DEPARTMENT OF REVENUE

Date: May 1, 2025
From: Jon Klockziem, Director – Property Tax Division
Subject: Final 2025 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 an annual Capitalization Rate Study and use the capitalization rates published in the study to help determine the unitary value of state assessed property.

We posted the 2025 Draft Capitalization Rate Study on February 28, 2025, and welcomed comments until March 28, 2025. 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.

Jon Klockziem, Director
Property Tax Division

2025 Capitalization Rate Study

Assessment Year 2025

Property Tax Division

Minnesota Department of Revenue

May 1, 2025

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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)
- 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 plant 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 (2020). The Appraisal of Real Estate, 15th Edition, Page 49

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	Short-Term Growth Rate [4]	Long-Term Real Growth Rate [5]	Long-Term Implied Inflation Rate [6]
Electric	8.34%	5.91%	6.30%	1.80%	2.00%
Gas Distribution	8.36%	5.43%	6.75%	1.80%	2.00%
Gas Transmission Pipeline	9.33%	5.03%	6.30%	1.80%	2.00%
Fluid Transportation Pipeline	9.21%	7.70%	8.00%	1.80%	2.00%
Railroad	9.66%	5.32%	8.15%	1.80%	2.00%

Yield Rates for Each Market Segment Over the Past Five Years

Market Segments Yield Rates	2025 AY	2024 AY	2023 AY	2022 AY	2021 AY
Electric	8.34%	8.27%	8.00%	6.34%	6.34%
Gas Distribution	8.36%	7.92%	7.83%	6.46%	6.63%
Gas Transmission Pipeline	9.33%	8.77%	9.10%	9.38%	9.82%
Fluid Transportation Pipeline	9.21%	9.09%	9.09%	9.88%	10.13%
Railroad	9.66%	9.68%	9.64%	8.81%	9.08%

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

[5] 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.

[6] See the Inflation Section in this narrative.

Updates

We posted the Draft 2025 Capitalization Rate Study on our website on February 28, 2025. We accepted comments through March 28, 2025, and made these updates to the study after the initial draft:

1. Based on comments, we revised our reconciled cost of equity for each market segment. This includes comments concerning all cost of equity models and the current market trends.

2. We corrected the market value of long-term debt for Chesapeake Utilities Corporation from $11,730,000,000 to $1,173,000,000. This correction updates the capital structure from 43% debt to 40% debt for the Gas Distribution market segment.

3. We agree with the comments that Antero Midstream Corporation is not a good fit as a guideline company for the Gas Transmission Pipeline market segment and removed Antero from the study. This also resolves the data errors and other disagreements with Antero.

4. We updated the Mergent Bond Yield Averages from the Public Utility averages to the Corporate Bond averages for the Gas Transmission Pipeline, Fluid Transportation Pipeline, and Railroad market segments.

5. Based on comments, we reconsidered DT Midstream Inc., Enbridge Inc., and ONEOK Inc. as guideline companies in the Gas Transmission market segment and has now included these companies as guideline companies. DT Midstream was removed as a guideline company from the Fluid Pipeline market segment.

The Public Comments on Draft Study section includes a summary of the comments we received and our responses.

Looking Forward

Implied Equity Risk Premium

The equity risk premium is the expected return of the stock market over a risk-free bond. Despite extensive research on the equity premiums, economists' estimate of its value differ widely.[7]

The equity risk premium is notoriously difficult to estimate as it changes over time and historical estimates mix apples and oranges because different time periods have different equity risk premiums. One way to combat this is to use short historical time periods to estimate the equity risk premium to limit the impact of the changes. Unfortunately, estimates of the equity risk premiums using estimation

[7] Tetlock, P. C. (April 2023). The Implied Equity Risk Premium. Columbia School of Business, 1.

periods even as long as a decade do not result in meaningful statistical conclusions. A better approach is to estimate the implied equity risk premium.[8]

As provided by Damodaran, “The problem with any historical premium approach, even with substantial modifications, is that it is backward looking. Given that our objective is to estimate an updated, forward-looking premium, it seems foolhardy to put your faith in mean reversion and past data”[9] Damodaran also states, “The advantage of the implied premium approach is that it is market-driven and current and does not require any historical data”.[10]

If you assume the market, in aggregate, is correct, you should use the implied equity risk premium. For these reasons, we placed more weight than in previous years on Damodaran’s implied equity risk premium used in the capital asset pricing models for each market segment in the 2025 Study.

Single-Stage Dividend Growth Models

We plan to remove the single-stage dividend growth models (earnings and dividend growth) from the Study next year in our cost of equity analysis. We have not placed any weight on the single-stage DGMs for a few years as we strongly disagree with the assumptions made in these models. The single-stage DGM assumes unrealistic long-term growth. In these single-stage models, short-term growth is used to determine an estimated cost of equity. Short-term growth rates are generally not sustainable in the long-term. See further comments on the DGM models in the Market Rate of Equity section of this study.

Historical Equity Risk Premium Calculations

The department would also like to hear more from stakeholders on their opinions of calculating historical equity risk premiums using total returns on bonds compared to income returns on bonds.

Cost of Debt

Some commented they agreed with the department’s use of Mergent Bond Yield Averages to estimate the cost of debt, and others suggested we use S&P data or Fitch data. Others suggested we utilize specific market segment data available from these financial platforms. We would like to hear from more stakeholders on the difference between these data sets and which stakeholders prefer.

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[8] Cornell, B., Cornell, S., & Cornell, A. (2024, May). Structural Change and Valuation: Implications for Future Stock Returns. Retrieved from Cornell Capital Group: https://www.cornell-capital.com/wp-content/uploads/2024/05/Structural-Change-and-Valuation.pdf

[9] Damodaran, A. (2024, March). Equity Risk Premiums (ERP): Determinants, Estimation, and Implications - The 2024 Edition, page 88. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4751941

[10] Ibid, Page 116.

Market News

Electric Market Segment

As provided by Value Line Investment Survey, “Since our last review three months ago, Electric Utility (Central) stocks covered in The Value Line Investment Survey jumped 8.5% in value, on average, versus a 5.8% gain in the S&P 500 over that interim.”

“Over the past year, Utilities under our coverage have lagged behind The Value Line Arithmetic Index. However, the group has experienced a nice recovery from the downturn of recent years. Notably, as the yield on the benchmark 10-year Treasury note jumped from below 3.0% to a peak of around 5.0% in October 2023, utility stocks hit their lowest levels. But, with interest rates stabilizing and a recent shift in Federal Reserve policy, these equities have advanced nicely. Treasurys offer a compelling alternative to utility stocks. Monitoring the yield spread between bonds and utility dividends is crucial, as investors often choose their preferred investment vehicle based on this spread, considering the relative attractiveness of each option in terms of risk and return potential. The 10-year Treasury yield now stands at 4.31%. What’s more, the market’s forward-looking perspective on potential future rate trajectories carries even greater significance for investment decision making. Thus, it is important to keep an eye out for future rate setting meetings and shifts in the Federal Reserve’s interest rate policy.”[11]

Gas Distribution Market Segment

As provided by Value Line Investment Survey, “Stocks across Value Line’s Natural Gas Utility Industry have climbed in value since our last report in August. We think those movements can be traced partly to some decent earnings performances. Strength in the financial markets has provided further support. But at recent quotations, long-term capital gains potential for a number of these equities is not spectacular, resulting in unexciting total return possibilities.”[12]

Gas Transmission Pipeline Market Segment

As provided by Value Line Investment Survey, “Oil/Gas Distribution Industry stocks have had solid investment results in the past few months. Demand for natural gas and its transportation will likely hold up better than other portions of the economy, given the need for natural gas as a power source domestically and abroad. Thanks to the limited supplies coming in from Russia, demand for LNG in Europe should continue to increase. Cash flow has accelerated, and a larger portion is being utilized on shareholder-friendly initiatives. Dividend payouts have improved in this space, and more hikes will likely occur in the coming quarters. Dividend yields also tend to be well above the Value Line median. In the meantime, risks vary due to differing operations and capital structures. Corporate philosophies have diverged here, with some paying off debt aggressively and others generously returning more cash

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11 Hodgsikson, Zachary J (2024). Electric Utility (Central Industry). Value Line Investment Survey.

12 Harris, Frederick, III (2024). Natural Gas Utility. Value Line Investment Survey.

to shareholders through increased dividends and stock buybacks. This group offers equities that meet a wide variety of investment objectives."[13]

Fluid Transportation Pipeline Market Segment

As provided by Value Line Investment Survey, "The nine entities in this sector have business structures that differ. Most are master limited partnerships (MLP), but one company is a limited partnership and another is similar to a corporation. These firms, while often involved in a few sectors of the energy market, all depend mostly on their pipelines for a large portion of their revenues. These companies are classified as being in the midstream space of the energy industry. Their purpose is to bring oil, gas, and other energy products from the location where they are being developed or extracted to places where the commodity can be refined, stored, or moved to a specific factory, port, or energy hub. The just-completed elections ought to have a significant impact on this group. Republicans ran on the platform that energy prices are too high because regulations and executive orders from the current administration are limiting the amount of fossil fuels being produced in America. This Industry is well situated to benefit from increased drilling activity. One sector of this market that could really experience explosive growth is in liquefied natural gas (LNG). Since Russia attacked Ukraine, its pipelines to Europe have been closed. With winter approaching, Europe will need to import a sizable amount of LNG for heating purposes. The United States has an ample supply of natural gas that can be frozen or liquefied and shipped there to help them meet their energy needs."[14]

Railroad Market Segment

As provided by Value Line Investment Survey, "We expect conditions for the Railroad industry to remain fairly stable for the balance of this year and into 2025. It appears that any disruption from weather or labor strife will be minimal going forward. The recent decline in interest rates should provide a bit of a tailwind for the economy, and further cuts seem likely. Expected growth in infrastructure spending should bolster demand for construction materials such as aggregates, cement, and forest products. There is always some uncertainty with a new administration taking the helm next year, but, overall, Industrial Production and Gross Domestic Production should both exhibit growth in 2025. None of the mainline railroads that we follow are currently expected to outperform the market in the coming year. However, several of them pay solid dividends and have good measures for quality and safety. The best choices appear to be the equipment suppliers as both Wabtec and Greenbrier carry our highest rank for Timeliness."[15]

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[13] Seibert, John, III. (2024). Oil/Gas Distribution Industry. Value Line Investment Survey.
[14] Flood, James A. (2024). Pipeline MLPs. Value Line Investment Survey.
[15] Benway, Stuart J. (2024). Railroad Industry. Value Line Investment Survey.

Yield Capitalization Rate (Yield Rate)

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.[16] 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.

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

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.

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

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

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.

$$\text{Value} = NCF_1 / (Y_0 - 0\%)^1$$

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:

$$\text{Value} = NOI_1 / (Y_0 - 0\%)^1$$

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.[17]

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
Oil/Gas Distribution	Gas Transmission Pipeline
Pipeline MLPs	Fluid Transportation Pipeline
Railroad	Railroad

We reviewed possible guideline companies to compare their market segments to the companies doing business in Minnesota. We generally 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

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

companies. For this year's study, there were several mergers and acquisitions in Value Line's Oil/Gas Distribution Industry, and we used several of those as guideline companies.

Guideline Company Updates

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

Allete Inc. is the parent company of Minnesota Power, which supplies electricity to customers. We did not include Allete as a guideline company in the 2025 study as it was acquired through a partnership of the Canada Pension Plan (CPP) and Investments and Global Infrastructure Partners (GIP). The acquisition is expected to close in 2025, and the company will be privately held.

We added MGE Energy Inc. to the Electric market segment in 2025. It provides electricity and gas to customers in the Midwest. Electric customers represent 49% of customers and gas customers represent 51% of customers. MGE is similar to the electric companies we are responsible for valuing in Minnesota. We are also using this company as a guideline company for the Gas Distribution market segment because approximately 51% of their customers are gas distribution customers.

Gas Distribution Market Segment

Chesapeake Utilities Corporation operates much like the utilities we value in Minnesota. Following the acquisition of Florida City gas in December 2023, regulated utility operations account for 87% of its operations which include natural gas transmission and distribution in Delaware, Maryland, and Florida. It also generates and distribute electricity in Florida.

We added MGE Energy Inc. to the Gas Distribution market segment in 2025. It provides electricity and gas to customers in the Midwest. Electric customers represent 49% of customers and gas customers represent 51% of customers. MGE is similar to the gas companies we are responsible for valuing in Minnesota. We are also using this company as a guideline company for the Electric market segment because approximately 49% of their customers are gas distribution customers.

Gas Transmission Pipeline Market Segment

We added DT Midstream Inc as a guideline company for the Gas Transmission Pipeline market segment. DT Energy owns and operates a diverse, integrated portfolio of midstream pipeline, storage and gathering assets allowing the company to provide an extraordinarily comprehensive set of midstream services to its customers. DT Midstream owns 2,900 miles of transportation and lateral pipelines and more than 800 miles of gathering lines. DT Midstream is an owner, operator and developer of natural gas interstate and intrastate pipelines, storage and gathering systems, compression, treatment and surface facilities. The company transports clean natural gas for utilities, power plants, marketers, large industrial customers and energy producers across the Southern, Northeastern and Midwestern United States and Canada.

We added ONEOK Inc. as a guideline company for the Gas Transmission Pipeline market segment. The company was not included in last year's study due to mergers and acquisitions. While the company is still involved in mergers and acquisitions, the department has reconsidered ONEOK as a guideline company for the current year after comments on the Draft Study.

Fluid Transportation Pipeline Market Segment

We added Energy Transfer L.P as a guideline company in 2025. Energy Transfer L.P. 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. It is similar to the fluid transportation pipeline companies we are responsible for valuing. Energy Transfer L.P recently completed a merger of Crestwood Equity Partners L.P.

We removed NuStar as a guideline company in the 2025 study because the company was acquired by Sunoco in the second quarter of 2024. NuStar is no longer covered by Value Line and its financial metrics are now consolidated under Sunoco.

Railroad Market Segment

We included Canadian Pacific Kansas City (CPKC) as a guideline company in 2025 due to the finalized and approved merger of Canadian Pacific Railway and Kansas City Southern in April of 2023. CPKC operated as the merged entity for the entirety of 2024 and is filing a R-1 as CPKC for its 2024 operations.

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 six different CAPMs, six different empirical capital asset pricing models (ECAPMs), and four 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).
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, 2025, property assessment date. We used a risk-free rate of 4.86% for this study.[19] This rate includes inflation expectations.[20, 21]

Beta

The beta[22] 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.[23] 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 over time, become more diversified and have more assets in place, producing cash flows. All these factors push betas toward one.[24]

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. [25]

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[18] Pratt, Shannon and Grabowski, Roger, (2014). *Cost of Capital Applications and Examples,* 5th Ed., Page 199

[19] The daily observations rate for 20-year U.S. Treasury coupon bonds was 4.86% as of January 2, 2025.

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

[21] Pratt, Shannon and Grabowski, Roger, (2014). Cost of Capital Applications and Examples, 5th Ed., Pages 96-97

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

[23] Value Line. (2025). Investment Education: Glossary, Beta. Retrieved from https://www.valueline.com/investment-education/glossary/b

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

[25] 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.

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)].[26]

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.[27] 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.[28] 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."[29]

As provided by Pratt and Grabowski, "There is no one universally accepted method for estimate the ERP [equity risk premium].[30] 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 (3.04%)
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.[31] 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." [32] In the three-stage model:

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[26] Pratt, Shannon and Grabowski, Roger, (2014). *Cost of Capital Applications and Examples,* 5th Ed., Pages 247-248
[27] Ibid, Pages 114-115
[28] Cornell, Bradford, (1999). *The Equity Risk Premium,* Page 18
[29] 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
[30] Pratt, Shannon and Grabowski, Roger, (2014). *Cost of Capital Applications and Examples,* 5th Ed., Page 113
[31] See Appendix F for this calculation.
[32] Ibbotson, *SBBI 2013 valuation yearbook.* Page 51

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 (15.29%)[33] to a single-stage model would imply that the S&P 500 will continue to grow at 15.29% 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 the sustainable growth rate used in a single-stage model cannot exceed the long-term growth rate of the economy. Therefore, we do not complete a single-stage ex ante calculation.

Damodaran (4.33%)
This is an implied equity risk premium as calculated by Damodaran, Professor of Finance at the Stern School of Business at New York University.[34] 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.[35]

Dr. Damodaran calculates a forward-looking equity risk premium by using expected cash flows in the future, and what investors are paying for those cash flows today, making them forward looking.[36] The implied equity risk premium adjusts to market data and assumes the market is correct in the aggregate.

Using a forward-looking equity risk premium fits with the forward-looking nature of the capital asset pricing model. In addition, forward-looking equity risk premia more stable with lower standard deviations than ex post market risk premia.[37]

The CFO Survey (5.39%)
This survey is issued by Duke University's Fuqua School of Business and the Federal Reserve

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33 S&P 500 Earnings and Estimate Report dated February 28, 2024, https://www.spglobal.com/spdji/en/indices/equity/sp-500/#overviewhttp

34 Damodaran, Aswath (2024). Implied Equity Risk Premium on January 5, 2025. Retrieved on January 24, 2024 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4751941

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

36 Damodaran, A. (2024). *Equity Risk Premiums: Determinants, estimation, and implications – The 2024 Edition*. Accessed 4/9/2025 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4751941

37 Nicado-Cuyugan, J., & Phipps, R., (n.d.). *Forward-Looking Market Risk Premiums (1992-2020) and Macroeconomic Factors: Inflation, real GDP, stock market volatility and term spread.* Public Utilities Fortnightly. Accessed 4/9/2025 from https://www.fortnightly.com/white-papers/capm-market-risk-premium-forward-looking.

Banks of Richmond and Atlanta. It was fielded from November 8 to November 19, 2021. The 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 9.6% over the next ten years.[38] This is paired with the annual yield on 10-year Treasury Bonds of 4.21%.[39] 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."[40]

Fernandez, Garcia, and Acin (5.5%)
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.[41]

Business Valuation Resources, Historical, Arithmetic Mean (6.71%)
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.[42]

Business Valuation Resources, Historical, Geometric Mean (5.46%)
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.[43]

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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38 The CFO Survey (2025). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

39 The annual yield for 10-year U.S. Treasury coupon bonds was 4.21%.

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

41 Fernandez, P., Garcia T., and Acín, J. F. (March 2024). *Survey: Market Risk Premium and Risk-Free Rate Used for 96 Countries in 2024:* SSRN Electronic Journal. https://ssrn.com/ abstract=4754347

42 Business Valuation Resources. (2025). *Cost of Capital Platform.* Historical Equity Risk Premium (20-Year T-Bond) – for Period 1928-2024), Arithmetic Average. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

43 Business Valuation Resources. (2025). *Cost of Capital Platform.* Historical Equity Risk Premium (20-Year T-Bond) – for Period 1928-2024), Geometric Average. Retrieved February 3, 2025 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.[44] 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."[45] 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."[46]

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

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

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

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.[47]

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

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

[46] 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

[47] 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."[48]

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.

Dividend Growth Model (DGM)

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

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.[49] 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."[50]

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

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. The formula uses dividend yield (DY), which is next year's expected dividends per share divided by the current market price per share of

[48] 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. https://eta-publications.lbl.gov/sites/default/files/lbnl-1005828.pdf

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

[50] Cornell, Bradford, (1999). *The Equity Risk Premium,* Page 105

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:

$K_E = D_1 / P_0 + G_1$

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

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 2021-2023 to 2027-2029. We use these growth rates in the dividend growth model for each market segment.[51]

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

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. Pratt and Grabowski state, "Long-term growth rates exceeding the real growth in GDP (Gross Domestic Product) plus inflation are generally not sustainable."[52]

In an 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

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[51] 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.

[52] Pratt, Shannon and Grabowski, Roger, (2014). *Cost of Capital Applications and Examples,* 5th Ed., Page 1195

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." [53]

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.

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

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 100 years, where the dividends are grown at the long-term sustainable growth rate of the U.S. economy. We use the internal rate of return function utilizing the calculated, expected dividends and the current price of the stock.

As provided by Dr. Damodaran, "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 the

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

economy.... A simple rule of thumb on the stable growth rate is that it should not exceed the riskless rate used in the valuation".[54]

The final stage of a company life cycle is the relative decline stage. If a company does not move into a relative decline stage, then their constant growth rate must not be greater than the growth rate of the overall economy. Assuming a growth rate equal to the growth rate of the overall economy is conservative.

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.[55] 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.[56]

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.

According to S&P Global, the stock buybacks for the S&P 500 in 2024 were $942.5 billion, up from $795.2 billion in 2023.[57] According to Goldman Sachs strategists, stock buybacks in 2022 were at $950 billion and decreased to $815 billion in 2023. However, Goldman Sachs expects that stock buybacks will increase by 13% in 2024 to $924 billion[58], indicating that stock buybacks remain a prevalent strategy among companies to return cash to its shareholders.

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

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

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

[57] S&P Global (2025). "S&P 500 Q4 Buybacks Increase 7.4% and 2024 Expenditures Sets New Record...". https://press.spglobal.com/2025-03-19-S-P-500-Q4-2024-Buybacks-Increase-7-4-and-2024-Expenditure-Sets-New-Record-by-Increasing-18-5-Earnings-Per-Share-Increases-from-Buybacks-Decline-for-the-Quarter,-as-Q1-2025s-Impact-is-Expected-to-Increase#:~:text=Key%20Highlights%3A,June%202022%20with%20%241.005%20trillion.

[58] Ed Carson (March 2024), "Stock Buybacks To Top $1 Trillion In 2025, Goldman Says", Investor's Business Daily, https://www.investors.com/news/sp500-stock-buybacks-top-1-trillion-in-2025-goldman-says/#:~:text=Stock%20buybacks%20will%20exceed%20%241,)%2C%20Goldman%20Sachs%20strategists%20said.

Given the trend of U.S. companies to include stock buybacks in their dividend payment policies[i], we prefer the use of an earnings-growth DGM in part due to stock buyback policies.

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.[59] The CAPM assumes that the risk premium portion of a security's expected return is a function of that security's systematic risk.[60]

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.[61]

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.

Market rate of equity for Market Segment = $R_f + RP_e + RP_u$

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. We 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 Indicated 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.

59 Pratt, Shannon and Grabowski, Roger, (2014). Cost of Capital Applications and Examples, 5th Ed., Page 188
60 Ibid, Pages 191-192
61 Keown, Arthur; Martin, John; and Petty, J., *Foundations of Finance: The Logic and Practice of Financial Management*, 8th Ed., (2014). Page 195

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.[62]

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.

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

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

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

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 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.[63] The correct procedure for the economic analysis of flotation costs does not alter the weighted average cost of capital.[64]

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

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

63 Ibid, Page III-31

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

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."[65]

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.[66] 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 not as conclusive as it was initially thought to be.[67] 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.[68]

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."[69]

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.[70]

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

66 Copeland and Weston. *Financial Theory and Corporate Policy* (3rd Ed.). Page 534-535

67 Damodaran, Aswath (2024). Implied Equity Risk Premium on January 5, 2025. Retrieved on January 24, 2024 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4751941

68 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.

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

70 Graham, J. R., and Harvey, C. R. (28 March 2018). The Equity Risk Premium in 2018.Page 8. SSRN Electronic Journal. doi:10.2139/ssrn.3155709

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 inappropriate.[71]

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 stream, 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. We can estimate these inputs if the company does not provide them.

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. Western States Association of Tax Administrators Appraisal Handbook states, "direct capitalization is not affected by the appraiser's view of the future income."[72]

Short-Term Growth Rate

We reviewed short-term growth rates from a few 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 2, 2025.

Electric	Gas Distribution	Gas Transmission Pipeline	Fluid Transportation Pipeline	Railroad
7.6%	6.1%	5.9%	5.9%	9.1%

71 Appraisal Institute (2020). The Appraisal of Real Estate, 15th Edition, Page 430

72 Ibid., Page III-9

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

In previous years' cap rate studies, we have used Yahoo Finance estimates of short-term growth rates for the companies included in our study. We did not use Yahoo Finance growth rates for the 2025 study because the rates are no longer publicly available on their website.

Source	CFRA[73]	Value Line Earnings[74]	Value Line Dividends[75]	Zacks[76]
Electric	7.00%	6.00%	6.00%	6.60%
Gas Distribution	7.00%	6.50%	5.00%	7.00%
Gas Transmission Pipeline	7.50%	10.00%	4.00%	5.10%
Fluid Transportation Pipeline	2.50%	7.50%	8.50%	15.20%
Railroad	3.00%	8.00%	8.50%	8.30%

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
6.30%	6.75%	6.30%	8.00%	8.15%

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

[73] CFRA (as downloaded from S&P NetAdvantage) three-year projected earnings per share compound annual growth rate. CFRA stock reports dated January 7-8, 2025.

[74] Value Line Investment Survey provides estimated growth rates for dividends and earnings 2021-2023 to 2027-2029. Value Line tear sheets are dated November 15, 2024 to December 6, 2024.

[75] Value Line Investment Survey provides estimated growth rates for dividends and earnings 2021-2023 to 2027-2029. Value Line tear sheets are dated November 15, 2024 to December 6, 2024.

[76] Zacks Investment Research provides expected earnings per share growth (3-5 years). Data downloaded January 2, 2025.

in which it operates, the constant growth rate cannot be greater than the overall growth rate of the economy."[77] 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%.[78]
- The World Bank forecasts U.S. GDP will grow 2.3% in 2025, and 2.0% in 2026.[79]
- Trading Economics projects the U.S. GDP annual growth rate to trend around 2.0% in 2026 and 1.9% in 2027.[80]
- The Congressional Budget Office projects that real GDP will grow by 1.9% in 2025 1.8% in 2026 and 1.8% in 2027. The CBO projects that real GDP will grow at an annual average of 1.8% from 2028 to 2029, and 1.8% from 2030 to 2035.[81]

After considering the above sources, we find the indicated long-term real growth rate of the U.S. economy to be 1.8%.

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.[82]

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."[83] According to Damodaran, "An inflation-indexed Treasury security does not offer a guaranteed nominal return to buyers, but instead provides a guaranteed real return."[84]

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."[85] Cornell continues, "When investors invest, their goal is to increase future

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

78 Board of Governors of the Federal Reserve System, Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assumptions of projected appropriate monetary policy. December 2024. Retrieved February 6, 2025 from https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20241218.pdf

79 World Bank Group Flagship Report, Global Economic Prospects. January 2025. Page 4. Retrieved January 23, 2025 from http://www.worldbank.org/en/publication/global-economic-prospects

80 Trading Economics, United States Full Year GDP Growth Rate Forecast. Retrieved February 5, 2025 from https://tradingeconomics.com/united-states/full-year-gdp-growth

81 Congressional Budget Office. (January 2025). The Budget and Economic Outlook: 2025 to 2035. Retrieved February 6, 2025 from https://www.cbo.gov/publication/60870

82 http://economictimes.indiatimes.com/definition/inflation

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

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

85 Cornell, Bradford, (1999). *The Equity Risk Premium,* Page 29

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."[86]

The U.S. Treasury issues inflation-indexed securities. Comparing the inflation-indexed securities to the non-inflation indexed securities, we can calculate the inflation rate. Using the 10-year, 20-year, and 30-year securities, we calculated the inflation rates as of January 2, 2025.[87]

	10-Year	20-Year	30-Year
Calculated Inflation	2.34%	2.46%	2.31%

The Budget and Economic Outlook: 2025 to 2035, published by the Congressional Budget Office (CBO), estimates that inflation for personal consumption expenditures will change from 4th quarter to 4th quarter by 2.2% in 2025, 2.1% in 2026, 2.0% in 2027, 2.0% from 2028 to 2029, and 2.0% from 2030 to 2035.[88]

The Federal Reserve Board members and the Federal Reserve Bank presidents estimated the longer-run personal consumption expenditures inflation rate at 2%.[89]

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 1.8% and the expected inflation rate of 2%, we estimated the long-term growth rate at 3.8%.[90]

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.

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86 Ibid. Page 31

87 Difference between inflation-indexed and non-inflation indexed securities for 10-year, 20-year, and 30-year daily rates as of January 2, 2025. Retrieved January 15, 2025 from www.federalreserve.gov

88 Congressional Budget Office. (January 2025). The Budget and Economic Outlook: 2025 to 2035. Retrieved February 6, 2025 from https://www.cbo.gov/publication/60870

89 Board of Governors of the Federal Reserve System, Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assumptions of projected appropriate monetary policy. December 2024. Retrieved February 6, 2025 from https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20241218.pdf

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

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

Public Comments on Draft Study

The Minnesota Department of Revenue posted the Draft 2025 Capitalization Rate Study on our website on February 28, 2025, and accepted comments through March 28, 2025. 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. For a list of the updates in this Final Study compared to the Draft Study, please see the Updates Section on page three of this narrative.

Aggregated Written Public Comments by Section

General

1. We received several comments related to the selection of median, mean, or other measures to select the data point we use in our study.

   Response

   The selection of data points, using the consideration of various measures of data, are selected using our best judgment. In many cases, we rely more heavily on the median of a data set if the data set has one or more outliers. In other instances, we may rely more heavily on the mean if it appears to be a good reflection of the market segment's data.

2. One commenter suggested an updated calculation for the market value of common equity for Energy Transfer in the Fluid Transportation pipeline market segment.

   Response

   We verified the data used for Energy Transfer and the calculation is the same as the other guideline companies." Therefore, we did not make any updates to Energy Transfer's capital structure calculations.

3. One commenter suggested using a different debt rating for Pembina Pipeline Corporation as the department used Mergent Bond Record yield averages for a S&P rating.

   Response

   We note the definitions for Mergent Bond Record's Baa rating and S&P's BBB rating are very similar. We did not adjust the debt rate for Pembina Pipeline Corporation.

4. One commenter recommended TC Energy Corp not be part of the guideline companies. In October 2024, it spun off its liquids pipelines (U.S. $4.49 billion in value) to South Bow Corporation. In addition, in November 2024, it reduced its dividend.

   Response
   TC Energy Corp still operates 57,900 miles of natural gas pipelines and more than 653 cubic feet of natural gas storage in Canada, the U.S., and Mexico. TC Energy Corp owns two natural gas pipelines with operations in Minnesota.[91] According to Value Line's November 22, 2024, report, 77% of TC Energy Corp's revenues came from its natural gas pipelines segment. TC Energy Corp remains a guideline company for the Gas Transmission market segment.

Overall Rate Not Moving in Direction Expected

One commenter stated that the department's cap rate for the gas transmission segment has shown a significant decline over the past six years despite a slight uptick in this year's rate. The downward trend does not correlate to the various risks the natural gas transmission industry and financial markets have faced over the same time-period.

The commenter asks us to consider the risks the natural gas pipeline has faced in recent years, despite the industry friendly administration under President Trump. The commenter stated the permitting process is risky despite federal promises to make the process more efficient. There have been no similar promises made by the states to streamline their permitting processes. There is also a significant amount of federal, state and local opposition faced by the industry. Under current conditions, pipeline expansion is limited to the Gulf Coast and Midwest regions of the U.S., whereas the rest of the country is limited to modernization of compressor stations intended to increase efficiency and decrease greenhouse gas emissions.

Other commenters discussed industry trends and the impact on the selected rates throughout the study. They also took issue with the yield rates not moving in the direction as they expected and expressed frustration over the department changing its reliance on certain models.

Response
The changes in the rate over a given period do not contradict what is actually happening in the market. The capitalization rate study is developed using actual market data of the guideline companies. It is useful to look at a year-over-year comparison to analyze trends, but you must understand that methodology changes may have impacted the study as well. These methodology

[91] https://www.tcenergy.com/operations/, accessed 4/8/2025

changes must be isolated from actual market observations to have a true “apple to apples” comparison from one year’s cap rate to the next.

We believe if there is an increased risk experienced in any of the market segments involved with fossil fuels, then the market data we collect and use in our study will capture that risk. We trust the market data inherently includes the risks of investment.

We will continue to evaluate the reliability of each model in our study using a critical approach to the reliability of data inputs and strengths and weaknesses of each model.

Debt Rate

1. One commenter explained their Cost of Debt for railroads should be 5.76%, instead of 5.62%. Minnesota selected a 2025 cost of debt (5.62%) that is 49 basis points higher than the 2024 selected cost of debt (5.13%). December 2024 Baa Corporate bond yields increased 16 basis points versus the December 2023 Baa Corporate bond yields. December 2024 Baa Industrial bond yields increased 22 basis point versus the December 2023 Industrial bond yields, suggesting a slightly higher increase in the cost of debt than Minnesota has selected. The commenter believes banks would lend to railroad investors using bonds of similar risk, in this case, Baa Corporate and Industrial bonds. The December 2024 average yield for Baa Corporate and Baa Industrial bonds were 5.80% and 5.83%, respectively, approximately 18 basis points higher than the 2025 cost of debt Minnesota has selected.

   Response
   Three of the five guideline companies in the railroad market segment have a higher debt rating than Baa1. We inadvertently used the public utility bond yield averages in the draft study as opposed to the industrial bond yield averages. We updated the railroad market segment to reflect the industrial bond yield averages. After consideration of an updated median rate of 5.47% and a mean of 5.61%, the department selected a debt rate of 5.61% for the railroad market segment.

2. One commenter suggested the department use an average of the 12-month bond yield averages as opposed to the December bond yield average.

   Response
   We use the December bond yield average as this reflects the bond market nearest to the assessment date.

Cost of Equity

1. One commenter noted the two-stage dividend growth models (DGM) can be manipulated by simply changing the weighting between the two growth rates. The commenter also pointed to the lack of reversion calculated in the three-stage DGM and made note that the reversion price is necessary to capture the final price of the stock. Also, on the three-stage DGM, the

commenter states the model does not account for the increase in payout that must occur as the company enters the period of stable growth.

Response

It is true that the two-stage DGM can be manipulated by changing weights between the growth rates used (short-term growth and stable growth rates). The manipulation is an attempt to arrive at reasonable growth assumptions for a longer period. We used the weightings that David Parcell (2010) provides in the two-stage DGM formula in The Cost of Capital – A Practitioner's Guide, published by the Society of Utility and Regulatory Financial Analysts.

Short-term growth rates are generally not sustainable in the long-term. A blend between the short-term growth rate and a more sustainable or realistic long-term growth rate is required. Our primary concern with the DGM models is unrealistic growth assumptions. This is why we favor the use of a three-stage DGM over the single and two-stage DGM, which tapers growth in the long term to something more realistic.

We extended the time horizon out to 115 years in the three-stage DGM, where stage three includes 100 years in its calculation. Including a discount rate after this many years results in an insignificant change in the reconciled rate. Because of the ability to include over 100 years in the Excel spreadsheet calculation, a reversion calculation is not needed.

2. Commenters expressed their preference for Kroll over Business Valuation Resources as a data source for the historical equity risk premium used in the capital asset pricing model. One commenter also stated that the department has a lack of knowledge of the difference between the two data sources.

   Response

   As we said, Business Valuation Resources (BVR) is a respected, widely accepted source for a published, historical equity risk premium (ERP) calculation. One advantage to using BVR's ERP is that it compares total return on both stocks and bonds, rather than total return on stocks with income return on bonds. The difference in BVR's calculation using total return rather than income return on bonds could account for the difference between the two data sources the commenter pointed out, in addition to the difference in length of time included in the calculation.

3. Commenters expressed concerns with the department's multi-stage dividend growth models, including the model used to estimate an ex-ante equity risk premium. The commenter said the models do not increase the dividend payout ratios over time to compensate investors for the lower long-term growth rates. The return to investors should not change over time. Investors would require higher dividend payouts in later years if long- term growth rates are lower. The

models should increase the dividend payout ratios when the long-term growth rates become lower.

Response
As provided by Pratt and Grabowski (2014), one way to avoid companies changing dividend payments unrelated to level of growth in earnings or cash flow is for the analyst to consider amounts that could be paid to equity investors.[92] We used the estimated growth in earnings, not dividends.

The multi-stage dividend growth model allows for the consideration of changes in the growth rate over time. The multi-stage models allow the consideration that a company cannot grow at a rate greater than the overall economy into perpetuity.

4. One commenter disagreed with the department's use of multi-stage models in that the model allows the appraiser an arbitrary choice that has a major impact on value.

   Response
   Multistage models involve additional variables that require estimating. However, multistage models come closer to reversing the discounting process than single-stage models. Multistage models have one main advantage over single-stage models: using more than one growth rate reduces reliance on a single such rate.[93]

5. One commenter expressed disagreement with the department's assertion that the growth rate in the third stage of a dividend growth model cannot be greater than the growth rate of the overall economy. They gave direct evidence of an implied growth rate of 12.52% for one company's earnings per share between 2001 and 2021 when the growth rate of the economy was 3.79%.

   Response
   It is not possible for a company to grow at a growth rate higher than the U.S. economy in the long-term. Please see pages 17-18 of this narrative for more information.

6. One commenter suggests we not use earnings growth estimates from Value Line as the growth rate estimates include earnings per share from the past year to compare to future years. The commenter suggests calculating a forward-looking earnings growth rate.

   Response

[92] Pratt, Shannon and Grabowski, Roger, (2014). *Cost of Capital Applications and Examples,* 5th Ed., Page 461
[93] Ibid, Pages 461-462

Value Line's analysts' estimates have been found to be optimistic in predicting future returns.[94] We also analyze analysts' estimates through Zack's Investment Research and in CFRA's Quantitative Stock Reports and Value Line is in line with these other estimates.

7. Commenters disagreed with amount of reliance on Dr. Damodaran's forward-looking equity risk premium in the capital asset pricing model.

Response
Dr. Damodaran calculates his forward-looking equity risk premium, assuming the market is correct in the aggregate or the valuation is market neutral. He suggests the use of a historical risk premium if one assumes premiums revert to historical norms and the time period yields these norms.

Dr. Damodaran calculates a forward-looking equity risk premium by using expected cash flows in the future, and what investors are paying for those cash flows today, making them forward looking.[95] The implied equity risk premium adjusts to market data.

Using a forward-looking equity risk premium fits with the forward-looking nature of the capital asset pricing model. In addition, forward-looking equity risk premia are more stable with lower standard deviations than ex post market risk premia regardless of time horizon.[96]

8. Some commenters suggested the department reconsider its reliance on the Dividend Growth Model. One of the comments specifically stated, "The DGM will more accurately reflect investor expected rates of returns based on earnings and dividends and less on theoretical market metrics." Another requested at least half of the reliance in deciding the cost of equity be placed on the two-stage DGM.

Response
The department stated it would consider removing the single-stage dividend growth model from its study in the coming year. We disagree with using a growth rate higher than the growth rate of the overall economy, for the reasons stated throughout this narrative. However, we also complete two-stage and multi-stage dividend growth models. While the department did not put specific reliance on these models, the department used the models to estimate a range of reasonableness for the select cost of equity.

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[94] Szakmary, Andrew; Conover, C. Mitchell; and Lancaster, Carol. (2008) "An Examination of Value Line's Long-term Projection" (2008). Finance Faculty Publications. 30. https://scholarship.richmond.edu/cgi/viewcontent.cgi?article=1034&context=finance-faculty-publications

[95] Damodaran, A. (2024). *Equity Risk Premiums: Determinants, estimation, and implications – The 2024 Edition*. Page 88. Accessed 4/9/2025 from Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4751941

[96] Nicado-Cuyugan, J., & Phipps, R., (n.d.). *Forward-Looking Market Risk Premiums (1992-2020) and Macroeconomic Factors: Inflation, real GDP, stock market volatility and term spread.* Public Utilities Fortnightly. Accessed 4/9/2025 from https://www.fortnightly.com/white-papers/capm-market-risk-premium-forward-looking.

9. To quote one comment, "Importantly, the Department of Revenue (again) provided no explanation at all for its decision to rely on merely two of the 16 models it identified. [The Company] has identified this issue now for at least the past three years and has not received any convincing explanation from the department. … [The Company] requests the department provide a clear explanation of the strengths and weaknesses of the models it uses to determine the Equity Rate, explain the relationship of those strengths and weaknesses to current conditions in each utility industry, and explain how it reaches a decision as to the Equity Rate. [The Company] specifically requests the department to thoroughly address and discuss its decision to consistently exclude all DGM models from its analysis.

Response

We complete several models to estimate the cost of equity. As pointed out, there are 16 models. Of these 16, 12 are capital asset pricing models and four are dividend growth models. The strengths and weaknesses of each model is discussed **throughout this narrative**. Each model helps establish a range of reasonableness for the cost of equity even if we rely more heavily on some models than others.

To summarize:

Capital Asset Pricing Model (CAPM)

1. 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. There are several assumptions inherent in the CAPM. The inputs in the model are difficult to measure precisely.[97]
2. We gathered (and calculated in one instance) two historical equity risk premiums, two forward looking, and two from surveys.
    a. Historical equity risk premiums have been found to be less accurate than forward-looking equity risk premiums.
    b. Forward looking equity risk premiums follows the forward-looking premise of the model. Forward-looking equity risk premia are more stable with lower standard deviations than ex post market risk premia regardless of time horizon.[98]
    c. Surveys collect expected returns in the market from various financial experts, CFOs, analysts, professors, and managers. Surveys have been shown to focus on short-

[97] Brigham, E. & Ehrhardt, M., (2017). *Financial Management: Theory and Practice*, 15th Ed., Page 1006.

[98] Nicado-Cuyugan, J., & Phipps, R., (n.d.). *Forward-Looking Market Risk Premiums (1992-2020) and Macroeconomic Factors: Inflation, real GDP, stock market volatility and term spread.* Public Utilities Fortnightly. Accessed 4/9/2025 from https://www.fortnightly.com/white-papers/capm-market-risk-premium-forward-looking.

term and can be dependent on what questions are asked. There can also be a high variance between answers.[99]

Empirical Capital Asset Pricing Model

1. 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. This model is based on the theory that the CAPM can overstate the actual sensitivity of the cost of capital to beta. In other words, low (high) beta stocks can have a higher (lower) risk premium than the CAPM reflects. Some argue that low beta stocks having a higher risk premium than indicated by the CAPM disagrees with efficient market theory.

Dividend Growth Model

1. The dividend growth model is based on the theory that the prices paid for a share of stock reflect the investors' discounted present value of future expected earnings and is widely used.
2. We calculated four dividend growth models.

    a. **Single stage model** uses estimated **growth in dividends**. The single stage model assumes the growth rate will continue into perpetuity. Few companies are expected to grow in such regular ways.[100] The growth estimates available to the department are short-term growth rates. Often three- to five-year estimates. A growth rate above the long-term sustainable growth rate of the overall economy is not sustainable.

    a. **Single stage model** uses estimated **growth in earnings**. We prefer the use of earnings growth estimates over dividend growth estimates in the dividend growth models, for reasons, such as companies stock buyback policies (as mentioned by the company) and changes in dividend payouts during the life cycle of a company.

    b. **Two stage model** uses estimated **growth in earnings**. A weighted average of the short-term growth rate and the long-term, sustainable growth estimate.

    c. **Three-stage model** uses estimated **growth in earnings**. The short-term growth rate in the first stage and the long-term sustainable growth estimate in the last stage and the middle stage converges the short-term growth to the long-term growth.

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[99] Modugno, V. (2012). "Estimating Equity Risk Premiums". Sponsored by Society of Actuaries' Pension Section Research Committee. https://www.soa.org/49386e/globalassets/assets/files/research/projects/research-est-equity-risk-premiums-report.pdf

[100] Brealey, Myers, & Marcus (2009) *Fundamentals of Corporate Finance* 6th ed. McGraw-Hill/Irwan, New York, New York. ISBN 978-0-07-338230.

10. Comments stated that Dr. Damodaran's equity risk premium is outside of a range stated in academic tests, which suggest a range for the U.S. equity risk premium is between 5% to 8%.

    Response
    We understand the text to be from Principles of Corporate Finance, of which the most recent edition, the 14th edition, was published at the beginning of 2022. The cost of capital changes over time. In two editions of Valuation: Measuring and Managing the Value of Companies, the authors change their range for the U.S. equity risk premium by more than 34%. It is difficult to rely on a standard range provided by textbooks not published close to the assessment date.

