa, Kansas, Montana, Nebraska, South Dakota and Wyoming. Employees partner to produce results that improve life with energy.[5]

Why was the company included?
Black Hills Corporation provides electric and gas to customers. Electric customers represent 16% of customers and gas customers represent 84% of customers. This company is similar to the electric companies that we are responsible for valuing. The company engages in providing energy in the Midwest.

Also using this company as a guideline company for the Gas Distribution Market Segment. Over 80% of this company’s customers are gas distribution customers.

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[4] https://www.aep.com/about/, accessed 2/3/2023
[5] https://www.blackhillscorp.com/about, accessed 2/3/2023

CenterPoint Energy Inc.

Company Summary from Value Line:
CenterPoint Energy, Inc. is a holding company for Houston Electric, which serves 2.7 million customers in Houston and environs, Indiana Electric, which serves 150,000 customers, and gas utilities with 4.2 million customers in Texas, Minnesota, Louisiana, Mississippi, Indiana, and Ohio. Acquired Vectren 2/19. Sold nonutility operations in '20. Sold its stake in Energy Transfer LP in '21 and '22. Electric Revenue breakdown not available. Fuel costs: 28% of revenues. '21 depreciation rate: 3.9%. Has 8,900 employees.

Additional Company Information from Website:
Our vision to lead the nation in delivering energy, service and value drives our strategy and performance. We have an unwavering commitment to safely and reliably deliver electricity and natural gas to millions of people. Natural Gas. We sell and deliver natural gas to more than 4 million homes and businesses in six states: Indiana, Louisiana, Minnesota (including Minneapolis), Mississippi, Ohio, Oklahoma and Texas (including greater Houston area). We are investing in modernizing our natural gas infrastructure and are committed to eliminating cast-iron pipe in all our territories. Electric Transmission and Distribution and Power Generation. We maintain the wires, poles and electric infrastructure serving more than 2.8 million metered customers in the greater Houston area and in southwestern Indiana. We also own and operate nearly 1,300 megawatts of electric generation capacity in Indiana. We are committed to the reliable delivery of electricity generated from power plants and renewable energy resources to homes and businesses. CenterPoint Energy Home Service Plus®. For over 80 years, HSP has provided heating and cooling solutions for Minnesota homeowners. We proudly offer expert repair, along with service and maintenance plans, and professional sales for both gas and electric equipment. CenterPoint Energy and HomeServe. We have selected HomeServe, a trusted nationwide provider of emergency home repair programs, in our natural gas markets in Mississippi and Texas (including greater Houston area) to offer our customers service repair plans that help reduce the stress and expense from the unexpected.[6]

Why was the company included?
CenterPoint Energy Inc. provides electricity and gas to customers. Electric customers represent 39% of customers and gas customers represent 61% of customers. This company is similar to the electric companies that we are responsible for valuing.

We are also using this company as a guideline company for the Gas Distribution Market Segment because over 60% of their customers are gas customers.

CMS Energy Corporation

Company Summary from Value Line:
CMS Energy Corporation is a holding company for Consumers Energy, which supplies electricity and gas to lower Michigan (excluding Detroit). Has 1.9 million electric, 1.8 million gas customers. Has 1,234 megawatts of nonregulated generating capacity. Sold EnerBank in '21. Electric revenue breakdown: residential, 48%; commercial, 32%; industrial, 13%; other, 7%. Generating sources: coal, 31%; gas, 16%; renewables, 6%; purchased, 47%. Fuel costs: 42% of revenues. '21 reported deprec. rates: 3.9% electric, 2.9% gas, 9.4% other. Has 8,500 fulltime employees.

[6] https://www.centerpointenergy.com/en-us/corporate/about-us/company-overview, accessed on 2/2/2023

Additional Company Information from Website:
CMS Energy Corporation's business strategy is focused primarily on its principal subsidiary, Consumers Energy Company, Michigan's largest electric and natural gas utility, serving 6.8 million of the state's 10 million residents. With our subsidiary, NorthStar Clean Energy, we are also engaged in independent power generation in several states. Consumers Energy is one of the nation's largest combination electric and natural gas utilities. NorthStar Clean Energy helps clients reach ambitious business and sustainability goals with a wide range of custom energy and carbon reduction products. The company also owns and operates independent power generating plants, natural gas assets and an energy marketing group for the non-utility segment of CMS Energy's business.[7]

Why was the company included?
CMS Energy Corporation provides electricity and gas to customers. Electric customers represent 51% of customers and gas customers represent 49% of customers. This company is similar to the electric companies that we are responsible for valuing. The company serves an electric service territory in the Midwest.

We are also using this company as a guideline company for the Gas Distribution Market Segment because over 49% of their customers are gas distribution customers.

DTE Energy Company
Company Summary from Value Line:
DTE Energy Company is a holding company for DTE Electric (formerly Detroit Edison), which supplies electricity in Detroit and a 7,600-square-mile area in southeastern Michigan, and DTE Gas (formerly Michigan Consolidated Gas). Customers: 2.2 mill. electric, 1.3 mill. gas. Has various nonutility operations. Electric revenue breakdown: residential, 50%; commercial, 33%; industrial, 11%; other, 6%. Generating sources: coal, 67%; nuclear, 17%; gas, 1%; purchased, 15%. Fuel costs: 62% of revenues. '21 reported deprec. rates: 4.2% electric, 2.9% gas. Has 10,600 employees.

Additional Company Information from Website:
DTE Energy (NYSE: DTE) is a Detroit-based diversified energy company involved in the development and management of energy-related businesses and services nationwide. Its operating units include an electric utility serving 2.3 million customers in Southeastern Michigan and a natural gas company serving 1.3 million customers in Michigan. The DTE portfolio also includes non-utility businesses focused on industrial energy services, renewable natural gas, and energy marketing and trading. As one of Michigan's leading corporate citizens, DTE Energy is a force for growth and prosperity in the 450 Michigan communities it serves in a variety of ways, including philanthropy, volunteerism and economic progress. Information about DTE Energy is available on the DTE Energy home page, Twitter account and Facebook page. DTE Energy has more than 10,000 employees in utility and non-utility subsidiaries involved in a wide range of energy-related businesses. The company's growing non-utility businesses are built around the strengths, skills and assets of DTE Energy's electric and gas utilities.[8]

Why was the company included?
DTE Energy Company provides electricity and gas to customers. Electric customers represent 63% of

[7] https://www.cmsenergy.com/about-cms-energy/default.aspx, accessed 2/2/2023
[8] https://newlook.dteenergy.com/wps/wcm/connect/dte-web/home/about-dte/common/about-dte/about-dte, accessed 2/2/2023

customers and gas customers represent 37% of customers. This company is similar to the electric companies that we are responsible for valuing. The company serves an electric service territory in the Midwest.

Evergy Inc.

Company Summary from Value Line:

Evergy, Inc. was formed through the merger of Great Plains Energy and Westar Energy in June of 2018. Through its subsidiaries (now doing business under the Evergy name), provides electric service to 1.6 million customers in Kansas and Missouri, including the greater Kansas City area. Electric revenue breakdown: residential, 34%; commercial, 30%; industrial, 11%; wholesale, 13%; other, 12%. Generating sources: coal, 54%; nuclear, 17%; purchased, 29%. Fuel costs: 28% of revenues. ’21 reported deprec. rate: 3%. Has 4,900 employees.

Additional Company Information from Website:

Evergy Inc. (NYSE: EVRG), through its operating subsidiaries Evergy Kansas Central, Evergy Metro, and Evergy Missouri West, provides clean, safe, reliable energy to 1.7 million customers in Kansas and Missouri. By combining Great Plains Energy and Westar Energy in 2018, a leading energy company was created that provides value to shareholders and a stronger company for customers. As a combined company, our mission is to empower a better future. Today, half of the power supplied by Evergy comes from clean sources, creating more reliable energy with less impact to the environment. And as the industry evolves, we will continue to innovate and adopt new technologies that give our customers better ways to manage their energy use.[9]

Why was the company included?

This company was created through the merger of Great Plains Energy Incorporated and Westar Energy, Inc. in 2018. This company is located in the Electric Utility (Central) Value Line Industry. This company is similar to the electric companies that we are responsible for valuing. The company serves an electric service territory in the Midwest.

NorthWestern Corporation

Company Summary from Value Line:

NorthWestern Corporation (doing business as NorthWestern Energy) supplies electricity & gas in the Upper Midwest and Northwest, serving 456,000 electric customers in Montana and South Dakota and 298,000 gas customers in Montana (85% of gross margin), South Dakota (14%), and Nebraska (1%). Electric revenue breakdown: residential, 43%; commercial, 49%; industrial, 4%; other, 4%. Generating sources: coal, 28%; hydro, 27%; wind, 6%; other, 4%; purchased, 35%. Fuel costs: 31% of revenues. ’21 reported deprec. rate: 2.8%. Has 1,500 employees.

Additional Company Information from Website:

For more than 100 years, NorthWestern Energy has been committed to delivering safe, reliable and innovative energy solutions. We serve gas and electric to customers in the western two-thirds of Montana and eastern South Dakota. We also have gas service in Nebraska, and serve electricity to Yellowstone National Park. We own and operate a diverse generation fleet of wind, water, natural gas

[9] https://investors.evergy.com/about-evergy/company-information, accessed 2/2/2023

and coal-fired resources and the high-voltage electric transmission system and distribution system. We also own and operate natural gas production, transmission and distribution systems. NorthWestern Energy has provided reliable and affordable electricity and natural gas to customers in Montana, South Dakota and Nebraska for more than 100 years.[10]

Why was the company included?
NorthWestern Corporation provides electricity and gas to customers. Electric customers represent 60% of customers and gas customers represent 40% of customers. This company is similar to the electric companies that we are responsible for valuing. This company operates in the Midwest.

OGE Energy Corporation
Company Summary from Value Line:
OGE Energy Corp. is a holding company for Oklahoma Gas and Electric Company (OG&E), which supplies electricity to 879,000 customers in Oklahoma (84% of electric revenues) and western Arkansas (8%); wholesale is (8%). Owns 3% of Energy Transfer's limited partnership units. Electric revenue breakdown: residential, 44%; commercial, 25%; industrial, 11%; oilfield, 10%; other, 10%. Generating sources: gas, 25%; coal, 21%; wind, 6%; purchased, 48%. Fuel costs: 58% of revenues. '21 reported depreciation rate (utility): 2.6%. Has 2,200 employees.

Additional Company Information from Website:
We not only serve more than 870,000 electric customers, we also power communities in other ways. We're the largest ad valorem taxpayer in Oklahoma, contributing approximately $80 million annually, which funds public education, libraries and career techs. With about 7,122 megawatts of capacity, our generation portfolio represents a balanced approach to generating electricity through a diversity of fuel types — 66 percent natural gas, 26 percent coal and 8 percent renewable energy (solar and wind). This fuel diversity allows us to maintain system reliability and affordable rates for the people we serve. We continuously seek opportunities to bring value to our customers and investors through the use of new technology. We were the first public utility in our area to install a Smart Grid, so all customers can participate in the management of their energy use and costs.[11]

Why was the company included?
OGE Energy Corporation provides electricity to customers. This company is similar to the electric companies that we are responsible for valuing. The company serves an electric service territory in Oklahoma and Arkansas.

Otter Tail Corporation
Company Summary from Value Line:
Otter Tail Corporation is the parent of Otter Tail Power Company, which supplies electricity to 133,000 customers in Minnesota (52% of retail electric revenues), North Dakota (38%), and South Dakota (10%).

[10] https://www.northwesternenergy.com/about-us/our-company, accessed 2/2/2023
[11] https://www.oge.com/wps/portal/ord/who-we-are/what-we-do/!ut/p/z1/jZBPb4JAEMU_DUeYESva3kibstpGY1Iq3Uuz2i1gVoYMi8Rv7_rn0ENLnTm9l9-8yQxIyEBWal_mypZUKeP0h4w-xWISiVmCi2R-P8bl-1Q8D6YCk5cIVmcgFE9X4C0d4HLo-vFuFCKGIG-Zxz8qxtvmewDZH78CeUb6LvgvYwYyN7S-vCuu1sNJDpL1t2bNQcvOLqytmwcPPey6LqBcBxvaOVE3HtbEVhkPib-cU5DfaV-xdkbL_qY1tj2Jomws8eG3DQU1FrIfwVDv0jTD7cjsX-Mj0NT0_A!!/dz/d5/L2dJQSEvUUt3QS80TmxFL1o2XzJIRDZISkcwTzhWQUQwUTM2Nk9JOVAyR0c2/, accessed 2/3/2023

Electric rev. breakdown: residential, 32%; commercial & farms, 36%; industrial, 30%; other, 2%. Generating sources: coal, 38%; wind & other, 18%; purchased, 44%. Fuel costs: 10% of revenues. Also has operations in manufacturing and plastics (62% of ’21 operating income). ’21 deprec. rate: 2.9%. Has 2,500 employees.

Additional Company Information from Website:
Our strategy is to continue to grow our largest business, the regulated electric utility, which will lower our overall risk, create a more predictable earnings stream, improve our credit quality, and preserve our ability to fund the dividend. Over time, we expect the electric utility business will provide approximately 70% of our overall earnings. We expect our manufacturing and plastic pipe businesses will provide 30% of our earnings and will continue to be a fundamental part of our strategy. Reliable utility performance along with rate base investment opportunities over the next five years will provide us with a strong base of revenues, earnings, and cash flows. We also look to our manufacturing and plastic pipe companies to provide organic growth. Organic, internal growth comes from new products and services, market expansion, and increased efficiencies. We expect much of our growth in these businesses in the next few years will come from utilizing existing plant capacity from capital investments made in previous years. We will also evaluate opportunities to allocate capital to potential acquisitions in our Manufacturing and Plastics segments. We are a committed long-term owner and therefore we do not acquire companies in pursuit of short-term gains. However, we will divest operating companies that no longer fit into our strategy and risk profile over the long term. In evaluating our portfolio of operating companies, we look for the following characteristics: A threshold level of net earnings and a return on invested capital in excess of our weighted average cost of capital. A strategic differentiation from competitors and sustainable cost advantage. Operates within a stable and growing industry and is able to quickly adapt to changing economic cycles. A strong management team committed to operational excellence.[12]

Why was the company included?
Otter Tail Corporation provides electricity to customers. This company is similar to (and is one of) the electric companies that we are responsible for valuing. The company serves an electric service territory in the Midwest.

WEC Energy Group
Company Summary from Value Line:
WEC Energy Group, Inc. (formerly Wisconsin Energy) is a holding company for utilities that provide electric, gas & steam service in WI & gas service in IL, MN, & MI. Customers: 1.6 mill. elec., 2.9 mill. gas. Acq’d Integrys Energy 6/15. Sold Point Beach nuclear plant in ’07. Electric revenue breakdown: residential, 39%; small commercial & industrial, 32%; large commercial & industrial, 21%; other, 8%. Generating sources: coal, 36%; gas, 28%; renewables, 5%; purchased, 31%. Fuel costs: 40% of revenues. ’21 reported deprec. rates: 2.4%-3.1%. Has 6,900 employees.

Additional Company Information from Website:
We are one of the nation’s largest electric generation and distribution and natural gas delivery holding companies, with the operational expertise and financial resources to serve the Midwest’s energy needs safely, reliably and responsibly. Our subsidiaries focus on reliable service, customer satisfaction and

[12] https://www.ottertail.com/investors/corporate-profile/default.aspx, accessed 2/3/2023

shareholder value. Together, we provide energy services to more than 4.6 million customers in Wisconsin, Illinois, Michigan and Minnesota. Our combined assets allow operating efficiencies across 71,000 miles of electric distribution lines, 51,400 miles of natural gas distribution and transmission lines, and 7,700 megawatts of reliable power plant capacity. Our family of companies is committed to delivering world-class reliability and the very best customer care anywhere. Customers are the heart of our business, and we work every day to help grow and support communities where we provide vital energy services. As a Fortune 500 company, we value and develop our employees who are making a difference in a mission that matters.[13]

Why was the company included?
WEC Energy Group provides electricity and gas to customers. Electric customers represent 36% of customers and gas customers represent 64% of customers. This company is similar to the electric companies that we are is responsible for valuing. The company serves an electric service territory in the Midwest.

We are also using this company as a guideline company for the Gas Distribution Market Segment because over 60% of their customers are gas distribution customers.

Xcel Energy Inc.
Company Summary from Value Line:
Xcel Energy Inc. is the parent of Northern States Power (NSP), which supplies electricity to MN, WI, ND, SD & MI & gas to MN, WI, ND & MI; Public Service Company of Colorado (PSCo), which supplies electricity & gas to CO; & Southwestern Public Service Company (SPS), which supplies electricity to TX & NM. Customers: 3.7 mill. electric, 2.1 mill. gas. Electric revenue breakdown: residential, 31%; small comm'l & ind'l, 36%; large comm'l & ind'l, 18%; other, 15%. Generating sources not available. Fuel costs: 43% of revenues. '21 reported deprec. rate: 3.5%. Has 11,300 employees.

Additional Company Information from Website:
Xcel Energy is a major U.S. electricity and natural gas company, with operations in 8 Western and Midwestern states. Xcel Energy provides a comprehensive portfolio of energy-related products and services to 3.7 million electricity customers and 2.1 million natural gas customers through its regulated operating companies. Company headquarters are located in Minneapolis.[14]

Why was the company included?
Xcel Energy Inc. provides electricity and gas to customers. Electric customers represent 64% of customers and gas customers represent 36% of customers. This company is similar to (and is one of) the electric companies that we are is responsible for valuing. The company serves an electric service territory in the Midwest.

[13] https://www.wecenergygroup.com/about/aboutus.htm, accessed 2/3/2023
[14] https://investors.xcelenergy.com/corporate-information/corporate-profile/default.aspx, accessed 1/31/2023

Companies Not Included in the Electric Market Segment

AVANGRID Inc.

Company Summary from Value Line:
AVANGRID Inc. (formerly Iberdrola USA, Inc.), is a diversified energy and utility company that serves 2.3 million electric customers in New York, Connecticut, and Maine and 1 million gas customers in New York, Connecticut, Massachusetts & Maine. Has a nonregulated generating subsidiary focused on wind and solar power generation, with 8.5 gigawatts of capacity. The Renewables segment currently accounts for roughly one third of operating income. Fuel costs: 25% of revenues. '21 reported depr. rate (utility): 2.8%. Iberdrola owns 81.5% of stock. Has approximately 7,300 employees.

Additional Company Information from Website:
AVANGRID is a leading sustainable energy company transitioning America toward a clean and connected future headquartered in Orange, CT, and has a footprint in 24 states with $40 billion in assets. Our primary businesses are Avangrid Networks, which serves 3.3 million electric and natural gas customers in the Northeast, and Avangrid Renewables, the third-largest renewable energy company in the U.S. with a diverse onshore and offshore renewable energy portfolio. With more than 7,000 employees, AVANGRID has built a culture that blends diversity, equity and inclusion guided by the company's ESG+F framework and the UN Sustainable Development Goals. This has led to recognition by JUST Capital in 2021 and 2022 as one of America's best corporate citizens and second in utilities for our commitment to the environment and the communities we serve. AVANGRID has been named one of the World's Most Ethical Companies for three consecutive years by the Ethisphere Institute.[15]

AVANGRID (NYSE: AGR), a leading sustainable energy company, and PNM Resources (NYSE: PNM) announced October 21, 2020 that their respective boards have approved the merger of PNM Resources and AVANGRID.

- Strategic transaction furthers AVANGRID's growth in both clean energy distribution and transmission - expands leadership position in renewables
- All Cash Offer for PNM Resources shares at $50.30 per share – $8.3 billion enterprise value transaction
- Creates one of biggest clean energy companies in the US with ten regulated utilities in six states and third largest renewables company with operations in 24 states
- Majority shareholder IBERDROLA supports the transaction and has provided a funding commitment letter[16]

On October 21, 2020, PNM Resources announced an agreement to enter into a merger with AVANGRID. Under the terms of the proposed merger, PNM Resources shareholders will receive $50.30 in cash for each share of PNM Resources common stock held at closing.

During 2021, PNM Resources shareholders, five federal regulatory agencies and the Public Utility Commission of Texas approved the merger, leaving the New Mexico Public Regulation Commission

[15] https://www.avangrid.com/wps/portal/avangrid/aboutus, accessed on 1/31/2023
[16] https://www.avangrid.com/w/avangrid-and-pnm-resources-announce-merger-plans, accessed 2/7/2023

(NMPRC) as the only remaining approval necessary to close the merger. In December 2021, the NMPRC rejected a stipulation agreement reached between parties in support of the merger.

On January 3, 2022, PNM Resources and AVANGRID announced an amendment and extension of their merger agreement to April 20, 2023 and an appeal of the NMPRC decision with the New Mexico Supreme Court. There is no statutory deadline for the Court to act.[17]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota. Avangrid Renewables has wind facilities in Minnesota, however, Avangrid Networks (electric and gas utilities) are located in New York and New England. The company is recently involved in a merger plan with PNM Resources for an $8.3 billion enterprise value transaction. PNM Resources is in the Electric Utility (West) Value Line Industry.

Avista Corporation
Company Summary from Value Line:
Avista Corporation (formerly The Washington Water Power Company) supplies electricity & gas in eastern Washington & northern Idaho. Supplies electricity to part of Alaska & gas to part of Oregon. Customers: 423,000 electric, 372,000 gas. Acq'd Alaska Electric Light and Power 7/14. Sold Ecova energy-management sub. 6/14. Electric rev. breakdown: residential, 41%; commercial, 34%; industrial, 11%; wholesale, 9%; other, 5%. Generating sources: gas & coal, 30%; hydro, 29%; purch., 41%. Fuel costs: 35% of revs. '21 reported depr. rate (Avista Utilities): 3.5%. Has 1,900 employees.

Additional Company Information from Website:
We are an energy company involved in the production, transmission and distribution of energy as well as other energy-related businesses. Avista Utilities is our operating division, providing electricity to nearly 406,000 customers and natural gas to about 372,000 customers across 30,000 square miles and four northwestern states. Alaska Energy and Resources Company, an Avista subsidiary, provides retail electric service in the city and borough of Juneau through its subsidiary Alaska Electric Light and Power Company. Avista's history of innovations rooted in the renewable energy we've generated since our founding in 1889.[18]

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Consolidated Edison Inc.
Company Summary from Value Line:
Consolidated Edison, Inc. (ConEd) is a holding company for Consolidated Edison Company of New York (CECONY), which sells electricity, gas, and steam in most of NY City and Westchester County. ConEd also owns Orange and Rockland Utilities (O&R), which operates in New York and New Jersey.

[17] https://www.pnmresources.com/investors/strategic-merger-transaction.aspx, accessed 2/7/2023
[18] https://investor.avistacorp.com/, accessed 1/31/2023

ConEd has 3.7 mill. electric, 1.2 mill. gas customers. It also pursues competitive energy opportunities through three wholly owned subsidiaries. It entered into midstream gas joint venture 6/16; sold it 7/21. Purchases most of its power. Fuel costs: 20% of revenues. '21 reported deprec. rates: 3.1%- 3.5%. Employs 13,900.

Additional Company Information from Website:
We operate one of the world's largest energy delivery systems. Founded in 1823 as the New York Gas Light company, our electric, gas, and steam service now provides energy for the 10 million people who live in New York City and Westchester County. We're constantly looking toward the future and exploring ways to innovate and take advantage of developing technology. But, more than anything, we're listening to you and working hard to give you cleaner, more efficient energy choices, and more control over when and how you use your power.[19]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Dominion Energy Inc.
Company Summary from Value Line:
Dominion Energy, Inc. (formerly Dominion Resources) is a holding company for Virginia Power, North Carolina Power, & South Carolina E&G, which serve 3.5 mill. customers in VA, SC, & NC. Serves 3.5 mill. gas customers in OH, WV, UT, SC, & NC. Other ops. incl. independent power production. Acq'd Questar 9/16; SCANA 1/19. Elec. rev. breakdown: residential, 47%; commercial, 34%; industrial, 8%; other, 11%. Generating sources: gas, 40%; nuclear, 29%; coal, 9%; other, 5%; purchased, 17%. Fuel costs: 25% of revs. '21 reported deprec. rates: 1.8%-3.8%. Has 17,100 employees.

