DEPARTMENT
OF REVENUE

Date: April 30, 2021
From: Jon Klockziem, Director – Property Tax Division
Subject: Final Capitalization Rate Study

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

We posted the 2021 Draft Capitalization Rate Study on March 1, 2021 and welcomed comments until March 31, 2021. We appreciate the thoughtful comments we received.

Who can I contact with questions?

If you have questions about this final study, contact Holly Soderbeck in our State Assessed Property Section at 651-556-6119 or sa.property@state.mn.us.

Jon Klockziem, Director
Property Tax Division

2021 Capitalization Rate Study

Assessment Year 2021

Property Tax Division
Minnesota Department of Revenue
April 30, 2021

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Introduction

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

For each market segment, this study derives

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

The market segments are

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

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

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

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

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

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

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

Both the yield and direct rates use 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 the table below.

	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.

This table summarizes the rates derived from this study.

Market Segments	Yield Rate	Direct Rate	Implied Growth Rate [4]	Short-Term Growth Rate [5]	Long-Term Real Growth Rate [6]	Long-Term Implied Inflation Rate [7]
Electric	6.34%	4.64%	1.70%	5.75%	1.70%	2.00%
Gas Distribution	6.63%	4.56%	2.07%	6.50%	1.70%	2.00%
Gas Transmission Pipeline	9.82%	5.40%	4.42%	11.00%	1.70%	2.00%
Fluid Transportation Pipeline	10.13%	7.43%	2.70%	8.00%	1.70%	2.00%
Railroad	9.08%	4.10%	4.98%	10.50%	1.70%	2.00%

This table compares the yield rates for each market segment over the past five assessment years.

Market Segments Yield Rates	2021 AY	2020 AY	2019 AY	2018 AY	2017 AY
Electric	6.34%	6.40%	7.20%	6.92%	7.13%
Gas Distribution	6.63%	7.07%	7.37%	7.01%	6.81%
Gas Transmission Pipeline	9.82%	12.11%	12.14%	8.77%	8.96%
Fluid Transportation Pipeline	10.13%	10.87%	12.45%	9.50%	10.08%
Railroad	9.08%	11.13%	10.73%	9.30%	9.16%

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

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

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

[7] See the Inflation Section in this narrative.

Updates

Changes Made Since Draft Study

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

Since the draft version was published, we updated the Draft Study as data became available:

- Market-to-book ratios for the guideline companies in each market segment (Market to Book Ratio section and Appendices A, B, C, D, and E).

As a result of comments provided during the comment period, we adjusted or updated:

- Adjusted weightings of the models to select the indicated rate of equity for each market segment. Removed some reliance from the capital asset pricing model (CAPM) using the Business Valuation Resources (BVR) historical, arithmetic equity risk premium, and added reliance to the CAPM using the ex post (Duff & Phelps Historical) equity risk premium. Removed some reliance from the two-stage dividend growth model (DGM) and added reliance to the single-stage DGM.
- Corrected the dividend growth model (DGM) – earnings growth and DGM – dividend growth amounts listed for the gas distribution market segment. These two amounts were transposed. As a result, the department placed reliance on the DGM – dividend growth instead of the DGM – earnings growth in the Draft Study. Making this correction increases the indicated cost of equity and yield rate for the gas distribution market segment.
- Corrected the amount of long-term debt for Phillips 66 Partners, LP to correct a typo. Correct amount 3,443,000,000 – incorrect amount 34,430,000,000. This affects the capital structure for fluid transportation pipeline market segment.
- Updated both modes for the indexed rate of debt in the fluid transportation pipeline market segment to reflect that 3.27% and 6.93% both occur the most in the data set. Previously, only 6.93% was listed.
- Removed Pembina Pipeline Corporation as a guideline company from the gas transmission pipeline market segment. This changed many factors for this market segment. Some key factors include:
    - The capital Structure shifted from 48% debt and 52% equity to 49% debt and 51% equity.
    - The cost of debt decreased from 4.16% to 4.03%.
    - Indicated rate of equity increased from 14.63% to 14.99%.
    - Dividend growth model – using earnings growth estimate increased from 20.43% to 20.86%.
    - Two-stage dividend growth model increased from 18.05% to 18.68%.
    - Beta increased from 1.27 to 1.30. Capital asset pricing models subsequently increased.
    - Overall yield rate after all changes, remained at 9.61%. In an interesting manner, the capital structure shifts, cost of debt, and cost of equity shifts balanced each other out.

Gas transmission pipeline market segment in Draft Study:

	Capital Structure	Rate	Composite
Long-Term Debt	48.00%	4.16%	2.00%
Common Equity	52.00%	14.63%	7.61%
Yield Rate			**9.61%**

Gas transmission pipeline market segment after removing Pembina as a guideline, holding all else the same in the Draft Study:

	Capital Structure	Rate	Composite
Long-Term Debt	49.00%	4.03%	1.97%
Common Equity	51.00%	14.99%	7.64%
Yield Rate			**9.61%**

New This Year

For the 2021 Study, we completed one market segment for railroad companies. We no longer complete the Class I and other railroad market segments separately. Genesee & Wyoming was the only non-Class I railroad and is no longer publicly traded.

We completed a three-stage dividend growth model (DGM) for each guideline company to estimate the cost of equity for each market segment. Last year, we completed a two-stage model called the multi-stage DGM. We renamed this mode the two-stage DGM.

We analyze several sources for equity risk premiums used in the capital asset pricing model (CAPM). This year, we included equity risk premium estimates from Business Valuation Resources Cost of Capital Platform. The Platform allows us to select the length of time for the estimate and includes arithmetic and geometric means.

For each market segment, we reconciled the indicated rate of equity using equal reliance on the

- CAPM using ex post equity risk premium estimate
- CAPM using the Business Valuation Resources equity risk premium, calculated with the arithmetic mean
- DGM using earnings growth (single stage)
- Two-stage DGM using earnings growth

In last year's study, we placed primary reliance on the DGM using earnings growth. We are increasingly concerned with relying on the single-stage dividend growth model. The earnings growth estimates are short-term (three to five years) and are used in an income model that assumes zero growth into perpetuity. These assumptions do not match.

We removed the Debt Rate Analysis Data appendix that was provided in last year's study. We included the issued debt by company and the yield to maturity calculation within the market segment appendices.

Market News

COVID-19

COVID-19 began impacting financial markets in early 2020. The S&P 500 index hit its lowest since 2016 in the early stages of the coronavirus pandemic. The U.S. stock index has since reached record highs. The coronavirus pandemic jeopardized corporate dividend programs earlier in 2020 as companies looking to preserve cash and fortify their finances suspended or slashed dividends. The strong recovery in the latter part of 2020 helped correct the situation to a large extent. Tony Despirito, chief investment officer of U.S. fundamental active equity at BlackRock, stated, "we expect dividend growth to resume in 2021 as vaccine distribution and greater clarity in general give company managements the confidence to release excess cash in the form of dividends and buybacks."[8]

General Market News

In March 2020, the yield on the benchmark 10-year Treasury note fell more than 11 basis points to an all-time low of 0.906% and the yield on the 30-year Treasury bond was also at a record low of 1.601%.[9]

The market yield on the 30-year U.S. Treasury bond decreased from 2.33% on January 2, 2020, to 1.66% on January 4, 2021.[10] The corporate bond December average yields for industrial bonds and public utilities bonds decreased in 2020 compared to 2019, calendar years.[11]

The S&P 500 index finished 2020 with a gain of 16.3% and a total return 18% including dividends. According to Sunitha Thomas, national portfolio advisor at Northern Trust Wealth Management, "We came into the year expecting slow growth and it turned out to be the fastest bear market recovery in history. In February 2020, the S&P 500 fell 8.4%, fell 12.5% in March, and increased 12.7% in April. By August, the index had recovered all of its losses and climbed to new highs.[12]

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8 Ahmed, Saqib Iqbal. (2020). S&P dividend payments to investors hit record in 2020 despite virus hit. Retrieved January 22, 2021 from https://www.reuters.com/article/usa-stocks-dividend/corrected-update-1-sp-dividend-payments-to-investors-hit-record-in-2020-despite-virus-hit-idUSL1N2JA1J6

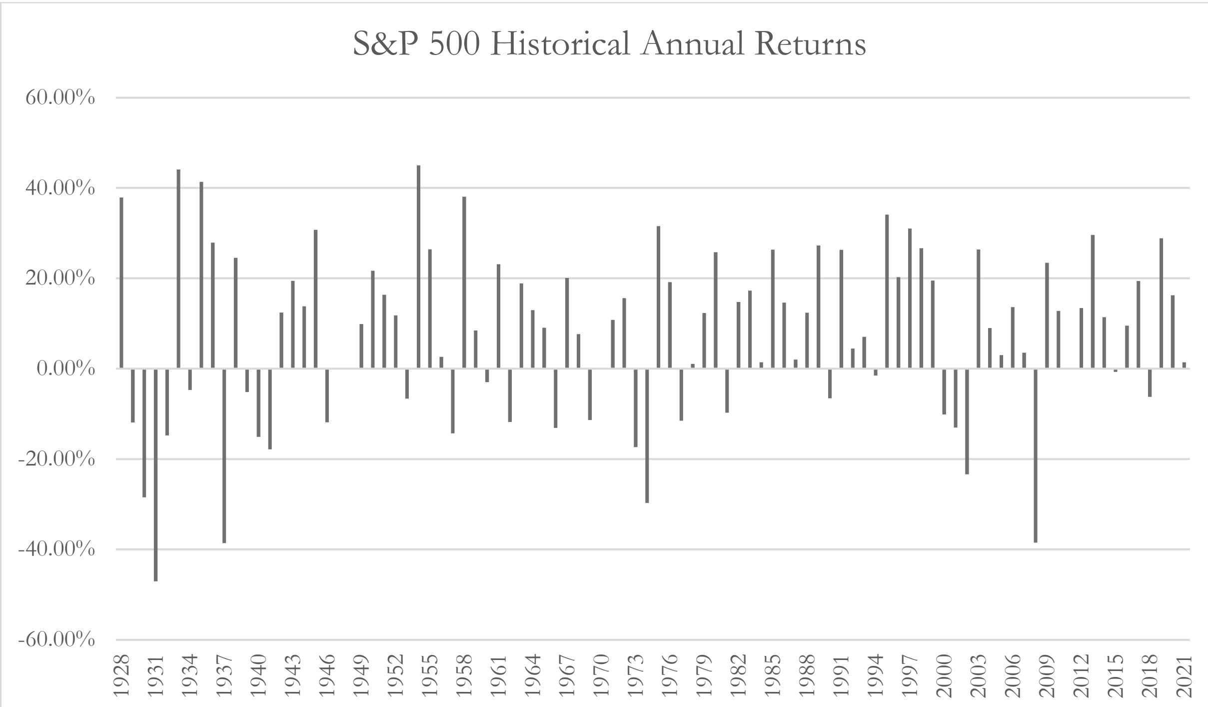
9 Li, Y. (2020). 10-year Treasury yield falls below 1% for the first time after Fed slashes rates due to coronavirus. Retrieved January 27, 2021 from https://www.cnbc.com/2020/03/03/treasury-yields-rise-after-stimulus-hopes-lift-risk-on-sentiment.html

10 https://www.federalreserve.gov/datadownload/Build.aspx?rel=H15

11 Derived from January 2021 and January 2020 Mergent Bond Record Publications.

12 Troise, Damian. (December 31, 2020). S&P 500 closes out 2020 at record high after quiet trading day but a year of wild swings. Retrieved January 14, 2021 from https://www.usatoday.com/story/money/2020/12/31/dow-jones-stocks-were-flat-early-trading-after-year-sharp-swings/4099199001/

This chart shows the annual percentage change in the S&P 500 index back to 1927. Performance is calculated as the percent change from the last trading day of each year compared to the previous year. [13]



Although there were a number of downgrades in debt ratings from investment-grade to high-yield, the yields offered by sub investment-grade debt reached record lows in November 2020. A collection of junk bonds offered an average yield of 4.33% in December 2020.[14]

U.S. corporations owed $10.5 trillion in bonds or loans as of August 31, 2020.[15] There was an increase in corporate debt issuances in the beginning of the pandemic. However, as provided by Brennan (2020), "companies have continued issuing bonds, taking advantage of lower borrowing costs to refinance debt and extend maturities." The yield premium on corporate debt over Treasury's has narrowed in 2020.[16] Yields for investment-grade companies typically fell below 2% in 2020. Accessing bond markets

[13] Data adapted from Yahoo Finance! https://finance.yahoo.com/quote/%5EGSPC/history?period1=-1325635200&period2=1610582400&interval=1d&filter=history&frequency=1d&includeAdjustedClose=true, Retrieved January 14, 2021

[14] Oh, Sunny (2020). This chart shows how U.S. corporate debt ratings are set for a comeback next year. Retrieved January 14, 2021 from https://www.marketwatch.com/story/this-chart-shows-how-u-s-corporate-debt-ratings-are-set-for-a-comeback-next-year-11609347894

[15] Wiltermut, Joy (2020). U.S. corporate debt soars to record $1.5 trillion. Retrieved January 14, 2021 from https://www.marketwatch.com/story/u-s-corporate-debt-soars-to-record-10-5-trillion-11598921886

[16] Brennan, Peter (2020). Fed keeps corporate bond market purring after COVID-19 drove record issuance. Retrieved January 14, 2021 from https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/fed-keeps-corporate-bond-market-purring-after-covid-19-drove-record-issuance-61566560

allowed companies to refinance existing debt not only at lower interest rates but at maturities pushed out several years.[17]

According to The Board of Governors of the Federal Reserve System's Financial Stability Report (November 2020), the Federal Reserve created several emergency lending facilities to "support the flow of credit throughout the economy both by providing backstop measures that give investors confidence that lending support is available should conditions deteriorate substantially and by supplying funding that is more directly used to meet credit demand." The Secondary Market Corporate Credit Facility purchased $13 billion of outstanding nonfinancial corporate bonds by November 2020. The report also notes that asset prices have generally increased since May 2020.[18]

As provided by John Lonski, chief capital markets economist for Moody's Capital Markets Research, "Longer maturities reduce the risk that the borrower may not be able to fund the principal payment once the obligation matures. Today's historically low bond yields have increased the attractiveness of locking up access to financial capital for an extended period and have thereby reduced principal repayment risk."[19]

Accounting organization Deloitte surveys chief financial officers (CFOs) quarterly to gauge CFOs' thoughts across a variety of topics, including the economy. The fourth quarter 2020 survey indicates that nearly two-thirds of those surveyed do not expect pre-crisis operating levels until at least the second half of 2021, and 26% do not expect to get there until the first quarter of 2022 or later. From an economic standpoint, about three-quarters of CFOs expect the US economy to improve in 2021. Eighty percent of CFOs say equities are overvalued, but nearly 60% expect the S&P 500 to be higher at the end of next year.[20]

Companies use dividends and stock buybacks to return cash to shareholders. Among S&P 500 companies, there were 42 dividend suspensions and 26 cuts in 2020.[21] On a per share basis, S&P 500 Q4 2020 dividend payments increased 4.8% from Q3 2020 and down 3.8% from Q4 2019. As provided by Howard Silverblatt, senior index analyst for S&P Dow Jones Indices, "Many companies have stabilized

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[17] Indap, Sujeet. (2021). US cash mountain: The agony of choice. Retrieved January 22, 2021 from https://www.ft.com/content/a850474d-b503-4e0d-abda-2668aa80e60a

[18] Board of Governors of the Federal Reserve System (2020). Financial Stability Report. Retrieved January 14, 2021 from https://www.federalreserve.gov/publications/files/financial-stability-report-20201109.pdf

[19] Lonski, John. (2020). Credit Markets Review and Outlook. Retrieved January 22, 2021 from https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_1262293

[20] Deloitte. (2020). CFO Signals: Q4 2020. Retrieved January 14, 2021 from file:///C:/Users/hsoderbe/AppData/Local/Temp/3/MicrosoftEdgeDownloads/4e14cada-b658-41d2-89b1-9330ed5f3007/us-cfo-q4-high-level-report.pdf

[21] Strauss, Lawrence. (2020). Dividend and buybacks look poised for a 2021 rebound. Retrieved January 14, 2021 from https://www.barrons.com/articles/dividends-and-buybacks-look-poised-for-a-2021-rebound-51608227101

their operations and sales are returning cash flow to the dividend market. Some issues which had suspended their payments at the start of COVID, have resumed payments."[22]

Electric Market Segment

As provided by Value Line Investment Survey, "This has been a difficult year for most stocks in the Electric Utility Industry. Considering how well the group performed in 2019, a reversion to the mean would not have been surprising at all, even if 2020 wasn't such an unusual year. Although the industry is known for its defensive characteristics, these equities got caught up in the market plunge that began in February. The recession caused some companies to cut their earnings guidance upon reporting the first-quarter results. Some companies are also incurring costs directly or indirectly related to the coronavirus pandemic, such as increased bad-debt expense. Most utility equities have recovered in price since then, but not as much as the broader market."[23]

Gas Distribution Market Segment

As provided by Value Line Investment Survey, "A number of stocks in Value Line's Natural Gas Utility Industry have risen in value during the past few months. We think these movements stem partly from better performing financial markets, given some welcome news on the economy. Indeed, for the September period of 2020, GDP jumped 33.1% on an annualized basis, the biggest expansion ever, as businesses reopened and individuals were able to move more freely after a relaxing of restrictions to prevent the spread of COVID-19. (That followed a record economic contraction of 31.4% for the second quarter.) Investors are also drawn to these shares' reliable, healthy amounts of dividend income, unlike a number of companies in other energy-related sectors, which have slashed or even suspended their payouts. The primary attraction of utility equities is their dividends, which tend to be adequately covered by corporate profits. (It's important to mention that the Financial Strength ratings for more than half of the 10 companies in our category are at least an A.) At the time of this industry report, the average yield for the group was 3.4%, compared to the Value Line median of 2.0%."[24]

Gas Transmission Pipeline Market Segment

As provided by Value Line Investment Survey, "Companies in the space experienced improved operational performances compared to weaker second quarter results, but are still largely lagging year over year. This underperformance was partially attributable to lower commodity prices, which have hurt throughput in many pipelines. Too, demand for the commodities was lower due to coronavirus-related economic impacts. Companies have changed their operating mixes over the past 12 months, as asset divestitures have hurt the top lines, as well. Still, the sector has benefited from lower input costs across their systems, and managements have made great strides to reduce administrative expenses. Meanwhile, natural Gas and Oil prices have suffered from higher amounts of price volatility over the past year. But they have rebounded since oil traded at a negative price early in the second quarter. Early fourth-quarter

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22 S&P Dow Jones Indices. (2021). S&P Dow Jones Indices Reports U.S. Indicated Dividend Payments Increased $9.5 Billion in Q4 2020, a reversal from Q3's $2.3 billion decline. Retrieved January 22, 2021 from https://www.prnewswire.com/news-releases/sp-dow-jones-indices-reports-us-indicated-dividend-payments-increased-9-5-billion-in-q4-2020--a-reversal-from-q3s-2-3-billion-decline-301202077.html

23 Debbas, Paul, CFA (2020). Electric Utility (Central Industry). Value Line Investment Survey.

24 Harris, Frederick, III (2020). Natural Gas Utility. Value Line Investment Survey.

prices are higher, but remain lower than levels of a year ago. Elsewhere, interest rates are near record lows in the United States, and this may affect performance over the short term and change capital allocation strategies over the long haul. As for share prices, many stocks remain at depressed levels, even as the S&P 500 recently hit an all-time high. The industry remains well below its apex. Dividend yields here compare favorably with most in the Survey, making the Oil/Gas Industry a solid choice for long-term investors who can withstand some price volatility. The stocks in the Oil/Gas Distribution Industry seem to be somewhat less volatile now than they were at the start of the pandemic. Still, share prices remain low despite a rally in the broader market. Longer-term, earnings growth should be decent, as companies have moved into operations that are less dependent on oil and natural gas prices. When prices are this low, it often affects upstream drillers and reduces demand for transportation. Demand for natural gas as a power source will likely increase both in the United States and abroad. Further buildouts should slow considerably, allowing companies to use cash flow on shareholder-friendly initiatives. Dividends have largely held steady in this space, despite a weak economic backdrop, while other industries have dealt with payout suspensions. In many cases, dividend yields have remained well above the Value Line average."[25]

Fluid Transportation Pipeline Market Segment

As provided by Value Line Investment Survey, "The MLP [Master Limited Partnership] Industry consists of tax-advantaged oil and gas transporting, processing, and distribution companies. They do not pay state or federal corporate income taxes. Instead, the general partnerships (GP) typically pay out all of their distributable income to unitholders (usually, earnings plus depreciation and other noncash expenses, minus maintenance capital spending and payouts to the general partner) less a small portion retained to fund growth. MLPs own storage, processing, and transportation assets and charge customers fees for usage. They do not typically take title to hydrocarbons and, thus, are not generally directly exposed to commodity prices. MLPs are operated by a GP, which often trades separately. Oil and gas production trended higher for many years. This growth came largely from the domestic shale regions. As a result, production growth outpaced domestic consumption, and the United States became a net exporter of oil. This was the first time this has happened since the 1950s. But more supply has also caused downward pressure on price realizations over the past 12 months. Meanwhile, the COVID-19 pandemic and the ensuing stay-at-home orders crippled end-use consumer demand for fossil fuels. To make matters worse, it took Russia and OPEC some time to come to an agreement on dialing back oil production, which applied further pressure to commodity prices. These factors are evident in natural gas marketed production falling 3.8% versus the prior-year figures, to 3.039 trillion cubic feet, or roughly 98.0 billion cubic feet per day for the month of August (the latest period with available data). Natural gas has maintained a cost advantage over other fossil fuels for some time now. This has helped to keep the industry in a growth phase. However, over the past year, crude oil prices have been trading in a wide range with highs of $63.27 per barrel, and a brief fall into negative territory. More recently, West Texas Intermediate (WTI) and Brent crude were trading at about $41.00 per barrel and $43.55 per barrel, respectively. What's more, with the reduced demand and uncertainty from the coronavirus, commodity prices may continue to lag. Should oil prices trend lower, this will likely weigh on the economic viability of some regions. Areas like the Eagle Ford are capable of producing profitably at $25.00 a barrel, while other shale plays need prices of $75.00 to stay in the black. As a result, many producers size up what kind of flow-through they can expect at the wellhead, then cap those wells, and wait for

[25] Seibert, John, III. (2020). Oil/Gas Distribution Industry. Value Line Investment Survey.

rising prices. Still, the industry has been getting a boost from the relatively low interest-rate environment facilitated by the Federal Reserve. This has allowed MLPs to finance their capital projects at a discount. It remains to be seen what the Fed will do, following some major central banks' shifting to negative interest rates. This means that investors will actually have to pay to hold bonds in those countries as a means to store cash balances. These trends should allow for more cost-efficient capital project financing. Many of the more financially sound companies in this space are self-funding their growth projects. As U.S. energy exports continue to surge, MLPs are quickly responding with increased capacity for transportation and processing. Unfortunately, the economic headwinds stemming from the coronavirus pandemic have severely hindered consumer demand. At the same time, although fossil fuel prices have rebounded from their 52-week lows, they are still trading significantly lower than they were. These trends have curtailed system throughput lower than before public health concerns arose. An important shift in policy regulations by the Federal Energy Regulatory Commission has disallowed income tax recovery on some cost-of-service rate contracts for interstate pipelines. The old policy allowed MLPs to include an income tax allowance in that fee structure. However, since most MLPs pay little to no income taxes, some argued that the old policy effectively allowed them to recover taxes twice. At this point, this policy change is only expected to impact those with regulated cost-of-service pipelines. Thus, most companies affected by the shift have had their general partners buy-in their MLP entities. This past July, the FERC softened its stance on its original policy, stating that the MLPs could recoup those taxes paid by a corporate parent if one exists."[26]

Railroad Market Segment

As provided by Value Line Investment Survey, "All railroads are now trading at levels higher than they were before the outbreak of the COVID-19 virus. These companies saw sharp volume declines in the second quarter, but have since seen healthy improvements. Railroads are now starting to roll out more locomotives and railcars from storage, as well as bring back furloughed workers to meet the growing demand. The industry has been cautious with new crew starts, owing to longer train lengths and heavier weights. Intermodal carloads have rebounded faster than other areas of the economy. The acceleration in e-commerce traffic and inventory restocking, due to the COVID-19 pandemic, has fueled the gains in this sector. The implementation of the Precision Scheduled Railroading (PSR) model, which seeks to do more with less, continues to be a theme."[27]

[26] Fong, Bryan. (2020). Pipeline MLPs. Value Line Investment Survey.

[27] Collins, Michael. (2020). 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.[28] Yield capitalization calculates the present value of the anticipated future income by discounting cash flows using the yield rate (Y_0).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 located in the proper sector.[29]

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

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

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

Guideline 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

We did not make any changes to the guideline companies in the electric market segment.

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

Gas Distribution Market Segment
We did not make any changes to the guideline companies in the gas distribution market segment.

Gas Transmission Pipeline Market Segment
We removed TC Energy Corporation as a guideline company. TC Energy Corporation has entered a definitive agreement and planned merger to acquire all of the outstanding units of TC PipeLines LP not beneficially owned by TC Energy or its affiliates. [30] Given this significant acquisition, we are not including TC Energy Corporation as a guideline company for this year.

Fluid Transportation Pipeline Market Segment
The department included MPLX LP as a guideline company. For the 2020 Study, we removed MPLX LP as a guideline company related to a merger that the company since completed.[31]

Railroad Market Segment
We removed Genesee & Wyoming Inc. as a guideline company as it is no longer publicly traded.[32]

We completed one market segment for railroads for this study.

Market Rate of Equity

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

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

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

Capital Asset Pricing Model (CAPM)

The CAPM is based on the theory that all investors will independently optimize their portfolios. The expected return on an asset is related to its risk. We used this model to determine the market rate of equity. For the risk-free rate in the CAPM, we use the U.S. Treasury 30-year coupon bond yield. We also use a market-specific beta calculated with data from the Value Line Investment Survey.

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30 https://www.globenewswire.com/news-release/2020/12/15/2145167/0/en/TC-Energy-announces-definitive-agreement-to-acquire-all-outstanding-common-units-of-TC-PipeLines-LP.html, Retrieved January 11, 2021

31 Retrieved November 27, 2019 from https://www.prnewswire.com/news-releases/mplx-completes-acquisition-of-andeavor-logistics-300893108.html

32 https://ir.gwrr.com/press-release/acquisitions-investments/genesee-wyoming-announces-completion-sale-brookfield, Retrieved January 7, 2020

The CAPM is based on the following assumptions, according to Shannon Pratt and Roger Grabowski [33]:

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, 2021, property assessment date. We used a risk-free rate of 1.66% for this study.[34] This rate includes inflation expectations.[35, 36]

"Low interest rates are not a short-term aberration, but part of a long-term trend," Ben Bernanke noted during his term as Federal Reserve chair. The Fed, he added, is keeping the interest rates low, only in a very narrow sense: "The [Federal Reserve's] ability to affect real rates of return, especially longer-term real rates, is transitory and limited."[37]

While serving as vice chair of the Federal Reserve, Stanley Fischer said, "The actual federal funds rate has to be so low for the Fed to meet its objectives suggests that the equilibrium interest rate –that is, the federal funds rate that will prevail in the longer run, once cyclical and other transitory factors have played out—has fallen." In addition, "…changes in factors over which the Federal Reserve has little influence—such as technological innovation and demographics—are important factors contributing to both short- and long-term interest rates being so low at present." [38]

Corporate finance and equity valuation expert Dr. Aswath Damodaran also addressed this topic: "There is only one rate that the Federal Reserve sets, and it is the Fed Funds rate. It is the rate at which banks

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

34 The daily observations rate for 30-year U.S. Treasury coupon bonds was 1.66% as of January 4, 2021.

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

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

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

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

trade funds that they hold at the Federal Reserve, with each other. … [I]nterest rates in the U.S. (and Europe) have been low because inflation has been non-existent and real growth has been anemic."[39]

In another publication, Damodaran notes: "In the long term, the real riskless rate will converge on the real growth rate of the economy and the nominal riskless rate will approach the nominal growth rate of the economy.… A simple rule of thumb on the stable growth rate is that it should not exceed the riskless rate used in the valuation"[40].

Some company representatives have suggested that the risk-free rate used in the capital asset pricing model is arbitrarily low due to actions of the Federal Reserve, and that we should normalize to a higher risk-free rate. According to the Federal Reserve website, "the Federal Reserve controls three tools of monetary policy – open market operations, the discount rate, and reserve requirements."[41] Using the three tools, the Federal Reserve influences the demand for, and supply of, balances that depository institutions hold at Federal Reserve Banks and in this way alters the federal funds rate.[42]

According to Thornton, "the Fed's ability to control interest rates is exaggerated for the simple reason that historically the effect of policy actions on the total supply of credit has been too small to have a significant effect on the level of the structure of interest rates."[43] According to Fama, "The evidence says that Fed actions with respect to its target rate TF have little effect on long-term interest rates, and there is substantial uncertainty about the extent of Fed control of short-term rates."[44] We will continue to use the actual yield on U.S. Treasury Securities rather than a "normalized" rate.[45]

Some company representatives have suggested using the risk-free rate listed by Damodaran to match the use of the implied risk premium calculated by Damodaran. The risk-free rate listed in the data set is 0.93%. This is the U.S. Treasury Bond Yield on 10-year securities as of January 4, 2021, not a forward-looking estimate. We used the yield on 30-year U.S. Treasury Bonds as of January 4, 2021, to match the length of time used in the Yield to Maturities calculation for the cost of debt.

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

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

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

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

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

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

45 Except for the normalized rate required to be used in conjunction with the Duff & Phelps equity risk premium.

Beta

The beta[46] 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.[47] 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 of these factors push betas towards one.[48]

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. [49]

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)].[50]

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.[51] Bradford Cornell has a similar definition for the equity risk premium, noting it is the

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

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

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

49 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.

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

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

difference between the return on common stock and the return on government securities.[52] 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."[53]

As provided by Pratt and Grabowski, "There is no one universally accepted method for estimate the ERP [equity risk premium].[54] A wide variety of premiums are used in practice and recommended by academics and financial advisors." We reviewed seven different calculations of the equity risk premium:

> **Ex Post** (7.25%)
> A long-horizon expected equity risk premium from Duff & Phelps Cost of Capital Navigator, last updated February 9, 2021.[55] Large company stock total returns minus long-term government bond income returns.[56] As provided in Duff & Phelps Valuation Handbook, the long-term "historical" equity risk premium is calculated as, "the average annual return of the S&P 500 total return index minus the average annual return of the SBBI long-term (20-year) government bond income return series over the 1926-2016 time period."[57]

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

53 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

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

55 Duff & Phelps. (2020). *Cost of Capital Navigator*. Historical long-term (1926-present) equity risk premium. Retrieved January 27, 2021 from https://costofcapital.duffandphelps.com/landing

56 Duff & Phelps. (2017). *Valuation Handbook: Guide to Cost of Capital*. Hoboken: John Wiley & Sons. Chapter 3, Page 1

57 Duff & Phelps. (2017). *Valuation Handbook: Guide to Cost of Capital*. Hoboken: John Wiley & Sons. Chapter 5, p. 14.

Supply Side (6%)
A long-horizon expected equity risk premium forecasted by the use of supply side models from Duff & Phelps Cost of Capital Navigator.[58] Finance and capital expert Roger Ibbotson described the Supply Side Model in his Stocks, Bonds, Bills, and Inflation Yearbook: "Long-term expected equity return scan be forecasted by the use of supply side models. "The supply of stock market returns is generated by the productivity of the corporations in the real economy. Investors should not expect a much higher or lower return than that produced by the companies in the real economy. Thus, over the long run, equity returns should be close to the long-run supply estimates." [59]

Three Stage Ex Ante (5.91%)
A forward looking model using a three-stage dividend growth model of the S&P 500. We calculated this equity risk premium. [60] 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 regards to company growth." [61]

We received suggestions for completing a single-stage ex ante calculation. In the three-stage model:

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

Applying the short-term growth rate (13.26%) to a single-stage model would imply that the S&P 500 will continue to grow at 13.26% in perpetuity. Financial theory suggests that the sustainable growth rate used in a single-stage model cannot exceed the long-term growth rate of the economy as a whole. Therefore, we did not complete a single-stage ex ante calculation.

Damodaran (4.2%)
An implied equity risk premium as calculated by Damodaran, Professor of Finance at the Stern School of Business at New York University.[62] Dr. Damodaran estimates equity risk premium using the current level of index, the expected dividends on stock, and the expected growth rate in earnings. The expected growth rate from 1960 to 1985 Dr. Damodaran estimated using historical

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58 Duff & Phelps. (2021). *Cost of Capital Navigator*. Supply side (1926-present) equity risk premium. Retrieved February 9, 2021 from https://costofcapital.duffandphelps.com/landing

59 *Ibbotson SBBI 2013 valuation yearbook: market results for stocks, bonds, bills, and inflation, 1926-2012*. (2013). Chicago: Morningstar. P. 64.

60 See Appendix F for this calculation.

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

62 Damodaran, Aswath (2020). Implied Equity Risk Premium on January 1, 2021. Retrieved on January 8, 2021 from http://pages.stern.nyu.edu/~adamodar/

growth rates. From 1985 onwards, he uses the Zacks Investment Research consensus estimate of growth for the stocks in the S&P 500.[63]

Some company representatives have debated that the correct equity risk premium to use as calculated by Damodaran is the historical risk premium comparing stocks to Treasury bonds from 1928 to the current year. While this is a similar calculation to the Duff & Phelps equity risk premium and the ex post equity risk premium, we find that using Damodaran's forward-looking approach allows for a different calculation than already provided by the other equity risk premium estimates.