    As stated in other responses to comments, the department updated our reliance on the capital asset pricing model using Dr. Damodaran's equity risk premium.

11. Commenters expressed disagreements with the Empirical Capital Asset Pricing Model, specifically because the department uses betas calculated from Value Line, which already adjust betas to account for a long-term tendency for betas to converge to one.

    Response
    We recognize the Empirical CAPM reduces the sensitivity of the cost of equity estimate to changes in the beta coefficient and that Value Lines adjusts its beta. However, we completed the Empirical CAPM model to assist in establishing a range of reasonableness, but did not rely on this model specifically when selecting the cost of equity.

Overall Disagreement

Commenters expressed disagreement, and unhappiness with the department's selected rates in the Draft Study. One commenter would like the department to give specifics about why a study from another state is an irrelevant comparison, such as approaches, assumptions, and differences in law.

Response
We will not comment on our direct disagreement with another state's study. The department does not review other states' studies with the objective of critiquing or otherwise criticizing another state. We review studies from other states, and studies provided by companies, to continuously gain a better understanding about which data others rely on and how that can vary from study to study and year-to-year.

Flotation Costs

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

Response
We do not include an adjustment for flotation costs. See the Flotation Costs section for a detailed discussion.

Illiquidity

Some commenters opined that the department should adjust for illiquidity in the cost of equity.

Response

We do not adjust capitalization rates for illiquidity. See the Illiquidity section for a detailed discussion.

Questions?

If you have questions about this Study, contact us at sa.property@state.mn.us.

Appendix A - Electric

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	42.00%	5.77%	2.42%
Common Equity	58.00%	10.20%	5.92%
Yield Rate			**8.34%**

Electric Yield Rate	**8.34%**

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
Alliant Energy Corp	9,245,000,000	-	16,327,407,223	25,572,407,223	36.15%	0.00%	63.85%
Ameren Corp	16,422,000,000	129,000,000	22,040,225,721	38,591,225,721	42.55%	0.33%	57.11%
American Electric Power Co Inc.	39,148,000,000	-	52,734,619,472	91,882,619,472	42.61%	0.00%	57.39%
Black Hills Corp	4,247,100,000	-	4,064,408,837	8,311,508,837	51.10%	0.00%	48.90%
CenterPoint Energy Inc.	19,729,000,000	-	21,168,101,924	40,897,101,924	48.24%	0.00%	51.76%
CMS Energy Corp	15,660,000,000	224,000,000	20,816,341,545	36,700,341,545	42.67%	0.61%	56.72%
DTE Energy Company	20,458,000,000	-	25,819,230,057	46,277,230,057	44.21%	0.00%	55.79%
Evergy Inc.	11,571,000,000	-	14,831,163,268	26,402,163,268	43.83%	0.00%	56.17%
MGE Energy Inc.	715,300,000		3,792,738,663	4,508,038,663	15.87%	0.00%	84.13%
Northwestern Corp	2,573,300,000	-	3,348,846,151	5,922,146,151	43.45%	0.00%	56.55%
OGE Energy Corp	5,020,800,000	-	7,965,573,924	12,986,373,924	38.66%	0.00%	61.34%
Otter Tail Corp	943,700,000	-	3,849,009,523	4,792,709,523	19.69%	0.00%	80.31%
WEC Energy Group	16,889,200,000	30,400,000	29,424,127,022	46,343,727,022	36.44%	0.07%	63.49%
Xcel Energy Inc.	27,716,000,000	-	35,128,117,910	62,844,117,910	44.10%	0.00%	55.90%

	% Long-Term Debt	% Preferred Equity	% Common Equity
Mean	39.26%	0.07%	60.67%
Median	42.64%	0.00%	56.92%
Indicated Industry Capital Structure	**42.00%**		**58.00%**

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
Alliant Energy Corp	Baa2	5.77%
Ameren Corp	Baa1	5.77%
American Electric Power Co Inc.	Baa2	5.77%
Black Hills Corp	Baa2	5.77%
CenterPoint Energy Inc.	Baa2	5.77%
CMS Energy Corp	Baa2	5.77%
DTE Energy Company	Baa2	5.77%
Evergy Inc.	Baa2	5.77%
MGE Energy Inc.	A1*	5.58%
Northwestern Corp	Baa2	5.77%
OGE Energy Corp	Baa1	5.77%
Otter Tail Corp	A3	5.58%
WEC Energy Group	Baa1	5.77%
Xcel Energy Inc.	Baa1	5.77%

Mean	5.74%
Median	5.77%
Mode	5.77%

Indicated Rate of Debt	5.77%

Public Utility Bond Yield Averages from Mergent Bond Record, January 2025 Edition
Public Utility Bond Averages, December 2024

Mergent	S&P	Dec. Yield Avg.
Aaa, Aa1, Aa2 Aa3	AAA, AA+, AA, AA-	5.45%
A1, A2, A3	A+, A, A-	5.58%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.77%

*MGE Energy, Inc. is not rated by Moody's, however, its wholly-owned subsidiary, Madison Gas & Electric Company is rated as A1.

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	7.69%
CAPM - Damodaran	8.89%
CAPM - The CFO Survey	9.87%
CAPM - Fernandez, Banuls, and Acin	9.98%
CAPM - Ex Post (BVR Historical, Arithmetic)	11.10%
CAPM - Ex Post (BVR Historical, Geometric)	9.94%
Empirical CAPM - Ex Ante, Three Stage	7.74%
Empirical CAPM - Damodaran	8.96%
Empirical CAPM - The CFO Survey	9.97%
Empirical CAPM - Fernandez, Banuls, and Acin	10.07%
Empirical CAPM - Ex Post (BVR Historical, Arithmetic)	11.22%
Empirical CAPM - Ex Post (BVR Historical, Geometric)	10.03%
DGM - Dividend Growth	8.76%
DGM - Earnings Growth	9.14%
DGM - Two-Stage	8.66%
DGM - Three-Stage	7.95%
Indicated Rate of Equity	**10.20%**

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

	Capital Structure	Rate	Composite
Debt Component	42.00%	5.77%	2.42%
Equity Component	58.00%	6.02%	3.49%
Direct Rate			**5.91%**

Direct Rate	**5.91%**

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]	3.04%	0.93	2.83%	4.86%	7.69%
Dr. Damodaran ERP[3]	4.33%	0.93	4.03%	4.86%	8.89%
The CFO Survey[4]	5.39%	0.93	5.01%	4.86%	9.87%
Fernandez, Banuls and Acin[5]	5.50%	0.93	5.12%	4.86%	9.98%
BVR - Historical, Arithmetic Mean[6]	6.71%	0.93	6.24%	4.86%	11.10%
BVR - Historical, Geometric Mean[7]	5.46%	0.93	5.08%	4.86%	9.94%

Notes:

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 15, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

6 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

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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]	3.04%	0.93	2.12%	0.76%	4.86%	**7.74%**
Dr. Damodaran ERP[3]	4.33%	0.93	3.02%	1.08%	4.86%	**8.96%**
The CFO Survey[4]	5.39%	0.93	3.76%	1.35%	4.86%	**9.97%**
Fernandez, Banuls and Acin[5]	5.50%	0.93	3.84%	1.38%	4.86%	**10.07%**
BVR - Historical, Arithmetic Mean[6]	6.71%	0.93	4.68%	1.68%	4.86%	**11.22%**
BVR - Historical, Geometric Mean[7]	5.46%	0.93	3.81%	1.37%	4.86%	**10.03%**

Notes:

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 15, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

6 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 3, 2025 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
Alliant Energy Corp	3.00%	6.00%	6.00%	9.00%	9.00%
Ameren Corp	3.20%	6.50%	6.50%	9.70%	9.70%
American Electric Power Co Inc.	3.60%	6.50%	5.50%	10.10%	9.10%
Black Hills Corp	4.50%	4.00%	4.00%	8.50%	8.50%
CenterPoint Energy	2.60%	6.50%	6.00%	9.10%	8.60%
CMS Energy Corp	3.00%	6.00%	5.00%	9.00%	8.00%
DTE Energy Company	3.30%	4.50%	3.00%	7.80%	6.30%
Evergy Inc.	4.40%	7.50%	7.00%	11.90%	11.40%
MGE Energy Inc.	1.70%	7.00%	6.50%	8.70%	8.20%
Northwestern Corp	4.80%	4.00%	2.00%	8.80%	6.80%
OGE Energy Corp	4.30%	6.50%	3.00%	10.80%	7.30%
Otter Tail Corp	2.00%	4.50%	7.00%	6.50%	9.00%
WEC Energy Group	3.60%	6.00%	7.00%	9.60%	10.60%
Xcel Energy Inc.	3.60%	6.00%	6.00%	9.60%	9.60%
Mean	3.40%	5.82%	5.32%	9.22%	8.72%
Median	3.45%	6.00%	6.00%	9.05%	8.80%

DGM - Dividend Growth, Indicated Rate	**8.76%**
DGM - Earnings Growth, Indicated Rate	**9.14%**

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

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
Alliant Energy Corp	3.00%	6.00%	3.80%	4.90%	8.35%
Ameren Corp	3.20%	6.50%	3.80%	5.15%	8.89%
American Electric Power Co Inc.	3.60%	6.50%	3.80%	5.15%	9.30%
Black Hills Corp	4.50%	4.00%	3.80%	3.90%	8.52%
CenterPoint Energy Inc.	2.60%	6.50%	3.80%	5.15%	8.28%
CMS Energy Corp	3.00%	6.00%	3.80%	4.90%	8.35%
DTE Energy Company	3.30%	4.50%	3.80%	4.15%	7.64%
Evergy Inc.	4.40%	7.50%	3.80%	5.65%	10.80%
MGE Energy Inc.	1.70%	7.00%	3.80%	5.40%	7.69%
Northwestern Corp	4.80%	4.00%	3.80%	3.90%	8.83%
OGE Energy Corp	4.30%	6.50%	3.80%	5.15%	10.02%
Otter Tail Corp	2.00%	4.50%	3.80%	4.15%	6.31%
WEC Energy Group	3.60%	6.00%	3.80%	4.90%	8.96%
Xcel Energy Inc.	3.60%	6.00%	3.80%	4.90%	8.96%

Mean	8.64%
Median	8.67%
Two-Stage DGM, Indicated Rate	**8.66%**

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 1.8% 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

Company	Year	Alliant Energy Corp		Ameren Corp		American Electric Power Co Inc.		Black Hills Corp		CenterPoint Energy Inc.		CMS Energy Corp		DTE Energy Company		Evergy Inc.		MGE Energy Inc.		Northwestern Corp		OGE Energy Corp		Otter Tail Corp		WEC Energy Group		Xcel Energy Inc.	
Start Price	2024		-63.63		-82.57		-99.02		-59.12		-32.48		-69.67		-124.67		-64.49		-104.75		-54.63		-39.64		-92.02		-93.01		-63.01
Expected Dividends	2025		2.04		2.86		3.81		2.70		0.89		2.25		4.34		2.74		2.00		2.64		1.73		1.97		3.57		2.30
Stage One Growth	2026	6.00%	2.16	6.50%	3.05	6.50%	4.06	4.00%	2.81	6.50%	0.95	6.00%	2.39	4.50%	4.54	7.50%	2.95	7.00%	2.14	4.00%	2.75	6.50%	1.84	4.50%	2.06	6.00%	3.78	6.00%	2.44
Stage One Growth	2027	6.00%	2.29	6.50%	3.24	6.50%	4.32	4.00%	2.92	6.50%	1.01	6.00%	2.53	4.50%	4.74	7.50%	3.17	7.00%	2.29	4.00%	2.86	6.50%	1.96	4.50%	2.15	6.00%	4.01	6.00%	2.58
Stage One Growth	2028	6.00%	2.43	6.50%	3.45	6.50%	4.60	4.00%	3.04	6.50%	1.08	6.00%	2.68	4.50%	4.95	7.50%	3.40	7.00%	2.45	4.00%	2.97	6.50%	2.09	4.50%	2.25	6.00%	4.25	6.00%	2.74
Stage One Growth	2029	6.00%	2.58	6.50%	3.68	6.50%	4.90	4.00%	3.16	6.50%	1.15	6.00%	2.84	4.50%	5.18	7.50%	3.66	7.00%	2.62	4.00%	3.09	6.50%	2.23	4.50%	2.35	6.00%	4.51	6.00%	2.90
Stage One Growth	2030	6.00%	2.73	6.50%	3.92	6.50%	5.22	4.00%	3.28	6.50%	1.22	6.00%	3.01	4.50%	5.41	7.50%	3.93	7.00%	2.81	4.00%	3.21	6.50%	2.37	4.50%	2.46	6.00%	4.78	6.00%	3.08
Stage Two Growth	2031	5.80%	2.89	6.25%	4.16	6.25%	5.55	3.98%	3.42	6.25%	1.30	5.80%	3.19	4.44%	5.65	7.16%	4.22	6.66%	2.99	3.98%	3.34	6.25%	2.52	4.44%	2.56	5.80%	5.05	5.80%	3.26
Stage Two Growth	2032	5.60%	3.05	6.01%	4.41	6.01%	5.88	3.96%	3.55	6.01%	1.37	5.60%	3.36	4.37%	5.90	6.83%	4.50	6.33%	3.18	3.96%	3.47	6.01%	2.67	4.37%	2.68	5.60%	5.34	5.60%	3.44
Stage Two Growth	2033	5.40%	3.21	5.76%	4.67	5.76%	6.22	3.95%	3.69	5.76%	1.45	5.40%	3.55	4.31%	6.15	6.49%	4.80	5.99%	3.37	3.95%	3.61	5.76%	2.82	4.31%	2.79	5.40%	5.63	5.40%	3.62
Stage Two Growth	2034	5.20%	3.38	5.52%	4.93	5.52%	6.56	3.93%	3.84	5.52%	1.53	5.20%	3.73	4.25%	6.41	6.15%	5.09	5.65%	3.56	3.93%	3.75	5.52%	2.98	4.25%	2.91	5.20%	5.92	5.20%	3.81
Stage Two Growth	2035	5.00%	3.55	5.27%	5.19	5.27%	6.91	3.91%	3.99	5.27%	1.61	5.00%	3.92	4.18%	6.68	5.82%	5.39	5.32%	3.75	3.91%	3.90	5.27%	3.14	4.18%	3.03	5.00%	6.21	5.00%	4.00
Stage Two Growth	2036	4.80%	3.72	5.03%	5.45	5.03%	7.26	3.89%	4.14	5.03%	1.69	4.80%	4.10	4.12%	6.95	5.48%	5.68	4.98%	3.94	3.89%	4.05	5.03%	3.29	4.12%	3.16	4.80%	6.51	4.80%	4.20
Stage Two Growth	2037	4.60%	3.89	4.78%	5.71	4.78%	7.60	3.87%	4.30	4.78%	1.78	4.60%	4.29	4.05%	7.24	5.15%	5.97	4.65%	4.12	3.87%	4.21	4.78%	3.45	4.05%	3.28	4.60%	6.81	4.60%	4.39
Stage Two Growth	2038	4.40%	4.06	4.54%	5.97	4.54%	7.95	3.85%	4.47	4.54%	1.86	4.40%	4.48	3.99%	7.52	4.81%	6.26	4.31%	4.30	3.85%	4.37	4.54%	3.61	3.99%	3.42	4.40%	7.11	4.40%	4.58
Stage Two Growth	2039	4.20%	4.23	4.29%	6.22	4.29%	8.29	3.84%	4.64	4.29%	1.94	4.20%	4.67	3.93%	7.82	4.47%	6.54	3.97%	4.47	3.84%	4.54	4.29%	3.76	3.93%	3.55	4.20%	7.41	4.20%	4.77
Stage Two Growth	2040	4.00%	4.40	4.05%	6.47	4.05%	8.62	3.82%	4.82	4.05%	2.01	4.00%	4.86	3.86%	8.12	4.14%	6.81	3.64%	4.63	3.82%	4.71	4.05%	3.92	3.86%	3.69	4.00%	7.71	4.00%	4.97
Stage Three Growth	2041	3.80%	4.57	3.80%	6.72	3.80%	8.95	3.80%	5.00	3.80%	2.09	3.80%	5.04	3.80%	8.43	3.80%	7.07	3.80%	4.81	3.80%	4.89	3.80%	4.06	3.80%	3.83	3.80%	8.00	3.80%	5.15
Stage Three Growth	2042	3.80%	4.74	3.80%	6.97	3.80%	9.29	3.80%	5.19	3.80%	2.17	3.80%	5.23	3.80%	8.75	3.80%	7.34	3.80%	4.99	3.80%	5.07	3.80%	4.22	3.80%	3.97	3.80%	8.30	3.80%	5.35
Stage Three Growth	2043	3.80%	4.93	3.80%	7.24	3.80%	9.64	3.80%	5.39	3.80%	2.25	3.80%	5.43	3.80%	9.08	3.80%	7.62	3.80%	5.18	3.80%	5.27	3.80%	4.38	3.80%	4.12	3.80%	8.62	3.80%	5.55
Stage Three Growth	2044	3.80%	5.11	3.80%	7.51	3.80%	10.01	3.80%	5.59	3.80%	2.34	3.80%	5.64	3.80%	9.43	3.80%	7.91	3.80%	5.38	3.80%	5.47	3.80%	4.55	3.80%	4.28	3.80%	8.95	3.80%	5.76
Stage Three Growth	2045	3.80%	5.31	3.80%	7.80	3.80%	10.39	3.80%	5.80	3.80%	2.43	3.80%	5.85	3.80%	9.79	3.80%	8.21	3.80%	5.58	3.80%	5.67	3.80%	4.72	3.80%	4.44	3.80%	9.29	3.80%	5.98
Stage Three Growth	2046	3.80%	5.51	3.80%	8.10	3.80%	10.79	3.80%	6.02	3.80%	2.52	3.80%	6.08	3.80%	10.16	3.80%	8.52	3.80%	5.79	3.80%	5.89	3.80%	4.90	3.80%	4.61	3.80%	9.64	3.80%	6.21
Stage Three Growth	2047	3.80%	5.72	3.80%	8.40	3.80%	11.20	3.80%	6.25	3.80%	2.62	3.80%	6.31	3.80%	10.54	3.80%	8.84	3.80%	6.02	3.80%	6.11	3.80%	5.08	3.80%	4.79	3.80%	10.01	3.80%	6.45
Stage Three Growth	2048	3.80%	5.94	3.80%	8.72	3.80%	11.62	3.80%	6.49	3.80%	2.72	3.80%	6.55	3.80%	10.95	3.80%	9.18	3.80%	6.24	3.80%	6.35	3.80%	5.28	3.80%	4.97	3.80%	10.39	3.80%	6.69
Stage Three Growth	2049	3.80%	6.16	3.80%	9.06	3.80%	12.06	3.80%	6.74	3.80%	2.82	3.80%	6.79	3.80%	11.36	3.80%	9.53	3.80%	6.48	3.80%	6.59	3.80%	5.48	3.80%	5.16	3.80%	10.78	3.80%	6.95
Stage Three Growth	2050	3.80%	6.39	3.80%	9.40	3.80%	12.52	3.80%	6.99	3.80%	2.93	3.80%	7.05	3.80%	11.79	3.80%	9.89	3.80%	6.73	3.80%	6.84	3.80%	5.69	3.80%	5.35	3.80%	11.19	3.80%	7.21
Stage Three Growth	2051	3.80%	6.64	3.80%	9.76	3.80%	13.00	3.80%	7.26	3.80%	3.04	3.80%	7.32	3.80%	12.24	3.80%	10.27	3.80%	6.98	3.80%	7.10	3.80%	5.90	3.80%	5.56	3.80%	11.62	3.80%	7.48
Stage Three Growth	2052	3.80%	6.89	3.80%	10.13	3.80%	13.49	3.80%	7.53	3.80%	3.15	3.80%	7.60	3.80%	12.71	3.80%	10.66	3.80%	7.25	3.80%	7.37	3.80%	6.13	3.80%	5.77	3.80%	12.06	3.80%	7.77
Stage Three Growth	2053	3.80%	7.15	3.80%	10.51	3.80%	14.00	3.80%	7.82	3.80%	3.27	3.80%	7.89	3.80%	13.19	3.80%	11.06	3.80%	7.52	3.80%	7.65	3.80%	6.36	3.80%	5.99	3.80%	12.52	3.80%	8.06
Stage Three Growth	2054	3.80%	7.42	3.80%	10.91	3.80%	14.54	3.80%	8.12	3.80%	3.40	3.80%	8.19	3.80%	13.69	3.80%	11.48	3.80%	7.81	3.80%	7.94	3.80%	6.60	3.80%	6.21	3.80%	12.99	3.80%	8.37
Stage Three Growth	2055	3.80%	7.71	3.80%	11.33	3.80%	15.09	3.80%	8.43	3.80%	3.53	3.80%	8.50	3.80%	14.21	3.80%	11.92	3.80%	8.11	3.80%	8.24	3.80%	6.85	3.80%	6.45	3.80%	13.48	3.80%	8.69
Stage Three Growth	2056	3.80%	8.00	3.80%	11.76	3.80%	15.66	3.80%	8.75	3.80%	3.66	3.80%	8.82	3.80%	14.75	3.80%	12.37	3.80%	8.41	3.80%	8.55	3.80%	7.11	3.80%	6.70	3.80%	14.00	3.80%	9.02
Stage Three Growth	2057	3.80%	8.30	3.80%	12.20	3.80%	16.26	3.80%	9.08	3.80%	3.80	3.80%	9.16	3.80%	15.31	3.80%	12.84	3.80%	8.73	3.80%	8.88	3.80%	7.38	3.80%	6.95	3.80%	14.53	3.80%	9.36
Stage Three Growth	2058	3.80%	8.62	3.80%	12.67	3.80%	16.88	3.80%	9.42	3.80%	3.94	3.80%	9.51	3.80%	15.89	3.80%	13.33	3.80%	9.07	3.80%	9.21	3.80%	7.66	3.80%	7.21	3.80%	15.08	3.80%	9.72
Stage Three Growth	2059	3.80%	8.95	3.80%	13.15	3.80%	17.52	3.80%	9.78	3.80%	4.09	3.80%	9.87	3.80%	16.50	3.80%	13.84	3.80%	9.41	3.80%	9.56	3.80%	7.95	3.80%	7.49	3.80%	15.65	3.80%	10.09
Stage Three Growth	2060	3.80%	9.29	3.80%	13.65	3.80%	18.18	3.80%	10.15	3.80%	4.25	3.80%	10.24	3.80%	17.12	3.80%	14.36	3.80%	9.77	3.80%	9.93	3.80%	8.26	3.80%	7.77	3.80%	16.25	3.80%	10.47
Stage Three Growth	2061	3.80%	9.64	3.80%	14.17	3.80%	18.87	3.80%	10.54	3.80%	4.41	3.80%	10.63	3.80%	17.77	3.80%	14.91	3.80%	10.14	3.80%	10.30	3.80%	8.57	3.80%	8.07	3.80%	16.87	3.80%	10.87
Stage Three Growth	2062	3.80%	10.00	3.80%	14.71	3.80%	19.59	3.80%	10.94	3.80%	4.58	3.80%	11.03	3.80%	18.45	3.80%	15.48	3.80%	10.52	3.80%	10.70	3.80%	8.89	3.80%	8.37	3.80%	17.51	3.80%	11.28
Stage Three Growth	2063	3.80%	10.38	3.80%	15.26	3.80%	20.33	3.80%	11.36	3.80%	4.75	3.80%	11.45	3.80%	19.15	3.80%	16.06	3.80%	10.92	3.80%	11.10	3.80%	9.23	3.80%	8.69	3.80%	18.17	3.80%	11.71
Stage Three Growth	2064	3.80%	10.78	3.80%	15.84	3.80%	21.11	3.80%	11.79	3.80%	4.93	3.80%	11.89	3.80%	19.88	3.80%	16.67	3.80%	11.34	3.80%	11.52	3.80%	9.58	3.80%	9.02	3.80%	18.86	3.80%	12.15
Stage Three Growth	2065	3.80%	11.19	3.80%	16.45	3.80%	21.91	3.80%	12.24	3.80%	5.12	3.80%	12.34	3.80%	20.63	3.80%	17.31	3.80%	11.77	3.80%	11.96	3.80%	9.95	3.80%	9.37	3.80%	19.58	3.80%	12.62
Stage Three Growth	2066	3.80%	11.61	3.80%	17.07	3.80%	22.74	3.80%	12.70	3.80%	5.31	3.80%	12.81	3.80%	21.42	3.80%	17.97	3.80%	12.22	3.80%	12.42	3.80%	10.33	3.80%	9.72	3.80%	20.32	3.80%	13.09
Stage Three Growth	2067	3.80%	12.06	3.80%	17.72	3.80%	23.61	3.80%	13.18	3.80%	5.51	3.80%	13.30	3.80%	22.23	3.80%	18.65	3.80%	12.68	3.80%	12.89	3.80%	10.72	3.80%	10.09	3.80%	21.10	3.80%	13.59
Stage Three Growth	2068	3.80%	12.51	3.80%	18.39	3.80%	24.50	3.80%	13.68	3.80%	5.72	3.80%	13.80	3.80%	23.08	3.80%	19.36	3.80%	13.16	3.80%	13.38	3.80%	11.13	3.80%	10.47	3.80%	21.90	3.80%	14.11
Stage Three Growth	2069	3.80%	12.99	3.80%	19.09	3.80%	25.43	3.80%	14.20	3.80%	5.94	3.80%	14.33	3.80%	23.95	3.80%	20.09	3.80%	13.66	3.80%	13.89	3.80%	11.55	3.80%	10.87	3.80%	22.73	3.80%	14.64
Stage Three Growth	2070	3.80%	13.48	3.80%	19.82	3.80%	26.40	3.80%	14.74	3.80%	6.17	3.80%	14.87	3.80%	24.86	3.80%	20.86	3.80%	14.18	3.80%	14.42	3.80%	11.99	3.80%	11.29	3.80%	23.59	3.80%	15.20
Stage Three Growth	2071	3.80%	13.99	3.80%	20.57	3.80%	27.40	3.80%	15.30	3.80%	6.40	3.80%	15.44	3.80%	25.81	3.80%	21.65	3.80%	14.72	3.80%	14.96	3.80%	12.44	3.80%	11.71	3.80%	24.49	3.80%	15.78
Stage Three Growth	2072	3.80%	14.53	3.80%	21.35	3.80%	28.45	3.80%	15.89	3.80%	6.65	3.80%	16.02	3.80%	26.79	3.80%	22.47	3.80%	15.28	3.80%	15.53	3.80%	12.91	3.80%	12.16	3.80%	25.42	3.80%	16.38

Stage Three Growth	2073	3.80%	15.08	3.80%	22.16	3.80%	29.53	3.80%	16.49	3.80%	6.90	3.80%	16.63	3.80%	27.81	3.80%	23.32	3.80%	15.86	3.80%	16.12	3.80%	13.41	3.80%	12.62	3.80%	26.39	3.80%	17.00
Stage Three Growth	2074	3.80%	15.65	3.80%	23.01	3.80%	30.65	3.80%	17.12	3.80%	7.16	3.80%	17.26	3.80%	28.86	3.80%	24.21	3.80%	16.47	3.80%	16.73	3.80%	13.92	3.80%	13.10	3.80%	27.39	3.80%	17.65
Stage Three Growth	2075	3.80%	16.25	3.80%	23.88	3.80%	31.81	3.80%	17.77	3.80%	7.43	3.80%	17.92	3.80%	29.96	3.80%	25.13	3.80%	17.09	3.80%	17.37	3.80%	14.44	3.80%	13.60	3.80%	28.43	3.80%	18.32
Stage Three Growth	2076	3.80%	16.86	3.80%	24.79	3.80%	33.02	3.80%	18.44	3.80%	7.71	3.80%	18.60	3.80%	31.10	3.80%	26.09	3.80%	17.74	3.80%	18.03	3.80%	14.99	3.80%	14.12	3.80%	29.51	3.80%	19.01
Stage Three Growth	2077	3.80%	17.50	3.80%	25.73	3.80%	34.28	3.80%	19.14	3.80%	8.01	3.80%	19.31	3.80%	32.28	3.80%	27.08	3.80%	18.41	3.80%	18.72	3.80%	15.56	3.80%	14.65	3.80%	30.63	3.80%	19.74
Stage Three Growth	2078	3.80%	18.17	3.80%	26.71	3.80%	35.58	3.80%	19.87	3.80%	8.31	3.80%	20.04	3.80%	33.51	3.80%	28.11	3.80%	19.11	3.80%	19.43	3.80%	16.15	3.80%	15.21	3.80%	31.80	3.80%	20.49
Stage Three Growth	2079	3.80%	18.86	3.80%	27.72	3.80%	36.93	3.80%	20.62	3.80%	8.63	3.80%	20.80	3.80%	34.78	3.80%	29.17	3.80%	19.84	3.80%	20.16	3.80%	16.77	3.80%	15.79	3.80%	33.01	3.80%	21.26
Stage Three Growth	2080	3.80%	19.58	3.80%	28.78	3.80%	38.33	3.80%	21.41	3.80%	8.96	3.80%	21.59	3.80%	36.10	3.80%	30.28	3.80%	20.59	3.80%	20.93	3.80%	17.40	3.80%	16.39	3.80%	34.26	3.80%	22.07
Stage Three Growth	2081	3.80%	20.32	3.80%	29.87	3.80%	39.79	3.80%	22.22	3.80%	9.30	3.80%	22.41	3.80%	37.47	3.80%	31.43	3.80%	21.38	3.80%	21.73	3.80%	18.07	3.80%	17.01	3.80%	35.56	3.80%	22.91
Stage Three Growth	2082	3.80%	21.09	3.80%	31.00	3.80%	41.30	3.80%	23.07	3.80%	9.65	3.80%	23.26	3.80%	38.90	3.80%	32.63	3.80%	22.19	3.80%	22.55	3.80%	18.75	3.80%	17.66	3.80%	36.91	3.80%	23.78
Stage Three Growth	2083	3.80%	21.89	3.80%	32.18	3.80%	42.87	3.80%	23.94	3.80%	10.02	3.80%	24.15	3.80%	40.38	3.80%	33.87	3.80%	23.03	3.80%	23.41	3.80%	19.47	3.80%	18.33	3.80%	38.32	3.80%	24.69
Stage Three Growth	2084	3.80%	22.73	3.80%	33.40	3.80%	44.50	3.80%	24.85	3.80%	10.40	3.80%	25.07	3.80%	41.91	3.80%	35.15	3.80%	23.91	3.80%	24.30	3.80%	20.21	3.80%	19.02	3.80%	39.77	3.80%	25.62
Stage Three Growth	2085	3.80%	23.59	3.80%	34.67	3.80%	46.19	3.80%	25.80	3.80%	10.79	3.80%	26.02	3.80%	43.50	3.80%	36.49	3.80%	24.82	3.80%	25.22	3.80%	20.97	3.80%	19.75	3.80%	41.28	3.80%	26.60
Stage Three Growth	2086	3.80%	24.49	3.80%	35.99	3.80%	47.95	3.80%	26.78	3.80%	11.20	3.80%	27.01	3.80%	45.16	3.80%	37.88	3.80%	25.76	3.80%	26.18	3.80%	21.77	3.80%	20.50	3.80%	42.85	3.80%	27.61
Stage Three Growth	2087	3.80%	25.42	3.80%	37.36	3.80%	49.77	3.80%	27.79	3.80%	11.63	3.80%	28.03	3.80%	46.87	3.80%	39.32	3.80%	26.74	3.80%	27.18	3.80%	22.60	3.80%	21.28	3.80%	44.48	3.80%	28.66
Stage Three Growth	2088	3.80%	26.38	3.80%	38.78	3.80%	51.66	3.80%	28.85	3.80%	12.07	3.80%	29.10	3.80%	48.65	3.80%	40.81	3.80%	27.75	3.80%	28.21	3.80%	23.46	3.80%	22.08	3.80%	46.17	3.80%	29.75
Stage Three Growth	2089	3.80%	27.38	3.80%	40.25	3.80%	53.62	3.80%	29.95	3.80%	12.53	3.80%	30.21	3.80%	50.50	3.80%	42.36	3.80%	28.81	3.80%	29.28	3.80%	24.35	3.80%	22.92	3.80%	47.92	3.80%	30.88
Stage Three Growth	2090	3.80%	28.43	3.80%	41.78	3.80%	55.66	3.80%	31.08	3.80%	13.00	3.80%	31.35	3.80%	52.42	3.80%	43.97	3.80%	29.90	3.80%	30.39	3.80%	25.27	3.80%	23.80	3.80%	49.75	3.80%	32.05
Stage Three Growth	2091	3.80%	29.51	3.80%	43.37	3.80%	57.78	3.80%	32.27	3.80%	13.50	3.80%	32.54	3.80%	54.41	3.80%	45.64	3.80%	31.04	3.80%	31.55	3.80%	26.23	3.80%	24.70	3.80%	51.64	3.80%	33.27
Stage Three Growth	2092	3.80%	30.63	3.80%	45.02	3.80%	59.97	3.80%	33.49	3.80%	14.01	3.80%	33.78	3.80%	56.48	3.80%	47.38	3.80%	32.22	3.80%	32.75	3.80%	27.23	3.80%	25.64	3.80%	53.60	3.80%	34.53
Stage Three Growth	2093	3.80%	31.79	3.80%	46.73	3.80%	62.25	3.80%	34.76	3.80%	14.54	3.80%	35.06	3.80%	58.63	3.80%	49.18	3.80%	33.44	3.80%	33.99	3.80%	28.26	3.80%	26.61	3.80%	55.63	3.80%	35.84
Stage Three Growth	2094	3.80%	33.00	3.80%	48.50	3.80%	64.62	3.80%	36.09	3.80%	15.10	3.80%	36.40	3.80%	60.86	3.80%	51.05	3.80%	34.72	3.80%	35.28	3.80%	29.34	3.80%	27.62	3.80%	57.75	3.80%	37.21
Stage Three Growth	2095	3.80%	34.25	3.80%	50.35	3.80%	67.07	3.80%	37.46	3.80%	15.67	3.80%	37.78	3.80%	63.17	3.80%	52.99	3.80%	36.03	3.80%	36.62	3.80%	30.45	3.80%	28.67	3.80%	59.94	3.80%	38.62
Stage Three Growth	2096	3.80%	35.55	3.80%	52.26	3.80%	69.62	3.80%	38.88	3.80%	16.26	3.80%	39.22	3.80%	65.57	3.80%	55.00	3.80%	37.40	3.80%	38.01	3.80%	31.61	3.80%	29.76	3.80%	62.22	3.80%	40.09
Stage Three Growth	2097	3.80%	36.91	3.80%	54.25	3.80%	72.27	3.80%	40.36	3.80%	16.88	3.80%	40.71	3.80%	68.06	3.80%	57.09	3.80%	38.83	3.80%	39.46	3.80%	32.81	3.80%	30.89	3.80%	64.59	3.80%	41.61
Stage Three Growth	2098	3.80%	38.31	3.80%	56.31	3.80%	75.01	3.80%	41.89	3.80%	17.52	3.80%	42.25	3.80%	70.65	3.80%	59.26	3.80%	40.30	3.80%	40.96	3.80%	34.06	3.80%	32.07	3.80%	67.04	3.80%	43.19
Stage Three Growth	2099	3.80%	39.76	3.80%	58.45	3.80%	77.86	3.80%	43.48	3.80%	18.19	3.80%	43.86	3.80%	73.33	3.80%	61.51	3.80%	41.83	3.80%	42.52	3.80%	35.35	3.80%	33.29	3.80%	69.59	3.80%	44.83
Stage Three Growth	2100	3.80%	41.27	3.80%	60.67	3.80%	80.82	3.80%	45.14	3.80%	18.88	3.80%	45.53	3.80%	76.12	3.80%	63.85	3.80%	43.42	3.80%	44.13	3.80%	36.70	3.80%	34.55	3.80%	72.23	3.80%	46.54
Stage Three Growth	2101	3.80%	42.84	3.80%	62.97	3.80%	83.89	3.80%	46.85	3.80%	19.60	3.80%	47.26	3.80%	79.01	3.80%	66.27	3.80%	45.07	3.80%	45.81	3.80%	38.09	3.80%	35.86	3.80%	74.98	3.80%	48.31
Stage Three Growth	2102	3.80%	44.47	3.80%	65.37	3.80%	87.08	3.80%	48.63	3.80%	20.34	3.80%	49.05	3.80%	82.01	3.80%	68.79	3.80%	46.78	3.80%	47.55	3.80%	39.54	3.80%	37.23	3.80%	77.83	3.80%	50.14
Stage Three Growth	2103	3.80%	46.16	3.80%	67.85	3.80%	90.39	3.80%	50.48	3.80%	21.12	3.80%	50.91	3.80%	85.13	3.80%	71.41	3.80%	48.56	3.80%	49.36	3.80%	41.04	3.80%	38.64	3.80%	80.78	3.80%	52.05
Stage Three Growth	2104	3.80%	47.91	3.80%	70.43	3.80%	93.83	3.80%	52.40	3.80%	21.92	3.80%	52.85	3.80%	88.36	3.80%	74.12	3.80%	50.41	3.80%	51.23	3.80%	42.60	3.80%	40.11	3.80%	83.85	3.80%	54.03
Stage Three Growth	2105	3.80%	49.74	3.80%	73.11	3.80%	97.39	3.80%	54.39	3.80%	22.75	3.80%	54.86	3.80%	91.72	3.80%	76.94	3.80%	52.32	3.80%	53.18	3.80%	44.22	3.80%	41.63	3.80%	87.04	3.80%	56.08
Stage Three Growth	2106	3.80%	51.63	3.80%	75.88	3.80%	101.09	3.80%	56.46	3.80%	23.62	3.80%	56.94	3.80%	95.21	3.80%	79.86	3.80%	54.31	3.80%	55.20	3.80%	45.90	3.80%	43.22	3.80%	90.35	3.80%	58.21
Stage Three Growth	2107	3.80%	53.59	3.80%	78.77	3.80%	104.93	3.80%	58.60	3.80%	24.51	3.80%	59.11	3.80%	98.83	3.80%	82.89	3.80%	56.38	3.80%	57.30	3.80%	47.64	3.80%	44.86	3.80%	93.78	3.80%	60.42
Stage Three Growth	2108	3.80%	55.62	3.80%	81.76	3.80%	108.92	3.80%	60.83	3.80%	25.45	3.80%	61.35	3.80%	102.58	3.80%	86.04	3.80%	58.52	3.80%	59.47	3.80%	49.45	3.80%	46.56	3.80%	97.34	3.80%	62.72
Stage Three Growth	2109	3.80%	57.74	3.80%	84.87	3.80%	113.06	3.80%	63.14	3.80%	26.41	3.80%	63.68	3.80%	106.48	3.80%	89.31	3.80%	60.74	3.80%	61.73	3.80%	51.33	3.80%	48.33	3.80%	101.04	3.80%	65.10
Stage Three Growth	2110	3.80%	59.93	3.80%	88.09	3.80%	117.36	3.80%	65.54	3.80%	27.42	3.80%	66.10	3.80%	110.53	3.80%	92.71	3.80%	63.05	3.80%	64.08	3.80%	53.28	3.80%	50.17	3.80%	104.88	3.80%	67.57
Stage Three Growth	2111	3.80%	62.21	3.80%	91.44	3.80%	121.82	3.80%	68.03	3.80%	28.46	3.80%	68.62	3.80%	114.73	3.80%	96.23	3.80%	65.45	3.80%	66.51	3.80%	55.31	3.80%	52.08	3.80%	108.87	3.80%	70.14
Stage Three Growth	2112	3.80%	64.57	3.80%	94.91	3.80%	126.45	3.80%	70.61	3.80%	29.54	3.80%	71.22	3.80%	119.08	3.80%	99.89	3.80%	67.93	3.80%	69.04	3.80%	57.41	3.80%	54.05	3.80%	113.00	3.80%	72.81
Stage Three Growth	2113	3.80%	67.03	3.80%	98.52	3.80%	131.25	3.80%	73.30	3.80%	30.66	3.80%	73.93	3.80%	123.61	3.80%	103.68	3.80%	70.51	3.80%	71.67	3.80%	59.59	3.80%	56.11	3.80%	117.30	3.80%	75.57
Stage Three Growth	2114	3.80%	69.57	3.80%	102.27	3.80%	136.24	3.80%	76.08	3.80%	31.83	3.80%	76.74	3.80%	128.31	3.80%	107.62	3.80%	73.19	3.80%	74.39	3.80%	61.86	3.80%	58.24	3.80%	121.76	3.80%	78.45
Stage Three Growth	2115	3.80%	72.22	3.80%	106.15	3.80%	141.41	3.80%	78.97	3.80%	33.04	3.80%	79.65	3.80%	133.18	3.80%	111.71	3.80%	75.97	3.80%	77.22	3.80%	64.21	3.80%	60.45	3.80%	126.38	3.80%	81.43
Stage Three Growth	2116	3.80%	74.96	3.80%	110.19	3.80%	146.79	3.80%	81.97	3.80%	34.29	3.80%	82.68	3.80%	138.24	3.80%	115.96	3.80%	78.86	3.80%	80.15	3.80%	66.65	3.80%	62.75	3.80%	131.19	3.80%	84.52
Stage Three Growth	2117	3.80%	77.81	3.80%	114.37	3.80%	152.37	3.80%	85.09	3.80%	35.59	3.80%	85.82	3.80%	143.50	3.80%	120.36	3.80%	81.86	3.80%	83.20	3.80%	69.18	3.80%	65.14	3.80%	136.17	3.80%	87.73
Stage Three Growth	2118	3.80%	80.77	3.80%	118.72	3.80%	158.16	3.80%	88.32	3.80%	36.95	3.80%	89.09	3.80%	148.95	3.80%	124.94	3.80%	84.97	3.80%	86.36	3.80%	71.81	3.80%	67.61	3.80%	141.35	3.80%	91.07
Stage Three Growth	2119	3.80%	83.84	3.80%	123.23	3.80%	164.17	3.80%	91.68	3.80%	38.35	3.80%	92.47	3.80%	154.61	3.80%	129.69	3.80%	88.20	3.80%	89.64	3.80%	74.54	3.80%	70.18	3.80%	146.72	3.80%	94.53
Stage Three Growth	2120	3.80%	87.02	3.80%	127.91	3.80%	170.40	3.80%	95.16	3.80%	39.81	3.80%	95.98	3.80%	160.49	3.80%	134.61	3.80%	91.55	3.80%	93.04	3.80%	77.37	3.80%	72.85	3.80%	152.29	3.80%	98.12
Stage Three Growth	2121	3.80%	90.33	3.80%	132.77	3.80%	176.88	3.80%	98.78	3.80%	41.32	3.80%	99.63	3.80%	166.58	3.80%	139.73	3.80%	95.03	3.80%	96.58	3.80%	80.31	3.80%	75.61	3.80%	158.08	3.80%	101.85
Stage Three Growth	2122	3.80%	93.76	3.80%	137.82	3.80%	183.60	3.80%	102.53	3.80%	42.89	3.80%	103.42	3.80%	172.91	3.80%	145.04	3.80%	98.64	3.80%	100.25	3.80%	83.36	3.80%	78.49	3.80%	164.09	3.80%	105.72
Stage Three Growth	2123	3.80%	97.32	3.80%	143.06	3.80%	190.58	3.80%	106.43	3.80%	44.52	3.80%	107.35	3.80%	179.48	3.80%	150.55	3.80%	102.39	3.80%	104.06	3.80%	86.53	3.80%	81.47	3.80%	170.32	3.80%	109.73
Stage Three Growth	2124	3.80%	101.02	3.80%	148.49	3.80%	197.82	3.80%	110.47	3.80%	46.21	3.80%	111.43	3.80%	186.31	3.80%	156.27	3.80%	106.28	3.80%	108.01	3.80%	89.82	3.80%	84.57	3.80%	176.79	3.80%	113.90
Stage Three Growth	2125	3.80%	104.86	3.80%	154.13	3.80%	205.34	3.80%	114.67	3.80%	47.97	3.80%	115.66	3.80%	193.38	3.80%	162.21	3.80%	110.32	3.80%	112.12	3.80%	93.23	3.80%	87.78	3.80%	183.51	3.80%	118.23
Stage Three Growth	2126	3.80%	108.85	3.80%	159.99	3.80%	213.14	3.80%	119.03	3.80%	49.79	3.80%	120.06	3.80%	200.73	3.80%	168.37	3.80%	114.51	3.80%	116.38	3.80%	96.77	3.80%	91.12	3.80%	190.48	3.80%	122.73
Stage Three Growth	2127	3.80%	112.98	3.80%	166.07	3.80%	221.24	3.80%	123.55	3.80%	51.68	3.80%	124.62	3.80%	208.36	3.80%	174.77	3.80%	118.86	3.80%	120.80	3.80%	100.45	3.80%	94.58	3.80%	197.72	3.80%	127.39
Stage Three Growth	2128	3.80%	117.27	3.80%	172.38	3.80%	229.65	3.80%	128.25	3.80%	53.65	3.80%	129.35	3.80%	216.28	3.80%	181.41	3.80%	123.38	3.80%	125.39	3.80%	104.27	3.80%	98.17	3.80%	205.24	3.80%	132.23
Stage Three Growth	2129	3.80%	121.73	3.80%	178.93	3.80%	238.37	3.80%	133.12	3.80%	55.69	3.80%	134.27	3.80%	224.50	3.80%	188.31	3.80%	128.07	3.80%	130.16	3.80%	108.23	3.80%	101.90	3.80%	213.04	3.80%	137.26
Stage Three Growth	2130	3.80%	126.36	3.80%	185.73	3.80%	247.43	3.80%	138.18	3.80%	57.80	3.80%	139.37	3.80%	233.03	3.80%	195.46	3.80%	132.93	3.80%	135.10	3.80%	112.34	3.80%	105.77	3.80%	221.13	3.80%	142.47
Stage Three Growth	2131	3.80%	131.16	3.80%	192.79	3.80%	256.83	3.80%	143.43	3.80%	60.00	3.80%	144.67	3.80%	241.88	3.80%	202.89	3.80%	137.98	3.80%	140.24	3.80%	116.61	3.80%	109.79	3.80%	229.53	3.80%	147.88