Additional Company Information from Website:
We employ over 17,000 people in 16 states, providing reliable, affordable, clean energy to nearly 7 million customers. We are a leader in the clean energy transition, with a clear strategy to achieve net-zero carbon and methane emissions. Headquartered in Richmond, VA, we're creating a diverse and inclusive workplace that reflects the communities we serve. We invest in communities where we live and work, and protect our natural resources.[20]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Duke Energy Corporation
Company Summary from Value Line:
Duke Energy Corporation is a holding company for utilities with 7.6 mill. elec. customers in NC, FL, IN, SC, OH, & KY, and 1.6 mill. gas customers in OH, KY, NC, SC, and TN. Owns independent power

[19] https://www.coned.com/en/about-us/company-information, accessed 1/31/2023
[20] https://www.dominionenergy.com/our-company, accessed 1/31/2023

plants & has 25% stake in National Methanol in Saudi Arabia. Acq'd Progress Energy 7/12; Piedmont Natural Gas 10/16; discontinued most int'l ops. in '16. Elec. rev. breakdown: residential, 45%; commercial, 28%; industrial, 13%; other, 14%. Generating sources: gas, 32%; nuclear, 30%; coal, 18%; other, 1%; purchased, 19%. Fuel costs: 28% of revs. '21 reported deprec. rate: 2.9%. Has 27,600 employees.

Additional Company Information from Website:
Duke Energy, a Fortune 150 company headquartered in Charlotte, N.C., is one of America's largest energy holding companies. Our electric utilities serve 8.2 million customers in North Carolina, South Carolina, Florida, Indiana, Ohio and Kentucky, and collectively own 50,000 megawatts of energy capacity. Our natural gas unit serves 1.6 million customers in North Carolina, South Carolina, Tennessee, Ohio and Kentucky. Our company employs 28,000 people.[21]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Edison International (formerly SCECorp)
Company Summary from Value Line:
Edison International (formerly SCECorp) is a holding company for Southern California Edison Company (SCE), which supplies electricity to 5.2 mill. customers in a 50,000-sq.-mi. area in central, coastal, & southern CA (excl. Los Angeles & San Diego). Edison Energy is an energy svcs. co. Disc. Edison Mission Energy (independent power producer) in '12. Elec. rev. breakdown: residential, 43%; commercial, 45%; industrial, 3%; other, 9%. Generating sources: nuclear, 8%; gas, 3%; hydro, 3%; purch., 86%. Power costs: 37% of revs. '21 reported depr. rate: 3.7%. Has 13,000 empls.

Additional Company Information from Website:
At Edison International, our vision is to lead the transformation of the electric power industry toward a clean energy future. Through our subsidiaries, we generate and distribute electric power, as well as provide energy services and technologies, including renewable energy. With 136 years of innovation in our history, our company is well-positioned and prepared for the work that lies ahead as we focus on opportunities in clean energy, efficient electrification, the grid of the future, and customer choice to strengthen and grow our business.[22]

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Entergy Corporation
Company Summary from Value Line:
Entergy Corporation supplies electricity to 3 million customers through subsidiaries in Arkansas,

[21] https://www.duke-energy.com/our-company/about-us, accessed 1/31/2023
[22] https://www.edison.com/about-us, accessed 1/31/2023

Louisiana, Mississippi, Texas, and New Orleans (regulated separately from Louisiana). Distributes gas to 206,000 customers in Louisiana. Is selling its last nonutility nuclear unit (shut down 5/22). Has a nonutility subsidiary that owns four nuclear units (three no longer operating). Electric revenue breakdown: residential, 37%; commercial, 24%; industrial, 27%; other, 12%. Generating sources: gas, 46%; nuclear, 30%; coal, 6%; purchased, 18%. Fuel costs: 32% of revenues. '21 reported depreciation rate: 2.7%. Has 12,400 employees.

Additional Company Information from Website:
Entergy, a Fortune 500 company headquartered in New Orleans, powers life for 3 million customers across Arkansas, Louisiana, Mississippi and Texas. Entergy is creating a cleaner, more resilient energy future for everyone with our diverse power generation portfolio, including increasingly carbon-free energy sources. With roots in the Gulf South region for more than a century, Entergy is a recognized leader in corporate citizenship, delivering more than $100 million in economic benefits to local communities through philanthropy and advocacy efforts annually over the last several years. Our approximately 12,000 employees are dedicated to powering life today and for future generations.[23]

Why was the company not included?
Entergy Corporation provides electricity and gas to customers. Electric customers represent 94% of customers and gas customers represent 6% of customers. This company is similar to the electric companies that we are responsible for valuing. The company serves an electric service territory in Arkansas, Louisiana, Mississippi, New Orleans, and Texas. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Eversource Energy
Company Summary from Value Line:
Eversource Energy (formerly Northeast Utilities) is the parent of utilities with 3.3 mill. electric, 887,000 gas, 226,000 water customers. Supplies power to most of Connecticut; supplies power to 3/4 of New Hampshire's population; supplies power to western Massachusetts and parts of eastern MA & gas to central & eastern MA; supplies water to CT, MA, & NH. Acq'd NSTAR 4/12; Aquarion 12/17; Columbia Gas 10/20. Electric rev. breakdown: residential, 53%; commercial, 33%; industrial, 5%; other, 9%. Fuel costs: 34% of revs. '21 reported deprec. rate: 3.1%. Has 9,200 empls.

Additional Company Information from Website:
At Eversource, Energy brings us together. We live in the neighborhoods we serve, working for a better tomorrow. We're 9,200 people committed to providing safe, reliable and sustainable electric, gas and water service in Massachusetts, Connecticut and New Hampshire. Our operations trace their roots back to the middle of the 19th century. Through the decades, many companies have come together to form Eversource, New England's largest energy delivery company. Today, we're proud to serve 4.4 million customers. Like our predecessor companies, we're focused on supporting every one of our communities, to power the possible for New England.[24]

[23] http://entergy.com/about_entergy/, accessed 1/31/2023
[24] https://www.eversource.com/content/general/about/about-us/about-us/welcome-to-eversource, accessed 1/31/2023

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Exelon Corporation
Company Summary from Value Line:
Exelon Corporation is a holding company for Commonwealth Edison (ComEd), PECO Energy, Baltimore Gas and Electric (BGE), Pepco, Delmarva Power (DPL), & Atlantic City Electric (ACE). Has 9.1 mill. elec., 1.3 mill. gas customers. Spun off Constellation Energy (nonregulated generating & energy-marketing ops.) 2/22. Acq'd Constellation Energy 3/12; Pepco Holdings 3/16. Elec. rev. breakdown: residntl, 54%; small commercl. & indstrl, 16%; large commercl. & indstrl, 17%; other, 13%. Fuel costs: 48% of revs. '21 deprec. rates: 2.8%-8.7% elec., 2.1% gas. Has 18,700 empls.

Additional Company Information from Website:
Exelon is recognized as an industry leader with best-in-class operations, with utilities achieving top quartile or better performance in customer satisfaction, reduced outage frequency, and faster service restoration. This strong record of reliability and customer satisfaction is reinforced by substantial infrastructure investments across the fleet. Exelon is the nation's largest utility company, serving more than 10 million customers through six fully regulated transmission and distribution utilities — Atlantic City Electric (ACE), Baltimore Gas and Electric (BGE), Commonwealth Edison (ComEd), Delmarva Power & Light (DPL), PECO Energy Company (PECO), and Potomac Electric Power Company (Pepco).[25]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

FirstEnergy Corporation
Company Summary from Value Line:
FirstEnergy Corp. is a holding company for Ohio Edison, Pennsylvania Power, Cleveland Electric, Toledo Edison, Metropolitan Edison, Penelec, Jersey Central Power & Light, West Penn Power, Potomac Edison, & Mon Power. Provides electric service to 6.2 million customers in OH, PA, NJ, WV, MD, & NY. Acq'd Allegheny Energy 2/11. Electric revenue breakdown: residential, 61%; commercial, 25%; industrial, 13%; other, 1%. Purchases most of its power. Power costs: 31% of revenues. 2021 reported depreciation rate: 2.7%. Has 12,400 employees.

Additional Company Information from Website:
We are a forward-thinking electric utility centered on integrity, powered by a diverse team of employees committed to making customers' lives brighter, the environment better and our communities stronger. FirstEnergy (NYSE: FE) is dedicated to integrity, safety, reliability and operational excellence. Headquartered in Akron, Ohio, FirstEnergy includes one of the nation's largest investor-owned electric

[25] http://www.exeloncorp.com/company/about-exelon, accessed 2/1/2023

systems, approximately 24,000 miles of transmission lines that connect the Midwest and Mid-Atlantic regions, and a regulated generating fleet with a total capacity of more than 3,500 megawatts.[26]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Fortis Inc.
Company Summary from Value Line:
Fortis Inc.'s main focus is electricity, hydroelectric, and gas utility operations (both regulated and nonregulated) in the United States, Canada, and the Caribbean. Has 2 mill. electric, 1.3 mill. gas customers. Owns UNS Energy (Arizona), Central Hudson (New York), FortisBC Energy (British Columbia), FortisAlberta (Central Alberta), and Eastern Canada (Newfoundland). Sold commercial real estate and hotel property assets in 2015. Acquired ITC Holdings 10/16. Fuel costs: 31% of revs. '21 reported deprec. rate: 2.6%. Has 9,100 employees.

Additional Company Information from Website:
We are an energy delivery business. Ninety-three percent of our total assets are investments in infrastructure that support the safe and reliable transmission and distribution of electricity and natural gas to our customers. We are diverse from a regulatory and a geographic perspective. Fortis is virtually 100% regulated and we operate in 17 jurisdictions. We are one of the most geographically diverse utility businesses on the continent, with each jurisdiction having distinct regulatory regimes. Our utility leadership is local. Fortis utilities operate close to their customers and regulators. Our local teams have the authority and independence to deliver what's most important in their communities. Fortis Inc. has its origin in the formation of St. John's Electric Light Company in 1885 in the province now known as Newfoundland and Labrador. That company eventually became Newfoundland Light & Power Co. Limited which became the first wholly owned subsidiary of Fortis Inc. Fortis was created as a holding company in 1987 with the mission to expand and diversify.[27]

Why was the company not included?
Although this company is similar to the electric companies that we are responsible for valuing, and it is in the Electric Utility (Central) Value Line Industry, they trade on the Toronto and New York Stock Exchanges. All data provided by Value Line is in Canadian Dollars, making conversion to US dollars necessary. Since there are enough comparable companies, will not use this company. This also limits the number of additional calculations that can decrease the reliability of the data.

Hawaiian Electric Industries Inc.
Company Summary from Value Line:
Hawaiian Electric Industries, Inc. is the parent company of Hawaiian Electric Company, Inc. (HECO), American Savings Bank (ASB), and Pacific Current. HECO & its subs., Maui Electric Co. (MECO) & Hawaii Electric Light Co. (HELCO), supply electricity to 471,000 customers on Oahu, Maui, Molokai, Lanai, & Hawaii. Operating companies' systems are not interconnected. Elec. rev. breakdown:

[26] https://www.firstenergycorp.com/about.html, accessed 2/1/2023
[27] https://www.fortisinc.com/about-us/about-us#profile, accessed 2/1/2023

residential, 34%; commercial, 34%; large light & power, 32%; other, less than 1%. Generating sources: oil, 52%; purch., 48%. Fuel costs: 46% of revs. '21 reported deprec. rate (utility): 3.2%. Has 3,600 employees.

Additional Company Information from Website:
Hawaiian Electric strives to be one of the most progressive and highest performing companies in the world, serving the energy needs of each person in Hawaii with purpose, compassion, empathy, and aloha for our fellow humans and our natural environment. We commit to be the best in all we do. We turn our Hawaii spirit and our connectedness with others to our community's advantage. We act with boldness and urgency, without fear of failure. Our highest priority is to build a sustainable Hawaii in which our children and grandchildren, our communities, our customers, and employees will thrive, together. We succeed by providing exceptional service to our customers and integrating and aligning our actions with those of other businesses and organizations. We drive ourselves and others to higher levels of achievement than ever before. At Hawaiian Electric, we're committed to reaching our 100% clean energy future, and reducing our carbon footprint. Let's continue to work together to build sustainable, resilient communities.[28]

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

IDACORP Inc.
Company Summary from Value Line:
IDACORP, Inc. is a holding company for Idaho Power Company, a regulated electric utility that serves 604,000 customers throughout a 24,000-square-mile area in southern Idaho and eastern Oregon (population: 1.3 million). Most of the company's revenues are derived from the Idaho portion of its service area. Revenue breakdown: residential, 45%; commercial, 24%; industrial, 15%; irrigation, 13%; other, 3%. Generating sources: hydro, 30%; coal, 17%; gas, 15%; purchased, 38%. Fuel costs: 36% of revenues. '21 reported depreciation rate: 2.9%. Has 2,000 employees.

Additional Company Information from Website:
Boise, Idaho-based IDACORP is a holding company comprised of Idaho Power Company, a regulated electric utility; IDACORP Financial, a holder of affordable housing projects and other real estate investments; and Ida-West Energy, an operator of small hydroelectric generation projects that satisfy the requirements of the Public Utility Regulatory Policies Act of 1978. IDACORP was formed Oct. 1, 1998, following approval by Idaho Power shareholders, the Federal Energy Regulatory Commission and the public utility commissions of Idaho, Oregon, Nevada and Wyoming (states where IDACORP has conducted business or has holdings). Under the holding company structure, Idaho Power Company is the primary subsidiary. This regulated utility, headquartered in vibrant and fast-growing Boise, Idaho, has been a locally operated energy company since 1916. Today, it serves a 24,000-square-mile service area in Idaho and Oregon. Idaho Power's goal to provide 100% clean energy by 2045 builds on its long history as a clean-energy leader that provides reliable service at affordable prices. With 17 low-cost hydropower projects at the core of its diverse energy mix, Idaho Power's residential, business, and agricultural

[28] https://www.hei.com/company-profile/about-hawaiian-electric/default.aspx, accessed 2/1/2023

customers pay among the nation's lowest prices for electricity. It's 2,000 employees proudly serve more than 610,000 customers with a culture of safety first, integrity always, and respect for all. IDACORP's common stock is traded on the New York Stock Exchange under the trading symbol "IDA".[29]

Why was the company not included?
This company is part of Value Line's Electric Utility (West) industry, but it is similar to the electric companies that we are responsible for valuing. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

MDU Resources Group Inc.
Company Summary from Value Line:
MDU Resources Group, Inc. is a regulated energy delivery and construction materials and services company. Segments: construction materials and contracting (39% of '21 revs; 36% of '21 op. inc.), construction services (36%, 27%), natural gas distribution (17%, 17%); electric (6%, 12%) and pipeline (2%, 8%). Utilities sell gas & electricity in northwest and upper midwest U.S. Construction materials has 1.1 billion tons of construction reserves. Has about 12,826 employees.

Additional Company Information from Website:
MDU Resources provides essential products and services through its regulated energy delivery and construction materials and services businesses. Our company was founded in 1924 as a small electric utility serving a handful of farm communities on the border of Montana and North Dakota. We realized early the value of delivering a variety of services and grew our company by developing businesses around our expertise. Today, MDU Resources has operations, customers and employees across the country. We have approximately 16,000 employees during peak construction season and conduct business in nearly every state. We are the largest publicly traded company headquartered in North Dakota. Our stock has traded since 1948 under the symbol MDU on the New York Stock Exchange. Strong infrastructure is the heart of the U.S. economy. It is the natural gas and electricity that power business, industry and our daily lives. It is the pipes and wires that connect our homes, factories, offices and stores to bring them to life. It is the transportation network of roads, highways and airports that keeps our economy moving. Infrastructure is our business. We have paid dividends uninterrupted to our shareholders for 84 years. We have increased dividends 31 consecutive years, a feat accomplished by only about 80 other U.S.-listed companies. Our commitment to paying dividends is reflected in our membership in the S&P High-Yield Dividend Aristocrats index.[30]

Why was the company not included?
This company was reviewed as a potential guideline company because it has an operating subsidiary located in Minnesota. This company is located in the Natural Gas Diversified Company Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota that are very similar to the companies in Minnesota. MDU Resources Group Inc.'s majority operating segment is construction materials and contracting.

[29] http://www.idacorpinc.com/about-us/at-a-glance, accessed 2/1/2023
[30] https://www.mdu.com/our-company/overview/default.aspx, accessed 2/1/2023

MGE Energy Inc.

Company Summary from Value Line:

MGE Energy, Inc. is an investor-owned public utility holding company. The company's segments include: regulated electric utility operations, which generates purchases, and distributes electricity through its subsidiary, Madison Gas and Electric Company (MGE); regulated gas utility operations, which purchases and distributes natural gas through MGE; nonregulated energy operations, which owns and leases electric generating capacity that assists MGE through the company's subsidiaries MGE Power Elm Road, LLC, and MGE Power West Campus, LLC; and transmission investments, in which MGE Energy invests in American Transmission Company, LLC, a company that provides electric transmission services in Wisconsin. Madison Gas and Electric, generates and distributes electricity to 159,000 customers in Dane County, Wisconsin., and purchases and distributes natural gas to gas 169,000 customers in seven south-central and western Wisconsin counties. Has 706 employees.

Additional Company Information from Website:

MGE Energy, a public utility holding company, is headquartered in the state capital Madison, Wis. MGE Energy trades on NASDAQ with the stock ticker MGEE. MGE Energy is dedicated to long-term value for its shareholders. We have increased our dividend for more than 47 consecutive years and have paid dividends for more than 110 years. MGE Energy is the parent company of the following:

- Madison Gas and Electric Company (MGE) provides natural gas and electric service in south-central and western Wisconsin.
- MGE Transco Investment holds an ownership interest in ATC LLC, which invests in transmission assets, primarily within Wisconsin.
- MGEE Transco LLC holds an ownership interest in ATC Holdco, which invests in transmission assets outside ATC LLC service territory.
- MGE Power owns assets in the West Campus Cogeneration Facility in Madison, Wis. and the Elm Road Generating Station in Oak Creek, Wis.
- MAGAEL, LLC holds title to properties acquired for future utility plant expansion.
- Central Wisconsin Development Corporation promotes business growth in MGE's service area.
- MGE Services, LLC provides construction and other services.[31]

Why was the company not included?

MGE Energy Inc. provides electricity and gas to customers. Electric customers represent 49% of customers and gas customers represent 51% of customers. This company is similar to the electric companies that we are responsible for valuing. The company serves an electric service territory in the Midwest. However, the company has less publicly available information than other guideline companies used in this market segment.

NextEra Energy Inc.

Company Summary from Value Line:

NextEra Energy, Inc. is a holding company for Florida Power & Light Company (FPL), which provides electricity to roughly 5.8 million customers in eastern, southern, & northwestern FL. NextEra Energy Resources is a nonregulated power generator with nuclear, gas, & renewable ownership. Has 55% stake in NextEra Energy Partners. Acquired Gulf Power 1/19; Florida City Gas 7/18. Rev. breakdown: residential, 55%; commercial, 33%; industrial & other, 12%. Generating sources: gas, 73%; nuclear, 22%;

[31] https://www.mgeenergy.com/en/about/about-mge-energy/, accessed 2/2/2023

other, 3%; purchased, 2%. Fuel costs: 27% of revenues. '21 depreciation rate: 3.3%. Has 15,000 employees.

Additional Company Information from Website:
NextEra Energy, Inc. (NYSE: NEE) is a leading clean energy company headquartered in Juno Beach, Florida. NextEra Energy owns Florida Power & Light Company, which is America's largest electric utility that sells more power than any other utility, providing clean, affordable, reliable electricity to approximately 5.8 million customer accounts, or more than 12 million people across Florida. NextEra Energy also owns a competitive clean energy business, NextEra Energy Resources, LLC, which, together with its affiliated entities, is the world's largest generator of renewable energy from the wind and sun and a world leader in battery storage. Through its subsidiaries, NextEra Energy generates clean, emissions-free electricity from seven commercial nuclear power units in Florida, New Hampshire and Wisconsin. NextEra Energy has been recognized often by third parties for its efforts in sustainability, corporate responsibility, ethics and compliance, and diversity. NextEra Energy is ranked No. 1 in the electric and gas utilities industry on Fortune's 2023 list of "World's Most Admired Companies," recognized on Fortune's 2021 list of companies that "Change the World" and received the S&P Global Platts 2020 Energy Transition Award for leadership in environmental, social and governance.[32]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota. This company has nuclear plants in Wisconsin as well as renewable energy generators in Minnesota. However, these operations are very small considering the overall company.

Ormat Technologies Inc.
Company Summary from Value Line:
Ormat Technologies, Inc., together with its subsidiaries, provides geothermal and recovered energy power and products through two operating segments. Its electricity division, 88% of 2021 revs., develops, constructs, owns, and operates geothermal power plants that sell electricity. Under the product segment, 7% of revs., the company designs and manufactures power units for geothermal plants and power units for recovered generation. Other revs., 5%. Employs about 1,385.

Additional Company Information from Website:
Headquartered in Reno, Nevada, Ormat is a leading geothermal company and the only vertically integrated company engaged in geothermal and recovered energy generation (REG). Ormat leveraged its core capabilities and global presence to expand its activity into different energy storage services and solar photovoltaic (PV), including hybrid geothermal and solar PV as well as energy storage plus Solar PV. Ormat's objective is to become a leading global provider of renewable energy. The Company has over five decades of experience in the development of state-of-the-art, environmentally sound power solutions. The company designs, develops, builds, owns and operates geothermal and recovered energy-based power plants. The in-depth knowledge gained from these operations gives the Company the competitive edge by enabling efficient maintenance and timely response to operational issues. Ormat leveraged its core capabilities in the geothermal and REG industries and its global presence to expand

[32] http://www.investor.nexteraenergy.com, accessed 2/1/2023

the Company's activity into energy storage services, solar Photovoltaic (PV) and energy storage plus Solar PV. Ormat's current total generating portfolio is 1.1 GW with 1,015 MW of geothermal and Solar generation portfolio that is spread globally in the U.S., Kenya, Guatemala, Indonesia, Honduras, and Guadeloupe, and 83 MW energy storage portfolio that is located in the U.S.

In addition to owning and operating geothermal power plants in the United States and other countries, the Company designs, manufactures and sells power generating equipment as well as complete power plants on a turnkey basis.[33]

Why was the company not included?
This company is located in the Power Company Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota. Ormat does have generating facilities in Minnesota, but they are a very small portion of their overall company and Ormat is not an accurate reflection of the types of companies we are valuing.

PG&E Corporation (Pacific Gas and Electric Company Inc.)
Company Summary from Value Line:
Not available.