Duff & Phelps (5.5%)
A recommended equity risk premium (conditional), to use with 2.5% "normalized risk-free rate."[64] Duff & Phelps develops the "Duff & Phelps Recommended ERP [equity risk premium]" and publishes the rate in their Cost of Capital Navigator. As provided by Duff & Phelps Valuation Handbook, "Duff & Phelps employs a multi-faceted analysis to estimate the conditional ERP that takes into account broad range of economic information and multiple ERP estimation methodologies to arrive at its recommendation."[65]

Duke CFO Global Business Outlook Survey (5.31%)
Known as the CFO Study, this survey is issued by Duke University's Fuqua School of Business and the Federal Reserve Banks of Richmond and Atlanta. It was fielded from November 30 to December 11, 2020. The 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 6.20% over the next ten years.[66] This is paired with the annual yield on 10-year Treasury Bonds of 0.89%.[67] Graham & Harvey also published a paper regarding their 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."[68]

Fernandez, Apellaniz, and Acin (5.6%)
A forward-looking equity risk premium based on surveys of finance and economics professors,

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

64 Duff & Phelps. (2021). *Cost of Capital Navigator*. Recommended equity risk premium and normalized risk-free rate. Retrieved February 9, 2021 from https://costofcapital.duffandphelps.com/landing

65 Duff & Phelps. (2017). *Valuation Handbook: Guide to Cost of Capital*. Hoboken: John Wiley & Sons. Chapter 3, p. 38.

66 Duke CFO Global Business Outlook Survey (2020). Retrieved January 10, 2020 from https://www.cfosurvey.org/ and https://www.cfosurvey.org/wp-content/uploads/2019/12/2019-Q4-US-Banners.pdf

67 The daily observations rate for 10-year U.S. Treasury coupon bonds was 0.89% as of December 31, 2020.

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

analysts and managers of companies and their opinion of the required market risk premium in different countries.[69]

Business Valuation Resources, Historical, Arithmetic Mean (5.9%)
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.[70]

Note: Business Valuation Resources' Cost of Capital Platform allows users to select different starting points other than 1928.

Business Valuation Resources, Historical, Geometric Mean (4.59%)
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.[71]

Note: Business Valuation Resources' Cost of Capital Platform allows users to select different starting points other than 1928.

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 security's required rate of return. In general, the lower the returns, the greater is the disparity between the two averages.[72] 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."[73] In 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

69 Fernandez, P., Apellaniz, E., and Acín, J. F. (March 2020). *Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020:* SSRN Electronic Journal. https://ssrn.com/abstract=3560869

70 Business Valuation Resources. (2021). *Cost of Capital Platform.* Historical Equity Risk Premium (20-Year T-Bond) – for Period 1928-2020), Arithmetic Average. Retrieved February 2, 2021 from https://coc.bvresources.com/#/

71 Business Valuation Resources. (2021). *Cost of Capital Platform.* Historical Equity Risk Premium (20-Year T-Bond) – for Period 1928-2020), Geometric Average. Retrieved February 2, 2021 from https://coc.bvresources.com/#/

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

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

approaches 1. For even longer horizons, both the geometric and arithmetic average forecasts will be upwardly biased."[74]

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. [75]

Empirical Capital Asset Pricing Model

The empirical capital asset pricing model (ECAPM) is a modification of the above 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.

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."[76]

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

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.

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[74] 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

[75] 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

[76] 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

Dividend Growth Model (DGM)

We also used the DGM to determine the market rate of equity. It is based on the theory that the prices paid for a share of stock reflect the investors' discounted present value of future expected earnings.[77] The DGM is a widely used method and is also called the discounted cash flows model or Gordon growth model.

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

The formula for this model is the same as the simplified discounted cash flows income model explained previously, referred to as stable growth yield capitalization, using a stable growth rate.

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."[78]

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

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

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

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

Market Rate of Equity for Market Segment = DY + DG

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

Market Rate of Equity for Market Segment = DY + EG

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

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

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 2017-2019 to 2023-2025. We use these growth rates in the dividend growth model for each market segment.[79]

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

The growth rate used in the DGM is a short-term growth rate, typically much higher than the growth rate of the U.S. economy. We use this to calculate value of a company into perpetuity. It is not possible for a company to grow at a growth rate higher than the U.S. economy in the long-term. According to Damodaran, "the amount of cash that U.S. companies are returning to stockholders is unstainable, given the earnings and expectations of growth."[80] Pratt and Grabowski also state, "Long-term growth rates exceeding the real growth in GDP (Gross Domestic Product) plus inflation are generally not sustainable."[81]

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79 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. For the 2020 and 2021 studies, Value Line does have sufficient data for these market segments and the department is using Value Line in order to remain consistent with the other market segments.

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

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

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:

$$K_E = (DY \times (1+.5(G)) + 0.67(G_1) + 0.33(g)$$

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

Three-Stage Dividend Growth Model

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

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

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

Stock Buybacks

A company's net income represents income that the company can reinvest or distribute to its owners.[82] 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.[83]

Because a company cannot act as its own shareholder, it absorbs repurchased shares, reducing the number of outstanding shares on the market. This increases the relative ownership stake of each investor because there are fewer shares, or claims, on the company earnings. The amount of cash that U.S. companies are returning to stockholders is unsustainable, given the earnings and expectations of growth.

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

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

In 2015 and 2016, the companies in the S&P 500 returned more than 100% of earnings to investors.[84] As provided by Sanders and Schumer (2019), "between 2008 and 2017, 466 of the S&P 500 companies spent around $4 trillion on stock buybacks, equal to 53 percent of profits. An additional 40 percent of corporate profits went to dividends."[85] Another article notes, "U.S. companies have spent $1 trillion this year on buying back their own stock – a record figure reached three weeks before year's end."[86] In 2019, the S&P 500 paid an aggregate $485.48 billion to shareholders, up 6.4% from 2018, and marks the eight consecutive year of record payments.[87] The S&P 500 Index spent $806 billion in stock buybacks in 2018 and $370 billion in repurchases during the first half of 2019.[88] Debt-funded repurchases reached a record level of 34% of the total in 2017 with most repurchases funded with cash in 2018.[89]

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

Build-Up Model

The build-up model is another model used to estimate the market rate of equity. Some view this as a version of the CAPM without specifically incorporating systematic risk.[90] The CAPM assumes that the risk premium portion of a security's expected return is a function of that security's systematic risk.[91]

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.[92]

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

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

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

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

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

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

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

91 Ibid, p. 105

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

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

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

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 the Build-Up Model.

Market Rate of Debt

Beginning with the 2018 study, we analyzed the guideline companies' actual cost of debt and used them to estimate debt rates.[93] For the 2021 study, we will continue to analyze the guideline companies' actual cost of debt as an estimate for each market segment. This process provides greater transparency with the issuances used in the calculations than using averages from the Mergent Bond Record and provides a more accurate reflection of the market segment than using averages based on debt ratings.

We compiled our debt analysis using a majority blend of the market-observed, true cost of each guideline company's debt – using yield to maturity (YTM) calculations as described below – and spread analysis when such data was unavailable. The Current Actual Cost of Debt pages for each market segment (see appendices A through E) references this debt analysis.

We calculated the YTMs for each guideline company based on the following information: the issuers' stated coupon rate, maturity date, settlement date (three business days following pricing date, the normal settlement for corporate debt), closing market price, and eventual redemption price. As provided by the Western States Association of Tax Administrators Appraisal handbook:

> Four basic conditions are present in a bond: (a) coupon rate, (b) period of years to maturity, (c) present value of the bond, and (d) yield to maturity.… Effective rates for new issues and yield to maturity rates based on current market prices usually provide an excellent pattern of debt rates to determine the debt costs of a particular industry. The current cost of a closely held bond issue, which is not publicly traded, can be ascertained by comparing it with similar publicly traded bond with the same risk and term to maturity.[94]

To find each individual guideline company's cost of debt, we:

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[93] In previous years, the department used the Corporate Bond Yield Averages for Public Utility Bonds from Mergent Bond Record as an estimate of the cost of debt for the Electric and Gas Distribution market segments and the Corporate Bond Yield Averages for Industrial Bonds from Mergent Bond Record, for the Gas Transmission Pipeline, Fluid Transportation Pipeline, and Railroad market segments.

[94] Western States Association of Tax Administrators (2009). Appraisal Handbook – Unit Valuation of Centrally Assessed Properties, Pages III-28 -29

1. Accessed public information available for specific corporate bond mutual funds on the website for these specific funds.[95]
   - TIIA-CREF Bond Index Fund
   - Vanguard Long-Term Corporate Bond Index Fund Admiral Shares
   - BlackRock Allocation Target Shares; Series C Fund
2. Identified company-specific marketable debt securities data, which include: issue name, coupon rate, maturity date, holding (face) amount, and market value amount.
3. Combined the data with reasonable assumptions to calculate the cost of debt.
4. Derived the Yield to Maturity (YTM) for each company. We calculate a market price (Market Value divided by Face Value). From that point we assume:
   - A T+3 settlement date from the date listed on the fund (December 31, 2020)
   - A redemption price of par ($100.00)
   - A semi-annual interest payment
   - The debt is non-callable (the "make whole" call included in most corporate debt securities favors the issuer and is therefore irrelevant to the company's cost of debt)

We calculated 32 of the 39 guideline companies' cost of debt and YTM using the method outlined above.[96] For seen companies, we employed a spread analysis tool using long-term debt information from the guideline company's most recently published Form 10-K, 10-Q or public statement regarding recently issued debt.

We focused on a long-term average industry YTM.[97] To arrive at this average, we built a spot U.S. Treasury zero coupon yield curve and then calculated a Z-spread to build out the data. This "boot-strapping" process is common practice in the financial sector when it comes to pricing new issue corporate debt.

As provided by Pratt & Grabowski:

> Traditionally, the relevant market "yield" has been either the yield to maturity or the yield-to-call date. Either of these yields represents the total return the debt holder expects to receive over the life of the debt instrument, including current yield and any appreciation or depreciation from the market price, to the redemption of the debt at either its maturity or its call date, if callable. If the stated interest rate is above current

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[95] Data downloaded on January 14 -19, 2021 from: https://www.tiaa.org/public/investment-performance/mutualfunds/profile?ticker=20739663; https://investor.vanguard.com/mutual-funds/profile/portfolio/VLTCX/portfolio-holdings; and https://www.blackrock.com/us/individual/products/239460/ishares-credit-bond-etf

[96] The 39-guideline company total does not double count the guideline companies used in both the electric and gas distribution market segments.

[97] The indexed cost of debt analysis in the Capitalization Rate Studies prior to the 2018 assessment year also used a long-term basis.

market rates, the bond would be excited to sell at a premium. The yield-to-call date would probably be the appropriate yield, because it is likely to be in the issuer's best interest to call it (redeem it) as soon as possible and refinance it at a lower interest cost. If the stated interest rate is below current market rates, then it usually would not be attractive to the issuer to call it, and the yield to maturity would be the most appropriate rate.[98]

Why use Yield to Maturity?

The Yield to Maturity (YTM) calculation is the most popular measure of yield in the bond market.[99] YTM represents a summation of the present values of the interest cash-flows that equal the current market price of the bond, as well as the accrued interest due on that principle. The financial sector accepts YTM calculations on secondary corporate bonds as a clear representation of the borrower's current cost of capital for that specific maturity, no matter the issue date.

We used information filed publicly with the Securities and Exchange Committee to calculate the YTM for each guideline company. We used the YTM as the cost of debt for each market segment.

Yield to Maturity Example

The overarching popularity of the YTM calculation stems from its ability to constantly adjust its yield through various interest rate environments over time. For example, let us assume:

- XYZ Corp. comes to market on January 2, 2010, to borrow money for 20 years.
- XYZ's prevailing cost of debt is 10%, and its bond is issued with a 10% coupon rate.
- A decade later (January 2, 2020), XYZ's cost of debt is now 5%.

An investor will pay more for the XYZ Corp. bond on January 2, 2020, because the coupon rate of 10% is higher than the market rate of 5%. In this example, the price is $142 – as shown in this table – a $42 premium over the original (par) value of $100.

Purchase Date	Market Rate	Coupon	Maturity Date	Market Price	Yield to Maturity
January 2, 2010	10%	10%	January 2, 2030	$100.00	10%
January 2, 2020	5%	10%	January 2, 2030	$142.00	5%

This premium will disappear as time progresses and the bond eventually matures at its par value of $100 on January 2, 2030. An investor who purchases the bond in 2020 does not recover the $42 premium. The bond yields 10% interest each year, but the premium reduces the investor's actual yield for the 10 years they hold the bond to 5% – the bond's YTM.

[98] Pratt, Shannon and Grabowski, Roger. (2010). *Cost of Capital Applications and Examples,* 4th Ed., Pages 65-66

[99] Fabozzi, Frank Ph.D. CFA. (2000). *Fixed Income Analysis*. p.187

This behavior explains why cost-of-debt indexes rely on YTM calculations to ensure accuracy in the face of changing market rates. The YTM tracks a company's current cost of debt – even if the company is not currently looking to borrow capital or has not recently borrowed capital.

Market Rate of Preferred Stock

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

Direct Capitalization Rate (Direct Rate)

Appraisers use direct capitalization to convert an estimate of a single year's net operating income expectancy into an indication of value in one direct step.[100]

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

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

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

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

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

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

Equity Component

We used an inverse of the Price to Earnings Ratio (P/E Ratio) to estimate the equity component in 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

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

cost of capital is not affected by the flotation costs of a particular firm.[101] The correct procedure for the economic analysis of flotation costs does not alter the weighted average cost of capital.[102]

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

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."[103]

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.[104]

We do not include an adjustment for flotation costs.

Company-Specific Risk

The department does not include an adjustment for company-specific risk or 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.[105] 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.[106]

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

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

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

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

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

[106] 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.

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."[107]

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.[108]

Illiquidity

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

> A discount rate reflects the relationship between income and the value that a market will attribute to that income. The financial and economic concepts implicitly in a discount rate are complex and have been the subject of significant analysis for more than a century. Although four key components can be identified within a discount rate – the safe rate plus considerations of illiquidity, management, and various risks – a discount rate that is constructed by adding allowances for these components can be misleading and inaccurate.[109]

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, the model may not accurately reflect the market value of the company.

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

The implied growth rate is the difference between the yield rate and the direct rate. The direct rate is the relationship between an estimate of a single year's net operating income and the value of the property, while the yield rate converts income from future periods into present value.

The Western States Association of Tax Administrators Appraisal Handbook states, "direct capitalization is not affected by the appraiser's view of the future income."[110] In addition, Unit Valuation Insights

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

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

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

[110] Ibid., Page III-9

states, "The direct capitalization rate is typically calculated as the yield capitalization rate minus an expected long-term growth rate."[111]

Short-Term Growth Rate

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

Zacks Investment Research provides industry growth estimates for the next five years, by industry. We downloaded this data on January 28, 2020.

Electric	Gas Distribution	Gas Transmission Pipeline	Fluid Transportation Pipeline	Railroad
6.5%	8.3%	7.8%	10%	9.4%

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

Source	CFRA[112]	Reuters 5 Year[113]	Value Line Earnings[114]	Value Line Dividends[115]	Yahoo! Finance[116]	Zacks[117]
Electric	6%	4.58%	5.5%	3.4%	5.9%	5.67%
Gas Distribution	6%	3.41%	6.25%	6%	5.19%	5.9%
Gas Transmission Pipeline	6%	14.84%	12%	6.5%	4.86%	5%
Fluid Transportation Pipeline	7%	6.25%	8%	4.50%	-0.44%	N/A
Railroad	7%	9.32%	10.5%	7.75%	7.65%	8.19%

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

112 CFRA (as downloaded from S&P NetAdvantage) three-year projected earnings per share compound annual growth rate. CFRA stock reports dated January 12, 2021.

113 Reuters five-year earnings per share growth rates downloaded January 12-13, 2021.

114 Value Line Investment Survey provides estimated growth rates for dividends and earnings 2017-2019 to 2023-2025. Value Line tear sheets are dated October 23, 2020 to November 27, 2020.

115 Value Line Investment Survey provides estimated growth rates for dividends and earnings 2017-2019 to 2023-2025. Value Line tear sheets are dated October 23, 2020 to November 27, 2020.

116 Yahoo! Finance growth estimates, next five years (per annum) downloaded on January 12, 2021.

117 Zacks Investment Research provides expected earnings per share growth (3-5 years). Data downloaded January 12, 2021.

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
5.67%	5.9%	6.5%	6.62%	8.19%

This evidence indicates that there is significant short-term growth in each market segment.

Long-Term Growth Rate

We reviewed long-term growth rates from several sources to derive an estimate of long-term growth for the market as a whole. "Since no firm can grow forever at a rate higher than the growth rate of the economy in which it operates, the constant growth rate cannot be greater than the overall growth rate of the economy."[118] These sources indicate varying rates of growth in the U.S. economy over the long-term:

- The market yield on 30-year U.S. Treasury was 1.66% on January 4, 2021.[119]
- The Federal Reserve Bank projects their "longer run" estimate of change in U.S. real Gross Domestic Product (GDP) at 1.8%[120].
- The World Bank forecasts U.S. GDP will grow 3.5% in 2021, and 3.3% in 2022.[121]
- Trading Economics projects the U.S. GDP annual growth rate to trend around 1.9% in 2022.[122]
- The Economist Intelligence Unit forecasts U.S. real GDP will grow 1.7% from 2020 to 2050.[123]

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

[119] Board of Governors of the Federal Reserve System, H.15, Selected Interest Rates, Market Yield on U.S. Treasury Securities 30-year constant maturity quoted on investment bases, daily observations, January 4, 2021. Retrieved January 13, 2021 from http://www.federalreserve.gov/

[120] Board of Governors of the Federal Reserve System, Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy. December 2020 Retrieved January 14, 2021 from https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20191211.pdf

[121] World Bank Group Flagship Report, Global Economic Prospects. January 2021. Page 4. Retrieved January 14, 2021 from http://www.worldbank.org/en/publication/global-economic-prospects

[122] Trading Economics, United States GDP Growth Rate Forecast. Retrieved January 14, 2021 from https://tradingeconomics.com/united-states/gdp-growth

[123] The Economist Intelligence Unit. July 6, 2020 Retrieved January 14, 2021 from http://country.eiu.com/article.aspx?articleid=1418456125&Country=United States&topic=Economy&subtopic=Long-term+outlook&subsubtopic=Summary

- The Congressional Budget Office projects that real GDP will shrink 2.5% in 2020 and grow 3.7% in 2021 and 2.4% in 2022. The CBO projects that real GDP will grow at an annual average of 2.3% in 2023, 2.2% from 2024 to 2025, and 1.6% from 2026 to 2031.[124]

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

Inflation

Inflation makes future income less valuable than today's income. Inflation is the percentage change in the value of the Wholesale Price Index (WPI) on a year-to-year basis. It effectively measures the change in the prices of a basket of goods and services in a year.[125]

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."[126] According to Damodaran, "An inflation-indexed Treasury security does not offer a guaranteed nominal return to buyers, but instead provides a guaranteed real return."[127]

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."[128] Cornell continues, "When investors invest, their goal is to increase future consumption. Consequently, the success of an investment is measured not in nominal dollars but real dollars… investors are concerned with real returns, defined as the percent increase in purchasing power, not nominal returns."[129]

The U.S. Treasury issues inflation-indexed securities. Comparing the inflation-indexed securities to the non-inflation indexed securities, one can calculate the inflation rate. Using the 10-year, 20-year, and 30-year securities, we calculated the inflation rates as of January 4, 2021.[130]

	10-Year	20-Year	30-Year
Calculated Inflation	2.01%	2.09%	2.05%

[124] Congressional Budget Office. (Feb 2021). An Overview of the Economic Outlook: 2021 to 2031. Retrieved February 2, 2021 from https://www.cbo.gov/system/files/2021-02/56965-Economic-Outlook.pdf

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

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

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

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

[129] Ibid. Page 31

[130] Difference between inflation-indexed and non-inflation indexed securities for 10-year, 20-year, and 30-year daily rates as of January 4, 2021. Retrieved January 13, 2021 from www.federalreserve.gov

An Overview of the Economic Outlook: 2021-2031, published by the Congressional Budget Office (CBO), estimates that inflation for personal consumption expenditures will change from year to year by 1.2% in 2020, 1.63% in 2021, 1.8% in 2022, 1.9% in 2023, 2% from 2024 to 2025, and 1.7% from 2026 to 2031.[131]

The Federal Reserve Board members and the Federal Reserve Bank presidents estimated the longer-run personal consumption expenditures inflation rate at 2%.[132]

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

Given the indicated long-term real growth rate of 1.7% and the expected inflation rate of 2.0%, we estimated the long-term growth rate at 3.7%.[133]

Market to Book Ratios

We analyzed market-to-book ratios of publicly traded stock and debt securities by market segment as data is available. 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.

For more information, see each market segment's Market-to-Book Ratio analysis in the appendices of this report.

In addition to market-to-book ratios, the department reviewed the Houlihan Lokey 2018 Purchase Price Allocation Study, published in June 2020. The Houlihan Lokey 2019 Purchase Price Allocation Study is not yet published as of April 2021. The department is relying on the 2018 Purchase Price Allocation Study as the 2019 or 2020 Purchase Price Allocation Studies were not available in time for this publication. Houlihan Lokey reviewed public filings for 2,428 completed transactions in 2018. The number of transactions that met the search criteria increased after incorporating data from multiple providers. After apply search criteria, there was sufficient disclosures for 715 transactions. The Houlihan Lokey study reviews the amount of purchase consideration allocated to tangible assets, identifiable intangible assets, and goodwill. The 2018 study finds that:

- The median percentage of purchase consideration allocated to intangible assets in 2018 and 2017 was 33% and 35%, respectively (p. 15).

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131 Congressional Budget Office. (Feb 2021). to the Overview of the Economic Outlook: 2021 to 2031. Retrieved February 2, 2021 from https://www.cbo.gov/system/files/2021-02/56965-Economic-Outlook.pdf

132 Board of Governors of the Federal Reserve System, Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy. December 2020 Retrieved January 14, 2021 from https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20191211.pdf

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

- The median percentage of purchase consideration allocated to goodwill in 2018 and 2017 was 41% and 40%, respectively (p. 15).
- Larger transactions generally recorded lower allocations to intangible assets and higher allocations to goodwill (p. 21).
- Indefinite-lived intangible assets accounted for approximately 17% of the total intangible asset value in 2018, as compared with 12% in 2017. Trademarks and trade names were the most common intangible assets to be considered indefinite lived (p. 27).
- Seventy-two percent of the transactions allocated 25% or more of purchase consideration to goodwill. The mean and median allocations of purchase considerations to goodwill were 41% (p. 45).

Public Comments on Draft Study

The department posted the Draft 2021 Capitalization Rate Study on our website (www.revenue.state.mn.us) on March 1, 2021. We accepted comments through March 31, 2021. 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, including our responses:

Questions from the forum

1. Could the department expand on the change in reliance on indicators of the cost of equity? Also, expand on the differences between Business Valuation Resources and Duff & Phelps. Also, provide additional disclosures on the decisions made in the model and transparency on how the ERP is calculated.

   Response
   Mentioned in the Draft Study and at the forum, the department added two equity risk premium estimates (used in the capital asset pricing model) from Business Valuation Resources. The department placed reliance on one of the capital asset pricing models, using the equity risk premium estimate from BVR when reconciling the indicated cost of equity for each market segment.

   Business Valuation Resources' Cost of Capital Platform provides estimates for the equity risk premium. The department used two estimates and titled them "Business Valuation Resources, Historical, Arithmetic Mean" and "Business Valuation Resources, Historical, Geometric Mean" in the Draft Study. The BVR, historical, arithmetic equity risk premium is 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.[134] The BVR, historical, geometric equity risk premium is calculated using a geometric

[134] Business Valuation Resources. (2021). *Cost of Capital Platform.* Historical Equity Risk Premium (20-Year T-Bond) – for Period 1928-2020), Arithmetic Average. Retrieved February 2, 2021 from https://coc.bvresources.com/#/

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.[135]

BVR provides that, "the historical ERP computed as the average difference between the average annualized monthly return of CRSP's [Center for Research in Security Prices] S&P 500 Universe (500 stocks since March 1957 and 90 stocks prior) value-weighted and the annualized monthly return for the 10-year U.S. Treasury or the 20-year U.S. Treasury. Sources from the Center for Research in Security Prices (CRSP). This methodology measures the historical difference between what investors earned by holding stocks rather than government bonds. If the "Returns Reference – Start Year" selected is prior to 1942, the 20-year U.S. Treasury used represents a reconstructed 20-year Treasury based on the 10-year return plus the difference in the 20-year and 10-year returns based on CRSP data from 1942 to the selected "Returns Reference – End Year.'"[136]

Duff & Phelps' Cost of Capital Navigator provides estimates for the equity risk premium. Duff and Phelps uses data from the Center of Research in Security Pricing (CRSP) since 1926. Duff & Phelps measure the realized risk premium by comparing the stock market returns during the specified period to the income return on long-term U.S. government bonds (or total returns for the years prior to 1926). The reported returns include the effects from reinvestment of dividends. The dollars invested (including reinvested dividends) are reallocated to available investments annually, and the return is calculated for each year.[137]

2. The forum was at the same time as another state's capitalization rate discussion. Can the department consider dates that would not conflict with other states' capitalization rate hearings?

   Response
   The department will try to schedule the forum at times that do not conflict with another state. However, it is difficult when we do not know the other states' schedules. If possible, companies could let us know when other states anticipate holding their conferences to help the department avoid scheduling conflicts.

Error in long-term debt listed in the fluid transportation pipeline market segment

Several comments pointed out an error in the long-term debt listed for Phillips 66 Partners, LP in the fluid transportation pipeline market segment.

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135 Business Valuation Resources. (2021). *Cost of Capital Platform.* Historical Equity Risk Premium (20-Year T-Bond) – for Period 1928-2020), Geometric Average. Retrieved February 2, 2021 from https://coc.bvresources.com/#/

136 Business Valuation Resources (2021). Cost of Capital Frequently Asked Questions. Retrieved March 22, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

137 Cost of Capital Navigator (2020) Chapter 3: Basic Building Blocks of the Cost of Equity Capital – Risk-free Rate and Equity Risk Premium. Retrieved March 22, 2021 from https://costofcapital.duffandphelps.com/85d2a9da-fc4e-4300-b688-4871f1460a0a

Response
We agree and corrected the amount of long-term debt for Phillips 66 Partners, LP to correct a typo. Correct amount 3,443,000,000 – incorrect amount 34,430,000,000. This affects the capital structure for fluid transportation pipeline market segment.

Date of source data from Value Line

The department uses Value Line as the source for the dividend yield for each guideline company. Other comments suggested the department calculate dividend yields by accessing another source for stock prices, such as Yahoo! Finance and use Value Line as the source for dividends.

Response
The dividend yield used in the dividend growth models is the expected dividends divided by recent stock price. The department does not calculate the dividend yield, rather obtains the dividend yield from the Value Line Report for each guideline company. The dividend yield provided by Value Line is forward-looking and reflects dividend increased expected over the next 12 months.[138] The department uses the Value line reports with the following dates for each market segment:

- Electric – October 23, 2020 – December 11, 2020[139]
- Gas Distribution – November 27, 2020
- Gas Transmission Pipeline – November 24, 2020
- Fluid Transportation Pipeline – November 27, 2020
- Railroad – November 20, 2020

The commenter suggested the department calculate the dividend yield for guideline companies by using the stock price as of the first business day of the assessment year provided by Yahoo! Finance divided by the expected dividends provided by Value Line.

The department agrees that using the stock price of the guideline company of the first trading day of the year or the last trading day of the previous year is accurate. However, the department is using the Value Line Report for each guideline company to collect the expected dividends. Changing the date and source for one part of the dividend yield calculation brings our attention to additional questions to consider:

- If the department changes the source for the stock price, should the department also change the source for expected dividends?
- Yahoo! Finance provides a forward dividend yield. Would it be better if the department used the forward divided yield provided by Yahoo! Finance on a date closer to the assessment date rather than using the Value Line Reports from October – November of the year before the assessment date?

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[138] Debbas, P., CFA. (2012). Dividends on the VL Report Explained. Retrieved March 18, 2021 from https://www.valueline.com/Tools/Educational_Articles/Stocks/Dividends_on_the_VL_Report_Explained.aspx#.YFNgtE6SmUk

[139] The department reviews three Value Line Industries for the electric market segment. The Electric Utility (Central) Industry reports are dated December 11, 2020, Electric Utility (West) are dated October 23, 2020), and Electric Utility (East) are dated November 13, 2020. The department will consider using the Electric Utility (West) reports dated January, as opposed to October, in future studies.

- The department largely relies on the information in the Value Line reports as the main data source for guideline company information (beta, dividend yield, projected earnings growth rate, projected dividend growth rate, income tax rate, long-term debt, common equity, etc.). The department also uses Value Line information, in part, to determine appropriate guideline companies. Should the department consider other data sources that may provide more timely information?
- Is there a benefit to the department using Value Line as the main data source for guideline-specific information?

As provided by the commenter, if the department were to update their dividend yield calculation to use the first trading day of the assessment year divided by the expected dividends provided by Value Line as opposed to using the forward-looking dividend yield provided in the Value Line report, there is no material change for the 2021 Study (at least for the market segment reviewed by the commenter). Because the difference is not material to the commenter, the department will not make changes for the 2021 Study to avoid changing the data source without giving other interested parties time to comment on changes in data sources.

Use the Value Line reports dated January 22, 2021 as opposed to October 23, 2020 for the Electric Utility (West) guideline companies.[140]

Response
Holding all else equal, updating the data inputs for Black Hills Corporation, Northwestern Corporation, and Xcel Energy Inc. decreases the yield rate for the electric market segment. The indicated cost of equity increases, but the increase is outweighed by the shift in capital structure. The department did not update the data inputs for the Value Line reports dated January 22, 2021 for the Electric Utility (West) guideline companies but will consider using the January report as opposed to the October report in future studies.

Remove Pembina Pipeline Corporation as a guideline company from the gas transmission pipeline market segment.

Commenter stated that Pembina Pipeline Corporation (Pembina) is one of Canada's largest light & medium crudes, Oil sands, and heavy oil pipeline operators, the company is listed both in Canada (TSX: PPL) and in the U.S. (NYSE: PBA). Commenter asked why Pembina was selected as a guideline company for the gas transmission pipeline market segment instead of a guideline for the fluid transportation pipeline market segment.

Response
After further review, we agree that we should remove Pembina as a guideline company from the gas transmission pipeline market segment. We did not include Pembina as a guideline for the fluid transportation pipeline market segment as the other guidelines are all limited partnerships.

[140] Black Hills Corporation, NorthWestern Corporation, and Xcel Energy Inc.

Remove Canadian National as a guideline company from the railroad market segment

Commenter stated that Canadian National is not a reliable guideline company due to not being burdened by competition for a century when it was owned by Canada's taxpayers until 1995.

Response

It is difficult to determine how much influence the government ownership has on the current capital structure, cost of debt, and cost of equity on Canadian National Railway (CN) as of January 2, 2021. CN has been private for over 25 years. As provided by Robert Pace, chair of CN's board, "CN's initial public offering (IPO) took place on November 17, 1995. That is when the Government of Canada sold what many considered to be a clunky, inefficient railway to private investors for CAN $2.25 billion, the largest IPO in Canadian history at the time."[141]

In addition, if we were to remove CN as a guideline company, holding all else equal, the indicated yield rate for the railroad market segment would decrease, not increase. This is due to the shift in capital structure toward debt that overrides the slight increase in the indicated rates for debt and equity. The department did not remove Canadian National Railway as a guideline company from the railroad market segment.

Add additional guideline companies in the electric market segment

Commenter stated that the department relies too much on geography when selecting guideline companies for the electric market segment and encouraged the department to include companies such as Avista Corporation, Eversource Energy, IDACORP, PNM Resources, and MidAmerica Energy Company.[142] These additional companies would allow for better comparability of all size electric companies.

Response

There are 39 companies in Value Line's East, Central, and West Electric Utility industries. The department focuses on the Central industry and adds companies in the West or East, related to proximity to Minnesota, for a total of 15 guideline companies. It is unclear why the commenter requested only four additional publicly traded companies and one additional private company when there are 24 other companies in Value Line's Electric Utility industries.

Including these companies would not increase the yield rate for the electric market segment. The beta increases, but so does the amount of debt in the capital structure. The cost of debt remains the same. The dividend growth models decrease given the lower estimates for earnings growth.

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141 Canadian National. (2020). Celebrating 25 years since privatization. Retrieved April 12, 2021 from https://online.pubhtml5.com/avqf/evrv/#p=1

142 Commenter noted that MidAmerica Energy Company is not publicly traded but does issue SEC financial data.

MidAmerican Energy Company is a subsidiary of Berkshire Hathaway Energy and is a rate-regulated utility servicing Iowa, Illinois, Nebraska, and South Dakota.[143] Value Line does not issue analysts estimates for MidAmerican Energy Company, which would make it difficult to include the company without comparable data sources as the other guideline companies used.

The department did not include the additional guideline companies for the electric market segment. In addition, if the department should consider additional guidelines for future studies, the department will review all electric companies in Value Line's East and West industries.

Add Shell Midstream Partners LP as a guideline in the fluid transportation pipeline market segment

Commenter stated that Shell Midstream Partners LP should be included in the department's study and not excluded just because of the location of its assets as all other fluid pipeline companies used in the study also own and operate assets along the U.S. Gulf Coast.

Response

The department will consider using Shell Midstream Partners LP as a guideline company in future studies. We are not including Shell Midstream as a guideline company for the 2021 study because including them would decrease the yield rate for the fluid transportation pipeline market segment. Shell Midstream's beta, growth, and cost of debt are lower than the other guideline companies, which decreases the yield rate.