Stage Three Growth	2132	3.80%	136.14	3.80%	200.12	3.80%	266.59	3.80%	148.88	3.80%	62.28	3.80%	150.16	3.80%	251.08	3.80%	210.60	3.80%	143.23	3.80%	145.57	3.80%	121.04	3.80%	113.97	3.80%	238.26	3.80%	153.50
Stage Three Growth	2133	3.80%	141.32	3.80%	207.72	3.80%	276.72	3.80%	154.54	3.80%	64.65	3.80%	155.87	3.80%	260.62	3.80%	218.60	3.80%	148.67	3.80%	151.10	3.80%	125.64	3.80%	118.30	3.80%	247.31	3.80%	159.34
Stage Three Growth	2134	3.80%	146.69	3.80%	215.61	3.80%	287.24	3.80%	160.41	3.80%	67.10	3.80%	161.79	3.80%	270.52	3.80%	226.91	3.80%	154.32	3.80%	156.84	3.80%	130.42	3.80%	122.79	3.80%	256.71	3.80%	165.39
Stage Three Growth	2135	3.80%	152.26	3.80%	223.81	3.80%	298.15	3.80%	166.51	3.80%	69.65	3.80%	167.94	3.80%	280.80	3.80%	235.53	3.80%	160.18	3.80%	162.80	3.80%	135.37	3.80%	127.46	3.80%	266.46	3.80%	171.68
Stage Three Growth	2136	3.80%	158.05	3.80%	232.31	3.80%	309.48	3.80%	172.83	3.80%	72.30	3.80%	174.32	3.80%	291.47	3.80%	244.48	3.80%	166.27	3.80%	168.98	3.80%	140.52	3.80%	132.30	3.80%	276.59	3.80%	178.20
Stage Three Growth	2137	3.80%	164.05	3.80%	241.14	3.80%	321.25	3.80%	179.40	3.80%	75.05	3.80%	180.95	3.80%	302.55	3.80%	253.77	3.80%	172.59	3.80%	175.41	3.80%	145.85	3.80%	137.33	3.80%	287.10	3.80%	184.97
Stage Three Growth	2138	3.80%	170.29	3.80%	250.30	3.80%	333.45	3.80%	186.22	3.80%	77.90	3.80%	187.82	3.80%	314.04	3.80%	263.42	3.80%	179.15	3.80%	182.07	3.80%	151.40	3.80%	142.55	3.80%	298.01	3.80%	192.00
Stage Three Growth	2139	3.80%	176.76	3.80%	259.81	3.80%	346.12	3.80%	193.29	3.80%	80.86	3.80%	194.96	3.80%	325.98	3.80%	273.43	3.80%	185.95	3.80%	188.99	3.80%	157.15	3.80%	147.96	3.80%	309.33	3.80%	199.30
Stage Three Growth	2140	3.80%	183.47	3.80%	269.69	3.80%	359.28	3.80%	200.64	3.80%	83.93	3.80%	202.37	3.80%	338.36	3.80%	283.82	3.80%	193.02	3.80%	196.17	3.80%	163.12	3.80%	153.59	3.80%	321.09	3.80%	206.87
Implied Cost of Equity			**7.55%**		**8.02%**		**8.49%**		**8.41%**		**7.11%**		**7.58%**		**7.41%**		**9.34%**		**6.05%**		**8.68%**		**9.10%**		**5.83%**		**8.30%**		**8.08%**

Mean	7.85%
Median	8.05%
Selected Three-Stage DGM Cost of Equity	**7.95%**

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Alliant Energy Corp	19.9
Ameren Corp	17.1
American Electric Power Co Inc.	16.8
Black Hills Corp	15.2
CenterPoint Energy Inc.	21.1
CMS Energy Corp	20.3
DTE Energy Company	16.4
Evergy Inc.	14.9
MGE Energy Inc.	1.4
Northwestern Corp	15.2
OGE Energy Corp	16.1
Otter Tail Corp	14.5
WEC Energy Group	17.7
Xcel Energy Inc.	17.6
Mean	16.0
Median	16.6
Selected Price to Earnings (P/E) Ratio	16.6
Indicated Equity Component of the Direct Rate	**6.02%**

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
Alliant Energy Corp	0.90
Ameren Corp	0.90
American Electric Power Co Inc.	0.85
Black Hills Corp	1.05
CenterPoint Energy Inc.	1.15
CMS Energy Corp	0.85
DTE Energy Company	1.00
Evergy Inc.	0.95
MGE Energy Inc.	0.85
Northwestern Corp	1.00
OGE Energy Corp	1.05
Otter Tail Corp	0.95
WEC Energy Group	0.85
Xcel Energy Inc.	0.85
Beta Mean	0.94
Beta Median	0.93
Unlevered and Relevered Mean*	0.99
Indicated Beta	**0.93**

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**
Alliant Energy Corp	2.00%	36.15%	63.85%	0.90	0.58
Ameren Corp	12.00%	42.55%	57.11%	0.90	0.54
American Electric Power Co Inc.	21.00%	42.61%	57.39%	0.85	0.54
Black Hills Corp	8.50%	51.10%	48.90%	1.05	0.54
CenterPoint Energy Inc.	16.00%	48.24%	51.76%	1.15	0.65
CMS Energy Corp	15.50%	42.67%	56.72%	0.85	0.52
DTE Energy Company	5.00%	44.21%	55.79%	1.00	0.57
Evergy Inc.	4.50%	43.83%	56.17%	0.95	0.54
MGE Energy Inc.	19.00%	15.87%	84.13%	0.85	0.74
Northwestern Corp	6.00%	43.45%	56.55%	1.00	0.58
OGE Energy Corp	12.00%	38.66%	61.34%	1.05	0.68
Otter Tail Corp	20.00%	19.69%	80.31%	0.95	0.79
WEC Energy Group	19.00%	36.44%	63.49%	0.85	0.58
Xcel Energy Inc.	NMF	44.10%	55.90%	0.85	N/A
			Average	**0.94**	

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**
Alliant Energy Corp	12.35%	42.00%	58.00%	0.95
Ameren Corp	12.35%	42.00%	58.00%	0.88
American Electric Power Co Inc.	12.35%	42.00%	58.00%	0.88
Black Hills Corp	12.35%	42.00%	58.00%	0.88
CenterPoint Energy Inc.	12.35%	42.00%	58.00%	1.06
CMS Energy Corp	12.35%	42.00%	58.00%	0.85
DTE Energy Company	12.35%	42.00%	58.00%	0.93
Evergy Inc.	12.35%	42.00%	58.00%	0.88
MGE Energy Inc.	12.35%	42.00%	58.00%	1.21
Northwestern Corp	12.35%	42.00%	58.00%	0.95
OGE Energy Corp	12.35%	42.00%	58.00%	1.11
Otter Tail Corp	12.35%	42.00%	58.00%	1.29
WEC Energy Group	12.35%	42.00%	58.00%	0.95
Xcel Energy Inc.	12.35%	42.00%	58.00%	N/A
			Average	**0.99**

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 Electric Market Segment

- December 31, 2024 calendar year information for the January 2, 2025 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
Alliant Energy Corp	16,327,407,223	7,004,000,000	2.33	Alliant Energy Corp. 2024 10-K, p. 50
Ameren Corp	22,040,225,721	12,243,000,000	1.80	Ameren Corp. 2024 10-K, p. 87
American Electric Power Co Inc.	52,734,619,472	26,943,800,000	1.96	American Electric Power Co. 2024 10-K, p. 74
Black Hills Corp	4,064,408,837	3,501,500,000	1.16	Black Hills Corp. 2024 10-K, p. 45
CenterPoint Energy Inc.	21,168,101,924	10,666,000,000	1.98	CenterPoint Energy Inc. 2024 10-K, p. 98
CMS Energy Corp	20,816,341,545	8,230,000,000	2.53	CMS Energy Corp. 2024 10-K, p. 97
DTE Energy Company	25,819,230,057	11,699,000,000	2.21	DTE Energy Co. 2024 10-K, p. 59
Evergy Inc.	14,831,163,268	9,955,000,000	1.49	Evergy Inc. 2024 10-K, p. 76
MGE Energy Inc.	3,792,738,663	3,649,000,000	1.04	MGE Energy Inc. 2024 10-K, p. 56
Northwestern Corp	3,348,846,151	2,857,700,000	1.17	NorthWestern Corp. 2024 10-K, p. F-6
OGE Energy Corp	7,965,573,924	4,640,900,000	1.72	OGE Energy Corp. 2024 10-K, p. 52
Otter Tail Corp	3,849,009,523	1,668,499,000	2.31	Otter Tail Corp. 2024 10-K, p. 49
WEC Energy Group	29,424,127,022	12,395,000,000	2.37	WEC Energy Group. 2024 10-K, p. 82
Xcel Energy Inc.	35,128,117,910	19,522,000,000	1.80	Xcel Energy Inc. 2024 10-K, p. 51
		Average	**1.85**	

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
Alliant Energy Corp	9,577,000,000	9,848,000,000	0.97	Alliant Energy Corp. 2024 10-K, p. 96
Ameren Corp	15,395,000,000	17,579,000,000	0.88	Ameren Corp. 2024 10-K, p. 131
American Electric Power Co Inc.	38,964,700,000	42,642,800,000	0.91	American Electric Power Co. 2024 10-K, p. 266
Black Hills Corp	4,059,100,000	4,250,200,000	0.96	Black Hills Corp. 2024 10-K, p. 88
CenterPoint Energy Inc.	19,597,000,000	20,961,000,000	0.93	CenterPoint Energy Inc. 2024 10-K, p. 149
CMS Energy Corp	14,876,000,000	16,386,000,000	0.91	CMS Energy Corp. 2024 10-K, p. 133
DTE Energy Company	18,283,000,000	21,963,000,000	0.83	DTE Energy Co. 2023 10-K, p. 105
Evergy Inc.	11,535,000,000	12,460,900,000	0.93	Evergy Inc. 2024 10-K, p. 137
MGE Energy Inc.	698,765,000	773,400,000	0.90	MGE Energy 2024 10-K p. 93
Northwestern Corp	2,645,779,000	2,995,293,000	0.88	NorthWestern Corp. 2024 10-K, p. F-21
OGE Energy Corp	4,174,900,000	4,499,600,000	0.93	OGE Energy Corp. 2024 10-K, p. 73
Otter Tail Corp	876,441,000	1,013,349,000	0.86	Otter Tail Corp. 2024 10-K, p. 85
WEC Energy Group	17,840,800,000	18,907,100,000	0.94	WEC Energy Group. 2024 10-K, p. 147
Xcel Energy Inc.	25,115,000,000	28,419,000,000	0.88	Xcel Energy Inc. 2024 10-K, p. 71
		Average	**0.91**	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	58.00%	1.85	1.07
Long-term Debt	42.00%	0.91	0.38
			1.45

Appendix B - Gas Distribution

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	41.00%	5.77%	2.37%
Common Equity	59.00%	10.15%	5.99%
Yield Rate			**8.36%**

Gas Distribution Yield Rate	**8.36%**

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	7,866,500,000	-	22,681,068,353	30,547,568,353	25.75%	0.00%	74.25%
Black Hills Corp	4,247,100,000	-	4,064,408,837	8,311,508,837	51.10%	0.00%	48.90%
CenterPoint Energy Inc.	19,729,000,000	-	21,168,101,924	40,897,101,924	48.24%	0.00%	51.76%
Chesapeake Utilities	1,173,000,000		2,880,406,754	4,053,406,754	28.94%	0.00%	71.06%
CMS Energy Corp	15,660,000,000	224,000,000	20,816,341,545	36,700,341,545	42.67%	0.61%	56.72%
MGE Energy Inc.	715,300,000	-	3,792,738,663	4,508,038,663	15.87%	0.00%	84.13%
New Jersey Resources Corp	2,793,700,000	-	4,716,409,344	7,510,109,344	37.20%	0.00%	62.80%
NiSource Inc.	12,086,300,000	-	16,906,733,315	28,993,033,315	41.69%	0.00%	58.31%
Northwest Natural Gas	1,574,880,000	-	1,602,496,072	3,177,376,072	49.57%	0.00%	50.43%
ONE Gas Inc	2,384,900,000	-	4,250,277,305	6,635,177,305	35.94%	0.00%	64.06%
Southwest Gas Holdings Inc.	4,382,100,000	-	5,531,436,649	9,913,536,649	44.20%	0.00%	55.80%
Spire Inc / Laclede Group Inc.	3,422,300,000	242,000,000	3,816,151,322	7,480,451,322	45.75%	3.24%	51.01%
WEC Energy Group	16,889,200,000	30,400,000	29,424,127,022	46,343,727,022	36.44%	0.07%	63.49%
				Mean	38.72%	0.30%	60.98%
				Median	41.69%	0.00%	58.31%
		Indicated Industry Capital Structure			**41.00%**		**59.00%**

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
Atmos Energy Corp	A1	5.58%
Black Hills Corp	Baa2	5.77%
CenterPoint Energy Inc.	Baa2	5.77%
Chesapeake Utilities	NR	N/A
CMS Energy Corp	Baa2	5.77%
MGE Energy Inc.	NR	N/A
New Jersey Resources Corp	NR	N/A
NiSource Inc.	Baa2	5.77%
Northwest Natural Gas	Baa1	5.77%
ONE Gas Inc	A3	5.58%
Southwest Gas Holdings Inc.	Baa1	5.77%
Spire Inc / Laclede Group Inc.	Baa2	5.77%
WEC Energy Group	Baa1	5.77%

Mean	5.73%
Median	5.77%
Mode	5.77%

Indicated Rate of Debt	5.77%

Public Utility Bond Yield Averages from Mergent Bond Record, January 2025 Edition

Public Utility Bond Averages, December 2024

Mergent	S&P	Dec. Yield Avg.
Aaa, Aa1, Aa2 Aa3	AAA, AA+, AA, AA-	5.45%
A1, A2, A3	A+, A, A-	5.58%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.77%

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	7.66%
CAPM - Damodaran	8.84%
CAPM - The CFO Survey	9.82%
CAPM - Fernandez, Banuls, and Acin	9.92%
CAPM - Ex Post (BVR Historical, Arithmetic)	11.03%
CAPM - Ex Post (BVR Historical, Geometric)	9.88%
Empirical CAPM - Ex Ante, Three Stage	7.72%
Empirical CAPM - Damodaran	8.93%
Empirical CAPM - Graham and Harvey	9.93%
Empirical CAPM - Fernandez, Banuls, and Acin	10.03%
Empirical CAPM - Ex Post (BVR Historical, Arithmetic)	11.17%
Empirical CAPM - Ex Post (BVR Historical, Geometric)	9.99%
DGM - Dividend Growth	8.52%
DGM - Earnings Growth	9.36%
DGM - Two-Stage	8.68%
DGM - Three-Stage	7.80%
Indicated Rate of Equity	**10.15%**

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

	Capital Structure	Rate	Composite
Debt Component	41.00%	5.77%	2.37%
Equity Component	59.00%	5.18%	3.06%
Direct Rate			**5.43%**

Direct Rate	**5.43%**

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]	3.04%	0.92	2.80%	4.86%	7.66%
Dr. Damodaran ERP[3]	4.33%	0.92	3.98%	4.86%	8.84%
The CFO Survey[4]	5.39%	0.92	4.96%	4.86%	9.82%
Fernandez, Banuls and Acin[5]	5.50%	0.92	5.06%	4.86%	9.92%
BVR - Historical, Arithmetic Mean[6]	6.71%	0.92	6.17%	4.86%	11.03%
BVR - Historical, Geometric Mean[7]	5.46%	0.92	5.02%	4.86%	9.88%

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 15, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

6 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 3, 2025 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]	3.04%	0.92	2.10%	0.76%	4.86%	7.72%
Dr. Damodaran ERP[3]	4.33%	0.92	2.99%	1.08%	4.86%	8.93%
The CFO Survey[4]	5.39%	0.92	3.72%	1.35%	4.86%	9.93%
Fernandez, Banuls and Acin[5]	5.50%	0.92	3.80%	1.38%	4.86%	10.03%
BVR - Historical, Arithmetic Mean[6]	6.71%	0.92	4.63%	1.68%	4.86%	11.17%
BVR - Historical, Geometric Mean[7]	5.46%	0.92	3.77%	1.37%	4.86%	9.99%

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 15, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

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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	2.40%	7.00%	7.50%	9.40%	9.90%
Black Hills Corp	4.50%	4.00%	4.00%	8.50%	8.50%
CenterPoint Energy Inc.	2.60%	6.50%	6.00%	9.10%	8.60%
Chesapeake Utilities	2.10%	6.50%	8.00%	8.60%	10.10%
CMS Energy Corp	3.00%	6.00%	5.00%	9.00%	8.00%
MGE Energy Inc.	1.70%	7.00%	6.50%	8.70%	8.20%
New Jersey Resources Corp	3.80%	5.00%	5.00%	8.80%	8.80%
NiSource Inc.	3.10%	9.50%	4.50%	12.60%	7.60%
Northwest Natural Gas	4.70%	6.50%	0.50%	11.20%	5.20%
ONE Gas Inc	3.60%	3.50%	2.50%	7.10%	6.10%
Southwest Gas Holdings Inc.	3.20%	10.00%	5.50%	13.20%	8.70%
Spire Inc / Laclede Group Inc.	4.80%	4.50%	4.50%	9.30%	9.30%
WEC Energy Group	3.60%	6.00%	7.00%	9.60%	10.60%
Mean	3.32%	6.31%	5.12%	9.62%	8.43%
Median	3.20%	6.50%	5.00%	9.10%	8.60%

DGM - Dividend Growth, Indicated Rate	**8.52%**
DGM - Earnings Growth, Indicated Rate	**9.36%**

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
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	2.40%	7.00%	3.80%	5.40%	8.41%
Black Hills Corp	4.50%	4.00%	3.80%	3.90%	8.52%
CenterPoint Energy Inc.	2.60%	6.50%	3.80%	5.15%	8.28%
Chesapeake Utilities	2.10%	6.50%	3.80%	5.15%	7.76%
CMS Energy Corp	3.00%	6.00%	3.80%	4.90%	8.35%
MGE Energy Inc.	1.70%	7.00%	3.80%	5.40%	7.69%
New Jersey Resources Corp	3.80%	5.00%	3.80%	4.40%	8.49%
NiSource Inc.	3.10%	9.50%	3.80%	6.65%	10.82%
Northwest Natural Gas	4.70%	6.50%	3.80%	5.15%	10.43%
ONE Gas Inc	3.60%	3.50%	3.80%	3.65%	7.26%
Southwest Gas Holdings Inc.	3.20%	10.00%	3.80%	6.90%	11.26%
Spire Inc / Laclede Group Inc.	4.80%	4.50%	3.80%	4.15%	9.17%
WEC Energy Group	3.60%	6.00%	3.80%	4.90%	8.96%

Mean	8.88%
Median	8.49%
Two-Stage DGM, Indicated Rate	**8.68%**

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 1.8% 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

Company	Year	Atmos Energy Corp		Black Hills Corp		CenterPoint Energy Inc.		Chesapeake Utilities		CMS Energy Corp		MGE Energy Inc.		New Jersey Resources Corp		NiSource Inc.		Northwest Natural		ONE Gas Inc		Southwest Gas Holdings Inc.		Spire Inc / Laclede Group Inc.		WEC Energy Group	
Start Price	2024		-146.11		-59.12		-32.48		-126.44		-69.67		-104.75		-47.56		-36.22		-41.44		-75.02		-77.1		-66.08		-93.01
Expected Dividends	2025		3.22		2.70		0.89		2.64		2.25		2.00		1.76		1.12		1.96		2.68		2.52		3.16		3.57
Stage One Growth	2026	7.00%	3.45	4.00%	2.81	6.50%	0.95	6.50%	2.81	6.00%	2.39	7.00%	2.14	5.00%	1.85	9.50%	1.23	6.50%	2.09	3.50%	2.77	10.00%	2.77	4.50%	3.30	6.00%	3.78
Stage One Growth	2027	7.00%	3.69	4.00%	2.92	6.50%	1.01	6.50%	2.99	6.00%	2.53	7.00%	2.29	5.00%	1.94	9.50%	1.34	6.50%	2.22	3.50%	2.87	10.00%	3.05	4.50%	3.45	6.00%	4.01
Stage One Growth	2028	7.00%	3.94	4.00%	3.04	6.50%	1.08	6.50%	3.19	6.00%	2.68	7.00%	2.45	5.00%	2.04	9.50%	1.47	6.50%	2.37	3.50%	2.97	10.00%	3.35	4.50%	3.61	6.00%	4.25
Stage One Growth	2029	7.00%	4.22	4.00%	3.16	6.50%	1.15	6.50%	3.40	6.00%	2.84	7.00%	2.62	5.00%	2.14	9.50%	1.61	6.50%	2.52	3.50%	3.08	10.00%	3.69	4.50%	3.77	6.00%	4.51
Stage One Growth	2030	7.00%	4.52	4.00%	3.28	6.50%	1.22	6.50%	3.62	6.00%	3.01	7.00%	2.81	5.00%	2.25	9.50%	1.76	6.50%	2.69	3.50%	3.18	10.00%	4.06	4.50%	3.94	6.00%	4.78
Stage Two Growth	2031	6.71%	4.82	3.98%	3.42	6.25%	1.30	6.25%	3.84	5.80%	3.19	6.75%	2.99	4.89%	2.36	8.98%	1.92	6.25%	2.85	3.53%	3.30	9.44%	4.44	4.44%	4.11	5.80%	5.05
Stage Two Growth	2032	6.42%	5.13	3.96%	3.55	6.01%	1.37	6.01%	4.07	5.60%	3.36	6.51%	3.19	4.78%	2.47	8.46%	2.08	6.01%	3.02	3.55%	3.41	8.87%	4.84	4.37%	4.29	5.60%	5.34
Stage Two Growth	2033	6.13%	5.44	3.95%	3.69	5.76%	1.45	5.76%	4.31	5.40%	3.55	6.26%	3.39	4.67%	2.58	7.95%	2.25	5.76%	3.20	3.58%	3.53	8.31%	5.24	4.31%	4.48	5.40%	5.63
Stage Two Growth	2034	5.84%	5.76	3.93%	3.84	5.52%	1.53	5.52%	4.55	5.20%	3.73	6.02%	3.59	4.56%	2.70	7.43%	2.42	5.52%	3.38	3.61%	3.66	7.75%	5.64	4.25%	4.67	5.20%	5.92
Stage Two Growth	2035	5.55%	6.08	3.91%	3.99	5.27%	1.61	5.27%	4.79	5.00%	3.92	5.77%	3.80	4.45%	2.82	6.91%	2.58	5.27%	3.55	3.64%	3.80	7.18%	6.05	4.18%	4.86	5.00%	6.21
Stage Two Growth	2036	5.25%	6.40	3.89%	4.14	5.03%	1.69	5.03%	5.03	4.80%	4.10	5.53%	4.01	4.35%	2.95	6.39%	2.75	5.03%	3.73	3.66%	3.93	6.62%	6.45	4.12%	5.06	4.80%	6.51
Stage Two Growth	2037	4.96%	6.72	3.87%	4.30	4.78%	1.78	4.78%	5.27	4.60%	4.29	5.28%	4.22	4.24%	3.07	5.87%	2.91	4.78%	3.91	3.69%	4.08	6.05%	6.84	4.05%	5.27	4.60%	6.81
Stage Two Growth	2038	4.67%	7.03	3.85%	4.47	4.54%	1.86	4.54%	5.51	4.40%	4.48	5.04%	4.44	4.13%	3.20	5.35%	3.07	4.54%	4.09	3.72%	4.23	5.49%	7.21	3.99%	5.48	4.40%	7.11
Stage Two Growth	2039	4.38%	7.34	3.84%	4.64	4.29%	1.94	4.29%	5.74	4.20%	4.67	4.79%	4.65	4.02%	3.33	4.84%	3.21	4.29%	4.26	3.75%	4.39	4.93%	7.57	3.93%	5.69	4.20%	7.41
Stage Two Growth	2040	4.09%	7.64	3.82%	4.82	4.05%	2.01	4.05%	5.98	4.00%	4.86	4.55%	4.86	3.91%	3.46	4.32%	3.35	4.05%	4.44	3.77%	4.56	4.36%	7.90	3.86%	5.91	4.00%	7.71
Stage Three Growth	2041	3.80%	7.93	3.80%	5.00	3.80%	2.09	3.80%	6.20	3.80%	5.04	3.80%	5.04	3.80%	3.59	3.80%	3.48	3.80%	4.60	3.80%	4.73	3.80%	8.20	3.80%	6.14	3.80%	8.00
Stage Three Growth	2042	3.80%	8.23	3.80%	5.19	3.80%	2.17	3.80%	6.44	3.80%	5.23	3.80%	5.24	3.80%	3.72	3.80%	3.61	3.80%	4.78	3.80%	4.91	3.80%	8.51	3.80%	6.37	3.80%	8.30
Stage Three Growth	2043	3.80%	8.54	3.80%	5.39	3.80%	2.25	3.80%	6.68	3.80%	5.43	3.80%	5.43	3.80%	3.86	3.80%	3.75	3.80%	4.96	3.80%	5.09	3.80%	8.84	3.80%	6.61	3.80%	8.62
Stage Three Growth	2044	3.80%	8.87	3.80%	5.59	3.80%	2.34	3.80%	6.94	3.80%	5.64	3.80%	5.64	3.80%	4.01	3.80%	3.89	3.80%	5.15	3.80%	5.29	3.80%	9.17	3.80%	6.87	3.80%	8.95
Stage Three Growth	2045	3.80%	9.21	3.80%	5.80	3.80%	2.43	3.80%	7.20	3.80%	5.85	3.80%	5.86	3.80%	4.16	3.80%	4.04	3.80%	5.35	3.80%	5.49	3.80%	9.52	3.80%	7.13	3.80%	9.29
Stage Three Growth	2046	3.80%	9.56	3.80%	6.02	3.80%	2.52	3.80%	7.47	3.80%	6.08	3.80%	6.08	3.80%	4.32	3.80%	4.19	3.80%	5.55	3.80%	5.70	3.80%	9.88	3.80%	7.40	3.80%	9.64
Stage Three Growth	2047	3.80%	9.92	3.80%	6.25	3.80%	2.62	3.80%	7.76	3.80%	6.31	3.80%	6.31	3.80%	4.49	3.80%	4.35	3.80%	5.76	3.80%	5.91	3.80%	10.26	3.80%	7.68	3.80%	10.01
Stage Three Growth	2048	3.80%	10.30	3.80%	6.49	3.80%	2.72	3.80%	8.05	3.80%	6.55	3.80%	6.55	3.80%	4.66	3.80%	4.52	3.80%	5.98	3.80%	6.14	3.80%	10.65	3.80%	7.97	3.80%	10.39
Stage Three Growth	2049	3.80%	10.69	3.80%	6.74	3.80%	2.82	3.80%	8.36	3.80%	6.79	3.80%	6.80	3.80%	4.83	3.80%	4.69	3.80%	6.21	3.80%	6.37	3.80%	11.05	3.80%	8.27	3.80%	10.78
Stage Three Growth	2050	3.80%	11.09	3.80%	6.99	3.80%	2.93	3.80%	8.68	3.80%	7.05	3.80%	7.06	3.80%	5.02	3.80%	4.87	3.80%	6.44	3.80%	6.61	3.80%	11.47	3.80%	8.59	3.80%	11.19
Stage Three Growth	2051	3.80%	11.51	3.80%	7.26	3.80%	3.04	3.80%	9.01	3.80%	7.32	3.80%	7.32	3.80%	5.21	3.80%	5.05	3.80%	6.69	3.80%	6.87	3.80%	11.91	3.80%	8.91	3.80%	11.62
Stage Three Growth	2052	3.80%	11.95	3.80%	7.53	3.80%	3.15	3.80%	9.35	3.80%	7.60	3.80%	7.60	3.80%	5.41	3.80%	5.25	3.80%	6.94	3.80%	7.13	3.80%	12.36	3.80%	9.25	3.80%	12.06
Stage Three Growth	2053	3.80%	12.41	3.80%	7.82	3.80%	3.27	3.80%	9.70	3.80%	7.89	3.80%	7.89	3.80%	5.61	3.80%	5.45	3.80%	7.20	3.80%	7.40	3.80%	12.83	3.80%	9.60	3.80%	12.52
Stage Three Growth	2054	3.80%	12.88	3.80%	8.12	3.80%	3.40	3.80%	10.07	3.80%	8.19	3.80%	8.19	3.80%	5.82	3.80%	5.65	3.80%	7.48	3.80%	7.68	3.80%	13.32	3.80%	9.97	3.80%	12.99
Stage Three Growth	2055	3.80%	13.37	3.80%	8.43	3.80%	3.53	3.80%	10.45	3.80%	8.50	3.80%	8.50	3.80%	6.05	3.80%	5.87	3.80%	7.76	3.80%	7.97	3.80%	13.82	3.80%	10.35	3.80%	13.48
Stage Three Growth	2056	3.80%	13.87	3.80%	8.75	3.80%	3.66	3.80%	10.85	3.80%	8.82	3.80%	8.83	3.80%	6.28	3.80%	6.09	3.80%	8.06	3.80%	8.27	3.80%	14.35	3.80%	10.74	3.80%	14.00
Stage Three Growth	2057	3.80%	14.40	3.80%	9.08	3.80%	3.80	3.80%	11.26	3.80%	9.16	3.80%	9.16	3.80%	6.51	3.80%	6.32	3.80%	8.36	3.80%	8.59	3.80%	14.89	3.80%	11.15	3.80%	14.53
Stage Three Growth	2058	3.80%	14.95	3.80%	9.42	3.80%	3.94	3.80%	11.69	3.80%	9.51	3.80%	9.51	3.80%	6.76	3.80%	6.56	3.80%	8.68	3.80%	8.91	3.80%	15.46	3.80%	11.57	3.80%	15.08
Stage Three Growth	2059	3.80%	15.52	3.80%	9.78	3.80%	4.09	3.80%	12.14	3.80%	9.87	3.80%	9.87	3.80%	7.02	3.80%	6.81	3.80%	9.01	3.80%	9.25	3.80%	16.05	3.80%	12.01	3.80%	15.65
Stage Three Growth	2060	3.80%	16.11	3.80%	10.15	3.80%	4.25	3.80%	12.60	3.80%	10.24	3.80%	10.24	3.80%	7.28	3.80%	7.07	3.80%	9.35	3.80%	9.60	3.80%	16.66	3.80%	12.47	3.80%	16.25
Stage Three Growth	2061	3.80%	16.72	3.80%	10.54	3.80%	4.41	3.80%	13.08	3.80%	10.63	3.80%	10.63	3.80%	7.56	3.80%	7.34	3.80%	9.71	3.80%	9.97	3.80%	17.29	3.80%	12.94	3.80%	16.87
Stage Three Growth	2062	3.80%	17.35	3.80%	10.94	3.80%	4.58	3.80%	13.57	3.80%	11.03	3.80%	11.04	3.80%	7.85	3.80%	7.62	3.80%	10.08	3.80%	10.35	3.80%	17.95	3.80%	13.43	3.80%	17.51
Stage Three Growth	2063	3.80%	18.01	3.80%	11.36	3.80%	4.75	3.80%	14.09	3.80%	11.45	3.80%	11.46	3.80%	8.15	3.80%	7.91	3.80%	10.46	3.80%	10.74	3.80%	18.63	3.80%	13.94	3.80%	18.17
Stage Three Growth	2064	3.80%	18.70	3.80%	11.79	3.80%	4.93	3.80%	14.62	3.80%	11.89	3.80%	11.89	3.80%	8.46	3.80%	8.21	3.80%	10.86	3.80%	11.15	3.80%	19.34	3.80%	14.47	3.80%	18.86
Stage Three Growth	2065	3.80%	19.41	3.80%	12.24	3.80%	5.12	3.80%	15.18	3.80%	12.34	3.80%	12.35	3.80%	8.78	3.80%	8.52	3.80%	11.27	3.80%	11.57	3.80%	20.07	3.80%	15.02	3.80%	19.58
Stage Three Growth	2066	3.80%	20.15	3.80%	12.70	3.80%	5.31	3.80%	15.76	3.80%	12.81	3.80%	12.81	3.80%	9.11	3.80%	8.84	3.80%	11.70	3.80%	12.01	3.80%	20.83	3.80%	15.60	3.80%	20.32

Stage Three Growth	2067	3.80%	20.91	3.80%	13.18	3.80%	5.51	3.80%	16.36	3.80%	13.30	3.80%	13.30	3.80%	9.46	3.80%	9.18	3.80%	12.14	3.80%	12.47	3.80%	21.63	3.80%	16.19	3.80%	21.10
Stage Three Growth	2068	3.80%	21.71	3.80%	13.68	3.80%	5.72	3.80%	16.98	3.80%	13.80	3.80%	13.81	3.80%	9.82	3.80%	9.53	3.80%	12.61	3.80%	12.94	3.80%	22.45	3.80%	16.80	3.80%	21.90
Stage Three Growth	2069	3.80%	22.53	3.80%	14.20	3.80%	5.94	3.80%	17.62	3.80%	14.33	3.80%	14.33	3.80%	10.19	3.80%	9.89	3.80%	13.08	3.80%	13.44	3.80%	23.30	3.80%	17.44	3.80%	22.73
Stage Three Growth	2070	3.80%	23.39	3.80%	14.74	3.80%	6.17	3.80%	18.29	3.80%	14.87	3.80%	14.88	3.80%	10.58	3.80%	10.26	3.80%	13.58	3.80%	13.95	3.80%	24.19	3.80%	18.10	3.80%	23.59
Stage Three Growth	2071	3.80%	24.28	3.80%	15.30	3.80%	6.40	3.80%	18.99	3.80%	15.44	3.80%	15.44	3.80%	10.98	3.80%	10.66	3.80%	14.10	3.80%	14.48	3.80%	25.11	3.80%	18.79	3.80%	24.49
Stage Three Growth	2072	3.80%	25.20	3.80%	15.89	3.80%	6.65	3.80%	19.71	3.80%	16.02	3.80%	16.03	3.80%	11.40	3.80%	11.06	3.80%	14.63	3.80%	15.03	3.80%	26.06	3.80%	19.51	3.80%	25.42
Stage Three Growth	2073	3.80%	26.16	3.80%	16.49	3.80%	6.90	3.80%	20.46	3.80%	16.63	3.80%	16.64	3.80%	11.83	3.80%	11.48	3.80%	15.19	3.80%	15.60	3.80%	27.05	3.80%	20.25	3.80%	26.39
Stage Three Growth	2074	3.80%	27.15	3.80%	17.12	3.80%	7.16	3.80%	21.24	3.80%	17.26	3.80%	17.27	3.80%	12.28	3.80%	11.92	3.80%	15.77	3.80%	16.19	3.80%	28.08	3.80%	21.02	3.80%	27.39
Stage Three Growth	2075	3.80%	28.18	3.80%	17.77	3.80%	7.43	3.80%	22.04	3.80%	17.92	3.80%	17.93	3.80%	12.75	3.80%	12.37	3.80%	16.37	3.80%	16.80	3.80%	29.14	3.80%	21.82	3.80%	28.43
Stage Three Growth	2076	3.80%	29.25	3.80%	18.44	3.80%	7.71	3.80%	22.88	3.80%	18.60	3.80%	18.61	3.80%	13.23	3.80%	12.84	3.80%	16.99	3.80%	17.44	3.80%	30.25	3.80%	22.65	3.80%	29.51
Stage Three Growth	2077	3.80%	30.36	3.80%	19.14	3.80%	8.01	3.80%	23.75	3.80%	19.31	3.80%	19.31	3.80%	13.73	3.80%	13.33	3.80%	17.63	3.80%	18.11	3.80%	31.40	3.80%	23.51	3.80%	30.63
Stage Three Growth	2078	3.80%	31.52	3.80%	19.87	3.80%	8.31	3.80%	24.65	3.80%	20.04	3.80%	20.05	3.80%	14.26	3.80%	13.83	3.80%	18.30	3.80%	18.79	3.80%	32.60	3.80%	24.40	3.80%	31.80
Stage Three Growth	2079	3.80%	32.72	3.80%	20.62	3.80%	8.63	3.80%	25.59	3.80%	20.80	3.80%	20.81	3.80%	14.80	3.80%	14.36	3.80%	19.00	3.80%	19.51	3.80%	33.83	3.80%	25.33	3.80%	33.01
Stage Three Growth	2080	3.80%	33.96	3.80%	21.41	3.80%	8.96	3.80%	26.56	3.80%	21.59	3.80%	21.60	3.80%	15.36	3.80%	14.90	3.80%	19.72	3.80%	20.25	3.80%	35.12	3.80%	26.29	3.80%	34.26
Stage Three Growth	2081	3.80%	35.25	3.80%	22.22	3.80%	9.30	3.80%	27.57	3.80%	22.41	3.80%	22.42	3.80%	15.94	3.80%	15.47	3.80%	20.47	3.80%	21.02	3.80%	36.45	3.80%	27.29	3.80%	35.56
Stage Three Growth	2082	3.80%	36.59	3.80%	23.07	3.80%	9.65	3.80%	28.62	3.80%	23.26	3.80%	23.27	3.80%	16.55	3.80%	16.06	3.80%	21.25	3.80%	21.82	3.80%	37.84	3.80%	28.32	3.80%	36.91
Stage Three Growth	2083	3.80%	37.98	3.80%	23.94	3.80%	10.02	3.80%	29.71	3.80%	24.15	3.80%	24.16	3.80%	17.18	3.80%	16.67	3.80%	22.06	3.80%	22.65	3.80%	39.28	3.80%	29.40	3.80%	38.32
Stage Three Growth	2084	3.80%	39.42	3.80%	24.85	3.80%	10.40	3.80%	30.83	3.80%	25.07	3.80%	25.08	3.80%	17.83	3.80%	17.30	3.80%	22.89	3.80%	23.51	3.80%	40.77	3.80%	30.52	3.80%	39.77
Stage Three Growth	2085	3.80%	40.92	3.80%	25.80	3.80%	10.79	3.80%	32.01	3.80%	26.02	3.80%	26.03	3.80%	18.51	3.80%	17.96	3.80%	23.76	3.80%	24.40	3.80%	42.32	3.80%	31.68	3.80%	41.28
Stage Three Growth	2086	3.80%	42.47	3.80%	26.78	3.80%	11.20	3.80%	33.22	3.80%	27.01	3.80%	27.02	3.80%	19.21	3.80%	18.64	3.80%	24.67	3.80%	25.33	3.80%	43.93	3.80%	32.88	3.80%	42.85
Stage Three Growth	2087	3.80%	44.09	3.80%	27.79	3.80%	11.63	3.80%	34.48	3.80%	28.03	3.80%	28.04	3.80%	19.94	3.80%	19.35	3.80%	25.60	3.80%	26.29	3.80%	45.60	3.80%	34.13	3.80%	44.48
Stage Three Growth	2088	3.80%	45.76	3.80%	28.85	3.80%	12.07	3.80%	35.79	3.80%	29.10	3.80%	29.11	3.80%	20.70	3.80%	20.09	3.80%	26.58	3.80%	27.29	3.80%	47.33	3.80%	35.43	3.80%	46.17
Stage Three Growth	2089	3.80%	47.50	3.80%	29.95	3.80%	12.53	3.80%	37.15	3.80%	30.21	3.80%	30.22	3.80%	21.49	3.80%	20.85	3.80%	27.59	3.80%	28.33	3.80%	49.13	3.80%	36.77	3.80%	47.92
Stage Three Growth	2090	3.80%	49.31	3.80%	31.08	3.80%	13.00	3.80%	38.57	3.80%	31.35	3.80%	31.36	3.80%	22.30	3.80%	21.64	3.80%	28.63	3.80%	29.40	3.80%	50.99	3.80%	38.17	3.80%	49.75
Stage Three Growth	2091	3.80%	51.18	3.80%	32.27	3.80%	13.50	3.80%	40.03	3.80%	32.54	3.80%	32.56	3.80%	23.15	3.80%	22.46	3.80%	29.72	3.80%	30.52	3.80%	52.93	3.80%	39.62	3.80%	51.64
Stage Three Growth	2092	3.80%	53.13	3.80%	33.49	3.80%	14.01	3.80%	41.55	3.80%	33.78	3.80%	33.79	3.80%	24.03	3.80%	23.32	3.80%	30.85	3.80%	31.68	3.80%	54.94	3.80%	41.13	3.80%	53.60
Stage Three Growth	2093	3.80%	55.15	3.80%	34.76	3.80%	14.54	3.80%	43.13	3.80%	35.06	3.80%	35.08	3.80%	24.94	3.80%	24.20	3.80%	32.02	3.80%	32.88	3.80%	57.03	3.80%	42.69	3.80%	55.63
Stage Three Growth	2094	3.80%	57.24	3.80%	36.09	3.80%	15.10	3.80%	44.77	3.80%	36.40	3.80%	36.41	3.80%	25.89	3.80%	25.12	3.80%	33.24	3.80%	34.13	3.80%	59.20	3.80%	44.31	3.80%	57.75
Stage Three Growth	2095	3.80%	59.42	3.80%	37.46	3.80%	15.67	3.80%	46.47	3.80%	37.78	3.80%	37.79	3.80%	26.87	3.80%	26.08	3.80%	34.50	3.80%	35.43	3.80%	61.45	3.80%	46.00	3.80%	59.94
Stage Three Growth	2096	3.80%	61.67	3.80%	38.88	3.80%	16.26	3.80%	48.24	3.80%	39.22	3.80%	39.23	3.80%	27.89	3.80%	27.07	3.80%	35.82	3.80%	36.78	3.80%	63.78	3.80%	47.74	3.80%	62.22
Stage Three Growth	2097	3.80%	64.02	3.80%	40.36	3.80%	16.88	3.80%	50.07	3.80%	40.71	3.80%	40.72	3.80%	28.95	3.80%	28.10	3.80%	37.18	3.80%	38.17	3.80%	66.21	3.80%	49.56	3.80%	64.59
Stage Three Growth	2098	3.80%	66.45	3.80%	41.89	3.80%	17.52	3.80%	51.97	3.80%	42.25	3.80%	42.27	3.80%	30.06	3.80%	29.17	3.80%	38.59	3.80%	39.63	3.80%	68.72	3.80%	51.44	3.80%	67.04
Stage Three Growth	2099	3.80%	68.98	3.80%	43.48	3.80%	18.19	3.80%	53.95	3.80%	43.86	3.80%	43.87	3.80%	31.20	3.80%	30.27	3.80%	40.06	3.80%	41.13	3.80%	71.33	3.80%	53.40	3.80%	69.59
Stage Three Growth	2100	3.80%	71.60	3.80%	45.14	3.80%	18.88	3.80%	56.00	3.80%	45.53	3.80%	45.54	3.80%	32.38	3.80%	31.42	3.80%	41.58	3.80%	42.69	3.80%	74.05	3.80%	55.43	3.80%	72.23
Stage Three Growth	2101	3.80%	74.32	3.80%	46.85	3.80%	19.60	3.80%	58.13	3.80%	47.26	3.80%	47.27	3.80%	33.61	3.80%	32.62	3.80%	43.16	3.80%	44.32	3.80%	76.86	3.80%	57.53	3.80%	74.98
Stage Three Growth	2102	3.80%	77.14	3.80%	48.63	3.80%	20.34	3.80%	60.34	3.80%	49.05	3.80%	49.07	3.80%	34.89	3.80%	33.86	3.80%	44.80	3.80%	46.00	3.80%	79.78	3.80%	59.72	3.80%	77.83
Stage Three Growth	2103	3.80%	80.07	3.80%	50.48	3.80%	21.12	3.80%	62.63	3.80%	50.91	3.80%	50.93	3.80%	36.22	3.80%	35.14	3.80%	46.50	3.80%	47.75	3.80%	82.81	3.80%	61.99	3.80%	80.78
Stage Three Growth	2104	3.80%	83.12	3.80%	52.40	3.80%	21.92	3.80%	65.01	3.80%	52.85	3.80%	52.87	3.80%	37.59	3.80%	36.48	3.80%	48.27	3.80%	49.56	3.80%	85.96	3.80%	64.34	3.80%	83.85
Stage Three Growth	2105	3.80%	86.27	3.80%	54.39	3.80%	22.75	3.80%	67.48	3.80%	54.86	3.80%	54.88	3.80%	39.02	3.80%	37.87	3.80%	50.10	3.80%	51.45	3.80%	89.22	3.80%	66.79	3.80%	87.04
Stage Three Growth	2106	3.80%	89.55	3.80%	56.46	3.80%	23.62	3.80%	70.04	3.80%	56.94	3.80%	56.96	3.80%	40.50	3.80%	39.31	3.80%	52.01	3.80%	53.40	3.80%	92.61	3.80%	69.33	3.80%	90.35
Stage Three Growth	2107	3.80%	92.96	3.80%	58.60	3.80%	24.51	3.80%	72.71	3.80%	59.11	3.80%	59.13	3.80%	42.04	3.80%	40.80	3.80%	53.98	3.80%	55.43	3.80%	96.13	3.80%	71.96	3.80%	93.78
Stage Three Growth	2108	3.80%	96.49	3.80%	60.83	3.80%	25.45	3.80%	75.47	3.80%	61.35	3.80%	61.37	3.80%	43.64	3.80%	42.35	3.80%	56.03	3.80%	57.54	3.80%	99.79	3.80%	74.70	3.80%	97.34
Stage Three Growth	2109	3.80%	100.15	3.80%	63.14	3.80%	26.41	3.80%	78.34	3.80%	63.68	3.80%	63.71	3.80%	45.30	3.80%	43.96	3.80%	58.16	3.80%	59.72	3.80%	103.58	3.80%	77.53	3.80%	101.04
Stage Three Growth	2110	3.80%	103.96	3.80%	65.54	3.80%	27.42	3.80%	81.31	3.80%	66.10	3.80%	66.13	3.80%	47.02	3.80%	45.63	3.80%	60.37	3.80%	61.99	3.80%	107.52	3.80%	80.48	3.80%	104.88
Stage Three Growth	2111	3.80%	107.91	3.80%	68.03	3.80%	28.46	3.80%	84.40	3.80%	68.62	3.80%	68.64	3.80%	48.81	3.80%	47.36	3.80%	62.67	3.80%	64.35	3.80%	111.60	3.80%	83.54	3.80%	108.87
Stage Three Growth	2112	3.80%	112.01	3.80%	70.61	3.80%	29.54	3.80%	87.61	3.80%	71.22	3.80%	71.25	3.80%	50.66	3.80%	49.16	3.80%	65.05	3.80%	66.79	3.80%	115.84	3.80%	86.71	3.80%	113.00
Stage Three Growth	2113	3.80%	116.27	3.80%	73.30	3.80%	30.66	3.80%	90.94	3.80%	73.93	3.80%	73.96	3.80%	52.59	3.80%	51.03	3.80%	67.52	3.80%	69.33	3.80%	120.24	3.80%	90.01	3.80%	117.30
Stage Three Growth	2114	3.80%	120.69	3.80%	76.08	3.80%	31.83	3.80%	94.39	3.80%	76.74	3.80%	76.77	3.80%	54.59	3.80%	52.97	3.80%	70.09	3.80%	71.97	3.80%	124.81	3.80%	93.43	3.80%	121.76
Stage Three Growth	2115	3.80%	125.27	3.80%	78.97	3.80%	33.04	3.80%	97.98	3.80%	79.65	3.80%	79.68	3.80%	56.66	3.80%	54.98	3.80%	72.75	3.80%	74.70	3.80%	129.56	3.80%	96.98	3.80%	126.38
Stage Three Growth	2116	3.80%	130.03	3.80%	81.97	3.80%	34.29	3.80%	101.71	3.80%	82.68	3.80%	82.71	3.80%	58.81	3.80%	57.07	3.80%	75.51	3.80%	77.54	3.80%	134.48	3.80%	100.66	3.80%	131.19
Stage Three Growth	2117	3.80%	134.97	3.80%	85.09	3.80%	35.59	3.80%	105.57	3.80%	85.82	3.80%	85.85	3.80%	61.05	3.80%	59.24	3.80%	78.38	3.80%	80.49	3.80%	139.59	3.80%	104.49	3.80%	136.17
Stage Three Growth	2118	3.80%	140.10	3.80%	88.32	3.80%	36.95	3.80%	109.58	3.80%	89.09	3.80%	89.12	3.80%	63.37	3.80%	61.49	3.80%	81.36	3.80%	83.54	3.80%	144.89	3.80%	108.46	3.80%	141.35
Stage Three Growth	2119	3.80%	145.43	3.80%	91.68	3.80%	38.35	3.80%	113.75	3.80%	92.47	3.80%	92.50	3.80%	65.78	3.80%	63.83	3.80%	84.45	3.80%	86.72	3.80%	150.40	3.80%	112.58	3.80%	146.72
Stage Three Growth	2120	3.80%	150.95	3.80%	95.16	3.80%	39.81	3.80%	118.07	3.80%	95.98	3.80%	96.02	3.80%	68.27	3.80%	66.25	3.80%	87.66	3.80%	90.01	3.80%	156.11	3.80%	116.86	3.80%	152.29
Stage Three Growth	2121	3.80%	156.69	3.80%	98.78	3.80%	41.32	3.80%	122.55	3.80%	99.63	3.80%	99.67	3.80%	70.87	3.80%	68.77	3.80%	90.99	3.80%	93.44	3.80%	162.05	3.80%	121.30	3.80%	158.08
Stage Three Growth	2122	3.80%	162.64	3.80%	102.53	3.80%	42.89	3.80%	127.21	3.80%	103.42	3.80%	103.45	3.80%	73.56	3.80%	71.39	3.80%	94.45	3.80%	96.99	3.80%	168.20	3.80%	125.91	3.80%	164.09