Additional Company Information from Website:
Pacific Gas and Electric Company, incorporated in California in 1905, is one of the largest combined natural gas and electric energy companies in the United States. Based in San Francisco, the company is a subsidiary of PG&E Corporation. In 2022, PG&E will be relocating its headquarters across the San Francisco Bay to Oakland, California. There are approximately 23,000 employees who carry out Pacific Gas and Electric Company's primary business—the transmission and delivery of energy. The company provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California. Pacific Gas and Electric Company and other energy companies in the state are regulated by the California Public Utilities Commission. The CPUC was created by the state Legislature in 1911. Fast Facts. Service area stretches from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada in the east. 106,681 circuit miles of electric distribution lines and 18,466 circuit miles of interconnected transmission lines. 42,141 miles of natural gas distribution pipelines and 6,438 miles of transmission pipelines. 5.5 million electric customer accounts. 4.5 million natural gas customer accounts.[34]

PG&E Corporation (the "Corporation") and Pacific Gas and Electric Company (the "Utility," together "PG&E") announced July 1, 2020 that PG&E has emerged from Chapter 11, successfully completing its restructuring process and implementing PG&E's Plan of Reorganization ("Plan") that was confirmed by the United States Bankruptcy Court on June 20, 2020.[35]

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline

[33] https://investor.ormat.com/corporate-profile/default.aspx, accessed 2/1/2023
[34] https://www.pge.com/en_US/about-pge/company-information/profile/profile.page, accessed 2/1/2023
[35] https://www.pgecorp.com/news/press_releases/Release_Archive2020/200701press_release.shtml, accessed 2/1/2023

companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota. Also, this company recently emerged from Chapter 11 Bankruptcy.

Pinnacle West Capital Corporation

Company Summary from Value Line:

Pinnacle West Capital Corporation is a holding company for Arizona Public Service Company (APS), which supplies electricity to 1.3 million customers in most of Arizona, except about half of the Phoenix metro area, the Tucson metro area, and Mohave County in northwestern Arizona. Discontinued SunCor real estate subsidiary in ’10. Electric revenue breakdown: residential, 51%; commercial, 38%; industrial, 5%; other, 6%. Generating sources: gas & other, 30%; nuclear, 27%; coal, 20%; purchased, 23%. Fuel costs: 30% of revenues. ’21 reported deprec. rate: 2.9%. Has 5,900 employees.

Additional Company Information from Website:

Pinnacle West Capital Corporation (NYSE: PNW) is an investor-owned electric utility holding company based in Phoenix, Ariz. We are recognized for our strong customer growth, healthy finances, principled ESG focus and innovative energy solutions to meet the changing needs of our customers. Along with our main subsidiary, Arizona Public Service (APS), we are working to meet business needs with practices that balance a healthy environment, a vibrant economy and strong communities for current and future generations. We provide our nearly 1.3 million customers with clean, reliable and affordable energy today and are committed to power Arizona’s future with electricity that is 100% clean and carbon-free by 2050. APS also is the operator and co-owner of the Palo Verde Generating Station – the largest nuclear plant and the single-largest generator of carbon-free electricity in the U.S. Beyond electricity, Arizona is our home and giving back is an important part of our culture. Our employees volunteer hundreds of thousands of hours to support causes and non-profits important to them. And, our company contributes to teachers and charitable organizations, assists our communities with economic development, and provides millions of dollars in direct financial assistance to customers struggling to pay their bills.[36]

Why was the company not included?

This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

PNM Resources Inc.

Company Summary from Value Line:

PNM Resources, Inc. is a holding company with two regulated electric utilities. Public Service Company of New Mexico (PNM) serves 538,000 customers in north central New Mexico, including Albuquerque and Santa Fe. Texas-New Mexico Power Company (TNMP) transmits and distributes power to 261,000 customers in Texas. Electric revenue breakdown: residential, 42%; commercial, 36%; industrial, 8%; other, 14%. Generating sources not available. Fuel costs: 36% of revenues. ’21 reported depreciation rates: 2.5%-7.9%. Has 1,600 employees.

Additional Company Information from Website:

PNM Resources is an energy holding company based in Albuquerque, N.M., with 2021 consolidated

[36] http://www.pinnaclewest.com/about-us/default.aspx, accessed 2/1/2023

operating revenues of $1.8 billion. Through its regulated utilities, PNM and TNMP, PNM Resources provides electricity to approximately 800,000 homes and businesses in New Mexico and Texas. PNM serves its customers with a diverse mix of generation and purchased power resources totaling 2.7 gigawatts of capacity, with a goal to achieve 100% emissions-free energy by 2040. PNM Resources is publicly traded on the New York Stock Exchange as PNM. PNM Resources strives to create enduring value for customers, communities and shareholders built on a foundation of Environmental, Social and Governance Principles. At the core of our business we are focused on our Vision, our Purpose and our Values.[37]

On October 21, 2020, PNM Resources announced an agreement to enter into a merger with AVANGRID. Under the terms of the proposed merger, PNM Resources shareholders will receive $50.30 in cash for each share of PNM Resources common stock held at closing.

During 2021, PNM Resources shareholders, five federal regulatory agencies and the Public Utility Commission of Texas approved the merger, leaving the New Mexico Public Regulation Commission (NMPRC) as the only remaining approval necessary to close the merger. In December 2021, the NMPRC rejected a stipulation agreement reached between parties in support of the merger.

On January 3, 2022, PNM Resources and AVANGRID announced an amendment and extension of their merger agreement to April 20, 2023 and an appeal of the NMPRC decision with the New Mexico Supreme Court. There is no statutory deadline for the Court to act.[38]

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota. Also, PNM Resources and AVANGRID Inc. recently entered into an amendment of their merger agreement extending the end date to April 20, 2023. AVANGRID Inc. is in the Electric Utility (East) Value Line Industry.

Portland General Electric Company
Company Summary from Value Line:
Portland General Electric Company (PGE) provides electricity to 917,000 customers in 51 cities in a 4,000-square-mile area of Oregon, including Portland and Salem. The company is in the process of decommissioning the Trojan nuclear plant, which it closed in 1993. Electric revenue breakdown: residential, 47%; commercial, 29%; industrial, 11%; other, 13%. Generating sources: gas, 37%; wind, 9%; coal, 8%; hydro, 4%; purchased, 42%. Fuel costs: 34% of revenues. '21 reported depreciation rate: 3.4%. Has 2,800 full-time employees.

Additional Company Information from Website:
Portland General Electric Company is an investor-owned utility in Northwest Oregon engaged in the generation, transmission and distribution of electricity to 901,000 residential, commercial and industrial customers in 51 cities and seven counties. We're committed to providing shareholders with easy access to information about the company. As Oregon's largest utility, PGE is expanding to keep pace with the

[37] https://www.pnmresources.com/about-us.aspx, accessed 2/1/2023
[38] https://www.pnmresources.com/investors/strategic-merger-transaction.aspx, accessed 2/1/2023

economic growth in northwest Oregon. See the PGE service territory. PGE offers a diverse mix of resources that includes hydropower, coal and gas combustion, wind and solar, as well as key transmission resources. Our power plants have a combined generating capacity of more than 3,300 megawatts.[39]

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

PPL Corporation
Company Summary from Value Line:
PPL Corporation (formerly PP&L Resources, Inc.) is a holding company for PPL Electric Utilities, which distributes electricity to 1.4 mill. customers in eastern & central Pennsylvania. Acquired Kentucky Utilities and Louisville Gas and Electric (1.3 mill. customers) 11/10. Acq'd Narragansett Electric (770,000 customers, renamed Rhode Island Energy) 5/22. Spun off power-generating sub. in '15. Sold electric distribution sub. in U.K. in '21. Electric rev. breakdown: res'l, 46%; comm'l, 22%; ind'l, 11%; other, 21%. Fuel costs: 25% of revs. '21 reported deprec. rate: 3.6%. Has 6,700 employees.

Additional Company Information from Website:

We are customer-centric, people-driven and technology-enabled. We are harnessing our power to lead the clean energy transition while keeping energy service affordable and reliable for our customers. PPL Corporation's family of companies provide electricity and natural gas to power our customers' lives. PPL's high-performing, award-winning utilities are addressing energy challenges head-on by building smarter, more resilient and more dynamic power grids and advancing sustainable energy solutions. We're focused on an economical and sustainable transition to cleaner energy sources through innovation, responsible resource management and investments in infrastructure that support a more reliable, resilient and efficient grid.[40]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Public Service Enterprise Group, Inc.
Company Summary from Value Line:
Public Service Enterprise Group Inc. is a holding company for Public Service Electric and Gas Company (PSE&G), which serves 2.3 million electric and 1.9 million gas customers in NJ, and PSEG Power LLC, a nonregulated power generator with nuclear plants in the Northeast (sold its fossil-fuel generating plants, 2/22). PSEG Energy Holdings is involved in renewable energy. The company no longer breaks out detailed data on electric and gas operating statistics. Fuel costs: 36% of revenues. '21 reported depreciation rates (utility): 1.8%-2.6%. Has 12,700 employees.

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[39] https://investors.portlandgeneral.com/?_ga=2.127402757.96222047.1610120276-359187513.1610120276, accessed 2/2/2023
[40] https://www.pplweb.com/who-we-are/about-us/, accessed 2/2/2023

Additional Company Information from Website:
The Public Service Corporation was formed in 1903, by amalgamating more than 400 gas, electric and transportation companies in New Jersey. Thomas McCarter was named the Corporation's first president and held the position until 1939. Internally, Public Service consolidated its gas and electric interests into Public Service Electric and Gas, and its transportation interests into Public Service Coordinated Transport (later Transport of New Jersey). Concerns about the concentration of economic power resulted in federal and state actions requiring the breakup of utilities. In 1943, Public Service once again became a stand-alone company, and was renamed Public Service Electric and Gas Company (PSE&G) in 1948.[41]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Sempra Energy
Company Summary from Value Line:
Sempra Energy is a holding company for San Diego Gas & Electric (SDG&E), which sells electricity & gas mainly in San Diego County, & Southern California Gas (SoCalGas), which distributes gas to most of Southern California. Owns 80% of Oncor (acq'd 3/18), which distributes electricity in Texas. Customers: 5.2 million electric, 7.0 million gas. Electric revenue breakdown not available. Purchases most of its power; the rest is gas. Has nonutility subsidiaries, incl. IEnova in Mexico. Sold commodities business in '10. Power costs: 20% of revenues. '21 reported deprec. rates: 2.6%-7.2%. Has 15,400 employees.

Additional Company Information from Website:
Sempra Energy is an energy infrastructure company focused on connecting millions through the power of people, ideas and innovation. Our 20,000+ employees pride themselves on being part of a leader in the energy industry, serving more than 40 million consumers worldwide. From our San Diego, CA headquarters to our operations in key markets in North America, we are making great strides in developing forward-thinking energy solutions and positively impacting the communities we serve by delivering energy with purpose. With more than $72 billion in total assets at the end of 2021, combined with informed and impactful strategies and an inspiring mission, we strive for sustainable long-term growth.[42]

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

Southern Company
Company Summary from Value Line:
The Southern Company, through its subsidiaries, supplies electricity to 4.4 mill. customers in GA, AL,

[41] https://corporate.pseg.com/aboutpseg/companyinformation, accessed 2/2/2023
[42] http://www.sempra.com/about-us, accessed 2/2/2023

and MS. Also has a competitive generation business. Acq'd AGL Resources (renamed Southern Company Gas, 4.4 mill. customers in GA, NJ, IL, VA, & TN) 7/16. Sold Gulf Power 1/19. Electric revenue breakdown: residential, 37%; commercial, 30%; industrial, 19%; other, 14%. Generating sources: gas, 44%; coal, 20%; nuclear, 16%; other, 11%; purchased, 9%. Fuel costs: 29% of revenues. '21 reported deprec. rates (utility.): 2.7%-3.6%. Has 27,300 employees.

Additional Company Information from Website:
While Atlanta is our home, we bring energy to homes and businesses across the country. We've made our name as a leading producer of clean, safe, reliable and affordable energy, and we approach each day as a vital step in building the future of energy. We're always looking ahead, and our innovations in the industry—from new nuclear to deployment of electric transportation and renewables —help brighten the lives and businesses of millions of customers nationwide. Our family of companies is proud to deliver clean, safe, reliable and affordable energy to our 9 million customers across the Southeast and beyond. Every day, our employees carry out their jobs with a customer-focused approach and service excellence. That means we are leaders who take action to meet our customers' and communities' needs while advancing our commitment to net zero emissions by 2050. We create community value through energy, social, economic and environmental progress. We do this through electric operating companies in three states and natural gas distribution companies in four states. Our system draws on diverse energy sources to create the best mix for our service areas, including electricity, natural gas, solar power, wind power, carbon-free nuclear, battery storage, microgrids and other sustainable sources. We leverage our leading distributed energy infrastructure company and other innovative technology to better serve every customer. Our competitive, national generation company serves wholesale customers, and our family includes a fiber optics network and telecommunications services. Together, we're building the future of energy.[43]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as companies located in or directly next to Minnesota.

[43] https://www.southerncompany.com/about/our-business.html, accessed 2/3/2023

Market Segment: Gas Distribution

Companies Included in the Gas Distribution Market Segment

Atmos Energy Corporation
Company Summary from Value Line:
Atmos Energy Corporation is engaged primarily in the distribution and sale of natural gas to over three million customers through six regulated natural gas utility operations: Louisiana Division, West Texas Division, Mid-Tex Division, Mississippi Division, Colorado-Kansas Division, and Kentucky/Mid-States Division. Gas sales breakdown for fiscal 2021: 67.9%, residential; 26.8%, commercial; 3.6%, industrial; and 1.7% other. The company sold Atmos Energy Marketing, 1/17.

Additional Company Information from Website:
We are the country's largest natural gas-only distributor and safely deliver reliable, affordable, efficient, and abundant natural gas to more than 3 million distribution customers in over 1,400 communities across eight states located primarily in the South. Our vision is for Atmos Energy to be the safest provider of natural gas services. We will be recognized for Exceptional Customer Service, for being a Great Employer and for achieving Superior Financial Results. As part of our vision, we are modernizing our business and infrastructure while continuing to invest in safety, innovation, environmental sustainability and our communities. We're investing approximately $2 billion a year in system upgrades to provide our customers with safe and reliable natural gas service for generations to come.[44]

Why was the company included?
Atmos Energy Corporation provides gas to customers through six regulated natural gas utility operations. This company is similar to the gas distribution companies that we are responsible for valuing.

Black Hills Corporation
Company Summary from Value Line:
Black Hills Corporation is a holding company for Black Hills Energy, which serves 218,000 electric customers in CO, SD, WY and MT, and 1.1 million gas customers in NE, IA, KS, CO, WY, and AR. Has coal mining sub. Acq'd utility ops. from Aquila 7/08; SourceGas 2/16. Discontinued gas marketing in '11; gas & oil E&P in '17. Electric rev. breakdown: residential, 31%; commercial, 34%; industrial, 19%; other, 16%. Generating sources: coal, 34%; gas, 25%; wind, 11%; purchased, 30%. Fuel costs: 38% of revs. '21 deprec. rate: 3.1%. Has 2,900 employees.

Additional Company Information from Website:
Black Hills Corporation is a customer focused, growth-oriented utility company with a tradition of exemplary service and a vision to be the energy partner of choice. Based in Rapid City, South Dakota, the company serves over 1.28 million electric and natural gas utility customers in more than 800

[44] https://www.atmosenergy.com/company/about-atmos-energy, accessed 2/3/2023

communities in Arkansas, Colorado, Iowa, Kansas, Montana, Nebraska, South Dakota and Wyoming. Employees partner to produce results that improve life with energy.[45]

Why was the company included?
Black Hills Corporation provides electric and gas to customers. Electric customers represent 16% of customers and gas customers represent 84% of customers. This company is similar to the gas distribution companies that we are responsible for valuing. The company provides gas distribution services.

We are also using this company as a guideline company for the Electric Market Segment.

CenterPoint Energy Inc.
Company Summary from Value Line:
CenterPoint Energy, Inc. is a holding company for Houston Electric, which serves 2.7 million customers in Houston and environs, Indiana Electric, which serves 150,000 customers, and gas utilities with 4.2 million customers in Texas, Minnesota, Louisiana, Mississippi, Indiana, and Ohio. Acquired Vectren 2/19. Sold nonutility operations in ’20. Sold its stake in Energy Transfer LP in ’21 and ’22. Electric revenue breakdown not available. Fuel costs: 28% of revenues. ’21 depreciation rate: 3.9%. Has 8,900 employees.

Additional Company Information from Website:
Our vision to lead the nation in delivering energy, service and value drives our strategy and performance. We have an unwavering commitment to safely and reliably deliver electricity and natural gas to millions of people. Natural Gas. We sell and deliver natural gas to more than 4 million homes and businesses in six states: Indiana, Louisiana, Minnesota (including Minneapolis), Mississippi, Ohio, Oklahoma and Texas (including greater Houston area). We are investing in modernizing our natural gas infrastructure and are committed to eliminating cast-iron pipe in all our territories. Electric Transmission and Distribution and Power Generation. We maintain the wires, poles and electric infrastructure serving more than 2.8 million metered customers in the greater Houston area and in southwestern Indiana. We also own and operate nearly 1,300 megawatts of electric generation capacity in Indiana. We are committed to the reliable delivery of electricity generated from power plants and renewable energy resources to homes and businesses. CenterPoint Energy Home Service Plus®. For over 80 years, HSP has provided heating and cooling solutions for Minnesota homeowners. We proudly offer expert repair, along with service and maintenance plans, and professional sales for both gas and electric equipment. CenterPoint Energy and HomeServe. We have selected HomeServe, a trusted nationwide provider of emergency home repair programs, in our natural gas markets in Mississippi and Texas (including greater Houston area) to offer our customers service repair plans that help reduce the stress and expense from the unexpected.[46]

Why was the company included?
CenterPoint Energy Inc. provides electricity and gas to customers. Electric customers represent 39% of customers and gas customers represent 61% of customers. This company is similar to the gas

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[45] https://www.blackhillscorp.com/about, accessed on 2/3/2023
[46] https://www.centerpointenergy.com/en-us/corporate/about-us/company-overview, accessed on 2/2/2023

distribution companies that we are responsible for valuing. The company engages in providing gas distribution services in Minnesota.

We are also using this company as a guideline company for the Electric Market Segment.

CMS Energy Corporation
Company Summary from Value Line:
CMS Energy Corporation is a holding company for Consumers Energy, which supplies electricity and gas to lower Michigan (excluding Detroit). Has 1.9 million electric, 1.8 million gas customers. Has 1,234 megawatts of nonregulated generating capacity. Sold EnerBank in '21. Electric revenue breakdown: residential, 48%; commercial, 32%; industrial, 13%; other, 7%. Generating sources: coal, 31%; gas, 16%; renewables, 6%; purchased, 47%. Fuel costs: 42% of revenues. '21 reported deprec. rates: 3.9% electric, 2.9% gas, 9.4% other. Has 8,500 fulltime employees.

Additional Company Information from Website:
CMS Energy Corporation's business strategy is focused primarily on its principal subsidiary, Consumers Energy Company, Michigan's largest electric and natural gas utility, serving 6.8 million of the state's 10 million residents. With our subsidiary, NorthStar Clean Energy, we are also engaged in independent power generation in several states. Consumers Energy is one of the nation's largest combination electric and natural gas utilities. NorthStar Clean Energy helps clients reach ambitious business and sustainability goals with a wide range of custom energy and carbon reduction products. The company also owns and operates independent power generating plants, natural gas assets and an energy marketing group for the non-utility segment of CMS Energy's business.[47]

Why was the company included?
CMS Energy Corporation provides electricity and gas to customers. Electric customers represent 51% of customers and gas customers represent 49% of customers. This company is similar to the gas distribution companies that we are responsible for valuing. The company provides gas distribution services.

We are also using this company as a guideline company for the Electric Market Segment.

New Jersey Resources Corporation
Company Summary from Value Line:
New Jersey Resources Corp. is a holding company providing retail/wholesale energy svcs. to customers in NJ, and in states from the Gulf Coast to New England, and Canada. New Jersey Natural Gas had 564,000 cust. at 9/30/21. Fiscal 2021 volume: 112 bill. cu. ft. (20% interruptible, 61% residential, commercial & firm transportation, 19% other). N.J. Natural Energy subsidiary provides unregulated retail/wholesale natural gas and related energy svcs. 2021 dep. rate: 2.4%. Has 1,251 empls.

Additional Company Information from Website:
New Jersey Resources - New Jersey Resources (NJR), a Fortune 1000 company that provides safe and reliable natural gas and clean energy services, including transportation, distribution, asset management and home services. With its demonstrated leadership as a premier energy infrastructure and environmentally-forward thinking company, NJR is committed to meeting customers' expectations for

[47] https://www.cmsenergy.com/about-cms-energy/default.aspx, accessed 2/2/2023

safe, reliable service; delivering value for our shareowners; strengthening our communities and supporting a transition to a clean energy future. NJR is composed of the following core businesses: New Jersey Natural Gas - New Jersey Natural Gas (NJNG), NJR's principal subsidiary, operates and maintains over 7,600 miles of natural gas transportation and distribution infrastructure to serve over half a million customers in New Jersey's Monmouth, Ocean, Morris, Middlesex and Burlington counties. NJR Energy Services - NJR Energy Services (NJRES) manages a diversified portfolio of natural gas transportation and storage assets and provides physical natural gas services and customized energy solutions to its customers across North America. NJR Clean Energy Ventures - NJR Clean Energy Ventures (NJRCEV) invests in, owns and operates solar projects with a total capacity of nearly 365 megawatts, providing residential and commercial customers with low-carbon solutions. Storage & Transportation - Storage & Transportation serves customers from local distributors and producers to electric generators and wholesale marketers through its ownership of Leaf River Energy Center and the Adelphia Gateway Pipeline Project, as well as a 50 percent equity ownership in Steckman Ridge natural gas storage facility. NJR Home Services - NJR Home Services (NJRHS) provides service contracts as well as heating, central air conditioning, water heaters, standby generators, solar and other indoor and outdoor comfort products to residential homes throughout New Jersey. NJR and its more than 1,200 employees are committed to helping customers save energy and money by promoting conservation and encouraging efficiency through Conserve to Preserve® and initiatives such as The SAVEGREEN Project® and The Sunlight Advantage®.[48]

Why was the company included?
New Jersey Resources Corporation provides energy and natural gas services to customers. This company is similar to the gas distribution companies that we are responsible for valuing.

NiSource Inc.
Company Summary from Value Line:
NiSource Inc. is a holding company for Northern Indiana Public Service Company (NIPSCO), which supplies electricity and gas to the northern third of Indiana. Customers: 479,185 electric in Indiana, 3,200,000 million gas in Indiana, Ohio, Pennsylvania, Kentucky, Virginia, Maryland, through its Columbia subsidiaries. Revenue breakdown, 2021: electrical, 31%; gas, 69%; other, less than 1%. Generating sources, coal, 69.4%; purchased & other, 30.6%. 2021 reported depreciation rates: 2.9% electric, 2.2% gas. Has 7,304 employees.

Additional Company Information from Website:
We're a leading natural gas and electric utility company. Our over 7,500 employees ensure Columbia Gas and NIPSCO customers have the energy they need across six states. Strategically investing in our energy infrastructure will enable us to meet our customer commitments as the future of energy evolves. It's all about our customers. By investing at record levels, we're: Improving reliability and safety for our customers and our communities. Making it easier for customers to do business with us. Providing additional access to natural gas and electric service. Reducing emissions and preserving our natural resources.[49]

[48] https://www.njresources.com/about/index.aspx, accessed 2/6/2023
[49] https://www.nisource.com/company, accessed 2/2/2023

Why was the company included?
NiSource Inc. provides electricity and gas to customers. This company is similar to the gas distribution companies that we are responsible for valuing.

Northwest Natural Holding Company
Company Summary from Value Line:
Northwest Natural Holding Co. distributes natural gas to 1000 communities, 775,000 customers, in Oregon (89% of customers) and in southwest Washington state. Principal cities served: Portland and Eugene, OR; Vancouver, WA. Service area population: 3.7 mill. (77% in OR). Company buys gas supply from Canadian and U.S. producers; has transportation rights on Northwest Pipeline system. Owns local underground storage. Rev. breakdown: residential, 37%; commercial, 22%; industrial, gas transportation, 41%. Employs 1,167.

Additional Company Information from Website:
NW Natural is a local distribution company that currently provides natural gas service to approximately 2.5 million people in more than 140 communities through nearly 780,000 meters in Oregon and Southwest Washington with one of the most modern pipeline systems in the nation.[50]

Why was the company included?
Northwest Natural Holding Company provides gas to customers. This company is similar to the gas distribution companies that we are responsible for valuing.