Market rate of debt

1. One suggestion is to replace yield to maturity calculations with corporate bond yield averages, by debt rating, from Mergent Bond Record for determining the market rate of debt. Also, use a twelve-month average as opposed to the December yields from Mergent Bond Record.
2. One commenter has concerns about transparency in the department's yield to maturity calculations.
3. One commenter provided that the use of Yield to Maturity is a well-established method in appraisal practice and would typically provide the appraiser with a reliable estimate for the cost of debt. The commenter continued, however, due to COVID-19 and the Federal Reserve's actions in the market, the yield to maturity model understates debt costs. The commenter addressed concerns about the Federal Reserve's interventions unknown and unstudied nature into the corporate bond market and suggested the department rely on the corporate bond spreads as opposed to the yield to maturity calculations for the 2021 study.

Response

1. Yield to maturity is calculated as the internal rate of return of debt that causes the debt cash flows to equal the market price of the debt. As provided by Richard Brealey, Stewart Meyers,

143 https://www.midamericanenergy.com/about-us/investors, Retrieved April 13, 2021

and Alan Marcus, "the yield to maturity is defined as the discount rate that makes the present value of the bond's payments equal to its price."[144]

We provide the issuances used in calculating yield to maturities. The issuances used are limited to those issued by guideline companies. It is unclear what issuances Mergent Bond Record uses to calculate its corporate bond yield averages. Rather than using yields provided by Mergent Bond Record, we are using only issuances of the guideline companies.

The department uses the yield to maturity analysis which considers the nominal interest rates of debt issued in prior years as investors must consider a company's financial position of its assets and liabilities prior to setting an interest rate. If a company, for example, borrowed at 10% for 30 years, then didn't borrow for 20 years, then came back to the market to borrow again, investors have to price in, as part of their interest rate determination, the company's ability to repay all of its debt, not just the current issue. This would be included in the 'credit worthiness' variable of the total borrowing rate determination. Therefore, the 10% from 20 years ago is still considered in the current calculation, no matter where rates are today.

2. Specifically related to a comment about transparency of the issues used, see Current Actual Cost of Debt page of appendices A through E for the issues the department used to calculate the cost of debt and the cost of debt calculation. For an explanation on the calculations, see the Market Rate of Debt section in the narrative. If commenters have more-specific questions about the cost of debt calculation, they should contact us as sa.property@state.mn.us so that we can address those questions.

   The Mergent Bond Record does not list the debt issuances used for the Corporate Bond Yield Averages. The January 2021 Mergent Bond Record states, "Moody's® Long-Term Corporate Bond Yield Averages have been published daily since 1929. They are derived from pricing data on a regularly-replenished population of over 100 seasoned corporate bonds in the US market, each with current outstandings over $100 million. The bonds have maturities as close as possible to 30 years, with an average maturity of 28 years. They are dropped from the list if their remaining life falls below 20 years or if their ratings change. Bonds with deep discounts or steep premiums to par are generally excluded. All yields are yield-to-maturity calculated on a semi-annual compounding basis. Each observation is an unweighted average, with Average Corporate Yields representing the unweighted average of the corresponding Average Industrial and Average Public Utility observations."[145]

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[144] Brealey, Myers, & Marcus (2009) Fundamentals of Corporate Finance 6th ed. p. 164. McGraw-Hill/Irwan, New York, New York. ISBN 978-0-07-338230.

[145] Mergent Bond Record: Corporates Convertibles Governments Municipals. (January 2021). Volume 87, No. 1. Mergent Business Prese by FTSE Russell. ISBN # 0148-1878. P. 251.

3. The Federal Reserve employed only a small fraction of its capacity to directly purchase investment-grade corporate bonds of U.S. companies in the secondary markets. In addition, the Federal Reserve had not yet purchased newly issued bonds directly from corporate bond issuers as of October 2020. As provided by Sharpe and Zhou, "While such broad-based and speedy rebound in the multi-trillion corporate bond market might seem improbable given the relatively modest resources actually deployed, ideally, this is how backstop is supposed to work. It restores market functioning by halting investor runs that can result in a self-fulfilling equilibrium involving serial defaults, widespread bankruptcies, as well as the collateral damage to defaulting firms' employees and suppliers. Such an equilibrium almost surely would have deepened the economic contractions, causing more extensive damage to employment and economic output."[146]

   The department agrees that it is difficult to understand the long-term impacts of the Federal Reserve's actions. In a note discussing the Federal Reserve's actions, Steven Sharpe and Alex Zhou provided that, "Through its acceptance of corporate bonds as collateral for funding as well as its outright purchases, the Federal Reserve will inevitably influence the assessment and pricing of credit risks and instruments (Small and Clouse 2005). Whether and how much such Fed actions ultimately affect the longer-term allocation of credit in the economy remains to be seen." [147]

   However, the suggestion that the department rely on corporate bond spreads provided by Mergent Bond Record as opposed to the department's calculated corporate bond spreads, seems contradictory.

Market rate of equity

1. Place more reliance on the DGM and less on the CAPM.

2. If placing weight on the CAPM, make adjustments, (including an illiquidity adjustment, a size premium adjustment, and normalizing the risk-free rate) and add a 31% premium to the historical equity risk premium provided by Duff & Phelps.

3. If using CAPM, consider using a properly adjusted ex ante equity risk premium or empirical CAPM.

4. Calculate earnings growth rate using the projected earnings per share from Value Line tear sheets instead of using the provided growth estimate from Value Line. The provided growth estimates from Value Line combine the previous 3 years with forward looking projections.

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[146] Sharpe, S. & Zhou, A. (2020) The corporate bond market crisis and the government response. Retrieved April 12, 2021 from https://www.federalreserve.gov/econres/notes/feds-notes/the-corporate-bond-market-crises-and-the-government-response-20201007.htm

[147] Sharpe, S. & Zhou, A. (2020) The corporate bond market crisis and the government response. Retrieved April 12, 2021 from https://www.federalreserve.gov/econres/notes/feds-notes/the-corporate-bond-market-crises-and-the-government-response-20201007.htm

5. Error in the growth rate used in the two-stage and three-stage dividend growth models.

6. Consider rates and methods used by regulatory agencies
   a. Under Federal Energy Regulatory Commissioner Order 569, the weightings and application of growth in a two-stage DGM are now 80% weight on short-term growth and 20% weight on long-term growth. Another commenter stated that when the Federal Energy Regulatory Commission sets rates for gas transmission companies, it relies 100% on a two-stage DGM.

7. Little to no reliance on the two-stage DGM due to the uncertainty of the long-term growth rate.

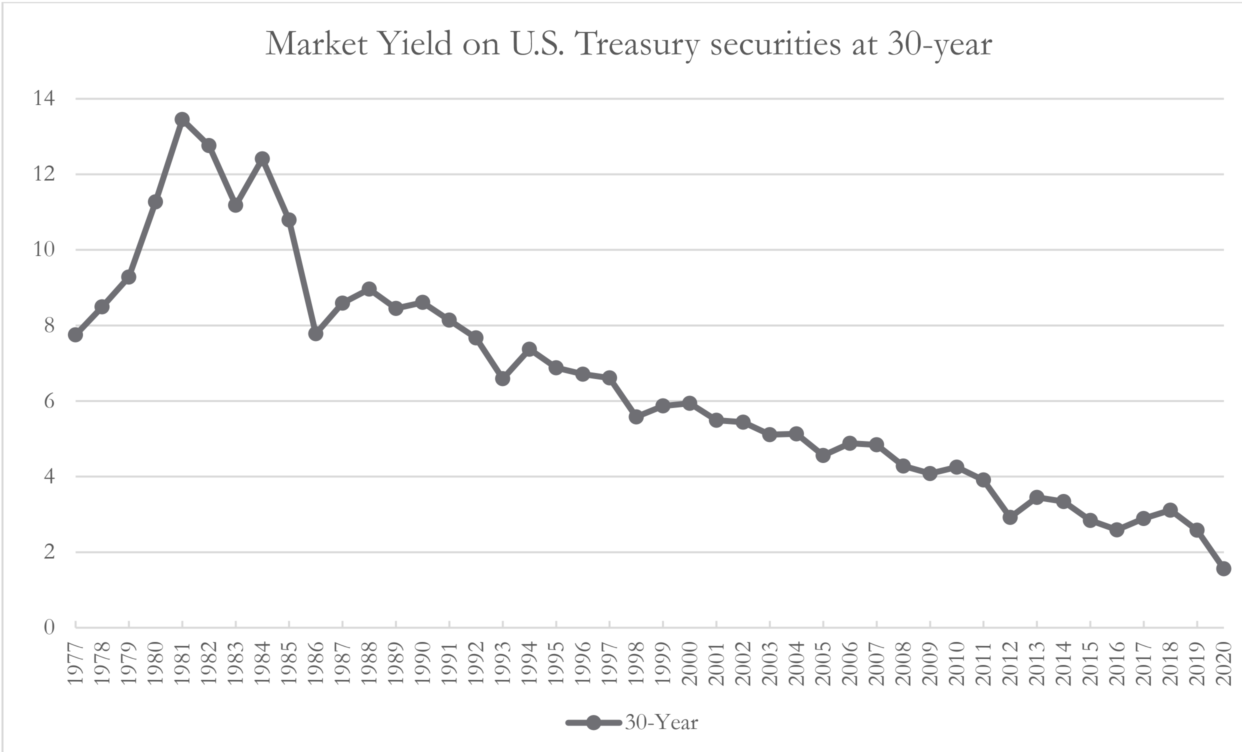
8. Use the long-term growth forecast published in Livingston Survey by the Federal Reserve of Philadelphia.

Response

1. The department adjusted reliance on the indicators of equity for each market segment. We removed some reliance from the capital asset pricing model (CAPM) using the Business Valuation Resources (BVR) historical, arithmetic equity risk premium and added reliance to the CAPM using the ex post (Duff & Phelps Historical) equity risk premium. Removed reliance from the two-stage dividend growth model (DGM) and added reliance to the single-stage DGM.

2. CAPM adjustments
   a. The department does not adjust capitalization rates for illiquidity. See the Illiquidity section for a detailed discussion.
   b. The department does not include size premium adjustments. See the Company Specific Risk section for a detailed discussion.
   c. The department finds that the risk-free rate should not be adjusted, as discussed in further detail on the Risk-Free Rate section. The downward trend in the risk-free rate has continued for years. This chart shows the long-term decline in yields on 30-year U.S. Treasury Securities.[148]

[148] Board of Governors of the Federal Reserve System. Data Download Program. Retrieved February 24, 2020 from https://www.federalreserve.gov/datadownload/H15/H15/RIFLGFCY30_N.A



   d. The analysis suggesting the department include an adjustment for volatility supported the adjustment with a two-stage DGM of the New York Stock Exchange to arrive at an equity risk premium to use in the CAPM of 8.99%. The department completes forward-looking CAPMs that do not arrive at as high of an equity risk premium, including a three-stage DGM of the S&P 500.

3. The commenter requesting the department to use an ex ante equity risk premium in the CAPM refers to a study completed by the commenter. The most recent study available to the department from the commenter is from the 2019 assessment year. The study includes a single-stage DGM of the S&P 500 with a growth rate of 13.06%. This indicates that the growth rate of the S&P 500 will be 13.06% into perpetuity.
   a. The department completes a three-stage DGM of the S&P 500 in order to calculate an ex ante equity risk premium. The department finds a three-stage model more applicable as we apply the yield rate derived in the study to an income model that assumes zero growth into perpetuity.

4. Department will continue to use the analysts' estimates of earnings growth and dividend growth provided by Value Line instead of calculating the estimate of growth using the projected earnings per share growth estimate.

5. As provided in the Growth section of the narrative, we find the indicated long-term real growth rate of the U.S. economy to be 1.7% and the inflation expectation to be 2.0%, for a total long-term growth rate of 3.7%. The department corrected the stable growth rate listed in the notes section of the appendices on the two-stage dividend growth models from 1.9% to 1.7%.

6. As provided by the Federal Energy Regulatory Commission's (FERC) news release, FERC did set return on equity, in part, using a two-stage DGM with 80% weight on the short-term growth rate and 20% weight on the long-term growth rate. However, the news release also stated that the policy statement does not alter the weighting of the short- and long-term growth rates in the two-step model.[149] The policy statement, issued May 21, 2020 with Docket No. PL19-4-000, states, "we retain the existing two-third/one-third weighting for the short-term and long-term growth projections in the DCF [discounted cash flow model]."[150] In addition, the policy statement provides for equal weighting applied to the CAPM and two-stage DGM.

    a. Comments suggested that if the market segment is regulated, the indicated cost of equity should be in line with the allowed rate of return by regulators. The comments continued that for regulated industries, the rates are set based on a cost of service, return on equity model and that investors expect the rate of return on their capital or the investors invest elsewhere.

    b. The department determines the cost of equity by reviewing market evidence of returns for a market segment, rather than ratemaking for a particular company as regulatory agencies do when authorization return on equity. We observe that authorized rates of return are not equivalent to a market segment's cost of equity for valuation purposes. Regulatory agencies set rates that allow companies to earn a fair return while also protecting consumers from natural monopolies. The department estimates the cost of equity for each market segment.

7. The department disagrees that the long-term growth rate projections are less reliable than the short-term growth estimates. If the long-term growth rate projections are not reliable, the short-term growth estimates are equally unreliable, calling into question the reliability of all DGMs. The reliability of the growth estimates is further reason for less reliance on the DGM, in addition to the fact that the models use growth and are applied to an income model that assumes zero percent growth into perpetuity.

8. The Livingston Survey dated December 18, 2020 estimates real GDP over the first half of 2021 and second half of 2021.[151] These are not long-term growth estimates.

[149] Federal Energy Regulatory Commissioner (2020). FERC Revises Public Utility ROE Methodology; Sets Policy for Natural Gas, Oil Pipelines. Retrieved April 12, 2021 from https://www.ferc.gov/news-events/news/ferc-revises-public-utility-roe-methodology-sets-policy-natural-gas-oil-pipelines#

[150] Federal Energy Regulatory Commission (2020). Inquiry Regarding Commission's Policy for Determining Return on Equity. Retrieved April 12, 2021 from https://www.ferc.gov/sites/default/files/2020-06/E-2-052120.pdf

[151] Federal Reserve Bank of Philadelphia (2020). Livingston Survey December 18, 2020. Retrieved April 12, 2021 from https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/livingston-2020-12

Predictability and stability are important

Several commenters mentioned concerns that this year will be an anomaly due to the COVID pandemic and suggested the department make adjustments to keep the rates in line with last year. Comments expressed concern about the percentage decrease, concern that the rates may rebound in the following assessment and concerns that change in yield rate represents a large impact on a company's individual valuation, holding all else equal.

In addition, one commenter stated that by any measure, the electric market segment declined in value during 2020, yet the department's capitalization rate implies a growth in value. Another commenter stated that appraisers should be cautious of using a cost of capital indicator that reflects lower risk for their valuations as of January 1, 2021. Another commenter stated that increased risk in the fluid pipeline industry (and in the broad energy sector) is not reflected in the department's Draft Study.

Response

The Minnesota Department of Revenue determines the estimated market value[152] for utility, pipeline, and railroad operating property, as of January 2 each year. The department determines the unit value of the entire system[153] to estimate the market value of these properties.

The department's Property Tax Division determines the unit value of these systems, in part, with the income capitalization approach to valuation. The department completes the Capitalization Rate Study each year to develop rates to use in the income approach for these systems. Both the individual valuation and the study use information known or knowable as of January 2 each year. The department completes the study based on empirical market data and independent of the valuations. Each year, the data changes as markets are in a continual state of change and market forces constantly influence the value of property.

The department does not find that declining common equity values specifically lead to investors requiring a higher rate of return.

Include an adjustment for flotation costs

Several commenters requested that the department include an adjustment to the yield rate for flotation costs.

Response

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

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[152] 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.

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

Debt Issuance for NuStar Energy LP in fluid transportation pipeline market segment

One commenter stated that it appears that NuStar Energy LP's issued debt was given no weight in the Draft Study, on page D-7.

Response

NuStar's issuance was given weight and is included in the average listed on pages D-4, D-5, and D-6 of the Draft Study.[154] However, it was included in the table on page D-7 of the Draft Study as the table is to highlight which issuances from bond sources the department used. We obtained the bond information directly from NuStar Energy LP's Form 10-Q and listed the pertinent information used on pages D-4, D-5, and D-6 of the Draft Study. The table on D-7 lists the issuances selected from specific bond sources. The department could not find NuStar's issuance listed in those bond sources and used their Form 10-Q instead. NuStar's debt issuance was considered and included in the average debt yield for the fluid transportation market segment.

Include a Plowback or Retention Growth Model

As provided by the commenter, the plowback or retention ratio measures earnings retained by a company after dividends are paid out.

Response

The department is not going to complete this model for several reasons. The commenter provided us with a copy of their Cost of Capital Study. The commenter's study did not include the use of this suggested model. We have been able to find one other state that utilizes the retention rate when estimating the cost of equity. The other state's model (a residual income model) is more complex than simply replacing the growth rate with the retention rate times return on equity in the DGM. Shannon Pratt and Roger Grabowski also discuss a residual income model.[155] Both the other state's model and the Pratt and Grabowski models includes a factor for net book value and the commenter's proposed model does not. The growth rate used in the recommended model reflects growth rates higher than the analysts' estimates of short-term growth for earnings and dividends for the applicable market segment. This high growth rate does not match the assumptions of the zero percent stable growth model we use in the valuations.

State Assessed Property Spring Forum

The department held the State Assessed Property Spring Forum on March 11, 2021. The department presented the 2021 Draft Capitalization Rate Study. Industries and interested parties did not offer data or presentations.

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[154] Pages numbers updated since Draft Study

[155] Pratt, Shannon and Grabowski, Roger, (2010). Cost of Capital Applications and Examples, 4th Ed., Page 463

Looking Forward to the 2022 Capitalization Rate Study

As the department prepared the 2021 Draft Capitalization Rate Study, we identified several topics we are going to research and consider for updating in the 2022 Study.

Is the 20-Year Treasury Yield a better estimate of the risk-free rate?
The U.S. Department of the Treasury announced on January 16, 2020 that it plans to issue a 20-year nominal coupon bond in the first half of calendar year 2020.[156] The first auction of a 20-year Treasury bond was in May 2020. The government sold $20 billion of the issue, priced to yield 1.22%.[157] As the Treasury begins this new issue, we will consider using the yield on the 20-year bond as the risk-free rate. We will consider using 20-years as the length of time when calculating yield to maturities for the cost of debt.

Removing the equity risk premium estimates as provided by Duff & Phelps Cost of Capital Navigator
For the 2021 Study, we added equity risk premium estimates provided by Business Valuation Resources' Cost of Capital Professional. Professional allows us to select the time period and geometric or arithmetic means for the equity risk premium. Given that we use Professional, we are considering cancelling our subscription to Navigator.

What is the appropriate growth rate to use in three-stage dividend growth models?
We use a three-stage dividend growth model based on the S&P 500 to calculate the ex ante equity risk premium used in the capital asset pricing models. We also calculate a three-stage dividend growth model for each guideline company to estimate the cost of equity for each market segment.

The third stage uses the long-run nominal growth rate of the U.S. economy. When estimating the cost of equity for each market segment, using the long-run nominal growth rate of the U.S. economy may overstate the growth rate for the established market segments within this Study. As provided by Bernstein and Arnott, "An often overlooked, but unsurprising fact is that more than half of aggregate economic growth comes from new ideas and the creation of new enterprises, not from the growth of established enterprises." Their article also found that dividends grew 2.3% slower, on average, than GDP. The article continues, "two independent analytical methods point to the same conclusion: In stable nations, a roughly 2% net annual creation of new shares leads to a separation between long-term economic growth and long-term growth in dividends per share, earnings per share, and share price."[158] Cornell found a similar 2% dilution in his study.[159]

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156 U.S. Department of the Treasury. (2020). "Treasury to Issue New 20-Year Bond in First Half of 2020." Retrieved January 23, 2020 from https://home.treasury.gov/news/press-releases/sm878

157 Domm, P. (2020). New 20-year bond met with strong reception as U.S. moves to extend time to pay debt. Retrieved January 27, 2021 from https://www.cnbc.com/2020/05/20/new-20-year-bond-met-with-strong-reception-as-us-moves-to-extend-time-to-pay-debt.html

158 Bernstein, W. & Arnott, R. (2003). Earnings Growth: The Two Percent Dilution. Retrieved January 27, 2021 from https://www.researchaffiliates.com/content/dam/ra/documents/FAJ-2003-Two-Percent-Dilution.pdf?mod=article_inline

159 Cornell, B. (2010). Economic Growth and Equity Investing. Retrieved January 27, 2021 from https://psc.ky.gov/pscecf/2012-00221/rateintervention%40ag.ky.gov/10252012c/Cornell_--_Growth_FAJ_2010.pdf

These studies indicate that we should multiply the real growth rate in the third stage of our model by one third before adding inflation.

Should we use raw or adjusted betas?
We use adjusted betas provided by the Value Line Investment Survey. Value Line adjusts their betas The adjusted betas are based on the concept that, over time, there is a tendency on the part of betas of all companies to move towards 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 of these factors push betas towards one.[160]

We are considering using raw betas. We will consider the tendency of the guideline companies' betas converging toward one and the factors that would push betas towards one.

Should we analyze short-term debt when developing the capital structure?
We do not include short-term debt when developing the capital structure for each market segment. We will review the short-term debt used by the guideline companies over time to determine if we should consider short-term debt in the capital structure for every market segment.[161] [162]

Questions?

If you have questions about the 2021 Capitalization Rate Study, contact Holly Soderbeck at 651-556-6119 or sa.property@state.mn.us.

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

[161] Pratt, Shannon and Grabowski, Roger, (2010). *Cost of Capital Applications and Examples,* 4th Ed., Page 522, "Traditionally, only long-term liabilities are included in a capital structure. However, many businesses, especially smaller closely held businesses, use what is technically short-term interest-bearing debt as if it were long-term debt."[161]

[162] Parcell, D. (2010) The Cost of Capital – A Practitioner's Guide, published by the Society of Utility and Regulatory Financial Analysts, "Short-term debt is normally utilized by utilities to fund working capital and construction projects on temporary basis pending refinancing by permanent sources of capital, although some utilities appear to employ short-term debt on an on-going or permanent basis."

Appendix A - Electric

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	35.00%	3.17%	1.11%
Common Equity	65.00%	8.05%	5.23%
Yield Rate			**6.34%**

Electric Yield Rate	**6.34%**

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
ALLETE Inc.	1,608,000,000	-	2,923,067,532	4,531,067,532	35.49%	0.00%	64.51%
Alliant Energy Corp	6,574,000,000	400,000,000	13,137,410,874	20,111,410,874	32.69%	1.99%	65.32%
Ameren Corp	10,172,000,000	142,000,000	19,227,758,749	29,541,758,749	34.43%	0.48%	65.09%
American Electric Power Co Inc.	28,156,000,000	-	42,138,228,932	70,294,228,932	40.05%	0.00%	59.95%
Black Hills Corp	3,532,900,000	-	3,680,641,351	7,213,541,351	48.98%	0.00%	51.02%
CenterPoint Energy Inc.	11,946,000,000	2,441,000,000	12,634,401,773	27,021,401,773	44.21%	9.03%	46.76%
CMS Energy Corp	13,336,000,000	37,000,000	17,621,023,038	30,994,023,038	43.03%	0.12%	56.85%
DTE Energy Company	18,219,000,000	-	24,351,732,395	42,570,732,395	42.80%	0.00%	57.20%
Entergy Corp	19,613,000,000	254,400,000	21,795,310,020	41,662,710,020	47.08%	0.61%	52.31%
MGE Energy Inc.	520,400,000	-	2,481,484,528	3,001,884,528	17.34%	0.00%	82.66%
Northwestern Corp	2,173,900,000	-	2,664,852,022	4,838,752,022	44.93%	0.00%	55.07%
OGE Energy Corp	3,493,900,000	-	6,478,648,351	9,972,548,351	35.04%	0.00%	64.96%
Otter Tail Corp	764,300,000	-	1,635,170,511	2,399,470,511	31.85%	0.00%	68.15%
WEC Energy Group	11,653,000,000	30,400,000	29,950,508,718	41,633,908,718	27.99%	0.07%	71.94%
Xcel Energy Inc.	19,463,000,000	-	38,675,700,420	58,138,700,420	33.48%	0.00%	66.52%
				Mean	37.29%	0.82%	61.89%
				Median	35.49%	0.00%	64.51%
		Indicated Industry Capital Structure			**35.00%**	**0%**	**65.00%**

We placed more reliance on the median when selecting the indicated capital structure for the market segment, rounding to 35% debt and 65% equity.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
ALLETE Inc.	Baa1	3.05%
Alliant Energy Corp	Baa2	3.05%
Ameren Corp	Baa1	3.05%
American Electric Power Co Inc.	Baa2	3.05%
Black Hills Corp	Baa2	3.05%
CenterPoint Energy Inc.	Baa2	3.05%
CMS Energy Corp	Baa1	3.05%
DTE Energy Company	Baa2	3.05%
Entergy Corp	Baa2	3.05%
MGE Energy Inc.	A1	2.77%
Northwestern Corp	Baa2	3.05%
OGE Energy Corp	(P)Baa1	3.05%
Otter Tail Corp	Baa2	3.05%
WEC Energy Group	Baa1	3.05%
Xcel Energy Inc.	Baa1	3.05%

Mean	3.03%
Median	3.05%
Mode	3.05%

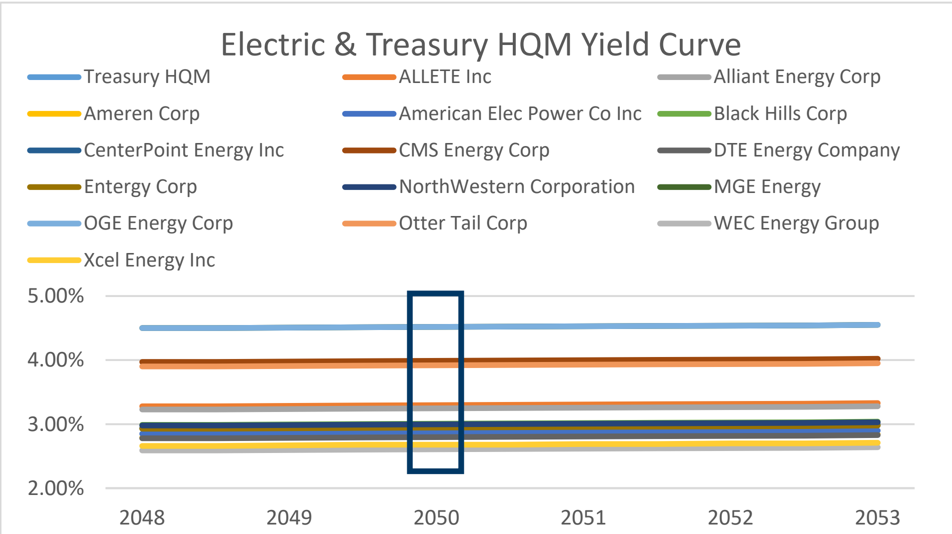
Public Utility Bond Yield Averages from Mergent Bond Record, January 2021 Edition

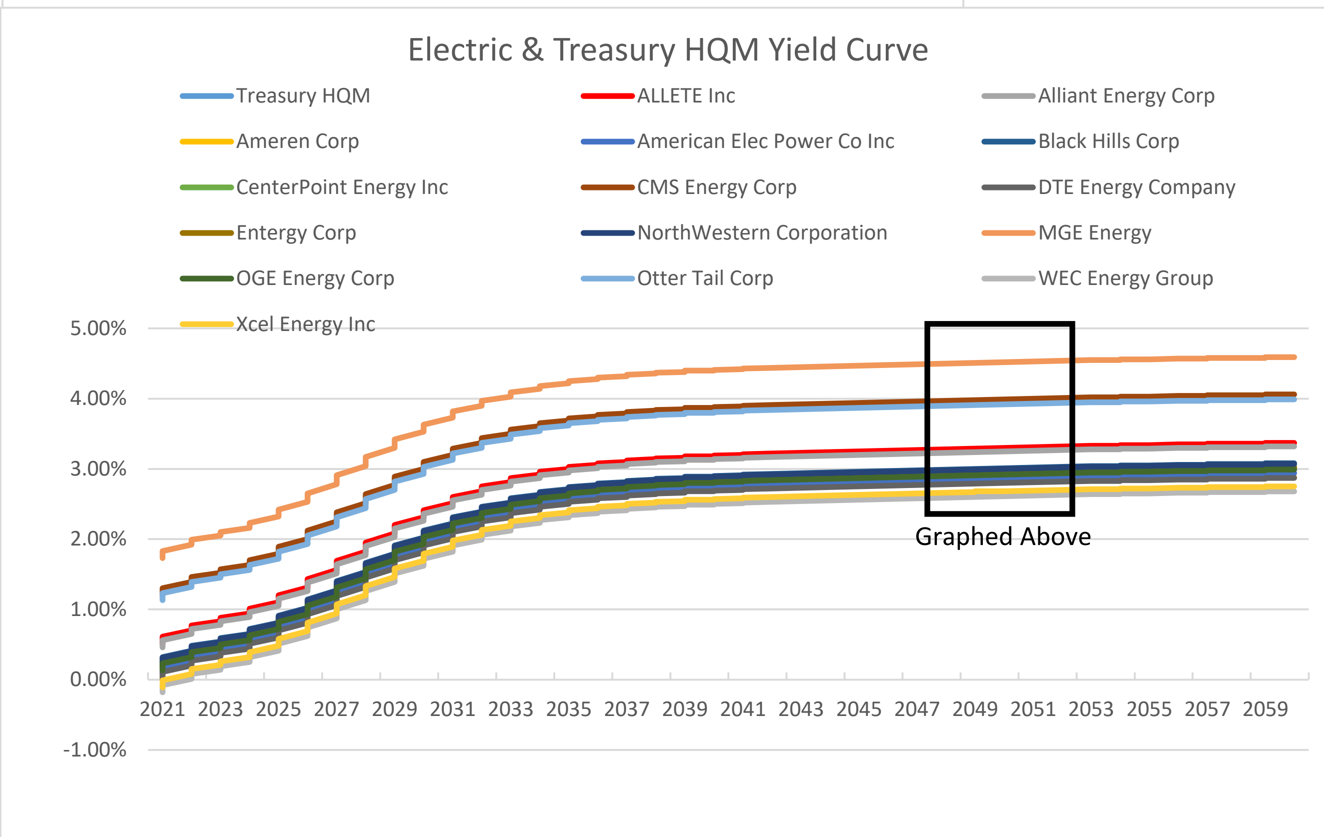
Public Utility Bond Averages, December 2020

Mergent	S&P	Dec. Yield Avg.
Aaa, Aa1, Aa2 Aa3	AAA, AA+, AA, AA-	2.57%
A1, A2, A3	A+, A, A-	2.77%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	3.05%