Stage Three Growth	2123	3.80%	168.82	3.80%	106.43	3.80%	44.52	3.80%	132.05	3.80%	107.35	3.80%	107.38	3.80%	76.36	3.80%	74.10	3.80%	98.04	3.80%	100.67	3.80%	174.60	3.80%	130.69	3.80%	170.32
Stage Three Growth	2124	3.80%	175.24	3.80%	110.47	3.80%	46.21	3.80%	137.06	3.80%	111.43	3.80%	111.47	3.80%	79.26	3.80%	76.91	3.80%	101.77	3.80%	104.50	3.80%	181.23	3.80%	135.66	3.80%	176.79
Stage Three Growth	2125	3.80%	181.90	3.80%	114.67	3.80%	47.97	3.80%	142.27	3.80%	115.66	3.80%	115.70	3.80%	82.27	3.80%	79.84	3.80%	105.63	3.80%	108.47	3.80%	188.12	3.80%	140.81	3.80%	183.51
Stage Three Growth	2126	3.80%	188.81	3.80%	119.03	3.80%	49.79	3.80%	147.68	3.80%	120.06	3.80%	120.10	3.80%	85.40	3.80%	82.87	3.80%	109.65	3.80%	112.59	3.80%	195.27	3.80%	146.17	3.80%	190.48
Stage Three Growth	2127	3.80%	195.98	3.80%	123.55	3.80%	51.68	3.80%	153.29	3.80%	124.62	3.80%	124.66	3.80%	88.64	3.80%	86.02	3.80%	113.81	3.80%	116.87	3.80%	202.69	3.80%	151.72	3.80%	197.72
Stage Three Growth	2128	3.80%	203.43	3.80%	128.25	3.80%	53.65	3.80%	159.11	3.80%	129.35	3.80%	129.40	3.80%	92.01	3.80%	89.29	3.80%	118.14	3.80%	121.31	3.80%	210.39	3.80%	157.49	3.80%	205.24
Stage Three Growth	2129	3.80%	211.16	3.80%	133.12	3.80%	55.69	3.80%	165.16	3.80%	134.27	3.80%	134.32	3.80%	95.51	3.80%	92.68	3.80%	122.63	3.80%	125.92	3.80%	218.38	3.80%	163.47	3.80%	213.04
Stage Three Growth	2130	3.80%	219.19	3.80%	138.18	3.80%	57.80	3.80%	171.44	3.80%	139.37	3.80%	139.42	3.80%	99.14	3.80%	96.20	3.80%	127.29	3.80%	130.70	3.80%	226.68	3.80%	169.68	3.80%	221.13
Stage Three Growth	2131	3.80%	227.51	3.80%	143.43	3.80%	60.00	3.80%	177.95	3.80%	144.67	3.80%	144.72	3.80%	102.90	3.80%	99.86	3.80%	132.12	3.80%	135.67	3.80%	235.30	3.80%	176.13	3.80%	229.53
Stage Three Growth	2132	3.80%	236.16	3.80%	148.88	3.80%	62.28	3.80%	184.71	3.80%	150.16	3.80%	150.22	3.80%	106.81	3.80%	103.65	3.80%	137.15	3.80%	140.83	3.80%	244.24	3.80%	182.82	3.80%	238.26
Stage Three Growth	2133	3.80%	245.13	3.80%	154.54	3.80%	64.65	3.80%	191.73	3.80%	155.87	3.80%	155.92	3.80%	110.87	3.80%	107.59	3.80%	142.36	3.80%	146.18	3.80%	253.52	3.80%	189.77	3.80%	247.31
Stage Three Growth	2134	3.80%	254.45	3.80%	160.41	3.80%	67.10	3.80%	199.02	3.80%	161.79	3.80%	161.85	3.80%	115.09	3.80%	111.68	3.80%	147.77	3.80%	151.73	3.80%	263.15	3.80%	196.98	3.80%	256.71
Stage Three Growth	2135	3.80%	264.12	3.80%	166.51	3.80%	69.65	3.80%	206.58	3.80%	167.94	3.80%	168.00	3.80%	119.46	3.80%	115.93	3.80%	153.38	3.80%	157.50	3.80%	273.15	3.80%	204.47	3.80%	266.46
Stage Three Growth	2136	3.80%	274.15	3.80%	172.83	3.80%	72.30	3.80%	214.43	3.80%	174.32	3.80%	174.38	3.80%	124.00	3.80%	120.33	3.80%	159.21	3.80%	163.48	3.80%	283.53	3.80%	212.24	3.80%	276.59
Stage Three Growth	2137	3.80%	284.57	3.80%	179.40	3.80%	75.05	3.80%	222.58	3.80%	180.95	3.80%	181.01	3.80%	128.71	3.80%	124.90	3.80%	165.26	3.80%	169.69	3.80%	294.31	3.80%	220.30	3.80%	287.10
Stage Three Growth	2138	3.80%	295.39	3.80%	186.22	3.80%	77.90	3.80%	231.04	3.80%	187.82	3.80%	187.89	3.80%	133.60	3.80%	129.65	3.80%	171.54	3.80%	176.14	3.80%	305.49	3.80%	228.67	3.80%	298.01
Stage Three Growth	2139	3.80%	306.61	3.80%	193.29	3.80%	80.86	3.80%	239.82	3.80%	194.96	3.80%	195.03	3.80%	138.68	3.80%	134.58	3.80%	178.06	3.80%	182.84	3.80%	317.10	3.80%	237.36	3.80%	309.33
Stage Three Growth	2140	3.80%	318.26	3.80%	200.64	3.80%	83.93	3.80%	248.93	3.80%	202.37	3.80%	202.44	3.80%	143.95	3.80%	139.69	3.80%	184.82	3.80%	189.78	3.80%	329.15	3.80%	246.38	3.80%	321.09
Implied Cost of Equity			**6.52%**		**8.41%**		**7.11%**		**6.24%**		**7.58%**		**6.15%**		**7.81%**		**8.52%**		**9.53%**		**7.21%**		**8.95%**		**8.81%**		**8.30%**

Mean	7.78%
Median	7.81%
Selected Three-Stage DGM Cost of Equity	**7.80%**

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Atmos Energy Corp	20.4
Black Hills Corp	15.2
CenterPoint Energy Inc.	21.1
Chesapeake Utilities	24.4
CMS Energy Corp	20.3
MGE Energy Inc.	26.8
New Jersey Resources Corp	15.9
NiSource Inc.	20.1
Northwest Natural	14.6
ONE Gas Inc	18.8
Southwest Gas Holdings Inc.	20.7
Spire Inc / Laclede Group Inc.	15.5
WEC Energy Group	17.7
Mean	19.3
Median	20.1
Selected Price to Earnings (P/E) Ratio	19.3
Indicated Equity Component of the Direct Rate	**5.18%**

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	0.90
Black Hills Corp	1.05
CenterPoint Energy Inc.	1.15
Chesapeake Utilities	0.85
CMS Energy Corp	0.85
MGE Energy Inc.	0.85
New Jersey Resources Corp	1.00
NiSource Inc.	0.95
Northwest Natural	0.85
ONE Gas Inc	0.85
Southwest Gas Holdings Inc.	0.95
Spire Inc / Laclede Group Inc.	0.90
WEC Energy Group	0.85
Beta Mean	0.92
Beta Median	0.90
Unlevered and Relevered Mean*	0.94
Indicated Beta	**0.92**

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

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	15.60%	25.75%	74.25%	0.90	0.7
Black Hills Corp	8.50%	51.10%	48.90%	1.05	0.54
CenterPoint Energy Inc.	16.00%	48.24%	51.76%	1.15	0.65
Chesapeake Utilities	27.00%	28.94%	71.06%	0.85	0.66
CMS Energy Corp	15.50%	42.67%	56.72%	0.85	0.52
MGE Energy Inc.	19.00%	15.87%	84.13%	0.85	0.74
New Jersey Resources Corp	21.50%	37.20%	62.80%	1.00	0.68
NiSource Inc.	19.00%	41.69%	58.31%	0.95	0.6
Northwest Natural Gas	25.00%	49.57%	50.43%	0.85	0.49
ONE Gas Inc	16.50%	35.94%	64.06%	0.85	0.58
Southwest Gas Holdings Inc.	21.00%	44.20%	55.80%	0.95	0.58
Spire Inc / Laclede Group Inc.	19.50%	45.75%	51.01%	0.90	0.52
WEC Energy Group	19.00%	36.44%	63.49%	0.85	0.58
			Average	**0.92**	

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	18.70%	41.00%	59.00%	1.10
Black Hills Corp	18.70%	41.00%	59.00%	0.85
CenterPoint Energy Inc.	18.70%	41.00%	59.00%	1.02
Chesapeake Utilities	18.70%	41.00%	59.00%	1.03
CMS Energy Corp	18.70%	41.00%	59.00%	0.81
MGE Energy Inc.	18.70%	41.00%	59.00%	1.16
New Jersey Resources Corp	18.70%	41.00%	59.00%	1.06
NiSource Inc.	18.70%	41.00%	59.00%	0.94
Northwest Natural Gas	18.70%	41.00%	59.00%	0.77
ONE Gas Inc	18.70%	41.00%	59.00%	0.91
Southwest Gas Holdings Inc.	18.70%	41.00%	59.00%	0.91
Spire Inc / Laclede Group Inc.	18.70%	41.00%	59.00%	0.81
WEC Energy Group	18.70%	41.00%	59.00%	0.91
			Average	**0.94**

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, 2024 calendar year information for the January 2, 2025 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	22,681,068,353	12,157,669,000	1.87	Atmos Energy Corp. 2024 10-K, p. 31	
Black Hills Corp	4,064,408,837	3,501,500,000	1.16	Black Hills Corp. 2024 10-K, p. 45	
CenterPoint Energy Inc.	21,168,101,924	10,666,000,000	1.98	CenterPoint Energy Inc. 2024 10-K, p. 98	
Chesapeake Utilities	2,880,406,754	1,390,200,000	2.07	Chesapeake Utilites 2024 10-K, p. 47	
CMS Energy Corp	20,816,341,545	8,230,000,000	2.53	CMS Energy Corp. 2024 10-K, p. 97	
MGE Energy Inc.	3,792,738,663	3,649,000,000	1.04	MGE Energy Inc. 2024 10-K, p. 56	
New Jersey Resources Corp	4,716,409,344	2,200,443,000	2.14	New Jersey Resources. 2024 10-K, p. 68	
NiSource Inc.	16,906,733,315	8,684,200,000	1.95	NiSource Inc. 2024 10-K, p. 64	
Northwest Natural	1,602,496,072	1,324,050,000	1.21	Northwest Natural Gas 2024 10-K, p. 85	
ONE Gas Inc	4,250,277,305	3,104,548,000	1.37	One Gas Inc. 2024 10-K, p. 41	
Southwest Gas Holdings Inc.	5,531,436,649	3,681,422,000	1.50	Southwest Gas Holdings 2024 10-K, p. 53	
Spire Inc / Laclede Group Inc.	3,816,151,322	3,232,700,000	1.18	Spire Inc. 2024 10-K, p. 55	
WEC Energy Group	29,424,127,022	12,395,000,000	2.37	WEC Energy Group. 2024 10-K, p. 82	
		Average	**1.72**		

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	85,100,000	87,800,000	0.97	Atmos Energy Corp. 2024 10-K, p. 63	
Black Hills Corp	4,007,622,000	4,250,200,000	0.94	Black Hills Corp. 2024 10-K, p. 88	
CenterPoint Energy Inc.	19,597,000,000	20,961,000,000	0.93	CenterPoint Energy Inc. 2024 10-K, p. 149	
Chesapeake Utilities	1,200,000,000	1,300,000,000	0.92	Chesapeake Utilites 2024 10-K, p,83	

CMS Energy Corp	14,876,000,000	16,386,000,000	0.91	CMS Energy Corp. 2024 10-K, p. 133	
MGE Energy Inc.	698,765,000	773,400,000	0.90	MGE Energy 2024 10-K p. 93	
New Jersey Resources Corp	1,439,849,000	1,647,845,000	0.87	New Jersey Resources. 2024 10-K, p. 4	
NiSource Inc.	12,505,200,000	13,355,700,000	0.94	NiSource Inc. 2024 10-K, p. 93	
Northwest Natural	1,191,194,000	1,365,399,000	0.87	Northwest Natural Gas 2024 10-K, p. 111	
ONE Gas Inc	2,200,000,000	2,414,256,000	0.91	One Gas Inc. 2024 10-K, p. 71 FV & 53 BV	
Southwest Gas Holdings Inc.	3,607,622,000	4,348,340,000	0.83	Southwest Gas Holdings 2024 10-K, p. 83	
Spire Inc / Laclede Group Inc.	3,270,200,000	3,710,600,000	0.88	Spire Inc. 2024 10-K, p. 85	
WEC Energy Group	17,840,800,000	18,907,100,000	0.94	WEC Energy Group. 2024 10-K, p. 147	
		Average	**0.91**		

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	59.00%	1.72	1.01
Long-term Debt	41.00%	0.91	0.37
			1.38

Appendix C - Gas Transmission Pipeline

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	31.00%	5.83%	1.81%
Common Equity	69.00%	10.90%	7.52%
Yield Rate			**9.33%**

Gas Transmission Pipeline Yield Rate	**9.33%**

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
DT Midstream Inc.	2,674,000,000	-	9,698,111,920	12,372,111,920	21.61%	0.00%	78.39%
Enbridge Inc.	87,000,000,000	7,747,000,000	129,675,511,850	224,422,511,850	38.77%	3.45%	57.78%
Kinder Morgan Inc.	30,000,000,000	-	60,584,126,754	90,584,126,754	33.12%	0.00%	66.88%
ONEOK Inc.	26,880,000,000	-	63,699,444,187	90,579,444,187	29.68%	0.00%	70.32%
Pembina Pipeline Corp.	11,182,000,000	2,208,000,000	33,490,833,390	46,880,833,390	23.85%	4.71%	71.44%
TC Energy Corp.	50,060,500,000	1,839,300,000	51,474,420,000	103,374,220,000	48.43%	1.78%	49.79%
Williams Companies Inc.	24,825,000,000	-	69,361,771,306	94,186,771,306	26.36%	0.00%	73.64%
				Mean	31.69%	1.42%	66.89%
				Median	29.68%	0.00%	70.32%

Indicated Industry Capital Structure	**31.00%**		**69.00%**

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
DT Midstream Inc.	Baa2	5.83%
Enbridge Inc.	Baa2	5.83%
Kinder Morgan Inc.	Baa2	5.83%
ONEOK Inc.	Baa2	5.83%
Pembina Pipeline Corp.	BBB	5.83%
TC Energy Corp.	Baa3	5.83%
Williams Companies Inc.	Baa2	5.83%

Mean	5.83%
Median	5.83%
Mode	5.83%

Indicated Rate of Debt	**5.83%**

Corporate Bond Yield Averages from Mergent Bond Record, January 2025 Edition

Industrial Bond Averages, December 2024

Mergent	S&P	Dec. Yield Avg.
Aa1, Aa2 Aa3	AA+, AA, AA-	5.28%
A1, A2, A3	A+, A, A-	5.47%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.83%

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	8.05%
CAPM - Damodaran	9.41%
CAPM - The CFO Survey	10.52%
CAPM - Fernandez, Banuls, and Acin	10.64%
CAPM - Ex Post (BVR Historical, Arithmetic)	11.91%
CAPM - Ex Post (BVR Historical, Geometric)	10.59%
Empirical CAPM - Ex Ante, Three Stage	8.01%
Empirical CAPM - Damodaran	9.35%
Empirical CAPM - Graham and Harvey	10.45%
Empirical CAPM - Fernandez, Banuls, and Acin	10.57%
Empirical CAPM - Ex Post (BVR Historical, Arithmetic)	11.82%
Empirical CAPM - Ex Post (BVR Historical, Geometric)	10.52%
DGM - Dividend Growth	8.70%
DGM - Earnings Growth	12.69%
DGM - Two-Stage	11.12%
DGM - Three-Stage	10.08%
Indicated Rate of Equity	**10.90%**

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

	Capital Structure	Rate	Composite
Debt Component	31.00%	5.83%	1.81%
Equity Component	69.00%	4.67%	3.22%
Direct Rate			**5.03%**

Direct Rate	**5.03%**

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]	3.04%	1.05	3.19%	4.86%	8.05%
Dr. Damodaran ERP[3]	4.33%	1.05	4.55%	4.86%	9.41%
The CFO Survey[4]	5.39%	1.05	5.66%	4.86%	10.52%
Fernandez, Banuls and Acin[5]	5.50%	1.05	5.78%	4.86%	10.64%
BVR - Historical, Arithmetic Mean[6]	6.71%	1.05	7.05%	4.86%	11.91%
BVR - Historical, Geometric Mean[7]	5.46%	1.05	5.73%	4.86%	10.59%

Notes:

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 14, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

6 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 3, 2025 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]	3.04%	1.05	2.39%	0.76%	4.86%	8.01%
Dr. Damodaran ERP[3]	4.33%	1.05	3.41%	1.08%	4.86%	9.35%
The CFO Survey[4]	5.39%	1.05	4.24%	1.35%	4.86%	10.45%
Fernandez, Banuls and Acin[5]	5.50%	1.05	4.33%	1.38%	4.86%	10.57%
BVR - Historical, Arithmetic Mean[6]	6.71%	1.05	5.28%	1.68%	4.86%	11.82%
BVR - Historical, Geometric Mean[7]	5.46%	1.05	4.30%	1.37%	4.86%	10.52%

Notes:

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 14, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

6 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 3, 2025 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
DT Midstream Inc.	2.90%	2.00%	7.00%	4.90%	9.90%
Enbridge Inc.	6.10%	5.00%	2.50%	11.10%	8.60%
Kinder Morgan Inc.	4.20%	10.00%	6.00%	14.20%	10.20%
ONEOK Inc.	3.70%	12.00%	4.00%	15.70%	7.70%
Pembina Pipeline Corp.	4.60%	3.50%	3.00%	8.10%	7.60%
TC Energy Corp.	4.80%	12.50%	5.00%	17.30%	9.80%
Williams Companies Inc.	3.30%	10.00%	4.50%	13.30%	7.80%
Mean	4.23%	7.86%	4.57%	12.09%	8.80%
Median	4.20%	10.00%	4.50%	13.30%	8.60%

DGM - Dividend Growth, Indicated Rate	**8.70%**
DGM - Earnings Growth, Indicated Rate	**12.69%**

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

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

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
DT Midstream Inc.	2.90%	2.00%	3.80%	2.90%	5.54%
Enbridge Inc.	6.10%	5.00%	3.80%	4.40%	10.84%
Kinder Morgan Inc.	4.20%	10.00%	3.80%	6.90%	12.30%
ONEOK Inc.	3.70%	12.00%	3.80%	7.90%	13.14%
Pembina Pipeline Corp.	4.60%	3.50%	3.80%	3.65%	8.28%
TC Energy Corp.	4.80%	12.50%	3.80%	8.15%	14.62%
Williams Companies Inc.	3.30%	10.00%	3.80%	6.90%	11.37%

Mean	10.87%
Median	11.37%
Two-Stage DGM, Indicated Rate	**11.12%**

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 1.8% 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

Company	Year	DT Midstream Inc.		Enbridge Inc.		Kinder Morgan Inc.		ONEOK Inc.		Pembina Pipeline Corp.		TC Energy Corp.		Williams Companies Inc.	
Start Price	2023		-99.82		-59.54		-27.27		-109.04		-57.69		-49.59		-56.90
Expected Dividends	2024		3.00		3.80		1.20		4.10		2.82		2.40		1.90
Stage One Growth	2025	2.00%	3.06	5.00%	3.99	10.00%	1.32	12.00%	4.59	3.50%	2.92	12.50%	2.70	10.00%	2.09
Stage One Growth	2026	2.00%	3.12	5.00%	4.19	10.00%	1.45	12.00%	5.14	3.50%	3.02	12.50%	3.04	10.00%	2.30
Stage One Growth	2027	2.00%	3.18	5.00%	4.40	10.00%	1.60	12.00%	5.76	3.50%	3.13	12.50%	3.42	10.00%	2.53
Stage One Growth	2028	2.00%	3.25	5.00%	4.62	10.00%	1.76	12.00%	6.45	3.50%	3.24	12.50%	3.84	10.00%	2.78
Stage One Growth	2029	2.00%	3.31	5.00%	4.85	10.00%	1.93	12.00%	7.23	3.50%	3.35	12.50%	4.33	10.00%	3.06
Stage Two Growth	2030	2.16%	3.38	4.89%	5.09	9.44%	2.12	11.25%	8.04	3.53%	3.47	11.71%	4.83	9.44%	3.35
Stage Two Growth	2031	2.33%	3.46	4.78%	5.33	8.87%	2.30	10.51%	8.88	3.55%	3.59	10.92%	5.36	8.87%	3.65
Stage Two Growth	2032	2.49%	3.55	4.67%	5.58	8.31%	2.49	9.76%	9.75	3.58%	3.72	10.13%	5.90	8.31%	3.95
Stage Two Growth	2033	2.65%	3.64	4.56%	5.83	7.75%	2.69	9.02%	10.63	3.61%	3.85	9.34%	6.45	7.75%	4.25
Stage Two Growth	2034	2.82%	3.75	4.45%	6.09	7.18%	2.88	8.27%	11.51	3.64%	3.99	8.55%	7.00	7.18%	4.56
Stage Two Growth	2035	2.98%	3.86	4.35%	6.36	6.62%	3.07	7.53%	12.38	3.66%	4.14	7.75%	7.55	6.62%	4.86
Stage Two Growth	2036	3.15%	3.98	4.24%	6.63	6.05%	3.26	6.78%	13.22	3.69%	4.29	6.96%	8.07	6.05%	5.16
Stage Two Growth	2037	3.31%	4.11	4.13%	6.90	5.49%	3.44	6.04%	14.01	3.72%	4.45	6.17%	8.57	5.49%	5.44
Stage Two Growth	2038	3.47%	4.25	4.02%	7.18	4.93%	3.60	5.29%	14.75	3.75%	4.62	5.38%	9.03	4.93%	5.71
Stage Two Growth	2039	3.64%	4.41	3.91%	7.46	4.36%	3.76	4.55%	15.43	3.77%	4.79	4.59%	9.45	4.36%	5.96
Stage Three Growth	2040	3.80%	4.58	3.80%	7.74	3.80%	3.91	3.80%	16.01	3.80%	4.98	3.80%	9.81	3.80%	6.18
Stage Three Growth	2041	3.80%	4.75	3.80%	8.04	3.80%	4.05	3.80%	16.62	3.80%	5.16	3.80%	10.18	3.80%	6.42
Stage Three Growth	2042	3.80%	4.93	3.80%	8.34	3.80%	4.21	3.80%	17.25	3.80%	5.36	3.80%	10.57	3.80%	6.66
Stage Three Growth	2043	3.80%	5.12	3.80%	8.66	3.80%	4.37	3.80%	17.91	3.80%	5.56	3.80%	10.97	3.80%	6.92
Stage Three Growth	2044	3.80%	5.31	3.80%	8.99	3.80%	4.53	3.80%	18.59	3.80%	5.78	3.80%	11.38	3.80%	7.18
Stage Three Growth	2045	3.80%	5.51	3.80%	9.33	3.80%	4.71	3.80%	19.29	3.80%	6.00	3.80%	11.82	3.80%	7.45
Stage Three Growth	2046	3.80%	5.72	3.80%	9.69	3.80%	4.88	3.80%	20.03	3.80%	6.22	3.80%	12.27	3.80%	7.73
Stage Three Growth	2047	3.80%	5.94	3.80%	10.05	3.80%	5.07	3.80%	20.79	3.80%	6.46	3.80%	12.73	3.80%	8.03

Stage Three Growth	2048	3.80%	6.17	3.80%	10.44	3.80%	5.26	3.80%	21.58	3.80%	6.71	3.80%	13.22	3.80%	8.33
Stage Three Growth	2049	3.80%	6.40	3.80%	10.83	3.80%	5.46	3.80%	22.40	3.80%	6.96	3.80%	13.72	3.80%	8.65
Stage Three Growth	2050	3.80%	6.64	3.80%	11.24	3.80%	5.67	3.80%	23.25	3.80%	7.22	3.80%	14.24	3.80%	8.98
Stage Three Growth	2051	3.80%	6.90	3.80%	11.67	3.80%	5.89	3.80%	24.13	3.80%	7.50	3.80%	14.78	3.80%	9.32
Stage Three Growth	2052	3.80%	7.16	3.80%	12.11	3.80%	6.11	3.80%	25.05	3.80%	7.78	3.80%	15.34	3.80%	9.67
Stage Three Growth	2053	3.80%	7.43	3.80%	12.57	3.80%	6.34	3.80%	26.00	3.80%	8.08	3.80%	15.92	3.80%	10.04
Stage Three Growth	2054	3.80%	7.71	3.80%	13.05	3.80%	6.58	3.80%	26.99	3.80%	8.39	3.80%	16.53	3.80%	10.42
Stage Three Growth	2055	3.80%	8.01	3.80%	13.55	3.80%	6.83	3.80%	28.02	3.80%	8.71	3.80%	17.16	3.80%	10.82
Stage Three Growth	2056	3.80%	8.31	3.80%	14.06	3.80%	7.09	3.80%	29.08	3.80%	9.04	3.80%	17.81	3.80%	11.23
Stage Three Growth	2057	3.80%	8.63	3.80%	14.60	3.80%	7.36	3.80%	30.18	3.80%	9.38	3.80%	18.49	3.80%	11.66
Stage Three Growth	2058	3.80%	8.95	3.80%	15.15	3.80%	7.64	3.80%	31.33	3.80%	9.74	3.80%	19.19	3.80%	12.10
Stage Three Growth	2059	3.80%	9.29	3.80%	15.73	3.80%	7.93	3.80%	32.52	3.80%	10.11	3.80%	19.92	3.80%	12.56
Stage Three Growth	2060	3.80%	9.65	3.80%	16.33	3.80%	8.23	3.80%	33.76	3.80%	10.49	3.80%	20.67	3.80%	13.04
Stage Three Growth	2061	3.80%	10.01	3.80%	16.95	3.80%	8.55	3.80%	35.04	3.80%	10.89	3.80%	21.46	3.80%	13.53
Stage Three Growth	2062	3.80%	10.39	3.80%	17.59	3.80%	8.87	3.80%	36.37	3.80%	11.30	3.80%	22.28	3.80%	14.05
Stage Three Growth	2063	3.80%	10.79	3.80%	18.26	3.80%	9.21	3.80%	37.75	3.80%	11.73	3.80%	23.12	3.80%	14.58
Stage Three Growth	2064	3.80%	11.20	3.80%	18.95	3.80%	9.56	3.80%	39.19	3.80%	12.18	3.80%	24.00	3.80%	15.13
Stage Three Growth	2065	3.80%	11.62	3.80%	19.67	3.80%	9.92	3.80%	40.68	3.80%	12.64	3.80%	24.91	3.80%	15.71
Stage Three Growth	2066	3.80%	12.07	3.80%	20.42	3.80%	10.30	3.80%	42.22	3.80%	13.12	3.80%	25.86	3.80%	16.31
Stage Three Growth	2067	3.80%	12.52	3.80%	21.20	3.80%	10.69	3.80%	43.83	3.80%	13.62	3.80%	26.84	3.80%	16.93
Stage Three Growth	2068	3.80%	13.00	3.80%	22.00	3.80%	11.10	3.80%	45.49	3.80%	14.14	3.80%	27.86	3.80%	17.57
Stage Three Growth	2069	3.80%	13.49	3.80%	22.84	3.80%	11.52	3.80%	47.22	3.80%	14.67	3.80%	28.92	3.80%	18.24
Stage Three Growth	2070	3.80%	14.01	3.80%	23.70	3.80%	11.96	3.80%	49.02	3.80%	15.23	3.80%	30.02	3.80%	18.93
Stage Three Growth	2071	3.80%	14.54	3.80%	24.61	3.80%	12.41	3.80%	50.88	3.80%	15.81	3.80%	31.16	3.80%	19.65
Stage Three Growth	2072	3.80%	15.09	3.80%	25.54	3.80%	12.88	3.80%	52.81	3.80%	16.41	3.80%	32.35	3.80%	20.40
Stage Three Growth	2073	3.80%	15.67	3.80%	26.51	3.80%	13.37	3.80%	54.82	3.80%	17.04	3.80%	33.57	3.80%	21.17
Stage Three Growth	2074	3.80%	16.26	3.80%	27.52	3.80%	13.88	3.80%	56.90	3.80%	17.68	3.80%	34.85	3.80%	21.98
Stage Three Growth	2075	3.80%	16.88	3.80%	28.56	3.80%	14.41	3.80%	59.07	3.80%	18.35	3.80%	36.17	3.80%	22.81
Stage Three Growth	2076	3.80%	17.52	3.80%	29.65	3.80%	14.95	3.80%	61.31	3.80%	19.05	3.80%	37.55	3.80%	23.68
Stage Three Growth	2077	3.80%	18.19	3.80%	30.78	3.80%	15.52	3.80%	63.64	3.80%	19.78	3.80%	38.98	3.80%	24.58
Stage Three Growth	2078	3.80%	18.88	3.80%	31.95	3.80%	16.11	3.80%	66.06	3.80%	20.53	3.80%	40.46	3.80%	25.51
Stage Three Growth	2079	3.80%	19.59	3.80%	33.16	3.80%	16.72	3.80%	68.57	3.80%	21.31	3.80%	41.99	3.80%	26.48
Stage Three Growth	2080	3.80%	20.34	3.80%	34.42	3.80%	17.36	3.80%	71.18	3.80%	22.12	3.80%	43.59	3.80%	27.49
Stage Three Growth	2081	3.80%	21.11	3.80%	35.73	3.80%	18.02	3.80%	73.88	3.80%	22.96	3.80%	45.25	3.80%	28.53
Stage Three Growth	2082	3.80%	21.91	3.80%	37.09	3.80%	18.70	3.80%	76.69	3.80%	23.83	3.80%	46.97	3.80%	29.62
Stage Three Growth	2083	3.80%	22.75	3.80%	38.49	3.80%	19.41	3.80%	79.60	3.80%	24.74	3.80%	48.75	3.80%	30.74
Stage Three Growth	2084	3.80%	23.61	3.80%	39.96	3.80%	20.15	3.80%	82.63	3.80%	25.68	3.80%	50.60	3.80%	31.91
Stage Three Growth	2085	3.80%	24.51	3.80%	41.48	3.80%	20.92	3.80%	85.77	3.80%	26.65	3.80%	52.53	3.80%	33.12

Stage Three Growth	2086	3.80%	25.44	3.80%	43.05	3.80%	21.71	3.80%	89.03	3.80%	27.66	3.80%	54.52	3.80%	34.38
Stage Three Growth	2087	3.80%	26.41	3.80%	44.69	3.80%	22.54	3.80%	92.41	3.80%	28.72	3.80%	56.59	3.80%	35.69
Stage Three Growth	2088	3.80%	27.41	3.80%	46.39	3.80%	23.39	3.80%	95.92	3.80%	29.81	3.80%	58.74	3.80%	37.04
Stage Three Growth	2089	3.80%	28.45	3.80%	48.15	3.80%	24.28	3.80%	99.56	3.80%	30.94	3.80%	60.98	3.80%	38.45
Stage Three Growth	2090	3.80%	29.53	3.80%	49.98	3.80%	25.21	3.80%	103.35	3.80%	32.12	3.80%	63.29	3.80%	39.91
Stage Three Growth	2091	3.80%	30.66	3.80%	51.88	3.80%	26.16	3.80%	107.28	3.80%	33.34	3.80%	65.70	3.80%	41.43
Stage Three Growth	2092	3.80%	31.82	3.80%	53.85	3.80%	27.16	3.80%	111.35	3.80%	34.60	3.80%	68.20	3.80%	43.00
Stage Three Growth	2093	3.80%	33.03	3.80%	55.90	3.80%	28.19	3.80%	115.58	3.80%	35.92	3.80%	70.79	3.80%	44.64
Stage Three Growth	2094	3.80%	34.28	3.80%	58.02	3.80%	29.26	3.80%	119.98	3.80%	37.28	3.80%	73.48	3.80%	46.33
Stage Three Growth	2095	3.80%	35.59	3.80%	60.22	3.80%	30.37	3.80%	124.53	3.80%	38.70	3.80%	76.27	3.80%	48.09
Stage Three Growth	2096	3.80%	36.94	3.80%	62.51	3.80%	31.53	3.80%	129.27	3.80%	40.17	3.80%	79.17	3.80%	49.92
Stage Three Growth	2097	3.80%	38.34	3.80%	64.89	3.80%	32.73	3.80%	134.18	3.80%	41.70	3.80%	82.18	3.80%	51.82
Stage Three Growth	2098	3.80%	39.80	3.80%	67.35	3.80%	33.97	3.80%	139.28	3.80%	43.28	3.80%	85.30	3.80%	53.79
Stage Three Growth	2099	3.80%	41.31	3.80%	69.91	3.80%	35.26	3.80%	144.57	3.80%	44.92	3.80%	88.54	3.80%	55.83
Stage Three Growth	2100	3.80%	42.88	3.80%	72.57	3.80%	36.60	3.80%	150.06	3.80%	46.63	3.80%	91.90	3.80%	57.95
Stage Three Growth	2101	3.80%	44.51	3.80%	75.33	3.80%	37.99	3.80%	155.77	3.80%	48.40	3.80%	95.40	3.80%	60.15
Stage Three Growth	2102	3.80%	46.20	3.80%	78.19	3.80%	39.43	3.80%	161.69	3.80%	50.24	3.80%	99.02	3.80%	62.44
Stage Three Growth	2103	3.80%	47.96	3.80%	81.16	3.80%	40.93	3.80%	167.83	3.80%	52.15	3.80%	102.78	3.80%	64.81
Stage Three Growth	2104	3.80%	49.78	3.80%	84.25	3.80%	42.49	3.80%	174.21	3.80%	54.13	3.80%	106.69	3.80%	67.28
Stage Three Growth	2105	3.80%	51.67	3.80%	87.45	3.80%	44.10	3.80%	180.83	3.80%	56.19	3.80%	110.74	3.80%	69.83
Stage Three Growth	2106	3.80%	53.64	3.80%	90.77	3.80%	45.78	3.80%	187.70	3.80%	58.33	3.80%	114.95	3.80%	72.49
Stage Three Growth	2107	3.80%	55.68	3.80%	94.22	3.80%	47.52	3.80%	194.83	3.80%	60.54	3.80%	119.32	3.80%	75.24
Stage Three Growth	2108	3.80%	57.79	3.80%	97.80	3.80%	49.32	3.80%	202.23	3.80%	62.84	3.80%	123.86	3.80%	78.10
Stage Three Growth	2109	3.80%	59.99	3.80%	101.52	3.80%	51.20	3.80%	209.92	3.80%	65.23	3.80%	128.56	3.80%	81.07
Stage Three Growth	2110	3.80%	62.27	3.80%	105.37	3.80%	53.14	3.80%	217.90	3.80%	67.71	3.80%	133.45	3.80%	84.15
Stage Three Growth	2111	3.80%	64.63	3.80%	109.38	3.80%	55.16	3.80%	226.18	3.80%	70.28	3.80%	138.52	3.80%	87.34
Stage Three Growth	2112	3.80%	67.09	3.80%	113.53	3.80%	57.26	3.80%	234.77	3.80%	72.95	3.80%	143.78	3.80%	90.66
Stage Three Growth	2113	3.80%	69.64	3.80%	117.85	3.80%	59.44	3.80%	243.69	3.80%	75.73	3.80%	149.25	3.80%	94.11
Stage Three Growth	2114	3.80%	72.29	3.80%	122.33	3.80%	61.69	3.80%	252.95	3.80%	78.60	3.80%	154.92	3.80%	97.68
Stage Three Growth	2115	3.80%	75.03	3.80%	126.97	3.80%	64.04	3.80%	262.56	3.80%	81.59	3.80%	160.80	3.80%	101.40
Stage Three Growth	2116	3.80%	77.88	3.80%	131.80	3.80%	66.47	3.80%	272.54	3.80%	84.69	3.80%	166.91	3.80%	105.25
Stage Three Growth	2117	3.80%	80.84	3.80%	136.81	3.80%	69.00	3.80%	282.90	3.80%	87.91	3.80%	173.26	3.80%	109.25
Stage Three Growth	2118	3.80%	83.91	3.80%	142.01	3.80%	71.62	3.80%	293.65	3.80%	91.25	3.80%	179.84	3.80%	113.40
Stage Three Growth	2119	3.80%	87.10	3.80%	147.40	3.80%	74.34	3.80%	304.81	3.80%	94.72	3.80%	186.67	3.80%	117.71
Stage Three Growth	2120	3.80%	90.41	3.80%	153.00	3.80%	77.17	3.80%	316.39	3.80%	98.32	3.80%	193.77	3.80%	122.18
Stage Three Growth	2121	3.80%	93.85	3.80%	158.82	3.80%	80.10	3.80%	328.41	3.80%	102.05	3.80%	201.13	3.80%	126.83
Stage Three Growth	2122	3.80%	97.42	3.80%	164.85	3.80%	83.14	3.80%	340.89	3.80%	105.93	3.80%	208.77	3.80%	131.65
Stage Three Growth	2123	3.80%	101.12	3.80%	171.12	3.80%	86.30	3.80%	353.85	3.80%	109.96	3.80%	216.71	3.80%	136.65