ONE Gas Inc.
Company Summary from Value Line:
ONE Gas, Inc. provides natural gas distribution services to more than two million customers. There are three divisions: Oklahoma Natural Gas, Kansas Gas Service, and Texas Gas Service. The company purchased 164 Bcf of natural gas supply in 2021, compared to 153 Bcf in 2020. Total volumes delivered by customer (fiscal 2021): transportation, 59.3%; residential, 30.4%; commercial & industrial, 9.7%; other, .6%. ONE Gas has around 3,600 employees.

Additional Company Information from Website:
ONE Gas Inc. (NYSE: OGS) is a 100-percent regulated natural gas utility, and trades on the New York Stock Exchange under the symbol "OGS." ONE Gas is included in the S&P MidCap 400 Index, and is one of the largest natural gas utilities in the United States. ONE Gas provides natural gas distribution services to more than 2.2 million customers in Kansas, Oklahoma and Texas. ONE Gas is headquartered in Tulsa, Okla. It's divisions include Kansas Gas Service, the largest natural gas distributor in Kansas; Oklahoma Natural Gas, the largest in the state, and Texas Gas Service, the third largest in the state in terms of customers. Its largest natural gas distribution markets by customer count are Oklahoma City and Tulsa, Okla.; Kansas City, Wichita and Topeka, Kan.; and Austin and El Paso, Texas. ONE Gas serves residential, commercial, industrial, transportation and wholesale customers in all three states.[51]

[50] https://www.nwnatural.com/about-us/the-company/overview, accessed 2/2/2023
[51] https://www.onegas.com/about-one-gas/default.aspx, accessed 2/2/2023

Why was the company included?
ONE Gas Inc. provides natural gas to customers. This company is similar to the gas distribution companies that we are responsible for valuing.

Southwest Gas Holdings Inc.
Company Summary from Value Line:
Southwest Gas Holdings Inc. is the parent holding company of Southwest Gas and Centuri Construction Group. Southwest Gas is a regulated gas distributor serving 2.2 million customers in Arizona, Nevada, and California. Centuri provides construction services. 2021 margin mix: residential and small commercial, 85%; large commercial and industrial, 4%; transportation, 11%. Total throughput: 2.2 billion therms. Has 12,973 employees.

Additional Company Information from Website:
Southwest Gas Corporation was founded in 1931 and is a subsidiary of Southwest Gas Holdings Inc. We provide natural gas service to Arizona, Nevada, and portions of California. Our communities, and the more than 2 million customers we serve, are the reasons why we've been heating things up for decades. So, whether you're enjoying a backyard barbeque with friends, getting cozy indoors during the winter, or preparing an epicurean delight in your new restaurant, Southwest Gas is here to support your comfort and your lifestyle. Natural gas is a clean and abundant energy source, and essential to the American economy. Southwest Gas is dedicated to investing in sustainable and responsible business practices that protect the environment, preserve natural resources and safeguard our customers and employees. With approximately 2,300 employees serving more than 2 million natural gas customers located in Arizona, California and Nevada, we're dedicated to providing a clean, essential and sustainable energy future for our customers, employees and shareholders.[52]

Why was the company included?
Southwest Gas Holdings Inc. provides gas to customers and also has a construction services company. The gas distribution segment is similar to the gas distribution companies that we are responsible for valuing.

Spire Inc., formerly The Laclede Group
Company Summary from Value Line:
Spire Inc., formerly known as the Laclede Group, Inc., is a holding company for natural gas utilities, which distributes natural gas across Missouri, including the cities of St. Louis and Kansas City, Alabama, and Mississippi. Has roughly 1.7 million customers. Acquired Missouri Gas 9/13, Alabama Gas Co 9/14. Utility therms sold and transported in fiscal 2021: 3.3 bill. Revenue mix for regulated operations: residential, 58%; commercial and industrial, 28%; transportation, 6%; other, 8%. Has about 3,710 employees.

Additional Company Information from Website:
The energy industry is changing, and we know that natural gas plays a key role in creating a sustainable energy future. That's why we're committed to advancing our industry, delivering personalized experiences for our customers, and being a company that loves both people and the planet. We serve 1.7 million homes and businesses across Alabama, Mississippi and Missouri by providing affordable,

[52] https://www.swgas.com/en/about-us, accessed 2/7/2023

reliable and clean natural gas to warm homes, grow businesses and advance communities. For more than 160 years, we've served people. With a vision for the future, we're now redefining what it means to serve our customers and communities for the next 100 years. Learn more about our history and how it has shaped our future.[53]

Why was the company included?
Spire Inc. provides gas to customers. This company is similar to the gas distribution companies that we are responsible for valuing.

WEC Energy Group
Company Summary from Value Line:
WEC Energy Group, Inc. (formerly Wisconsin Energy) is a holding company for utilities that provide electric, gas & steam service in WI & gas service in IL, MN, & MI. Customers: 1.6 mill. elec., 2.9 mill. gas. Acq'd Integrys Energy 6/15. Sold Point Beach nuclear plant in '07. Electric revenue breakdown: residential, 39%; small commercial & industrial, 32%; large commercial & industrial, 21%; other, 8%. Generating sources: coal, 36%; gas, 28%; renewables, 5%; purchased, 31%. Fuel costs: 40% of revenues. '21 reported deprec. rates: 2.4%-3.1%. Has 6,900 employees.

Additional Company Information from Website:
We are one of the nation's largest electric generation and distribution and natural gas delivery holding companies, with the operational expertise and financial resources to serve the Midwest's energy needs safely, reliably and responsibly. Our subsidiaries focus on reliable service, customer satisfaction and shareholder value. Together, we provide energy services to more than 4.6 million customers in Wisconsin, Illinois, Michigan and Minnesota. Our combined assets allow operating efficiencies across 71,000 miles of electric distribution lines, 51,400 miles of natural gas distribution and transmission lines, and 7,700 megawatts of reliable power plant capacity. Our family of companies is committed to delivering world-class reliability and the very best customer care anywhere. Customers are the heart of our business, and we work every day to help grow and support communities where we provide vital energy services. As a Fortune 500 company, we value and develop our employees who are making a difference in a mission that matters.[54]

Why was the company included?
WEC Energy Group provides electricity and gas to customers. Electric customers represent 36% of customers and gas customers represent 64% of customers. This company is similar to the gas distribution companies that we are responsible for valuing. The company provides gas distribution services in Minnesota.

We are also using this company as a guideline company for the Electric Market Segment.

[53] https://www.spireenergy.com/about-spire, accessed 2/7/2023
[54] https://www.wecenergygroup.com/about/aboutus.htm, accessed 2/3/2023

Companies Not Included in the Gas Distribution Market Segments

Adams Resources and Energy Inc.
Company Summary from Value Line:
Adams Resources & Energy, Inc., through its subsidiaries, is primarily engages the marketing, transportation, terminalling, and storage in various crude oil and natural gas basins in the US. The company also conducts tank truck transportation of liquid chemicals, pressurized gases, asphalt, and dry bulk primarily in the lower 48 states of the US with deliveries into Canada and Mexico, and with 19 terminals across the US. Adams' crude oil marketing activities includes a fleet of 201 tractor-trailer rigs, the majority of which it owns and operates, used to transport crude oil. The company also maintains approximately 180 pipeline inventory locations or injection stations. In August 2022, Adams completed the purchase of Firebird Bulk Carriers, Inc. and Phoenix Oil, Inc. for an aggregate purchase price of approximately $33 million. In November 2022, the company announced the repurchase of all of the shares of its common stock owned by KSA Industries, Inc. Has 710 employees.

Additional Company Information from Website:
Adams Resources & Energy, Inc. (NYSE AMERICAN:AE) ("Adams" or "AE") is primarily engaged in the business of crude oil marketing, transportation and storage and tank truck transportation of liquid chemicals and dry bulk through its two wholly-owned subsidiaries GulfMark Energy, Inc. ("GulfMark") and Service Transport Company. Adams' strategy is to enhance shareholder value through providing competitive crude oil marketing and transportation services from petroleum producing companies to the refining community, as well as provide safe, reliable and competitive liquid and dry chemical tank transportation services to customers throughout the United States, Canada and into Mexico. Adams' business principles are founded on honesty and integrity and the Company maintains and cultivates an entrepreneurial spirt throughout the organization. Adams believes that strong relationships with its customers and vendors are keys to success for both Adams and its stakeholders. Additionally, the Company is committed to paying a consistent and reliable dividend.[55]

Why was the company not included?
Adams Resources and Energy Inc. is primarily engaged in the business of crude oil marketing, transportation and storage and tank truck transportation of liquid chemicals and dry bulk. These business segments are different than the business segments of the companies that we are responsible for valuing.

AltaGas Canada Inc.
Company Summary from Value Line:
Not available.

Additional Company Information from Website:
We are a North American energy infrastructure company with a focus on connecting customers and markets to affordable and reliable sources of energy. Our talented team, nearly 3,000 strong, leverages the strength of our assets and expertise along the energy value chain to connect customers with premier energy solutions – from the well sites of upstream producers to the doorsteps of homes and businesses, to new markets around the world. Our Midstream business is comprised of global export facilities and strategically located processing, fractionation, and logistics infrastructure, as well as hydrocarbon

[55] https://www.adamsresources.com/about-us/, accessed 2/7/2023

storage in North America that connects North American producers from wellhead to offshore global export and domestic markets. It also includes integrated hydrocarbons handling services comprised of storage, rail logistics, pipeline, transportation services, and wellsite fluids; natural gas and NGL marketing initiatives that support the Midstream infrastructure; and three gas-fired cogeneration plants. Our integrated footprint in the region provides North American producers with value-added services and the opportunity to move LPGs to premium markets in Asia through Ridley Island Propane Export Terminal (RIPET) and the Ferndale Terminal.

Through our regulated natural gas utilities – Washington Gas, SEMCO and ENSTAR – we serve approximately 1.7 million residential, commercial and industrial customers in five jurisdictions in the U.S. including the District of Columbia (D.C.), Maryland, Virginia, Michigan and Alaska. The Utilities business also comprises interests in natural gas storage facilities.

Although no longer core to our strategy, we continue to maintain a small portfolio of power assets including 695 MW of operational gross capacity from natural gas-fired power generation and energy storage assets located in facilities in Alberta, Canada, as well as nine states and the District of Columbia in the United States. The Power business also includes energy efficiency contracting and WGL's retail power marketing business.[56]

Why was the company not included?
This company's initial public offering was on October 25, 2018. The company's operations are located in Western Canada. We will consider this company as a guideline company after several years of established financials.

MGE Energy Inc.
Company Summary from Value Line:
MGE Energy, Inc. is an investor-owned public utility holding company. The company's segments include: regulated electric utility operations, which generates purchases, and distributes electricity through its subsidiary, Madison Gas and Electric Company (MGE); regulated gas utility operations, which purchases and distributes natural gas through MGE; nonregulated energy operations, which owns and leases electric generating capacity that assists MGE through the company's subsidiaries MGE Power Elm Road, LLC, and MGE Power West Campus, LLC; and transmission investments, in which MGE Energy invests in American Transmission Company, LLC, a company that provides electric transmission services in Wisconsin. Madison Gas and Electric, generates and distributes electricity to 159,000 customers in Dane County, Wisconsin., and purchases and distributes natural gas to gas 169,000 customers in seven south-central and western Wisconsin counties. Has 706 employees.

Additional Company Information from Website:
MGE Energy, a public utility holding company, is headquartered in the state capital Madison, Wis. MGE Energy trades on NASDAQ with the stock ticker MGEE. MGE Energy is dedicated to long-term value for its shareholders. We have increased our dividend for more than 47 consecutive years and have paid dividends for more than 110 years. MGE Energy is the parent company of the following:

- Madison Gas and Electric Company (MGE) provides natural gas and electric service in south-central and western Wisconsin.
- MGE Transco Investment holds an ownership interest in ATC LLC, which invests in

[56] https://www.altagas.ca/about/overview-altagas, accessed 2/7/2023

transmission assets, primarily within Wisconsin.

- MGEE Transco LLC holds an ownership interest in ATC Holdco, which invests in transmission assets outside ATC LLC service territory.
- MGE Power owns assets in the West Campus Cogeneration Facility in Madison, Wis. and the Elm Road Generating Station in Oak Creek, Wis.
- MAGAEL, LLC holds title to properties acquired for future utility plant expansion.
- Central Wisconsin Development Corporation promotes business growth in MGE's service area.
- MGE Services, LLC provides construction and other services.[57]

Why was the company not included?
MGE Energy Inc. provides electricity and gas to customers. Electric customers represent 49% of customers and gas customers represent 51% of customers. This company is similar to the electric companies that we are responsible for valuing. The company serves an electric service territory in the Midwest. However, the company has less publicly available information than other guideline companies used in this market segment.

RGC Resources Inc.
Company Summary from Value Line:
RGC Resources, Inc. is engaged in the regulated sale and distribution of natural gas to approximately 62,400 residential, commercial, and industrial customers in Roanoke, Virginia and the surrounding localities through its Roanoke Gas Company subsidiary. The utility operations of Roanoke Gas are regulated by the Virginia State Corporation Commission (SCC), which oversees the terms, conditions, and rates charged to customers for natural gas service, safety standards, extension of service, and depreciation. Nearly all of the company’s revenues, excluding equity in earnings of Mountain Valley Pipeline (MVP), are derived from the sale and delivery of natural gas to Roanoke Gas customers based on rates and fees authorized by the SCC. As a wholly owned subsidiary of Resources, RGC Midstream, L.L.C. (Midstream), is a more than 1% investor in MVP and a less than 1% investor in Mountain Valley Pipeline, LLC’s Southgate project (Southgate). Has 99 employees.

Additional Company Information from Website:
RGC Resources Inc. is a public utility holding Company providing energy and related products and services through its operating subsidiaries Roanoke Gas Company and RGC Midstream, LLC. Roanoke Gas, which began in 1883, provides safe, reliable natural gas service to more than 60,000 customers in the greater Roanoke Valley. RGC Midstream owns a 1 percent interest in the Mountain Valley Pipeline project.[58]

Why was the company not included?
RGC Resources Inc. provides gas to customers. This company is similar to the gas distribution companies that we are responsible for valuing. However, the company has limited analysts’ estimates available.

[57] https://www.mgeenergy.com/en/about/about-mge-energy/, accessed 2/2/2023
[58] https://www.rgcresources.com/about/, accessed 2/7/2023

South Jersey Industries Inc.

Company Summary from Value Line:
South Jersey Industries, Inc. is a holding company. The company distributes natural gas in New Jersey and Maryland. South Jersey Gas rev. mix ’21: residential, 48%; commercial, 23%; cogen. and electric gen., 9%; industrial, 20%. Acq. Elizabethtown Gas and Elkton Gas, 7/18. Nonutil. oper. incl. South Jersey Energy, South Jersey Resources Group, South Jersey Exploration, Marina Energy, South Jersey Energy Service Plus, and SJI Midstream. Has about 1,173 employees.

Additional Company Information from Website:
SJI (NYSE: SJI), an energy services holding company based in Folsom, NJ, delivers energy services to its customers through three primary subsidiaries. SJI Utilities, SJI's regulated natural gas utility business, delivers safe, reliable, affordable natural gas to approximately 700,000 South Jersey Gas and Elizabethtown Gas customers. SJI's non-utility businesses within South Jersey Energy Solutions promote efficiency, clean technology and renewable energy by providing customized wholesale commodity marketing and fuel management services; and developing, owning and operating on-site energy production facilities. SJI Midstream houses the company's interest in the PennEast Pipeline Project.[59]

Why was the company not included?
South Jersey Industries is no longer publicly traded after being acquired by Infrastructure Investments Fund (IIF) as of February 2022.

Star Group L.P. (formerly Star Gas Partners, L.P.)

Company Summary from Value Line:
Star Group, L.P. is specializing in the sale of home heating products and services to residential and commercial customers to heat their homes and buildings. The company’s operations are conducted through Petro Holdings, Inc. and its subsidiaries. Petro is primarily a Northeast, Central, and Southeast region retail distributor of home heating oil and propane that at June 30, 2022, served approximately 421,000 full service residential and commercial home heating oil and propane customers and 73,200 customers on a delivery only basis. It also sells gasoline and diesel fuel to approximately 27,800 customers. The company installs, maintains, and repairs heating and air conditioning equipment and to a lesser extent provide these services outside its heating oil and propane customer base including approximately 18,200 service contracts. In October 2022, Star Group declared its quarterly distribution of $0.1525 per common unit for the three months ended September 30, 2022. Has 3121 employees.

Additional Company Information from Website:
Star Group, L.P. is a full service energy provider specializing in the sale of home heating and air conditioning products and services to residential and commercial customers. The Company also services and sells heating and air conditioning equipment and for certain areas, provides plumbing services. In addition, Star sells diesel fuel, gasoline and home heating oil on a delivery-only basis. Star is the nation's largest retail distributor of home heating oil, based upon sales volume, operating throughout the Northeast and Mid-Atlantic. Star Group, is a limited partnership that has approved an election to be treated as a corporation for U.S. federal income tax purposes effective November 1, 2017. Common units, representing limited partner interests in the Company, are listed and trade on the New York Stock

[59] https://www.sjindustries.com/about-sji/company-overview, accessed 2/2/2023

Exchange ("NYSE") under the symbol "SGU." For Company activity through October 31, 2017, our unitholders are required to report for U.S. federal income tax purposes their allocable share of our income, gains, losses, deductions and credits, regardless of whether we make cash distributions. This activity will be reported on final 2017 Schedules K-1.[60]

Why was the company not included?
This company's business segments include sale of home heating and air conditioning products and services to residential and commercial home heating oil and propane customers. These business segments are different than the business segments of the companies that we are responsible for valuing.

UGI Corporation
Company Summary from Value Line:
UGI Corp. operates six business segments: AmeriGas Propane (accounted for 35.1% of net income in 2021), UGI International (35.6%), Gas Utility (13.6%), Midstream & Marketing (15.9%), and Corp. & Other (-2%). UGI Utilities distributes natural gas and electricity to over 672,000 customers mainly in Pennsylvania; wholly-owned AmeriGas Ptrs. is the largest U.S. propane marketer, serving about 1.5 million users in 50 states. Acquired remaining 80% interest in Antargaz (3/04); Energy Transfer Partners (1/12). Vanguard Group owns 11.0% of stock; Blackrock, 11.8%; Officers/ directors, 2.0% (12/21 proxy). Has 11,300 empls.

Additional Company Information from Website:
International distributor and marketer of energy products and services, including natural gas, LPG, electricity and renewable solutions, with well-developed infrastructure in key markets. By operating as a best-in-class service provider, offering a great place to work, serving our communities and delivering value to investors, we aim to positively impact the lives of our shareholders, employees, customers and communities. UGI Corporation (NYSE: UGI) is a holding company that distributes and markets energy products and services through our subsidiaries and the company's common stock is a balanced growth and income investment. UGI Corporation has paid common dividends for more than 137 consecutive years.[61]

Why was the company not included?
This company's non-gas utility segments accounted for most of their net income. Their gas utility segment only accounted for 13.6% of their net income. Unregulated business segments are different from the companies that we are responsible for valuing.

[60] http://www.stargrouplp.com/investor-relations, accessed 2/7/2023
[61] https://www.ugicorp.com/company/corporate-information/about-ugi/default.aspx, accessed 2/7/2023

Market Segment: Gas Transmission Pipeline and Fluid Transportation Pipeline

Companies Included in the Gas Transmission Pipeline Market Segment

Enbridge Inc.
Company Summary from Value Line:
Enbridge Inc., is a leader in energy transportation and distribution in North America and int'l. As a transporter of energy, it operates the world's longest crude oil and liquids pipeline system. The company also has international operations and a growing involvement in natural gas transmission and midstream businesses. As a distributor of energy, it owns and operates Canada's largest natural gas distribution company, and provides services in Ontario, Quebec, New Brunswick, and New York State. Owns 38.9% of Noverco. In '17, Merged with Spectra Energy Corp. (SE). Employs. 11,300.

Additional Company Information from Website:
Our name spells out our mission: a bridge to a cleaner energy future. That bridge safely connects millions of people around the world to the energy they rely on every day, fueling quality of life. Throughout our history, and especially today, we are looking beyond the horizon to invest in and build modern infrastructure, resilient communities and reliable energy. We operate across North America and beyond—powering industry, empowering society and safely delivering reliable, affordable sources of energy through our four core businesses: Liquids pipelines, Natural gas pipelines, Gas utilities and storage, Renewable energy. We move about 30% of the crude oil produced in North America, we transport nearly 20% of the natural gas consumed in the U.S., and we operate North America's third-largest natural gas utility by consumer count. Enbridge was an early investor in renewable energy, and we have a growing offshore wind portfolio. As a diversified energy company, we are uniquely positioned to help accelerate the global transition to a cleaner energy future, and we're doing it in ways that are ethical, sustainable and socially responsible. We're advancing new low-carbon energy technologies—including hydrogen, renewable natural gas, and carbon capture and storage. We're committed to reducing the carbon footprint of the energy we deliver, and to achieving net zero emissions by 2050. Enbridge was named to the Thomson Reuters Top 100 Global Energy Leaders in 2018; we've been selected to Bloomberg's Gender Equality Index four years running, most recently in 2022; and we have been ranked among Canada's Top 100 Employers 19 times, most recently in 2022. Enbridge Inc. is headquartered in Calgary, Canada. We have a workforce of more than 12,000 people, primarily in the United States and Canada. Enbridge (ENB) is traded on the New York and Toronto stock exchanges.[62]

At Enbridge, we connect people to the energy they need to fuel their quality of life. Enbridge operates the world's longest and most complex crude oil and liquids transportation system, with approximately 17,809 miles (28,661 kilometers) of active crude pipeline across North America—including 9,299 miles (14,965 km) of active pipe in the United States, and 8,510 miles (13,696 km) of active pipe in Canada.[63]

Why was the company included?
Enbridge Inc. transports 20% of the natural gas consumed in the U.S. with 73,796 miles of gas transmission and midstream pipelines in 30 U.S. states, five Canadian provinces, and offshore in the

[62] https://www.enbridge.com/about-us, accessed 2/7/2023
[63] https://www.enbridge.com/About-Us/Liquids-Pipelines.aspx, accessed 2/7/2023

Gulf of Mexico.[64] This company is similar to the gas transmission pipeline companies that we are responsible for valuing. Enbridge Inc. also has 17,809 miles of active crude pipelines across North America.

Kinder Morgan Inc.

Company Summary from Value Line:
Kinder Morgan, Inc. is one of the largest energy infrastructure companies in North America. It transports natural gas, refined petroleum products, crude oil, condensate and carbon dioxide among other products using its more than 83,000 miles of pipelines. Its 147 terminals handle various commodities, including gasoline, diesel fuel, chemicals, ethanol, metals and petroleum coke. The company employs more than 11,000 individuals. Sold Kinder Morgan Canada, 12/18.