Current Actual Cost of Debt

Indicated Rate of Debt	3.17%	Average YTM at 2050





	Treasury HQM	ALLETE Inc	Alliant Energy Corp	Ameren Corp	American Elec Power Co Inc	Black Hills Corp	CenterPoint Energy Inc	CMS Energy Corp	DTE Energy Company	Entergy Corp	NorthWestern Corporation	MGE Energy	OGE Energy Corp	Otter Tail Corp	WEC Energy Group	Xcel Energy Inc
2021	0.16%	0.51%	0.46%	0.02%	0.08%	0.22%	0.17%	1.20%	0.01%	0.16%	0.21%	1.73%	0.13%	1.13%	-0.18%	-0.11%
2021.5	0.26%	0.61%	0.56%	0.12%	0.18%	0.32%	0.27%	1.30%	0.11%	0.26%	0.31%	1.83%	0.23%	1.23%	-0.08%	-0.01%
2022	0.35%	0.70%	0.65%	0.21%	0.27%	0.41%	0.36%	1.39%	0.20%	0.35%	0.40%	1.92%	0.32%	1.32%	0.01%	0.08%
2022.5	0.42%	0.77%	0.72%	0.28%	0.34%	0.48%	0.43%	1.46%	0.27%	0.42%	0.47%	1.99%	0.39%	1.39%	0.08%	0.15%
2023	0.48%	0.83%	0.78%	0.34%	0.40%	0.54%	0.49%	1.52%	0.33%	0.48%	0.53%	**2.05%**	0.45%	1.45%	0.14%	0.21%
2023.5	0.53%	0.88%	0.83%	0.39%	0.45%	0.59%	0.54%	1.57%	0.38%	0.53%	0.58%	2.10%	0.50%	1.50%	0.19%	0.26%
2024	0.59%	0.94%	0.89%	0.45%	0.51%	0.65%	0.60%	1.63%	0.44%	0.59%	0.64%	2.16%	0.56%	1.56%	0.25%	0.32%
2024.5	0.66%	1.01%	0.96%	0.52%	0.58%	0.72%	0.67%	1.70%	0.51%	0.66%	0.71%	2.23%	0.63%	1.63%	0.32%	0.39%
2025	0.75%	1.10%	1.05%	0.61%	0.67%	0.81%	0.76%	1.79%	0.60%	0.75%	0.80%	2.32%	0.72%	1.72%	0.41%	0.48%
2025.5	0.85%	1.20%	1.15%	0.71%	0.77%	0.91%	0.86%	1.89%	0.70%	0.85%	0.90%	2.42%	0.82%	1.82%	0.51%	0.58%
2026	0.96%	1.31%	1.26%	**0.82%**	0.88%	1.02%	0.97%	2.00%	0.81%	0.96%	1.01%	2.53%	0.93%	1.93%	0.62%	0.69%
2026.5	1.08%	1.43%	1.38%	0.94%	1.00%	1.14%	1.09%	2.12%	0.93%	1.08%	1.13%	2.65%	1.05%	2.05%	0.74%	0.81%
2027	1.21%	1.56%	1.51%	1.07%	1.13%	1.27%	1.22%	2.25%	1.06%	1.21%	1.26%	2.78%	1.18%	2.18%	0.87%	0.94%
2027.5	1.34%	1.69%	1.64%	1.20%	1.26%	1.40%	1.35%	2.38%	1.19%	1.34%	1.39%	2.91%	1.31%	2.31%	1.00%	1.07%
2028	1.47%	1.82%	1.77%	1.33%	1.39%	1.53%	1.48%	2.51%	1.32%	1.47%	1.52%	3.04%	1.44%	2.44%	1.13%	1.20%
2028.5	1.60%	1.95%	**1.90%**	1.46%	1.52%	1.66%	1.61%	2.64%	1.45%	1.60%	1.65%	3.17%	1.57%	2.57%	1.26%	1.33%
2029	1.73%	2.08%	2.03%	1.59%	1.65%	1.79%	1.74%	2.77%	1.58%	1.73%	1.78%	3.30%	1.70%	2.70%	1.39%	1.46%
2029.5	1.85%	2.20%	2.15%	1.71%	1.77%	1.91%	1.86%	2.89%	1.70%	1.85%	1.90%	3.42%	1.82%	2.82%	1.51%	1.58%
2030	1.96%	2.31%	2.26%	1.82%	1.88%	2.02%	1.97%	3.00%	1.81%	1.96%	2.01%	3.53%	1.93%	2.93%	1.62%	1.69%
2030.5	2.06%	2.41%	2.36%	1.92%	1.98%	2.12%	2.07%	3.10%	1.91%	2.06%	2.11%	3.63%	2.03%	3.03%	**1.72%**	1.79%
2031	2.16%	2.51%	2.46%	2.02%	2.08%	2.22%	2.17%	3.20%	2.01%	2.16%	2.21%	3.73%	2.13%	3.13%	1.82%	1.89%
2031.5	2.25%	2.60%	2.55%	2.11%	2.17%	2.31%	2.26%	3.29%	2.10%	2.25%	2.30%	3.82%	2.22%	3.22%	1.91%	1.98%
2032	2.33%	2.68%	2.63%	2.19%	2.25%	2.39%	2.34%	3.37%	2.18%	2.33%	2.38%	3.90%	2.30%	3.30%	1.99%	2.06%
2032.5	2.40%	2.75%	2.70%	2.26%	2.32%	2.46%	2.41%	3.44%	2.25%	2.40%	2.45%	3.97%	2.37%	3.37%	2.06%	2.13%
2033	2.46%	2.81%	2.76%	2.32%	2.38%	2.52%	2.47%	3.50%	**2.31%**	2.46%	2.51%	4.03%	2.43%	3.43%	2.12%	2.19%
2033.5	2.52%	2.87%	2.82%	2.38%	2.44%	2.58%	2.53%	3.56%	2.37%	2.52%	2.57%	4.09%	2.49%	3.49%	2.18%	2.25%
2034	2.57%	2.92%	2.87%	2.43%	2.49%	2.63%	2.58%	3.61%	2.42%	2.57%	2.62%	4.14%	2.54%	3.54%	2.23%	2.30%
2034.5	2.61%	2.96%	2.91%	2.47%	2.53%	2.67%	2.62%	3.65%	2.46%	2.61%	2.66%	4.18%	2.58%	3.58%	2.27%	2.34%
2035	2.65%	3.00%	2.95%	2.51%	2.57%	2.71%	2.66%	3.69%	2.50%	2.65%	2.70%	4.22%	2.62%	3.62%	2.31%	2.38%
2035.5	2.68%	3.03%	2.98%	2.54%	2.60%	2.74%	2.69%	3.72%	2.53%	2.68%	2.73%	4.25%	2.65%	3.65%	2.34%	2.41%
2036	2.71%	3.06%	3.01%	2.57%	2.63%	2.77%	2.72%	3.75%	2.56%	2.71%	2.76%	4.28%	2.68%	3.68%	2.37%	2.44%
2036.5	2.73%	3.08%	3.03%	2.59%	2.65%	2.79%	2.74%	3.77%	2.58%	2.73%	2.78%	4.30%	2.70%	3.70%	2.39%	2.46%
2037	2.75%	3.10%	3.05%	2.61%	2.67%	2.81%	2.76%	3.79%	2.60%	2.75%	2.80%	4.32%	2.72%	3.72%	2.41%	2.48%
2037.5	2.77%	3.12%	3.07%	2.63%	2.69%	2.83%	2.78%	3.81%	2.62%	2.77%	2.82%	4.34%	2.74%	3.74%	2.43%	2.50%
2038	2.79%	3.14%	3.09%	2.65%	2.71%	2.85%	2.80%	3.83%	2.64%	2.79%	2.84%	4.36%	2.76%	3.76%	2.45%	2.52%
2038.5	2.80%	3.15%	3.10%	2.66%	2.72%	2.86%	2.81%	3.84%	2.65%	2.80%	2.85%	4.37%	2.77%	3.77%	2.46%	2.53%
2039	2.81%	3.16%	3.11%	2.67%	2.73%	2.87%	2.82%	3.85%	2.66%	2.81%	2.86%	4.38%	2.78%	3.78%	2.47%	2.54%
2039.5	2.83%	3.18%	3.13%	2.69%	2.75%	2.89%	2.84%	3.87%	2.68%	2.83%	2.88%	4.40%	2.80%	3.80%	2.49%	2.56%
2040	2.83%	3.18%	3.13%	2.69%	2.75%	2.89%	2.84%	3.87%	2.68%	2.83%	2.88%	4.40%	2.80%	3.80%	2.49%	2.56%
2040.5	2.84%	3.19%	3.14%	2.70%	2.76%	2.90%	2.85%	3.88%	2.69%	2.84%	2.89%	4.41%	2.81%	3.81%	2.50%	2.57%
2041	2.85%	3.20%	3.15%	2.71%	2.77%	2.91%	2.86%	3.89%	2.70%	2.85%	2.90%	4.42%	2.82%	3.82%	2.51%	2.58%
2041.5	2.86%	3.21%	3.16%	2.72%	2.78%	2.92%	2.87%	3.90%	2.71%	2.86%	2.91%	4.43%	2.83%	3.83%	2.52%	2.59%

2042	2.87%	3.22%	3.17%	2.73%	2.79%	2.93%	2.88%	3.91%	2.72%	2.87%	2.92%	4.44%	2.84%	3.84%	2.53%	2.60%
2042.5	2.87%	3.22%	3.17%	2.73%	2.79%	2.93%	2.88%	3.91%	2.72%	2.87%	2.92%	4.44%	2.84%	3.84%	2.53%	2.60%
2043	2.88%	3.23%	3.18%	2.74%	2.80%	2.94%	2.89%	3.92%	2.73%	2.88%	2.93%	4.45%	2.85%	3.85%	2.54%	2.61%
2043.5	2.88%	3.23%	3.18%	2.74%	2.80%	2.94%	2.89%	3.92%	2.73%	2.88%	2.93%	4.45%	2.85%	3.85%	2.54%	2.61%
2044	2.89%	3.24%	3.19%	2.75%	2.81%	2.95%	2.90%	3.93%	2.74%	2.89%	2.94%	4.46%	2.86%	3.86%	2.55%	2.62%
2044.5	2.89%	3.24%	3.19%	2.75%	2.81%	2.95%	2.90%	3.93%	2.74%	2.89%	**2.94%**	4.46%	2.86%	3.86%	2.55%	2.62%
2045	2.90%	3.25%	3.20%	2.76%	2.82%	2.96%	2.91%	3.94%	2.75%	2.90%	2.95%	4.47%	2.87%	3.87%	2.56%	2.63%
2045.5	2.90%	3.25%	3.20%	2.76%	2.82%	2.96%	2.91%	3.94%	2.75%	2.90%	2.95%	4.47%	2.87%	3.87%	2.56%	2.63%
2046	2.91%	3.26%	3.21%	2.77%	2.83%	2.97%	2.92%	3.95%	2.76%	2.91%	2.96%	4.48%	2.88%	3.88%	2.57%	2.64%
2046.5	2.91%	3.26%	3.21%	2.77%	2.83%	2.97%	2.92%	3.95%	2.76%	2.91%	2.96%	4.48%	2.88%	3.88%	2.57%	2.64%
2047	2.92%	3.27%	3.22%	2.78%	2.84%	2.98%	2.93%	3.96%	2.77%	2.92%	2.97%	4.49%	2.89%	3.89%	2.58%	2.65%
2047.5	2.92%	3.27%	3.22%	2.78%	2.84%	2.98%	2.93%	3.96%	2.77%	2.92%	2.97%	4.49%	**2.89%**	3.89%	2.58%	2.65%
2048	2.93%	3.28%	3.23%	2.79%	2.85%	2.99%	2.94%	3.97%	2.78%	2.93%	2.98%	4.50%	2.90%	3.90%	2.59%	2.66%
2048.5	2.93%	3.28%	3.23%	2.79%	2.85%	2.99%	2.94%	3.97%	2.78%	2.93%	2.98%	4.50%	2.90%	3.90%	2.59%	2.66%
2049	2.94%	3.29%	3.24%	2.80%	2.86%	3.00%	2.95%	3.98%	2.79%	2.94%	2.99%	4.51%	2.91%	3.91%	2.60%	2.67%
2049.5	2.94%	3.29%	3.24%	2.80%	2.86%	**3.00%**	**2.95%**	3.98%	2.79%	2.94%	2.99%	4.51%	2.91%	3.91%	2.60%	**2.68%**
2050	**2.95%**	**3.30%**	**3.25%**	**2.81%**	**2.87%**	**3.01%**	**2.96%**	**3.99%**	**2.80%**	**2.95%**	**3.00%**	**4.52%**	**2.92%**	**3.92%**	**2.61%**	**2.68%**
2050.5	2.95%	**3.30%**	3.25%	2.81%	2.87%	3.01%	2.96%	**3.99%**	2.80%	**2.95%**	3.00%	4.52%	2.92%	3.92%	2.61%	2.68%
2051	2.96%	3.31%	3.26%	2.82%	2.88%	3.02%	2.97%	4.00%	2.81%	2.96%	3.01%	4.53%	2.93%	3.93%	2.62%	2.69%
2051.5	2.96%	3.31%	3.26%	2.82%	2.88%	3.02%	2.97%	4.00%	2.81%	2.96%	3.01%	4.53%	2.93%	3.93%	2.62%	2.69%
2052	2.97%	3.32%	3.27%	2.83%	2.89%	3.03%	2.98%	4.01%	2.82%	2.97%	3.02%	4.54%	2.94%	3.94%	2.63%	2.70%
2052.5	2.97%	3.32%	3.27%	2.83%	2.89%	3.03%	2.98%	4.01%	2.82%	2.97%	3.02%	4.54%	2.94%	3.94%	2.63%	2.70%
2053	2.98%	3.33%	3.28%	2.84%	2.90%	3.04%	2.99%	4.02%	2.83%	2.98%	3.03%	4.55%	2.95%	3.95%	2.64%	2.71%
2053.5	2.98%	3.33%	3.28%	2.84%	2.90%	3.04%	2.99%	4.02%	2.83%	2.98%	3.03%	4.55%	2.95%	3.95%	2.64%	2.71%
2054	2.98%	3.33%	3.28%	2.84%	2.90%	3.04%	2.99%	4.02%	2.83%	2.98%	3.03%	4.55%	2.95%	3.95%	2.64%	2.71%
2054.5	2.99%	3.34%	3.29%	2.85%	2.91%	3.05%	3.00%	4.03%	2.84%	2.99%	3.04%	4.56%	2.96%	3.96%	2.65%	2.72%
2055	2.99%	3.34%	3.29%	2.85%	2.91%	3.05%	3.00%	4.03%	2.84%	2.99%	3.04%	4.56%	2.96%	3.96%	2.65%	2.72%
2055.5	2.99%	3.34%	3.29%	2.85%	2.91%	3.05%	3.00%	4.03%	2.84%	2.99%	3.04%	4.56%	2.96%	3.96%	2.65%	2.72%
2056	3.00%	3.35%	3.30%	2.86%	2.92%	3.06%	3.01%	4.04%	2.85%	3.00%	3.05%	4.57%	2.97%	3.97%	2.66%	2.73%
2056.5	3.00%	3.35%	3.30%	2.86%	2.92%	3.06%	3.01%	4.04%	2.85%	3.00%	3.05%	4.57%	2.97%	3.97%	2.66%	2.73%
2057	3.00%	3.35%	3.30%	2.86%	2.92%	3.06%	3.01%	4.04%	2.85%	3.00%	3.05%	4.57%	2.97%	3.97%	2.66%	2.73%
2057.5	3.01%	3.36%	3.31%	2.87%	2.93%	3.07%	3.02%	4.05%	2.86%	3.01%	3.06%	4.58%	2.98%	3.98%	2.67%	2.74%
2058	3.01%	3.36%	3.31%	2.87%	2.93%	3.07%	3.02%	4.05%	2.86%	3.01%	3.06%	4.58%	2.98%	3.98%	2.67%	2.74%
2058.5	3.01%	3.36%	3.31%	2.87%	2.93%	3.07%	3.02%	4.05%	2.86%	3.01%	3.06%	4.58%	2.98%	3.98%	2.67%	2.74%
2059	3.01%	3.36%	3.31%	2.87%	2.93%	3.07%	3.02%	4.05%	2.86%	3.01%	3.06%	4.58%	2.98%	3.98%	2.67%	2.74%
2059.5	3.02%	3.37%	3.32%	2.88%	2.94%	3.08%	3.03%	4.06%	2.87%	3.02%	3.07%	4.59%	2.99%	3.99%	2.68%	2.75%
2060	3.02%	3.37%	3.32%	2.88%	2.94%	3.08%	3.03%	4.06%	2.87%	3.02%	3.07%	4.59%	2.99%	3.99%	2.68%	2.75%

DEPARTMENT OF REVENUE

Company	Coupon	Maturity	Face Amount	Market Value	Market Price	YTM	Fund/Source
Alliant Energy Corp	4.25%	6/15/2028	295,000	342,823	116	1.90%	iShares Broad USD Inv Grade
Ameren Corp	3.65%	2/15/2026	420,000	479,464	114	0.82%	iShares Broad USD Inv Grade
American Elec Power Co	3.25%	3/1/2050	2,432,000	2,615,538	108	2.87%	iShares Broad USD Inv Grade
Black Hills Corp	3.88%	10/15/2049	542,000	633,397	117	3.00%	Vanguard Long-Term Corp
CenterPoint Energy Inc.	3.70%	9/1/2049	500,000	572,134	114	2.95%	TIAA-CREF Bond
CMS Energy Corp	4.75%	6/1/2050	530,000	599,165	113	3.99%	iShares Broad USD Inv Grade
DTE Energy Company	6.38%	4/15/2033	1,464,000	2,097,651	143	2.31%	Vanguard Long-Term Corp
Entergy Corp	3.75%	6/15/2050	1,465,000	1,695,723	116	2.95%	Vanguard Long-Term Corp
Northwestern Corp	4.18%	11/15/2044	370,000	448,206	121	2.94%	iShares Broad USD Inv Grade
OGE Energy Corp	3.85%	8/15/2047	456,000	537,229	118	2.89%	Vanguard Long-Term Corp
WEC Energy Group	1.80%	10/15/2030	1,000,000	1,007,050	101	1.72%	iShares Broad USD Inv Grade
Xcel Energy Inc.	3.50%	12/1/2049	685,000	797,973	116	2.68%	Vanguard Long-Term Corp

Fund:

iShares Broad USD Investment Grade Corporate Bond ETF; Dated 12/31/2020

TIAA-CREF Bond Index Fund (Retail); All Holdings As of 11/30/2020

Vanguard Long-Term Corporate Bond Index Fund Admiral Shares (VLTCX); As of 12/31/2020

Notes:

On August 3, 2020, ALLETE issued first mortgage bonds (Bonds) to certain institutional buyers in the private placement market:

Maturity Date	Principal Amount	Interest Rate
8/1/2050	94 Million	3.30%

ALLETE, Inc. Form 10-Q, ending September 30, 2020, p. 19

In April 2020, MGE borrowed $19.3 million from the City of Madison, Wisconsin's issuance of Industrial Development Revenue Refunding Bonds. The bonds carry an interest rate of 2.05% per annum. The bonds require their holder to tender them on April 30, 2023. MGE Energy, Inc. Form 10-Q, ending September 30, 2020, p. 19

On September 12, 2019, OTP [Otter Tail Power] entered into a Note Purchase Agreement with the purchasers, pursuant to which OTP agreed to issue to the purchasers, in a private placement transaction, $175 million aggregate principle amount of OTP's senior unsecured notes, including:

Maturity Date	Principal Amount	Interest Rate
2/25/2040	$10 Million	3.62%

Otter Tail Power Corp Form 10-Q, ending September 30, 2020, p. 23

Alliant Energy Corp is Alliant Energy Finance

OGE Energy Corp is Oklahoma Gas & Electric Co

Indicated Rate of Equity

Model	Rate
CAPM - Ex Post	7.90%
CAPM - Supply Side	6.82%
CAPM - Three Stage Ex Ante	6.74%
CAPM - Damodaran	5.27%
CAPM - Duff & Phelps	7.23%
CAPM - Graham and Harvey	6.23%
CAPM - Fernandez, Apellaniz, and Acin	6.48%
CAPM - BVR Historical, Arithmetic	6.73%
CAPM - BVR Historical, Geometric	5.61%
Empirical CAPM - Ex Post	8.15%
Empirical CAPM - Supply Side	7.03%
Empirical CAPM - Three Stage Ex Ante	6.95%
Empirical CAPM - Damodaran	5.42%
Empirical CAPM - Duff & Phelps	7.42%
Empirical CAPM - Graham and Harvey	6.41%
Empirical CAPM - Fernandez, Apellaniz, and Acin	6.67%
Empirical CAPM - BVR Historical, Arithmetic	6.94%
Empirical CAPM - BVR Historical, Geometric	5.77%
DGM - Dividend Growth	9.00%
DGM - Earnings Growth	8.50%
Two-Stage DGM	8.01%
Three-Stage DGM	5.15%
Indicated Rate of Equity	**8.05%**

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 dividend growth model (DGM) using earnings growth and the capital asset pricing model (CAPM) using the ex post equity risk premium. We also relied on the two-stage DGM and the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	35.00%	3.17%	1.11%
Equity Component	65.00%	5.43%	3.53%
Direct Rate			**4.64%**

Direct Rate	**4.64%**

Yield Rate	6.34%
Direct Rate	4.64%
Implied Industry Growth Rate	**1.70%**

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
Ex Post[2]	7.25%	0.86	6.24%	1.66%	7.90%
Supply Side[3]	6.00%	0.86	5.16%	1.66%	6.82%
Three Stage Ex Ante[4]	5.91%	0.86	5.08%	1.66%	6.74%
Dr. Damodaran ERP[5]	4.20%	0.86	3.61%	1.66%	5.27%
Duff & Phelps Recommended[6]	5.50%	0.86	4.73%	2.50%	7.23%
Duke CFO Global Business Outlook[7]	5.31%	0.86	4.57%	1.66%	6.23%
Fernandez, Apellaniz and Acin[8]	5.60%	0.86	4.82%	1.66%	6.48%
BVR - Historical, Arithmetic Mean[9]	5.90%	0.86	5.07%	1.66%	6.73%
BVR - Historical, Geometric Mean[10]	4.59%	0.86	3.95%	1.66%	5.61%

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2020 as determined by Dr. Aswath Damodaran; http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retrieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 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
Ex Post[2]	7.25%	0.86	4.68%	1.81%	1.66%	**8.15%**
Supply Side[3]	6.00%	0.86	3.87%	1.50%	1.66%	**7.03%**
Three Stage Ex Ante[4]	5.91%	0.86	3.81%	1.48%	1.66%	**6.95%**
Dr. Damodaran ERP[5]	4.20%	0.86	2.71%	1.05%	1.66%	**5.42%**
Duff & Phelps[6]	5.50%	0.86	3.55%	1.38%	2.50%	**7.42%**
Duke CFO Global Business Outlook[7]	5.31%	0.86	3.42%	1.33%	1.66%	**6.41%**
Fernandez, Apellaniz and Acir	5.60%	0.86	3.61%	1.40%	1.66%	**6.67%**
BVR - Historical, Arithmetic Mean[9]	5.90%	0.86	3.81%	1.48%	1.66%	**6.94%**
BVR - Historical, Geometric Mean[10]	4.59%	0.86	2.96%	1.15%	1.66%	**5.77%**

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2021 as determined by Dr. Aswath Damodaran; Retrieved January 8, 2021 from http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retrieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Dividend Growth Model

Company	Current Dividend Yield (DY)	Projected Short-term EPS Growth Rate (EG)	Projected Short-term Dividend Growth Rate (DG)	Cost of Equity Earnings Growth DY + EG	Cost of Equity Dividend Growth DY + DG
ALLETE Inc.	4.60%	4.50%	4.00%	9.10%	8.60%
Alliant Energy Corp	2.90%	5.50%	7.00%	8.40%	9.90%
Ameren Corp	2.70%	6.00%	5.00%	8.70%	7.70%
American Electric Power Co Inc.	3.50%	6.00%	5.50%	9.50%	9.00%
Black Hills Corp	3.80%	3.50%	6.00%	7.30%	9.80%
CMS Energy Corp	2.80%	7.50%	7.00%	10.30%	9.80%
DTE Energy Company	3.40%	6.00%	6.50%	9.40%	9.90%
Entergy Corp	3.50%	3.00%	4.00%	6.50%	7.50%
MGE Energy Inc.	2.20%	4.00%	5.50%	6.20%	7.70%
Northwestern Corp	4.70%	2.50%	4.00%	7.20%	8.70%
OGE Energy Corp	5.00%	3.00%	6.00%	8.00%	11.00%
Otter Tail Corp	3.90%	6.50%	5.00%	10.40%	8.90%
WEC Energy Group	2.80%	6.00%	6.50%	8.80%	9.30%
Xcel Energy Inc.	2.40%	6.00%	6.00%	8.40%	8.40%
Mean	3.44%	5.00%	5.57%	8.44%	9.01%
Median	3.45%	5.75%	5.75%	8.55%	8.95%

DGM - Dividend Growth, Indicated Rate	**9.00%**
DGM - Earnings Growth, Indicated Rate	**8.50%**

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

Notes:
Dividend Yield and growth rates provided by Value Line

Removed as outlier:

CenterPoint Energy Inc.	2.80%	5.00%	-5.50%	7.80%	-2.70%

Two-Stage Dividend Growth Model

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

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

Company	**DY** Dividend Yield	**G1** Short-term Growth Estimate	**g** Stable Growth	**G** Average Growth Rate	**K_E** Cost of Equity
ALLETE Inc.	4.60%	4.50%	3.70%	4.10%	8.93%
Alliant Energy Corp	2.90%	5.50%	3.70%	4.60%	7.87%
Ameren Corp	2.70%	6.00%	3.70%	4.85%	8.01%
American Electric Power Co Inc.	3.50%	6.00%	3.70%	4.85%	8.83%
Black Hills Corp	3.80%	3.50%	3.70%	3.60%	7.43%
CenterPoint Energy Inc.	2.80%	5.00%	3.70%	4.35%	7.43%
CMS Energy Corp	2.80%	7.50%	3.70%	5.60%	9.12%
DTE Energy Company	3.40%	6.00%	3.70%	4.85%	8.72%
Entergy Corp	3.50%	3.00%	3.70%	3.35%	6.79%
MGE Energy Inc.	2.20%	4.00%	3.70%	3.85%	6.14%
Northwestern Corp	4.70%	2.50%	3.70%	3.10%	7.67%
OGE Energy Corp	5.00%	3.00%	3.70%	3.35%	8.31%
Otter Tail Corp	3.90%	6.50%	3.70%	5.10%	9.58%
WEC Energy Group	2.80%	6.00%	3.70%	4.85%	8.11%
Xcel Energy Inc.	2.40%	6.00%	3.70%	4.85%	7.70%

Mean	8.04%
Median	8.01%
Multi-Stage DGM, Indicated Rate	**8.01%**

We placed more reliance on the 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 1.9% plus the expected inflation rate of 2.0%).

The average cost of equity, without considering CenterPoint Energy Inc. is 7.75%.

Three-Stage Dividend Growth Model

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

Company	Year	ALLETE Inc.		Alliant Energy Corp		Ameren Corp		American Electric Power Co Inc.		Black Hills Corp		CenterPoint Energy Inc.		CMS Energy Corp		DTE Energy Company		Entergy Corp		MGE Energy Inc.		Northwestern Corp		OGE Energy Corp		Otter Tail Corp		WEC Energy Group		Xcel Energy Inc.	
Start Price	2020		-56.24		-52.6		-77.78		-84.89		-58.66		-23.19		-61.54		-125.81		-108.85		-68.67		-52.69		-32.39		-39.82		-94.95		-73.62
Expected Dividends	2021		2.56		1.61		2.09		3.00		2.31		0.64		1.74		4.41		3.86		1.52		2.50		1.68		1.56		2.70		1.82
Stage One Growth	2022	4.50%	2.68	5.50%	1.70	6.00%	2.22	6.00%	3.18	3.50%	2.39	5.00%	0.67	7.50%	1.87	6.00%	4.67	3.00%	3.98	4.00%	1.58	2.50%	2.56	3.00%	1.73	6.50%	1.66	6.00%	2.86	6.00%	1.93
Stage One Growth	2023	4.50%	2.80	5.50%	1.79	6.00%	2.35	6.00%	3.37	3.50%	2.47	5.00%	0.71	7.50%	2.01	6.00%	4.96	3.00%	4.10	4.00%	1.64	2.50%	2.63	3.00%	1.78	6.50%	1.77	6.00%	3.03	6.00%	2.05
Stage One Growth	2024	4.50%	2.92	5.50%	1.89	6.00%	2.49	6.00%	3.57	3.50%	2.56	5.00%	0.74	7.50%	2.16	6.00%	5.25	3.00%	4.22	4.00%	1.71	2.50%	2.69	3.00%	1.84	6.50%	1.88	6.00%	3.22	6.00%	2.17
Stage One Growth	2025	4.50%	3.05	5.50%	1.99	6.00%	2.64	6.00%	3.79	3.50%	2.65	5.00%	0.78	7.50%	2.32	6.00%	5.57	3.00%	4.34	4.00%	1.78	2.50%	2.76	3.00%	1.89	6.50%	2.01	6.00%	3.41	6.00%	2.30
Stage Two Growth	2026	4.43%	3.19	5.34%	2.10	5.79%	2.79	5.79%	4.01	3.52%	2.74	4.88%	0.82	7.15%	2.49	5.79%	5.89	3.06%	4.48	3.97%	1.85	2.61%	2.83	3.06%	1.95	6.25%	2.13	5.79%	3.61	5.79%	2.43
Stage Two Growth	2027	4.35%	3.33	5.17%	2.21	5.58%	2.95	5.58%	4.23	3.54%	2.84	4.76%	0.85	6.81%	2.66	5.58%	6.22	3.13%	4.62	3.95%	1.92	2.72%	2.91	3.13%	2.01	5.99%	2.26	5.58%	3.81	5.58%	2.57
Stage Two Growth	2028	4.28%	3.47	5.01%	2.32	5.37%	3.11	5.37%	4.46	3.55%	2.94	4.65%	0.89	6.46%	2.83	5.37%	6.55	3.19%	4.76	3.92%	2.00	2.83%	2.99	3.19%	2.07	5.74%	2.39	5.37%	4.01	5.37%	2.70
Stage Two Growth	2029	4.21%	3.62	4.85%	2.43	5.16%	3.27	5.16%	4.69	3.57%	3.05	4.53%	0.94	6.12%	3.00	5.16%	6.89	3.25%	4.92	3.89%	2.07	2.94%	3.08	3.25%	2.14	5.48%	2.52	5.16%	4.22	5.16%	2.84
Stage Two Growth	2030	4.14%	3.76	4.68%	2.55	4.95%	3.43	4.95%	4.92	3.59%	3.16	4.41%	0.98	5.77%	3.18	4.95%	7.23	3.32%	5.08	3.86%	2.15	3.05%	3.17	3.32%	2.21	5.23%	2.65	4.95%	4.43	4.95%	2.99
Stage Two Growth	2031	4.06%	3.92	4.52%	2.66	4.75%	3.59	4.75%	5.15	3.61%	3.27	4.29%	1.02	5.43%	3.35	4.75%	7.58	3.38%	5.26	3.84%	2.24	3.15%	3.27	3.38%	2.29	4.97%	2.78	4.75%	4.64	4.75%	3.13
Stage Two Growth	2032	3.99%	4.07	4.35%	2.78	4.54%	3.75	4.54%	5.39	3.63%	3.39	4.17%	1.06	5.08%	3.52	4.54%	7.92	3.45%	5.44	3.81%	2.32	3.26%	3.38	3.45%	2.37	4.72%	2.92	4.54%	4.85	4.54%	3.27
Stage Two Growth	2033	3.92%	4.23	4.19%	2.89	4.33%	3.92	4.33%	5.62	3.65%	3.51	4.05%	1.10	4.74%	3.69	4.33%	8.26	3.51%	5.63	3.78%	2.41	3.37%	3.49	3.51%	2.45	4.46%	3.05	4.33%	5.06	4.33%	3.41
Stage Two Growth	2034	3.85%	4.40	4.03%	3.01	4.12%	4.08	4.12%	5.85	3.66%	3.64	3.94%	1.15	4.39%	3.85	4.12%	8.60	3.57%	5.83	3.75%	2.50	3.48%	3.61	3.57%	2.54	4.21%	3.17	4.12%	5.27	4.12%	3.55
Stage Two Growth	2035	3.77%	4.56	3.86%	3.13	3.91%	4.24	3.91%	6.08	3.68%	3.78	3.82%	1.19	4.05%	4.01	3.91%	8.94	3.64%	6.04	3.73%	2.59	3.59%	3.74	3.64%	2.63	3.95%	3.30	3.91%	5.47	3.91%	3.69
Stage Three Growth	2036	3.70%	4.73	3.70%	3.24	3.70%	4.39	3.70%	6.31	3.70%	3.92	3.70%	1.23	3.70%	4.15	3.70%	9.27	3.70%	6.26	3.70%	2.69	3.70%	3.88	3.70%	2.73	3.70%	3.42	3.70%	5.68	3.70%	3.83
Stage Three Growth	2037	3.70%	4.91	3.70%	3.36	3.70%	4.56	3.70%	6.54	3.70%	4.06	3.70%	1.28	3.70%	4.31	3.70%	9.61	3.70%	6.50	3.70%	2.79	3.70%	4.03	3.70%	2.83	3.70%	3.55	3.70%	5.89	3.70%	3.97
Stage Three Growth	2038	3.70%	5.09	3.70%	3.49	3.70%	4.72	3.70%	6.78	3.70%	4.21	3.70%	1.33	3.70%	4.47	3.70%	9.97	3.70%	6.74	3.70%	2.89	3.70%	4.18	3.70%	2.93	3.70%	3.68	3.70%	6.10	3.70%	4.11
Stage Three Growth	2039	3.70%	5.28	3.70%	3.62	3.70%	4.90	3.70%	7.03	3.70%	4.37	3.70%	1.38	3.70%	4.63	3.70%	10.34	3.70%	6.98	3.70%	3.00	3.70%	4.33	3.70%	3.04	3.70%	3.82	3.70%	6.33	3.70%	4.27
Stage Three Growth	2040	3.70%	5.47	3.70%	3.75	3.70%	5.08	3.70%	7.29	3.70%	4.53	3.70%	1.43	3.70%	4.80	3.70%	10.72	3.70%	7.24	3.70%	3.11	3.70%	4.49	3.70%	3.15	3.70%	3.96	3.70%	6.56	3.70%	4.42
Stage Three Growth	2041	3.70%	5.67	3.70%	3.89	3.70%	5.27	3.70%	7.56	3.70%	4.70	3.70%	1.48	3.70%	4.98	3.70%	11.12	3.70%	7.51	3.70%	3.23	3.70%	4.66	3.70%	3.27	3.70%	4.10	3.70%	6.81	3.70%	4.59
Stage Three Growth	2042	3.70%	5.88	3.70%	4.03	3.70%	5.46	3.70%	7.84	3.70%	4.87	3.70%	1.54	3.70%	5.17	3.70%	11.53	3.70%	7.79	3.70%	3.35	3.70%	4.83	3.70%	3.39	3.70%	4.25	3.70%	7.06	3.70%	4.76
Stage Three Growth	2043	3.70%	6.10	3.70%	4.18	3.70%	5.67	3.70%	8.13	3.70%	5.05	3.70%	1.59	3.70%	5.36	3.70%	11.95	3.70%	8.08	3.70%	3.47	3.70%	5.01	3.70%	3.52	3.70%	4.41	3.70%	7.32	3.70%	4.93
Stage Three Growth	2044	3.70%	6.33	3.70%	4.34	3.70%	5.87	3.70%	8.43	3.70%	5.24	3.70%	1.65	3.70%	5.55	3.70%	12.40	3.70%	8.38	3.70%	3.60	3.70%	5.19	3.70%	3.65	3.70%	4.58	3.70%	7.59	3.70%	5.12
Stage Three Growth	2045	3.70%	6.56	3.70%	4.50	3.70%	6.09	3.70%	8.74	3.70%	5.43	3.70%	1.71	3.70%	5.76	3.70%	12.85	3.70%	8.69	3.70%	3.73	3.70%	5.39	3.70%	3.78	3.70%	4.74	3.70%	7.87	3.70%	5.31
Stage Three Growth	2046	3.70%	6.80	3.70%	4.66	3.70%	6.32	3.70%	9.07	3.70%	5.63	3.70%	1.78	3.70%	5.97	3.70%	13.33	3.70%	9.01	3.70%	3.87	3.70%	5.58	3.70%	3.92	3.70%	4.92	3.70%	8.16	3.70%	5.50
Stage Three Growth	2047	3.70%	7.06	3.70%	4.84	3.70%	6.55	3.70%	9.40	3.70%	5.84	3.70%	1.84	3.70%	6.19	3.70%	13.82	3.70%	9.34	3.70%	4.01	3.70%	5.79	3.70%	4.07	3.70%	5.10	3.70%	8.46	3.70%	5.71
Stage Three Growth	2048	3.70%	7.32	3.70%	5.01	3.70%	6.79	3.70%	9.75	3.70%	6.05	3.70%	1.91	3.70%	6.42	3.70%	14.34	3.70%	9.69	3.70%	4.16	3.70%	6.01	3.70%	4.22	3.70%	5.29	3.70%	8.78	3.70%	5.92
Stage Three Growth	2049	3.70%	7.59	3.70%	5.20	3.70%	7.05	3.70%	10.11	3.70%	6.28	3.70%	1.98	3.70%	6.66	3.70%	14.87	3.70%	10.04	3.70%	4.31	3.70%	6.23	3.70%	4.37	3.70%	5.49	3.70%	9.10	3.70%	6.14
Reversion	2050		24.22		38.71		64.16		49.00		35.96		19.80		43.01		73.55		80.28		73.47		26.05		12.71		18.33		73.59		65.92
Implied Cost of Equity			**6.40%**		**4.86%**		**4.54%**		**5.61%**		**5.31%**		**4.39%**		**5.10%**		**5.57%**		**4.74%**		**3.66%**		**5.88%**		**6.59%**		**6.31%**		**4.73%**		**4.29%**

Mean	5.20%
Median	5.10%
Selected Three-Stage DGM Cost of Equity	**5.15%**

Reversion Calculation:

A. Last period's exp. dividends with growth	7.87	5.39	7.31	10.49	6.51	2.05	6.91	15.42	10.42	4.47	6.46	4.53	5.69	9.44	6.36
B. Cost of equity, less long-term growth	4.74%	3.20%	2.88%	3.95%	3.65%	2.73%	3.44%	3.91%	3.08%	2.00%	4.22%	4.93%	4.65%	3.07%	2.63%
C. A / B	165.9	168.5	253.9	265.8	178.6	75.1	200.9	394.5	337.8	223.8	153.1	92.0	122.3	307.9	242.2
D. C / ((1 + Cost of Equity) ^ Last Period +1)	24.22	38.71	64.16	49.00	35.96	19.80	43.01	73.55	80.28	73.47	26.05	12.71	18.33	73.59	65.92

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
ALLETE Inc.	16.4
Alliant Energy Corp	22.5
Ameren Corp	22.7
American Electric Power Co Inc.	18.9
Black Hills Corp	16.4
CenterPoint Energy Inc.	17.7
CMS Energy Corp	22.2
DTE Energy Company	17.6
Entergy Corp	18.4
MGE Energy Inc.	25.9
Northwestern Corp	15.3
OGE Energy Corp	15.7
Otter Tail Corp	16.4
WEC Energy Group	24.6
Xcel Energy Inc.	25.9
Mean	19.8
Median	18.4
Selected Price to Earnings (P/E) Ratio	18.4
Indicated Equity Component of the Direct Rate	**5.43%**

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
ALLETE Inc.	0.85
Alliant Energy Corp	0.85
Ameren Corp	0.85
American Electric Power Co Inc.	0.75
Black Hills Corp	0.95
CenterPoint Energy Inc.	1.15
CMS Energy Corp	0.80
DTE Energy Company	0.95
Entergy Corp	0.95
MGE Energy Inc.	0.70
Northwestern Corp	0.90
OGE Energy Corp	1.10
Otter Tail Corp	0.85
WEC Energy Group	0.80
Xcel Energy Inc.	0.80
Beta Mean	0.88
Beta Median	0.85
Unlevered and Relevered Mean*	0.85
Indicated Beta	**0.86**

We considered the mean, median, and unlevered/relevered mean. We placed more reliance on the mean without CenterPoint Energy when selecting the indicated beta. CenterPoint Energy is the only beta that is more than 2 standard deviations away from the mean.