Stage Three Growth	2124	3.80%	104.96	3.80%	177.62	3.80%	89.58	3.80%	367.29	3.80%	114.13	3.80%	224.94	3.80%	141.84
Stage Three Growth	2125	3.80%	108.95	3.80%	184.37	3.80%	92.99	3.80%	381.25	3.80%	118.47	3.80%	233.49	3.80%	147.23
Stage Three Growth	2126	3.80%	113.09	3.80%	191.38	3.80%	96.52	3.80%	395.74	3.80%	122.97	3.80%	242.36	3.80%	152.83
Stage Three Growth	2127	3.80%	117.39	3.80%	198.65	3.80%	100.19	3.80%	410.78	3.80%	127.65	3.80%	251.57	3.80%	158.63
Stage Three Growth	2128	3.80%	121.85	3.80%	206.20	3.80%	103.99	3.80%	426.39	3.80%	132.50	3.80%	261.13	3.80%	164.66
Stage Three Growth	2129	3.80%	126.48	3.80%	214.03	3.80%	107.95	3.80%	442.59	3.80%	137.53	3.80%	271.06	3.80%	170.92
Stage Three Growth	2130	3.80%	131.28	3.80%	222.17	3.80%	112.05	3.80%	459.41	3.80%	142.76	3.80%	281.36	3.80%	177.41
Stage Three Growth	2131	3.80%	136.27	3.80%	230.61	3.80%	116.31	3.80%	476.86	3.80%	148.18	3.80%	292.05	3.80%	184.15
Stage Three Growth	2132	3.80%	141.45	3.80%	239.37	3.80%	120.73	3.80%	494.98	3.80%	153.81	3.80%	303.15	3.80%	191.15
Stage Three Growth	2133	3.80%	146.82	3.80%	248.47	3.80%	125.31	3.80%	513.79	3.80%	159.66	3.80%	314.66	3.80%	198.42
Stage Three Growth	2134	3.80%	152.40	3.80%	257.91	3.80%	130.08	3.80%	533.32	3.80%	165.73	3.80%	326.62	3.80%	205.96
Stage Three Growth	2135	3.80%	158.19	3.80%	267.71	3.80%	135.02	3.80%	553.58	3.80%	172.02	3.80%	339.03	3.80%	213.78
Stage Three Growth	2136	3.80%	164.21	3.80%	277.88	3.80%	140.15	3.80%	574.62	3.80%	178.56	3.80%	351.92	3.80%	221.91
Stage Three Growth	2137	3.80%	170.45	3.80%	288.44	3.80%	145.47	3.80%	596.46	3.80%	185.35	3.80%	365.29	3.80%	230.34
Stage Three Growth	2138	3.80%	176.92	3.80%	299.40	3.80%	151.00	3.80%	619.12	3.80%	192.39	3.80%	379.17	3.80%	239.09
Stage Three Growth	2139	3.80%	183.65	3.80%	310.78	3.80%	156.74	3.80%	642.65	3.80%	199.70	3.80%	393.58	3.80%	248.18
Implied Cost of Equity			**6.21%**		**10.72%**		**10.55%**		**10.46%**		**8.55%**		**12.31%**		**9.06%**

Mean	9.69%
Median	10.46%
Selected Three-Stage DGM Cost of Equity	**10.08%**

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
DT Midstream Inc.	26.3
Enbridge Inc.	21.3
Kinder Morgan Inc.	22.9
ONEOK Inc.	20.5
Pembina Pipeline Corp.	18.8
TC Energy Corp.	14.3
Williams Companies Inc.	25.5
Mean	21.4
Median	21.3
Selected Price to Earnings (P/E) Ratio	21.4
Indicated Equity Component of the Direct Rate	**4.67%**

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

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Beta Analysis

Company	Beta
DT Midstream Inc.	0.95
Enbridge Inc.	0.85
Kinder Morgan Inc.	1.15
ONEOK Inc.	1.50
Pembina Pipeline Corp.	1.05
TC Energy Corp.	1.05
Williams Companies Inc.	1.10
Beta Mean	1.09
Beta Median	1.05
Unlevered and Relevered Mean*	1.08
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**
DT Midstream Inc.	21.00%	21.61%	78.39%	0.95	0.78
Enbridge Inc.	15.00%	38.77%	57.78%	0.85	0.54
Kinder Morgan Inc.	21.00%	33.12%	66.88%	1.15	0.83
ONEOK Inc.	24.00%	29.68%	70.32%	1.50	1.14
Pembina Pipeline Corp.	21.00%	23.85%	71.44%	1.05	0.83
TC Energy Corp.	18.00%	48.43%	49.79%	1.05	0.58
Williams Companies Inc.	21.00%	26.36%	73.64%	1.10	0.86
			Average	**1.09**	

Relevering of Betas				
Three Stage Dividend Grow	*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**
DT Midstream Inc.	20.14%	31.00%	69.00%	1.06
Enbridge Inc.	20.14%	31.00%	69.00%	0.73
Kinder Morgan Inc.	20.14%	31.00%	69.00%	1.13
ONEOK Inc.	20.14%	31.00%	69.00%	1.55
Pembina Pipeline Corp.	20.14%	31.00%	69.00%	1.13
TC Energy Corp.	20.14%	31.00%	69.00%	0.79
Williams Companies Inc.	20.14%	31.00%	69.00%	1.17
			Average	**1.08**

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 Gas Transmission Pipeline Market Segment

- December 31, 2024 calendar year information for the January 2, 2025 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
DT Midstream Inc.	9,698,111,920	4,766,000,000	2.03	DT Midstream Inc. 2024 10-K, p. 61
Enbridge Inc.	129,675,511,850	65,900,000,000	1.97	Enbridge Inc. 2024 10-K, p. 109 (CAD)
Kinder Morgan Inc.	60,584,126,754	30,531,000,000	1.98	Kinder Morgan Inc. 2024 10-K, p. 73
ONEOK Inc.	63,699,444,187	22,133,000,000	2.88	ONEOK Inc. 2024 10-K, p. 68
Pembina Pipeline Corp.	33,490,833,390	12,169,450,000	2.75	Pembina Pipeline. 2024 Annual Report, p. 92*
TC Energy Corp.	51,474,420,000	20,920,195,000	2.46	TC Energy Corp. 2024 Annual Report, p. 146 *
Williams Companies Inc.	69,361,771,306	12,436,000,000	5.58	Williams Companies 2024 10-K, p. 98
		Average	2.81	

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
DT Midstream Inc.	3,136,000,000	3,319,000,000	0.94	DT Midstream Inc. 2024 10-K, p. 78
Enbridge Inc.	98,900,000,000	101,600,000,000	0.97	Enbridge Inc. 2024 10-K, p. 180 (CAD)
Kinder Morgan Inc.	30,794,000,000	31,890,000,000	0.97	Kinder Morgan Inc. 2024 10-K, p. 98
ONEOK Inc.	30,800,000,000	32,100,000,000	0.96	ONEOK Inc. 2024 10-K, p. 87
Pembina Pipeline Corp.	12,649,000,000	12,656,000,000	1.00	Pembina Pipeline Corp 2024 Annual Report, p. 144
TC Energy Corp.	59,142,000,000	58,979,000,000	1.00	TC Energy Corp. 2024 Annual Report, p. 213 (CAD)
Williams Companies Inc.	25,553,000,000	25,713,000,000	0.99	Williams Companies 2024 10-K, p. 176
		Average	0.98	

DEPARTMENT OF REVENUE

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	69.00%	2.81	1.94
Long-term Debt	31.00%	0.98	0.30
			2.24

Notes:

*Convert Pembina Pipeline 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.

17,510,000,000	CAD
0.6950	Exchange Rate as of 12/31/2024
12,169,450,000	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.

30,101,000,000	CAD
0.6950	Exchange Rate as of 12/31/2024
20,920,195,000	USD

Appendix D - Fluid Transportation Pipeline

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	34.00%	5.83%	1.98%
Common Equity	66.00%	10.95%	7.23%
Yield Rate			**9.21%**

Fluid Transportation Pipeline Yield Rate	**9.21%**

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
Energy Transfer LP	58,995,000,000	-	59,028,320,753	118,023,320,753	49.99%	0.00%	50.01%
Enterprise Products Partners LP	28,349,000,000	-	66,262,766,711	94,611,766,711	29.96%	0.00%	70.04%
MPLX LP	19,300,000,000	965,000,000	47,160,811,970	67,425,811,970	28.62%	1.43%	69.94%
Plains All American Pipeline LP	7,212,000,000	2,300,000,000	12,180,511,411	21,692,511,411	33.25%	10.60%	56.15%
				Mean	35.45%	3.01%	61.54%
				Median	31.60%	0.72%	63.05%
		Indicated Industry Capital Structure			**34.00%**		**66.00%**

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate	
Energy Transfer LP	Baa2	5.83%	
Enterprise Products Partners LP	A3	5.47%	*
MPLX LP	Baa2	5.83%	
Plains All American Pipeline LP	Baa2	5.83%	

Mean	5.74%
Median	5.83%
Mode	5.83%

Indicated Rate of Debt	**5.83%**

Corporate Bond Yield Averages from Mergent Bond Record, January 2025 Edition
Industrial Bond Averages, December 2024

Mergent	S&P	Dec. Yield Avg.
Aa1, Aa2 Aa3	AA+, AA, AA-	5.28%
A1, A2, A3	A+, A, A-	5.47%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.83%

*Enterprise Products Partners LP is not rated by Moody's, but its wholly owned subsidiary, Enterprise Products Operating LLC is rated A3.

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	8.08%
CAPM - Damodaran	9.45%
CAPM - The CFO Survey	10.57%
CAPM - Fernandez, Banuls, and Acin	10.69%
CAPM - Ex Post (BVR Historical, Arithmetic)	11.97%
CAPM - Ex Post (BVR Historical, Geometric)	10.65%
Empirical CAPM - Ex Ante, Three Stage	8.04%
Empirical CAPM - Damodaran	9.38%
Empirical CAPM - Graham and Harvey	10.49%
Empirical CAPM - Fernandez, Banuls, and Acin	10.61%
Empirical CAPM - Ex Post (BVR Historical, Arithmetic)	11.87%
Empirical CAPM - Ex Post (BVR Historical, Geometric)	10.57%
DGM - Dividend Growth	16.60%
DGM - Earnings Growth	15.65%
DGM - Two-Stage	15.00%
DGM - Three-Stage	14.04%
Indicated Rate of Equity	**10.95%**

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

	Capital Structure	Rate	Composite
Debt Component	34.00%	5.83%	1.98%
Equity Component	66.00%	8.66%	5.72%
Direct Rate			**7.70%**

Direct Rate	**7.70%**

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]	3.04%	1.06	3.22%	4.86%	8.08%
Dr. Damodaran ERP[3]	4.33%	1.06	4.59%	4.86%	9.45%
The CFO Survey[4]	5.39%	1.06	5.71%	4.86%	10.57%
Fernandez, Banuls and Acin[5]	5.50%	1.06	5.83%	4.86%	10.69%
BVR - Historical, Arithmetic Mean[6]	6.71%	1.06	7.11%	4.86%	11.97%
BVR - Historical, Geometric Mean[7]	5.46%	1.06	5.79%	4.86%	10.65%

Notes:

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 14, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

6 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 3, 2025 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]	3.04%	1.06	2.42%	0.76%	4.86%	**8.04%**
Dr. Damodaran ERP[3]	4.33%	1.06	3.44%	1.08%	4.86%	**9.38%**
The CFO Survey[4]	5.39%	1.06	4.29%	1.35%	4.86%	**10.49%**
Fernandez, Banuls and Acin[5]	5.50%	1.06	4.37%	1.38%	4.86%	**10.61%**
BVR - Historical, Arithmetic Mean[6]	6.71%	1.06	5.33%	1.68%	4.86%	**11.87%**
BVR - Historical, Geometric Mean[7]	5.46%	1.06	4.34%	1.37%	4.86%	**10.57%**

Notes:

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 14, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

6 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 3, 2025 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
Energy Transfer LP	7.50%	7.50%	8.50%	15.00%	16.00%
Enterprise Products Partners LP	7.20%	6.00%	10.00%	13.20%	17.20%
MPLX LP	8.30%	8.00%	6.50%	16.30%	14.80%
Plains All American Pipeline LP	8.50%	16.00%	20.00%	24.50%	28.50%
Mean	7.88%	9.38%	11.25%	17.25%	19.13%
Median	7.90%	7.75%	9.25%	15.65%	16.60%

DGM - Dividend Growth, Indicated Rate	**16.60%**
DGM - Earnings Growth, Indicated Rate	**15.65%**

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

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
Energy Transfer LP	7.50%	7.50%	3.80%	5.65%	13.99%
Enterprise Products Partners LP	7.20%	6.00%	3.80%	4.90%	12.65%
MPLX LP	8.30%	8.00%	3.80%	5.90%	15.16%
Plains All American Pipeline LP	8.50%	16.00%	3.80%	9.90%	20.89%
				Mean	15.67%
				Median	14.57%

Two-Stage DGM, Indicated Rate	**15.00%**

We placed more reliance on the 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 1.8% 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

Company	Year	Energy Transfer LP		Enterprise Products Partners LP		MPLX LP		Plains All American Pipeline LP	
Start Price	2024		-17.24		-30.57		-46.29		-17.31
Expected Dividends	2025		1.36		2.20		3.85		1.50
Stage One Growth	2026	7.50%	1.46	6.00%	2.33	8.00%	4.16	16.00%	1.74
Stage One Growth	2027	7.50%	1.57	6.00%	2.47	8.00%	4.49	16.00%	2.02
Stage One Growth	2028	7.50%	1.69	6.00%	2.62	8.00%	4.85	16.00%	2.34
Stage One Growth	2029	7.50%	1.82	6.00%	2.78	8.00%	5.24	16.00%	2.72
Stage One Growth	2030	7.50%	1.95	6.00%	2.94	8.00%	5.66	16.00%	3.15
Stage Two Growth	2031	7.16%	2.09	5.80%	3.11	7.62%	6.09	14.89%	3.62
Stage Two Growth	2032	6.83%	2.24	5.60%	3.29	7.24%	6.53	13.78%	4.12
Stage Two Growth	2033	6.49%	2.38	5.40%	3.47	6.85%	6.98	12.67%	4.64
Stage Two Growth	2034	6.15%	2.53	5.20%	3.65	6.47%	7.43	11.56%	5.18
Stage Two Growth	2035	5.82%	2.67	5.00%	3.83	6.09%	7.88	10.45%	5.72
Stage Two Growth	2036	5.48%	2.82	4.80%	4.01	5.71%	8.33	9.35%	6.25
Stage Two Growth	2037	5.15%	2.97	4.60%	4.20	5.33%	8.77	8.24%	6.77
Stage Two Growth	2038	4.81%	3.11	4.40%	4.38	4.95%	9.21	7.13%	7.25
Stage Two Growth	2039	4.47%	3.25	4.20%	4.57	4.56%	9.63	6.02%	7.69
Stage Two Growth	2040	4.14%	3.38	4.00%	4.75	4.18%	10.03	4.91%	8.06
Stage Three Growth	2041	3.80%	3.51	3.80%	4.93	3.80%	10.41	3.80%	8.37
Stage Three Growth	2042	3.80%	3.64	3.80%	5.12	3.80%	10.81	3.80%	8.69
Stage Three Growth	2043	3.80%	3.78	3.80%	5.31	3.80%	11.22	3.80%	9.02
Stage Three Growth	2044	3.80%	3.93	3.80%	5.51	3.80%	11.64	3.80%	9.36

Stage Three Growth	2045	3.80%	4.07	3.80%	5.72	3.80%	12.09	3.80%	9.72
Stage Three Growth	2046	3.80%	4.23	3.80%	5.94	3.80%	12.55	3.80%	10.09
Stage Three Growth	2047	3.80%	4.39	3.80%	6.17	3.80%	13.02	3.80%	10.47
Stage Three Growth	2048	3.80%	4.56	3.80%	6.40	3.80%	13.52	3.80%	10.87
Stage Three Growth	2049	3.80%	4.73	3.80%	6.64	3.80%	14.03	3.80%	11.28
Stage Three Growth	2050	3.80%	4.91	3.80%	6.90	3.80%	14.56	3.80%	11.71
Stage Three Growth	2051	3.80%	5.10	3.80%	7.16	3.80%	15.12	3.80%	12.15
Stage Three Growth	2052	3.80%	5.29	3.80%	7.43	3.80%	15.69	3.80%	12.61
Stage Three Growth	2053	3.80%	5.49	3.80%	7.71	3.80%	16.29	3.80%	13.09
Stage Three Growth	2054	3.80%	5.70	3.80%	8.01	3.80%	16.91	3.80%	13.59
Stage Three Growth	2055	3.80%	5.92	3.80%	8.31	3.80%	17.55	3.80%	14.11
Stage Three Growth	2056	3.80%	6.14	3.80%	8.63	3.80%	18.22	3.80%	14.64
Stage Three Growth	2057	3.80%	6.37	3.80%	8.95	3.80%	18.91	3.80%	15.20
Stage Three Growth	2058	3.80%	6.62	3.80%	9.29	3.80%	19.63	3.80%	15.78
Stage Three Growth	2059	3.80%	6.87	3.80%	9.65	3.80%	20.37	3.80%	16.38
Stage Three Growth	2060	3.80%	7.13	3.80%	10.01	3.80%	21.15	3.80%	17.00
Stage Three Growth	2061	3.80%	7.40	3.80%	10.39	3.80%	21.95	3.80%	17.65
Stage Three Growth	2062	3.80%	7.68	3.80%	10.79	3.80%	22.78	3.80%	18.32
Stage Three Growth	2063	3.80%	7.97	3.80%	11.20	3.80%	23.65	3.80%	19.01
Stage Three Growth	2064	3.80%	8.28	3.80%	11.62	3.80%	24.55	3.80%	19.74
Stage Three Growth	2065	3.80%	8.59	3.80%	12.07	3.80%	25.48	3.80%	20.49
Stage Three Growth	2066	3.80%	8.92	3.80%	12.52	3.80%	26.45	3.80%	21.26
Stage Three Growth	2067	3.80%	9.26	3.80%	13.00	3.80%	27.46	3.80%	22.07
Stage Three Growth	2068	3.80%	9.61	3.80%	13.49	3.80%	28.50	3.80%	22.91
Stage Three Growth	2069	3.80%	9.97	3.80%	14.01	3.80%	29.58	3.80%	23.78
Stage Three Growth	2070	3.80%	10.35	3.80%	14.54	3.80%	30.71	3.80%	24.68
Stage Three Growth	2071	3.80%	10.75	3.80%	15.09	3.80%	31.87	3.80%	25.62
Stage Three Growth	2072	3.80%	11.15	3.80%	15.67	3.80%	33.08	3.80%	26.60
Stage Three Growth	2073	3.80%	11.58	3.80%	16.26	3.80%	34.34	3.80%	27.61
Stage Three Growth	2074	3.80%	12.02	3.80%	16.88	3.80%	35.65	3.80%	28.66
Stage Three Growth	2075	3.80%	12.47	3.80%	17.52	3.80%	37.00	3.80%	29.75
Stage Three Growth	2076	3.80%	12.95	3.80%	18.19	3.80%	38.41	3.80%	30.88
Stage Three Growth	2077	3.80%	13.44	3.80%	18.88	3.80%	39.87	3.80%	32.05
Stage Three Growth	2078	3.80%	13.95	3.80%	19.59	3.80%	41.38	3.80%	33.27

Stage Three Growth	2079	3.80%	14.48	3.80%	20.34	3.80%	42.95	3.80%	34.53
Stage Three Growth	2080	3.80%	15.03	3.80%	21.11	3.80%	44.59	3.80%	35.84
Stage Three Growth	2081	3.80%	15.60	3.80%	21.91	3.80%	46.28	3.80%	37.20
Stage Three Growth	2082	3.80%	16.20	3.80%	22.75	3.80%	48.04	3.80%	38.62
Stage Three Growth	2083	3.80%	16.81	3.80%	23.61	3.80%	49.86	3.80%	40.09
Stage Three Growth	2084	3.80%	17.45	3.80%	24.51	3.80%	51.76	3.80%	41.61
Stage Three Growth	2085	3.80%	18.11	3.80%	25.44	3.80%	53.73	3.80%	43.19
Stage Three Growth	2086	3.80%	18.80	3.80%	26.41	3.80%	55.77	3.80%	44.83
Stage Three Growth	2087	3.80%	19.52	3.80%	27.41	3.80%	57.89	3.80%	46.54
Stage Three Growth	2088	3.80%	20.26	3.80%	28.45	3.80%	60.09	3.80%	48.30
Stage Three Growth	2089	3.80%	21.03	3.80%	29.53	3.80%	62.37	3.80%	50.14
Stage Three Growth	2090	3.80%	21.83	3.80%	30.66	3.80%	64.74	3.80%	52.04
Stage Three Growth	2091	3.80%	22.66	3.80%	31.82	3.80%	67.20	3.80%	54.02
Stage Three Growth	2092	3.80%	23.52	3.80%	33.03	3.80%	69.75	3.80%	56.08
Stage Three Growth	2093	3.80%	24.41	3.80%	34.28	3.80%	72.40	3.80%	58.21
Stage Three Growth	2094	3.80%	25.34	3.80%	35.59	3.80%	75.15	3.80%	60.42
Stage Three Growth	2095	3.80%	26.30	3.80%	36.94	3.80%	78.01	3.80%	62.71
Stage Three Growth	2096	3.80%	27.30	3.80%	38.34	3.80%	80.97	3.80%	65.10
Stage Three Growth	2097	3.80%	28.34	3.80%	39.80	3.80%	84.05	3.80%	67.57
Stage Three Growth	2098	3.80%	29.41	3.80%	41.31	3.80%	87.25	3.80%	70.14
Stage Three Growth	2099	3.80%	30.53	3.80%	42.88	3.80%	90.56	3.80%	72.80
Stage Three Growth	2100	3.80%	31.69	3.80%	44.51	3.80%	94.00	3.80%	75.57
Stage Three Growth	2101	3.80%	32.90	3.80%	46.20	3.80%	97.57	3.80%	78.44
Stage Three Growth	2102	3.80%	34.15	3.80%	47.96	3.80%	101.28	3.80%	81.42
Stage Three Growth	2103	3.80%	35.44	3.80%	49.78	3.80%	105.13	3.80%	84.52
Stage Three Growth	2104	3.80%	36.79	3.80%	51.67	3.80%	109.13	3.80%	87.73
Stage Three Growth	2105	3.80%	38.19	3.80%	53.64	3.80%	113.27	3.80%	91.06
Stage Three Growth	2106	3.80%	39.64	3.80%	55.68	3.80%	117.58	3.80%	94.52
Stage Three Growth	2107	3.80%	41.15	3.80%	57.79	3.80%	122.04	3.80%	98.11
Stage Three Growth	2108	3.80%	42.71	3.80%	59.99	3.80%	126.68	3.80%	101.84
Stage Three Growth	2109	3.80%	44.33	3.80%	62.27	3.80%	131.50	3.80%	105.71
Stage Three Growth	2110	3.80%	46.02	3.80%	64.63	3.80%	136.49	3.80%	109.73
Stage Three Growth	2111	3.80%	47.77	3.80%	67.09	3.80%	141.68	3.80%	113.90
Stage Three Growth	2112	3.80%	49.58	3.80%	69.64	3.80%	147.06	3.80%	118.23

Stage Three Growth	2113	3.80%	51.46	3.80%	72.29	3.80%	152.65	3.80%	122.72
Stage Three Growth	2114	3.80%	53.42	3.80%	75.03	3.80%	158.45	3.80%	127.38
Stage Three Growth	2115	3.80%	55.45	3.80%	77.88	3.80%	164.47	3.80%	132.22
Stage Three Growth	2116	3.80%	57.56	3.80%	80.84	3.80%	170.72	3.80%	137.25
Stage Three Growth	2117	3.80%	59.74	3.80%	83.91	3.80%	177.21	3.80%	142.46
Stage Three Growth	2118	3.80%	62.01	3.80%	87.10	3.80%	183.95	3.80%	147.88
Stage Three Growth	2119	3.80%	64.37	3.80%	90.41	3.80%	190.94	3.80%	153.50
Stage Three Growth	2120	3.80%	66.82	3.80%	93.85	3.80%	198.19	3.80%	159.33
Stage Three Growth	2121	3.80%	69.36	3.80%	97.42	3.80%	205.72	3.80%	165.38
Stage Three Growth	2122	3.80%	71.99	3.80%	101.12	3.80%	213.54	3.80%	171.67
Stage Three Growth	2123	3.80%	74.73	3.80%	104.96	3.80%	221.65	3.80%	178.19
Stage Three Growth	2124	3.80%	77.57	3.80%	108.95	3.80%	230.08	3.80%	184.96
Stage Three Growth	2125	3.80%	80.51	3.80%	113.09	3.80%	238.82	3.80%	191.99
Stage Three Growth	2126	3.80%	83.57	3.80%	117.39	3.80%	247.90	3.80%	199.29
Stage Three Growth	2127	3.80%	86.75	3.80%	121.85	3.80%	257.32	3.80%	206.86
Stage Three Growth	2128	3.80%	90.05	3.80%	126.48	3.80%	267.09	3.80%	214.72
Stage Three Growth	2129	3.80%	93.47	3.80%	131.28	3.80%	277.24	3.80%	222.88
Stage Three Growth	2130	3.80%	97.02	3.80%	136.27	3.80%	287.78	3.80%	231.35
Stage Three Growth	2131	3.80%	100.71	3.80%	141.45	3.80%	298.71	3.80%	240.14
Stage Three Growth	2132	3.80%	104.53	3.80%	146.82	3.80%	310.07	3.80%	249.27
Stage Three Growth	2133	3.80%	108.51	3.80%	152.40	3.80%	321.85	3.80%	258.74
Stage Three Growth	2134	3.80%	112.63	3.80%	158.19	3.80%	334.08	3.80%	268.57
Stage Three Growth	2135	3.80%	116.91	3.80%	164.21	3.80%	346.77	3.80%	278.78
Stage Three Growth	2136	3.80%	121.35	3.80%	170.45	3.80%	359.95	3.80%	289.37
Stage Three Growth	2137	3.80%	125.96	3.80%	176.92	3.80%	373.63	3.80%	300.37
Stage Three Growth	2138	3.80%	130.75	3.80%	183.65	3.80%	387.83	3.80%	311.78
Stage Three Growth	2139	3.80%	135.72	3.80%	190.62	3.80%	402.56	3.80%	323.63
Stage Three Growth	2140	3.80%	140.87	3.80%	197.87	3.80%	417.86	3.80%	335.93
Implied Cost of Equity			**13.65%**		**12.08%**		**14.43%**		**19.78%**

Mean	14.99%
Median	14.04%
Selected Three-Stage DGM Cost of Equity	**14.04%**

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Energy Transfer LP	12.7
Enterprise Products Partners LP	10.7
MPLX LP	11.0
Plains All American Pipeline LP	12.1
Mean	11.63
Median	11.55
Selected Price to Earnings (P/E) Ratio	11.55
Indicated Equity Component of the Direct Rate	**8.66%**

We placed most reliance median price to earnings ratio.

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Beta Analysis

Company	Beta
Energy Transfer LP	1.10
Enterprise Products Partners LP	1.00
MPLX LP	0.95
Plains All American Pipeline LP	1.40
Beta Mean	1.11
Beta Median	1.05
Unlevered and Relevered Mean*	1.14
Indicated Beta	**1.06**

We considered the mean, median, and unlevered/relevered mean. We placed more reliance on the median 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**
Energy Transfer LP	NMF	49.99%	50.01%	1.10	N/A
Enterprise Products Partners LP	1.50%	29.96%	70.04%	1.00	0.70
MPLX LP	3.00%	28.62%	69.94%	0.95	0.68
Plains All American Pipeline LP	10.00%	33.25%	56.15%	1.40	0.91
			Average	**1.11**	

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**
Energy Transfer LP	4.83%	34.00%	66.00%	N/A
Enterprise Products Partners LP	4.83%	34.00%	66.00%	1.04
MPLX LP	4.83%	34.00%	66.00%	1.01
Plains All American Pipeline LP	4.83%	34.00%	66.00%	1.36
			Average	**1.14**

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, 2024 calendar year information for the January 2, 2025 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
Energy Transfer LP	59,028,320,753	46,017,000,000	1.28	Energy Transfer LP 2024 10-K, p. F-8
Enterprise Products Partners LP	66,262,766,711	29,589,000,000	2.24	Enterprise Products Partners LP 2024 10-K, p. F-8
MPLX LP	47,160,811,970	13,576,000,000	3.47	MPLX LP 2024 10-K, p. 80
Plains All American Pipeline LP	12,180,511,411	9,813,000,000	1.24	Plains All American Pipeline LP 2024 10-K, p. F-5
		Average	**2.06**	

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
Energy Transfer LP	59,010,000,000	59,760,000,000	0.99	Energy Transfer LP 2024 10-K, p. F-21
Enterprise Products Partners LP	28,900,000,000	31,600,000,000	0.91	Enterprise Products Partners LP 2024 10-K, p. F-60
MPLX LP	19,574,000,000	21,068,000,000	0.93	MPLX LP 2024 10-K, p. 103
Plains All American Pipeline LP	6,700,000,000	7,200,000,000	0.93	Plains All American Pipeline LP 2023 10-K, p. F-30
		Average	**0.94**	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	66.00%	2.06	1.36
Long-term Debt	34.00%	0.94	0.32
			1.68

Appendix E - Railroad

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	19.00%	5.61%	1.07%
Common Equity	81.00%	10.60%	8.59%
Yield Rate			**9.66%**

Yield Rate	**9.66%**

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	13,763,000,000	-	67,910,400,000	81,673,400,000	16.85%	0.00%	83.15%
CPKC	13,830,000,000	-	72,903,568,733	86,733,568,733	15.95%	0.00%	84.05%
CSX Corporation	18,535,000,000	-	64,332,062,944	82,867,062,944	22.37%	0.00%	77.63%
Norfolk Southern Corp	16,644,000,000	-	56,014,677,915	72,658,677,915	22.91%	0.00%	77.09%
Union Pacific Corp	29,761,000,000	-	139,384,461,114	169,145,461,114	17.59%	0.00%	82.41%
				Mean	19.13%	0.00%	80.87%
				Median	17.59%	0.00%	82.41%
	Indicated Capital Structure				**19.00%**		**81.00%**

Notes:

Data downloaded from Value Line.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
Canadian National Railway	A2	5.47%
CPKC	Baa2	5.83%
CSX Corporation	A3	5.47%
Norfolk Southern Corp	Baa1	5.83%
Union Pacific Corp	A3	5.47%

Mean	5.61%
Median	5.47%
Mode	5.47%

Indicated Rate of Debt	**5.61%**

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

Corporate Bond Yield Averages from Mergent Bond Record, January 2025 Edition

Industrial Bond Averages, December 2024

Mergent	S&P	Dec. Yield Avg.
Aa1, Aa2 Aa3	AA+, AA, AA-	5.28%
A1, A2, A3	A+, A, A-	5.47%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	5.83%

Indicated Rate of Equity

Model	Rate
CAPM - Ex Ante, Three Stage	7.90%
CAPM - Damodaran	9.19%
CAPM - The CFO Survey	10.25%
CAPM - Fernandez, Banuls, and Acin	10.36%
CAPM - Ex Post (BVR Historical, Arithmetic)	11.57%
CAPM - Ex Post (BVR Historical, Geometric)	10.32%
Empirical CAPM - Ex Ante, Three Stage	7.90%
Empirical CAPM - Damodaran	9.19%
Empirical CAPM - Graham and Harvey	10.25%
Empirical CAPM - Fernandez, Banuls, and Acin	10.36%
Empirical CAPM - Ex Post (BVR Historical, Arithmeti	11.57%
Empirical CAPM - Ex Post (BVR Historical, Geometri	10.32%
DGM - Dividend Growth	10.04%
DGM - Earnings Growth	10.44%
DGM - Two-Stage	8.93%
DGM - Three-Stage	6.67%
Indicated Rate of Equity	**10.60%**

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

	Capital Structure	Rate	Composite
Debt Component	19.00%	5.61%	1.07%
Equity Component	81.00%	5.25%	4.25%
Direct Rate			**5.32%**
		Direct Rate	**5.32%**

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]	3.04%	1.00	3.04%	4.86%	7.90%
Dr. Damodaran ERP[3]	4.33%	1.00	4.33%	4.86%	9.19%
The CFO Survey[4]	5.39%	1.00	5.39%	4.86%	10.25%
Fernandez, Banuls and Acin[5]	5.50%	1.00	5.50%	4.86%	10.36%
BVR - Historical, Arithmetic Mean[6]	6.71%	1.00	6.71%	4.86%	11.57%
BVR - Historical, Geometric Mean[7]	5.46%	1.00	5.46%	4.86%	10.32%

Notes:

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 14, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

6 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 3, 2025 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]	3.04%	1.00	2.28%	0.76%	4.86%	7.90%
Dr. Damodaran ERP[3]	4.33%	1.00	3.25%	1.08%	4.86%	9.19%
The CFO Survey[4]	5.39%	1.00	4.04%	1.35%	4.86%	10.25%
Fernandez, Banuls and Acin[5]	5.50%	1.00	4.13%	1.38%	4.86%	10.36%
BVR - Historical, Arithmetic Mean[6]	6.71%	1.00	5.03%	1.68%	4.86%	11.57%
BVR - Historical, Geometric Mean[7]	5.46%	1.00	4.10%	1.37%	4.86%	10.32%

Notes:

1 U.S. Treasury on January 2, 2025 - 20-year Coupon Bond Yield, Daily Observations, Retrieved January 14, 2025 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 2, 2025 as determined by Dr. Aswath Damodaran; Retrieved January 14, 2025 from http://pages.stern.nyu.edu/~adamodar/

4 The CFO Survey (2024). Data & Results December 4, 2024. Mean average annual S&P return over next ten years (9.6%) less annual yield on 10-year Treasury Bonds (4.21%). Retrieved January 16, 2025 from https://www.richmondfed.org/research/national_economy/cfo_survey

5 Fernandez, P., Garcia D., & Acin, J. F. (2024). Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024. SSRN Electronic Journal. Retrieved January 16, 2025 from https://ssrn.com/abstract=4754347

6 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 3, 2025 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

7 Business Valuation Resources, Cost of Capital Professional. (2025). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 3, 2025 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	2.40%	7.00%	8.50%	9.40%	10.90%
CPKC	1.00%	8.00%	9.00%	9.00%	10.00%
CSX Corporation	1.50%	9.00%	12.50%	10.50%	14.00%
Norfolk Southern Corp	2.20%	11.50%	5.00%	13.70%	7.20%
Union Pacific Corp	2.30%	8.00%	6.00%	10.30%	8.30%
Mean	1.88%	8.70%	8.20%	10.58%	10.08%
Median	2.20%	8.00%	8.50%	10.30%	10.00%

DGM - Dividend Growth, Indicated Rate	**10.04%**
DGM - Earnings Growth, Indicated Rate	**10.44%**

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
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
Canadian National Railway	2.40%	7.00%	3.80%	5.40%	8.41%
CPKC	1.00%	8.00%	3.80%	5.90%	7.64%
CSX Corporation	1.50%	9.00%	3.80%	6.40%	8.83%
Norfolk Southern Corp	2.20%	11.50%	3.80%	7.65%	11.24%
Union Pacific Corp	2.30%	8.00%	3.80%	5.90%	8.98%
				Mean	9.02%
				Median	8.83%

Two-Stage DGM, Indicated Rate	**8.93%**

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 1.8% 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

Company	Year	Canadian National Railway		CPKC		CSX Corporation		Norfolk Southern Corp		Union Pacific Corp	
Start Price	2024		-108		-78.11		-33.36		-247.59		-229.91
Expected Dividends	2025		2.68		0.64		0.52		5.60		5.48
Stage One Growth	2026	7.00%	2.87	8.00%	0.69	9.00%	0.57	11.50%	6.24	8.00%	5.92
Stage One Growth	2027	7.00%	3.07	8.00%	0.75	9.00%	0.62	11.50%	6.96	8.00%	6.39
Stage One Growth	2028	7.00%	3.28	8.00%	0.81	9.00%	0.67	11.50%	7.76	8.00%	6.90
Stage One Growth	2029	7.00%	3.51	8.00%	0.87	9.00%	0.73	11.50%	8.66	8.00%	7.46
Stage One Growth	2030	7.00%	3.76	8.00%	0.94	9.00%	0.80	11.50%	9.65	8.00%	8.05
Stage Two Growth	2031	6.71%	4.01	7.62%	1.01	8.53%	0.87	10.80%	10.69	7.62%	8.67
Stage Two Growth	2032	6.42%	4.27	7.24%	1.09	8.05%	0.94	10.10%	11.77	7.24%	9.29
Stage Two Growth	2033	6.13%	4.53	6.85%	1.16	7.58%	1.01	9.40%	12.88	6.85%	9.93
Stage Two Growth	2034	5.84%	4.79	6.47%	1.23	7.11%	1.08	8.70%	14.00	6.47%	10.57
Stage Two Growth	2035	5.55%	5.06	6.09%	1.31	6.64%	1.15	8.00%	15.12	6.09%	11.22
Stage Two Growth	2036	5.25%	5.33	5.71%	1.38	6.16%	1.22	7.30%	16.22	5.71%	11.86
Stage Two Growth	2037	4.96%	5.59	5.33%	1.46	5.69%	1.29	6.60%	17.29	5.33%	12.49
Stage Two Growth	2038	4.67%	5.85	4.95%	1.53	5.22%	1.36	5.90%	18.32	4.95%	13.11
Stage Two Growth	2039	4.38%	6.11	4.56%	1.60	4.75%	1.43	5.20%	19.27	4.56%	13.70
Stage Two Growth	2040	4.09%	6.36	4.18%	1.67	4.27%	1.49	4.50%	20.13	4.18%	14.28
Stage Three Growth	2041	3.80%	6.60	3.80%	1.73	3.80%	1.54	3.80%	20.90	3.80%	14.82
Stage Three Growth	2042	3.80%	6.85	3.80%	1.80	3.80%	1.60	3.80%	21.69	3.80%	15.38
Stage Three Growth	2043	3.80%	7.11	3.80%	1.86	3.80%	1.66	3.80%	22.52	3.80%	15.97
Stage Three Growth	2044	3.80%	7.38	3.80%	1.94	3.80%	1.73	3.80%	23.37	3.80%	16.57

Stage Three Growth	2045	3.80%	7.66	3.80%	2.01	3.80%	1.79	3.80%	24.26	3.80%	17.20
Stage Three Growth	2046	3.80%	7.95	3.80%	2.09	3.80%	1.86	3.80%	25.18	3.80%	17.86
Stage Three Growth	2047	3.80%	8.25	3.80%	2.17	3.80%	1.93	3.80%	26.14	3.80%	18.54
Stage Three Growth	2048	3.80%	8.57	3.80%	2.25	3.80%	2.00	3.80%	27.13	3.80%	19.24
Stage Three Growth	2049	3.80%	8.89	3.80%	2.33	3.80%	2.08	3.80%	28.17	3.80%	19.97
Stage Three Growth	2050	3.80%	9.23	3.80%	2.42	3.80%	2.16	3.80%	29.24	3.80%	20.73
Stage Three Growth	2051	3.80%	9.58	3.80%	2.51	3.80%	2.24	3.80%	30.35	3.80%	21.52
Stage Three Growth	2052	3.80%	9.95	3.80%	2.61	3.80%	2.33	3.80%	31.50	3.80%	22.34
Stage Three Growth	2053	3.80%	10.32	3.80%	2.71	3.80%	2.41	3.80%	32.70	3.80%	23.18
Stage Three Growth	2054	3.80%	10.72	3.80%	2.81	3.80%	2.51	3.80%	33.94	3.80%	24.07
Stage Three Growth	2055	3.80%	11.12	3.80%	2.92	3.80%	2.60	3.80%	35.23	3.80%	24.98
Stage Three Growth	2056	3.80%	11.55	3.80%	3.03	3.80%	2.70	3.80%	36.57	3.80%	25.93
Stage Three Growth	2057	3.80%	11.99	3.80%	3.14	3.80%	2.80	3.80%	37.96	3.80%	26.91
Stage Three Growth	2058	3.80%	12.44	3.80%	3.26	3.80%	2.91	3.80%	39.40	3.80%	27.94
Stage Three Growth	2059	3.80%	12.91	3.80%	3.39	3.80%	3.02	3.80%	40.90	3.80%	29.00
Stage Three Growth	2060	3.80%	13.41	3.80%	3.52	3.80%	3.13	3.80%	42.45	3.80%	30.10
Stage Three Growth	2061	3.80%	13.91	3.80%	3.65	3.80%	3.25	3.80%	44.06	3.80%	31.24
Stage Three Growth	2062	3.80%	14.44	3.80%	3.79	3.80%	3.38	3.80%	45.74	3.80%	32.43
Stage Three Growth	2063	3.80%	14.99	3.80%	3.93	3.80%	3.51	3.80%	47.48	3.80%	33.66
Stage Three Growth	2064	3.80%	15.56	3.80%	4.08	3.80%	3.64	3.80%	49.28	3.80%	34.94
Stage Three Growth	2065	3.80%	16.15	3.80%	4.24	3.80%	3.78	3.80%	51.15	3.80%	36.27
Stage Three Growth	2066	3.80%	16.77	3.80%	4.40	3.80%	3.92	3.80%	53.10	3.80%	37.65
Stage Three Growth	2067	3.80%	17.40	3.80%	4.56	3.80%	4.07	3.80%	55.12	3.80%	39.08
Stage Three Growth	2068	3.80%	18.07	3.80%	4.74	3.80%	4.22	3.80%	57.21	3.80%	40.56
Stage Three Growth	2069	3.80%	18.75	3.80%	4.92	3.80%	4.38	3.80%	59.38	3.80%	42.11
Stage Three Growth	2070	3.80%	19.46	3.80%	5.11	3.80%	4.55	3.80%	61.64	3.80%	43.71
Stage Three Growth	2071	3.80%	20.20	3.80%	5.30	3.80%	4.72	3.80%	63.98	3.80%	45.37
Stage Three Growth	2072	3.80%	20.97	3.80%	5.50	3.80%	4.90	3.80%	66.41	3.80%	47.09
Stage Three Growth	2073	3.80%	21.77	3.80%	5.71	3.80%	5.09	3.80%	68.94	3.80%	48.88
Stage Three Growth	2074	3.80%	22.60	3.80%	5.93	3.80%	5.28	3.80%	71.56	3.80%	50.74
Stage Three Growth	2075	3.80%	23.45	3.80%	6.15	3.80%	5.48	3.80%	74.28	3.80%	52.67
Stage Three Growth	2076	3.80%	24.35	3.80%	6.39	3.80%	5.69	3.80%	77.10	3.80%	54.67
Stage Three Growth	2077	3.80%	25.27	3.80%	6.63	3.80%	5.91	3.80%	80.03	3.80%	56.75
Stage Three Growth	2078	3.80%	26.23	3.80%	6.88	3.80%	6.13	3.80%	83.07	3.80%	58.90