Additional Company Information from Website:
Kinder Morgan is one of the largest energy infrastructure companies in North America. We own an interest in or operate approximately 82,000 miles of pipelines and 140 terminals. Our pipelines transport natural gas, gasoline, crude oil, carbon dioxide (CO2) and more. Our terminals store and handle renewable fuels, petroleum products, chemicals, vegetable oils and other products.[65]

With approximately 70,000 miles of natural gas pipelines, we own an interest in or operate the largest natural gas network in North America. Our pipelines serve major consuming domestic markets and transport approximately 40 percent of the natural gas consumed in the United States. Our pipelines are also connected to every important natural gas resource play and supply area in the United States, including the Eagle Ford, Marcellus, Bakken, Utica, Uinta Permian, Haynesville, Fayetteville and Barnett.[66]

Kinder Morgan is the largest independent transporter of petroleum products in North America, transporting approximately 2.4 million barrels per day. The great majority of these products are transported through our Products Pipelines business, which moves gasoline, jet fuel, diesel, natural gas liquids and condensate through about 9,500 miles of pipelines. We also have approximately 65 liquids terminals in this business segment that store fuels and offer blending services for ethanol and biofuels. Our Products Pipelines assets are strategically located in the West, Southeast and Midwestern United States and we have a number of exciting growth opportunities in this segment.[67]

Why was the company included?
Kinder Morgan Inc. owns an interest in or operates approximately 82,000 miles of natural gas pipelines and 140 terminals. Kinder Morgan Inc. has approximately 70,000 miles of natural gas pipelines and 9,500 miles of petroleum products pipelines. This company is similar to the gas transmission pipeline companies that we are responsible for valuing. The company is the parent company for one of the companies that we are responsible for valuing.

ONEOK Inc.

Company Summary from Value Line:
ONEOK, Inc. is a leading midstream service provider. It owns premier natural gas liquids systems connecting supply in the Mid-Continent, Permian, and Rocky Mountain regions with key market centers. Has three operating segments: natural gas liquids, natural gas gathering and processing, and

[64] https://www.enbridge.com/About-Us/Natural-Gas-Transmission-and-Midstream.aspx, accessed 2/7/2023
[65] https://www.kindermorgan.com/, accessed 2/7/2023
[66] https://www.kindermorgan.com/Operations/Natural-Gas/Index, accessed 2/7/2023
[67] https://www.kindermorgan.com/Operations/Products/Index, accessed 2/7/2023

natural gas pipelines. Completed separation of natural gas distribution business in February of 2014. Has 2,886 employees.

Additional Company Information from Website:
We are a leading midstream service provider and own one of the nation's premier natural gas liquids systems, connecting NGL supply in the Rocky Mountain, Mid-Continent and Permian regions with key market centers and an extensive network of natural gas gathering, processing, storage and transportation assets. We apply our core capabilities of gathering, processing, fractionating, transporting, storing and marketing natural gas and NGLs through vertical integration across the midstream value chain to provide our customers with premium services while generating consistent and sustainable earnings growth. Our primary business strategy is to maintain prudent financial strength and flexibility while growing our profits, fee-based earnings and dividends per share with a focus on safe, reliable, environmentally responsible, legally compliant and sustainable operations for our customers, employees, contractors and the public through the following: Operate in a safe, reliable, environmentally responsible and sustainable manner – environmental, safety and health issues continue to be a primary focus for us, and our emphasis on personal and process safety has produced improvements in the key indicators we track. We also continue to look for ways to reduce our environmental impact by conserving resources and utilizing more efficient technologies. Maintain prudent financial strength and flexibility while growing our fee-based earnings, dividends per share and cash flows from operations in excess of dividends paid – we operate primarily fee-based businesses in each of our three reportable segments. We continue to invest in organic growth projects to expand in our existing operating regions and provide a broad range of services to crude oil and natural gas producers and end-use markets. Manage our balance sheet and maintain investment-grade credit ratings – we seek to maintain investment-grade credit ratings. Attract, select, develop, motivate, challenge and retain a diverse group of employees to support strategy execution – we continue to execute on our recruiting strategy that targets professional and field personnel in our operating areas. We also continue to focus on employee development efforts with our current employees and monitor our benefits and compensation package to remain competitive.[68]

Why was the company included?
ONEOK Inc.'s operations include an integrated network of NGL and natural gas pipelines. This company is similar to the gas transmission pipeline companies that we are responsible for valuing. The company is the parent company for one of the companies that we are responsible for valuing.

Pembina Pipeline Corporation
Company Summary from Value Line:
Pembina Pipeline Corp. gathers, processes, and transports oil and natural gas in Western Canada. It owns and operates an integrated system of pipelines, gas gathering and processing facilities, and an oil and NGL infrastructure and logistics line. Its pipelines manages transportation capacity of 3.1 mmboe/d. Acquired Veresen, '17; Kinder Morgan Canada, '19. 2021 net volumes (operating income): Conventional Pipelines: 75% (56%); Facilities 25% (44%). Daily 2021 liquids throughput: 2.571 billion barrels; Oil Sands, 19%. Has 1,539 employees.

Additional Company Information from Website:
Pembina Pipeline Corporation is a dynamic energy transportation and midstream provider, serving customers for more than 65 years. Chances are, we do more than you think. We own pipelines that transport hydrocarbon liquids and natural gas products produced primarily in Western Canada. We also own gas gathering and processing facilities and an oil and natural gas liquids infrastructure and logistics

[68] http://www.oneok.com/about-us/what-we-do, accessed 2/7/2023

business. Our operations along the hydrocarbon value chain allow us to offer a full slate of midstream and marketing services to our customers in the energy industry. We're always keeping an eye out for opportunities to connect hydrocarbon production to new demand locations. These developments help ensure that hydrocarbons produced in the Western Canadian Sedimentary Basin -- and the other basins where Pembina operates -- can reach the highest value markets throughout the world. We're proud of our people and our more than 65 years of strong performance.[69]

Why was the company included?
Pembina Pipeline Corporation's business segments include transporting oil and natural gas and operating an integrated system of pipelines. The company's mix of business operations is similar to other companies included in the gas transmission market segment.

TC Energy Corporation (formerly known as TransCanada Corporation)
Company Summary from Value Line:
TC Energy Corp, formerly known as TransCanada Corp., operates the most extensive natural gas pipeline system in North America. The company's 50,640 mi. of natural gas pipelines supply more than 25% of clean burning natural gas consumed in North America, and it has gas storage facilities with a 653 bill. cubic capacity. It has 2,700 mi. of liquids pipelines. Its three major segments are natural gas pipelines (79% of '20 revenues), oil pipelines (18%), and power/storage (3%). Has 7,305 employees.

Additional Company Information from Website:
We're more than a pipeline company. Approximately 7,300 people strong, TC Energy is a vital part of modern life. Thanks to a safe, stable network of natural gas and crude oil pipelines, along with nuclear power facilities, wherever life happens — we're there. For more than 70 years, TC Energy has proudly operated pipelines, storage facilities and power-generation plants that support life in Canada, the U.S. and Mexico. Our facilities operate safely, reliably and quietly. Explore our core operations below. Energy Solutions – Positioned to be the most trusted and reliable resource of carbon free energy for North America's industrial, oil and natural gas sectors. Natural Gas - 93,300 km (57,900 miles) of pipeline and more than 653 billion cubic feet (Bcf) of natural gas storage in Canada, the U.S. and Mexico. Oil and Liquids - 4,900 km (3,000 miles) pipeline network supplying Alberta crude oil to U.S. markets in Illinois, Oklahoma, Texas and the U.S. Gulf Coast. Power and Storage – Investments in seven power generation facilities of 4,300 megawatts, enough to power more than four million homes.[70]

Why was the company included?
TC Energy Corporation's assets include 57,900 miles of natural gas pipelines. This company is similar to the gas transmission pipeline companies that we are responsible for valuing. The company is the parent company for one of the companies that we are responsible for valuing.

Williams Companies Inc.
Company Summary from Value Line:
The Williams Companies, Inc., gathers, processes, and transports natural gas throughout the United States. It also performs gas marketing services. Business segments include Transmission & Gulf of Mexico, Northeast G&P, West, and other. Acquired Access Midstream Partners, 7/14; WPX Energy, 1/12. I.P.O. for Williams Partners L.P., 8/05; Williams Pipeline Partners L.P., 1/08. Reacquired Williams Pipeline Partners L.P. 10/18. Has about 5,425 employees.

[69] https://www.pembina.com/about/, accessed 2/16/2023
[70] https://www.tcenergy.com/about/, accessed 2/7/2023

Additional Company Information from Website:
Williams handles one third of the natural gas in the United States that is used every day to heat our homes, cook our food and generate our electricity. Williams works closely with customers to provide the necessary infrastructure to serve growing markets and safely deliver natural gas products to reliably fuel the clean energy economy. With interstate natural gas pipelines and gathering & processing operations throughout the country, we reliably deliver value to our employees, investors, customers and communities by running our business with authenticity and a safety-driven culture, leading our industry into the future. Williams common stock (WMB) is listed on the New York Stock Exchange.[71]

Why was the company included?
Williams Companies Inc. handles one third of the natural gas in the United States. This company is similar to the gas transmission pipeline companies that we are responsible for valuing.

Companies Included in the Fluid Transportation Pipeline Market Segment

Holly Energy Partners L.P.
Company Summary from Value Line:
Holly Energy Partners, L.P. is a publicly held master limited partnership (MLP) that owns and operates petroleum product and crude oil pipelines, terminal, tankage & loading, and refineries that support Holly Frontier's (HFC) operations in the midcontinent, southwest, and northwest US and Alon USA's refinery in TX. Has two segments: Pipelines and Terminals, which transports light refined products from HFC's Navajo refinery and Alon USA's TX refinery to customers; and Refinery Processing Unit, which supports HFC's daily refining operations.

Additional Company Information from Website:
Holly Energy Partners, L.P. ("HEP") is a Delaware limited partnership formed in early 2004 by HollyFrontier and is headquartered in Dallas, Texas. HEP provides petroleum product and crude oil transportation, terminalling, storage and throughput services to the petroleum industry, including subsidiaries of HF Sinclair Corporation. HEP, through its subsidiaries and joint ventures, owns and/or operates petroleum product and crude pipelines, tankage and terminals in Colorado, Idaho, Iowa, Kansas, Missouri, Nevada, New Mexico, Oklahoma, Texas, Utah, Washington and Wyoming, as well as refinery processing units in Kansas and Utah. Business Highlights: Our assets are located in attractive high-growth markets; Revenues are mainly fee based revenues with limited commodity risk; A substantial part of our business operates under long-term contracts with minimum volume commitments; Strategic relationship with HF Sinclair; Experienced management team with a proven track record.[72]

Why was the company included?
Holly Energy Partners owns and operates petroleum product and crude oil pipelines, terminal, tankage and loading, and refineries. This company is similar to the fluid transportation pipeline companies that we are responsible for valuing.

Magellan Midstream Partners L.P.
Company Summary from Value Line:
Magellan Midstream Partners, L.P., engages in the transportation, storage, and distribution of hydrocarbons and related products, largely in the U.S. Gulf coast and upper Midwest regions. Segments:

[71] https://co.williams.com/our-company/, accessed 2/7/2023
[72] http://www.hollyenergy.com/about-us/corporate-structure/default.aspx, accessed 2/3/2023

Refined products (68% of 2021 Revs., 58% of operating income) has 9,800 miles of pipeline and 54 terminals, as well as 2 marine storage facilities; Crude oil (32%, 42%) has 2,200 miles of pipeline and storage capacity of 39 million barrels; Acquired Longhorn Pipeline, 7/09; storage and pipeline assets from BP, 9/10. Employs 1,715.

Additional Company Information from Website:
Magellan Midstream Partners, L.P. is a publicly traded partnership that primarily transports, stores and distributes refined petroleum products and crude oil based in Tulsa, Okla. Formerly a part of Williams Companies, Magellan began trading as Williams Energy Partners in February 2001. In September 2003, we changed our name to Magellan Midstream Partners and began trading under the stock ticker MMP. In 2004, Magellan purchased significant assets from Shell, including more than 3,000 miles of refined product pipelines as well as terminals and storage capacity. In 2009, we bought the Longhorn Pipeline running from Houston to El Paso. The reversal of this line has played a key part in Magellan's move into the crude oil business. In 2010, Magellan purchased another 100 miles of pipeline and 7.8 million barrels of storage from BP. In 2013, Magellan acquired approximately 800 miles of refined petroleum products pipeline, four terminals and 1.7 million barrels of storage from Plains All American Pipeline. This purchase added assets in Colorado, New Mexico, South Dakota and Wyoming. Today, Magellan has a 9,800-mile refined products pipeline system with 54 connected terminals and two marine storage terminals (one of which is owned through a joint venture). In addition, we own approximately 2,200 miles of crude oil pipelines, a condensate splitter and storage facilities with an aggregate storage capacity of about 39 million barrels, of which 29 million are used for contract storage. Approximately 1,000 miles of these pipelines, the condensate splitter and 31 million barrels of this storage capacity (including 25 million barrels used for contract storage) are wholly-owned, and the remainder is owned through joint ventures.[73]

Why was the company included?
Magellan Pipeline is an oil pipeline, storage and transportation company. This company is similar to (and is one of) the fluid transportation pipeline companies that we are responsible for valuing.

MPLX L.P.
Company Summary from Value Line:
MPLX LP is a diversified, growth-oriented master limited partnership (MLP) formed in 2012 by Marathon Petroleum Corporation to own, operate, develop and acquire midstream energy infrastructure assets. It is engaged in the gathering, processing, storage, marketing, and transportation of natural gas, crude oil, and other refined petroleum products. MPLX's assets consist of a network of common carrier crude oil and products pipelines located in the Midwest and Gulf Coast regions of the US. Has no direct employees.

Additional Company Information from Website:
MPLX is a diversified, growth-oriented master limited partnership formed in 2012 by MPC to own, operate, develop and acquire midstream energy infrastructure assets. We are engaged in the gathering, processing and transportation of natural gas; the gathering, transportation, fractionation, storage and marketing of NGLs; the transportation, storage and distribution of crude oil and refined petroleum products; as well as refining logistics and fuels distribution services. MPLX provides services in the midstream sector across the hydrocarbon value chain through our Logistics and Storage and Gathering and Processing segments.[74]

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[73] https://www.magellanlp.com/AboutUs/Default.aspx, accessed 2/3/2023
[74] http://www.mplx.com/About_MPLX/, accessed 2/3/2023

MPLX transports, distributes, stores and markets crude oil, refined products and other hydrocarbon-based products throughout the U.S. These assets consist of a network of wholly and jointly-owned common carrier crude oil and refined product pipelines and associated storage assets, refined product terminals, storage caverns, refinery integrated tank farm assets including rail and truck racks, a marine business, export terminals, and wholesale and fuels distribution businesses.[75]

Why was the company included?
This company is similar to the fluid transportation pipeline companies that we are responsible for valuing. The company engages in the transports of refined petroleum products.

NuStar Energy L.P.
Company Summary from Value Line:
NuStar Energy L.P., is engaged in the transportation of petroleum products and anhydrous ammonia, as well as the terminalling, storage, and marketing of petroleum products. On 12/31/21 assets included 9,910 miles of pipeline and 73 terminal and storage facilities, providing 72 million barrels of storage capacity. Three reportable segments: Pipelines (47% of segment revs. in 2021), Storage (27%), and Fuels Marketing (26%). Has 1,267 employees.

Additional Company Information from Website:
Since it went public in 2001, NuStar Energy L.P. has grown from 160 employees to about 1,200 today; from $387 million in assets to $5 billion; and from $100 million in revenues to $1.6 billion. As a result of its growth, NuStar currently has approximately 10,000 miles of pipeline and 63 terminal and storage facilities that store and distribute crude oil, refined products, renewable fuels, ammonia and specialty liquids. The partnership's combined system has approximately 49 million barrels of storage capacity at its facilities, and operations in the United States, Canada and Mexico. Known for its special caring and sharing culture, NuStar has been ranked as one of FORTUNE's "100 Best Companies to Work For" 12 times, recognized with many national safety awards, and lauded for its tremendous commitment to community service. NuStar Energy L.P. is an Equal Opportunity/Affirmative Action Employer including Women, Minorities, Veterans and Individuals with Disabilities.[76]

Why was the company included?
NuStar Energy LP transports petroleum products and anhydrous ammonia, as well as the terminal hauling, storage, and marketing of petroleum products. This company is similar to (and is one of) the fluid transportation pipeline companies that we are responsible for valuing.

Plains All American Pipeline L.P.
Company Summary from Value Line:
Plains All American Pipeline, L.P., is a publicly traded master limited partnership which operates through various subsidiaries. It engages in the transportation, storage, terminating, and marketing of crude oil, refined products, and liquefied petroleum gas. As of December 31, 2021, the company owned or leased 18,300 miles of active pipelines and gathering systems. Storage capacity 38 million barrels of natural gas liquids (NGL) storage facilities; About 74 millions barrels of crude oil and refined product. Also owns 815 trailers (primarily in Canada); 5 nat. gas processing plants, and 22 rail terminals. Employs 4,400.

[75] https://www.mplx.com/About_MPLX/Logistics_and_Storage/, accessed 2/3/2023
[76] http://www.nustarenergy.com/Company, accessed 2/3/2023

Additional Company Information from Website:
Plains (NASDAQ: PAA) is a publicly traded master limited partnership that owns and operates midstream energy infrastructure and provides logistics services for crude oil, natural gas liquids (NGL) and natural gas. PAA owns an extensive network of pipeline transportation, terminalling, storage and gathering assets in key crude oil and NGL producing basins and transportation corridors and at major market hubs in the United States and Canada. On average, Plains handles more than 6 million barrels per day of crude oil and natural gas liquids through our extensive network of assets located in key North American producing basins, major market hubs, and transportation gateways. This plays a vital role in the movement of U.S. and Canadian energy supplies.[77]

Why was the company included?
Plains All American Pipeline LP owns an extensive network of pipeline transportation, terminalling, storage, and gathering assets. This company is similar to the fluid transportation pipeline companies that we are responsible for valuing.

Companies Not Included in the Gas Transmission Pipeline or Fluid Transportation Pipeline Market Segments

Antero Midstream Corporation
Company Summary from Value Line:
Antero Midstream Corporation was created in March of 2019 when majority owner Antero Resources merged Antero Midstream Partners with AMGP, which was the General Partner and holder of the MLP's incentive distribution rights. The new entity owns and operates an integrated system of natural gas gathering pipelines, compression stations, processing and fractionation plants in the Marcellus and Utica Shales. Also owns water handling and treatment infrastructure that delivers fresh water and wastewater handling services for well completion operations.

Additional Company Information from Website:
Antero Midstream Corporation owns and operates midstream energy assets servicing rich gas production in two of the lowest cost natural gas and natural gas liquids (NGL) basins in North America: the Marcellus Shale and Utica Shale.
MMcf/d of low pressure gathering: 2,952 in 3Q 2022
MBbl/d fresh water delivery: 103 in 3Q 2022
Gathering and Processing: Over 450 miles of gathering pipeline and 1.6 Bcf/d processing capacity
Water Handling: Over 325 miles of fresh water pipelines and an integrated flowback and producer water system.[78]

Why was the company not included?
Created in March 2019. We will consider this company after they have established financials.

Antero Resources Corporation
Company Summary from Value Line:
Antero Resources Corporation is an energy company engaged in the exploration and development of natural gas, NGLs, and oil properties in the Appalachian Basin. Holds 557,475 acres in parts of West Virginia, Ohio, and Pennsylvania. 2021 proved reserves: 17,729 bcfe consisting of 10,204 bcfe of

[77] https://www.plainsallamerican.com, accessed 2/7/2023
[78] https://www.anteromidstream.com/, accessed 2/2/2023

natural gas, 1,255 mmbbl NGLs, and 36 mmbbl oil. Net daily production averaged 3,271 mmcfe per day in 2021. Employees: 519. Depreciation rate: 5.4%.

Additional Company Information from Website:
Antero Resources is an independent oil and gas company that acquires, explores, develops, and produces natural gas, natural gas liquids (“NGLs”), and oil in the Appalachian Basin. Headquartered in Denver, we focus on developing low-cost, repeatable, liquids-rich unconventional targets in the Marcellus and the Utica shales, two of the premier North American shale plays. With a long history in Appalachia, we prioritize the well-being of our employees and neighbors and make long-term investments to strengthen the communities where we operate. Antero Resources is a leading gas producer and a top liquids producer. Due to our leading transportation portfolio and partial ownership of Antero Midstream (NYSE: AM), Antero is the most integrated natural gas and NGL business in the U.S. and one of the largest suppliers to the U.S. liquefied natural gas (LNG) market. Our affiliate, Antero Midstream, operates gathering pipelines, compression, and processing assets also in the Appalachian Basin—making us one of the most integrated natural gas producers in the US.[79]

Why was the company not included?
This company is involved in exploration and development, which is not similar to the main business segments of the companies we are responsible for valuing.

Callon Petroleum Co.
Company Summary from Value Line:
Callon Petroleum Company is an independent oil and natural gas company focused on the acquisition, exploration, and development of assets in the Permian Basina and Eagle Ford in Texas. During the year ended December 31, 2021, the company produced 95,559 barrels of oil equivalent (boe, approximately 63% oil); and reported proved reserves of 484.6 million boe. Acquired Carrizo Oil & Gas, 12/19. Shell Trading Company accounted for 31% of ’21 revenues; Valero Energy, 23%.

Additional Company Information from Website:
Callon Petroleum is an independent oil and natural gas company focused on the acquisition, exploration and development of high-quality assets in the leading oil plays of West and South Texas.[80]

We entered the Permian Basin in 2009 with the acquisition of approximately 8,800 net acres for $16 million. Through continued execution of our acquisition, delineation, and rationalization strategies, we focused our footprint on approximately 75,000 net acres in the Midland and Delaware Basins. In 2019, we completed our merger with Carrizo Oil & Gas which expanded our core footprint across the Permian Basin and added the Eagle Ford Shale. Today, we have approximately 180,000 net acres across both basins. Our size allows us to efficiently pivot our business and capitalize on new opportunities. As a company operating the vast majority of our acreage, we have the flexibility to modify development plans to appropriately address continuously-changing industry conditions and commodity price cycles. We have also proven our ability to move quickly to capitalize on opportunities to acquire new acreage and integrate into our operations, positioning us for additional consolidation of assets in the future.[81]

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[79] https://www.anteroresources.com/about-us, accessed 2/3/2023
[80] https://www.callon.com/about-callon, accessed 2/7/2023
[81] https://www.callon.com/operations, accessed 2/7/2023

Why was the company not included?
The company's development of unconventional onshore oil and natural gas reserves is not similar to the main business segments of the companies we are responsible for valuing.

Cheniere Energy Inc.
Company Summary from Value Line:
Cheniere Energy, Inc. engages in the liquefied natural gas (LNG) business and related natural gas pipelines in the Gulf Coast of the U.S. It operates the Sabine Pass LNG terminal in western Louisiana on the Sabine Pass Channel, and is developing Corpus Christi LNG near Corpus Christi, Texas; and Creole Trail LNG at the Calcasieu Channel in Louisiana. It operates the Creole Trail Pipeline, consisting of 94 miles of pipeline connecting the Sabine Pass LNG terminal to various existing interstate natural gas pipelines in southwest Louisiana. Has 1,519 employees.