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**
ALLETE Inc.	NMF	35.49%	64.51%	0.85	N/A
Alliant Energy Corp	NMF	32.69%	65.32%	0.85	N/A
Ameren Corp	12.50%	34.43%	65.09%	0.85	0.58
American Electric Power Co Inc.	2.00%	40.05%	59.95%	0.75	0.45
Black Hills Corp	13.00%	48.98%	51.02%	0.95	0.52
CenterPoint Energy Inc.	20.00%	44.21%	46.76%	1.15	0.65
CMS Energy Corp	16.00%	43.03%	56.85%	0.80	0.49
DTE Energy Company	10.00%	42.80%	57.20%	0.95	0.57
Entergy Corp	14.00%	47.08%	52.31%	0.95	0.54
MGE Energy Inc.	16.50%	17.34%	82.66%	0.70	0.6
Northwestern Corp	NMF	44.93%	55.07%	0.90	N/A
OGE Energy Corp	13.00%	35.04%	64.96%	1.10	0.75
Otter Tail Corp	18.00%	31.85%	68.15%	0.85	0.61
WEC Energy Group	16.50%	27.99%	71.94%	0.80	0.6
Xcel Energy Inc.	Nil	33.48%	66.52%	0.80	N/A
			Average	**0.88**	

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**
ALLETE Inc.	13.77%	35.00%	65.00%	N/A
Alliant Energy Corp	13.77%	35.00%	65.00%	N/A
Ameren Corp	13.77%	35.00%	65.00%	0.85
American Electric Power Co Inc.	13.77%	35.00%	65.00%	0.66
Black Hills Corp	13.77%	35.00%	65.00%	0.76
CenterPoint Energy Inc.	13.77%	35.00%	65.00%	0.95
CMS Energy Corp	13.77%	35.00%	65.00%	0.72
DTE Energy Company	13.77%	35.00%	65.00%	0.83
Entergy Corp	13.77%	35.00%	65.00%	0.79
MGE Energy Inc.	13.77%	35.00%	65.00%	0.88
Northwestern Corp	13.77%	35.00%	65.00%	N/A
OGE Energy Corp	13.77%	35.00%	65.00%	1.10
Otter Tail Corp	13.77%	35.00%	65.00%	0.89
WEC Energy Group	13.77%	35.00%	65.00%	0.88
Xcel Energy Inc.	13.77%	35.00%	65.00%	N/A
			Average	**0.85**

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, 2020 calendar year information for the January 2, 2021 Assessment
- A market to book ratio over one would be an indication of no obsolescence.
- Market Value estimates for Common Equity are from Value Line. Market Value Estimates for Long-Term Debt are from the company's 10-K.
- Book Value amounts are from the company's 10-K.

Market to Book Ratio for Equity

Company	Market Value of Common Equity from Value Line	Book Value of Common Equity from 10-K	Market to Book Ratio	Source
ALLETE Inc.	2,923,067,532	2,294,600,000	1.27	ALLETE, Inc. 2020 10-K, p. 66
Alliant Energy Corp	13,137,410,874	5,688,000,000	2.31	Alliant Energy Corp. 2020 10-K, p. 43
Ameren Corp	19,227,758,749	9,080,000,000	2.12	Ameren Corp. 2020 10-K, p. 81
American Electric Power Co Inc.	42,138,228,932	29,443,000,000	1.43	American Electric Power Co. 2020 10-K, p. S-5
Black Hills Corp	3,680,641,351	2,561,385,000	1.44	Black Hills Corp. 2020 10-K, p. 69
CenterPoint Energy Inc.	12,634,401,773	8,348,000,000	1.51	CenterPoint Energy Inc. 2020 10-K, p. 96
CMS Energy Corp	17,621,023,038	5,496,000,000	3.21	CMS Energy Corp. 2020 10-K, p. 97
DTE Energy Company	24,351,732,395	12,425,000,000	1.96	DTE Energy Co. 2020 10-K, p. 65
Entergy Corp	21,795,310,020	10,926,142,000	1.99	Entergy Corp. 2020 10-K, p. 49
MGE Energy Inc.	2,481,484,528	976,000,000	2.54	MGE Energy Inc. 2020 10-K, p. 64
Northwestern Corp	2,664,852,022	2,079,095,000	1.28	NorthWestern Corp. 2020 10-K, p. F-7
OGE Energy Corp	6,478,648,351	3,631,800,000	1.78	OGE Energy Corp. 2020 10-K, p. 77
Otter Tail Corp	1,635,170,511	870,966,000	1.88	Otter Tail Corp. 2020 10-K, p. 38
WEC Energy Group	29,950,508,718	10,469,700,000	2.86	WEC Energy Group. 2020 10-K, p. 83
Xcel Energy Inc.	38,675,700,420	14,575,000,000	2.65	Xcel Energy Inc. 2020 10-K, p. 50
		Average	**2.02**	

Market to Book Ratio for Debt

Company	Market Value of Long-Term Debt from 10-K	Book Value of Long-Term Debt from 10-K	Market to Book Ratio	Source
ALLETE Inc.	2,122,000,000	1,806,400,000	1.17	ALLETE, Inc. 2020 10-K, p. 92
Alliant Energy Corp	8,109,000,000	6,777,000,000	1.20	Alliant Energy Corp. 2020 10-K, p. 88
Ameren Corp	13,315,000,000	11,086,000,000	1.20	Ameren Corp. 2020 10-K, p. 120
American Electric Power Co Inc.	66,388,100,000	54,145,800,000	1.23	American Elec Power Co. 2020 10-K, p. 335
Black Hills Corp	4,208,167,000	3,536,536,000	1.19	Black Hills Corp. 2020 10-K, p. 105
CenterPoint Energy Inc.	15,226,000,000	13,401,000,000	1.14	CenterPoint Energy Inc. 2020 10-K, p. 153
CMS Energy Corp	17,512,000,000	15,120,000,000	1.16	CMS Energy Corp. 2020 10-K, p. 134
DTE Energy Company	22,174,000,000	19,439,000,000	1.14	DTE Energy Co. 2020 10-K, p. 116
Entergy Corp	24,813,818,000	22,369,776,000	1.11	Entergy Corp. 2020 10-K, p. 128
MGE Energy Inc.	639,271,000	528,220,000	1.21	MGE Energy Inc. 2020 10-K, p. 106
Northwestern Corp	2,629,755,000	2,315,261,000	1.14	NorthWestern Corp. 2020 10-K, p. F-22
OGE Energy Corp	4,328,200,000	3,494,400,000	1.24	OGE Energy Corp. 2020 10-K, p. 104
Otter Tail Corp	858,455,000	764,519,000	1.12	Otter Tail Corp. 2020 10-K, p. 568
WEC Energy Group	14,343,200,000	12,450,500,000	1.15	WEC Energy Group. 2020 10-K, p. 124
Xcel Energy Inc.	24,412,000,000	20,066,000,000	1.22	Xcel Energy Inc. 2020 10-K, p. 68
		Average	**1.17**	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	65.00%	2.02	1.31
Long-term Debt	35.00%	1.17	0.41
			1.72

Appendix B - Gas Distribution

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	38.00%	3.42%	1.30%
Common Equity	62.00%	8.60%	5.33%
Yield Rate			**6.63%**

Gas Distribution Yield Rate	**6.63%**

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	4,531,300,000	-	12,493,392,577	17,024,692,577	26.62%	0.00%	73.38%
Black Hills Corp	3,532,900,000	-	3,680,641,351	7,213,541,351	48.98%	0.00%	51.02%
CenterPoint Energy Inc.	11,946,000,000	2,441,000,000	12,634,401,773	27,021,401,773	44.21%	9.03%	46.76%
CMS Energy Corp	13,336,000,000	37,000,000	17,621,023,038	30,994,023,038	43.03%	0.12%	56.85%
MGE Energy Inc.	520,400,000	-	2,481,484,528	3,001,884,528	17.34%	0.00%	82.66%
New Jersey Resources Corp	1,664,500,000	-	3,589,707,747	5,254,207,747	31.68%	0.00%	68.32%
NiSource Inc.	9,208,900,000	880,000,000	9,410,064,192	19,498,964,192	47.23%	4.51%	48.26%
ONE Gas Inc	1,582,200,000	-	4,124,566,648	5,706,766,648	27.72%	0.00%	72.28%
South Jersey Industries	2,531,600,000	-	2,339,730,541	4,871,330,541	51.97%	0.00%	48.03%
Southwest Gas Holdings Inc.	2,685,700,000	-	3,977,386,147	6,663,086,147	40.31%	0.00%	59.69%
Spire Inc / Laclede Group Inc.	2,478,300,000	242,000,000	3,282,519,354	6,002,819,354	41.29%	4.03%	54.68%
WEC Energy Group	11,653,000,000	30,400,000	29,950,508,718	41,633,908,718	27.99%	0.07%	71.94%
				Mean	37.36%	1.48%	61.16%
				Median	40.80%	0.00%	58.27%
				Indicated Industry Capital Structure	**38.00%**	**0%**	**62.00%**

We placed more reliance on the mean when selecting the indicated capital structure for the market segment.

Note:

Without the newly added guideline companies from the Electric Value Line segment (that have more than 50% gas customers) the capital structure would be 38% debt, 62% equity.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
Atmos Energy Corp	A1	2.77%
Black Hills Corp	Baa2	3.05%
CenterPoint Energy Inc.	Baa2	3.05%
CMS Energy Corp	Baa1	3.05%
MGE Energy Inc.	A1	2.77%
New Jersey Resources Corp	N/A	N/A
NiSource Inc.	Baa2	3.05%
ONE Gas Inc	A2	2.77%
South Jersey Industries	A3	2.77%
Southwest Gas Holdings Inc.	Baa1	3.05%
Spire Inc / Laclede Group Inc.	Baa2	3.05%
WEC Energy Group	Baa1	3.05%

Mean	2.95%
Median	3.05%
Mode	3.05%

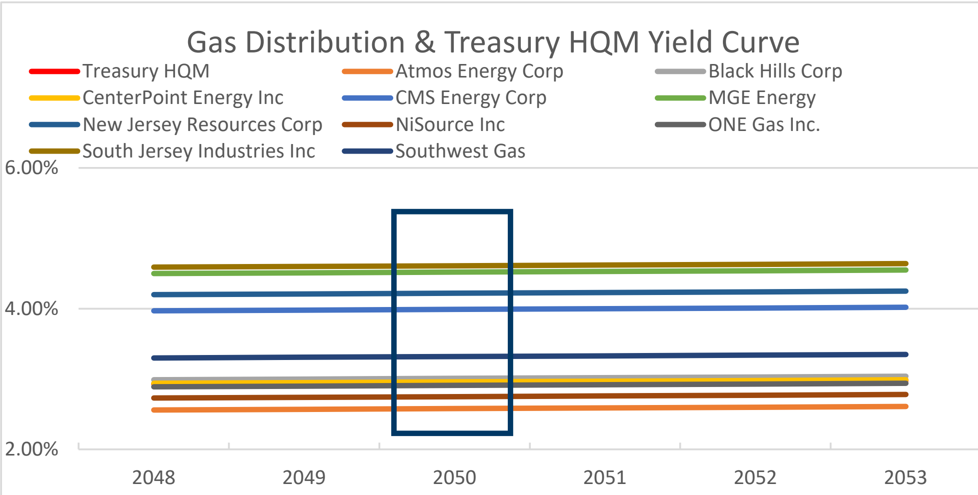
Public Utility Bond Yield Averages from Mergent Bond Record, January 2021 Edition

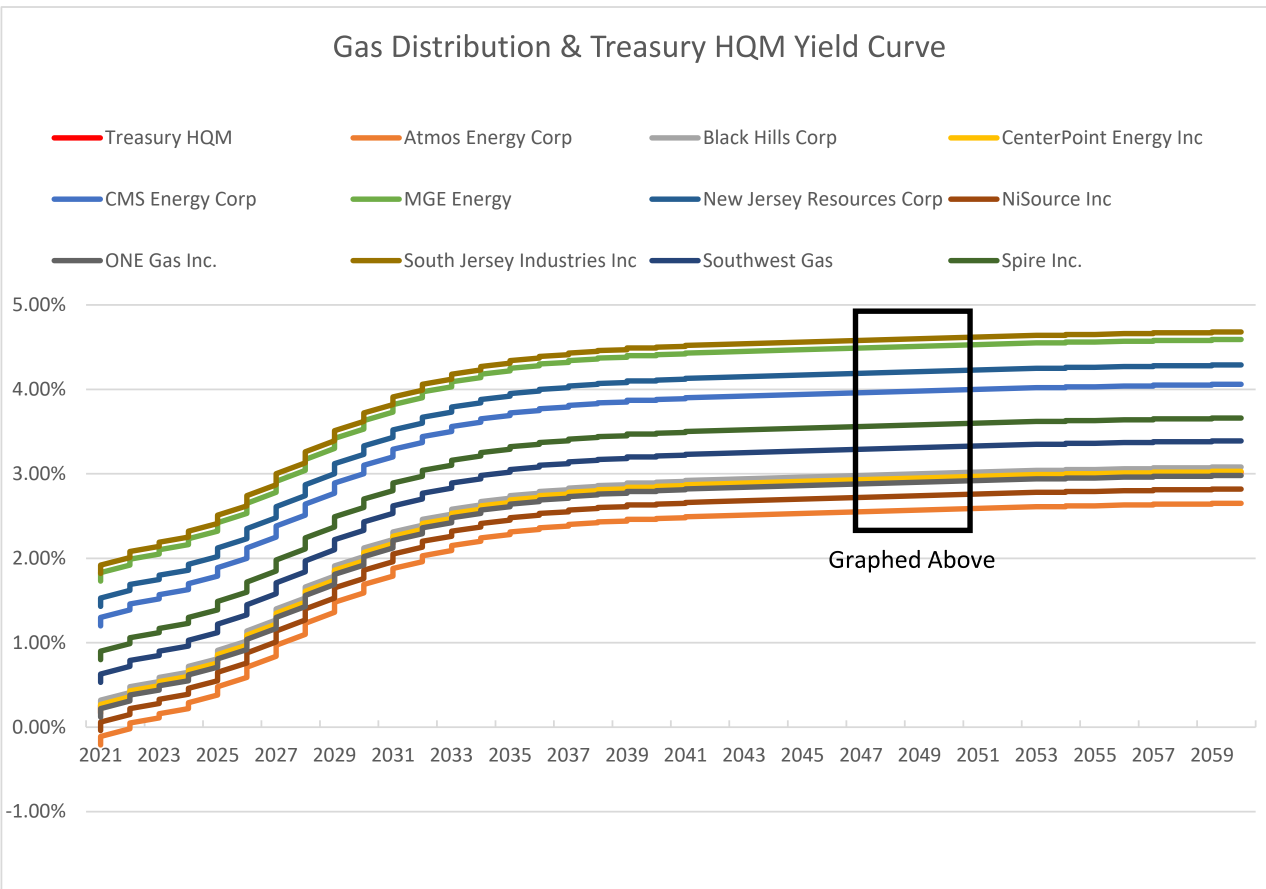
Public Utility Bond Averages, December 2020

Mergent	S&P	Dec. Yield Avg.
Aaa, Aa1, Aa2 Aa3	AAA, AA+, AA, AA-	2.57%
A1, A2, A3	A+, A, A-	2.77%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	3.05%

Current Actual Cost of Debt

Indicated Rate of Debt	3.42%	Average YTM at 2050





	Treasury HQM	Atmos Energy Corp	Black Hills Corp	CenterPoint Energy Inc	CMS Energy Corp	MGE Energy	New Jersey Resources Corp	NiSource Inc	ONE Gas Inc.	South Jersey Industries Inc	Southwest Gas	Spire Inc.	WEC Energy Group
2021	0.16%	-0.21%	0.22%	0.17%	1.20%	1.73%	1.43%	-0.04%	0.12%	1.82%	0.53%	0.80%	-0.18%
2021.5	0.26%	-0.11%	0.32%	0.27%	1.30%	1.83%	1.53%	0.06%	0.22%	1.92%	0.63%	0.90%	-0.08%
2022	0.35%	-0.02%	0.41%	0.36%	1.39%	1.92%	1.62%	0.15%	0.31%	2.01%	0.72%	0.99%	0.01%
2022.5	0.42%	0.05%	0.48%	0.43%	1.46%	1.99%	1.69%	0.22%	0.38%	2.08%	0.79%	1.06%	0.08%
2023	0.48%	0.11%	0.54%	0.49%	1.52%	**2.05%**	1.75%	0.28%	0.44%	2.14%	0.85%	1.12%	0.14%
2023.5	0.53%	0.16%	0.59%	0.54%	1.57%	2.10%	1.80%	0.33%	0.49%	2.19%	0.90%	1.17%	0.19%
2024	0.59%	0.22%	0.65%	0.60%	1.63%	2.16%	1.86%	0.39%	0.55%	2.25%	0.96%	1.23%	0.25%
2024.5	0.66%	0.29%	0.72%	0.67%	1.70%	2.23%	1.93%	0.46%	0.62%	2.32%	1.03%	1.30%	0.32%
2025	0.75%	0.38%	0.81%	0.76%	1.79%	2.32%	2.02%	0.55%	0.71%	2.41%	1.12%	1.39%	0.41%
2025.5	0.85%	0.48%	0.91%	0.86%	1.89%	2.42%	2.12%	0.65%	0.81%	2.51%	1.22%	1.49%	0.51%
2026	0.96%	0.59%	1.02%	0.97%	2.00%	2.53%	2.23%	0.76%	0.92%	2.62%	1.33%	1.60%	0.62%
2026.5	1.08%	0.71%	1.14%	1.09%	2.12%	2.65%	2.35%	0.88%	1.04%	2.74%	1.45%	1.72%	0.74%
2027	1.21%	0.84%	1.27%	1.22%	2.25%	2.78%	2.48%	1.01%	1.17%	2.87%	1.58%	1.85%	0.87%
2027.5	1.34%	0.97%	1.40%	1.35%	2.38%	2.91%	2.61%	1.14%	1.30%	3.00%	1.71%	1.98%	1.00%
2028	1.47%	1.10%	1.53%	1.48%	2.51%	3.04%	2.74%	1.27%	1.43%	3.13%	1.84%	2.11%	1.13%
2028.5	1.60%	1.23%	1.66%	1.61%	2.64%	3.17%	2.87%	1.40%	1.56%	3.26%	1.97%	2.24%	1.26%
2029	1.73%	1.36%	1.79%	1.74%	2.77%	3.30%	3.00%	1.53%	1.69%	3.39%	2.10%	2.37%	1.39%
2029.5	1.85%	1.48%	1.91%	1.86%	2.89%	3.42%	3.12%	1.65%	1.81%	3.51%	2.22%	2.49%	1.51%
2030	1.96%	1.59%	2.02%	1.97%	3.00%	3.53%	3.23%	1.76%	1.92%	3.62%	2.33%	2.60%	1.62%
2030.5	2.06%	1.69%	2.12%	2.07%	3.10%	3.63%	3.33%	1.86%	2.02%	3.72%	2.43%	2.70%	**1.72%**
2031	2.16%	1.79%	2.22%	2.17%	3.20%	3.73%	3.43%	1.96%	2.12%	3.82%	2.53%	2.80%	1.82%
2031.5	2.25%	1.88%	2.31%	2.26%	3.29%	3.82%	3.52%	2.05%	2.21%	**3.91%**	2.62%	2.89%	1.91%
2032	2.33%	1.96%	2.39%	2.34%	3.37%	3.90%	**3.60%**	2.13%	2.29%	3.99%	2.70%	2.97%	1.99%
2032.5	2.40%	2.03%	2.46%	2.41%	3.44%	3.97%	3.67%	2.20%	2.36%	4.06%	2.77%	3.04%	2.06%
2033	2.46%	2.09%	2.52%	2.47%	3.50%	4.03%	3.73%	2.26%	2.42%	4.12%	2.83%	3.10%	2.12%
2033.5	2.52%	2.15%	2.58%	2.53%	3.56%	4.09%	3.79%	2.32%	2.48%	4.18%	2.89%	3.16%	2.18%
2034	2.57%	2.20%	2.63%	2.58%	3.61%	4.14%	3.84%	2.37%	2.53%	4.23%	2.94%	3.21%	2.23%
2034.5	2.61%	2.24%	2.67%	2.62%	3.65%	4.18%	3.88%	2.41%	2.57%	4.27%	2.98%	3.25%	2.27%
2035	2.65%	2.28%	2.71%	2.66%	3.69%	4.22%	3.92%	2.45%	2.61%	4.31%	3.02%	3.29%	2.31%
2035.5	2.68%	2.31%	2.74%	2.69%	3.72%	4.25%	3.95%	2.48%	2.64%	4.34%	3.05%	3.32%	2.34%
2036	2.71%	2.34%	2.77%	2.72%	3.75%	4.28%	3.98%	2.51%	2.67%	4.37%	3.08%	3.35%	2.37%
2036.5	2.73%	2.36%	2.79%	2.74%	3.77%	4.30%	4.00%	2.53%	2.69%	4.39%	3.10%	3.37%	2.39%
2037	2.75%	2.38%	2.81%	2.76%	3.79%	4.32%	4.02%	2.55%	2.71%	4.41%	3.12%	3.39%	2.41%
2037.5	2.77%	2.40%	2.83%	2.78%	3.81%	4.34%	4.04%	2.57%	2.73%	4.43%	3.14%	3.41%	2.43%
2038	2.79%	2.42%	2.85%	2.80%	3.83%	4.36%	4.06%	2.59%	2.75%	4.45%	3.16%	3.43%	2.45%
2038.5	2.80%	2.43%	2.86%	2.81%	3.84%	4.37%	4.07%	2.60%	2.76%	4.46%	3.17%	3.44%	2.46%
2039	2.81%	2.44%	2.87%	2.82%	3.85%	4.38%	4.08%	2.61%	2.77%	4.47%	3.18%	3.45%	2.47%
2039.5	2.83%	2.46%	2.89%	2.84%	3.87%	4.40%	4.10%	2.63%	2.79%	4.49%	3.20%	3.47%	2.49%
2040	2.83%	2.46%	2.89%	2.84%	3.87%	4.40%	4.10%	2.63%	2.79%	4.49%	3.20%	3.47%	2.49%
2040.5	2.84%	2.47%	2.90%	2.85%	3.88%	4.41%	4.11%	2.64%	2.80%	4.50%	3.21%	3.48%	2.50%
2041	2.85%	2.48%	2.91%	2.86%	3.89%	4.42%	4.12%	2.65%	2.81%	4.51%	3.22%	3.49%	2.51%
2041.5	2.86%	2.49%	2.92%	2.87%	3.90%	4.43%	4.13%	2.66%	2.82%	4.52%	3.23%	3.50%	2.52%
2042	2.87%	2.50%	2.93%	2.88%	3.91%	4.44%	4.14%	2.67%	2.83%	4.53%	3.24%	3.51%	2.53%

2042.5	2.87%	2.50%	2.93%	2.88%	3.91%	4.44%	4.14%	2.67%	2.83%	4.53%	3.24%	3.51%	2.53%
2043	2.88%	2.51%	2.94%	2.89%	3.92%	4.45%	4.15%	2.68%	2.84%	4.54%	3.25%	3.52%	2.54%
2043.5	2.88%	2.51%	2.94%	2.89%	3.92%	4.45%	4.15%	2.68%	2.84%	4.54%	3.25%	3.52%	2.54%
2044	2.89%	2.52%	2.95%	2.90%	3.93%	4.46%	4.16%	2.69%	2.85%	4.55%	3.26%	3.53%	2.55%
2044.5	2.89%	2.52%	2.95%	2.90%	3.93%	4.46%	4.16%	2.69%	2.85%	4.55%	3.26%	**3.53%**	2.55%
2045	2.90%	2.53%	2.96%	2.91%	3.94%	4.47%	4.17%	2.70%	2.86%	4.56%	3.27%	3.54%	2.56%
2045.5	2.90%	2.53%	2.96%	2.91%	3.94%	4.47%	4.17%	2.70%	2.86%	4.56%	3.27%	3.54%	2.56%
2046	2.91%	2.54%	2.97%	2.92%	3.95%	4.48%	4.18%	2.71%	2.87%	4.57%	3.28%	3.55%	2.57%
2046.5	2.91%	2.54%	2.97%	2.92%	3.95%	4.48%	4.18%	2.71%	2.87%	4.57%	3.28%	3.55%	2.57%
2047	2.92%	2.55%	2.98%	2.93%	3.96%	4.49%	4.19%	2.72%	2.88%	4.58%	3.29%	3.56%	2.58%
2047.5	2.92%	2.55%	2.98%	2.93%	3.96%	4.49%	4.19%	2.72%	2.88%	4.58%	3.29%	3.56%	2.58%
2048	2.93%	2.56%	2.99%	2.94%	3.97%	4.50%	4.20%	**2.73%**	2.89%	4.59%	3.30%	3.57%	2.59%
2048.5	2.93%	2.56%	2.99%	2.94%	3.97%	4.50%	4.20%	2.73%	**2.89%**	4.59%	3.30%	3.57%	2.59%
2049	2.94%	2.57%	3.00%	2.95%	3.98%	4.51%	4.21%	2.74%	2.90%	4.60%	3.31%	3.58%	2.60%
2049.5	2.94%	**2.57%**	**3.00%**	**2.95%**	3.98%	4.51%	4.21%	2.74%	2.90%	4.60%	**3.31%**	3.58%	2.60%
2050	**2.95%**	**2.58%**	**3.01%**	**2.96%**	**3.99%**	**4.52%**	**4.22%**	**2.75%**	**2.91%**	**4.61%**	**3.32%**	**3.59%**	**2.61%**
2050.5	2.95%	2.58%	3.01%	2.96%	**3.99%**	4.52%	4.22%	2.75%	2.91%	4.61%	3.32%	3.59%	2.61%
2051	2.96%	2.59%	3.02%	2.97%	4.00%	4.53%	4.23%	2.76%	2.92%	4.62%	3.33%	3.60%	2.62%
2051.5	2.96%	2.59%	3.02%	2.97%	4.00%	4.53%	4.23%	2.76%	2.92%	4.62%	3.33%	3.60%	2.62%
2052	2.97%	2.60%	3.03%	2.98%	4.01%	4.54%	4.24%	2.77%	2.93%	4.63%	3.34%	3.61%	2.63%
2052.5	2.97%	2.60%	3.03%	2.98%	4.01%	4.54%	4.24%	2.77%	2.93%	4.63%	3.34%	3.61%	2.63%
2053	2.98%	2.61%	3.04%	2.99%	4.02%	4.55%	4.25%	2.78%	2.94%	4.64%	3.35%	3.62%	2.64%
2053.5	2.98%	2.61%	3.04%	2.99%	4.02%	4.55%	4.25%	2.78%	2.94%	4.64%	3.35%	3.62%	2.64%
2054	2.98%	2.61%	3.04%	2.99%	4.02%	4.55%	4.25%	2.78%	2.94%	4.64%	3.35%	3.62%	2.64%
2054.5	2.99%	2.62%	3.05%	3.00%	4.03%	4.56%	4.26%	2.79%	2.95%	4.65%	3.36%	3.63%	2.65%
2055	2.99%	2.62%	3.05%	3.00%	4.03%	4.56%	4.26%	2.79%	2.95%	4.65%	3.36%	3.63%	2.65%
2055.5	2.99%	2.62%	3.05%	3.00%	4.03%	4.56%	4.26%	2.79%	2.95%	4.65%	3.36%	3.63%	2.65%
2056	3.00%	2.63%	3.06%	3.01%	4.04%	4.57%	4.27%	2.80%	2.96%	4.66%	3.37%	3.64%	2.66%
2056.5	3.00%	2.63%	3.06%	3.01%	4.04%	4.57%	4.27%	2.80%	2.96%	4.66%	3.37%	3.64%	2.66%
2057	3.00%	2.63%	3.06%	3.01%	4.04%	4.57%	4.27%	2.80%	2.96%	4.66%	3.37%	3.64%	2.66%
2057.5	3.01%	2.64%	3.07%	3.02%	4.05%	4.58%	4.28%	2.81%	2.97%	4.67%	3.38%	3.65%	2.67%
2058	3.01%	2.64%	3.07%	3.02%	4.05%	4.58%	4.28%	2.81%	2.97%	4.67%	3.38%	3.65%	2.67%
2058.5	3.01%	2.64%	3.07%	3.02%	4.05%	4.58%	4.28%	2.81%	2.97%	4.67%	3.38%	3.65%	2.67%
2059	3.01%	2.64%	3.07%	3.02%	4.05%	4.58%	4.28%	2.81%	2.97%	4.67%	3.38%	3.65%	2.67%
2059.5	3.02%	2.65%	3.08%	3.03%	4.06%	4.59%	4.29%	2.82%	2.98%	4.68%	3.39%	3.66%	2.68%
2060	3.02%	2.65%	3.08%	3.03%	4.06%	4.59%	4.29%	2.82%	2.98%	4.68%	3.39%	3.66%	2.68%

Company	Coupon	Maturity	Face Amount	Market Value	Market Price	YTM	Fund/Source
Black Hills Corp	3.88%	10/15/2049	542,000	633,397	116.86	3.00%	Vanguard Long-Term Corp
CenterPoint Energy Inc.	3.70%	9/1/2049	500,000	572,134	114.43	2.95%	TIAA-CREF Bond
CMS Energy Corp	4.75%	6/1/2050	530,000	599,165	113.05	3.99%	iShares Broad USD Inv Grade Corp
WEC Energy Group	1.80%	10/15/2030	1,000,000	1,007,050	100.71	1.72%	iShares Broad USD Inv Grade Corp
Atmos Energy Corp	3.38%	9/15/2049	500,000	582,088	116.42	2.57%	TIAA-CREF Bond
NiSource Inc.	3.95%	3/30/2048	500,000	616,255	123.25	2.73%	TIAA-CREF Bond
ONE Gas Inc	4.50%	11/1/2048	500,000	653,575	130.72	2.89%	TIAA-CREF Bond
Southwest Gas Holdings	4.15%	6/1/2049	580,000	668,830	115.32	3.31%	Vanguard Long-Term Corp
Spire Inc / Laclede Grour	4.70%	8/15/2044	140,000	166,057	118.61	3.53%	iShares Broad USD Inv Grade Corp

Fund:

iShares Broad USD Investment Grade Corporate Bond ETF; Dated 12/31/2020
TIAA-CREF Bond Index Fund (Retail); All Holdings As of 11/30/2020
Vanguard Long-Term Corporate Bond Index Fund Admiral Shares (VLTCX); As of 12/31/2020

Notes:

In April 2020, MGE borrowed $19.3 million from the City of Madison, Wisconsin's issuance of Industrial Development Revenue Refunding Bonds. The bonds carry an interest rate of 2.05% per annum. The bonds require their holder to tender them on April 30, 2023. MGE Energy, Inc. Form 10-Q, ending September 30, 2020, p. 19

On May 14, 2020, NJR [New Jersey Resources] entered into a Note Purchase Agreement for $260 million of its senior notes, of which $130 million are at a fixe interest rate of 3.5%, maturing in 2030, and $130 million are at a fixed interest rate of 3.6%, maturing in 2032. New Jersey Resources, 2020 Annual Report

On May 27, 2020, SJI [South Jersey Industries] entered into a Note Purchase Agreement which provided for the Company to issue an aggregate of $200.0 million of senior unsecured notes in two tranches, as follows: (a) Senior Notes, Series 2020A due July 30, 2027, in the aggregate principal amount of $75.0 million; and Senior Notes, Series 2020 B due July 30, 2030, in the aggregate principal amount of $125.0 million. The Company issued both tranches of the Notes on July 30, 2020. The Series 2020A Notes bear interest at 3.71% and the Series 2020B Notes bear interest at 3.91%. South Jersey Industries Form 10-Q, ending September 30, 2020, p. 63

Southwest Gas Holdings Inc. is Southwest Gas Corp.