Stage Three Growth	2079	3.80%	27.23	3.80%	7.14	3.80%	6.37	3.80%	86.23	3.80%	61.14
Stage Three Growth	2080	3.80%	28.26	3.80%	7.41	3.80%	6.61	3.80%	89.50	3.80%	63.46
Stage Three Growth	2081	3.80%	29.34	3.80%	7.69	3.80%	6.86	3.80%	92.90	3.80%	65.87
Stage Three Growth	2082	3.80%	30.45	3.80%	7.99	3.80%	7.12	3.80%	96.44	3.80%	68.38
Stage Three Growth	2083	3.80%	31.61	3.80%	8.29	3.80%	7.39	3.80%	100.10	3.80%	70.98
Stage Three Growth	2084	3.80%	32.81	3.80%	8.61	3.80%	7.67	3.80%	103.90	3.80%	73.67
Stage Three Growth	2085	3.80%	34.06	3.80%	8.93	3.80%	7.96	3.80%	107.85	3.80%	76.47
Stage Three Growth	2086	3.80%	35.35	3.80%	9.27	3.80%	8.27	3.80%	111.95	3.80%	79.38
Stage Three Growth	2087	3.80%	36.69	3.80%	9.62	3.80%	8.58	3.80%	116.20	3.80%	82.40
Stage Three Growth	2088	3.80%	38.09	3.80%	9.99	3.80%	8.91	3.80%	120.62	3.80%	85.53
Stage Three Growth	2089	3.80%	39.54	3.80%	10.37	3.80%	9.24	3.80%	125.20	3.80%	88.78
Stage Three Growth	2090	3.80%	41.04	3.80%	10.76	3.80%	9.59	3.80%	129.96	3.80%	92.15
Stage Three Growth	2091	3.80%	42.60	3.80%	11.17	3.80%	9.96	3.80%	134.90	3.80%	95.65
Stage Three Growth	2092	3.80%	44.22	3.80%	11.60	3.80%	10.34	3.80%	140.03	3.80%	99.29
Stage Three Growth	2093	3.80%	45.90	3.80%	12.04	3.80%	10.73	3.80%	145.35	3.80%	103.06
Stage Three Growth	2094	3.80%	47.64	3.80%	12.50	3.80%	11.14	3.80%	150.87	3.80%	106.98
Stage Three Growth	2095	3.80%	49.45	3.80%	12.97	3.80%	11.56	3.80%	156.60	3.80%	111.04
Stage Three Growth	2096	3.80%	51.33	3.80%	13.46	3.80%	12.00	3.80%	162.55	3.80%	115.26
Stage Three Growth	2097	3.80%	53.28	3.80%	13.98	3.80%	12.46	3.80%	168.73	3.80%	119.64
Stage Three Growth	2098	3.80%	55.30	3.80%	14.51	3.80%	12.93	3.80%	175.14	3.80%	124.19
Stage Three Growth	2099	3.80%	57.41	3.80%	15.06	3.80%	13.42	3.80%	181.80	3.80%	128.90
Stage Three Growth	2100	3.80%	59.59	3.80%	15.63	3.80%	13.93	3.80%	188.71	3.80%	133.80
Stage Three Growth	2101	3.80%	61.85	3.80%	16.22	3.80%	14.46	3.80%	195.88	3.80%	138.89
Stage Three Growth	2102	3.80%	64.20	3.80%	16.84	3.80%	15.01	3.80%	203.32	3.80%	144.17
Stage Three Growth	2103	3.80%	66.64	3.80%	17.48	3.80%	15.58	3.80%	211.05	3.80%	149.64
Stage Three Growth	2104	3.80%	69.17	3.80%	18.14	3.80%	16.17	3.80%	219.07	3.80%	155.33
Stage Three Growth	2105	3.80%	71.80	3.80%	18.83	3.80%	16.79	3.80%	227.39	3.80%	161.23
Stage Three Growth	2106	3.80%	74.53	3.80%	19.55	3.80%	17.43	3.80%	236.03	3.80%	167.36
Stage Three Growth	2107	3.80%	77.36	3.80%	20.29	3.80%	18.09	3.80%	245.00	3.80%	173.72
Stage Three Growth	2108	3.80%	80.30	3.80%	21.06	3.80%	18.78	3.80%	254.31	3.80%	180.32
Stage Three Growth	2109	3.80%	83.35	3.80%	21.86	3.80%	19.49	3.80%	263.98	3.80%	187.17
Stage Three Growth	2110	3.80%	86.52	3.80%	22.69	3.80%	20.23	3.80%	274.01	3.80%	194.29
Stage Three Growth	2111	3.80%	89.81	3.80%	23.56	3.80%	21.00	3.80%	284.42	3.80%	201.67
Stage Three Growth	2112	3.80%	93.22	3.80%	24.45	3.80%	21.80	3.80%	295.23	3.80%	209.33

Stage Three Growth	2113	3.80%	96.77	3.80%	25.38	3.80%	22.62	3.80%	306.45	3.80%	217.29
Stage Three Growth	2114	3.80%	100.44	3.80%	26.35	3.80%	23.48	3.80%	318.09	3.80%	225.54
Stage Three Growth	2115	3.80%	104.26	3.80%	27.35	3.80%	24.38	3.80%	330.18	3.80%	234.11
Stage Three Growth	2116	3.80%	108.22	3.80%	28.39	3.80%	25.30	3.80%	342.72	3.80%	243.01
Stage Three Growth	2117	3.80%	112.33	3.80%	29.47	3.80%	26.26	3.80%	355.75	3.80%	252.24
Stage Three Growth	2118	3.80%	116.60	3.80%	30.58	3.80%	27.26	3.80%	369.27	3.80%	261.83
Stage Three Growth	2119	3.80%	121.03	3.80%	31.75	3.80%	28.30	3.80%	383.30	3.80%	271.78
Stage Three Growth	2120	3.80%	125.63	3.80%	32.95	3.80%	29.37	3.80%	397.86	3.80%	282.11
Stage Three Growth	2121	3.80%	130.41	3.80%	34.21	3.80%	30.49	3.80%	412.98	3.80%	292.83
Stage Three Growth	2122	3.80%	135.36	3.80%	35.51	3.80%	31.65	3.80%	428.68	3.80%	303.95
Stage Three Growth	2123	3.80%	140.51	3.80%	36.85	3.80%	32.85	3.80%	444.97	3.80%	315.50
Stage Three Growth	2124	3.80%	145.84	3.80%	38.26	3.80%	34.10	3.80%	461.87	3.80%	327.49
Stage Three Growth	2125	3.80%	151.39	3.80%	39.71	3.80%	35.39	3.80%	479.43	3.80%	339.94
Stage Three Growth	2126	3.80%	157.14	3.80%	41.22	3.80%	36.74	3.80%	497.64	3.80%	352.86
Stage Three Growth	2127	3.80%	163.11	3.80%	42.78	3.80%	38.14	3.80%	516.55	3.80%	366.27
Stage Three Growth	2128	3.80%	169.31	3.80%	44.41	3.80%	39.59	3.80%	536.18	3.80%	380.18
Stage Three Growth	2129	3.80%	175.74	3.80%	46.10	3.80%	41.09	3.80%	556.56	3.80%	394.63
Stage Three Growth	2130	3.80%	182.42	3.80%	47.85	3.80%	42.65	3.80%	577.71	3.80%	409.63
Stage Three Growth	2131	3.80%	189.35	3.80%	49.67	3.80%	44.27	3.80%	599.66	3.80%	425.19
Stage Three Growth	2132	3.80%	196.55	3.80%	51.55	3.80%	45.95	3.80%	622.45	3.80%	441.35
Stage Three Growth	2133	3.80%	204.02	3.80%	53.51	3.80%	47.70	3.80%	646.10	3.80%	458.12
Stage Three Growth	2134	3.80%	211.77	3.80%	55.55	3.80%	49.51	3.80%	670.65	3.80%	475.53
Stage Three Growth	2135	3.80%	219.82	3.80%	57.66	3.80%	51.39	3.80%	696.14	3.80%	493.60
Stage Three Growth	2136	3.80%	228.17	3.80%	59.85	3.80%	53.35	3.80%	722.59	3.80%	512.36
Stage Three Growth	2137	3.80%	236.84	3.80%	62.12	3.80%	55.37	3.80%	750.05	3.80%	531.83
Stage Three Growth	2138	3.80%	245.84	3.80%	64.48	3.80%	57.48	3.80%	778.55	3.80%	552.04
Stage Three Growth	2139	3.80%	255.18	3.80%	66.93	3.80%	59.66	3.80%	808.14	3.80%	573.01
Stage Three Growth	2140	3.80%	264.88	3.80%	69.48	3.80%	61.93	3.80%	838.84	3.80%	594.79
Implied Cost of Equity			**6.91%**		**4.34%**		**6.00%**		**7.87%**		**7.05%**

Mean	6.43%
Median	6.91%
Selected Three-Stage DGM Cost of Equity	**6.67%**

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Canadian National Railway	19.0
CPKC	21.2
CSX Corporation	18.0
Norfolk Southern Corp	17.1
Union Pacific Corp	20.0
Mean	19.06
Median	19.00
Selected Price to Earnings (P/E) Ratio	19.06
Indicated Equity Component of the Direct Rate	**5.25%**

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
Canadian National Railway	0.90
CPKC	0.95
CSX Corporation	1.00
Norfolk Southern Corp	1.05
Union Pacific Corp	1.00
Beta Mean	0.98
Beta Median	1.00
Unlevered Relevered Beta Mean^	0.98
Indicated Beta	**1.00**

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	21.00%	16.85%	83.15%	0.90	0.78
CPKC	23.00%	15.95%	84.05%	0.95	0.83
CSX Corporation	24.00%	22.37%	77.63%	1.00	0.82
Norfolk Southern Corp	24.00%	22.91%	77.09%	1.05	0.86
Union Pacific Corp	23.50%	17.59%	82.41%	1.00	0.86
			Average	**0.98**	

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	23.10%	19.00%	81.00%	0.92
CPKC	23.10%	19.00%	81.00%	0.98
CSX Corporation	23.10%	19.00%	81.00%	0.97
Norfolk Southern Corp	23.10%	19.00%	81.00%	1.02
Union Pacific Corp	23.10%	19.00%	81.00%	1.02
			Average	**0.98**

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, 2024 calendar year information for the January 2, 2025 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*	67,910,400,000	14,630,445,000	4.64	Canadian National Railway. 2024 Annual Report, p. 39
CPKC**	72,903,568,733	33,978,550,000	2.15	CPKC. 2024 10-K, p. 66
CSX Corporation	64,332,062,944	12,507,000,000	5.14	CSX Corporation. 2024 10-K, p. 66
Norfolk Southern Corp	56,014,677,915	14,306,000,000	3.92	Norfolk Southern. 2024 10-K, p. K48
Union Pacific Corp	139,384,461,114	16,890,000,000	8.25	Union Pacific Corporation. 2024 10-K, p. 42
		Average	**4.82**	

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	19,688,000,000	20,887,000,000	0.94	Canadian National Railway. 2024 Annual Report, p. 51
CPKC	18,911,000,000	20,749,000,000	0.91	CPKC. 2024 10-K, p. 66
CSX Corporation	16,481,000,000	18,503,000,000	0.89	CSX Corporation. 2024 10-K, p. 121
Norfolk Southern Corp	15,656,000,000	17,206,000,000	0.91	Norfolk Southern. 2024 10-K, p. K59
Union Pacific Corp	25,300,000,000	31,200,000,000	0.81	Union Pacific Corporation. 2024 10-K, p. 63
		Average	**0.89**	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	81.00%	4.82	3.90
Long-term Debt	19.00%	0.89	0.17
			4.07

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.

21,051,000,000	CAD
0.695	Exchange Rate
14,630,445,000	USD

**Convert CPKC'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.

48,890,000,000	CAD
0.695	Exchange Rate
33,978,550,000	USD

Appendix F - Three Stage Ex Ante Calculation

Three Stage Ex Ante Equity Risk Premium Calculation

Implied Market Rate Range =	**6.43%**	**to**	**7.90%**

Mean	7.17%
Median	7.17%
Market Rate Used	**7.90%**
(Less) Risk-Free Rate	4.86%
Equals Equity Risk Premium	**3.04%**

Assumptions:

Stages	**Years**		**Growth**	**Model 1**					**Model 2**			
1st Stage	1-5 years		Constant @:	15.29%			*		11.96%			*
												Linear
2nd Stage	6-15 years		Linear from:	14.35%	to	4.96%		OR	11.24%	to	4.04%	*from*
				Real Growth**					Inflation^			*1st*
3rd Stage	15 years -perpetuity	GDP Growth:	Real and Inflation	1.70%		2.50%		+	2.34%	to	2.46%	*Stage*
												to 3rd
		GDP Growth^^:	Real + Inflation	4.96%				TO	4.04%			*Stage*

	Model 1	Model 2
Implied Market Return	7.90%	6.43%

Year	Model 1				Model 2			
	Starting Industry			S & P 500	Starting Industry			S & P 500
2025	Start Price†		$	(5,868.55)	Start Price†		$	(5,868.55)
2026	Expected Dividends††		$	78.10	Expected Dividends††		$	78.10
2027	1st Stage Growth Rates	15.29%	$	90.04	1st Stage Growth Rates	11.96%	$	87.44
2028		15.29%	$	103.81		11.96%	$	97.90
2029		15.29%	$	119.68		11.96%	$	109.61
2030		15.29%	$	137.98		11.96%	$	122.72
2031		15.29%	$	159.08		11.96%	$	137.39
2032	2nd Stage Growth Rates	14.35%	$	181.91	2nd Stage Growth Rates	11.24%	$	152.84
2033		13.41%	$	206.30		10.52%	$	168.91
2034		12.47%	$	232.04		9.80%	$	185.47
2035		11.53%	$	258.80		9.08%	$	202.31
2036		10.59%	$	286.22		8.36%	$	219.22
2037		9.66%	$	313.85		7.64%	$	235.97
2038		8.72%	$	341.21		6.92%	$	252.30
2039		7.78%	$	367.74		6.20%	$	267.94
2040		6.84%	$	392.89		5.48%	$	282.63
2041		5.90%	$	416.07		4.76%	$	296.08
2042		4.96%	$	440.61		4.04%	$	310.17
2043		4.96%	$	462.47		4.04%	$	322.70
2044		4.96%	$	485.41		4.04%	$	335.74
2045		4.96%	$	509.48		4.04%	$	349.30
2046		4.96%	$	534.75		4.04%	$	363.42
2047		4.96%	$	561.28		4.04%	$	378.10
2048		4.96%	$	589.12		4.04%	$	393.37
2049		4.96%	$	618.34		4.04%	$	409.26
2050		4.96%	$	649.00		4.04%	$	425.80
2051		4.96%	$	681.20		4.04%	$	443.00
2052		4.96%	$	714.98		4.04%	$	460.90
2053		4.96%	$	750.45		4.04%	$	479.52
2054		4.96%	$	787.67		4.04%	$	498.89
2055		4.96%	$	826.74		4.04%	$	519.05
2056		4.96%	$	867.74		4.04%	$	540.02
2057		4.96%	$	910.78		4.04%	$	561.83
2058		4.96%	$	955.96		4.04%	$	584.53
2059		4.96%	$	1,003.37		4.04%	$	608.15
2060		4.96%	$	1,053.14		4.04%	$	632.72
2061		4.96%	$	1,105.38		4.04%	$	658.28
2062		4.96%	$	1,160.20		4.04%	$	684.87
2063		4.96%	$	1,217.75		4.04%	$	712.54
2064		4.96%	$	1,278.15		4.04%	$	741.33
2065		4.96%	$	1,341.54		4.04%	$	771.28
2066		4.96%	$	1,408.09		4.04%	$	802.44
2067		4.96%	$	1,477.93		4.04%	$	834.85
2068		4.96%	$	1,551.23		4.04%	$	868.58
2069		4.96%	$	1,628.17		4.04%	$	903.67
2070		4.96%	$	1,708.93		4.04%	$	940.18
2071		4.96%	$	1,793.69		4.04%	$	978.16
2072		4.96%	$	1,882.66		4.04%	$	1,017.68
2073		4.96%	$	1,976.04		4.04%	$	1,058.80
2074		4.96%	$	2,074.05		4.04%	$	1,101.57
2075		4.96%	$	2,176.92		4.04%	$	1,146.08
2076		4.96%	$	2,284.90		4.04%	$	1,192.38

2077		4.96%	$	2,398.23		4.04%	$	1,240.55
2078		4.96%	$	2,517.18		4.04%	$	1,290.67
2079		4.96%	$	2,642.04		4.04%	$	1,342.81
2080		4.96%	$	2,773.08		4.04%	$	1,397.06
2081		4.96%	$	2,910.63		4.04%	$	1,453.50
2082		4.96%	$	3,054.99		4.04%	$	1,512.22
2083		4.96%	$	3,206.52		4.04%	$	1,573.32
2084		4.96%	$	3,365.56		4.04%	$	1,636.88
2085		4.96%	$	3,532.50		4.04%	$	1,703.01
2086		4.96%	$	3,707.71		4.04%	$	1,771.81
2087		4.96%	$	3,891.61		4.04%	$	1,843.39
2088		4.96%	$	4,084.63		4.04%	$	1,917.86
2089		4.96%	$	4,287.23		4.04%	$	1,995.35
2090		4.96%	$	4,499.88		4.04%	$	2,075.96
2091	3rd Stage Growth Rates	4.96%	$	4,723.07	3rd Stage Growth Rates	4.04%	$	2,159.83
2092		4.96%	$	4,957.34		4.04%	$	2,247.08
2093		4.96%	$	5,203.22		4.04%	$	2,337.87
2094		4.96%	$	5,461.30		4.04%	$	2,432.32
2095		4.96%	$	5,732.18		4.04%	$	2,530.58
2096		4.96%	$	6,016.50		4.04%	$	2,632.82
2097		4.96%	$	6,314.91		4.04%	$	2,739.18
2098		4.96%	$	6,628.13		4.04%	$	2,849.85
2099		4.96%	$	6,956.89		4.04%	$	2,964.98
2100		4.96%	$	7,301.95		4.04%	$	3,084.76
2101		4.96%	$	7,664.13		4.04%	$	3,209.39
2102		4.96%	$	8,044.27		4.04%	$	3,339.05
2103		4.96%	$	8,443.26		4.04%	$	3,473.95
2104		4.96%	$	8,862.05		4.04%	$	3,614.29
2105		4.96%	$	9,301.61		4.04%	$	3,760.31
2106		4.96%	$	9,762.97		4.04%	$	3,912.23
2107		4.96%	$	10,247.21		4.04%	$	4,070.28
2108		4.96%	$	10,755.47		4.04%	$	4,234.72
2109		4.96%	$	11,288.94		4.04%	$	4,405.80
2110		4.96%	$	11,848.88		4.04%	$	4,583.80
2111		4.96%	$	12,436.58		4.04%	$	4,768.98
2112		4.96%	$	13,053.43		4.04%	$	4,961.65
2113		4.96%	$	13,700.89		4.04%	$	5,162.10
2114		4.96%	$	14,380.45		4.04%	$	5,370.65
2115		4.96%	$	15,093.72		4.04%	$	5,587.62
2116		4.96%	$	15,842.37		4.04%	$	5,813.36
2117		4.96%	$	16,628.15		4.04%	$	6,048.22
2118		4.96%	$	17,452.91		4.04%	$	6,292.57
2119		4.96%	$	18,318.57		4.04%	$	6,546.79
2120		4.96%	$	19,227.17		4.04%	$	6,811.28
2121		4.96%	$	20,180.84		4.04%	$	7,086.46
2122		4.96%	$	21,181.81		4.04%	$	7,372.75
2123		4.96%	$	22,232.43		4.04%	$	7,670.61
2124		4.96%	$	23,335.15		4.04%	$	7,980.50
2125		4.96%	$	24,492.58		4.04%	$	8,302.91
2126		4.96%	$	25,707.41		4.04%	$	8,638.35
2127		4.96%	$	26,982.50		4.04%	$	8,987.34
2128		4.96%	$	28,320.83		4.04%	$	9,350.43
2129		4.96%	$	29,725.54		4.04%	$	9,728.19
2130		4.96%	$	31,199.93		4.04%	$	10,121.21
2131		4.96%	$	32,747.44		4.04%	$	10,530.10
2132		4.96%	$	34,371.72		4.04%	$	10,955.52
2133		4.96%	$	36,076.56		4.04%	$	11,398.12
2134		4.96%	$	37,865.95		4.04%	$	11,858.61
2135		4.96%	$	39,744.10		4.04%	$	12,337.69
2136		4.96%	$	41,715.41		4.04%	$	12,836.14
2137		4.96%	$	43,784.50		4.04%	$	13,354.72
2138		4.96%	$	45,956.21		4.04%	$	13,894.25
2139		4.96%	$	48,235.63		4.04%	$	14,455.58
2140		4.96%	$	50,628.12		4.04%	$	15,039.58
2141		Reversion``	$	144.55		Reversion``	$	240.20
	Implied Market Return			**7.90%**	**Implied Market Return**			**6.43%**

*S&P 500 Earnings and Estimate Report dated 2/28/2025, http://us.spindices.com/indices/equity/sp-500

**First Quarter 2024 Survey of Professional Forecasters - Philadelphia Federal Reserve Release Date 2/28/2025

^Inflation Range = Federal Reserve, Treasuries Inflation - Indexed

^^GDP Growth = Real growth + Inflation

† Start Price is the S&P 500 Index adjusted close on 1/3/2025, downloaded from Yahoo! Finance

††Expected Dividends downloaded from http://www.cmegroup.com/trading/equity-index/us-index/sp-500-quarterly-dividend-index.html, 3/6/2025

``Reversion Calculation:

A.	Last period's expected dividends, growth applied	53,139.28	15,647.18
B.	Implied Market Risk Premium Less Long-Term Growth	5.40%	4.73%
C.	A / B	983,218.6	330,860.7
D.	C / ((1 + Implied Market Risk Premium) ^ Last Period +1)	144.55	240.20

Appendix G – Guideline Company Selection

Section Contents

Note: This information is verbatim from Value Line and the company’s website.

Market Segment: Electric

Companies Included in the Electric Market Segment

Alliant Energy Corp.

Company Summary from Value Line:

Alliant Energy Corporation is the parent company of Interstate Power and Light Company (IPL) and Wisconsin Power and Light Company (WPL). Together, the utility subsidiaries serve approximately one million electric and 425,000 natural gas customers in Wisconsin and Iowa. 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 revenues. ’23 reported depreciation rates: 2.9%-6.1%. Has 3,300 employees.

Additional Company Information from Website:

Alliant Energy Corporation (NASDAQ: LNT) provides regulated energy service to approximately 1 million electric and 425,000 natural gas retail customers across Iowa and Wisconsin. We have two public energy companies that are principally engaged in the generation and distribution of electricity to retail electric customers, along with the distribution and transportation of natural gas to customers in primarily rural communities. Interstate Power and Light Company (IPL): Provides electricity to approximately 500,000 retail electric customers in Iowa. Transports natural gas to approximately 225,000 customers in Iowa. Regulated by the Iowa Utilities Commission (IUC). Provides utility services to incorporated communities and utilize nonexclusive franchises that cover the use of public rights-of-way for utility facilities in incorporated communities for a maximum term of 25 years. Sells electricity to wholesale customers in Minnesota, Illinois and Iowa. Wisconsin Power and Light Company (WPL): Provides electricity to approximately 500,000 electric retail customers in Wisconsin. Transports natural gas to about 200,000 natural gas retail customers in Wisconsin. Regulated by the Public Service Commission of Wisconsin (PSC). Operates in municipalities pursuant to permits of indefinite duration and state statutes authorizing utility operation in areas annexed by a municipality. Sells electricity to wholesale customers in Wisconsin.[1]

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

[1] https://www.alliantenergy.com/aboutus/whoweare/whoweare, accessed 12/23/2024

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 and other, 9%; purchased, 7%. Fuel costs: 25% of revenues. Has approximately 9,250 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 approximately 10,000 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.[2]

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 customers in Arkansas, Kentucky, Indiana, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia, and 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. ’23 reported depreciation rates (utility): 2.6%-12.5%. Has approximately 16,700 employees.

Additional Company Information from Website:
At AEP, we understand and appreciate the vital role we play in delivering power to people across the country every day. Our vision and core principles are not just words; they serve as the guideposts for our company as we strive to meet our customers' expectations. We're one of the largest electric companies in the country, powering millions of homes and businesses daily. Our customers depend on us to provide reliable energy, and we're committed to going above and beyond their expectations to create an energy future we can all be proud of. We're passionate about our customers and communities, and to doing everything in our power to develop innovative and clean energy solutions

[2] https://www.ameren.com/company/about-ameren, accessed 12/23/2024

for a changing world. We serve nearly 5.6 million customers in our regulated service territory, spanning more than 200,000 square miles in 11 states. Maintaining the nation's largest electricity transmission system and more than 225,000 miles of distribution lines, we deliver safe, reliable power to customers in Arkansas, Indiana, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia and West Virginia, doing everything in our power to develop innovative and clean energy solutions for a changing world.[3]

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 222,340 electric customers in CO, SD, WY and MT, and 1.12 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 and oil E&P in '17. Electric rev. breakdown: residential, 34%; commercial, 39%; industrial, 24%; other, 3%. Generating sources: coal, 35%; gas, 26%; wind, 9%; purchased, 30%. Fuel costs: 38% of revs. '23 deprec. rate: 2.9%-3.5%. Has 2,874 employees.

Additional Company Information from Website:
Black Hills Corp. (NYSE: BKH) 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, we serve over 1.3 million natural gas and electric utility customers in eight states: Arkansas, Colorado, Iowa, Kansas, Montana, Nebraska, South Dakota and Wyoming.[4]

Why was the company included?
Black Hills Corporation provides electric and gas to customers. Electric customers represent 17% of customers and gas customers represent 83% 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.

We are 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.

CenterPoint Energy Inc.
Company Summary from Value Line:
CenterPoint Energy, Inc. is a holding company for Houston Electric, which serves over 2.76 million customers in Houston and environs. Indiana Electric, which serves approximately 152,000 customers, and gas utilities with 4.31 million customers in Texas, Minnesota, Louisiana, Mississippi, Indiana, and

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[3] https://www.aep.com/about/, accessed 12/23/2024
[4] https://www.blackhillscorp.com/about, accessed 12/23/2024

Ohio. Acquired Vectren 2/19. Sold nonutility operations in ’20. Sold its stake in Energy Transfer LP in ’22 and ’23. Electric revenue breakdown not available. Fuel costs: 25% of total revenues. Has 8,827 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 approximately 4 million homes and businesses in six states: Indiana, Louisiana, Minnesota (including Minneapolis), Mississippi, Ohio, 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 2.9 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 the greater Houston area) to offer our customers service repair plans that help reduce the stress and expense from the unexpected.[5]

Why was the company included?
CenterPoint Energy Inc. provides electricity and gas to customers. Electric customers represent 40% of customers and gas customers represent 60% 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 2,016 megawatts of nonregulated generating capacity. Sold EnerBank in ’21. Electric revenue breakdown: residential, 47%; commercial, 33%; industrial, 14%; other, 6%. Generating sources: coal, 20%; gas, 33%; renewables, 6%; purchased, 43%. Fuel costs: 37% of revenues. ’23 depreciation rates: 3.8% electric, 2.8% gas, 7.8% other. Has 8,350 full-time employees.

Additional Company Information from Website:
CMS Energy’s primary business is Consumers Energy, providing natural gas and electricity to 6.8 million

[5] https://www.centerpointenergy.com/en-us/corporate/about-us/company-overview, accessed on 12/23/2024

of the state's 10 million residents in all 68 Lower Peninsula counties. Consumers Energy is committed to serving our customers, and making Michigan a great place to live and work. Consumers Energy's Electric Business: Consumers Energy provides electric service to 1.8 million customers in 62 of Michigan's Lower Peninsula counties. Among the largest cities served are Battle Creek, Bay City, Cadillac, Flint, Grand Rapids, Jackson, Kalamazoo, Midland, Muskegon and Saginaw. In 2019, we launched our Clean Energy Plan, a 20-year strategy to safeguard Michigan's environment while supplying more clean energy to our homes and businesses. We plan to achieve net zero carbon emissions, end coal use and dramatically increase clean energy resources by 2040. Consumers Energy's Natural Gas Business: Consumers Energy provides natural gas service for heating and other uses to nearly 1.8 million customers in 54 of the 68 counties in Michigan's Lower Peninsula. It serves an area that spans 13,000 square miles and includes 215 cities and villages. Among the largest areas served are Bay City, Flint, Jackson, Kalamazoo, Lansing, Macomb, Midland, Royal Oak, Saginaw and Livonia. More than one-half of the utility's gas customers are in metro Detroit. The company has one of the largest underground natural gas storage capacities in the country. This allows the company to economically purchase and store gas during warm months, for eventual use in the winter heating season.[6]

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. '23 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 company serving 2.3 million customers in Southeast 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

[6] https://www.cmsenergy.com/about-cms-energy/default.aspx, accessed 12/23/2024

economic progress. Information about DTE Energy is available on the DTE Energy home page, X 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. DTE Electric generates, transmits and distributes electricity to 2.3 million customers in southeastern Michigan. With an 11,084 megawatt system capacity, the company uses coal, nuclear fuel, natural gas, hydroelectric pumped storage and renewable sources to generate its electrical output. Founded in 1903, DTE Electric is the largest electric utility in Michigan and one of the largest in the nation. At 1.1 million kilowatts, the company's Fermi 2 nuclear power plant represents 30% of Michigan's total nuclear generation capacity. This single plant can produce enough electricity to serve a city of about one million people. Fermi 2 has been providing reliable, cost-effective power to DTE Electric customers for more than 20 years. The plant also has been designated as one of the nation's best-performing nuclear facilities. DTE Gas is engaged in the purchase, storage, transmission, distribution and sale of natural gas to approximately 1.3 million customers in Michigan. The company owns and operates 278 storage wells representing approximately 34 percent of the underground working capacity in Michigan. There is more gas storage capacity in Michigan than in any other state. Founded in 1849, DTE Gas is one of the nation's largest natural gas utilities.[7]

Why was the company included?
DTE Energy Company provides electricity and gas to customers. Electric customers represent 63% of 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, 32%; commercial, 27%; industrial, 15%; wholesale, 13%; other, 13%. Generating sources: coal, 54%; nuclear, 17%; purchased, 29%. Fuel costs: 28% of revenues. ’23 reported deprec. rate: 3%. Has 4,900 employees.

Additional Company Information from Website:
Evergy, Inc. (NASDAQ: EVRG), through its operating subsidiaries Evergy Kansas Central, Evergy Metro, and Evergy Missouri West, provides clean, safe and 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

[7] https://newlook.dteenergy.com/wps/wcm/connect/dte-web/home/about-dte/common/about-dte/about-dte, accessed 12/23/2024

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.[8]

Why was the company included?
Evergy, Inc. was created through the merger of Great Plains Energy Incorporated and Westar Energy, Inc. in 2018. This company is 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.

MGE Energy, Inc.
Company Summary from Value Line:
MGE Energy, Inc. is a holding company for Madison Gas and Electric Company (MGE), which provides electric service to 163,000 customers in Dane County and gas service to 176,000 customers in seven counties in Wisconsin. Electric revenue breakdown: residential, 36%; commercial, 53%; industrial, 3%; other, 8%. Generating sources: coal, 40%; gas, 17%; renewables, 21%; purchased power, 22%. Fuel costs: 30% of revenues. ’23 reported depreciation rates: electric, 3.8%; gas, 2.1%; nonregulated, 2.3%. Has about 700 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 48 consecutive years and have paid dividends for more than 110 years. MGE Energy is the parent company of:

- 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.[9]

Why was the company 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 we are responsible for valuing. The company serves an electric service territory in the Midwest.

[8] https://investors.evergy.com/about-evergy/company-information, accessed 12/23/2024
[9] https://www.mgeenergy.com/en/about/about-mge-energy/, accessed 12/24/2024

We are also using this company as a guideline company for the Gas Distribution Market Segment because approximately 51% of their customers are gas distribution customers.

NorthWestern Corporation

Company Summary from Value Line:

NorthWestern Energy Group, Inc. supplies electricity and gas in the Upper Midwest and Northwest, serving 467,700 electric customers in Montana and South Dakota and 307,600 gas customers in Montana, South Dakota, and Nebraska. Electric revenue breakdown for 2023: residential, 44%; commercial, 50%; industrial, 4%; and other, 2%. Generating sources: coal, 18%; hydro, 37%; wind, 4%; natural gas, 12%; purchased power, 29%. Fuel costs: 30% of revenues. 2023 reported depreciation rate: 2.8%. Had 1,573 employees as of 12/31/23.

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 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. [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. ’23 reported depreciation rate (utility): 2.6%. Has 2,200 employees.

Additional Company Information from Website:

We not only serve nearly 900,000 electric customers, we also power communities in other ways. We’re the largest ad valorem taxpayer in Oklahoma, contributing approximately $90 million annually, which funds public education, libraries and career techs. Our employees also generously give their time and money to support their communities. With about 7,116 megawatts of capacity, our generation portfolio represents a balanced approach to generating electricity through a diversity of fuel types—67 percent natural gas, 22 percent coal and 7 percent renewable energy (solar and wind). This fuel diversity allows

[10] https://www.northwesternenergy.com/about-us/our-company, accessed 12/24/2024

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%). Electric rev. breakdown: residential, 32%; commercial and farms, 36%; industrial, 30%; other, 2%. Generating sources: coal, 38%; wind and other, 18%; purchased, 44%. Fuel costs: 10% of revenues. Also has operations in manufacturing and plastics (67% of ’23 operating income). ’23 deprec. rate: 3.0%. 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 65% of our overall earnings. We expect our manufacturing and plastic pipe businesses will provide 35% 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

[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 12/24/2024

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 and steam service in WI and gas service in IL, MN, and MI. Customers: 1.6 mill. elec., 2.9 mill. gas. Acq'd Integrys Energy 6/15. Electric revenue breakdown: residential, 39%; small commercial and industrial, 32%; large commercial and industrial, 21%; other, 8%. Generating sources: coal, 36%; gas, 28%; renewables, 5%; purchased, 31%. Fuel costs: 40% of revenues. '23 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 4.7 million customers in Wisconsin, Illinois, Michigan and Minnesota. Our combined assets allow operating efficiencies across 72,000 miles of electric distribution lines, 46,400 miles of natural gas distribution and transmission lines, and 8,300 megawatts of reliable power 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. Principal energy companies. We Energies delivers electricity and natural gas to more than 2.3 million customers in Wisconsin. Wisconsin Public Service delivers electricity and natural gas to more than 809,000 customers in Wisconsin. Peoples Gas delivers natural gas to approximately 891,000 customers in the city of Chicago. North Shore Gas delivers natural gas to approximately 165,000 customers in Chicago's northern suburbs. Minnesota Energy Resources delivers natural gas to approximately 251,000 customers in Minnesota. Michigan Gas Utilities delivers natural gas to approximately 185,000 customers in Michigan. Upper Michigan Energy Resources delivers electricity and natural gas to more than 42,000 customers in Michigan's Upper Peninsula.
Bluewater Gas Storage provides natural gas storage and hub services to 1.5 million natural gas customers of We Energies and Wisconsin Public Service.[13]

Why was the company included?

[12] https://www.ottertail.com/investors/corporate-profile/default.aspx, accessed 12/24/2024
[13] https://www.wecenergygroup.com/about/aboutus.htm, accessed 12/24/2024

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 64% 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 Company (NSP), which supplies electricity to MN, WI, ND, SD, and MI and gas to MN, WI, ND, and MI; Public Service Company of Colorado (PSCo), which supplies electricity and gas to CO; and Southwestern Public Service Company (SPS), which supplies electricity to TX and NM. Customers: 3.8 mill. electric, 2.2 mill. gas. Electric revenues: resid'l, 31%; comm'l and ind'l, 50%; other, 19%. Purchases 34% of power, owns 66%. Total electric mix: wind, 29%; gas, 23%; coal, 13%, nuclear, 24%, solar/other, 11%. Fuel cost: 40% of revenues. '23 deprec. rate: 3.6%. Employs 11,311.

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 millions of electricity and natural gas customers through its regulated operating companies. Northern States Power Company - Minnesota (NSPM) Electric and natural gas utility serving Minnesota, North Dakota, and South Dakota. Northern States Power Company - Wisconsin (NSPW) Electric and natural gas utility serving Wisconsin and Michigan. Public Service Company of Colorado (PSCo) Electric and natural gas utility serving Colorado. Southwestern Public Service Company (SPS) Electric utility serving Texas and New Mexico.[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.

[14] https://investors.xcelenergy.com/corporate-information/corporate-profile/default.aspx, accessed 12/24/2024

Companies Not 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, and Superior Water, Light & Power in northwestern WI. Electric rev. breakdown: taconite mining/processing, 26%; wholesale, 14%; residential, 13%; commercial, 13%; paper/wood products, 9%; other industrial, 8%; other, 17%. 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. '23 deprec. rate: 3.1%. 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 150,000 residents, 14 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; BNI Energy in North Dakota; Superior Water, Light and Power in Superior, Wisconsin; 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.[15]

Additional Information to Consider

On December 26, 2024, FERC approved ALLETE Inc.'s acquisition by a partnership between Canada Pension Plan (CPP) Investments and Global Infrastructure Partners (GIP). Under the transaction announced May 6, the CPP Investments-GIP partnership will acquire the publicly issued shares of Duluth, Minnesota-based ALLETE for $67 a unit in cash. Inclusive of ALLETE's debt, the transaction has a total value of $6.2 billion. ALLETE maintained it expected the transaction to close mid-2025. The deal still awaits other regulatory approvals and other customary closing conditions.

Why was the company not included?

ALLETE Inc. is the parent company of Minnesota Power, which supplies electricity to customers. ALLETE was not included due to being acquired by Canada Pension Plan (CPP) and Investments and Global Infrastructure Partners (GIP). The acquisition is expected to close in 2025, and the company will be privately held.

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 1.0 million gas customers in New York, Connecticut, Massachusetts, and Maine. Has a nonregulated generating subsidiary focused on wind and solar power generation, with 9.3 GW of capacity and 1.3 GW under construction. Renewables

[15] http://www.allete.com/OurBusinesses, accessed 12/23/2024

segment accounted for about 22% of net profits for trailing 12 months. Power/fuel costs: 29% of rev. '23 reported deprec. rate: 2.5%. Iberdrola owns 81.6% of stock. Employs about 8,000.

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 $44 billion in assets. We have two primary lines of business: networks and renewables. Through our networks business, we own and operate eight electric and natural gas utilities, serving more than 3.3 million customers in New York and New England. Through our renewables business, we own and operate a portfolio of renewable energy generation facilities across the United States. With more than 8,000 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 for four consecutive years 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 six consecutive years by the Ethisphere Institute.[16]

Merger with Iberdrola
Iberdrola has completed its merger with U.S. subsidiary Avangrid, acquiring the remaining 18.4% of shares it did not previously own. Shareholders will receive $35.75 per share, and Avangrid will be delisted from the New York Stock Exchange. The deal received approval from the Federal Energy Regulatory Commission (FERC), as well as regulators in Maine and New York. With the transaction finalized, Avangrid will operate as a private company, retaining its headquarters in Connecticut. Shareholders who held stock as of December 2, 2024, will receive a proportional quarterly dividend, set to be paid on January 2, 2025. This merger positions Iberdrola to enhance its investments in the United States, particularly in energy infrastructure and renewable energy projects. These initiatives aim to bolster the resilience and reliability of the power grid while generating significant local economic benefits, including the creation of hundreds of jobs. Avangrid plays a pivotal role in Iberdrola's U.S. strategy. With $46 billion in assets, the company distributes electricity to approximately seven million people across New York, Connecticut, Maine, and Massachusetts. Its renewable energy portfolio spans 8,700 MW across 24 states, supported by a workforce of 8,000 employees. This merger marks a key milestone in Iberdrola's two-decade presence in the U.S., enabling greater efficiency and growth in one of the world's most dynamic energy markets. Iberdrola's move aligns with broader trends in the global energy sector, where companies are consolidating operations to streamline investments in renewables and grid modernization. Avangrid's focus on renewable capacity and infrastructure positions it as a crucial player in the US energy transition, catering to increasing demands from utilities and data centers.[17]

Avangrid PNM Merger Agreement Terminated
PNM Resources (NYSE: PNM) announces the termination of its merger agreement with Avangrid. While the PNM Resources Board of Directors approved an extension, it was not accepted by Avangrid and

[16] https://www.avangrid.com/wps/portal/avangrid/aboutus, accessed on 12/24/2024
[17] https://www.4coffshore.com/news/iberdrola-finalises-avangrid-merger2c-strengthening-u.s.-operations-nid30674.html accessed 12/24/2024

Avangrid terminated the merger. “We are greatly disappointed with Avangrid’s decision to terminate the merger agreement and its proposed benefits to our customers, communities and shareholders,” said Pat Vincent-Collawn, PNM Resources Chairman and CEO. “As we move forward, our strategic plans remain focused on the infrastructure investments necessary to meet the future energy needs of our customers and communities. We look to build upon our strong track record of delivering financial results and continue to target long-term earnings growth of 5%.” The companies’ merger agreement, announced in October 2020, had been extended through December 31, 2023, while awaiting a decision from the New Mexico Supreme Court on the January 2022 appeal of the New Mexico Public Regulation Commission decision denying the transaction. All other federal and state approvals had been received in 2021.[18]

Why was the company not included?
Avangrid was in the Electric Utility (East) Value Line Industry. The company recently terminated a merger plan with PNM Resources and subsequently merged with Iberdrola. Shares of Avangrid are no longer publicly traded.

Avista Corporation
Company Summary from Value Line:
Avista Corporation (formerly The Washington Water Power Company) supplies electricity and gas in eastern Washington and northern Idaho. Supplies electricity to part of Alaska and gas to part of Oregon. Customers: 416,000 electric, 381,000 gas. Acq’d Alaska Electric Light and Power 7/14. Sold Ecova energy-management sub. 6/14. Electric rev. breakdown: residential, 36%; commercial, 29%; industrial, 9%; wholesale, 21%; other, 5%. Generating sources: gas and coal, 41%; hydro, 25%; purch., 42%. Fuel costs: 35% of revs. ’23 reported depr. rate (Avista Utilities): 3.5%. Has 1,858 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 418,000 customers and natural gas to about 382,000 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 is rooted in the renewable energy we’ve generated since our founding in 1889.[19]

Why was the company not included?
Avista is 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.

[18] https://www.pnmresources.com/~/media/Files/P/PNM-Resources/press-release/122024%20Merger%20Termination.pdf, accessed 12/24/2024
[19] https://investor.avistacorp.com/, accessed 12/24/2024

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 southeastern NY and northern NJ. ConEd has 4.0 mill. electric and 1.3 mill. gas customers. Sold its portfolio of renewable power generation for $6.8 billion (3/23). Entered midstream gas joint venture 6/16; sold it 7/21. Purchases most of its power. Fuel costs: 24% of revenues. ’23 depreciation rate for CECONY: 3.6%. Employs about 14,600.