Additional Company Information from Website:
Cheniere Energy, Inc. (NYSE American: LNG) (Cheniere), is a Houston-based energy company primarily engaged in LNG-related businesses. Through its subsidiaries, Cheniere owns and operates two natural gas liquefaction and export facilities located in Cameron Parish, Louisiana at Sabine Pass and near Corpus Christi, Texas (respectively, the "Sabine Pass LNG Terminal" and "Corpus Christi LNG Terminal"). Cheniere is also engaged in the LNG and natural gas marketing business through its subsidiary, Cheniere Marketing, LLC (together with its subsidiaries, "Cheniere Marketing"). Cheniere's subsidiary, Cheniere Energy Partners, L.P. (NYSE American: CQP) (Cheniere Partners) owns the Sabine Pass LNG Terminal which has natural gas liquefaction facilities consisting of six operational Trains for a total production capacity of approximately 30 mtpa of LNG (the "SPL Project"). The Sabine Pass LNG Terminal also has operational regasification facilities that include five LNG storage tanks, vaporizers and three marine berths. Cheniere Partners also owns the Creole Trail Pipeline, a 94-mile pipeline that interconnects the Sabine Pass LNG Terminal with a number of large interstate pipelines. As of June 30, 2022, Cheniere owned 100% of the general partner interest and a 48.6% limited partner interest in Cheniere Partners. The Corpus Christi LNG Terminal currently has three operational Trains for a total production capacity of approximately 15 mtpa of LNG, three LNG storage tanks and two marine berths. Cheniere is constructing an expansion of the Corpus Christi LNG Terminal (the "Corpus Christi Stage 3 Project") for seven midscale Trains with an expected total production capacity of over 10 mtpa of LNG. Through our wholly-owned subsidiary Cheniere Corpus Christi Pipeline, L.P., Cheniere also owns a 21.5-mile natural gas supply pipeline that interconnects the Corpus Christi LNG Terminal with several interstate and intrastate natural gas pipelines (the "Corpus Christi Pipeline" and together with the existing operational Trains, midscale trains, storage tanks and marine berths, the "CCL Project"). Cheniere has increased available liquefaction capacity at the SPL Project and the CCL Project as a result of debottlenecking and other optimization projects. Cheniere and its subsidiaries hold significant land positions at both the Sabine Pass LNG Terminal and the Corpus Christi LNG Terminal, which provide opportunity for further liquefaction capacity expansion. The development of these sites or other projects, including infrastructure projects in support of natural gas supply and LNG demand, will require, among other things, acceptable commercial and financing arrangements before Cheniere makes a positive FID.[82]

Why was the company not included?
This company is mainly located on the Gulf Coast. The Gulf Coast is a different market than the market of the companies for which we are responsible for valuing.

[82] https://lngir.cheniere.com/company-information, accessed 2/7/2023

Cheniere Energy Partners L.P.

Company Summary from Value Line:

Cheniere Energy Partners, L.P., through its subsidiary, Sabine Pass Liquefaction, LLC (SPL), is developing, constructing, and operating natural gas liquefaction (NGL) facilities at the Sabine Pass LNG terminal located in Cameron Parish, Louisiana. The company also owns a 94-mile pipeline that connects the Sabine Pass LNG terminal with a number of large interstate pipelines via its subsidiary, Cheniere Creole Trail Pipeline, L.P. (CTPL). Finally, through the Sabine Pass LNG, L.P. (SPLNG) subsidiary, Cheniere owns and operates regasification facilities at the Sabine Pass LNG terminal.

Additional Company Information from Website:

Cheniere Energy Partners, L.P. (NYSE American: CQP) is a publicly traded Delaware limited partnership formed by Cheniere Energy, Inc. ("Cheniere"). Cheniere Partners provide clean, secure and affordable LNG to integrated energy companies, utilities and energy trading companies around the world. Cheniere Partners aspires to conduct our business in a safe and responsible manner, delivering a reliable, competitive and integrated source of LNG to its global customers. Cheniere Partners owns the Sabine Pass LNG terminal located in Cameron Parish, Louisiana, which has natural gas liquefaction facilities consisting of six liquefaction Trains, with a total production capacity of approximately 30 mtpa of LNG. The Sabine Pass LNG terminal also has operational regasification facilities that include five LNG storage tanks, vaporizers, and three marine berths. Cheniere Partners also owns the Creole Trail Pipeline, which interconnects the Sabine Pass LNG terminal with a number of large interstate pipelines.[83]

Why was the company not included?

This company is mainly located on the Gulf Coast. The Gulf Coast is a different market than the market of the companies for which we are responsible for valuing.

Clean Energy Fuels Corp

Company Summary from Value Line:

Clean Energy Fuels Corp. provides natural gas as an alternative fuel for vehicle fleets in the United States and Canada. It designs, builds, finances, and operates fueling stations and supplies compressed natural gas and liquefied natural gas. The company serves over 1,000 fleet customers operating over 48,000 natural gas vehicles in various markets, including public transit, refuse hauling, airports, taxis, and trucking. It owns, operates, and supplies about 548 natural gas fueling stations. Also constructs fueling stations and sells or leases the stations to customers. Has about 482 employees.

Additional Company Information from Website:

Renewable natural gas is the cleanest solution available today for heavy-duty trucks. It's accessible, affordable, and the fastest way to lower carbon emissions. By 2025, the renewable natural gas we provide at Clean Energy stations will be fully zero-carbon and it will be available at all of our stations across North America. That's 20 years ahead of California's own statewide goal. The potential for renewable natural gas doesn't just stop there. Renewable natural gas can also be used as the feedstock for alternative solutions still in development, like hydrogen and electric, which are only as green as the fuel that makes them possible. Should our customers decide to explore these alternatives in the future, we'll be able to continue to support them by providing a renewable natural gas feedstock that is rated many times cleaner than most alternatives. We have experience building and operating hydrogen stations, and can even retrofit our current Clean Energy stations to add hydrogen.[84]

[83] https://cqpir.cheniere.com/company-information, accessed 2/7/2023
[84] https://www.cleanenergyfuels.com/about-us/, accessed 2/7/2023

Why was the company not included?
This company provides natural gas an alternative fuel for vehicle fleets. This business segment is not similar to the main business segments of the companies we are responsible for valuing.

CNX Resources Corp
Company Summary from Value Line:
CNX Resources Corp. is one of the largest independent natural gas exploration, development and production companies, with operations centered in the major shale formations of the Appalachian basin. It produced 590.2 bcfe of natural gas in 2021. Proved natural gas reserves: 9.6 trillion cubic feet at 12/31/21. Bought Dominion Resources' Appalachian gas operations, 4/10. Spun off CONSOL Energy 11/17. Has 467 employees.

Additional Company Information from Website:
CNX is a leader in the natural gas industry and one of the largest independent natural gas exploration, development and production companies in the Appalachian Basin. We have access to 9.81 trillion cubic feet equivalents of proved clean-burning natural gas reserves. With a leading acreage footprint in both the Marcellus and Utica shales, CNX is at the forefront of providing the energy to power America for generations to come.[85]

Why was the company not included?
This company is an exploration, development, and production company. These exploration and production business segments are not similar to the main business segments of the companies we are responsible for valuing.

Crestwood Equity Partners L.P.
Company Summary from Value Line:
Crestwood Equity Partners, LP is a master limited partnership (MLP) that develops, acquires, owns, and operates primarily fee-based assets and operations within the energy midstream sector. Provides infrastructure solutions to service natural gas and crude oil shale plays in the U.S. and operates a diversified portfolio of crude oil, natural gas, and liquidized natural gas (LNG). Storage & Logistics (85% of '21 rev.), Gathering & Processing North (13%), and Gathering & Processing South (2%). Employs 731.

Additional Company Information from Website:
Crestwood Equity Partners LP (NYSE: CEQP) is a publicly traded master limited partnership that owns and operates midstream assets located primarily in the Williston Basin, Delaware Basin, and Powder River Basin. Our operations and financial results are divided into three segments that include Gathering & Processing North, Gathering & Processing South and Storage & Logistics. Across our three segments Crestwood is engaged in the gathering, processing, treating, compression, storage and transportation of natural gas; storage, transportation, terminalling and marketing of NGLs; gathering, storage, transportation, terminalling and marketing of crude oil; and gathering and disposal of produced water. Our goal is to create long-term value for our unitholders by delivering increasing distributable cash flow through organic expansion, development projects and acquisitions, while at the same time ensuring the ongoing stability of our business. We aim to provide the highest quality of customer service while

[85] https://www.cnx.com/operations, accessed 2/15/2023

maintaining focus on safety, diversity & inclusion, environmental stewardship and building long-term community partnerships in the areas we operate.[86]

Why was the company not included?
This company is involved in three business segments: gathering and processing north; gathering and processing south; storage and logistics. The company's transportation services are small lines in key areas. The business segment is not similar to the main business segments of the companies we are responsible for valuing.

CrossAmerica Partners L.P.
Company Summary from Value Line:
CrossAmerica Partners, LP is a wholesale distributor of motor fuels and owner and lessee of real estate used in the retail distribution of motor fuels. Its general partner, CrossAmerica GP LLC, is a subsidiary of CST Brands, Inc., one of the largest independent retailers of motor fuels and convenience merchandise in North America. The company's wholesale segment includes the wholesale distribution of motor fuel to lessee dealers, independent dealers, commission agents, DMS, CST and company operated retail sites. The Retail segment includes the sale of convenience merchandise items, the retail sale of motor fuel at company operated retail sites and the retail sale of motor fuel at retail sites operated by commission agents. With a geographic footprint covering 34 states, the partnership has well-established relationships with several major oil brands, including ExxonMobil, BP, Shell, Chevron, Sunoco, Valero, Gulf, Citgo, Marathon and Phillips 66.

Additional Company Information from Website:
CrossAmerica Partners LP is a leading U.S. wholesale distributor of motor fuels, operator of convenience stores, and owner and lessee of real estate used in the retail distribution of motor fuels. With a geographic footprint of 34 states, CrossAmerica Partners distributes branded and unbranded petroleum for motor vehicles to approximately 1,800 locations and owns or leases approximately 1,100 sites. Our 7 convenience store brands offer food, essentials and car washes at more than 250 locations across 10 states. Formed in 2012, the Partnership has well-established relationships with several major oil brands, including Exxon, Mobil, BP, Shell, Valero, Citgo, Marathon and Phillips 66. CrossAmerica Partners ranks as one of ExxonMobil's largest U.S. distributors by fuel volume and in the top 10 for additional brands. Our convenience stores are also paired with prominent national brands, such as Dunkin', Subway and Arby's. Our general partner, CrossAmerica GP LLC, is indirectly owned and controlled by entities affiliated with Joseph V. Topper, Jr., the founder of CrossAmerica Partners and a member of the board of the general partner since 2012. Units of CrossAmerica Partners are traded on the New York Stock Exchange under the symbol "CAPL." CrossAmerica Partners is headquartered in Allentown, Pennsylvania. Our downtown location plays an integral part in the revitalization of the Lehigh Valley region's largest city.[87]

Why was the company not included?
This company is a wholesale distributor of motor fuels. They are also the owner and lessee of real estate used in the retail distribution of motor fuels. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

[86] http://www.crestwoodlp.com/about-us/, accessed 2/7/2023
[87] https://www.crossamericapartners.com/about/about-us, accessed 2/15/2023

DCP Midstream L.P.

Company Summary from Value Line:

DCP Midstream, LP (formerly DCP Midstream Partners, LP) was formed through a January, 2017 merger with DCP Midstream, LLC. It owns, operates, and develops a diversified portfolio of domestic midstream energy assets, including gathering and processing plants and 55,700 miles of natural gas and natural gas liquids (NGLs) pipelines. It is the nation's largest NGL producer and natural gas processor. Has two primary segments: Gathering & Processing and Logistics & Marketing.

Additional Company Information from Website:

DCP Midstream, LP (NYSE: DCP) is a midstream master limited partnership, with a diversified portfolio of assets, engaged in the business of gathering, compressing, treating, processing, transporting, storing and selling natural gas; producing, fractionating, transporting, storing and selling NGLs and recovering and selling condensate. DCP owns and operates more than 50 plants and 57,000 miles of natural gas and natural gas liquids pipelines, with operations in 9 states across major producing regions and leads the midstream segment as the largest natural gas liquids producer, the largest natural gas processor and one of the largest marketers in the U.S. Denver, Colorado based DCP is managed by its general partner, DCP Midstream GP, LP, which is managed by its general partner, DCP Midstream GP, LLC, which is 100% owned by DCP Midstream, LLC. DCP Midstream, LLC is a joint venture between Phillips 66 and Enbridge.[88]

Why was the company not included?

This company's main business segments are gathering, processing and logistics, and marketing. Natural gas liquids pipelines appear to be a smaller portion of business. NGL pipelines are in the Gulf Coast, Colorado, Kansas, Texas, Oklahoma, and New Mexico. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Delek Logistics Partners L.P.

Company Summary from Value Line:

Delek Logistics Partners, LP was formed by Delek US Holdings, Inc. to own, operate, acquire and construct crude oil and refined products logistics and marketing assets. The assets and investments in its pipelines and transportation segment consist of pipelines, tanks, offloading facilities, trucks and ancillary assets, which provide crude oil gathering and crude oil, intermediate and refined products transportation and storage services primarily in support of Delek Holdings' refining operations in Tyler, TX, El Dorado, AR, Big Spring, TX, and the Big Spring Gathering Assets. Additionally, the assets in this segment provide crude oil transportation services to certain third parties. The assets in its wholesale marketing and terminalling segment consist of refined products terminals and pipelines in Arkansas, Tennessee, Texas, and Oklahoma.

Additional Company Information from Website:

Delek Logistics Partners LP (NYSE: DKL), headquartered in Brentwood, Tennessee, is a growth-oriented publicly traded master limited partnership (MLP) formed by Delek US Holdings, Inc. (NYSE:DK) ("Delek") in 2012 to own, operate, acquire, and construct crude oil and refined products logistics and marketing assets. A substantial majority of our existing assets are integral to the success of Delek's refining and marketing operations. We gather, transport and store crude oil and market, distribute, transport and store refined products in select regions of the southeastern United States and

[88] http://ir.dcpmidstream.com/investor-overview, accessed 2/15/2023

west Texas for Delek and third parties, primarily in support of Delek's refineries in Tyler, Texas and El Dorado, Arkansas.[89]

Why was the company not included?
This company is mainly located in the Texas, Arkansas, and Tennessee area. This operating area is a different market than the market of the companies we are responsible for valuing.

Devon Energy Corp.
Company Summary from Value Line:
Devon Energy Corp. is a North American oil, NGL, and gas exploration and production company. It completed an all-stock merger with WPX Energy in January 2021; sold operations in Canada, 6/19; sold Barnett Shale assets, 10/20. 2021 production: 209 MMboe, including 325 Bcf gas and 154 Mbbls liquids. Proved reserves at 12/31/21: 1,625 mill. Bbls. of oil equiv., including 1,146 MMbls liquids and 2,878 bcf natural gas. Has about 1,600 emplys.

Additional Company Information from Website:
Devon Energy Corporation is a leading independent oil and natural gas exploration and production company. Devon's operations are focused onshore in the United States. The company's portfolio of oil and gas properties provides stable, environmentally responsible production and a platform for future growth. Devon's fourth quarter 2021 daily production was approximately 300,000 barrels of oil, more than 150,000 barrels of natural gas liquids and about 940 million cubic feet of natural gas.[90]

Why was the company not included?
This company is a gas exploration and production company. These exploration and production business segments are not similar to the main business segments of the companies we are responsible for valuing.

Energy Transfer L.P. (formerly known as Energy Transfer Equity, L.P.)
Company Summary from Value Line:
Energy Transfer, LP (ET) is a master limited partnership that owns a diversified portfolio of energy assets in the U.S. Its core operations include complementary natural gas midstream, intrastate and interstate transportation and storage assets; crude oil, natural gas liquids and refined product transportation and terminaling assets. Energy Transfer also owns the Lake Charles LNG Company. On a consolidated basis, the ET family owns and operates approximately 89,800 miles of natural gas pipeline. Acquired Energy Transfer Partners, 10/18. Has about 12,560 employees.

Additional Company Information from Website:
The oil and natural gas products that move through pipelines are an integral part of our modern way of life. From the clothes you wear and the food you eat to the transportation you use, oil and natural gas touch your life in thousands of ways you have never imagined. Energy Transfer is one of the largest and most diversified midstream energy companies in North America with approximately 120,000 miles of pipelines and associated energy infrastructure across 41 states transporting the oil and gas products that make our lives possible. $522MM spent to maintain and improve our assets in 2021. 120,000 miles of energy infrastructure nationwide. ~30% of our nation's natural gas and crude oil moved on our pipelines.[91]

[89] http://www.deleklogistics.com/investor-relations, accessed 2/15/2023
[90] https://www.devonenergy.com/about-us, accessed 2/15/2023
[91] https://www.energytransfer.com, accessed 2/15/2023

Why was the company not included?
This company's business segments include natural gas midstream, intrastate and interstate transportation and storage assets as well as crude oil, natural gas liquids and refined produce transportation and terminaling assets. This company is similar to the gas transmission pipeline companies that we are responsible for valuing. However, we are limiting the guideline companies to corporations.

Enerplus Corporation
Company Summary from Value Line:
Enerplus Corp. engages in the exploration and development of crude oil and natural gas in the U.S. (Montana, North Dakota, Pennsylvania, West Virginia, and Wyoming) and Canada. Average daily production in 2021: crude oil, 48,514 bbls; natural gas liquids, 7,823 bbls; natural gas, 215.304 mcf; total, 92,221 boe. At 12/31/21 proved plus probable reserves: US: 339 Mboe. Canada: 616 Mboe. Has 435 employees.

Additional Company Information from Website:
Enerplus is focused on the development of high-quality North American oil and natural gas assets. Today, our portfolio includes light oil assets in the Bakken (North Dakota) and a position in the arcellus natural gas shale region (northeast Pennsylvania).

2021 Production
 92,221 Barrels of Oil Equivalent/Day
 61% Crude oil & Natural Gas Liquids
 39% Natural Gas[92]

Why was the company not included?
This company's main business segments are exploration and development of crude oil and natural gas. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

EnLink Midstream LLC
Company Summary from Value Line:
EnLink Midstream, LLC provides midstream energy services in the United States. It operates throughout Texas, Oklahoma, and Louisiana. The company gathers, compresses, treats, processes, transports, stores, and sells natural gas. It also fractionates, transports, stores, and sells natural gas liquids and crude oil. Midstream energy assets include about 12,000 miles of pipelines, 21 natural gas processing plants and seven fractionators. Has 1,069 employees.

Additional Company Information from Website:
EnLink Midstream provides integrated midstream services across natural gas, crude oil, condensate, and NGL commodities. Our purposely built, integrated asset platforms are in premier production basins and core demand centers, including the Permian Basin, Oklahoma, North Texas, Ohio River Valley, and the Gulf Coast. EnLink operates gathering and transportation pipelines, processing plants, fractionators, barge and rail terminals, product storage facilities, brine disposal wells, and an extensive crude oil trucking fleet. We also have purchase and marketing capabilities. Thanks to the breadth and diversity of our asset mix, we're both robust and agile. We pursue strategic platform expansions and service offerings to create value for our customers.[93]

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[92] https://www.enerplus.com/operations/overview-operations.cfm, accessed 2/15/2023
[93] https://www.enlink.com/operations/, accessed 2/15/2023

Why was the company not included?
This company is mainly located in the Gulf Coast. The Gulf Coast is a different market than the market of the companies we are responsible for valuing.

Enterprise Products Partners LP
Company Summary from Value Line:
Enterprise Products Partners, LP, is a leading integrated provider of natural gas and natural gas liquids (NGLs) processing, fractionation, transportation, and storage services in the U.S. and Canada. All management, administrative, and operating functions are performed by EPCO and its 6,911 employees. Assets include about 50,000 miles of pipelines, 260 MMBbls of storage capacity for liquids and 14 Bcf for natural gas. Four segments: NGL Pipeline (40% of 2021 revenues); Crude Oil Pipelines, (27%); Petrochemical & Refined Products, (23%); Natural Gas Pipelines, (10%).

Additional Company Information from Website:
Enterprise Products Partners L.P. is a publicly traded partnership listed on the New York Stock Exchange (NYSE Ticker: EPD). Our origins began with Enterprise Products Company, formed in 1968 by Dan Duncan and two partners as a wholesale marketer of natural gas liquids. Today, our integrated energy infrastructure network provides midstream energy services to producers and consumers of natural gas, natural gas liquids, crude oil, refined products and petrochemicals. We link producers from some of the largest North American supply basins with domestic consumers and international markets.[94]

Why was the company not included?
This company is similar to the gas transmission pipeline companies we are responsible for valuing. However, the department is using corporations, not partnerships, as guideline companies in the Gas Transmission Pipeline market segment.

EOG Resources Inc.
Company Summary from Value Line:
EOG Resources, Inc. engages in the exploration, development, and production of natural gas and crude oil. Utilizes basins in the U.S., Canada, and offshore Trinidad. In 2021, net proved natural gas reserves were 8.2 trillion cubic feet equivalent, and net proved crude oil and natural gas liquids reserves were 2,377 million barrels. Est'd pretax present value of reserves: $58.6 billion. Has approx. 2,800 empls.

Additional Company Information from Website:
EOG Resources, Inc. (NYSE:EOG) is one of the largest crude oil and natural gas exploration and production companies in the United States with proved reserves in the United States and Trinidad. EOG's business strategy is to maximize the rate of return on investment of capital by controlling operating and capital costs and maximizing reserve recoveries. EOG strives to maintain the lowest possible operating cost structure that is consistent with robust environmental stewardship practices and performance and efficient, safe operations.[95]

Why was the company not included?
EOG Resources Inc.'s main business segments include exploration and production of natural gas and

[94] http://www.enterpriseproducts.com/about-us, accessed 2/15/2023
[95] https://www.eogresources.com/static/FactSheet_2022-2845ea29d98b1fd3b1994cb87aa5f3b7.pdf, accessed 2/15/2023

crude oil. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

EQT Corporation

Company Summary from Value Line:

EQT Corporation is a natural gas producer focused in the Marcellus and Utica Shales. It is the largest producer of natural gas in the U.S., based on average daily volumes of 1.858 Bcfe in 2021. The company reported 25.0 trillion cubic feet equivalent of proved reserves across 2.0 million acres (including 1.7 million acres in the Marcellus play) at the end of 2021. Spunoff Equitrans Midstream, 11/18. Acquired Alta Resources, 7/21; Rice Energy, 11/17. Has 693 employees.

Additional Company Information from Website:

EQT Corporation is a leading independent natural gas producer with an evolutionary focus on our future. EQT has operations in Pennsylvania, West Virginia and Ohio and is dedicated to responsibly developing our world-class asset base in the core of the Appalachian Basin. While we are currently the largest producer of natural gas in the United States, we know being the biggest doesn't always mean being the best. With that in mind, EQT is making strides toward becoming the best producer by creating long-term value for all stakeholders, including employees, landowners, communities, industry partners and investors.[96]

Why was the company not included?

EQT Corporation is a natural gas producer. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Genesis Energy L.P.

Company Summary from Value Line:

Genesis Energy, LP is a growth-oriented limited partnership focused on the midstream segment of the crude oil and natural gas industry. Its segments consist of: offshore pipeline transportation and processing of crude oil and natural gas in the Gulf of Mexico; sodium minerals and sulfur services involving trona and trona-based exploring, processing, and selling activities, and processing of high sulfur gas streams for refineries to remove the sulfur, and selling the related by-product, sodium hydrosulfide (NaHS); onshore facilities and transportation, which include terminalling, storing, and transporting crude oil, petroleum products, and CO 2; and marine transportation to provide waterborne transportation of petroleum products and crude oil. The company owns four onshore crude oil pipeline systems, with approximately 450 miles of pipe located primarily in Alabama, Florida, Louisiana, Mississippi and Texas that are rate regulated by the Federal Energy Regulatory Commission. Has 1892 employees.

Additional Company Information from Website:

Genesis Energy is a publicly traded, master limited partnership headquartered in Houston, Texas. We own and operate midstream assets in four business segments offshore pipeline transportation, sodium minerals and sulfur services, onshore facilities and transportation, and marine transportation. Our operations are located primarily in the Gulf Coast region of the United States, Wyoming, and the Gulf of Mexico. Our primary business strategy is to provide an integrated suite of services to refiners, crude oil and natural gas producers, and industrial and commercial enterprises. Our businesses include supporting long lived, world class oil developments of integrated and large independent energy companies in the Gulf of Mexico, producing, transporting, and marketing bulk and specialty chemicals with no known

[96] https://www.eqt.com/about/, accessed 2/15/2023

substitutes and providing strategic transportation into refinery centric demand centers. We remain steadfast in our mission to provide long term value for our stakeholders without ever losing our strong commitment to operating in a safe, reliable, and responsible manner. At Genesis Energy, we focus on further integrating these considerations into our business strategy every day.[97]

Why was the company not included?
This company's main business segments are grouped in four divisions: offshore pipeline transportation, sodium minerals and sulfur services, marine transportation, and onshore facilities and transportation. These market segments are not similar enough to the market segments of the companies we are responsible for valuing.