Indicated Rate of Equity

Model	Rate
CAPM - Ex Post	7.97%
CAPM - Supply Side	6.88%
CAPM - Three Stage Ex Ante	6.80%
CAPM - Damodaran	5.31%
CAPM - Duff & Phelps	7.29%
CAPM - Graham and Harvey	6.28%
CAPM - Fernandez, Apellaniz, and Acin	6.53%
CAPM - BVR Historical, Arithmetic	6.79%
CAPM - BVR Historical, Geometric	5.65%
Empirical CAPM - Ex Post	8.20%
Empirical CAPM - Supply Side	7.08%
Empirical CAPM - Three Stage Ex Ante	6.99%
Empirical CAPM - Damodaran	5.45%
Empirical CAPM - Duff & Phelps	7.46%
Empirical CAPM - Graham and Harvey	6.45%
Empirical CAPM - Fernandez, Apellaniz, and Acin	6.71%
Empirical CAPM - BVR Historical, Arithmetic	6.98%
Empirical CAPM - BVR Historical, Geometric	5.80%
DGM - Dividend Growth	9.50%
DGM - Earnings Growth	9.90%
Two-Stage DGM	8.86%
Three-Stage DGM	5.46%
Indicated Rate of Equity	**8.60%**

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 dividend growth model (DGM) using earnings growth and the capital asset pricing model (CAPM) using the ex post equity risk premium. We also relied on the two-stage DGM and the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	38.00%	3.42%	1.30%
Equity Component	62.00%	5.26%	3.26%
Direct Rate			**4.56%**

Direct Rate	**4.56%**

Yield Rate	6.63%
Direct Rate	4.56%
Implied Industry Growth Rate	**2.07%**

Capital Asset Pricing Model (CAPM)

(ERP x β) + RFR = Indicated Equity Rate

	Equity Risk Premium (ERP)	x Industry Beta (β)	= Industry Risk Premium	+ Risk-Free Rate[1] (RFR)	Indicated Equity Rate
Ex Post[2]	7.25%	0.87	6.31%	1.66%	7.97%
Supply Side[3]	6.00%	0.87	5.22%	1.66%	6.88%
Three Stage Ex Ante[4]	5.91%	0.87	5.14%	1.66%	6.80%
Dr. Damodaran ERP[5]	4.20%	0.87	3.65%	1.66%	5.31%
Duff & Phelps[6]	5.50%	0.87	4.79%	2.50%	7.29%
Duke CFO Global Business Outlook[7]	5.31%	0.87	4.62%	1.66%	6.28%
Fernandez, Apellaniz and Acin[8]	5.60%	0.87	4.87%	1.66%	6.53%
BVR - Historical, Arithmetic Mean[9]	5.90%	0.87	5.13%	1.66%	6.79%
BVR - Historical, Geometric Mean[10]	4.59%	0.87	3.99%	1.66%	5.65%

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2020 as determined by Dr. Aswath Damodaran; http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retrieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 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
Ex Post[2]	7.25%	0.87	4.73%	1.81%	1.66%	**8.20%**
Supply Side[3]	6.00%	0.87	3.92%	1.50%	1.66%	**7.08%**
Three Stage Ex Ante[4]	5.91%	0.87	3.86%	1.48%	1.66%	**6.99%**
Dr. Damodaran ERP[5]	4.20%	0.87	2.74%	1.05%	1.66%	**5.45%**
Duff & Phelps[6]	5.50%	0.87	3.59%	1.38%	2.50%	**7.46%**
Duke CFO Global Business Outlook[7]	5.31%	0.87	3.46%	1.33%	1.66%	**6.45%**
Fernandez, Apellaniz and Acin[8]	5.60%	0.87	3.65%	1.40%	1.66%	**6.71%**
BVR - Historical, Arithmetic Mean[9]	5.90%	0.87	3.85%	1.48%	1.66%	**6.98%**
BVR - Historical, Geometric Mean[10]	4.59%	0.87	2.99%	1.15%	1.66%	**5.80%**

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2021 as determined by Dr. Aswath Damodaran; Retrieved January 8, 2021 from http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retrieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

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	2.50%	7.00%	7.50%	9.50%	10.00%
Black Hills Corp	3.80%	3.50%	6.00%	7.30%	9.80%
CMS Energy Corp	2.80%	7.50%	7.00%	10.30%	9.80%
MGE Energy Inc.	2.20%	4.00%	5.50%	6.20%	7.70%
New Jersey Resources Corp	3.60%	2.00%	6.00%	5.60%	9.60%
NiSource Inc.	3.40%	13.00%	7.50%	16.40%	10.90%
ONE Gas Inc	3.00%	6.50%	7.50%	9.50%	10.50%
South Jersey Industries	5.30%	12.50%	3.50%	17.80%	8.80%
Southwest Gas Holdings Inc.	3.30%	9.00%	4.00%	12.30%	7.30%
Spire Inc / Laclede Group Inc.	4.10%	5.50%	5.00%	9.60%	9.10%
WEC Energy Group	2.80%	6.00%	6.50%	8.80%	9.30%
Mean	3.35%	6.95%	6.00%	10.30%	9.35%
Median	3.30%	6.50%	6.00%	9.50%	9.60%

DGM - Dividend Growth, Indicated Rate	**9.50%**
DGM - Earnings Growth, Indicated Rate	**9.90%**

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

Without the newly added guideline companies from the Electric Value Line segment (that have more than 50% gas customers) the median DGM-earnings is 9.60% and the median DGM-dividends is 9.60%.

Removed as outlier:

CenterPoint Energy Inc.	2.80%	5.00%	-5.50%	7.80%	-2.70%

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	2.50%	7.00%	3.70%	5.35%	8.48%
Black Hills Corp	3.80%	3.50%	3.70%	3.60%	7.43%
CenterPoint Energy Inc.	2.80%	5.00%	3.70%	4.35%	7.43%
CMS Energy Corp	2.80%	7.50%	3.70%	5.60%	9.12%
MGE Energy Inc.	2.20%	4.00%	3.70%	3.85%	6.14%
New Jersey Resources Corp	3.60%	2.00%	3.70%	2.85%	6.21%
NiSource Inc.	3.40%	13.00%	3.70%	8.35%	13.47%
ONE Gas Inc	3.00%	6.50%	3.70%	5.10%	8.65%
South Jersey Industries	5.30%	12.50%	3.70%	8.10%	15.11%
Southwest Gas Holdings Inc.	3.30%	9.00%	3.70%	6.35%	10.66%
Spire Inc / Laclede Group Inc.	4.10%	5.50%	3.70%	4.60%	9.10%
WEC Energy Group	2.80%	6.00%	3.70%	4.85%	8.11%

Mean	9.16%
Median	8.57%

Multi-Stage DGM, Indicated Rate	**8.86%**

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

Notes:

Dividend Yield provided by Value Line

Growth Estimates, Next 5 Years for Earnings provided Value Line

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

Without the newly added guideline companies from the Electric Value Line segment (that have more than 50% gas customers), median is 9.22%.

Three-Stage Dividend Growth Model

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

Company	Year	Atmos Energy Corp		Black Hills Corp		CenterPoint Energy Inc.		CMS Energy Corp		MGE Energy Inc.		New Jersey Resources Corp		NiSource Inc.		ONE Gas Inc		South Jersey Industries		Southwest Gas Holdings Inc.		Spire Inc / Laclede Group Inc.		WEC Energy Group	
Start Price	2020		-101.28		-58.66		-23.19		-61.54		-68.67		-37.42		-24.62		-77.68		-23.26		-70.44		-63.76		-94.95
Expected Dividends	2021		2.50		2.31		0.64		1.74		1.52		1.34		0.92		2.32		1.25		2.35		2.60		2.70
Stage One Growth	2022	7.00%	2.68	3.50%	2.39	5.00%	0.67	7.50%	1.87	4.00%	1.58	2.00%	1.37	13.00%	1.04	6.50%	2.47	12.50%	1.41	9.00%	2.56	5.50%	2.74	6.00%	2.86
Stage One Growth	2023	7.00%	2.86	3.50%	2.47	5.00%	0.71	7.50%	2.01	4.00%	1.64	2.00%	1.39	13.00%	1.17	6.50%	2.63	12.50%	1.58	9.00%	2.79	5.50%	2.89	6.00%	3.03
Stage One Growth	2024	7.00%	3.06	3.50%	2.56	5.00%	0.74	7.50%	2.16	4.00%	1.71	2.00%	1.42	13.00%	1.33	6.50%	2.80	12.50%	1.78	9.00%	3.04	5.50%	3.05	6.00%	3.22
Stage One Growth	2025	7.00%	3.28	3.50%	2.65	5.00%	0.78	7.50%	2.32	4.00%	1.78	2.00%	1.45	13.00%	1.50	6.50%	2.98	12.50%	2.00	9.00%	3.32	5.50%	3.22	6.00%	3.41
Stage Two Growth	2026	6.70%	3.50	3.52%	2.74	4.88%	0.82	7.15%	2.49	3.97%	1.85	2.15%	1.48	12.15%	1.68	6.25%	3.17	11.70%	2.24	8.52%	3.60	5.34%	3.39	5.79%	3.61
Stage Two Growth	2027	6.40%	3.72	3.54%	2.84	4.76%	0.85	6.81%	2.66	3.95%	1.92	2.31%	1.52	11.31%	1.87	5.99%	3.36	10.90%	2.48	8.04%	3.89	5.17%	3.57	5.58%	3.81
Stage Two Growth	2028	6.10%	3.95	3.55%	2.94	4.65%	0.89	6.46%	2.83	3.92%	2.00	2.46%	1.55	10.46%	2.07	5.74%	3.55	10.10%	2.73	7.55%	4.18	5.01%	3.75	5.37%	4.01
Stage Two Growth	2029	5.80%	4.18	3.57%	3.05	4.53%	0.94	6.12%	3.00	3.89%	2.07	2.62%	1.59	9.62%	2.27	5.48%	3.75	9.30%	2.99	7.07%	4.48	4.85%	3.93	5.16%	4.22
Stage Two Growth	2030	5.50%	4.41	3.59%	3.16	4.41%	0.98	5.77%	3.18	3.86%	2.15	2.77%	1.64	8.77%	2.47	5.23%	3.94	8.50%	3.24	6.59%	4.77	4.68%	4.11	4.95%	4.43
Stage Two Growth	2031	5.20%	4.64	3.61%	3.27	4.29%	1.02	5.43%	3.35	3.84%	2.24	2.93%	1.69	7.93%	2.66	4.97%	4.14	7.70%	3.49	6.11%	5.07	4.52%	4.30	4.75%	4.64
Stage Two Growth	2032	4.90%	4.86	3.63%	3.39	4.17%	1.06	5.08%	3.52	3.81%	2.32	3.08%	1.74	7.08%	2.85	4.72%	4.34	6.90%	3.73	5.63%	5.35	4.35%	4.49	4.54%	4.85
Stage Two Growth	2033	4.60%	5.09	3.65%	3.51	4.05%	1.10	4.74%	3.69	3.78%	2.41	3.24%	1.79	6.24%	3.03	4.46%	4.53	6.10%	3.96	5.15%	5.63	4.19%	4.67	4.33%	5.06
Stage Two Growth	2034	4.30%	5.30	3.66%	3.64	3.94%	1.15	4.39%	3.85	3.75%	2.50	3.39%	1.85	5.39%	3.19	4.21%	4.72	5.30%	4.17	4.66%	5.89	4.03%	4.86	4.12%	5.27
Stage Two Growth	2035	4.00%	5.52	3.68%	3.78	3.82%	1.19	4.05%	4.01	3.73%	2.59	3.55%	1.92	4.55%	3.34	3.95%	4.91	4.50%	4.35	4.18%	6.13	3.86%	5.05	3.91%	5.47
Stage Three Growth	2036	3.70%	5.72	3.70%	3.92	3.70%	1.23	3.70%	4.15	3.70%	2.69	3.70%	1.99	3.70%	3.46	3.70%	5.09	3.70%	4.51	3.70%	6.36	3.70%	5.24	3.70%	5.68
Stage Three Growth	2037	3.70%	5.93	3.70%	4.06	3.70%	1.28	3.70%	4.31	3.70%	2.79	3.70%	2.07	3.70%	3.59	3.70%	5.28	3.70%	4.68	3.70%	6.60	3.70%	5.43	3.70%	5.89
Stage Three Growth	2038	3.70%	6.15	3.70%	4.21	3.70%	1.33	3.70%	4.47	3.70%	2.89	3.70%	2.14	3.70%	3.72	3.70%	5.47	3.70%	4.85	3.70%	6.84	3.70%	5.63	3.70%	6.10
Stage Three Growth	2039	3.70%	6.38	3.70%	4.37	3.70%	1.38	3.70%	4.63	3.70%	3.00	3.70%	2.22	3.70%	3.86	3.70%	5.67	3.70%	5.03	3.70%	7.09	3.70%	5.84	3.70%	6.33
Stage Three Growth	2040	3.70%	6.62	3.70%	4.53	3.70%	1.43	3.70%	4.80	3.70%	3.11	3.70%	2.30	3.70%	4.00	3.70%	5.88	3.70%	5.22	3.70%	7.36	3.70%	6.06	3.70%	6.56
Stage Three Growth	2041	3.70%	6.86	3.70%	4.70	3.70%	1.48	3.70%	4.98	3.70%	3.23	3.70%	2.39	3.70%	4.15	3.70%	6.10	3.70%	5.41	3.70%	7.63	3.70%	6.28	3.70%	6.81
Stage Three Growth	2042	3.70%	7.11	3.70%	4.87	3.70%	1.54	3.70%	5.17	3.70%	3.35	3.70%	2.48	3.70%	4.30	3.70%	6.33	3.70%	5.61	3.70%	7.91	3.70%	6.51	3.70%	7.06
Stage Three Growth	2043	3.70%	7.38	3.70%	5.05	3.70%	1.59	3.70%	5.36	3.70%	3.47	3.70%	2.57	3.70%	4.46	3.70%	6.56	3.70%	5.82	3.70%	8.20	3.70%	6.75	3.70%	7.32
Stage Three Growth	2044	3.70%	7.65	3.70%	5.24	3.70%	1.65	3.70%	5.55	3.70%	3.60	3.70%	2.66	3.70%	4.63	3.70%	6.80	3.70%	6.04	3.70%	8.51	3.70%	7.00	3.70%	7.59
Stage Three Growth	2045	3.70%	7.93	3.70%	5.43	3.70%	1.71	3.70%	5.76	3.70%	3.73	3.70%	2.76	3.70%	4.80	3.70%	7.06	3.70%	6.26	3.70%	8.82	3.70%	7.26	3.70%	7.87

Stage Three Growth	2046	3.70%	8.23	3.70%	5.63	3.70%	1.78	3.70%	5.97	3.70%	3.87	3.70%	2.86	3.70%	4.98	3.70%	7.32	3.70%	6.49	3.70%	9.15	3.70%	7.53	3.70%	8.16
Stage Three Growth	2047	3.70%	8.53	3.70%	5.84	3.70%	1.84	3.70%	6.19	3.70%	4.01	3.70%	2.97	3.70%	5.16	3.70%	7.59	3.70%	6.73	3.70%	9.49	3.70%	7.81	3.70%	8.46
Stage Three Growth	2048	3.70%	8.85	3.70%	6.05	3.70%	1.91	3.70%	6.42	3.70%	4.16	3.70%	3.08	3.70%	5.35	3.70%	7.87	3.70%	6.98	3.70%	9.84	3.70%	8.10	3.70%	8.78
Stage Three Growth	2049	3.70%	9.18	3.70%	6.28	3.70%	1.98	3.70%	6.66	3.70%	4.31	3.70%	3.19	3.70%	5.55	3.70%	8.16	3.70%	7.24	3.70%	10.20	3.70%	8.40	3.70%	9.10
Reversion	2050		85.65		35.96		19.80		43.01		73.47		29.27		5.87		54.67		2.53		33.29		30.33		73.59
Implied Cost of Equity			**4.50%**		**5.31%**		**4.39%**		**5.10%**		**3.66%**		**4.53%**		**8.81%**		**5.04%**		**11.59%**		**6.36%**		**6.16%**		**4.73%**

Mean	5.85%
Median	5.07%
Selected Three-Stage DGM Cost of Equity	**5.46%**

Reversion Calculation:

A. Last period's exp. dividends with growth	9.51	6.51	2.05	6.91	4.47	3.31	5.75	8.46	7.51	10.58	8.71	9.44
B. Cost of equity, less long-term growth	2.84%	3.65%	2.73%	3.44%	2.00%	2.87%	7.15%	3.38%	9.93%	4.70%	4.50%	3.07%
C. A / B	335.1	178.6	75.1	200.9	223.8	115.5	80.5	250.7	75.6	225.1	193.5	307.9
D. C / ((1 + Cost of Equity) ^ Last Period + 1)	85.65	35.96	19.80	43.01	73.47	29.27	5.87	54.67	2.53	33.29	30.33	73.59

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Atmos Energy Corp	20.4
Black Hills Corp	16.4
CenterPoint Energy Inc.	17.7
CMS Energy Corp	22.2
MGE Energy Inc.	25.9
New Jersey Resources Corp	17.4
NiSource Inc.	18.4
ONE Gas Inc	21.2
South Jersey Industries	13.4
Southwest Gas Holdings Inc.	16.2
Spire Inc / Laclede Group Inc.	17.6
WEC Energy Group	24.6
Mean	19.3
Median	18.1
Selected Price to Earnings (P/E) Ratio	19.0
Indicated Equity Component of the Direct Rate	**5.26%**

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

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Without the newly added guideline companies from the Electric Value Line segment (that have more than 50% gas customers), mean P/E ratio is 21.2

Beta Analysis

Company	Beta
Atmos Energy Corp	0.80
Black Hills Corp	0.95
CenterPoint Energy Inc.	1.15
CMS Energy Corp	0.80
MGE Energy Inc.	0.70
New Jersey Resources Corp	0.95
NiSource Inc.	0.85
ONE Gas Inc	0.80
South Jersey Industries	1.05
Southwest Gas Holdings Inc.	0.95
Spire Inc / Laclede Group Inc.	0.85
WEC Energy Group	0.80
Beta Mean	0.89
Beta Median	0.85
Unlevered and Relevered Mean*	0.87
Indicated Beta	**0.87**

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

Notes:

*See the Unlevering Relevering Beta page for the calculation
Without the newly added guideline companies from the Electric Value Line segment (that have more than 50% gas customers), median and means remain the same.

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	19.50%	26.62%	73.38%	0.80	0.62
Black Hills Corp	13.00%	48.98%	51.02%	0.95	0.52
CenterPoint Energy Inc.	20.00%	44.21%	46.76%	1.15	0.65
CMS Energy Corp	16.00%	43.03%	56.85%	0.80	0.49
MGE Energy Inc.	16.50%	17.34%	82.66%	0.70	0.6
New Jersey Resources Corp	15.00%	31.68%	68.32%	0.95	0.68
NiSource Inc.	21.00%	47.23%	48.26%	0.85	0.48
ONE Gas Inc	18.00%	27.72%	72.28%	0.80	0.61
South Jersey Industries	21.00%	51.97%	48.03%	1.05	0.57
Southwest Gas Holdings Inc.	21.00%	40.31%	59.69%	0.95	0.62
Spire Inc / Laclede Group Inc.	12.30%	41.29%	54.68%	0.85	0.51
WEC Energy Group	16.50%	27.99%	71.94%	0.80	0.6
			Average	**0.89**	

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	17.48%	38.00%	62.00%	0.93
Black Hills Corp	17.48%	38.00%	62.00%	0.78
CenterPoint Energy Inc.	17.48%	38.00%	62.00%	0.98
CMS Energy Corp	17.48%	38.00%	62.00%	0.74
MGE Energy Inc.	17.48%	38.00%	62.00%	0.90
New Jersey Resources Corp	17.48%	38.00%	62.00%	1.02
NiSource Inc.	17.48%	38.00%	62.00%	0.72
ONE Gas Inc	17.48%	38.00%	62.00%	0.92
South Jersey Industries	17.48%	38.00%	62.00%	0.86
Southwest Gas Holdings Inc.	17.48%	38.00%	62.00%	0.93
Spire Inc / Laclede Group Inc.	17.48%	38.00%	62.00%	0.77
WEC Energy Group	17.48%	38.00%	62.00%	0.90
			Average	**0.87**

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, 2020 calendar year information for the January 2, 2021 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	12,493,392,577	6,791,203,000	1.84	Atmos Energy Corp. 2020 10-K, p. 39	9/30/2020
Black Hills Corp	3,680,641,351	2,561,385,000	1.44	Black Hills Corp. 2020 10-K, p. 69	
CenterPoint Energy Inc.	12,634,401,773	8,348,000,000	1.51	CenterPoint Energy Inc. 2020 10-K, p. 96	
CMS Energy Corp	17,621,023,038	5,496,000,000	3.21	CMS Energy Corp. 2020 10-K, p. 97	
MGE Energy Inc.	2,481,484,528	976,000,000	2.54	MGE Energy Inc. 2020 10-K, p. 64	
New Jersey Resources Corp	3,589,707,747	1,844,692,000	1.95	New Jersey Resources. 2020 10-K, p. 76	9/30/2020
NiSource Inc.	9,410,064,192	5,752,200,000	1.64	NiSource Inc. 2020 10-K, p. 56	
ONE Gas Inc	4,124,566,648	2,233,311,000	1.85	One Gas Inc. 2020 10-K, p. 57	
South Jersey Industries	2,339,730,541	1,303,726,000	1.79	South Jersey Industries 2020 10-K, p. 78	
Southwest Gas Holdings Inc.	3,977,386,147	2,674,953,000	1.49	Southwest Gas Holdings 2020 10-K, p. 29	
Spire Inc / Laclede Group Inc.	3,282,519,354	2,522,300,000	1.30	Spire Inc. 2020 10-K, p. 68	9/30/2020
WEC Energy Group	29,950,508,718	10,469,700,000	2.86	WEC Energy Group. 2020 10-K, p. 83	
		Average	1.95		

Market to Book Ratio for Debt

Company	Market Value of Long-Term Debt from 10-K	Book Value of Long-Term Debt from 10-K	Market to Book Ratio	Source	Fiscal Year End
Atmos Energy Corp	5,597,183,000	4,560,000,000	1.23	Atmos Energy Corp. 2020 10-K, p. 83	9/30/2020
Black Hills Corp	4,208,167,000	3,536,536,000	1.19	Black Hills Corp. 2020 10-K, p. 105	
CenterPoint Energy Inc.	15,226,000,000	13,401,000,000	1.14	CenterPoint Energy Inc. 2020 10-K, p. 153	

CMS Energy Corp	17,512,000,000	15,120,000,000	1.16	CMS Energy Corp. 2020 10-K, p. 134	
MGE Energy Inc.	639,271,000	528,220,000	1.21	MGE Energy Inc. 2020 10-K, p. 106	
New Jersey Resources Corp	1,146,033,000	1,010,000,000	1.13	New Jersey Resources. 2020 10-K, p. 106	9/30/2020
NiSource Inc.	11,034,200,000	9,243,100,000	1.19	NiSource Inc. 2020 10-K, p. 100	
ONE Gas Inc	2,000,000,000	1,600,000,000	1.25	One Gas Inc. 2020 10-K, p. 74	
South Jersey Industries	3,152,224,000	2,919,201,000	1.08	South Jersey Industries 2020 10-K, p. 106	
Southwest Gas Holdings Inc.	2,807,083,000	2,574,103,000	1.09	Southwest Gas Holdings 2020 10-K, p. 58	
Spire Inc / Laclede Group Inc.	2,908,600,000	2,484,100,000	1.17	Spire Inc. 2020 10-K, p. 100	9/30/2020
WEC Energy Group	14,343,200,000	12,450,500,000	1.15	WEC Energy Group. 2020 10-K, p. 124	9/30/2019
		Average	**1.17**		

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	62.00%	1.95	1.21
Long-term Debt	38.00%	1.17	0.44
			1.65

Appendix C - Gas Transmission Pipeline

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	49.00%	4.03%	1.97%
Common Equity	51.00%	15.40%	7.85%
Yield Rate			**9.82%**

Gas Transmission Pipeline Yield Rate	**9.82%**

Capital Structure

Company	Value of Long-Term Debt	Value of Preferred Equity	Value of Common Equity	Total Market Value	% Long-Term Debt	% Preferred Equity	% Common Equity
Enbridge Inc.	62,967,000,000	7,747,000,000	76,958,324,394	147,672,324,394	42.64%	5.25%	52.11%
Kinder Morgan Inc.	32,700,000,000	-	30,946,062,927	63,646,062,927	51.38%	0.00%	48.62%
ONEOK Inc.	14,249,300,000	-	14,376,256,343	28,625,556,343	49.78%	0.00%	50.22%
Williams Companies Inc.	21,951,000,000	-	24,550,839,055	46,501,839,055	47.20%	0.00%	52.80%
				Mean	47.75%	1.31%	50.94%
				Median	48.49%	0.00%	51.17%
				Indicated Industry Capital Structure	**49.00%**	**0%**	**51.00%**

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

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
Enbridge Inc.	Baa2	3.27%
Kinder Morgan Inc.	Baa2	3.27%
ONEOK Inc.	Baa3	3.27%
TC Energy Corp (FKA TransCanada Cor	Baa2	3.27%
Williams Companies Inc.	Baa3	3.27%

Mean	3.27%
Median	3.27%
Mode	3.27%

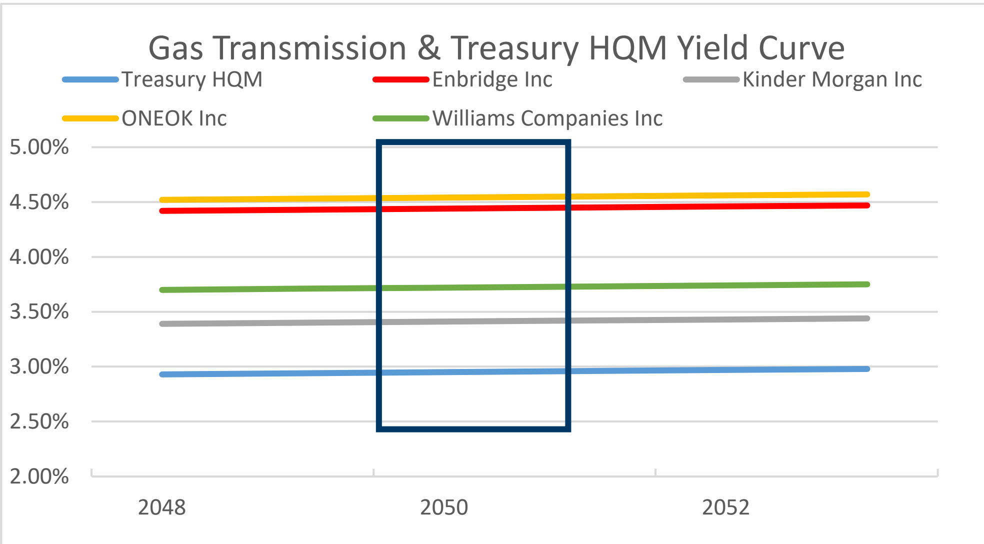
Corporate Bond Yield Averages from Mergent Bond Record, January 2021 Edition

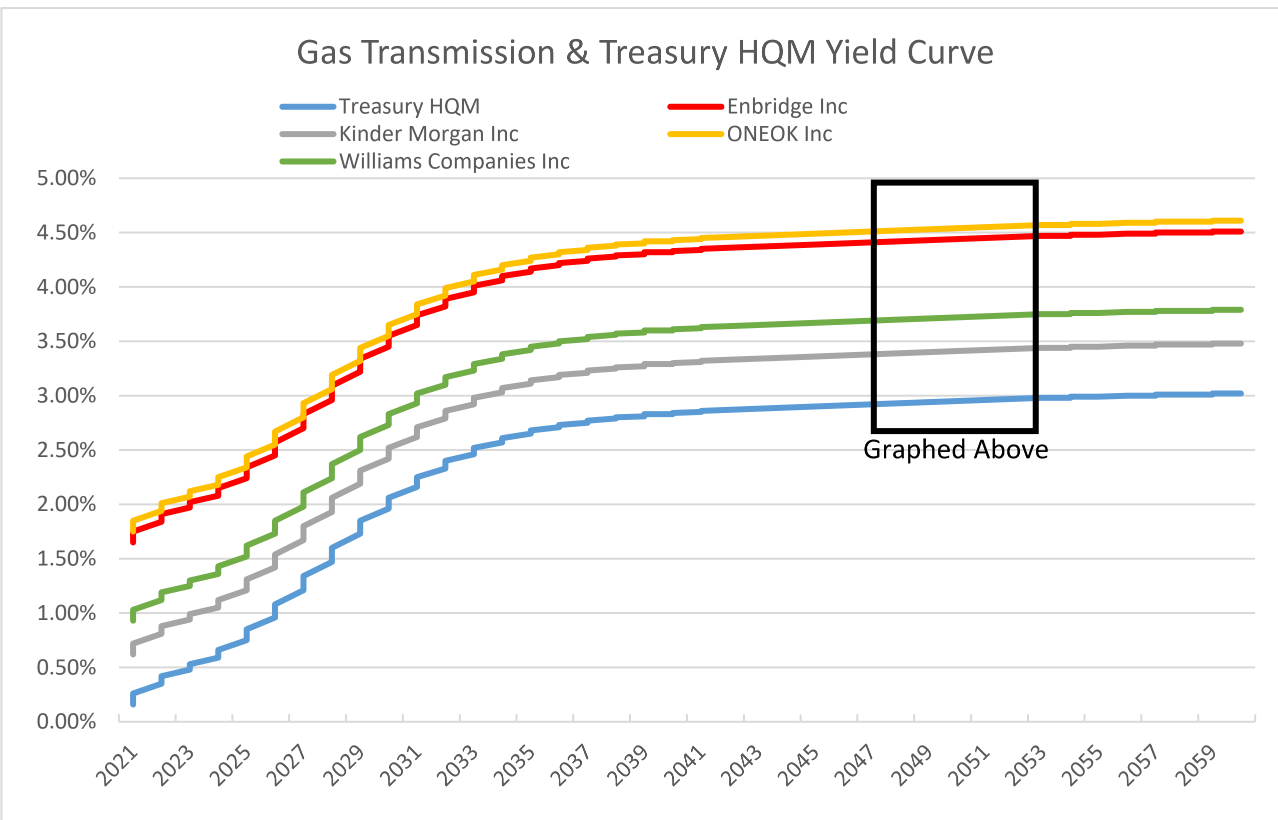
Corporate Bond Averages, December 2020

Mergent	S&P	Dec. Yield Avg.
Aaa	AAA	2.26%
Aa1, Aa2 Aa3	AA+, AA, AA-	2.31%
A1, A2, A3	A+, A, A-	2.66%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	3.27%