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.[20]

Consolidated Edison, Inc. ("Con Edison") (NYSE:ED) has successfully completed the sale of its wholly-owned subsidiary, Con Edison Clean Energy Businesses, Inc. (the "Clean Energy Businesses"), including the transfer of substantially all of its assets, to RWE Renewables Americas, LLC. The transaction is valued at $6.8 billion. The sale was finalized March 1, 2023.[21]

Why was the company not included?
Consolidated Edison is 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 Electric, and South Carolina Electric & Gas. The company provides regulated electricity service to 3.6 million homes and businesses in VA, NC, and SC, and regulated natural gas service to 400,000 customers in SC. Acquired Questar 9/16: SCANA 1/19. Electric rev. breakdown: resid’l, 44%; commercial, 39%; ind’l, 7%; oth., 10%. Generating sources: gas, 36%; nuclear, 29%; coal, 5%; renewable, 5%; purchased, 25%. Power/fuel costs: 31% of rev. Deprec. rates: 2.3%-4.2%. Employs 17,700.

Additional Company Information from Website:
Dominion Energy (NYSE: D), headquartered in Richmond, Va., provides regulated electricity service to 3.6 million homes and businesses in Virginia, North Carolina, and South Carolina, and regulated natural gas service to 500,000 customers in South Carolina. The company is one of the nation's leading developers and operators of regulated offshore wind and solar power and the largest producer of

[20] https://www.coned.com/en/about-us/company-information, accessed 12/24/2024
[21] https://investor.conedison.com/news-releases/news-release-details/con-edison-finalizes-sale-its-clean-energy-businesses, accessed 12/24/2024

carbon-free electricity in New England. The company's mission is to provide the reliable, affordable, and increasingly clean energy that powers its customers every day.[22]

CALGARY, AB, March 7, 2024 /CNW/ - Enbridge Inc. (TSX: ENB) (NYSE: ENB) ("Enbridge" or the "Company") announced today the closing of its acquisition of The East Ohio Gas Company ("EOG") from Dominion Energy, Inc. The gas utility will be doing business as Enbridge Gas Ohio and will join Enbridge's Gas Distribution and Storage Business Unit.

EOG is a premier single-state utility, serving over 1.2 million customers across more than 400 communities in Ohio, with key locations in major metropolitan areas. The gas utility has a robust portfolio of assets, including over 22,000 miles (over 35,400 km) of transmission, gathering and distribution pipelines, underground storage, and interconnections to multiple interstate pipelines and large natural gas producers.[23]

CALGARY, AB, June 3, 2024 /CNW/ - Enbridge Inc. (TSX: ENB) (NYSE: ENB) ("Enbridge" or the "Company") announced today the closing of its acquisition of the Questar Gas Company ("Questar Gas") and its related Wexpro companies ("Wexpro" and collectively with Questar Gas, "Questar") from Dominion Energy, Inc. ("Dominion"). The Questar Gas utility will be doing business in Utah as Enbridge Gas Utah, in Wyoming as Enbridge Gas Wyoming, and in Idaho as Enbridge Gas Idaho. Questar will join Enbridge's Gas Distribution and Storage Business Unit.

Questar Gas is a premier multi-state utility that distributes natural gas in Utah, southwestern Wyoming, and southeastern Idaho, serving approximately 1.2 million customers in service territories with fast growing economies and populations. Questar Gas Company has a cost-of-service supply agreement with Wexpro, which helps ensure reliability and affordability for Questar Gas's customers. Questar Gas's asset portfolio includes over 21,000 miles (over 33,500 km) of natural gas distribution and transmission pipelines, a liquefied natural gas storage facility that enhances system reliability, and interconnections to multiple interstate natural gas pipelines.[24]

CALGARY, AB, Oct. 1, 2024 /CNW/ - Enbridge Inc. (TSX: ENB) (NYSE: ENB) ("Enbridge" or the "Company") announced today the closing of its acquisition of Public Service Company of North Carolina, Incorporated ("PSNC") from Dominion Energy, Inc. ("Dominion Energy"). The PSNC gas utility will be doing business in North Carolina as Enbridge Gas North Carolina and will join Enbridge's Gas Distribution and Storage Business Unit. This marks the successful completion of the strategic acquisition of three U.S. based gas utilities first announced in September 2023.

PSNC is a premier single-state regulated gas utility in North Carolina serving over 600,000 customers in service territories supported by strong economic growth in cities such as Raleigh, Durham, Gastonia, and Asheville. The asset portfolio includes over 13,000 miles (over 20,500 km) of natural gas distribution and transmission pipelines, a liquefied natural gas storage facility in construction that will enhance system reliability, and non-operated minority interests in a natural gas transmission pipeline lateral and a liquefied

[22] https://investors.dominionenergy.com/home/default.aspx, accessed 12/24/2024
[23] https://enbridge.mediaroom.com/2024-03-07-Enbridge-Completes-Acquisition-of-The-East-Ohio-Gas-Company, accessed 12/24/2024
[24] Enbridge Completes Acquisition of Questar Gas Company - Jun 3, 2024, accessed 12/24/2024

natural gas storage facility.[25]

Why was the company not included?
Dominion Energy is 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, and KY, and 1.6 mill. gas customers in OH, KY, NC, SC, and TN. Owns independent power plants and 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. '22 reported deprec. rate: 3.6%. Has 27,600 employees.

Additional Company Information from Website:
Duke Energy (NYSE: DUK), a Fortune 150 company headquartered in Charlotte, N.C., is one of America's largest energy holding companies. The company's electric utilities serve 8.4 million customers in North Carolina, South Carolina, Florida, Indiana, Ohio and Kentucky, and collectively own approximately 54,800 megawatts of energy capacity. Its natural gas utilities serve 1.7 million customers in North Carolina, South Carolina, Tennessee, Ohio and Kentucky.[26]

Why was the company not included?
Duke Energy is 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 is a holding company for Southern California Edison Company (SoCal Edison), which supplies electricity to 5.28 mill. customers in a 50,000-sq.-mi. area in central, coastal, and southern CA (excl. Los Angeles and San Diego). Edison Energy is an energy svcs. co. Disc. Edison Mission Energy (independent power producer) in '12. Elec. rev. breakdown: residential, 40%; commercial, 43%; industrial, 3%; other, 14%. Generating sources: nuclear, 9%; gas, 5%; hydroelectric, 6%; purchased, 80%. Power costs: 34% of revs. '23 reported depr. rate: 4.1%. Employs 14,316.

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

[25] Enbridge Completes Acquisition of Public Service Company of North Carolina, Incorporated - Oct 1, 2024, accessed 12/24/2024
[26] https://www.duke-energy.com/our-company/about-us, accessed 12/24/2024

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.[27]

Why was the company not included?
Edison International is 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, 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). Electric revenue breakdown: residential, 37%; commercial, 24%; industrial, 27%; other, 12%. Generating sources: gas, 68%; nuclear, 22%; coal, 9%; hydro and solar, 1%. Fuel costs: 32% of revenues. ’23 reported depreciation rate: 2.7%. Has 11,707 employees

Additional Company Information from Website:
Entergy is a Fortune 500 company that powers life for 3 million customers through our operating companies in Arkansas, Louisiana, Mississippi and Texas. We’re investing in the reliability and resilience of the energy system while helping our region transition to cleaner, more efficient energy solutions. With roots in our communities for more than 100 years, Entergy is a nationally recognized leader in sustainability and corporate citizenship. Since 2018, we have delivered more than $100 million in economic benefits each year to local communities through philanthropy, volunteerism and advocacy. Entergy is headquartered in New Orleans, Louisiana, and has approximately 12,000 employees.[28]

Why was the company not included?
Entergy Corporation 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 12 regulated utilities with 4.45 million electric, natural gas, and water customers. Supplies power to most of Connecticut and gas to part of CT; supplies power to 3/4 of New Hampshire’s population; supplies power to western Massachusetts and parts of eastern MA and gas to central and eastern MA; supplies water to CT, MA, and NH. Acq’d NSTAR

[27] https://www.edison.com/about-us, accessed 12/24/2024
[28] http://entergy.com/about_entergy/, accessed 12/24/2024

4/12; Aquarion 12/17; Columbia Gas 10/20. Electric rev. breakdown: residential, 56%; commercial/indus'l/other, 43.4%. Fuel costs: 41% of revs. '23 reported deprec. rate: 3.1%. Employs about 10,200.

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 nearly 10,000 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.[29]

Why was the company not included?
Eversource Energy is 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), and Atlantic City Electric (ACE). Has 9.1 mill. elec., 1.3 mill. gas customers. Spun off Constellation Energy (nonregulated generating and energy-marketing ops.) 2/22. Acq'd Constellation Energy 3/12; Pepco Holdings 3/16. Elec. rev. breakdown: residntl., 54%; small commercl. and indstrl., 16%; large commercl. and indstrl., 17%; other, 13%. Fuel costs: 48% of revs. '23 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 (Nasdaq: EXC) is a Fortune 200 company and the nation's largest utility company, serving more than 10.5 million customers through six fully regulated transmission and distribution utilities — Atlantic City Electric, BGE, ComEd, Delmarva Power, PECO, and Pepco. Exelon's 20,000 employees dedicate their time and expertise to supporting our communities through reliable, affordable and efficient energy delivery, workforce development, equity, economic development and volunteerism. [30]

Why was the company not included?
Exelon is 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

[29] https://www.eversource.com/content/general/about/about-us/about-us/welcome-to-eversource, accessed 12/24/2024
[30] http://www.exeloncorp.com/company/about-exelon, accessed 12/21/2024

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 6.24 million customers in OH, PA, NJ, WV, MD, and NY. Acq'd Allegheny Energy 2/11. Electric revenue breakdown: residential, 59.6%; commercial, industrial, and other, 40.4%. Purchases most of its power. Power costs: 36.1% of revenues. 2023 reported depreciation rate: 2.8%. Employs about 12,000.

Additional Company Information from Website:

FirstEnergy is dedicated to integrity, safety, reliability and operational excellence. Its electric distribution companies form one of the nation's largest investor-owned electric systems, serving more than 6 million customers in Ohio, Pennsylvania, New Jersey, West Virginia, Maryland and New York. The company's transmission subsidiaries operate approximately 24,000 miles of transmission lines that connect the Midwest and Mid-Atlantic regions. FirstEnergy's regulated distribution companies form one of the nation's largest investor-owned electric systems, based on serving 6 million customers in the Midwest and Mid-Atlantic regions. Stretching from the Ohio-Indiana border to the New Jersey shore, the companies operate a vast infrastructure of more than 269,000 miles of distribution lines and are dedicated to providing customers with safe, reliable and responsive service. FirstEnergy's transmission operations include approximately 24,000 miles of lines and two regional transmission operation centers. The company's successful, 10-year Energizing the Future transmission investment initiative resulted in reliability improvements, operating flexibility, enhanced performance and system security while building a highly successful and valued transmission business that helped position FirstEnergy for success. As the needs of our customers evolve, critical investments to continue strengthening and modernizing the transmission system will continue through our Energize365 program, launched in 2024. FirstEnergy controls approximately 3,599 megawatts from regulated scrubbed coal, solar and hydro facilities in West Virginia and Virginia.[31]

Why was the company not included?

FirstEnergy is 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

[31] https://www.firstenergycorp.com/about.html, accessed 12/24/2024

hotel property assets in 2015. Acquired ITC Holdings 10/16. Fuel costs: 31% of revs. ’23 reported deprec. rate: 2.6%. Has 9,100 employees.

Additional Company Information from Website:
Fortis has ten regulated electric and gas utilities in Canada, the U.S., and the Caribbean. Our 9,600 employees serve 3.5 million electricity and natural gas customers. We’re united by our shared purpose to deliver a cleaner energy future and driven by values that focus on our customers, communities, and employees. Fortis has increased annual dividends paid to our shareholders for 51 consecutive years. Ninety-three per cent of our assets are dedicated to the transmission and distribution of safe and reliable electricity and natural gas to our customers. We prioritize emissions reductions and expect ninety-nine per cent of our assets to be focused on energy delivery and renewable generation by 2035.[32]

Why was the company not included?
Although Fortis 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 U.S. dollars necessary. Since there are enough comparable companies, we 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 (HEI) is the parent company of Hawaiian Electric Company, Inc. (HECO), American Savings Bank (ASB), and Pacific Current. HECO and its subs., Maui Electric Co. (MECO), and Hawaii Electric Light Co. (HELCO), supply electricity to 416,177 customers on Oahu, Maui, Molokai, Lanai, and Hawaii. Operating companies’ systems are not interconnected. Elec. rev. breakdown: residential, 32%; commercial, 36%; industrial, 32%; other, less than 1%. Generating sources: oil, 52%; purchased, 48%. Fuel costs: 50%+ of revs. ’23 reported deprec. rate: 3.2%. Has about 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,

[32] https://www.fortisinc.com/about-us/about-us#profile, accessed 12/24/2024

resilient communities.[33]

Why was the company not included?
Hawaiian Electric is 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 633,000 customers throughout a 24,000-square-mile area in southern Idaho and eastern Oregon (population: 1.4 million). Most of the company's revenues are derived from the Idaho portion of its service area. Revenue breakdown: residential, 39%; commercial, 21%; industrial, 14%; irrigation, 10%; other, 16%. Generating sources: hydro, 35%; coal, 13%; gas, 15%; purchased, 37%. Fuel costs: 40% of revenues. '23 reported depreciation rate: 3.1%. Has 2,112 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 customers pay among the nation's lowest prices for electricity. It's 2,000 employees proudly serve more than 620,000 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".[34]

Why was the company not included?
IDACORP 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.

[33] https://www.hei.com/company-profile/about-hawaiian-electric/default.aspx, accessed 12/24/2024
[34] http://www.idacorpinc.com/about-us/at-a-glance, accessed 12/24/2024

Company Summary from Value Line:
MDU Resources Group, Inc. is a regulated energy delivery and construction services company. Segments: construction services (61% of '23 revs; 45% of '23 op. inc.), natural gas distribution (28%, 22%), electric (9%, 22%); and pipeline (2%, 11%). Utilities sell gas and electricity in northwest and upper midwest U.S. Completed spinoff of the construction materials business, Knife River, 5/23. Has about 9,150 employees.

Additional Company Information from Website:
Our utility group, comprised of four utility companies, provides natural gas and/or electric power to approximately 1.2 million customers across eight states. From 2017 to 2022, our utility rate base grew at a compound annual rate of 8% to a combined $4.0 billion. We expect to invest approximately $2.3 billion from 2024-2028 to replace, expand and modernize our existing infrastructure. Cascade Natural Gas Corporation distributes natural gas in Oregon and Washington. Great Plains Natural Gas Co. distributes natural gas in western Minnesota and southeastern North Dakota. Intermountain Gas Company distributes natural gas in southern Idaho. Montana-Dakota Utilities Co. generates, transmits and distributes electricity and distributes natural gas in Montana, North Dakota, South Dakota, and Wyoming. WBI Energy provides natural gas transportation through approximately 3,800 miles of regulated pipeline systems primarily in the Rocky Mountain and northern Great Plains regions of the United States. WBI Energy's system is strategically located near five natural gas-producing basins, making natural gas readily supplies available to the company's transportation and storage customers. The system has 14 interconnecting points with other pipeline facilities, allowing for the receipt and/or delivery of natural gas to and from other regions of the country and Canada. WBI Energy owns the largest natural gas storage field in North America, which is adjacent to the Bakken play. Much of our pipeline business is regulated, providing low-risk, stable returns. From 2024-2028, WBI Energy plans to invest $405 million in its pipeline system, including organic growth projects and system upgrades and replacements with a focus on being the pipeline of choice for demand customers as well as customers in the Bakken. WBI Energy also provides cathodic protection and other energy-related services. [35]

Why was the company not included?
MDU Resources was reviewed as a potential guideline company because it has an operating subsidiary located in Minnesota. This company is 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. This company's majority operating segment is construction materials and contracting.

NextEra Energy Inc.

Company Summary from Value Line:
NextEra Energy, Inc. is a holding company for Florida Power & Light Co. (FP&L), which provides electricity to roughly 5.9 million customers in eastern, southern, and northwestern Florida. NextEra Energy Resources is a nonregulated power generator with nuclear, gas, and renewables. Has 51.4% stake in NextEra Energy Partners. Acquired Gulf Power 1/19; Florida City Gas 7/18. Revenue: residential,

[35] https://www.mdu.com/our-company/overview/default.aspx, accessed 12/24/2024

about 55%; commercial/industrial/other, 45%. Generating sources: gas, 73%; nuclear, 20%; solar, 6%; other, 1%. Fuel costs: 19.4% of revenues. ’23 depreciation rate: 3.4%. Employs about 16,800.

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 5.9 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. A Fortune 200 company, NextEra Energy has been recognized often by third parties for its efforts in sustainability, corporate responsibility, ethics and compliance, and diversity.[36]

Why was the company not included?
NextEra Energy is 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, 80% of 2023 revs., develops, constructs, owns, and operates geothermal power plants that sell electricity. Under the product segment, 16% of revs., the company designs and manufactures power units for geothermal plants and power units for recovered generation. Other revs., 4%. Employs about 1,576.

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

[36] http://www.investor.nexteraenergy.com, accessed 12/24/2024

presence to expand the Company's activity into energy storage services, solar Photovoltaic (PV) and energy storage plus Solar PV. Ormat's current total generating portfolio is 1.2 GW with 1,107 MW of geothermal and Solar generation portfolio that is spread globally in the U.S., Kenya, Guatemala, Indonesia, Honduras, and Guadeloupe, and 150 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. [37]

Why was the company not included?
Ormat is 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:
PG&E Corporation is a holding company for Pacific Gas and Electric Company and nonutility subsidiaries. Supplies electricity and natural gas to most of northern and central California (population 16 million). Has 5.6 million electric and 4.6 million natural gas customers. Electric revenue breakdown: residential, 40%; commercial, 37%; industrial, 12%; agricultural, 9%; other, about 2%. Power generating sources: nuclear, 40%; renewable, 24%; large hydro, 10%; fossil fuel, 26%. Power and Fuel costs: 17% of revenues. '23 reported depr. rate: 3.56% (utility). Has 28,000 employees.

Additional Company Information from Website:
Pacific Gas and Electric Company, incorporated in California in 1905, is one of the largest utility companies in the United States. Based in Oakland, the company is part of PG&E Corporation. 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. PG&E 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. [38]

Why was the company not included?
PG&E is 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

[37] https://investor.ormat.com/corporate-profile/default.aspx, accessed 12/24/2024
[38] https://www.pge.com/en/about/company-information/company-profile.html, accessed 12/24/2024

next to Minnesota.

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 1.4 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, 49%; commercial/industrial, 44%; other, 7%. Generating sources: gas, 25%; nuclear, 25%; coal, 18%; renewables, 2%; purchased, 30%. Fuel costs: 38% of revenues. ’23 reported deprec. rate: 2.98%. Has 6,133 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 approximately 1.4 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.[39]

Why was the company not included?

Pinnacle West Capital Corporation is 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. – See TXNM Energy, Inc.

Company Summary from Value Line:

In the third quarter, PNM Resources rebranded itself as TXNM Energy, Inc. The common stock remains listed on the New York Stock Exchange under the same CUSIP number (69349H107), but the ticker symbol changed from PNM to TXNM. As management explains it, the shift was made to better reflect the changing dynamics of the company, where the Lewisville-Texas based TNMP subsidiary now makes up 40% of the holding company's rate base (i.e., the dollar value of assets for which an electric utility receives a regulated return on equity). *From VL Oct 11, 2024, Commentary.*

[39] http://www.pinnaclewest.com/about-us/default.aspx, accessed 12/24/2024

Portland General Electric Company

Company Summary from Value Line:

Portland General Electric Company provides electricity to 934,000 customers in 51 cities in a 4,000-square-mile area of Oregon, including Portland and Salem (population: 1.9 million). The company is in the process of decommissioning the Trojan nuclear plant, which was closed in 1993. Electric revenue breakdown: residential, 52%; commercial, 33%; industrial, 15%; other, less than 1%. Generating sources: gas, 40%; wind, 7%; coal, 8%; hydro, 4%; purchased, 41%. Fuel costs: 40% of revenues. ’23 reported depreciation rate: 3.4%. Has 2,842 full-time employees.

Additional Company Information from Website:

Portland General Electric is a fully integrated investor-owned utility that generates, transmits and distributes electricity to approximately 934,000 customers in 51 cities across the state of Oregon. 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 economic growth in northwest Oregon. 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 3,500 megawatts.[40]

Why was the company not included?

Portland General Electric is 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 and 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, 48%; comm’l, 22%; ind’l, 10%; other, 20%. Fuel costs: 29% of revs. ’23 reported deprec. rate: 3.2%. Has 6,527 employees.

Additional Company Information from Website:

Our companies are investing in system enhancements and advanced technology to deliver industry-leading reliability and an exceptional customer experience. Our operating philosophy is aimed at maximizing customer and shareowner value by optimizing our assets and leveraging data and technology. We are replicating our proven, scalable utility playbook across all of the regions we serve. A powerful network. Louisville Gas and Electric and Kentucky Utilities. As fully integrated regulated utility companies, Louisville Gas and Electric Company and Kentucky Utilities Company serve more than 1.3 million customers and have consistently ranked among the best companies for customer

[40] https://investors.portlandgeneral.com/?_ga=2.168277097.977605494.1735073080-1231977241.1735073080, accessed 12/24/2024

service in the United States. LG&E serves 335,000 natural gas and 436,000 electric customers in Louisville and 16 surrounding counties. KU serves 545,000 customers in 77 Kentucky counties and five counties in Virginia. They also operate about 7,500 MW of regulated generating capacity. PPL Electric Utilities. A pure electric transmission and distribution company, PPL Electric Utilities delivers safe, reliable and affordable electricity to more than 1.4 million homes and businesses in central and eastern Pennsylvania. PPL Electric regularly ranks among the country's best utility companies for reliability and customer satisfaction and has developed one of the most advanced electric grids in the country. Rhode Island Energy provides essential energy services to over 770,000 customers across Rhode Island through the delivery of electricity or natural gas. Our team is dedicated to helping Rhode Island customers and communities thrive, while supporting the transition to a cleaner energy future. As part of PPL's family of companies, RIE is addressing energy challenges head-on by building smarter, more resilient and more dynamic power grids and advancing sustainable energy solutions.[41]

Why was the company not included?
PPL Corporation is 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. (PSEG) is a holding company for Public Service Electric and Gas Company (PSE&G), which serves 2.4 million electric and 1.9 million gas customers in NJ, and PSEG Power LLC, a nonregulated power generator with 5 nuclear plants in the Northeast. Sold fossil-fuel generation, (2/22). Divested offshore wind assets (5/23). Percentage of electric sales: Commercial (58%); Residential (33%); Industrial (9%). Fuel costs: 41% of revenues. '23 reported depreciation rates (utility): 1.84%-2.54%. Employs approximately 12,500.

Additional Company Information from Website:
Public Service Enterprise Group Inc. (PSEG) is a diversified energy company headquartered in Newark, N.J. Established in 1903, the company has long had a key role in fueling New Jersey's economy and supporting the state's quality of life. Public Service Electric and Gas Co. (PSE&G) is New Jersey's largest provider of electric and natural gas service. As of February 2024, PSE&G serves 2.4 million electric customers and 1.9 million gas customers. PSEG Long Island operates the electric transmission and distribution system of the Long Island Power Authority, with 1.1 million customers. PSEG Power is an energy supply company that integrates the operations of its nuclear generating assets with its fuel supply functions. PSEG is a Fortune 500 company included in the S&P 500 Index and has been named to the Dow Jones Sustainability Index for North America for 16 consecutive years. PSEG has approximately 12,500 employees, who are carrying forward a proud tradition of dedicated service that has continued over more than 120 years. [42]

Why was the company not included?

[41] https://www.pplelectric.com/site/More/About-Us/Our-Company, accessed 12/24/2024
[42] https://corporate.pseg.com/aboutpseg/companyinformation/thepsegfamilyofcompanies, accessed 12/24/2024

Public Service Enterprise Group is 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 and gas mainly in San Diego County, and Southern California Gas (SoCalGas), which distributes gas to most of Southern CA. Owns 80% of Oncor (acquired 3/18), which distributes electricity in TX. Serves nearly 40 mill. consumers, mainly in CA, TX, and Mexico. Elctrc. rev. breakdown: N/A. Purchases about 3/4ths of its power; rest is mainly gas. Sempra Infrastrucure (SI) subsidiary is active in LNG exportation and other energy endeavors. Sold S.A. utilities in ’20. Power costs: 25% of revenue. ’23 reported deprec. rates: 2.6%-7.1%. Employs 16,835.

Additional Company Information from Website:

Sempra 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 approximately 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 $87 billion in total assets at the end of 2023, combined with informed and impactful strategies and an inspiring mission, we strive for sustainable long-term growth.[43]

Why was the company not included?

Sempra is 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, 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, and TN) 7/16. Sold Gulf Power 1/19. Electric revenue breakdown: residential, 43%; commercial, 35%; industrial, 21%; other, 1%. Generating sources: gas, 51%; coal, 19%; nuclear, 10%; other, 11%; purchased, 9%. Fuel costs: 26% of revenues. ’23 reported deprec. rates (utility): 2.7%-3.4%. Has 27,300 employees.

Additional Company Information from Website:

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

[43] http://www.sempra.com/about-us, accessed 12/24/2024

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. [44]

Why was the company not included?
Southern Company is 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.

TXNM Energy, Inc.
Company Summary from Value Line:
TXNM Energy, Inc. (formerly PNM Resources) is a holding company with two regulated electric utilities. Public Service Company of New Mexico (PNM) serves about 550,000 customers in north central New Mexico, including Albuquerque and Santa Fe. Texas-New Mexico Power Company (TNMP) transmits and distributes power to more than 270,000 homes and businesses in Texas. Electric revenue: residential, 32%; commercial, 28%; indust'l, 7%; other, 33%. Fuel costs: 46% of revenues in 2023; reported depreciation rates: 2.67%-7.64%. Has about 1,600 employees.

Additional Company Information from Website:
TXNM Energy serves electricity to approximately 800,000 homes and businesses in New Mexico and Texas through its regulated utilities, PNM and TNMP. PNM is a regulated utility in New Mexico with operations primarily engaged in the generation, transmission and distribution of electricity. It is the state's largest electricity provider. PNM serves nearly 550,000 New Mexico residential and business customers in Greater Albuquerque, Rio Rancho, Los Lunas, Belen, Santa Fe, Las Vegas, Alamogordo, Ruidoso, Silver City, Deming, Bayard, Lordsburg, and Clayton. We also serve the New Mexico tribal communities of the Tesuque, Cochiti, Santo Domingo, San Felipe, Santa Ana, Sandia, Isleta, and Laguna Pueblos (portions of the Eastern reservation area). PNM is regulated by the New Mexico Public Regulation Commission and the Federal Energy Regulatory Commission. TNMP provides transmission and distribution services in Texas under the provisions of Texas Electric Choice Act (TECA) and the Texas Public Utility Regulatory Act. TNMP's transmission and distribution activities are solely within the Electric Reliability Council of Texas (ERCOT), which is the independent system operator responsible for maintaining reliable operations for the bulk electric power supply system in most of Texas. As of December 31, 2022, TNMP owned 992 circuit miles of overhead electric transmission lines; 7,319 pole miles of overhead distribution lines; 1,433 circuit miles of underground distribution lines; and 128

[44] https://www.southerncompany.com/about/our-business.html, accessed 12/24/2024

substations. TNMP, along with all other entities within ERCOT who do not have their own control areas, does not calculate transmission losses. ERCOT, as the Independent System Operator and the entity who balances and manages settlement, calculates transmission losses for all transmission systems within its control area, including TNMP's transmission systems. TNMP provides transmission and distribution services to Retail Electric Providers (REPs) that provide electric service to customers in TNMP's service territories.[45]

Why was the company not included?
TXNM Energy, Inc. is 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. TXNM operates primarily in Texas and New Mexico.

Unitil Corp
Company Summary from Value Line:
Unitil Corp. engages in the distribution of electricity and natural gas in the US. The company distributes electricity in the southeastern seacoast and state capital regions of New Hampshire, and the greater Fitchburg area of north central Massachusetts; and distributes natural gas in southeastern New Hampshire, portions of southern Maine to the Lewiston-Auburn area, and in the greater Fitchburg area of north central Massachusetts. It also operates 86 underground natural gas transmission pipeline that provides interstate natural gas pipeline access and transportation services in Maine and New Hampshire. In addition, Unitil provides energy brokering and advisory services to commercial and industrial customers and real estate management services.

Additional Company Information from Website:
Our work helps keep homes comfortable, businesses thriving and communities connected. Unitil Corporation is an investor-owned public utility proudly serving Maine, Massachusetts and New Hampshire. We are committed to delivering energy to our customers safely and reliably.[46]

Why was the company not included?
Unitil Corp is 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. Unitil Corp operates primarily in Maine, Massachusetts and New Hampshire.

[45] https://www.txnmenergy.com/about-us/our-businesses.aspx, accessed 12/24/2024
[46] https://unitil.com/our-company, accessed 12/24/2024

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 2023: 66.5%, residential; 28.0%, commercial; 3.8%, industrial; and 1.7% other.

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. Atmos Energy has grown from 279,000 customers in 1983 to more than 3 million customers today - mainly by acquiring utility assets. The company has regulated utility operations in Colorado, Kansas, Kentucky, Louisiana, Mississippi, Tennessee, Texas and Virginia. We are the largest natural gas distributor in the states of Texas, Louisiana, and Mississippi. We work closely with our state and federal regulators to operate a safe and reliable natural gas system.[47]

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 222,340 electric customers in CO, SD, WY and MT, and 1.12 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 and oil E&P in '17. Electric rev. breakdown: residential, 34%; commercial, 39%; industrial, 24%; other, 3%. Generating sources: coal, 35%; gas, 26%; wind, 9%; purchased, 30%. Fuel costs: 38% of revs. '23 deprec. rate: 2.9%-3.5%. Has 2,874 employees.

[47] https://www.atmosenergy.com/company/about-atmos-energy/, accessed 12/30/2024

Additional Company Information from Website:
Black Hills Corp. (NYSE: BKH) 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, we serve over 1.3 million natural gas and electric utility customers in eight states: Arkansas, Colorado, Iowa, Kansas, Montana, Nebraska, South Dakota and Wyoming.[48]

Why was the company included?
Black Hills Corporation provides electric and gas to customers. Electric customers represent 17% of customers and gas customers represent 83% 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 over 2.76 million customers in Houston and environs. Indiana Electric, which serves approximately 152,000 customers, and gas utilities with 4.31 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 ’22 and ’23. Electric revenue breakdown not available. Fuel costs: 25% of total revenues. Has 8,827 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 approximately 4 million homes and businesses in six states: Indiana, Louisiana, Minnesota (including Minneapolis), Mississippi, Ohio, 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 2.9 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 the greater Houston area) to offer our customers service repair plans

[48] https://www.blackhillscorp.com/about, accessed on 12/24/2024

that help reduce the stress and expense from the unexpected.[49]

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 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.

Chesapeake Utilities

Company Summary from Value Line:
Chesapeake Utilities Corporation consists of two main units. The Regulated Energy segment distributes natural gas in Delaware, Maryland, and Florida; distributes electricity in Florida; and transmits natural gas on the Delmarva Peninsula and in Florida. The Unregulated Energy operation wholesales and distributes propane; markets natural gas; and provides other unregulated energy services, including midstream services in Ohio. Revenue breakdown for 2023: Regulated Energy, 70.6%; Unregulated Energy, 33.3%; Other, 3.9%

Additional Company Information from Website:
Chesapeake Utilities Corporation (NYSE: CPK) is a diversified energy delivery company listed on the New York Stock Exchange. Chesapeake Utilities offers sustainable energy solutions through its natural gas transmission and distribution, electricity generation and distribution, propane gas distribution, mobile compressed natural gas utility services and solutions, and other businesses. We are committed to delivering outstanding service and generating long-term, sustainable shareholder value as proven by the Company's successful history. Our track record of superior performance is a testament to our unique company culture, financial discipline and the entrepreneurial spirit of our employees.[50]

Why was the company included?
Chesapeake Utilities Corporation operates much like the utilities we value in Minnesota. Following the acquisition of Florida City gas in December 2023, regulated utility operations account for 87% of its operations which include natural gas transmission and distribution in Delaware, Maryland, and Florida. The company also generates and distributes electricity in Florida.

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 2,016 megawatts of nonregulated generating capacity. Sold EnerBank in '21. Electric revenue breakdown: residential, 47%; commercial, 33%; industrial, 14%; other, 6%. Generating sources: coal, 20%; gas, 33%; renewables, 6%; purchased, 43%. Fuel costs: 37% of revenues. '23 depreciation rates: 3.8% electric,

[49] https://www.centerpointenergy.com/en-us/corporate/about-us/company-overview, accessed on 12/24/2024
[50] https://www.chpk.com/investors/, accessed 1/6/2025

2.8% gas, 7.8% other. Has 8,350 full-time employees.

Additional Company Information from Website:
CMS Energy's primary business is Consumers Energy, providing natural gas and electricity to 6.8 million of the state's 10 million residents in all 68 Lower Peninsula counties. Consumers Energy is committed to serving our customers and making Michigan a great place to live and work. Consumers Energy's Electric Business provides electric service to 1.8 million customers in 62 of Michigan's Lower Peninsula counties. Among the largest cities served are Battle Creek, Bay City, Cadillac, Flint, Grand Rapids, Jackson, Kalamazoo, Midland, Muskegon and Saginaw. In 2019, we launched our Clean Energy Plan, a 20-year strategy to safeguard Michigan's environment while supplying more clean energy to our homes and businesses. We plan to achieve net zero carbon emissions, end coal use and dramatically increase clean energy resources by 2040. Consumers Energy's Natural Gas Business provides natural gas service for heating and other uses to nearly 1.8 million customers in 54 of the 68 counties in Michigan's Lower Peninsula. It serves an area that spans 13,000 square miles and includes 215 cities and villages. Among the largest areas served are Bay City, Flint, Jackson, Kalamazoo, Lansing, Macomb, Midland, Royal Oak, Saginaw and Livonia. More than one-half of the utility's gas customers are in metro Detroit. The company has one of the largest underground natural gas storage capacities in the country. This allows the company to economically purchase and store gas during warm months, for eventual use in the winter heating season.[51]

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.

MGE Energy Inc.
Company Summary from Value Line:
MGE Energy, Inc. is a holding company for Madison Gas and Electric Company (MGE), which provides electric service to 163,000 customers in Dane County and gas service to 176,000 customers in seven counties in Wisconsin. Electric revenue breakdown: residential, 36%; commercial, 53%; industrial, 3%; other, 8%. Generating sources: coal, 40%; gas, 17%; renewables, 21%; purchased power, 22%. Fuel costs: 30% of revenues. '23 reported depreciation rates: electric, 3.8%; gas, 2.1%; nonregulated, 2.3%. Has about 700 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 48 consecutive years and have paid dividends for more than 110 years. MGE Energy is the parent company of:

[51] https://www.cmsenergy.com/about-cms-energy/default.aspx, accessed 12/24/2024

- 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.[52]

Why was the company 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 we are responsible for valuing. The company operates a gas distribution territory in the Midwest.

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 576,000 cust. at 9/30/23. Fiscal 2023 volume: 128 bill. cu. ft. (23% interruptible, 50% residential, commercial and firm transportation, 27% other). N.J. Natural Energy subsidiary provides unregulated retail/wholesale natural gas and related energy svcs. 2023 dep. rate: 2.8%. Has 1,350 empls.

Additional Company Information from Website:
New Jersey Resources (NJR) is a Fortune 1000 company that provides 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 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 business affiliates: New Jersey Natural Gas (NJNG), NJR's principal subsidiary, operates and maintains natural gas transportation and distribution infrastructure to serve approximately 582,000 customers in New Jersey's Monmouth, Ocean, Morris, Middlesex, and Burlington counties 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 (NJRCEV) invests in, owns, and operates solar projects with a total capacity of approximately 474 megawatts, providing residential and commercial customers with low-carbon solutions. Storage and 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

[52] https://www.mgeenergy.com/en/about/about-mge-energy/, accessed 12/24/2024

Pipeline Project, as well as a 50 percent equity ownership in Steckman Ridge natural gas storage facility. 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 1,300 employees are committed to helping customers save energy and money by promoting conservation and encouraging efficiency through Conserve to Preserve® and initiatives such as SAVEGREEN™ and The Sunlight Advantage.[53]

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: 488,833 electric in Indiana, 3,200,000 gas in Indiana, Ohio, Pennsylvania, Kentucky, Virginia, Maryland, through its Columbia subsidiaries. Revenue breakdown, 2023: electrical, 32%; gas, 67%; other, less than 1%. Generating capacity, coal, 69.4%; purchased and other, 30.6%. 2023 reported depreciation rates: 3.5% electric, 2.4% gas. Has 7,364 employees.

Additional Company Information from Website:
We're a leading natural gas and electric utility company. Our approximately 7,400 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.[54]

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
Company Summary from Value Line:
Northwest Natural Holding Co. distributes natural gas to 1,000 communities, 795,000 customers, in Oregon (88% 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

[53] https://www.njresources.com/about/index.aspx, accessed 12/30/2024
[54] https://www.nisource.com/company, accessed 12/30/2024

from Canadian and U.S. producers; has transportation rights on Northwest Pipeline system. Owns local underground storage. Rev. breakdown: residential, 38%; commercial, 23%; industrial, gas transportation, 39%. Employs 1,380.

Additional Company Information from Website:
NW Natural is a local distribution company that currently provides natural gas service to approximately two million people in more than 140 communities through 800,000 meters in Oregon and Southwest Washington with one of the most modern pipeline systems in the nation.[55]

Why was the company included?
Northwest Natural 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 160 Bcf of natural gas supply in 2023, compared to 165 Bcf in 2022. Total volumes delivered by customer (fiscal 2023): transportation, 59.3%; residential, 29.7%; commercial and industrial, 10.6%; other, .4%. ONE Gas has around 3,900 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 2.3 million customers in Kansas, Oklahoma and Texas. ONE Gas is headquartered in Tulsa, Okla. Its 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.[56]

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. Centuri Group spun-off

[55] https://www.nwnatural.com/about-us/the-company/overview, accessed 12/30/2024
[56] https://www.onegas.com/about-one-gas/default.aspx, accessed 12/30/2024

4/22/24. Southwest Gas is a regulated gas distributor serving 2.2 million customers in Arizona, Nevada, and California. 2023 margin mix: residential 68%; small commercial, 20%; large commercial and industrial, 8%; transportation, 4%. Total throughput: 2.2 billion therms. Southwest has 2,371 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.[57]

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 2023: 3.2 bill. Revenue mix for regulated operations: residential, 67%; commercial and industrial, 25%; transportation, 5%; other, 3%.

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. [58]

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, and steam service in WI and gas service in IL, MN, and MI. Customers: 1.6 mill. elec., 2.9 mill. gas. Acq'd Integrys Energy 6/15. Electric revenue breakdown: residential, 39%; small commercial and industrial, 32%; large commercial and industrial, 21%; other, 8%. Generating sources: coal, 36%; gas,

[57] https://www.swgas.com/en/about-us, accessed 12/30/2024
[58] https://www.spireenergy.com/about-spire, accessed 12/30/2024

28%; renewables, 5%; purchased, 31%. Fuel costs: 40% of revenues. ’23 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 4.7 million customers in Wisconsin, Illinois, Michigan and Minnesota. Our combined assets allow operating efficiencies across 72,000 miles of electric distribution lines, 46,400 miles of natural gas distribution and transmission lines, and 8,300 megawatts of reliable power 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. Principal energy companies. We Energies delivers electricity and natural gas to more than 2.3 million customers in Wisconsin. Wisconsin Public Service delivers electricity and natural gas to more than 809,000 customers in Wisconsin. Peoples Gas delivers natural gas to approximately 891,000 customers in the city of Chicago. North Shore Gas delivers natural gas to approximately 165,000 customers in Chicago’s northern suburbs. Minnesota Energy Resources delivers natural gas to approximately 251,000 customers in Minnesota. Michigan Gas Utilities delivers natural gas to approximately 185,000 customers in Michigan. Upper Michigan Energy Resources delivers electricity and natural gas to more than 42,000 customers in Michigan’s Upper Peninsula.
Bluewater Gas Storage provides natural gas storage and hub services to 1.5 million natural gas customers of We Energies and Wisconsin Public Service.[59]

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.

[59] https://www.wecenergygroup.com/about/aboutus.htm, accessed 12/24/2024

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, primarily engages in 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 18 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. It operates and reports in four business segments: crude oil marketing, transportation and storage; tank truck transportation of liquid chemicals, pressurized gases, asphalt and dry bulk; pipeline transportation, terminalling and storage of crude oil; and interstate bulk transportation logistics of crude oil, condensate, fuels, oils and other petroleum products. Has 741 employees.

Additional Company Information from Website:

Adams Resources' 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 transportation services to customers throughout the U.S, Canada, and 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 constituents. Additionally, the Company is committed to paying a consistent and reliable dividend.[60]

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.

RGC Resources Inc.

Company Summary from Value Line:

RGC Resources, Inc. is engaged in the regulated sale and distribution of natural gas to approximately 63,200 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,

[60] https://www.adamsresources.com/, accessed 12/30/2024

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 100 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.[61]

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.

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, 2024, served approximately 397,400 full service residential and commercial home heating oil and propane customers and 60,300 customers on a delivery only basis. It also sells gasoline and diesel fuel to approximately 26,800 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 20,800 service contracts. Star serves customers in the more northern and eastern states within the Northeast and Mid-Atlantic U.S. regions. Has 3052 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 Group sells diesel fuel, gasoline and home heating oil on a delivery-only basis. Star Group 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 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

[61] https://www.rgcresources.com/about/, accessed 12/30/2024

make cash distributions. This activity will be reported on final 2017 Schedules K-1.[62]

Why was the company not included?
Star Group'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 11.6% of net income in 2023), UGI International (28.1%), Gas Utility (35.7%), Midstream & Marketing (31.5%), and Corp. & Other (NMF). 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). Has 10,000 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 140 consecutive years.[63]

Why was the company not included?
UGI Corporation's non-gas utility segments accounted for most of their net income. Their gas utility segment only accounted for 19.1% of their net income. Unregulated business segments are different from the companies that we are responsible for valuing.

[62] http://www.stargrouplp.com/investor-relations, accessed 12/30/2024
[63] https://www.ugicorp.com/company/corporate-information/about-ugi/default.aspx, accessed 12/30/2024

Market Segment: Gas Transmission Pipeline and Fluid Transportation Pipeline

Companies Included in the Gas Transmission Pipeline Market Segment

DT Midstream Inc.

Company Summary from Value Line:

DT Midstream Inc. is an owner, operator, and developer of an integrated portfolio of natural gas midstream assets. The company provides multiple, integrated natural gas services to customers through its interstate pipelines, intrastate pipelines, storage systems, lateral pipelines, and gathering systems. DT Midstream also owns joint venture interests which own and operate interstate pipelines. DT Midstream's core assets strategically connect key demand centers across the U.S. to the premium production areas of the Marcellus/Utica natural gas formation in the Appalachian and Haynesville Basins. DT Midstream Inc. has 362 employees.

Additional Company Information from Website:

DT Midstream owns and operates a diverse, integrated portfolio of midstream pipeline, storage and gathering assets, allowing us to provide an extraordinarily comprehensive set of midstream services to our customers. Our company is the only independent, mid-cap, C-corp, gas-focused midstream company in the premier areas of the Marcellus/Utica and Haynesville shales. Our assets link supply from these low-cost production areas to major demand markets. We deliver to those high-quality markets via approximately 2,900 miles of transportation and lateral pipelines and more than 800 miles of gathering lines. We also own and operate 94 Bcf of natural gas storage capacity in Michigan, serving local distribution companies, power generators and other customers in regions across the Midwest, the Northeast and Canada. With our proven, experienced leadership team and highly engaged employees, our safety and reliability rankings are among the best in the industry.[64]

DT Midstream (NYSE: DTM) is an owner, operator and developer of natural gas interstate and intrastate pipelines, storage and gathering systems, compression, treatment and surface facilities. The company transports clean natural gas for utilities, power plants, marketers, large industrial customers and energy producers across the Southern, Northeastern and Midwestern United States and Canada. The Detroit-based company offers a comprehensive, wellhead-to-market array of services, including natural gas transportation, storage and gathering.[65]

Why was the company included?