Global Partners L.P.
Company Summary from Value Line:
Global Partners, LP is engaged in the purchasing, selling, and logistics of transporting petroleum and related products, including domestic and Canadian crude oil, gasoline and gasoline blendstocks (such as ethanol and naphtha), distillates (such as home heating oil, diesel, and kerosene), residual oil, renewable fuels, natural gas and propane. The company also receives revenue from convenience store sales and gasoline station rental income. Global owns, controls, or has access to one of the largest terminal networks of refined petroleum products and renewable fuels in the northeast. It owns transload and storage terminals in North Dakota and Oregon that extend its origin-to-destination capabilities from the mid-continent region of the United States and Canada to the east and west coasts. Global Partners has approximately 1,550 locations primarily in the Northeast. The company was incorporated in 2005 and is based in Waltham, Massachusetts. Has 2430 employees.

Additional Company Information from Website:
As one of the Northeast's largest independent owners, suppliers, and operators of gasoline stations and convenience stores, reliability, quality, and community are key to everything we do. We are proud to support the communities where we live and work. Our efforts to be a good neighbor began more than 75 years ago, when our company began delivering heating oil – door to door – in the neighborhoods around Greater Boston. These efforts continue through our active giving program, which enhances good works in communities across the country. Today, Global owns, controls, or has access to one of the largest terminal networks in New England and New York. We source and transport petroleum products and renewable fuels through our vertically integrated, adaptive distribution network across the U.S. and Canada. In addition, we are a leading wholesale distributor of petroleum products in New England and New York. Through our network, approximately 1M automobile tanks are filled per day. Customers stop at one of our gasoline stations to fill their tanks, recharge with a fresh cup of coffee, or grab a snack. Our vertically integrated model gives us the unique ability to adapt when markets change, creating stability for our customers, all while conducting a business that's been guided by family, with integrity and respect, since 1933.[98]

Why was the company not included?
This company is one of the largest distributors of gasoline, distillates, residual oil and renewable fuels to wholesalers, retailers, and commercial customers in New England and New York. This company also owns, supplies, and operates gasoline stations and convenience stores. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

[97] http://genesisenergy.com/about/, accessed 2/15/2023
[98] https://www.globalp.com/about/the-global-partners-story/, accessed 2/15/2023

Green Plains Partners L.P.

Company Summary from Value Line:

Green Plains Partners, L.P. provides fee based fuel storage and transportation services by owning, operating, developing, and acquiring ethanol and fuel storage tanks, terminals, transportation assets, and other related assets and businesses. The company was formed by Green Plains, a vertically integrated ethanol producer, to support its marketing and distribution activities as its primary downstream logistics provider. It generates a substantial portion of its revenues under fee-based commercial agreements with Green Plains Trade for receiving, storing, transferring, and transporting ethanol and other fuels, which are supported by minimum volume or take-or-pay capacity commitments. It owns or leases 31 ethanol storage facilities and approximately 44 acres of land; and six fuel terminals in Alabama, Arkansas, Louisiana, Mississippi, Kentucky, and Oklahoma. It also owns and operates a fleet of 19 trucks and tankers for transportation of ethanol and other products. Has 35 employees.

Additional Company Information from Website:

Green Plains Partners LP is a fee-based, limited partnership formed by our parent, Green Plains Inc., in 2015. We provide biofuel storage, terminal and transportation services by owning, operating, developing and acquiring ethanol and fuel storage tanks, terminals, transportation assets and other related assets and businesses.[99]

Why was the company not included?

This company's main operating segments are ethanol storage, fuel terminals, and transportation. The transportation segment includes railcars. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Hess Midstream Partners LP

Company Summary from Value Line:

Hess Midstream LP is a limited partnership (not an MLP) that owns, operates, develops, and acquires midstream related assets in the energy industry. It is also involved in providing water handling equipment required for fracking process. Primarily located in the Bakken and Three Forks Shale plays in the Williston Basin in North Dakota. Hess Corp. is responsible for 100% of all revenues generated in 2019, 2020, and 2021.

Additional Company Information from Website:

Hess Midstream (NYSE: HESM) is a fee-based, growth-oriented midstream company that owns, operates and develops a diverse set of midstream assets to provide services to Hess and third-party customers. Hess Midstream, through its ownership interests in HESM, owns oil, gas and produced water handling assets that are primarily located in the Bakken and Three Forks Shale plays in the Williston Basin area of North Dakota, one of the most prolific crude oil gathering basins in North America. HESM conducts its business through three operating segments: gathering, processing and storage and terminaling and export.[100]

Why was the company not included?

Hess Midstream Partners LP focuses on processing natural gas and fractionating natural gas (NGLs). These business segments are not similar to the main business segments of the companies we are responsible for valuing.

[99] http://www.greenplainspartners.com/about, accessed 2/15/2023
[100] https://hessmidstream.gcs-web.com/investors, accessed 2/15/2023

Martin Midstream Partners L.P.

Company Summary from Value Line:

Martin Midstream Partners, L.P. is a publicly traded limited partnership with a diverse set of operations focused primarily in the US Gulf Coast region. Its four primary business lines include: natural gas services, including liquids transportation and distribution services and natural gas storage; terminalling and storage services for petroleum products and by-products, including the refining of naphthenic crude oil, blending and packaging of finished lubricants; sulfur and sulfur-based products processing, manufacturing, marketing and distribution; and marine transportation services for petroleum products and byproducts. The petroleum products and by-products the company collects, transports, stores and markets are produced by oil and gas companies. It owns and operates: 19 marine shore-based terminal facilities and 14 specialty terminal facilities; 31 inland marine tank barges, 17 inland push boats and one offshore tug, and barge unit that transport petroleum products and by products.

Additional Company Information from Website:

Martin Midstream Partners L.P. is a publicly traded limited partnership with a diverse set of operations focused primarily in the United States Gulf Coast region. Our four primary business lines include: terminalling, processing, storage, and packaging services for petroleum products and by-products; land and marine transportation services for petroleum products and by-products, chemicals, and specialty products; sulfur and sulfur-based products processing, marketing, manufacturing, and distribution; natural gas liquids marketing, distribution, and transportation services. The petroleum products and by-products we collect, transport, store, and market are produced primarily by major and independent oil and gas companies who often turn to third parties, such as us, for the transportation and disposition of these products. In addition to these major and independent oil and gas companies, our primary customers include independent refiners, large chemical companies, fertilizer manufacturers, and other wholesale purchasers of these products. We operate primarily in the U.S. Gulf Coast region, which is a major hub for petroleum refining, natural gas gathering and processing, and support services for the exploration and production industry.[101]

Why was the company not included?

This company is mainly located in the Gulf Coast. The Gulf Coast is a different market than the market of the companies for which we are responsible for valuing.

MDU Resources Group Inc.

Company Summary from Value Line:

MDU Resources Group, Inc. is a regulated energy delivery and construction materials and services company. Segments: construction materials and contracting (39% of ’21 revs; 36% of ’21 op. inc.), construction services (36%, 27%), natural gas distribution (17%, 17%); electric (6%, 12%) and pipeline (2%, 8%). Utilities sell gas & electricity in northwest and upper midwest U.S. Construction materials has 1.1 billion tons of construction reserves. Has about 12,826 employees.

Additional Company Information from Website:

MDU Resources provides essential products and services through its regulated energy delivery and construction materials and services businesses. Our company was founded in 1924 as a small electric utility serving a handful of farm communities on the border of Montana and North Dakota. We realized early the value of delivering a variety of services and grew our company by developing businesses around our expertise. Today, MDU Resources has operations, customers and employees across the country. We have approximately 16,000 employees during peak construction season and conduct

[101] http://www.martinmidstream.com/about-us/default.aspx, accessed 2/15/2023

business in nearly every state. We are the largest publicly traded company headquartered in North Dakota. Our stock has traded since 1948 under the symbol MDU on the New York Stock Exchange. Strong infrastructure is the heart of the U.S. economy. It is the natural gas and electricity that power business, industry and our daily lives. It is the pipes and wires that connect our homes, factories, offices and stores to bring them to life. It is the transportation network of roads, highways and airports that keeps our economy moving. Infrastructure is our business. We have paid dividends uninterrupted to our shareholders for 84 years. We have increased dividends 31 consecutive years, a feat accomplished by only about 80 other U.S.-listed companies. Our commitment to paying dividends is reflected in our membership in the S&P High-Yield Dividend Aristocrats index.[102]

Why was the company not included?
MDU Resources Group Inc.'s largest business segment is construction materials and contracting and their second largest business segment is construction services. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

National Fuel Gas Company
Company Summary from Value Line:
National Fuel Gas Company is engaged in the production, gathering, transportation, distribution, and marketing of natural gas & oil. Exploration/Production and other (48% of fiscal 2021 sales); Utility and Energy Marketing Revenues (38%), and Pipeline, Storage & Gathering (14%). NFG has a large position in the Marcellus Shale basin in western NY & PA and oil reserves in CA. Proved reserves as of 9/30/21: 21,537 MMcf of natural gas. Employs 2,188.

Additional Company Information from Website:
National Fuel Gas Company (NYSE: NFG) is a diversified, integrated energy company with a complementary mix of natural gas assets located in the heart of the prolific Appalachian basin. From the bottom of the wellbore to the customer's burner tip, National Fuel has structured our collective group of businesses in a unique manner that leverages our vast upstream resources, valuable midstream footprint and reliable downstream operations to position us as a responsible player in America's energy renaissance.[103]

Why was the company not included?
National Fuel Gas Company's largest business segment is exploration and production. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

New Fortress Energy, Inc.
Company Summary from Value Line:
New Fortress Energy, Inc. is an integrated gas-to-power company that seeks to use ''stranded'' natural gas to satisfy the world's large and growing power needs by delivering customized energy solutions to its customers. The company has expertise in power, infrastructure, transportation and liquefied natural gas (LNG) and operate liquefaction facilities, onshore and offshore regasification terminals, pipelines, and power plants. The company also has an established logistics chain. NFE is majority owned by a fund managed by an affiliate of Fortress Investment Group. Has 201 employees.

[102] https://www.mdu.com/our-company/overview/default.aspx, accessed 2/15/2023
[103] https://www.nationalfuel.com/corporate/an-integrated-energy-company/, accessed 2/15/2023

Additional Company Information from Website:
We want to light the world. Billions of people around the planet lack access to affordable power. Electricity should not be a luxury good. As a liquefied natural gas (LNG) company, our mission is to provide capital, expertise and vision to address this problem while also making positive and meaningful impacts on communities and the environment. New Fortress Energy, a liquefied natural gas (LNG) company, was founded in 2014 by Wes Edens, with the belief that access to affordable, reliable, cleaner energy is not a privilege, but a human right. Universal access to energy can impact major world issues, from education to poverty reduction to gender equality. Creating that access – in an environmentally responsible way – is our fundamental mission. We identify places around the world where affordable, reliable, cleaner energy is in short supply. We build and operate liquefied natural gas (LNG) import facilities to supply natural gas locally, creating access to a better energy source. We finance, design, and build gas-fired power generation and industrial facilities to help our customers convert to liquefied natural gas (LNG). We invest in transforming local communities – creating jobs and supporting education and other initiatives so the next generation can also embrace a brighter future.[104]

Why was the company not included?
New Fortress Energy seeks to use "stranded" natural gas to satisfy the world's large and growing power needs by delivering customized energy solutions to its customers. The company has four operations in the Caribbean, one in Europe, six in Latin America, one in Asia, and two in the United States (developing liquefaction assets in Pennsylvania and Florida). The assets in the United States are not similar to the main business segments of the companies we are responsible for valuing.

NGL Energy Partners LP
Company Summary from Value Line:
NGL Energy Partners, LP, together with its subsidiaries, engages in the crude oil logistics, water solutions, liquids, retail propane, and refined products and renewables businesses. The company purchases crude oil from producers and transports it to refineries for resale at pipeline injection stations, storage terminals, barge loading facilities, rail facilities, refineries, and other trade hubs; and provides storage, terminaling, trucking, marine, and pipeline transportation services. It is involved in the treatment and disposal of wastewater generated from crude oil and natural gas production operations; disposal of solids, such as tank bottoms, drilling fluids, and drilling muds. It supplies natural gas liquids to retailers, wholesalers, refiners, and petrochemical plants in the United States and Canada through its 21 terminals. It sells propane, distillates, and equipment and supplies to end users consisting of residential, agricultural, commercial, and industrial customers. Has 842 employees.

Additional Company Information from Website:
We are a publicly traded Master Limited Partnership listed under the ticker symbol "NGL" on the New York Stock Exchange. NGL Energy Partners LP is a diversified midstream MLP that provides multiple services to producers and end-users, including transportation, storage, blending and marketing of crude oil, NGLs, refined products / renewables, and water solutions. Vertical integration enables NGL to be the full service provider: Transport crude oil from the wellhead to refiners. Wastewater from the wellhead to treatment for disposal, recycle or discharge. Natural Gas Liquids from fractionators / hubs to refineries and end users. Refined Products from refiners to customers.[105]

[104] https://www.newfortressenergy.com/about, accessed 2/15/2023
[105] http://www.nglenergypartners.com/about-ngl/, accessed 2/15/2023

Why was the company not included?
NGL Resources has several other business segments besides transportation, including blending and marketing of crude oil, water solutions, and settling propane, distillates, and equipment and supplies to end users. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Ovintiv Inc. (Formerly Encana Corporation)
Company Summary from Value Line:
Ovintiv Inc. (formerly Encana Corporation) is a North American energy producer focused on developing natural gas, oil, and NGL resource plays. Its core holdings are in the Permian (Texas), Anadarko (Oklahoma), and Montney (British Columbia, Canada) basins. Total proved reserves ('21 10-K), 2,258 million barrels of oil equivalent. 2021 Production; 533.9 million barrels of oil equivalent per day, including 568 million cubic feet equivalent of natural gas, 49,000 barrels of NGL, and 51,200 barrels of oil. Has 1,713 employees.

Additional Company Information from Website:
Ovintiv is a leading North American energy producer focused on developing its multi-basin portfolio of oil, natural gas liquids and natural gas producing plays.[106]

Why was the company not included?
Ovintiv Inc. is an energy producer focused on developing natural gas, oil, and natural gas liquid plays. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

PDC Energy Inc.
Company Summary from Value Line:
PDC Energy, Inc. is a domestic independent exploration and production company that produces, develops, acquires, and explores for crude oil, natural gas, and natural gas liquids, with primary operations in the Wattenberg Field in Colorado and the Delaware Basin in Texas. As of Dec. 31, 2021, the company owned an interest in approximately 3,471 gross producing wells, of which approximately 2290 were horizontal. Production of 71.3 MMboe from continuing operations for the year ended December 2021, an increase of 4% compared to 2020. Has 535 employees.

Additional Company Information from Website:
PDC Energy follows a simple and effective business strategy of maximizing margins and cash flow while maintaining a strong balance sheet and solid debt metrics. The Company is focused on horizontal drilling and low-risk organic development of oil and natural gas reserves from shales and tight reservoir rocks.

GEOGRAPHICAL DIVERSITY
We currently operate in two geographically distinct areas of the country, with primary interests in the Wattenberg Field and Delaware Basin. Denver – Julesburg Basin – Core Wattenberg Field – Weld County, Colorado. Permian Basin – Delaware Basin – Reeves County, West Texas
EMPHASIS ON OIL AND NGL
Our focus is on horizontal Niobrara and Codell development in the liquid-rich Wattenberg Field, where liquid content in new horizontal wells is expected to average 50% – 75% of the production stream. In the Delaware Basin, the Company is primarily targeting Wolfcamp A and B development where we

[106] https://investor.ovintiv.com/overview, accessed 2/15/2023

expect the Eastern acreage block to be 70-80% liquids and the Central block 60-70% liquids.
DRILLING AND DEVELOPMENT
Annual production for 2021 averaged 195,000 Boe per day and proved reserves at year-end 2021 totaled 814 MMboe.
FISCAL MANAGEMENT AND MARKETING STRATEGY
We are committed to maintain a strong balance sheet as part of our fiscal strategy. This is partially done through the utilization of an active hedging program for oil and natural gas aimed at reducing the potential effects of variable commodity prices while insulating our cash flow that funds our capital investment program.
COMMITMENT TO HEALTH, SAFETY AND ENVIRONMENT
At PDC Energy, our core values emphasize integrity and respect for the environment and for the health, safety and well-being of our employees and the communities where we live and work. We seek to live our core values every day.[107]

Why was the company not included?
PDC Energy, Inc.'s main business segments are exploration and production of crude oil, natural gas, and natural gas liquids. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Pembina Pipeline Corporation
Company Summary from Value Line:
Pembina Pipeline Corp. gathers, processes, and transports oil and natural gas in Western Canada. It owns and operates an integrated system of pipelines, gas gathering and processing facilities, and an oil and NGL infrastructure and logistics line. Its pipelines manages transportation capacity of 3.1 mmboe/d. Acquired Veresen, '17; Kinder Morgan Canada, '19. 2021 net volumes (operating income): Conventional Pipelines: 75% (56%); Facilities 25% (44%). Daily 2021 liquids throughput: 2.571 billion barrels; Oil Sands, 19%. Has 1,539 employees.

Additional Company Information from Website:
Pembina Pipeline Corporation is a dynamic energy transportation and midstream provider, serving customers for more than 65 years. Chances are, we do more than you think. We own pipelines that transport hydrocarbon liquids and natural gas products produced primarily in Western Canada. We also own gas gathering and processing facilities and an oil and natural gas liquids infrastructure and logistics business. Our operations along the hydrocarbon value chain allow us to offer a full slate of midstream and marketing services to our customers in the energy industry. We're always keeping an eye out for opportunities to connect hydrocarbon production to new demand locations. These developments help ensure that hydrocarbons produced in the Western Canadian Sedimentary Basin -- and the other basins where Pembina operates -- can reach the highest value markets throughout the world. We're proud of our people and our more than 65 years of strong performance.[108]

Why was the company not included?
Pembina Pipeline Corporation's business segments include transporting oil and natural gas and operating an integrated system of pipelines. Because the company is incorporated and not a partnership, we are not including this company as a guideline for the fluid transportation pipeline market segment.

[107] http://www.pdce.com/operations-overview/, accessed 2/16/2023
[108] https://www.pembina.com/about/, accessed 2/16/2023

Phillips 66 Partners L.P.
Company Summary from Value Line:
Value Line not available.

Additional Company Information from Website:
On March 9, 2022, Phillips 66 closed on its previously announced acquisition of Phillips 66 Partners. Upon closing, Phillips 66 Partners became a wholly-owned subsidiary of Phillips 66. Additional information on Phillips 66 can be found at www.phillips66.com, for more information on the transaction please review the Phillips 66 Partners FAQ.[109]

Why was the company not included?
The company is no longer publicly traded.

Plains GP Holdings L.P.
Company Summary from Value Line:
Plains GP Holdings, L.P., a limited partnership, does not directly own any operating assets. Its principal source of cash flow is from its indirect investment in Plains All American Pipeline, L.P. (PAA) and an approximate 55% limited partnership of Plains AAP, L.P. PAA is a publicly traded master limited partnership that owns and operates midstream energy infrastructure and provides logistics services for crude oil, natural gas liquids, and natural gas. It owns an extensive network of pipeline, terminalling, storage, and gathering assets. PAA has 4,400 employees.

Additional Company Information from Website:
Plains GP Holdings (NASDAQ: PAGP) is a publicly traded entity that owns a non-economic controlling general partner interest in PAA and an indirect limited partner interest in PAA, one of the largest energy infrastructure and logistics companies in North America.[110]

Why was the company not included?
This company was not included because we used Plains All American Pipeline L.P. as a guideline company. Plains GP Holdings L.P. does not own any operating assets.

San Juan Basin Royalty Trust
Company Summary from Value Line:
San Juan Basin Royalty Trust operates as an express trust. The principal asset of the trust is royalty. Its underlying properties include: the working, royalty, and other oil and natural gas interests (75%) owned by Southland Royalty Company in properties located in the San Juan Basin of northwestern New Mexico. The trust does not operate the underlying properties and does not carry on any business activity. The trust is a widely held fixed investment trust and is classified as a non-mortgage widely held fixed investment trust for federal income tax purposes. Burlington Resources Oil & Gas Company, LP is the principal operator of the underlying properties. The trustee of the trust is Compass Bank, which is a subsidiary of Banco Bilbao Vizcaya Argentaria, S.A. The function of the trustee is to collect the net proceeds attributable to the Royalty, to pay all expenses and charges of the trust, and distribute the remaining available income to the unit holders.

[109] https://www.phillips66.com/partners/, accessed 2/3/2023
[110] https://www.plainsallamerican.com/, accessed 2/16/2023

Additional Company Information from Website:
The Trust was established in November 1980 by Trust indenture between Southland Royalty and The Fort Worth National Bank. Pursuant to the indenture, Southland Royalty conveyed to the Trust a 75% net overriding royalty interest (equivalent to a net profit interest) carved out of Southland Royalty's oil and gas leasehold and royalty interest in the San Juan Basin of northwestern New Mexico. This net overriding royalty interest (the "Royalty") is the principal asset of the Trust. Under the Trust indenture, PNC Bank, N.A as Trustee, has the primary function of collecting monthly net proceeds ("Royalty Income") attributable to the Royalty and making the monthly distributions to the Unit Holders after deducting administrative expenses and any amounts necessary for cash reserves. The San Juan Basin Royalty Trust is a New York Stock Exchange-listed entity, with Units trading under the symbol "SJT".[111]

Why was the company not included?
San Juan Basin Royalty Trust's principal asset is a royalty. The underlying properties include: the working, royalty, and other oil and natural gas interests. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Southwestern Energy Company
Company Summary from Value Line:
Southwestern Energy Company is primarily engaged in the exploration & production of natural gas and oil. Exploration & production property locations include the Marcellus Shale. Also has E&P activities in Colorado. At 12/20, the company owned 11,990 billion cubic feet equivalent of total proven natural gas and oil reserves. Sold utility Arkansas Western Gas Co., 7/08. Had 900 employees at 12/31/20.

Additional Company Information from Website:
We are energy. For more than 90 years, Southwestern Energy has thrived because of a deep commitment to providing the energy that powers our world. Our success continues to be dependent upon the dedication of our employees to the company and to the communities in which we operate. Currently, SWN is among the largest natural gas and natural gas liquids producers in the United States. SWN is a growing independent energy company primarily engaged in the production and development of natural gas, natural gas liquids and crude oil within the nation's most prolific shale gas basins. We are explorers and producers. Every day, our people work to discover innovative new ways to fuel the future. Though we search far beyond our current operating footprint, our work is principally focused on the development of natural gas and natural gas liquids in the Marcellus and Utica Shales in Pennsylvania, Ohio and West Virginia and Louisiana's Haynesville and Bossier formations. We market and transport our products. Southwestern Energy markets and transports natural gas, natural gas liquids (NGLs) and oil. Our expertise, commercial support, market intelligence and a combination of transportation assets and relationships help move hydrocarbons to market at optimal valuations. Our gas team provides commercial and asset management services to our E&P operations. We secure, manage, and optimize the transport necessary to support large-scale production and sales of natural gas. Both teams collaborate to identify, lock in and drive value from production. SWN supports oil, condensate and NGL production sales, transport and related contracts. While much of SWN's production is gas, liquids contribute significant returns. The team negotiates optimal pricing and the transportation to take them to market. SWN contracts transportation services on a range of third party pipelines.[112]

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[111] http://www.sjbrt.com/Home/default.aspx, accessed 2/15/2023
[112] https://www.swn.com/about/, accessed 2/15/2023

Why was the company not included?
Southwestern Energy Company's main business segments include exploration and production of natural gas and oil. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Suburban Propane Partners L.P.
Company Summary from Value Line:
Suburban Propane Partners, L.P., is a master limited partnership (MLP) that markets and distributes propane, fuel oil, and other refined fuels in the U.S., operating in Propane; Fuel Oil and Refined Fuels; Natural Gas and Electricity; and Heating, Ventilation, and Air Conditioning (HVAC). As of 9/26/20, serves about 1.0 million active propane customers through roughly 700 locations in 41 states, concentrated on the east and west coasts of the United States. Sold approximately 403 million gallons of propane and 26.0 million gallons of fuel oil in fiscal 2020. Has 3,169 employees.