Current Actual Cost of Debt

Indicated Rate of Debt	4.03%	Average YTM at 2050





	Treasury HQM	Enbridge Inc	Kinder Morgan Inc	ONEOK Inc	Williams Companies Inc
2021	0.16%	1.65%	0.62%	1.75%	0.93%
2021.5	0.26%	1.75%	0.72%	1.85%	1.03%
2022	0.35%	1.84%	0.81%	1.94%	1.12%
2022.5	0.42%	1.91%	0.88%	2.01%	1.19%
2023	0.48%	1.97%	0.94%	2.07%	1.25%
2023.5	0.53%	2.02%	0.99%	2.12%	1.30%
2024	0.59%	2.08%	1.05%	2.18%	1.36%
2024.5	0.66%	2.15%	1.12%	2.25%	1.43%
2025	0.75%	2.24%	1.21%	2.34%	1.52%
2025.5	0.85%	2.34%	1.31%	2.44%	1.62%
2026	0.96%	2.45%	1.42%	2.55%	1.73%
2026.5	1.08%	2.57%	1.54%	2.67%	1.85%
2027	1.21%	2.70%	1.67%	2.80%	1.98%
2027.5	1.34%	2.83%	1.80%	2.93%	2.11%
2028	1.47%	2.96%	1.93%	3.06%	2.24%
2028.5	1.60%	3.09%	2.06%	3.19%	2.37%
2029	1.73%	3.22%	2.19%	3.32%	2.50%
2029.5	1.85%	3.34%	2.31%	3.44%	2.62%
2030	1.96%	3.45%	2.42%	3.55%	2.73%
2030.5	2.06%	3.55%	2.52%	3.65%	2.83%
2031	2.16%	3.65%	2.62%	3.75%	2.93%
2031.5	2.25%	3.74%	2.71%	3.84%	3.02%
2032	2.33%	3.82%	2.79%	3.92%	3.10%
2032.5	2.40%	3.89%	2.86%	3.99%	3.17%
2033	2.46%	3.95%	2.92%	4.05%	3.23%
2033.5	2.52%	4.01%	2.98%	4.11%	3.29%
2034	2.57%	4.06%	3.03%	4.16%	3.34%
2034.5	2.61%	4.10%	3.07%	4.20%	3.38%
2035	2.65%	4.14%	3.11%	4.24%	3.42%
2035.5	2.68%	4.17%	3.14%	4.27%	3.45%
2036	2.71%	4.20%	3.17%	4.30%	3.48%
2036.5	2.73%	4.22%	3.19%	4.32%	3.50%
2037	2.75%	4.24%	3.21%	4.34%	3.52%
2037.5	2.77%	4.26%	3.23%	4.36%	3.54%
2038	2.79%	4.28%	3.25%	4.38%	3.56%
2038.5	2.80%	4.29%	3.26%	4.39%	3.57%
2039	2.81%	4.30%	3.27%	4.40%	3.58%
2039.5	2.83%	4.32%	3.29%	4.42%	3.60%
2040	2.83%	4.32%	3.29%	4.42%	3.60%
2040.5	2.84%	4.33%	3.30%	4.43%	3.61%

2041	2.85%	4.34%	3.31%	4.44%	3.62%
2041.5	2.86%	4.35%	3.32%	4.45%	3.63%
2042	2.87%	4.36%	3.33%	4.46%	3.64%
2042.5	2.87%	4.36%	3.33%	4.46%	3.64%
2043	2.88%	4.37%	3.34%	4.47%	3.65%
2043.5	2.88%	4.37%	3.34%	4.47%	3.65%
2044	2.89%	4.38%	3.35%	4.48%	3.66%
2044.5	2.89%	4.38%	3.35%	4.48%	3.66%
2045	2.90%	4.39%	3.36%	4.49%	3.67%
2045.5	2.90%	4.39%	3.36%	4.49%	3.67%
2046	2.91%	4.40%	3.37%	4.50%	3.68%
2046.5	2.91%	4.40%	3.37%	4.50%	3.68%
2047	2.92%	4.41%	3.38%	4.51%	3.69%
2047.5	2.92%	4.41%	3.38%	4.51%	3.69%
2048	2.93%	4.42%	3.39%	4.52%	**3.70%**
2048.5	2.93%	4.42%	3.39%	4.52%	3.70%
2049	2.94%	4.43%	3.40%	4.53%	3.71%
2049.5	2.94%	4.43%	3.40%	4.53%	3.71%
2050	**2.95%**	**4.44%**	**3.41%**	**4.54%**	**3.72%**
2050.5	2.95%	4.44%	**3.41%**	4.54%	3.72%
2051	2.96%	4.45%	3.42%	4.55%	3.73%
2051.5	2.96%	4.45%	3.42%	4.55%	3.73%
2052	2.97%	4.46%	3.43%	4.56%	3.74%
2052.5	2.97%	4.46%	3.43%	4.56%	3.74%
2053	2.98%	4.47%	3.44%	4.57%	3.75%
2053.5	2.98%	4.47%	3.44%	4.57%	3.75%
2054	2.98%	4.47%	3.44%	4.57%	3.75%
2054.5	2.99%	4.48%	3.45%	4.58%	3.76%
2055	2.99%	4.48%	3.45%	4.58%	3.76%
2055.5	2.99%	4.48%	3.45%	4.58%	3.76%
2056	3.00%	4.49%	3.46%	4.59%	3.77%
2056.5	3.00%	4.49%	3.46%	4.59%	3.77%
2057	3.00%	4.49%	3.46%	4.59%	3.77%
2057.5	3.01%	4.50%	3.47%	4.60%	3.78%
2058	3.01%	4.50%	3.47%	4.60%	3.78%
2058.5	3.01%	4.50%	3.47%	4.60%	3.78%
2059	3.01%	4.50%	3.47%	4.60%	3.78%
2059.5	3.02%	4.51%	3.48%	4.61%	3.79%
2060	3.02%	4.51%	3.48%	4.61%	3.79%

Company	Coupon	Maturity	Face Amount	Market Value	Market Price	YTM	Fund/Source
Enbridge Inc.	5.00%	5/15/2050	4,830,000	5,270,738	109	4.44%	Vanguard Long-Term Corp
Kinder Morgan Inc.	3.25%	8/1/2050	500,000	485,491	97	3.41%	TIAA-CREF Bond
ONEOK Inc.	4.50%	3/15/2050	500,000	496,532	99	4.54%	TIAA-CREF Bond
Williams Companies Inc.	4.85%	3/1/2048	1,700,000	2,034,198	120	3.70%	TIAA-CREF Bond

Fund:

iShares Broad USD Investment Grade Corporate Bond ETF; Dated 12/31/2020
TIAA-CREF Bond Index Fund (Retail); All Holdings As of 11/30/2020
Vanguard Long-Term Corporate Bond Index Fund Admiral Shares (VLTCX); As of 12/31/2020

Indicated Rate of Equity

Model	Rate
CAPM - Ex Post	11.09%
CAPM - Supply Side	9.46%
CAPM - Three Stage Ex Ante	9.34%
CAPM - Damodaran	7.12%
CAPM - Duff & Phelps	8.81%
CAPM - Graham and Harvey	8.56%
CAPM - Fernandez, Apellaniz, and Acin	8.94%
CAPM - BVR Historical, Arithmetic	9.33%
CAPM - BVR Historical, Geometric	7.63%
Empirical CAPM - Ex Post	10.54%
Empirical CAPM - Supply Side	9.01%
Empirical CAPM - Three Stage Ex Ante	8.90%
Empirical CAPM - Damodaran	6.81%
Empirical CAPM - Duff & Phelps	9.24%
Empirical CAPM - Graham and Harvey	8.16%
Empirical CAPM - Fernandez, Apellaniz, and Acin	8.52%
Empirical CAPM - BVR Historical, Arithmetic	6.98%
Empirical CAPM - BVR Historical, Geometric	5.80%
DGM - Dividend Growth	16.43%
DGM - Earnings Growth	20.86%
Two-Stage DGM	18.68%
Three-Stage DGM	17.42%
Indicated Rate of Equity	**15.40%**

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 dividend growth model (DGM) using earnings growth and the capital asset pricing model (CAPM) using the ex post equity risk premium. We also relied on the two-stage DGM and the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	49.00%	4.03%	1.97%
Equity Component	51.00%	6.71%	3.42%
Direct Rate			**5.40%**

Direct Rate	**5.40%**

Yield Rate	9.82%
Direct Rate	5.40%
Implied Industry Growth Rate	**4.42%**

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
Ex Post[2]	7.25%	1.30	9.43%	1.66%	11.09%
Supply Side[3]	6.00%	1.30	7.80%	1.66%	9.46%
Three Stage Ex Ante[4]	5.91%	1.30	7.68%	1.66%	9.34%
Dr. Damodaran ERP[5]	4.20%	1.30	5.46%	1.66%	7.12%
Duff & Phelps[6]	5.50%	1.30	7.15%	1.66%	8.81%
Duke CFO Global Business Outlook[7]	5.31%	1.30	6.90%	1.66%	8.56%
Fernandez, Apellaniz and Acin[8]	5.60%	1.30	7.28%	1.66%	8.94%
BVR - Historical, Arithmetic Mean[9]	5.90%	1.30	7.67%	1.66%	9.33%
BVR - Historical, Geometric Mean[10]	4.59%	1.30	5.97%	1.66%	7.63%

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2020 as determined by Dr. Aswath Damodaran; http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retrieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 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
Ex Post[2]	7.25%	1.30	7.07%	1.81%	1.66%	**10.54%**
Supply Side[3]	6.00%	1.30	5.85%	1.50%	1.66%	**9.01%**
Three Stage Ex Ante[4]	5.91%	1.30	5.76%	1.48%	1.66%	**8.90%**
Dr. Damodaran ERP[5]	4.20%	1.30	4.10%	1.05%	1.66%	**6.81%**
Duff & Phelps[6]	5.50%	1.30	5.36%	1.38%	2.50%	**9.24%**
Duke CFO Global Business Outlook[7]	5.31%	1.30	5.18%	1.33%	1.66%	**8.16%**
Fernandez, Apellaniz and Acin[8]	5.60%	1.30	5.46%	1.40%	1.66%	**8.52%**
BVR - Historical, Arithmetic Mean[9]	5.90%	0.87	3.85%	1.48%	1.66%	**6.98%**
BVR - Historical, Geometric Mean[10]	4.59%	0.87	2.99%	1.15%	1.66%	**5.80%**

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2021 as determined by Dr. Aswath Damodaran; Retrieved January 8, 2021 from http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retrieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Dividend Growth Model

Company	Current Dividend Yield (DY)	Projected Short-term EPS Growth Rate (EG)	Projected Short-term Dividend Growth Rate (DG)	Cost of Equity Earnings Growth DY + EG	Cost of Equity Dividend Growth DY + DG
Enbridge Inc.	8.50%	6.50%	5.00%	15.00%	13.50%
Kinder Morgan Inc.	7.70%	18.50%	13.00%	26.20%	20.70%
ONEOK Inc.	12.00%	10.00%	6.00%	22.00%	18.00%
Williams Companies Inc.	7.90%	12.00%	6.50%	19.90%	14.40%
Mean	9.03%	11.75%	7.63%	20.78%	16.65%
Median	8.20%	11.00%	6.25%	20.95%	16.20%

DGM - Dividend Growth, Indicated Rate	**16.43%**
DGM - Earnings Growth, Indicated Rate	**20.86%**

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.

DGM - earnings average is 18.97% and median is 19.90% without Kinder Morgan Inc.

DGM - dividends average is 15.3% and median is 14.4% without Kinder Morgan Inc.

Comparing dividend yields and earnings per share growth estimates from Value Line for the 2019 and 2018 calendar years

	Dividend Yields		EPS Growth Estimates		% Change in
Company	**2019 CY**	**2018 CY**	**2019 CY**	**2018 CY**	Growth Est.
Enbridge Inc.	5.90%	6.10%	6.50%	4.50%	44.44%
Kinder Morgan Inc.	5.00%	4.60%	35.50%	NMF	---
ONEOK Inc.	5.40%	5.60%	17.00%	20.50%	-17.07%
TC Energy Corp (FKA TransCanada	5.90%	5.40%	17.00%	56.50%	-69.91%
Williams Companies Inc.	6.90%	5.40%	20.00%	22.50%	-11.11%

According to Value Line, Kinder Morgan's estimated earnings per share growth rate to 2022 - 2024 is 35.5%. The past five years growth rate was negative 18%. The summary provided by Value Line included that Kinder Morgan recorded weak third-quarter results and that revenues fell. A few new pipeline projects were placed into service. The company benefited from lower administrative expenses and reduced debt load caused interest costs to decline. The company's bottom line should increase at a strong rate over the combine 12 months related to 10 liquefaction units in service by this time next year and reduction of debt due to sale of some assets. John E. Seibert III, November 29, 2019.

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
Enbridge Inc.	8.50%	6.50%	3.70%	5.10%	14.29%
Kinder Morgan Inc.	7.70%	18.50%	3.70%	11.10%	21.74%
ONEOK Inc.	12.00%	10.00%	3.70%	6.85%	20.33%
Williams Companies Inc.	7.90%	12.00%	3.70%	7.85%	17.47%

Mean	18.46%
Median	18.90%

Multi-Stage DGM, Indicated Rate	**18.68%**

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 1.7% plus the expected inflation rate of 2.0%).

Average without Kinder Morgan Inc. is 17.73%. Median without Kinder Morgan is 18.62%.

Three-Stage Dividend Growth Model

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

Company	Year	Enbridge Inc.		Kinder Morgan Inc.		ONEOK Inc.		Williams Companies Inc.	
Start Price	2020		-38.00		-13.67		-32.35		-20.23
Expected Dividends	2021		3.28		1.20		3.90		1.68
Stage One Growth	2022	6.50%	3.49	18.50%	1.42	10.00%	4.29	12.00%	1.88
Stage One Growth	2023	6.50%	3.72	18.50%	1.69	10.00%	4.72	12.00%	2.11
Stage One Growth	2024	6.50%	3.96	18.50%	2.00	10.00%	5.19	12.00%	2.36
Stage One Growth	2025	6.50%	4.22	18.50%	2.37	10.00%	5.71	12.00%	2.64
Stage Two Growth	2026	6.25%	4.48	17.15%	2.77	9.43%	6.25	11.25%	2.94
Stage Two Growth	2027	5.99%	4.75	15.81%	3.21	8.85%	6.80	10.49%	3.25
Stage Two Growth	2028	5.74%	5.02	14.46%	3.67	8.28%	7.36	9.74%	3.57
Stage Two Growth	2029	5.48%	5.30	13.12%	4.16	7.71%	7.93	8.98%	3.89
Stage Two Growth	2030	5.23%	5.58	11.77%	4.65	7.14%	8.50	8.23%	4.21
Stage Two Growth	2031	4.97%	5.85	10.43%	5.13	6.56%	9.06	7.47%	4.52
Stage Two Growth	2032	4.72%	6.13	9.08%	5.60	5.99%	9.60	6.72%	4.82
Stage Two Growth	2033	4.46%	6.40	7.74%	6.03	5.42%	10.12	5.96%	5.11
Stage Two Growth	2034	4.21%	6.67	6.39%	6.41	4.85%	10.61	5.21%	5.38
Stage Two Growth	2035	3.95%	6.94	5.05%	6.74	4.27%	11.06	4.45%	5.62
Stage Three Growth	2036	3.70%	7.19	3.70%	6.99	3.70%	11.47	3.70%	5.83
Stage Three Growth	2037	3.70%	7.46	3.70%	7.25	3.70%	11.90	3.70%	6.04
Stage Three Growth	2038	3.70%	7.74	3.70%	7.51	3.70%	12.34	3.70%	6.26
Stage Three Growth	2039	3.70%	8.02	3.70%	7.79	3.70%	12.79	3.70%	6.50
Stage Three Growth	2040	3.70%	8.32	3.70%	8.08	3.70%	13.27	3.70%	6.74

Stage Three Growth	2041	3.70%	8.63	3.70%	8.38	3.70%	13.76	3.70%	6.99
Stage Three Growth	2042	3.70%	8.95	3.70%	8.69	3.70%	14.27	3.70%	7.24
Stage Three Growth	2043	3.70%	9.28	3.70%	9.01	3.70%	14.79	3.70%	7.51
Stage Three Growth	2044	3.70%	9.62	3.70%	9.34	3.70%	15.34	3.70%	7.79
Stage Three Growth	2045	3.70%	9.98	3.70%	9.69	3.70%	15.91	3.70%	8.08
Stage Three Growth	2046	3.70%	10.35	3.70%	10.05	3.70%	16.50	3.70%	8.38
Stage Three Growth	2047	3.70%	10.73	3.70%	10.42	3.70%	17.11	3.70%	8.69
Stage Three Growth	2048	3.70%	11.13	3.70%	10.81	3.70%	17.74	3.70%	9.01
Stage Three Growth	2049	3.70%	11.54	3.70%	11.21	3.70%	18.40	3.70%	9.34
Reversion	2050		2.47		0.18		0.44		0.72
Implied Cost of Equity			**12.91%**		**20.64%**		**19.43%**		**15.84%**

17.20%

17.63%

17.42%

Reversion Calculation:

A. Last period's exp. dividends with growth	11.96	11.62	19.08	9.69
B. Cost of equity, less long-term growth	11.25%	18.98%	17.77%	14.18%
C. A / B	106.4	61.2	107.4	68.3
D. C / ((1 + Cost of Equity) ^ Last Period + 1)	2.47	0.18	0.44	0.72

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Enbridge Inc.	14.3
Kinder Morgan Inc.	15.4
ONEOK Inc.	11.8
Williams Companies Inc.	17.7
Mean	14.8
Median	14.9
Selected Price to Earnings (P/E) Ratio	14.9
Indicated Equity Component of the Direct Rate	**6.71%**

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

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Beta Analysis

Company	Beta
Enbridge Inc.	0.90
Kinder Morgan Inc.	1.25
ONEOK Inc.	1.60
Williams Companies Inc.	1.45
Beta Mean	1.30
Beta Median	1.35
Unlevered and Relevered Mean*	1.36
Indicated Beta	**1.30**

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

Notes:

*See the Unlevering Relevering Beta page for the calculation

Comparing betas from Value Line for the 2019 and 2018 calendar years

	Betas		
Company	**2020 CY**	**2019 CY**	**2018 CY**
Enbridge Inc.	0.9	1.00	1.00
Kinder Morgan Inc.	1.25	1.35	1.45
ONEOK Inc.	1.6	1.50	1.55
TC Energy Corp (FKA TransCanada Corporation)*	1.05	1.05	1.10
Williams Companies Inc.	1.45	1.90	1.95

*Removed as a guideline for the 2021 Study.

Unlevering/Relevering Betas

Unlevering of Betas					
Company	*Value Line* **Actual Income Tax Rate**	*From Capital Structure Page* **Actual Debt in Capital Structure**	*From Capital Structure Page* **Actual Equity in Capital Structure**	*Value Line* **Levered Beta (Published)**	*Formula* **Unlevered Beta**
Enbridge Inc.	7.00%	42.64%	52.11%	0.90	0.51
Kinder Morgan Inc.	NMF	51.38%	48.62%	1.25	N/A
ONEOK Inc.	21.00%	49.78%	50.22%	1.60	0.9
Williams Companies Inc.	23.00%	47.20%	52.80%	1.45	0.86
			Average	**1.30**	

Relevering of Betas				
Company	*Formula* **Composite Income Tax Rate**	*From Capital Structure Page* **Industry Debt in Capital Structure**	*From Capital Structure Page* **Industry Equity in Capital Structure**	*Formula* **Levered Beta**
Enbridge Inc.	17.00%	49.00%	51.00%	0.92
Kinder Morgan Inc.	17.00%	49.00%	51.00%	N/A
ONEOK Inc.	17.00%	49.00%	51.00%	1.62
Williams Companies Inc.	17.00%	49.00%	51.00%	1.55
			Average	**1.36**

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 Electric Market Segment

- December 31, 2020 calendar year information for the January 2, 2021 Assessment
- A market to book ratio over one would be an indication of no obsolescence.
- Market Value estimates for Common Equity are from Value Line. Market Value Estimates for Long-Term Debt are from the company's 10-K.
- Book Value amounts are from the company's 10-K.

Market to Book Ratio for Equity

Company	Market Value of Common Equity from Value Line	Book Value of Common Equity from 10-K	Market to Book Ratio	Source
Enbridge Inc.	76,958,324,394	61,367,000,000	1.25	Enbridge Inc. 2020 10-K, p. 107 (CAD)
Kinder Morgan Inc.	30,946,062,927	31,436,000,000	0.98	Kinder Morgan Inc. 2020 10-K, p. 78
ONEOK Inc.	14,376,256,343	6,042,398,000	2.38	ONEOK Inc. 2020 10-K, p. 63
Williams Companies Inc.	24,550,839,055	11,769,000,000	2.09	Williams Companies 2020 10-K, p. 72
		Average	**1.68**	

Market to Book Ratio for Debt

Company	Market Value of Long-Term Debt from 10-K	Book Value of Long-Term Debt from 10-K	Market to Book Ratio	Source
Enbridge Inc.	75,100,000,000	66,100,000,000	1.14	Enbridge Inc. 2020 10-K, p. 170 (CAD)
Kinder Morgan Inc.	39,622,000,000	34,689,000,000	1.14	Kinder Morgan Inc. 2019 10-K, p. 105
ONEOK Inc.	16,300,000,000	14,200,000,000	1.15	ONEOK Inc. 2020 10-K, p. 78
Williams Companies Inc.	27,043,000,000	22,344,000,000	1.21	Williams Companies 2020 10-K, p. 65
		Average	**1.16**	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	51.00%	1.68	0.86
Long-term Debt	49.00%	1.16	0.57
			1.43

Appendix D - Fluid Transportation Pipeline

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	50.00%	4.86%	2.43%
Common Equity	50.00%	15.40%	7.70%
Yield Rate			**10.13%**

Fluid Transportation Pipeline Yield Rate	**10.13%**

Capital Structure

Company	Value of Long-Term Debt	Value of Preferred Equity	Value of Common Equity	Total Market Value	% Long-Term Debt	% Preferred Equity	% Common Equity
Holly Energy Partners LP	1,439,900,000	-	1,310,621,698	2,750,521,698	52.35%	0.00%	47.65%
Magellan Midstream Partners LP	4,900,300,000	-	9,180,686,701	14,080,986,701	34.80%	0.00%	65.20%
MPLX LP	20,042,000,000	1,000,000,000	21,229,855,903	42,271,855,903	47.41%	2.37%	50.22%
NuStar Energy LP	3,597,800,000	-	1,321,264,267	4,919,064,267	73.14%	0.00%	26.86%
Phillips 66 Partners LP	3,443,000,000	-	5,697,086,643	9,140,086,643	37.67%	0.00%	62.33%
Plains All American Pipeline	9,381,000,000	2,292,000,000	5,944,368,983	17,617,368,983	53.25%	13.01%	33.74%

Mean	49.77%	2.56%	47.67%
Median	49.88%	0.00%	48.94%

Indicated Industry Capital Structure	**50.00%**	**0%**	**50.00%**

We placed more reliance on the median when selecting the indicated capital structure for the industry.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate	
Holly Energy Partners LP	Ba2	6.93%	**
Magellan Midstream Partners LP	Baa1	3.27%	
MPLX LP	Baa2	3.27%	
NuStar Energy LP	Ba3	6.93%	**
Phillips 66 Partners LP	Baa3	3.27%	
Plains All American Pipeline	Ba1	6.93%	**

Mean	5.10%
Median	5.10%
Mode	Both 3.27% and 6.93%

Corporate Bond Yield Averages from Mergent Bond Record, January 2021 Edition

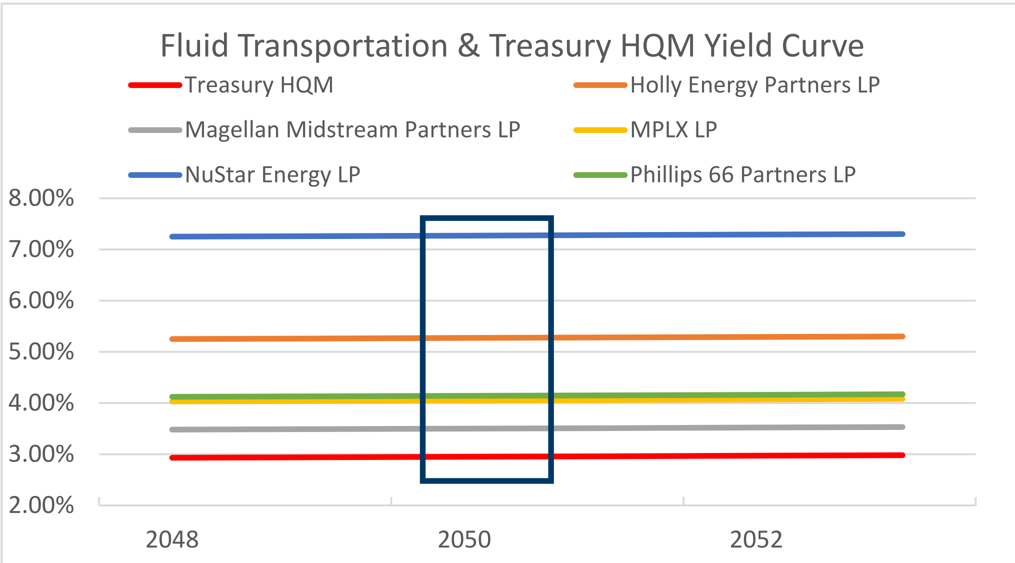
Corporate Bond Averages, December 2020

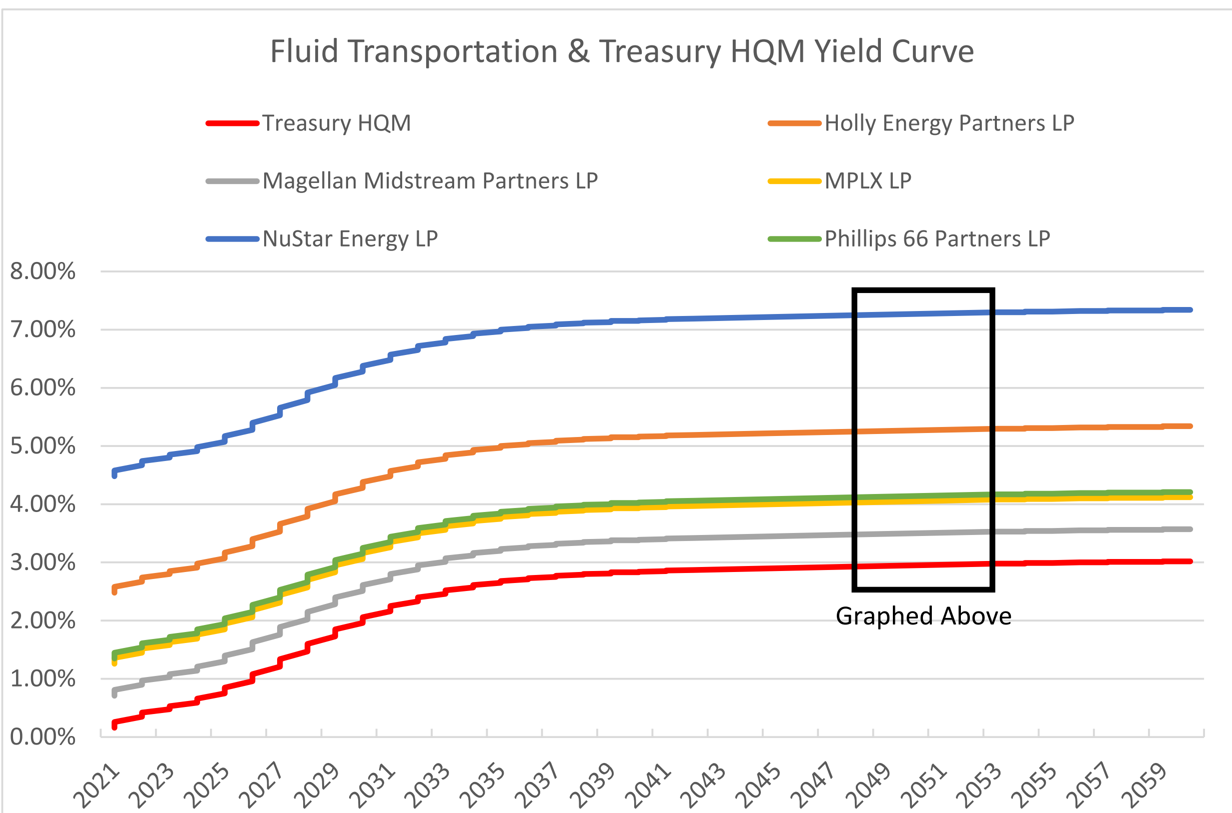
Mergent	S&P	Dec. Yield Avg.
Aaa	AAA	2.26%
Aa1, Aa2 Aa3	AA+, AA, AA-	2.31%
A1, A2, A3	A+, A, A-	2.66%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	3.27%

** These companies are rated below the Mergent Bond Record Bond Yield Averages. We analyzed the Mergent Bond Record, January 2020 issue, for U.S. Corporate Bonds with the same debt rating. We determined the average Ba1, Ba2, and Ba2 yield to maturity is 6.93%.