DT Midstream was added as a guideline company in 2025. DT Midstream was spun off from DTE Energy in 2021 and publicly traded on July 1, 2021. The company has established financials and is similar to the companies we value in Minnesota. On December 21, 2024, completed acquisition of three FERC regulated pipelines from ONEOK, Inc. including Viking Gas, Guardian Pipeline and Midwestern Gas Transmission.[66]

[64] https://www.devonenergy.com/about-us, accessed 12/31/2024
[65] https://investor.dtmidstream.com/home/default.aspx, accessed 4/8/2025
[66] https://investor.dtmidstream.com/investors/news/news-details/2024/DT-Midstream-Announces-Closing-of-Midwest-Pipeline-Acquisition/default.aspx, accessed 4/7/2025

We decided the company met the criteria to be used as a guideline company despite the recent acquisition.

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. 13,786.

Additional Company Information from Website:

At Enbridge, our goal is to be the first-choice energy delivery company in North America and beyond—for customers, communities, investors, regulators and policymakers, and employees. 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. We also recognize the importance of a secure, reliable and affordable supply of energy, which we deliver every day through our four core businesses: Liquids pipelines, Natural gas pipelines, Gas utilities, and storage Renewable energy. The energy transition requires a practical approach. That's why we're committed to lowering emissions while meeting growing energy demand; supporting our customers today while anticipating their needs tomorrow; and developing new energy sources while keeping energy costs in check. 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. We value safety, integrity, respect, inclusion and high performance. Above all else, we aim to make a difference, economically and socially—as an industry leader, as a responsible corporate citizen, as an exceptional employer. Enbridge was named to the Thomson Reuters Top 100 Global Energy Leaders in 2018; we've been selected to Bloomberg's Gender Equality Index five years running, most recently in 2023; and we have been ranked among Canada's Top 100 Employers 20 times, most recently in 2023. 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.[67]

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 18,085 miles (29,104 kilometers) of active pipeline across North America—including 9,619 miles (15,480 km) of active pipe in the United States, and 8,466 miles (13,624 km) of active pipe in Canada.[68]

[67] https://www.enbridge.com/about-us, accessed 12/30/2024

[68] https://www.enbridge.com/About-Us/Liquids-Pipelines.aspx, accessed 12/30/2024

On June 3, 2024, Enbridge announced the closing of its acquisition of the Questar Gas Company ("Questar Gas") and its related Wexpro companies ("Wexpro" and collectively with Questar Gas, "Questar") from Dominion Energy, Inc. ("Dominion"). The Questar Gas utility will be doing business in Utah as Enbridge Gas Utah, in Wyoming as Enbridge Gas Wyoming, and in Idaho as Enbridge Gas Idaho. Questar will join Enbridge's Gas Distribution and Storage Business Unit.[69]

On October 1, 2024, Enbridge announced the closing of its acquisition of Public Service Company of North Carolina, Incorporated ("PSNC") from Dominion Energy, Inc. ("Dominion Energy"). The PSNC gas utility will be doing business in North Carolina as Enbridge Gas North Carolina and will join Enbridge's Gas Distribution and Storage Business Unit. This marks the successful completion of the strategic acquisition of three U.S. based gas utilities first announced in September 2023.[70]

Why was the company included?
Enbridge Inc. is similar to the gas transmission pipeline companies that we are responsible for valuing. 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 Gulf of Mexico.[71] Enbridge Inc. has 17,809 miles of active crude pipelines across North America.

We decided the company met the criteria to be used as a guideline company despite the recent acquisitions.

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 82,000 miles of pipelines. Its 139 terminals handle various commodities, including gasoline, diesel fuel, chemicals, ethanol, metals and petroleum coke. The company employs nearly 11,000 individuals.

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 139 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.[72]

With approximately 67,000 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

[69] https://www.prnewswire.com/news-releases/enbridge-completes-acquisition-of-questar-gas-company-302161482.html, accessed 4/8/2025
[70] https://www.prnewswire.com/news-releases/enbridge-completes-acquisition-of-public-service-company-of-north-carolina-incorporated-302263404.html, accessed 4/8/2025
[71] https://www.enbridge.com/About-Us/Natural-Gas-Transmission-Midstream-and-LNG, accessed 2/5/2024
[72] https://www.kindermorgan.com/, accessed 12/30/2024

Barnett.[73]

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, crude oil 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.[74]

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 four operating segments: natural gas liquids, natural gas gathering and processing, natural gas pipelines, and refined products and crude. Has 4,775 employees.

Additional Company Information from Website:
At ONEOK (NYSE: OKE), we deliver energy products and services vital to an advancing world. We are one of the largest diversified energy infrastructure companies providing gathering, processing, fractionation, transportation and storage services. Through our more than 50,000-mile pipeline network – and access to nearly 50% of the nation’s refining capacity – we transport the natural gas, natural gas liquids (NGLs), refined products and crude oil that help meet domestic and international energy demand, contribute to energy security and provide safe, reliable and responsible energy solutions needed today and into the future. We deliver what’s important. The products we deliver help to heat homes, generate electricity and create end-use products that power healthier, safer and more connected lives. We are proud of our role in providing today’s essential services and believe our expertise will be important in the future energy transformation. 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: We are committed to operating in a safe, reliable, environmentally responsible and sustainable manner. Our strong business fundamentals and operating philosophies are anchored by our participation and investments in the communities where we live and work. We operate primarily fee-based businesses in each of our four reportable segments. We continue to invest in organic growth projects in markets we already serve to provide a broad range of services to producers and meet demand in end-use markets. We manage our balance sheet and seek to maintain investment-grade

[73] https://www.kindermorgan.com/Operations/Natural-Gas/Index, accessed 12/30/2024
[74] https://www.kindermorgan.com/Operations/Products/Index, accessed 12/30/2024

credit ratings.
We attract, select, develop, motivate, challenge and retain a diverse group of employees. We regularly monitor our benefits and compensation package to remain competitive.

As of Oct. 15, 2024, ONEOK is the managing member of EnLink Midstream, LLC (NYSE: ENLC) (EnLink) and owns 43% of EnLink's outstanding common units. EnLink provides integrated midstream infrastructure services for natural gas, crude oil and NGLs. [75]

Why was the company included?
ONEOK Inc. is the parent company for one of the companies that we are responsible for valuing. However, ONEOK Inc. recently completed (October 15, 2024) the acquisition of Global Infrastructure Partners ("GIP") under which ONEOK will acquire GIP's entire interest in EnLink Midstream, LLC (NYSE: ENLC) ("EnLink"), consisting of 43% of EnLink's outstanding common units for $14.90 per unit and 100% of the interests in the managing member for $300 million, for total cash consideration of approximately $3.3 billion. ONEOK and GIP also entered into a separate definitive agreement under which ONEOK will acquire from GIP all of the equity interests in Medallion Midstream, LLC ("Medallion"), the largest privately held crude gathering and transportation system in the Permian's Midland Basin, for $2.6 billion in cash representing approximately 6.3 times estimated 2025 EBITDA, including expected base case run-rate synergies.[76]

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. 2023 net volumes (operating income): Conventional Pipelines: 77% (58%); Facilities 23% (42%). Daily 2023 liquids throughput: 2.652 billion barrels; Oil Transmission, 18%; Conventional Pipelines, 63%; 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 70 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 70 years of strong performance.[77]

CALGARY, Alberta, April 01, 2024--(BUSINESS WIRE)--Pembina Pipeline Corporation ("Pembina" or the "Company") (TSX: PPL; NYSE: PBA) is pleased to announce that it has completed its previously

[75] http://www.oneok.com/about-us/what-we-do, accessed 12/31/2024
[76] https://ir.oneok.com/news-and-events/press-releases/2024/08-29-2024-023013839, accessed 12/31/2024
[77] https://www.pembina.com/about/, accessed 12/30/2024

announced acquisition of Enbridge's interest in the Alliance, Aux Sable, and NRGreen joint ventures (the "Transaction").

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 TransCanada Corporation)
Company Summary from Value Line:
TC Energy Corp, formerly known as TransCanada Corp., is a premier energy infrastructure company, operating an extensive natural gas pipeline system in North America. It has 58,147 miles of natural gas pipelines, and gas storage facilities with a 532 billion cubic feet capacity. The company also has 2,990 miles of liquids pipelines. TC Energy's three major segments are natural gas pipelines (77% of '23 revenues), oil pipelines (17%), and power/storage (6%). Had 7,415 employees at 12/31/23.

Additional Company Information from Website:
A leader in responsible energy infrastructure
With one of North America's largest energy infrastructure portfolios, no one powers day-to-day life like TC Energy. We share technical, stakeholder and operating expertise across all of our operations. Our Energy Solutions aim to leverage the size and scale of our energy network and trading platform to be the most trusted and reliable source of low carbon energy for the North American industrial and natural gas sectors. Positioned to be the most trusted and reliable resource of low carbon energy for North America's industrial and natural gas sectors. 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. Investments in seven power-generation facilities with a capacity of 4,300 megawatts, enough to power more than four million homes.[78]

CALGARY, Alberta, Oct. 01, 2024 (GLOBE NEWSWIRE) -- News Release – TC Energy Corporation (TSX, NYSE: TRP) (TC Energy or the Company) today announced that it has completed the spinoff of its Liquids Pipelines business into South Bow Corporation (South Bow). [79]

TC Energy Corporation maintains ownership of its natural gas pipelines.

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

[78] https://www.tcenergy.com/about/, accessed 12/30/2024
[79] https://www.tcenergy.com/operations/natural-gas/, accessed 4/7/2025

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. Required Williams Pipeline Partners L.P. 10/18. Has about 5,601 employees.

Additional Company Information from Website:
Williams handles approximately 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 and 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.[80]

TULSA, Okla., January 03, 2024--(BUSINESS WIRE)--Williams (NYSE: WMB) today announced that it has closed its acquisition of a portfolio of natural gas storage assets from an affiliate of Hartree Partners LP for $1.95 billion. The transaction includes six underground natural gas storage facilities located in Louisiana and Mississippi with total capacity of 115 billion cubic feet (Bcf), as well as 230 miles of gas transmission pipeline and 30 pipeline interconnects to attractive markets, including LNG markets, and connections to Transco, the nation's largest natural gas transmission pipeline. The acquisition price represents an approximate 10x estimated 2024 EBITDA multiple.

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

Energy Transfer L.P. (Formerly 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 11,500 employees.

Additional Company Information from Website:
(NYSE: ET) owns and operates one of the largest and most diversified portfolios of energy assets in the United States, with a strategic footprint in all the major domestic production basins. ET is a publicly traded limited partnership with core operations that include complementary natural gas midstream, intrastate and interstate transportation and storage assets; crude oil, natural gas liquids (NGL) and refined product transportation and terminalling assets; NGL fractionation; and various

[80] https://co.williams.com/our-company/, accessed 12/30/2024

acquisition and marketing assets. ET also owns Lake Charles LNG Company.[81]

We provide natural gas gathering, compression, treating, transportation, storage and marketing services for natural gas, using nearly 107,000 miles of pipeline, ~235 Bcf of working storage capacity and more than 70 natural gas processing and treating facilities. Our approximately 17,950 miles of pipelines are located across 20 states and are situated atop the nation's premier oil resources, efficiently connecting oil producing regions with premier demand centers. This extensive pipeline footprint, combined with the approximately 73 million barrels of storage capacity within our terminals, enables Energy Transfer to offer the flow assurance that many of our nation's largest producers, refiners and marketers depend on every day. Natural Gas Liquids (NGLs) operations utilize our approximately 5,700 miles of pipeline to transport demethanized mix (Y-grade or raw make) from natural gas processing plants to fractionation plants, storage and terminalling facilities to provide access to multiple NGL markets. NGL fractionators separate Y-grade into purity products which typically include ethane, propane, isobutane, normal butane and natural gasoline. The product is moved to NGL storage facilities, which store Y-grade, purity products and petrochemical feedstocks in underground salt caverns. We provide refined products transportation and terminalling services, as well as acquisition and marketing activities, to refined products markets in several regions of the United States via our integrated pipeline and terminalling assets. These assets include approximately 3,760 miles of refined products pipelines and approximately 35 active refined products marketing terminals with approximately 8 million barrels of refined products storage capacity. Energy Transfer LP is developing a large-scale LNG export facility in Lake Charles, Louisiana located on the Calcasieu Ship Channel. The project will convert Energy Transfer's existing Lake Charles LNG import and regasification terminal to an LNG export facility, which provides a cost advantage over other proposed LNG projects on the Gulf Coast. In addition to our core segments, we also have a stake in various operations held by multiple subsidiaries, which include retail propane, natural gas marketing services, natural resources operations, and natural gas compression services, among others.[82]

Nov. 3, 2023-- Energy Transfer LP (NYSE: ET) ("Energy Transfer") announced today the completion of its previously announced merger with Crestwood Equity Partners LP ("Crestwood"). The merger was approved by Crestwood unitholders at its special meeting of unitholders held on October 30, 2023. Effective with the opening of the market on November 3, 2023, Crestwood's common units and preferred units ceased trading on the New York Stock Exchange (NYSE).

Holders of Crestwood common units received 2.07 Energy Transfer common units for each Crestwood common unit held by them (the "Common Unit Merger Consideration"). Additionally, each outstanding Crestwood preferred unit was, at the election of the holder of such Crestwood preferred unit, either, (i) converted into a new preferred unit of Energy Transfer that has substantially similar terms, including with respect to economics and structural protections, as the Crestwood preferred units; (ii) redeemed in exchange for $9.857484 in cash plus accrued and unpaid distributions to the date of such redemption; or (iii) converted into a Crestwood common unit at the then-applicable conversion ratio of one Crestwood common unit for ten Crestwood preferred units, and such Crestwood common units then received the Common Unit Merger Consideration. The new Energy Transfer preferred units will be Series I Fixed Rate Perpetual Preferred Units and will trade on

[81] https://www.energytransfer.com/, accessed 12/31/2024
[82] https://www.energytransfer.com/business-overviews/, accessed 4/8/2025

the NYSE under the ticker symbol "ETprI". As a result of the acquisition, Energy Transfer now owns and operates more than 125,000 miles of pipelines and related assets in all the major U.S. producing regions and markets across 41 states, further enhancing its leadership position in the midstream sector. The transaction is immediately accretive to distributable cash flow per unit for Energy Transfer, and adds significant cash flows from firm, long-term contracts and significant acreage dedications. Additionally, the combined operations of the two companies are expected to generate initial annual run-rate cost and efficiency synergies of at least $40 million before additional anticipated benefits of financial and commercial synergies.[83]

Why was the company included?
Energy Transfer L.P. 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 fluid transportation pipeline companies that we are responsible for valuing.

Enterprise Products Partners L.P.
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 and operating functions are performed by EPCO and its 7,500 employees. Assets include 51,000 miles of pipelines, 217 MMBbls of storage capacity for liquids and 14.1 Bcf for natural gas. Four segments: NGL Pipeline (35% of 2023 re.); Crude Oil Pipelines, (39%); Petrochemical & Refined Products, (18%); Natural Gas Pipelines, (8%).

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.[84]

Why was the company included?
Enterprise Products Partners' mix of business operations is similar to other companies included in the fluid transportation market segment. Additionally, this company is similar to the fluid transportation pipeline companies we are responsible for valuing.

MPLX L.P.
Company Summary from Value Line:

[83] https://ir.energytransfer.com/news-releases/news-release-details/energy-transfer-completes-acquisition-crestwood, accessed 12/31/2024
[84] http://www.enterpriseproducts.com/about-us, accessed 12/30/2024

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. MPLX has no direct employees.

Additional Company Information from Website:
MPLX is a diversified, large-cap master limited partnership formed by Marathon Petroleum Corporation (MPC) that owns and operates midstream energy infrastructure and logistics assets and provides fuels distribution services. MPLX's assets include a network of crude oil and refined product pipelines; an inland marine business; light-product terminals; storage caverns; refinery tanks, docks, loading racks, and associated piping; and crude and light-product marine terminals. The company also owns crude oil and natural gas gathering systems and pipelines as well as natural gas and natural gas liquids (NGL) processing and fractionation facilities in key U.S. supply basins.[85]

Why was the company included?
MPLX is similar to the fluid transportation pipeline companies that we are responsible for valuing. The company engages in the transports of refined petroleum products.

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, 2023, the company owned or leased 18,335 miles of pipelines and gathering systems. Storage capacity 24 million barrels of natural gas liquids (NGL) storage facilities; about 72 million barrels of crude oil product. Also owns 1,355 trailers; 4 nat. gas processing plants, and 16 rail terminals. Employs 4,200.

Additional Company Information from Website:
At Plains, we believe in the value energy brings to people, communities, and businesses—today and for generations to come. That's why our employees are dedicated to playing a vital role in transporting North American energy to where it's needed. Through our team of more than 4,000 employees and our extensive network of infrastructure and assets across the United States and Canada, we move more than 8 million barrels per day of crude oil and natural gas liquids to power communities, spark innovation, and fuel quality of life. We strive to be the midstream leader in safe, reliable, efficient, and responsible operations. Our commitment to operational and safety excellence is reflected in this vision and in the dedication shared by every employee who operates our assets and contributes to our company's success. [86]

Why was the company included?
Plains All American Pipeline L.P. owns an extensive network of pipeline transportation, terminalling, storage, and gathering assets. This company is similar to the fluid transportation pipeline companies that

[85] http://www.mplx.com/About_MPLX/, accessed 12/30/2024
[86] https://www.plains.com/who-we-are, accessed 12/30/2024

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 is a full-service midstream energy company with operations in the Appalachian Basin. Antero Midstream's assets include gathering pipelines, compression facilities, interests in processing and fractionation plants, and water handling systems in two of the premier North American Shale plays, the Marcellus and Utica Shales. We own and operate a highly customized, integrated system of midstream assets in West Virginia and Ohio. Through our gathering operations, we transport natural gas with a network of gathering pipelines and compressor stations. In addition, we have a joint venture to develop processing and fractionation assets with MPLX, LP (NYSE: MPLX). Our water handling operations include permanent and surface water pipelines, pump stations and storage facilities that source water from the Ohio River, local reservoirs, and several regional waterways to service well completions.[87]

Why was the company not included?

The department heard from companies as part of the Draft 2025 Study that Antero Midstream is similar to the companies the department values.

Antero Midstream Corporation has 708 miles of gathering pipeline and 4.6 Bcf/d compression capacity. Antero Midstream owns and operates freshwater pipelines and storage facilities. It has 350 miles of freshwater pipelines, 5.5 mm barrels of water storage and 100k Bbl/d of wastewater recycling and reuse capacity.[88]

Callon Petroleum Co.

Company Summary from Value Line:

Callon Petroleum Company was acquired by APA Corporation on March 27, 2024

Additional Company Information from Website:

Callon Petroleum no longer has an active website.

Why was the company not included?

[87] https://www.anteromidstream.com/about-us/, accessed 12/31/2024

[88] https://www.anteromidstream.com/operations, accessed 4/7/2025

Callon Petroleum is no longer publicly traded as of March 27, 2024.

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 1,605 employees.

Additional Company Information from Website:

Around the globe, countries, communities and companies want many of the same things: to be productive, healthy and safe. At Cheniere, we provide clean, secure and affordable energy to the world — energy that can reduce carbon emissions, help lead to cleaner air, and light homes and power factories — all manufactured and transported by modern energy infrastructure run by a world-class workforce. The energy we make is liquefied natural gas, or LNG. We began operations in 2016, and we're already the largest producer of LNG in the United States and the second largest LNG operator in the world. Our LNG has reached dozens of markets on five continents, and the demand for our fuel is expected to grow as countries around the world seek cleaner ways to power their economies. While you'll find our headquarters in Houston, Texas, and our LNG facilities in Southwest Louisiana and South Texas, we are a global company with offices in London, Singapore, Washington, Beijing and Tokyo. Cheniere's energy infrastructure represents a more than $38 billion investment in the future of energy and is a demonstration of the company's ability to execute. Cheniere established industry records for bringing new liquefaction units online ahead of schedule and is the fastest company to produce and export 1,000 cargoes of LNG. Cheniere is operating, constructing and developing two LNG facilities on the U.S. Gulf Coast. These massive LNG facilities reliably and safely process billions of cubic feet of natural gas per day into LNG and load the liquid energy onto insulated ships that keep the product cold for their journeys around the world. Cheniere's Sabine Pass LNG facility, which is located in Cameron Parish in Southwest Louisiana, began export operations in 2016 and currently has six fully operational liquefaction units, or "trains." With all six trains complete, the aggregate nominal production capacity of Sabine Pass is approximately 30 million tons per annum (mtpa) of LNG. Cheniere's Corpus Christi LNG facility in South Texas is the first greenfield LNG export facility in the U.S. lower 48 and began operations in 2018. All three trains are operating, and the aggregate nominal production capacity of the Corpus Christi facility is approximately 15 mtpa of LNG. What we do is provide LNG to customers, but how we do it makes us different. Cheniere is a full-service LNG provider. We purchase natural gas from the robust, transparent and liquid North American gas market, process the natural gas into LNG, and offer our customers the option to load the LNG onto their vessels at our terminals, or we will deliver the LNG to regasification facilities around the world.

About 90% of Cheniere's expected aggregate LNG production capacity, either completed or under construction, is contracted through long-term take-or-pay style agreements with creditworthy counterparties. The remaining volumes of LNG we can produce are available for our integrated marketing unit to sell into the market. That gives Cheniere the unique combination of stability and opportunity — long-term, contracted, stable cash flows, plus marketing opportunities driven by shorter-term natural gas supply and demand fundamentals in markets worldwide. Natural gas is transported to Cheniere's LNG facilities on third-party pipelines on which we own firm transportation capacity, as well as on pipelines Cheniere has constructed, owns and operates.[89]

Why was the company not included?
Cheniere 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.

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: CQP) (Cheniere Partners) is a publicly traded Delaware limited partnership formed by Cheniere Energy, Inc. ("Cheniere"). Cheniere Partners provides clean, secure and affordable LNG to integrated energy companies, utilities and energy trading companies around the world. Cheniere Partners aspires to conduct 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.[90]

Why was the company not included?
Cheniere 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.

CrossAmerica Partners L.P. (LeHigh)
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,

[89] https://lngir.cheniere.com/company-information, accessed 12/31/2024
[90] https://cqpir.cheniere.com/company-information, accessed 12/31/2024

Gulf, Citgo, Marathon and Phillips 66. Has 244 employees.

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.[91]

Why was the company not included?
CrossAmerica Partners 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.

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. Delek owns the general partner interest as well as a majority limited partner interest in Delek Logistics and is also a significant customer.

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 west

[91] https://www.crossamericapartners.com/about/about-us, accessed 12/31/2024

Texas for Delek and third parties, primarily in support of Delek's refineries in Tyler, Texas and El Dorado, Arkansas.[92]

Why was the company not included?
Delek 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.

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 13,600 miles of pipelines, 25 natural gas processing plants and seven fractionators. Has 1,072 employees.

Additional Company Information from Website:
EnLink Midstream (NYSE: ENLC) provides integrated energy infrastructure services for natural gas, crude oil, and NGLs, including gathering and transportation pipelines, processing plants, fractionators, barge and rail terminals, product storage facilities, and brine disposal wells, as well as CO_2 transportation for carbon capture and sequestration. Our large-scale, cash-flow-generating asset platforms are in premier production basins and core demand centers, including the Permian Basin, Louisiana, Oklahoma, and North Texas. EnLink is focused on maintaining the financial flexibility and operational excellence that enables us to strategically grow through the energy transition and create sustainable value.[93]

Why was the company not included?
EnLink Midstream 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.

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 2137 employees.

[92] http://www.deleklogistics.com/investor-relations, accessed 12/31/2024
[93] https://www.enlink.com/operations/, accessed 12/31/2024

Additional Company Information from Website:
Genesis Energy, L.P. is a publicly traded, master limited partnership headquartered in Houston, Texas. We provide critical pipeline infrastructure supporting long-lived, world-class developments in the Gulf of Mexico. Our business also includes the production and marketing of natural soda ash and other specialty chemicals with no known substitutes; a diversified suite of Jones Act compliant marine transportation equipment used to transport crude oil and intermediate refined products along the Gulf and East Coast, and major river systems; and an increasingly integrated portfolio of onshore crude oil pipelines and terminals along the Gulf Coast. We are steadfast in our resolution to continue to provide our stakeholders with long-term value while simultaneously operating in a safe, reliable, and environmentally friendly manner. This resolve is integrated into the very core of our culture, which transfers directly into our daily operations.[94]

Why was the company not included?
Genesis Energy'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 1,700 locations primarily in the Northeast. The company was incorporated in 2005 and is based in Waltham, Massachusetts. Has 3485 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,

[94] http://genesisenergy.com/about/, accessed 12/31/2024

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.[95]

Why was the company not included?
Global Partners 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.

Kinetik Holdings
Company Summary from Value Line:
Kinetik Holdings Inc is the result of a merger between Eagle Claw and Altus Midstream. This merger was effective as of February 2nd, 2022. The company provides services such as gathering, transportation, compression, processing, and treating for businesses in the energy sector. Kinetik operates as an integrated midstream services provider and its crude oil assets consist of over 200 miles of pipeline. Its operations are primarily located in the Permian Basin, which is located in Texas and New Mexico, and serves customers in the United States. Has 200 full-time employees.

Additional Company Information from Website:
Kinetik is the premier midstream operator in the Delaware Basin. Through our gas, natural gas liquids, crude, water and transmission service offerings, we are able to provide a unique set of solutions for each of our customers, tailored to maximize growth and efficiency. Every day, we strive to exceed the expectations of our customers through safe and reliable operations, collaboration and transparency. We are committed partners and emphasize the importance of safety, integrity, service and teamwork. At Kinetik, we are proud to support our customers in the most exciting and robust oil and gas basin in the world, the Permian Basin.[96]

Why was the company not included?
Kinetik Holdings is mainly located in the Permian Basin, which is located in Texas and New Mexico. This company's operations focus on gathering and processing. These are different markets than the market of the companies we are responsible for valuing.

Hess Midstream Partners L.P.
Company Summary from Value Line:
Hess Midstream LP is a limited partnership that owns, operates, develops, and acquires midstream related assets in the energy industry. It is also involved in providing water handling equipment required for the 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 from 2019 to 2023. Officers/directors own less than 1.0% of the shares outstanding. Entities affiliated with Hess Midstream GP (the general partner) own 65.1% of Class A, and 100% Class B shares (2023 10-K). Employs 211.

Additional Company Information from Website:
Hess Midstream (NYSE: HESM) is a fee-based, growth-oriented midstream company that owns, operates

[95] https://www.globalp.com/about/the-global-partners-story/, accessed 12/31/2024
[96] https://www.kinetik.com/about-us/, accessed 1/6/2024

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.[97]

Why was the company not included?
Hess Midstream Partners L.P. 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.

Martin Midstream Partners L.P.
Company Summary from Value Line:
In October 2024, Martin Midstream Partners, L.P. entered into a definitive agreement and plan of merger pursuant to which Martin Resource Management Corporation (‘‘MRMC’’) would acquire all of the outstanding common units of MMLP not already owned by MRMC and its subsidiaries for $4.02 per unit. Due to this news, the company’s ranks were suspended. 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 by-products. Has 1619 employees.

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, and storage 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; marketing, distribution, and transportation services for natural gas liquids and blending and packaging services for specialty lubricants and grease. 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.[98]

Why was the company not included?

[97] https://hessmidstream.gcs-web.com/investors, accessed 12/31/2024
[98] https://mmlp.com/about-us/default.aspx, accessed 12/31/2024

Martin Midstream Partners 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 services company. Segments: construction services (61% of ’23 revs; 45% of ’23 op. inc.), natural gas distribution (28%, 22%), electric (9%, 22%); and pipeline (2%, 11%). Utilities sell gas and electricity in northwest and upper midwest U.S. Completed spinoff of the construction materials business, Knife River, 5/23. Has about 9,150 employees.

Additional Company Information from Website:

MDU Resources provides essential products and services through its regulated energy delivery 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 more than 2,000 employees across eight states in the Pacific Northwest and Midwest.[99]

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.

NGL Energy Partners L.P.

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 24 terminals. It sells propane, distillates, and equipment and supplies to end users consisting of residential, agricultural, commercial, and industrial customers. Has 607 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

[99] https://www.mdu.com/about-us/, accessed 12/31/2024

to refineries and end users. Refined Products from refiners to customers.[100]

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.

NuStar Energy L.P.
Company Summary from Value Line:
Value Line no longer has information for NuStar Energy, L.P.

Additional Company Information from Website:
As of May 3, 2024, Sunoco has successfully completed its acquisition of NuStar Energy L.P.[101]

Sunoco announced the completion of the acquisition of NuStar. The merger was approved by NuStar unitholders at its Special Meeting held on May 1, 2024. Effective as of the opening of markets on May 3, 2024, NuStar's common units ceased trading on the New York Stock Exchange.

The completion of this transaction increases Sunoco's stability and credit profile, strengthens its financial foundation, and enhances its ability to grow. Sunoco expects to realize at least $150 million of expense and commercial synergies. In addition, Sunoco expects at least $50 million per year of additional cash flow from refinancing activity. Sunoco expects the transaction to be immediately accretive to distributable cash flow per LP unit, growing to greater than 10% accretion by the third year following close.[102]

Why was the company not included?
NuStar Energy L.P. is no longer publicly traded.

Plains GP Holdings L.P.
Company Summary from Value Line:
Plains GP Holdings, L.P., is a limited partnership that 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 a 55% stake in 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. PAA owns an extensive network of pipelines, terminals, storage facilities, and gathering assets. PAA has 4,000 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

[100] http://www.nglenergypartners.com/about-ngl/, accessed 12/31/2024
[101] https://www.nustarenergy.com/Business, accessed 4/8/2025
[102] https://www.prnewswire.com/news-releases/sunoco-lp-completes-acquisition-of-nustar-energy-lp-announces-a-4-increase-in-quarterly-distribution-302135594.html, accessed 4/8/20025

infrastructure and logistics companies in North America.[103]

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.

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 9/30/23, serves about 1.0 million active propane customers through roughly 700 locations in 42 states, concentrated on the east and west coasts of the United States. Sold approximately 397 million gallons of propane and 19.1 million gallons of fuel oil in fiscal 2023. Has 3,240 employees.

Additional Company Information from Website:
A Master Limited Partnership since 1996, Suburban Propane Partners, L.P. (NYSE: SPH) has been in the customer service business since 1928. A value and growth-oriented company headquartered in Whippany, New Jersey, Suburban Propane is managed for long-term, consistent performance. Suburban Propane is a nationwide marketer and distributor of a diverse array of energy-related products, specializing in propane, fuel oil and refined fuels, as well as marketing natural gas and electricity in deregulated markets. With more than 3,300 full-time employees, Suburban Propane maintains business operations in 41 states, providing dependable service to approximately 1 million residential, commercial, industrial and agricultural customers through approximately 700 locations.[104]

Why was the company not included?
Suburban Propane 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 Corp. focuses on owning, developing, and operating midstream energy infrastructure assets primarily in United States. The company operates natural gas, crude oil, and produced water gathering systems in four unconventional resource basins, including the Williston Basin in North Dakota, which includes the Bakken and Three Forks shale formations; the Denver-Julesburg Basin that consists of the Niobrara and Codell shale formations in Colorado and Wyoming; the Fort Worth Basin in Texas, which comprises the Barnett Shale formation; and the Piceance Basin in Colorado, which includes the Mesaverde formation, and the emerging Mancos and Niobrara Shale formations. In October 2024, the company announced that it and its wholly owned subsidiary, Summit Midstream Partners, LP, have entered into definitive agreements to acquire Tall Oak Midstream Operating, LLC and its subsidiaries from an affiliate of Tailwater Capital LLC for a mix of cash and equity consideration. Has 244 employees.

[103] https://www.plainsallamerican.com/, accessed 12/31/2024
[104] https://www.suburbanpropane.com/about/, accessed 12/31/2024

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.

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
- the Piceance Basin in Colorado, which includes the liquids-rich Mesaverde formation as well as the emerging Mancos and Niobrara Shale formation.

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
- 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. Most 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 most 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.[105]

[105] http://www.summitmidstream.com/about, accessed 12/31/2024

Why was the company not included?
Summit Midstream Partners' 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.

Sunoco LP
Company Summary from Value Line:
Sunoco LP engages in the distribution and retailing of motor fuels in the U.S. The company operates through two segments, Fuel Distribution and Marketing (96% of '23 revenues) and All Other (4%). The Fuel Distribution and Marketing segment purchases motor fuel from independent refiners and major oil companies and supplies it to independently operated dealer stations, distributors and other consumers of motor fuel, and partnership operated stations, as well as to commission agent locations. All Other operates retail stores that offer motor fuel, merchandise, foodservice and other services. It also leases and rents real estate properties.

Additional Company Information from Website:
Sunoco LP distributes approximately 9 billion gallons of branded and unbranded fuel annually across more than 40 states and the Caribbean. Sunoco LP's network contains approximately 14,000 miles of pipeline transporting refined products, crude oil, and ammonia. Sunoco LP owns and operates over 100 terminals throughout the United States, Puerto Rico, Mexico, and Europe.[106]

Why was the company not included?
Sunoco LP owns fluid transportation pipeline assets in Minnesota. However, Sunoco LP also has a significant number of operations from fuel distribution. Therefore, we are not including it as a guideline company.

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 gathering, compressing, treating, processing, and selling natural gas, along with storing, fractionating, treating, transporting, and selling NGLs. Plant natural gas inlet 6,898.2 MMcf/d; Gross NGL production, 864.5 MBbl/d; Crude oil gathered 132.9 MBbl/d (as of 12/31/23). 2023 depr. rate: 5.1%. Has 3,182 employees.

Additional Company Information from Website:
Targa is a leading provider of midstream services and is one of the largest independent midstream infrastructure companies in North America. We own, operate, acquire, and develop a diversified portfolio of complementary domestic midstream infrastructure assets, allowing us to endeavor to supply natural gas and natural gas liquids (NGLs) efficiently and safely to meet the increasing domestic and global demand for cleaner, affordable fuel and feedstocks.[107]

Why was the company not included?
Targa Resources Corporation has several other main business segments besides common carrier

[106] https://www.sunocolp.com/, accessed 4/8/2025
[107] https://www.targaresources.com/about-us, accessed 12/31/2024

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 L.P. (Formerly 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. Has 15,794 miles of pipeline located in the Rocky Mountains, Texas/NM, 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, and Wyoming. 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. In our capacity as a natural gas processor, we also buy and sell natural gas, NGLs, and condensate on our behalf and our customers under certain gas processing contracts. In December 2019, we executed several agreements with Occidental that enabled us to operate as a standalone business. As a 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. [108]

Why was the company not included?
Western Midstream Partners' 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.

[108] http://www.westernmidstream.com/About/, accessed 12/31/2024

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 and Chemicals, 19% of '23 revenues; Metals and Minerals, 12%; Forest Products, 12%; Intermodal, 23%; Coal, 6%; Grain and Fertilizer, 19%; Automotive, 6%. 2023 labor costs: 19% of revenue. 2023 operating ratio: 60.8%. Has about 25,000 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.[109]

Why was the company included?
Canadian National Railway 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 Kansas City
Company Summary from Value Line:
Canadian Pacific Kansas City, LTD. formed from the April 2023 merger of Canadian Pacific and Kansas City Limited, originally founded in the 1800's, is the only transnational rail network in North America, and operates about 8,800 miles of track in the U.S., 8,400 miles in CA, and 3,100 miles in MX. Grain shipments 20%, of '23 freight revenue; intermodal, 20%; metals/minerals, 13%; coal, 7%; other, 40%. Operating ratio in '23: 65.0%. Employs 18,200 as of December 2023.

Additional Company Information from Website:
CPKC is the combination of two historic railways – Canadian Pacific (CP) and Kansas City Southern (KCS). Today, we are CPKC and have created the first and only transnational rail network in North America. Drawing on our strong foundations and heritage, CPKC moves essential goods across our 20,000-mile network to support economic growth throughout Canada, the U.S. and Mexico.[110]

Why was the company included?
Canadian Pacific Railway completed the $31 billion acquisition of Kansas City Southern in 2021. Kansas

[109] https://www.cn.ca/en/about-cn/, accessed 12/31/2024
[110] https://www.cpkcr.com/en/about-cpkc, accessed 12/31/2024

City Southern shares were placed into a voting trust, ensuring independent operations between Kansas City Southern and Canadian Pacific Railway during the regulatory review process.[111] The merger was approved in 2023. The financial statements of the merged companies have been combined and we will use Canadian Pacific Kansas City as a guideline company for the 2025 Capitalization Rate Study.

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. 2023 rail operating ratio: 62.1%. Had 23,232 employees, as of 12/31/23.

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.[112]

Why was the company included?

CSX 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. ’23 freight revenue mix: merchandise, 61% (includes agriculture, wood products, chemicals, metals, aggregates, automotive); intermodal, 25%; coal, 14%. Labor costs: about 21% of revenue. Operating ratio: 62.3%. Has 18,500 employees.

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[111] https://www.cpkcr.com/en/media/canadian-pacific-and-kansas-city-southern-combine-to-create-cpkc, accessed 2/14/2024

[112] https://www.csx.com/index.cfm/about-us/company-overview/, accessed 12/31/2024

Additional Company Information from Website:
Since 1827, we've been moving the goods and materials that power the U.S. economy. Customer-centric and operations-driven, we are dedicated to advancing safety, serving communities, and driving innovation for tomorrow's rail. 19,500 + Route miles across 22 states and the District of Columbia, connecting 800 industrial sites, 175 warehouses, and 43 ports. 20,000 Talented conductors, engineers, and employees committed to safe, efficient rail transport. $1.5 Billion In capital investments including locomotives, freight cars, tracks, and bridges in one year.[113]

Why was the company included?
Norfolk Southern 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 32,693 route miles serving the western two-thirds of the United States. ’23 railroad revenue mix: Premium 31%; Industrial, 36%; Bulk, 33%. Roughly 10% of its sales from Mexico. Divested Overnite Transportation in 11/03. ’23 RR operating ratio: 62.3%. Has about 33,000 employees.

Additional Company Information from Website:
Union Pacific Railroad is the principal operating company of Union Pacific Corporation (NYSE: UNP). One of America's most recognized companies, Union Pacific Railroad connects 23 states in the western two-thirds of the country by rail, providing a critical link in the global supply chain. From 2013 to 2022, Union Pacific invested approximately $34 billion in its network and operations to support America's transportation infrastructure. The railroad's diversified business mix includes its Bulk, Industrial and Premium business groups. Union Pacific serves many of the fastest-growing U.S. population centers, operates from all major West Coast and Gulf Coast ports to eastern gateways, connects with Canada's rail systems and is the only railroad serving all six major Mexico gateways. Union Pacific provides value to its roughly 10,000 customers by delivering products in a safe, reliable, fuel-efficient and environmentally responsible manner.[114]

Why was the company included?
Union Pacific 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

Freightcar America
Company Summary from Value Line:
FreightCar America, Inc. operates primarily in North America through its direct and indirect subsidiaries, JAC Operations, Inc.; Johnstown America, LLC; Freight Car Services, Inc.; JAIX Leasing Company; FreightCar Roanoke, LLC; FreightCar Mauritius, Ltd.; FreightCar Rail Services, LLC; FreightCar Short Line,

[113] https://www.norfolksouthern.com/en/about-us/company-overview, accessed 12/31/2024
[114] https://www.up.com/aboutup/corporate_info/uprrover/index.htm, accessed 12/31/2024

Inc.; and FreightCar Alabama, LLC. It manufactures freight cars, supplies railcar parts, leases freight cars, and provides railcar maintenance, repairs, and management. It designs and builds coal cars, bulk commodity cars, flat cars, mill gondola cars, intermodal cars, coil steel cars, and motor vehicle carriers. The company's Manufacturing segment includes new railcar manufacturing, used railcar sales, railcar leasing and major railcar rebuilds. The Parts operating segment is not significant for reporting purposes and has been combined with corporate and other non-operating activities as Corporate and Other.

Additional Company Information from Website:
FreightCar America designs and manufactures steel, stainless steel, aluminum and hybrid steel-aluminum freight cars that transport a wide variety of bulk commodities, containerized freight and other products. Our experienced team works closely with you to create customized railcar solutions for all your needs.[115]

Why was the company not included?
FreightCar America is a designer and manufacturer of freight cars. The company is not engaged in the logistics of railroad transportation services. The company will not be included as its operations are not similar to the companies we are responsible for valuing.

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 in143,874 railcars, and manages 295 railcars for third-party owners. Specialty unit finances marine and industrial equipment. The company sold the American Steamship unit in February of 2020, which provided waterborne transportation of dry bulk commodities. Rail North America accounted for 70% of revenue in ’23; Rail Int’l, 22%; Engine Leasing, 5%; Other, 3%. 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. [116]

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. is one of the largest manufacturers of railroad freight cars and related equipment in the Western hemisphere. It also has a fleet of equipment that it leases to users of railcars and provides maintenance service and parts. The company operates in three business segments:

[115] https://freightcaramerica.com/about-us/, accessed 12/31/2024
[116] https://www.gatx.com/about-us/, accessed 12/31/2024

Manufacturing (85% of 2024 revenues); Maintenance Services (8%); Leasing and Services (7%). At 8/31/24, its backlog consisted of 26,700 railcars. Has about 14,200 employees.

Additional Company Information from Website:
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 product and service 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 reportable segments thereby enhancing our margins. We believe our integrated model is difficult to duplicate and provides greater value for our customers and investors.[117]

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.

Trinity Industries
Company Summary from Value Line:
Trinity Industries, Inc. manufactures railcars and provides a variety of services to the freight market. Trinity has three principal operating segments: Railcar Manufacturing (railcars and component parts), Railcar Leasing, and Railcar Services. Spun off the Energy Equipment, Construction Products, and Inland Barge divisions in November of 2018. ’23 depreciation rate: 9.3% of revenues. Has about 9,480 employees.

Additional Company Information from Website:
Trinity Industries, Inc. owns market-leading businesses that provide railcar products and services in North America under the trade name TrinityRail®. TrinityRail’s unique platform provides a single source for comprehensive rail transportation solutions that optimizes our customers’ ownership and usage of railcar equipment and enhances the value-proposition of the rail modal supply chain. Our purpose is to Deliver Goods for the Good of All. We remain committed to rail solutions that deliver goods—safely, efficiently, and sustainably - for the good of our customers, shareholders, and employees in all the communities we serve. Trinity reports its financial results in two principal segments: the Railcar Leasing and Management Services Group and the Rail Products Group. Our common stock is traded on the New York Stock Exchange under the symbol TRN.[118]

Why was the company not included?
Trinity Industries primary business is Railcar Manufacturing (railcars and component parts), Railcar Leasing, and Railcar Services. The company provides railcar products and services to the railroads but does not operate as a traditional railroad like the companies we are responsible for valuing.

USD Partners L.P.

[117] Greenbrier Companies 2024 Annual Report, page 4. https://investors.gbrx.com/annual-reports-proxies, accessed 12/31/2024
[118] https://www.trin.net/home/default.aspx, accessed 12/31/2024

Company Summary from Value Line:
No Value Line summary available.

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 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.[119]

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 (72% of revenue in 2023) manufactures and services components used in freight trains; the Transit division (28%) makes products for passenger vehicles, e.g., subways and buses. Acquired GE transportation assets (2/19). Foreign revenues: 44%. Off. and dir. own 1.1% of common stock outstanding; The Vanguard Group, 11.1%; BlackRock, Inc., 6.7% (4/24 proxy). Has about 25,000 employees.

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.[120]

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.

[119] https://investor.usdpartners.com/investors/investor-center-home/default.aspx, accessed 12/31/2024
[120] https://www.wabteccorp.com/about-wabtec, accessed 12/31/2024