Additional Company Information from Website:
Headquartered in Whippany, New Jersey, Suburban Propane is a nationwide marketer and distributor of a diverse array of products to meet the energy needs of our customers. Specializing in propane, heating oil and refined fuels, as well as the marketing of natural gas and electricity in deregulated markets. With nearly 3,300 full-time employees, Suburban Propane maintains business operations in 41 states, providing prompt, reliable service to approximately 1 million residential, commercial, industrial and agricultural customers through 700 locations.[113]

Why was the company not included?
This company specializes in marketing and distributing fuel oil and refined fuels as well as the marketing of natural gas and electricity in deregulated markets. These specializations are not the same market segments as the companies we are responsible for valuing.

Summit Midstream Partners L.P.
Company Summary from Value Line:
Summit Midstream Partners, LP focuses on developing and operating midstream energy infrastructure assets primarily shale formations in the continental United States. The company provides natural gas gathering, compression, treating, and processing services, as well as crude oil and produced water gathering services. Its unconventional resource basins include the Appalachian Basin, which comprise the Utica and Point Pleasant shale formations in Ohio, and the Marcellus Shale formation in West Virginia; the Williston Basin that consists of the Bakken and Three Forks shale formations in northwestern North Dakota; the Denver-Julesburg Basin, which include the Niobrara and Codell shale formations in northeastern Colorado and southeastern Wyoming; the northern Delaware Basin that comprise the Wolfcamp and Bone Spring formations in southeastern New Mexico; and the Piceance Basin, which include the Mesaverde formation, and the Mancos and Niobrara shale formations in Colorado. Has 209 employees.

Additional Company Information from Website:
Headquartered in Houston, Texas, Summit Midstream Partners, LP (NYSE: SMLP) is a value-driven master limited partnership focused on developing, owning and operating midstream energy infrastructure assets that are strategically located in unconventional resource basins, primarily shale formations, in the continental United States.

[113] https://www.suburbanpropane.com/about/, accessed 2/15/2023

We currently operate natural gas, crude oil and produced water gathering systems in five unconventional resource basins:

- the Appalachian Basin, which includes the Marcellus and Utica shale formations in West Virginia and Ohio;
- the Williston Basin in North Dakota, which includes the Bakken and Three Forks shale formations;
- the Denver-Julesburg Basin, which includes the Niobrara and Codell shale formations in Colorado and Wyoming;
- the Fort Worth Basin in Texas, which includes the Barnett Shale formation; and
- the Piceance Basin in Colorado, which includes the liquids-rich Mesaverde formation as well as the emerging Mancos and Niobrara Shale formations.

Our systems and the basins they serve are as follows:

- the Mountaineer Midstream system, which serves the Appalachian Basin;
- the Bison Midstream system, which serves the Williston Basin;
- the Polar & Divide system, which serves the Williston Basin;
- the DFW Midstream system, which serves the Fort Worth Basin;
- the Grand River system, which serves the Piceance Basin;
- the Summit Utica system, which serves the Appalachian Basin; and
- the Niobrara G&P system, which serves the DJ Basin.

SMLP has an equity investment in and operates Double E Pipeline, LLC, which is natural gas transmission infrastructure that provides transportation service from multiple receipt points in the Delaware Basin to various delivery points in and around the Waha Hub in Texas. SMLP also has an equity investment in Ohio Gathering, which operates extensive natural gas gathering and condensate stabilization infrastructure in the Utica Shale in Ohio. We generate a substantial majority of our revenue under primarily long-term and fee-based gathering agreements with our customers. The majority of our gathering agreements are underpinned by areas of mutual interest ("AMIs") and minimum volume commitments ("MVCs"). Our AMIs provide that any production drilled by our customers within the AMIs will be shipped on our gathering systems. The MVCs are designed to ensure that we will generate a minimum amount of gathering revenue over the life of each respective gathering agreement. The fee-based nature of the majority of the gathering agreements enhances the stability of our cash flows and limits our direct commodity price exposure. Since our formation in 2009, our management team has established a track record of executing this strategy through the acquisition and subsequent development of DFW Midstream, Grand River, Bison Midstream, Polar & Divide, Mountaineer Midstream, Summit Utica, Niobrara G&P, and Double E Pipeline.[114]

Why was the company not included?
This company's main business segments are natural gas gathering, treating, and compression services. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Targa Resources Corporation
Company Summary from Value Line:
Targa Resources is a leading provider of midstream services. It operates a diversified portfolio of midstream energy assets. Targa is engaged in the business of gathering, compressing, treating, processing, and selling natural gas, along with storing, fractionating, treating, transporting, and selling

[114] http://www.summitmidstream.com/about, accessed 2/16/2023

NGLs. Plant natural gas inlet 4,470.3 MMcf/d; Gross NGL production, 550.4 MBbl/d; Crude oil gathered 175.9 MBbl/d (as of 12/31/21). 2021 depr. rate: 4.2%. Has 2,430 employees.

Additional Company Information from Website:
Targa is a leading provider of midstream services as one of the largest independent midstream infrastructure companies in North America. Our operations are critical to the efficient, safe, and reliable delivery of energy across the United States and increasingly to the world. Our assets connect natural gas and natural gas liquids (NGLs) to domestic and international markets with growing demand for cleaner fuels and feedstocks.
We are primarily engaged in the business of:

- Gathering, compressing, treating, processing and selling natural gas
- Transporting, storing, fractionating, treating and selling NGL and NGL products, including services to liquefied petroleum gas ("LPG") exporters
- Gathering, storing, terminaling and selling crude oil

Our assets are not easily replicated and are strategically located in some of the most attractive basins in the U.S., and interconnected with key NGL markets and logistics centers. Our gathering and processing assets are across multiple shale and natural resource plays, including the Permian Basin, Bakken Shale, Barnett Shale, Eagle Ford Shale, Anadarko Basin, Arkoma Basin, onshore Louisiana and the Gulf of Mexico. We have a leading position in Mont Belvieu, Texas the NGL hub of North America. We have one of the largest fractionation ownership positions in Mont Belvieu and world class LPG export facilities on the Gulf Coast at our Galena Park Marine Terminal, which is interconnected to Mont Belvieu.[115]

Why was the company not included?
Targa Resources Corporation has several other main business segments besides common carrier transportation of gas or fluids. These include, selling, gathering, compressing, treating, processing, fractionating, etc. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Western Midstream Partners LP (Formerly known as Western Gas Equity Partners, L.P.)
Company Summary from Value Line:
Western Midstream Partners, LP (formed by the merger between Western Gas Partners and its general partner Western Gas Equity in 2/19) is a growth-oriented master limited partnership. It is engaged in the acquisition, ownership, development, and operation of midstream pipeline assets. Pipelines are located in the Rocky Mountains (10,343 miles), Texas/NM (4,160), and North-central, PA (146). Also owns, operates, or has equity interests in gathering systems, treating facilities, and natural gas processing plants.

Additional Company Information from Website:
Our core assets provide services for customers in the Delaware Basin in West Texas and New Mexico, and the DJ Basin in northeastern Colorado. Additional assets and investments are located in South Texas, Utah, Wyoming, and north-central Pennsylvania. We're engaged in the business of gathering, compressing, treating, processing, and transporting natural gas; gathering, stabilizing and transporting condensate, natural gas liquids (NGLs) and crude oil; and gathering and disposing of produced water for our customers. As a natural gas processor, we also buy and sell natural gas, NGLs, and condensate on our behalf and as an agent for our customers under certain contracts. In December 2019, we executed several agreements with Occidental that enabled us to operate as a standalone business. As a

[115] https://www.targaresources.com/about-us, accessed 2/16/2023

result of these agreements, our employee workforce and management team is employed directly by Western Midstream, rather than Occidental, facilitating independent managerial control of our strategic initiatives and day-to-day operations. Additionally, we expanded unitholder voting rights through revisions to our limited partnership agreement and to ensure that Occidental, as General Partner, is aligned with our public unitholders' interests. Western Midstream (WES) is publicly traded on the New York Stock Exchange under the symbol, WES.[116]

Why was the company not included?
This company's main business segments include gathering and treating. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

World Fuel Services Corp.
Company Summary from Value Line:
World Fuel Services Corp., a leading global fuel logistics company, is engaged in the worldwide marketing and sale of marine, aviation, and land fuel products and related services. Its Marine segment offers fuel and related services to maritime customers, including international container and tanker fleets among others. The Aviation segment provides aviation fuel to commercial airlines, and others. The Land segment provides fuel and related services to petroleum distributors among others. Has more than 4,300 employees.

Additional Company Information from Website:
World Fuel Services is a leader in the global energy industry. Our team is there for our customers when it matters most. With 5,000+ dedicated employees and local experts, we offer fuel and energy services, supply fulfillment, and transaction and payment management solutions. We provide energy, logistics, and technology solutions to aviation, marine, and land customers and suppliers around the world. Our global team of local professionals delivers innovative products and services at more than 8,000 global locations. We believe in doing the right thing. Whether at the office, on-site, or the road, we protect the health of our people, partners, and communities. Pushing forward. We play a leading role in promoting best practices within the transportation industry and develop, set, and maintain HSE industry standards. Strengthening our Integrated Management System (IMS). We have established a set of nine rules to drive appropriate safety behaviors and prevent workplace incidents.[117]

Why was the company not included?
This company is a global fuel distributor. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

[116] http://www.westernmidstream.com/About/, accessed 2/16/2023
[117] https://www.wfscorp.com/about-us, accessed 2/16/2023

Market Segment: Railroads

Companies Included in the Railroad Market Segment

Canadian National Railway Company
Company Summary from Value Line:
Canadian National Railway operates Canada's largest railroad system with 20,000 route miles spanning East-West across Canada and North-South to the Gulf of Mexico through the U.S. Midwest. Acquired BC Rail and GLT mid-'04; EJ&E 1/09. Petroleum & Chemicals, 20% of '21 revenues; Metals & Minerals, 11%; Forest Products, 13%; Intermodal, 30%; Coal, 4%; Grain & Fertilizer, 18%; Automotive, 4%. 2021 labor costs: 21% of revenue. 2021 operating ratio: 61.2%. Has about 24,000 employees.

Additional Company Information from Website:
A Leading North American Transportation and Logistics Company. Essential to the economy, the CN team of approximately 23,000 railroaders transports more than C$250 billion worth of goods annually for a wide range of business sectors, ranging from resource products to manufactured products to consumer goods, across a rail network of approximately 20,000 route-miles spanning Canada and mid-America. Spanning Canada and Mid-America as well as connecting ports on three coasts, the CN network penetrates deep into resource-rich and manufacturing-intensive regions, to move raw materials, intermediate goods and finished goods to market. Our reach extends beyond rail to offer fully integrated transportation and logistics services.[118]

Why was the company included?
This company is similar to (and is the parent of) the railroad companies that we are responsible for valuing. The company engages in railroad transportation services.

Canadian Pacific Railway Limited
Company Summary from Value Line:
Canadian Pacific Railway Limited provides rail and intermodal freight transportation services over a 12,500-mile network from Montreal to Vancouver. It extends into the U.S. midwest and northeast via Soo Line, Delaware & Hudson, and DM&E (purchased 10/4/07) subsidiaries. The railroad purchased Kansas City Southern in 2021. Grain shipments 22%, of 2021 freight revenue; intermodal, 22%; chemicals/plastics, 20%; coal, 10%; other, 26%. Operating ratio in 2021: 58.3%. Employs 11,834 as of 12/31/21.

Additional Company Information from Website:
Founded in 1881 to connect Canada, today we deliver transportation solutions that connect North America and the world. By doing this safely and efficiently, we create long-term sustainable value for our shareholders and the broader economy. We are an operating company with a team of dedicated, professional, community-minded railroaders, providing superior service for our customers, by doing what we say we are going to do. CP's culture is guided by three core values: accountability, diversity and pride. These values drive our actions, foster respect and inspire our journey towards excellence. Our people drive our growth; our culture is the engine. We are grounded in the foundations of precision

[118] https://www.cn.ca/en/about-cn/, accessed 2/3/2023

scheduled railroading. We operate safely, optimize assets, control costs, provide service and develop people. These are the foundations that have led CP's turnaround from 2012 to today – taking us from industry laggard to industry leader. From our multi-year strategic and business plans to our daily operations and sales and marketing playbooks, everything we do is driven by, and tested against, our purpose, our values and the foundations of precision scheduled railroading. We are environmental stewards who believe in re-investing in our business for long-term, sustainable and low-cost growth.[119]

Why was the company included?
This company is similar to (and is the parent of) the railroad companies that we are responsible for valuing. The company engages in railroad transportation services.

CSX Corporation
Company Summary from Value Line:
CSX Corporation provides rail, intermodal transportation, and rail-to-truck transload services. Has about 21,000 route miles in 23 states and two Canadian provinces, with links to more than 240 short-line railroads. Connects the Northeast, Midwest, and Canada with the Southeast. Principal freight: coal, fertilizer, chemicals, automobiles & parts, agricultural products, and intermodal cargo. Sold CSX World Terminals 2/05. 2021 rail operating ratio: 58.8%. Had about 20,900 employees, as of 12/31/21.

Additional Company Information from Website:
CSX Corporation, together with its subsidiaries based in Jacksonville, Fla., is one of the nation's leading transportation suppliers. The company's rail and intermodal businesses provide rail-based transportation services including traditional rail service and the transport of intermodal containers and trailers. Overall, the CSX Transportation network encompasses about 20,000 route miles of track in 23 states, the District of Columbia and the Canadian provinces of Ontario and Quebec. Our transportation network serves some of the largest population centers in the nation. Nearly two-thirds of Americans live within CSX's service territory. Our transportation network serves some of the largest population centers in the nation. Nearly two-thirds of Americans live within CSX's service territory. CSX serves major markets in the eastern United States and has access to over 70 ocean, river and lake port terminals along the Atlantic and Gulf Coasts, the Mississippi River, the Great Lakes and the St. Lawrence Seaway. The company also has access to Pacific ports through alliances with western railroads. CSX moves a broad portfolio of products across the country in a way that minimizes the effect on the environment, takes traffic off an already congested highway system, and minimizes fuel consumption and transportation costs.[120]

Why was the company included?
This company is similar to the railroad companies that we are responsible for valuing. The company engages in railroad transportation services.

Norfolk Southern Corporation
Company Summary from Value Line:
Norfolk Southern Corp. is the holding company formed by the merger of Norfolk & Western Railway and Southern Railway on 6/1/82. Its Norfolk Southern Railway subsidiary operates approximately 19,420 route miles of track in 22 eastern and southern states, plus the District of Columbia. Also owns a 58% stake in Conrail. '21 freight revenue mix: coal, 12%; intermodal, 28%; agriculture/consumer prod./gov't, 28%; metals/construction, 14%; other, 18%. Labor costs: about 22% of revenue. Operating ratio: 60.1%. Has 20,156 employees.

[119] https://www.cpr.ca/en/about-cp/our-purpose, accessed 2/3/2023
[120] https://www.csx.com/index.cfm/about-us/company-overview/, accessed 2/3/2023

Additional Company Information from Website:
Norfolk Southern Corporation (NYSE: NSC) is one of the nation's premier transportation companies. Its Norfolk Southern Railway Company subsidiary operates approximately 19,300 route miles in 22 states and the District of Columbia, serves every major container port in the eastern United States, and provides efficient connections to other rail carriers. Norfolk Southern is a major transporter of industrial products, including agriculture, forest and consumer products, chemicals, and metals and construction materials. In addition, the railroad operates the most extensive intermodal network in the East and is a principal carrier of coal, automobiles, and automotive parts.[121]

Why was the company included?
This company is similar to the railroad companies that we are responsible for valuing. The company engages in railroad transportation services.

Union Pacific Corporation
Company Summary from Value Line:
Union Pacific Corporation owns Union Pacific Railroad, the largest railroad in the United States in both track miles and total revenues, with nearly 32,236 route miles serving the western two-thirds of the United States. '21 railroad revenue mix: Premium 29%; Industrial, 34%; Bulk, 37%. About 10% of its sales from Mexico. Divested Overnite Transportation in 11/03. '21 RR operating ratio: 57.2%. Has about 31,000 employees.

Additional Company Information from Website:
Union Pacific Corporation (NYSE:UNP) is one of America's leading transportation companies. Its principal operating company, Union Pacific Railroad, is North America's premier railroad franchise, covering 23 states across the western two-thirds of the United States. VISION: Build America for all generations by connecting our nation's businesses and communities to each other and the world. PURPOSE: The people of Union Pacific deliver North America's safest, most reliable and most efficient supply chain solutions. VALUES: Passion for Performance. Passion, determination and expertise drive our safety, customer experience and financial results. High Ethical Standards. Our reputation will always be a source of pride for our employees and a bond with our customers, shareholders and communities. Work as a Team. We work together, embrace diversity and create opportunity for all. We promote an inclusive environment where people from varied backgrounds can be their best, reflect the communities where we live and work, and deliver a competitive advantage.

Union Pacific Railroad Fast Facts (For Full Year 2021)[122]

Route Miles	32,452
Employees	32,124
Annual Payroll	$3.2 billion
Capital Spending	$3 billion
Capital Spending 2012-2021	$35 billion
Locomotives	7,476
Customers	10,000

121 http://www.nscorp.com/content/nscorp/en/about-ns/corporate-profile.html, accessed 2/3/2023
122 https://www.up.com/aboutup/corporate_info/uprrover/index.htm, accessed 2/3/2023

Why was the company included?
This company is one of the railroad companies that we are responsible for valuing. The company engages in railroad transportation services.

Companies Not Included in the Railroad Market Segment

GATX Corporation

Company Summary from Value Line:
GATX Corp. specializes in tank car, freight car, and locomotive leasing. The company owns or has an interest in 146,729 railcars, and manages 323 railcars for third-party owners. Specialty unit finances marine and industrial equipment. The company sold in February of 2020 the American Steamship unit, which provided waterborne transportation of dry bulk commodities. Invests in joint ventures that complement existing businesses. Has about 1,900 employees.

Additional Company Information from Website:
We are the leading global provider of railcar leasing and service to customers throughout North America, Europe, and India. Through Trifleet, we own, lease, and manage a global fleet of tank containers. Jointly with Rolls-Royce plc, we also own one of the largest aircraft spare engine leasing portfolios in the world. Across all our businesses, we provide innovative, unparalleled service that enables our customers to transport what matters safely and sustainably, while championing the well-being of our employees and communities. GATX has been headquartered in Chicago since our founding in 1898.[123]

Why was the company not included?
GATX Corporation specializes in tank car, freight car, and locomotive leasing. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Greenbrier Companies Inc.

Company Summary from Value Line:
The Greenbrier Companies, Inc. designs, manufactures, repairs, and markets railroad freight cars and related equipment in North America, South America, and Europe. It also manufactures ocean-going marine barges. The company operates in three business segments: Manufacturing (83% of 2022 revenues); Wheel Services, Refurbishment & Parts (12%); Leasing & Services (5%). Inc.: OR. At 8/31/22, its backlog consisted of 26,600 railcars. Has about 10,300 employees.

Additional Company Information from Website:
We are one of the leading designers, manufacturers and marketers of railroad freight car equipment in North America, Europe, South America and other geographies as opportunities arise. We also are a manufacturer and marketer of marine barges in North America. We also offer railcar management, regulatory compliance services and leasing services to railcar owners or other users of railcars in North America. We are a leading provider of freight railcar wheel services, parts and maintenance in North America. Through unconsolidated affiliates we produce rail and industrial components and have an ownership stake in a railcar manufacturer in Brazil. We operate an integrated business model in North America that combines freight car manufacturing, wheel services, railcar maintenance, component parts, leasing and fleet management services. Our model is designed to provide customers with a comprehensive set of freight car solutions by utilizing our substantial engineering, mechanical and technical capabilities as well as our experienced commercial personnel. Our integrated model allows us to develop cross-selling opportunities and synergies among our various business segments thereby

[123] http://www.gatx.com/wps/wcm/connect/GATX/GATX_SITE/Home/About/, accessed 2/3/2023

enhancing our margins. We believe our integrated model is difficult to duplicate and provides greater value for our customers and investors.[124]

Why was the company not included?
Greenbrier Companies designs, manufactures, repairs, and markets railroad freight cars and related equipment. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

USD Partners L.P.
Company Summary from Value Line:
USD Partners, LP is a fee-based, growth-oriented master limited partnership formed by US Development Group LLC, to acquire, develop and operate midstream infrastructure and complementary logistics solutions for crude oil, biofuels and other energy-related products. It generates substantially all of its operating cash flows from multi-year, take-or-pay contracts with primarily investment grade customers, including major integrated oil companies, refiners and marketers. The company's network of crude oil terminals facilitates the transportation of heavy crude oil from Western Canada to key demand centers across North America. USD's operations include railcar loading and unloading, storage and blending in onsite tanks, inbound and outbound pipeline connectivity, truck transloading, as well as other related logistics services. It also provides its customers with leased railcars and fleet services to facilitate the transportation of liquid hydrocarbons and biofuels by rail.

Additional Company Information from Website:
USD Partners LP is a fee-based, growth-oriented master limited partnership formed in 2014 by US Development Group LLC to acquire, develop and operate energy-related logistics assets, including rail terminals and other high-quality and complementary midstream infrastructure. In addition, we provide our customers with railcars and fleet services related to the transportation of liquid hydrocarbons and biofuels by rail. We generate substantially all of our operating cash flow from multi-year, take-or-pay contracts. Rail transportation of energy-related products provides flexible access to key demand centers on a relatively low fixed-cost basis with faster physical delivery, while preserving the specific quality of customer products over long distances.[125]

Why was the company not included?
USD Partners L.P.'s operations include railcar loading and unloading, storage and blending in onsite tanks, inbound and outbound pipeline connectivity, truck transloading, and other logistic services. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

Wabtec Corporation
Company Summary from Value Line:
Wabtec provides equipment and services to the global rail industry. Products include brakes, air compressors, heat exchangers, cooling systems, door assemblies, and event recorders. The Freight division (67% of 2021 revs) manufactures and services components used in freight trains; the Transit division (33%) makes products for passenger vehicles, e.g., subways and buses. Acquired GE transportation assets (2/19). Foreign revenues: 50%. Officers and directors own 1.2% of common stock outstanding; Vanguard, 10.3%; BlackRock, 6.5% (4/22 proxy). Has about 25,000 employees.

[124] Greenbrier Companies 2022 10-K, page 4. https://investors.gbrx.com/annual-reports-proxies, accessed 2/3/2023
[125] https://investor.usdpartners.com/investors/investor-center-home/default.aspx, accessed 2/3/2023

Additional Company Information from Website:
Wabtec is a leading global provider of equipment, systems, digital solutions, and value-added services for the freight and transit rail sectors. Drawing on over 150 years of experience, we are leading the way in safety, efficiency, reliability, innovation, and productivity. Whether its freight, transit, mining, industrial or marine, our expertise, technologies, and people – together – are accelerating the future of transportation. Our people, with their extraordinary collective talent, vision and experience are our biggest asset. Our dynamic leadership team has a proven strategy to empower over 27,000 employees in over 50 countries around the world.[126]

Why was the company not included?
Wabtec Corporation provides equipment and services to the global rail industry. These business segments are not similar to the main business segments of the companies we are responsible for valuing.

[126] https://www.wabteccorp.com/about-wabtec, accessed 2/3/2023