Current Actual Cost of Debt

Indicated Rate of Debt	4.86%	Average YTM at 2050





	Treasury HQM	Holly Energy Partners LP	Magellan Midstream Partners LP	MPLX LP	NuStar Energy LP	Phillips 66 Partners LP	Plains All American Pipeline
2021	0.16%	2.48%	0.71%	1.26%	4.48%	1.35%	2.11%
2021.5	0.26%	2.58%	0.81%	1.36%	4.58%	1.45%	2.21%
2022	0.35%	2.67%	0.90%	1.45%	4.67%	1.54%	2.30%
2022.5	0.42%	2.74%	0.97%	1.52%	4.74%	1.61%	2.37%
2023	0.48%	2.80%	1.03%	1.58%	4.80%	1.67%	2.43%
2023.5	0.53%	2.85%	1.08%	1.63%	4.85%	1.72%	2.48%
2024	0.59%	2.91%	1.14%	1.69%	4.91%	1.78%	2.54%
2024.5	0.66%	2.98%	1.21%	1.76%	4.98%	1.85%	2.61%
2025	0.75%	3.07%	1.30%	1.85%	5.07%	1.94%	2.70%
2025.5	0.85%	3.17%	1.40%	1.95%	5.17%	2.04%	2.80%
2026	0.96%	3.28%	1.51%	2.06%	5.28%	2.15%	2.91%
2026.5	1.08%	3.40%	1.63%	2.18%	5.40%	2.27%	3.03%
2027	1.21%	3.53%	1.76%	2.31%	5.53%	2.40%	3.16%
2027.5	1.34%	3.66%	1.89%	2.44%	5.66%	2.53%	3.29%
2028	1.47%	3.79%	2.02%	2.57%	5.79%	2.66%	3.42%
2028.5	1.60%	3.92%	2.15%	2.70%	5.92%	2.79%	3.55%
2029	1.73%	4.05%	2.28%	2.83%	6.05%	2.92%	3.68%
2029.5	1.85%	4.17%	2.40%	2.95%	6.17%	3.04%	3.80%
2030	1.96%	4.28%	2.51%	3.06%	6.28%	3.15%	3.91%
2030.5	2.06%	**4.38%**	2.61%	3.16%	**6.38%**	3.25%	4.01%
2031	2.16%	4.48%	2.71%	3.26%	6.48%	3.35%	4.11%
2031.5	2.25%	4.57%	2.80%	3.35%	6.57%	3.44%	4.20%
2032	2.33%	4.65%	2.88%	3.43%	6.65%	3.52%	4.28%
2032.5	2.40%	4.72%	2.95%	3.50%	6.72%	3.59%	4.35%
2033	2.46%	4.78%	3.01%	3.56%	6.78%	3.65%	4.41%
2033.5	2.52%	4.84%	3.07%	3.62%	6.84%	3.71%	4.47%
2034	2.57%	4.89%	3.12%	3.67%	6.89%	3.76%	4.52%
2034.5	2.61%	4.93%	3.16%	3.71%	6.93%	3.80%	4.56%
2035	2.65%	4.97%	3.20%	3.75%	6.97%	3.84%	4.60%
2035.5	2.68%	5.00%	3.23%	3.78%	7.00%	3.87%	4.63%
2036	2.71%	5.03%	3.26%	3.81%	7.03%	3.90%	4.66%
2036.5	2.73%	5.05%	3.28%	3.83%	7.05%	3.92%	4.68%
2037	2.75%	5.07%	3.30%	3.85%	7.07%	3.94%	4.70%
2037.5	2.77%	5.09%	3.32%	3.87%	7.09%	3.96%	4.72%
2038	2.79%	5.11%	3.34%	3.89%	7.11%	3.98%	4.74%
2038.5	2.80%	5.12%	3.35%	3.90%	7.12%	3.99%	4.75%
2039	2.81%	5.13%	3.36%	3.91%	7.13%	4.00%	4.76%
2039.5	2.83%	5.15%	3.38%	3.93%	7.15%	4.02%	4.78%
2040	2.83%	5.15%	3.38%	3.93%	7.15%	4.02%	4.78%
2040.5	2.84%	5.16%	3.39%	3.94%	7.16%	4.03%	4.79%
2041	2.85%	5.17%	3.40%	3.95%	7.17%	4.04%	4.80%
2041.5	2.86%	5.18%	3.41%	3.96%	7.18%	4.05%	4.81%

2042	2.87%	5.19%	3.42%	3.97%	7.19%	4.06%	4.82%
2042.5	2.87%	5.19%	3.42%	3.97%	7.19%	4.06%	4.82%
2043	2.88%	5.20%	3.43%	3.98%	7.20%	4.07%	4.83%
2043.5	2.88%	5.20%	3.43%	3.98%	7.20%	4.07%	4.83%
2044	2.89%	5.21%	3.44%	3.99%	7.21%	4.08%	4.84%
2044.5	2.89%	5.21%	3.44%	3.99%	7.21%	4.08%	4.84%
2045	2.90%	5.22%	3.45%	4.00%	7.22%	4.09%	**4.85%**
2045.5	2.90%	5.22%	3.45%	4.00%	7.22%	4.09%	4.85%
2046	2.91%	5.23%	3.46%	4.01%	7.23%	4.10%	4.86%
2046.5	2.91%	5.23%	3.46%	4.01%	7.23%	**4.10%**	4.86%
2047	2.92%	5.24%	3.47%	4.02%	7.24%	4.11%	4.87%
2047.5	2.92%	5.24%	3.47%	4.02%	7.24%	4.11%	4.87%
2048	2.93%	5.25%	3.48%	4.03%	7.25%	4.12%	4.88%
2048.5	2.93%	5.25%	3.48%	4.03%	7.25%	4.12%	4.88%
2049	2.94%	5.26%	3.49%	**4.04%**	7.26%	4.13%	4.89%
2049.5	2.94%	5.26%	3.49%	4.04%	7.26%	4.13%	4.89%
2050	**2.95%**	**5.27%**	**3.50%**	**4.05%**	**7.27%**	**4.14%**	**4.90%**
2050.5	2.95%	5.27%	3.50%	4.05%	7.27%	4.14%	4.90%
2051	2.96%	5.28%	3.51%	4.06%	7.28%	4.15%	4.91%
2051.5	2.96%	5.28%	3.51%	4.06%	7.28%	4.15%	4.91%
2052	2.97%	5.29%	3.52%	4.07%	7.29%	4.16%	4.92%
2052.5	2.97%	5.29%	3.52%	4.07%	7.29%	4.16%	4.92%
2053	2.98%	5.30%	3.53%	4.08%	7.30%	4.17%	4.93%
2053.5	2.98%	5.30%	3.53%	4.08%	7.30%	4.17%	4.93%
2054	2.98%	5.30%	3.53%	4.08%	7.30%	4.17%	4.93%
2054.5	2.99%	5.31%	3.54%	4.09%	7.31%	4.18%	4.94%
2055	2.99%	5.31%	3.54%	4.09%	7.31%	4.18%	4.94%
2055.5	2.99%	5.31%	3.54%	4.09%	7.31%	4.18%	4.94%
2056	3.00%	5.32%	3.55%	4.10%	7.32%	4.19%	4.95%
2056.5	3.00%	5.32%	3.55%	4.10%	7.32%	4.19%	4.95%
2057	3.00%	5.32%	3.55%	4.10%	7.32%	4.19%	4.95%
2057.5	3.01%	5.33%	3.56%	4.11%	7.33%	4.20%	4.96%
2058	3.01%	5.33%	3.56%	4.11%	7.33%	4.20%	4.96%
2058.5	3.01%	5.33%	3.56%	4.11%	7.33%	4.20%	4.96%
2059	3.01%	5.33%	3.56%	4.11%	7.33%	4.20%	4.96%
2059.5	3.02%	5.34%	3.57%	4.12%	7.34%	4.21%	4.97%
2060	3.02%	5.34%	3.57%	4.12%	7.34%	4.21%	4.97%

Company	Coupon	Maturity	Face Amount	Market Value	Market Price	YTM	Fund/Source
Holly Energy Partners LP	4.50%	10/1/2030	500,000	504,517	101	4.38%	TIAA-CREF Bond
Magellan Midstream Partners	3.95%	3/1/2050	500,000	541,307	108	3.50%	TIAA-CREF Bond
MPLX LP	5.50%	2/15/2049	850,000	1,056,615	124	4.04%	TIAA-CREF Bond
Phillips 66 Partners LP	4.90%	10/1/2046	1,230,000	1,384,966	113	4.10%	Vanguard Long-Term Corp
Plains All American Pipeline	4.90%	2/15/2045	300,000	302,002	101	4.85%	TIAA-CREF Bond

Fund:

iShares Broad USD Investment Grade Corporate Bond ETF; Dated 12/31/2020

TIAA-CREF Bond Index Fund (Retail); All Holdings As of 11/30/2020

Vanguard Long-Term Corporate Bond Index Fund Admiral Shares (VLTCX); As of 12/31/2020

Notes:

On September 14, 2020, NuStar Logistics issued $600.0 million of 5.75% senior notes due October 1, 2025 and $600.0 million of 6.375% senior notes due October 1, 2030. NuStar Energy LP Form 10-Q, September 30, 2020, p. 8

Indicated Rate of Equity

Model	Rate
CAPM - Ex Post	10.22%
CAPM - Supply Side	8.74%
CAPM - Three Stage Ex Ante	8.63%
CAPM - Damodaran	6.62%
CAPM - Duff & Phelps	8.99%
CAPM - Graham and Harvey	7.93%
CAPM - Fernandez, Apellaniz, and Acin	8.27%
CAPM - BVR Historical, Arithmetic	8.62%
CAPM - BVR Historical, Geometric	7.08%
Empirical CAPM - Ex Post	9.89%
Empirical CAPM - Supply Side	8.47%
Empirical CAPM - Three Stage Ex Ante	8.37%
Empirical CAPM - Damodaran	6.43%
Empirical CAPM - Duff & Phelps	8.74%
Empirical CAPM - Graham and Harvey	7.69%
Empirical CAPM - Fernandez, Apellaniz, and Acin	8.02%
Empirical CAPM - BVR Historical, Arithmetic	8.36%
Empirical CAPM - BVR Historical, Geometric	6.87%
DGM - Dividend Growth	17.00%
DGM - Earnings Growth	21.50%
Two-Stage DGM	19.94%
Three-Stage DGM	19.20%
Indicated Rate of Equity	**15.40%**

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 dividend growth model (DGM) using earnings growth and the capital asset pricing model (CAPM) using the ex post equity risk premium. We also relied on the two-stage DGM and the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	50.00%	4.86%	2.43%
Equity Component	50.00%	10.00%	5.00%
Direct Rate			**7.43%**

Direct Rate	**7.43%**

Yield Rate	10.13%
Direct Rate	7.43%
Implied Industry Growth Rate	**2.70%**

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
Ex Post[2]	7.25%	1.18	8.56%	1.66%	10.22%
Supply Side[3]	6.00%	1.18	7.08%	1.66%	8.74%
Three Stage Ex Ante[4]	5.91%	1.18	6.97%	1.66%	8.63%
Dr. Damodaran ERP[5]	4.20%	1.18	4.96%	1.66%	6.62%
Duff & Phelps[6]	5.50%	1.18	6.49%	2.50%	8.99%
Duke CFO Global Business Outlook[7]	5.31%	1.18	6.27%	1.66%	7.93%
Fernandez, Apellaniz and Acin[8]	5.60%	1.18	6.61%	1.66%	8.27%
BVR - Historical, Arithmetic Mean[9]	5.90%	1.18	6.96%	1.66%	8.62%
BVR - Historical, Geometric Mean[10]	4.59%	1.18	5.42%	1.66%	7.08%

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2020 as determined by Dr. Aswath Damodaran; http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retrieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 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
Ex Post[2]	7.25%	1.18	6.42%	1.81%	1.66%	**9.89%**
Supply Side[3]	6.00%	1.18	5.31%	1.50%	1.66%	**8.47%**
Three Stage Ex Ante[4]	5.91%	1.18	5.23%	1.48%	1.66%	**8.37%**
Dr. Damodaran ERP[5]	4.20%	1.18	3.72%	1.05%	1.66%	**6.43%**
Duff & Phelps[6]	5.50%	1.18	4.87%	1.38%	2.50%	**8.74%**
Duke CFO Global Business Outlook[7]	5.31%	1.18	4.70%	1.33%	1.66%	**7.69%**
Fernandez, Apellaniz and Acin[8]	5.60%	1.18	4.96%	1.40%	1.66%	**8.02%**
BVR - Historical, Arithmetic Mean[9]	5.90%	1.18	5.22%	1.48%	1.66%	**8.36%**
BVR - Historical, Geometric Mean[10]	4.59%	1.18	4.06%	1.15%	1.66%	**6.87%**

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2021 as determined by Dr. Aswath Damodaran; Retrieved January 8, 2021 from http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved Februrary 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

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
Magellan Midstream Partners LP	10.00%	3.50%	7.00%	13.50%	17.00%
MPLX LP	13.50%	8.00%	2.00%	21.50%	15.50%
NuStar Energy LP	13.20%	21.00%	-1.00%	34.20%	12.20%
Phillips 66 Partners LP	14.00%	9.00%	9.50%	23.00%	23.50%
Plains All American Pipeline	8.80%	2.50%	8.50%	11.30%	17.30%
Mean	11.90%	8.80%	5.20%	20.70%	17.10%
Median	13.20%	8.00%	7.00%	21.50%	17.00%

DGM - Dividend Growth, Indicated Rate	**17.00%**
DGM - Earnings Growth, Indicated Rate	**21.50%**

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

Notes:

Dividend Yield and growth rates provided by Value Line

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

Removed Holly Energy Partners as an outlier:

Holly Energy Partners LP	11.30%	Nil	-10.00%		

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
Holly Energy Partners LP	11.30%	Nil	3.70%	N/A	N/A
Magellan Midstream Partners LP	10.00%	3.50%	3.70%	3.60%	13.75%
MPLX LP	13.50%	8.00%	3.70%	5.85%	20.48%
NuStar Energy LP	13.20%	21.00%	3.70%	12.35%	29.31%
Phillips 66 Partners LP	14.00%	9.00%	3.70%	6.35%	21.70%
Plains All American Pipeline	8.80%	2.50%	3.70%	3.10%	11.83%

Mean	19.41%
Median	20.48%

Multi-Stage DGM, Indicated Rate	**19.94%**

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

Notes:
Dividend Yield provided by Value Line
Growth Estimates, Next 5 Years for Earnings provided Value Line

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

Three-Stage Dividend Growth Model

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

Company	Year	Magellan Midstream Partners LP		MPLX LP		NuStar Energy LP		Phillips 66 Partners LP		Plains All American Pipeline	
Start Price	2020		-41.04		-20.41		-12.1		-24.95		-8.16
Expected Dividends	2021		4.11		2.75		1.60		3.60		0.72
Stage One Growth	2022	3.50%	4.25	8.00%	2.97	21.00%	1.94	9.00%	3.92	2.50%	0.74
Stage One Growth	2023	3.50%	4.40	8.00%	3.21	21.00%	2.34	9.00%	4.28	2.50%	0.76
Stage One Growth	2024	3.50%	4.56	8.00%	3.46	21.00%	2.83	9.00%	4.66	2.50%	0.78
Stage One Growth	2025	3.50%	4.72	8.00%	3.74	21.00%	3.43	9.00%	5.08	2.50%	0.79
Stage Two Growth	2026	3.52%	4.88	7.61%	4.03	19.43%	4.10	8.52%	5.51	2.61%	0.82
Stage Two Growth	2027	3.54%	5.06	7.22%	4.32	17.85%	4.83	8.04%	5.96	2.72%	0.84
Stage Two Growth	2028	3.55%	5.23	6.83%	4.61	16.28%	5.61	7.55%	6.41	2.83%	0.86
Stage Two Growth	2029	3.57%	5.42	6.44%	4.91	14.71%	6.44	7.07%	6.86	2.94%	0.89
Stage Two Growth	2030	3.59%	5.62	6.05%	5.20	13.14%	7.28	6.59%	7.31	3.05%	0.91
Stage Two Growth	2031	3.61%	5.82	5.65%	5.50	11.56%	8.13	6.11%	7.76	3.15%	0.94
Stage Two Growth	2032	3.63%	6.03	5.26%	5.79	9.99%	8.94	5.63%	8.20	3.26%	0.97
Stage Two Growth	2033	3.65%	6.25	4.87%	6.07	8.42%	9.69	5.15%	8.62	3.37%	1.01
Stage Two Growth	2034	3.66%	6.48	4.48%	6.34	6.85%	10.36	4.66%	9.02	3.48%	1.04
Stage Two Growth	2035	3.68%	6.72	4.09%	6.60	5.27%	10.90	4.18%	9.40	3.59%	1.08
Stage Three Growth	2036	3.70%	6.97	3.70%	6.85	3.70%	11.30	3.70%	9.75	3.70%	1.12
Stage Three Growth	2037	3.70%	7.22	3.70%	7.10	3.70%	11.72	3.70%	10.11	3.70%	1.16
Stage Three Growth	2038	3.70%	7.49	3.70%	7.36	3.70%	12.16	3.70%	10.48	3.70%	1.20
Stage Three Growth	2039	3.70%	7.77	3.70%	7.64	3.70%	12.61	3.70%	10.87	3.70%	1.25
Stage Three Growth	2040	3.70%	8.06	3.70%	7.92	3.70%	13.07	3.70%	11.27	3.70%	1.29

Stage Three Growth	2041	3.70%	8.35	3.70%	8.21	3.70%	13.56	3.70%	11.69	3.70%	1.34
Stage Three Growth	2042	3.70%	8.66	3.70%	8.51	3.70%	14.06	3.70%	12.12	3.70%	1.39
Stage Three Growth	2043	3.70%	8.98	3.70%	8.83	3.70%	14.58	3.70%	12.57	3.70%	1.44
Stage Three Growth	2044	3.70%	9.32	3.70%	9.16	3.70%	15.12	3.70%	13.03	3.70%	1.50
Stage Three Growth	2045	3.70%	9.66	3.70%	9.49	3.70%	15.68	3.70%	13.51	3.70%	1.55
Stage Three Growth	2046	3.70%	10.02	3.70%	9.85	3.70%	16.26	3.70%	14.01	3.70%	1.61
Stage Three Growth	2047	3.70%	10.39	3.70%	10.21	3.70%	16.86	3.70%	14.53	3.70%	1.67
Stage Three Growth	2048	3.70%	10.77	3.70%	10.59	3.70%	17.48	3.70%	15.07	3.70%	1.73
Stage Three Growth	2049	3.70%	11.17	3.70%	10.98	3.70%	18.13	3.70%	15.63	3.70%	1.79
Reversion	2050		2.53		0.24		0.03		0.19		0.86
Implied Cost of Equity			**12.75%**		**19.73%**		**28.65%**		**21.53%**		**10.75%**

Mean	18.68%
Median	19.73%
Selected Three-Stage DGM Cost of Equity	**19.20%**

Reversion Calculation:

A. Last period's exp. dividends with growth	11.58	11.39	18.80	16.21	1.86
B. Cost of equity, less long-term growth	11.09%	18.07%	26.99%	19.87%	9.09%
C. A / B	104.5	63.0	69.6	81.6	20.5
D. C / ((1 + Cost of Equity) ^ Last Period + 1)	2.53	0.24	0.03	0.19	0.86

Note:
Holly Energy Partners LP's estimated earnings growth rate is NIL and therefore, we were not able to complete this analysis for the company.

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Holly Energy Partners LP	7.4
Magellan Midstream Partners LP	11.3
MPLX LP	8.4
NuStar Energy LP	22.0
Phillips 66 Partners LP	6.6
Plains All American Pipeline	9.4
Mean	10.85
Median	8.90
Selected Price to Earnings (P/E) Ratio	10.00
Indicated Equity Component of the Direct Rate	**10.00%**

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

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Average without NuStar Energy LP is 8.6.

Beta Analysis

Company	Beta
Holly Energy Partners LP	0.95
Magellan Midstream Partners LP	1.20
MPLX LP	1.15
NuStar Energy LP	1.30
Phillips 66 Partners LP	1.00
Plains All American Pipeline	1.55
Beta Mean	1.19
Beta Median	1.18
Unlevered and Relevered Mean*	1.21
Indicated Beta	**1.18**

We considered the mean, median, and unlevered/relevered mean. We placed more reliance on the median when selecting the indicated beta. We placed the least amount of 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. Without Plains All American Pipeline, the mean beta is 1.12.

Notes:

*See the Unlevering Relevering Beta page for the calculation

Unlevering/Relevering Betas

Unlevering of Betas					
Company	*Value Line* **Actual Income Tax Rate**	*From Capital Structure Page* **Actual Debt in Capital Structure**	*From Capital Structure Page* **Actual Equity in Capital Structure**	*Value Line* **Levered Beta (Published)**	*Formula* **Unlevered Beta**
Holly Energy Partners LP	0.10%	52.35%	47.65%	0.95	0.45
Magellan Midstream Partners	0.20%	34.80%	65.20%	1.20	0.78
MPLX LP	0.50%	47.41%	50.22%	1.15	0.59
NuStar Energy LP	Nil	73.14%	26.86%	1.30	N/A
Phillips 66 Partners LP	Nil	37.67%	62.33%	1.00	N/A
Plains All American Pipeline	NMF	53.25%	33.74%	1.55	N/A
			Average	**1.19**	

Relevering of Betas				
Company	*Formula* **Composite Income Tax Rate**	*From Capital Structure Page* **Industry Debt in Capital Structure**	*From Capital Structure Page* **Industry Equity in Capital Structure**	*Formula* **Levered Beta**
Holly Energy Partners LP	0.27%	50.00%	50.00%	0.90
Magellan Midstream Partners	0.27%	50.00%	50.00%	1.56
MPLX LP	0.27%	50.00%	50.00%	1.18
NuStar Energy LP	0.27%	50.00%	50.00%	N/A
Phillips 66 Partners LP	0.27%	50.00%	50.00%	N/A
Plains All American Pipeline	0.27%	50.00%	50.00%	N/A
			Average	**1.21**

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

- December 31, 2020 calendar year information for the January 2, 2021 Assessment
- A market to book ratio over one would be an indication of no obsolescence.
- Market Value estimates for Common Equity are from Value Line. Market Value Estimates for Long-Term Debt are from the company's 10-K.
- Book Value amounts are from the company's 10-K.

Market to Book Ratio for Equity

Company	Market Value of Common Equity from Value Line	Book Value of Common Equity from 10-K	Market to Book Ratio	Source
Holly Energy Partners LP	1,310,621,698	379,292,000	3.46	Holly Energy Partners LP 2020 10-K, p. 74
Magellan Midstream Partners LP	9,180,686,701	2,715,028,000	3.38	Magellan Midstream Partners LP 2020 10-K, p. 63
MPLX LP	21,229,855,903	12,772,000,000	1.66	MPLX LP 2020 10-K, p. 103
NuStar Energy LP	1,321,264,267	1,231,959,000	1.07	NuStar Energy LP 2020 10-K, p. 56
Phillips 66 Partners LP	5,697,086,643	2,798,000,000	2.04	Phillips 66 Partners LP 2020 10-K, p. 64
Plains All American Pipeline	5,944,368,983	9,593,000,000	0.62	Plains All American Pipeline LP 2020 10-K, p. F-6
		Average	2.04	

Market to Book Ratio for Debt

Company	Market Value of Long-Term Debt from 10-K	Book Value of Long-Term Debt from 10-K	Market to Book Ratio	Source
Holly Energy Partners LP	506,540,000	492,103,000	1.03	Holly Energy Partners LP 2020 10-K, p. 92
Magellan Midstream Partners LP	5,880,850,000	4,978,691,000	1.18	Magellan Midstream Partners LP 2020 10-K, p. 103
MPLX LP	22,951,000,000	20,244,000,000	1.13	MPLX LP 2020 10-K, p. 139
NuStar Energy LP	3,799,378,000	3,539,258,000	1.07	NuStar Energy LP 2020 10-K, p. 87
Phillips 66 Partners LP	4,217,000,000	3,940,000,000	1.07	Phillips 66 Partners LP 2020 10-K, p. 84
Plains All American Pipeline	9,900,000,000	9,100,000,000	1.09	Plains All American Pipeline LP 2020 10-K, p. F-36
		Average	1.10	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	50.00%	2.04	1.02
Long-term Debt	50.00%	1.10	0.55
			1.57

Appendix E - Railroad

Yield Rate

	Capital Structure	Rate	Composite
Long-Term Debt	15.00%	2.70%	0.41%
Common Equity	85.00%	10.20%	8.67%
Yield Rate			**9.08%**

Yield Rate	**9.08%**

Capital Structure

Company	Value of Long-Term Debt	Value of Preferred Equity	Value of Common Equity	Total Market Value	% Long-Term Debt	% Preferred Equity	% Common Equity
Canadian National Railway	9,815,000,000	-	76,644,784,000	86,459,784,000	11.35%	0.00%	88.65%
Canadian Pacific Railway	6,800,000,000	-	43,760,920,000	50,560,920,000	13.45%	0.00%	86.55%
CSX Corporation	16,121,000,000	-	67,453,151,296	83,574,151,296	19.29%	0.00%	80.71%
Kansas City Southern	3,765,300,000	6,100,000	17,251,701,496	21,023,101,496	17.91%	0.03%	82.06%
Norfolk Southern Corp	12,634,000,000	-	58,523,301,582	71,157,301,582	17.76%	0.00%	82.24%
Union Pacific Corp	26,080,000,000	-	133,426,035,270	159,506,035,270	16.35%	0.00%	83.65%
				Mean	16.02%	0.00%	83.98%
				Median	17.05%	0.00%	82.95%
	Indicated Capital Structure				**15.00%**		**85.00%**

We placed more reliance on the mean capital structure when selecting the indicated capital structure, rounding to 15% debt, 85% equity.

Notes:

Data downloaded from Value Line.

Indexed Rate of Debt

Company	Debt Rating	Long-Term Debt Rate
Canadian National Railway	A2	2.66%
Canadian Pacific Railway	Baa1	3.27%
CSX Corporation	Baa1	3.27%
Kansas City Southern	Baa2	3.27%
Norfolk Southern Corp	Baa1	3.27%
Union Pacific Corp	Baa1	3.27%

Mean	3.17%
Median	3.27%
Mode	3.27%

Corporate Bond Yield Averages from Mergent Bond Record, January 2021 Edition

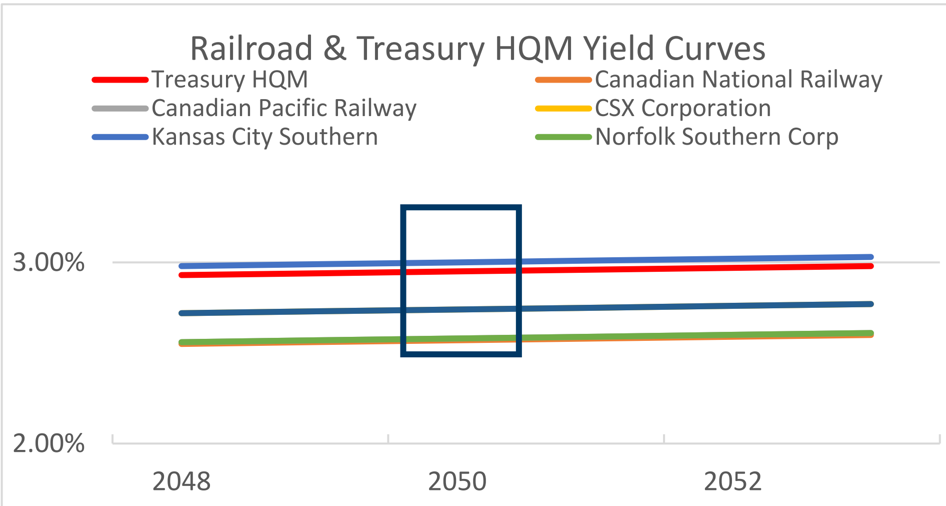
Corporate Bond Averages, December 2020

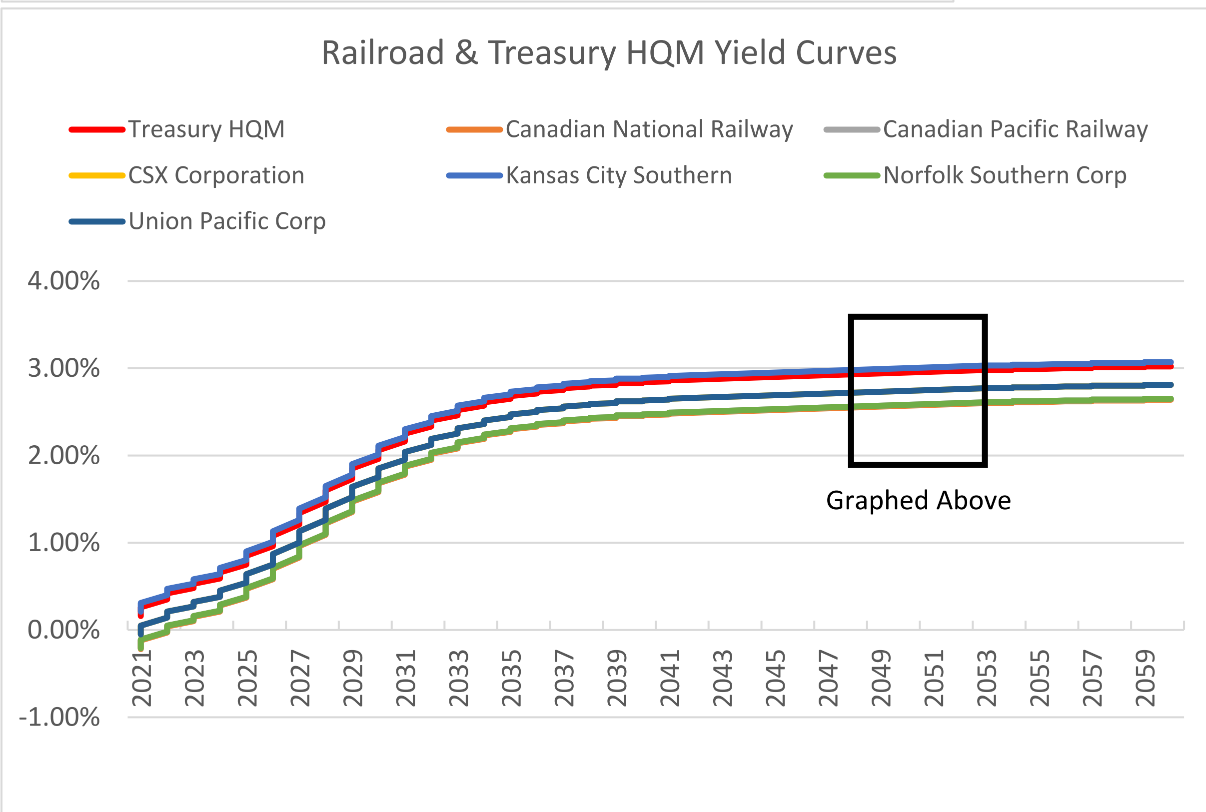
Mergent	S&P	Dec. Yield Avg.
Aaa	AAA	2.26%
Aa1, Aa2 Aa3	AA+, AA, AA-	2.31%
A1, A2, A3	A+, A, A-	2.66%
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	3.27%

Notes:

Current Actual Cost of Debt

Indicated Rate of Debt	2.70%	Average YTM at 2050





	Treasury HQM	Canadian National Railway	Canadian Pacific Railway	CSX Corporation	Kansas City Southern	Norfolk Southern Corp	Union Pacific Corp
2021	0.16%	-0.22%	-0.21%	-0.05%	0.21%	-0.21%	-0.05%
2021.5	0.26%	-0.12%	-0.11%	0.05%	0.31%	-0.11%	0.05%
2022	0.35%	-0.03%	-0.02%	0.14%	0.40%	-0.02%	0.14%
2022.5	0.42%	0.04%	0.05%	0.21%	0.47%	0.05%	0.21%
2023	0.48%	0.10%	0.11%	0.27%	0.53%	0.11%	0.27%
2023.5	0.53%	0.15%	0.16%	0.32%	0.58%	0.16%	0.32%
2024	0.59%	0.21%	0.22%	0.38%	0.64%	0.22%	0.38%
2024.5	0.66%	0.28%	0.29%	0.45%	0.71%	0.29%	0.45%
2025	0.75%	0.37%	0.38%	0.54%	0.80%	0.38%	0.54%
2025.5	0.85%	0.47%	0.48%	0.64%	0.90%	0.48%	0.64%
2026	0.96%	0.58%	0.59%	0.75%	1.01%	0.59%	0.75%
2026.5	1.08%	0.70%	0.71%	0.87%	1.13%	0.71%	0.87%
2027	1.21%	0.83%	0.84%	1.00%	1.26%	0.84%	1.00%
2027.5	1.34%	0.96%	0.97%	1.13%	1.39%	0.97%	1.13%
2028	1.47%	1.09%	1.10%	1.26%	1.52%	1.10%	1.26%
2028.5	1.60%	1.22%	1.23%	1.39%	1.65%	1.23%	1.39%
2029	1.73%	1.35%	1.36%	1.52%	1.78%	1.36%	1.52%
2029.5	1.85%	1.47%	1.48%	1.64%	1.90%	1.48%	1.64%
2030	1.96%	1.58%	1.59%	1.75%	2.01%	1.59%	1.75%
2030.5	2.06%	1.68%	1.69%	1.85%	2.11%	1.69%	1.85%
2031	2.16%	1.78%	1.79%	1.95%	2.21%	1.79%	1.95%
2031.5	2.25%	1.87%	1.88%	2.04%	2.30%	1.88%	2.04%
2032	2.33%	1.95%	1.96%	2.12%	2.38%	1.96%	2.12%
2032.5	2.40%	2.02%	2.03%	2.19%	2.45%	2.03%	2.19%
2033	2.46%	2.08%	2.09%	2.25%	2.51%	2.09%	2.25%
2033.5	2.52%	2.14%	2.15%	2.31%	2.57%	2.15%	2.31%
2034	2.57%	2.19%	2.20%	2.36%	2.62%	2.20%	2.36%
2034.5	2.61%	2.23%	2.24%	2.40%	2.66%	2.24%	2.40%
2035	2.65%	2.27%	2.28%	2.44%	2.70%	2.28%	2.44%
2035.5	2.68%	2.30%	2.31%	2.47%	2.73%	2.31%	2.47%
2036	2.71%	2.33%	2.34%	2.50%	2.76%	2.34%	2.50%
2036.5	2.73%	2.35%	2.36%	2.52%	2.78%	2.36%	2.52%
2037	2.75%	2.37%	2.38%	2.54%	2.80%	2.38%	2.54%
2037.5	2.77%	2.39%	2.40%	2.56%	2.82%	2.40%	2.56%
2038	2.79%	2.41%	2.42%	2.58%	2.84%	2.42%	2.58%
2038.5	2.80%	2.42%	2.43%	2.59%	2.85%	2.43%	2.59%
2039	2.81%	2.43%	2.44%	2.60%	2.86%	2.44%	2.60%
2039.5	2.83%	2.45%	2.46%	2.62%	2.88%	2.46%	2.62%
2040	2.83%	2.45%	2.46%	2.62%	2.88%	2.46%	2.62%
2040.5	2.84%	2.46%	2.47%	2.63%	2.89%	2.47%	2.63%

2041	2.85%	2.47%	2.48%	2.64%	2.90%	2.48%	2.64%
2041.5	2.86%	2.48%	2.49%	2.65%	2.91%	2.49%	2.65%
2042	2.87%	2.49%	2.50%	2.66%	2.92%	2.50%	2.66%
2042.5	2.87%	2.49%	2.50%	2.66%	2.92%	2.50%	2.66%
2043	2.88%	2.50%	2.51%	2.67%	2.93%	2.51%	2.67%
2043.5	2.88%	2.50%	2.51%	2.67%	2.93%	2.51%	2.67%
2044	2.89%	2.51%	2.52%	2.68%	2.94%	2.52%	2.68%
2044.5	2.89%	2.51%	2.52%	2.68%	2.94%	2.52%	2.68%
2045	2.90%	2.52%	2.53%	2.69%	2.95%	2.53%	2.69%
2045.5	2.90%	2.52%	**2.53%**	2.69%	2.95%	2.53%	2.69%
2046	2.91%	2.53%	2.54%	2.70%	2.96%	2.54%	2.70%
2046.5	2.91%	2.53%	2.54%	2.70%	2.96%	2.54%	2.70%
2047	2.92%	2.54%	2.55%	2.71%	2.97%	2.55%	2.71%
2047.5	2.92%	2.54%	2.55%	2.71%	2.97%	2.55%	2.71%
2048	2.93%	2.55%	2.56%	2.72%	2.98%	2.56%	2.72%
2048.5	2.93%	2.55%	2.56%	2.72%	2.98%	2.56%	2.72%
2049	2.94%	**2.56%**	2.57%	2.73%	2.99%	2.57%	2.73%
2049.5	2.94%	2.56%	2.57%	2.73%	2.99%	2.57%	2.73%
2050	**2.95%**	**2.57%**	**2.58%**	**2.74%**	**3.00%**	**2.58%**	**2.74%**
2050.5	2.95%	2.57%	2.58%	**2.74%**	**3.00%**	**2.58%**	2.74%
2051	2.96%	2.58%	2.59%	2.75%	3.01%	2.59%	2.75%
2051.5	2.96%	2.58%	2.59%	2.75%	3.01%	2.59%	**2.75%**
2052	2.97%	2.59%	2.60%	2.76%	3.02%	2.60%	2.76%
2052.5	2.97%	2.59%	2.60%	2.76%	3.02%	2.60%	2.76%
2053	2.98%	2.60%	2.61%	2.77%	3.03%	2.61%	2.77%
2053.5	2.98%	2.60%	2.61%	2.77%	3.03%	2.61%	2.77%
2054	2.98%	2.60%	2.61%	2.77%	3.03%	2.61%	2.77%
2054.5	2.99%	2.61%	2.62%	2.78%	3.04%	2.62%	2.78%
2055	2.99%	2.61%	2.62%	2.78%	3.04%	2.62%	2.78%
2055.5	2.99%	2.61%	2.62%	2.78%	3.04%	2.62%	2.78%
2056	3.00%	2.62%	2.63%	2.79%	3.05%	2.63%	2.79%
2056.5	3.00%	2.62%	2.63%	2.79%	3.05%	2.63%	2.79%
2057	3.00%	2.62%	2.63%	2.79%	3.05%	2.63%	2.79%
2057.5	3.01%	2.63%	2.64%	2.80%	3.06%	2.64%	2.80%
2058	3.01%	2.63%	2.64%	2.80%	3.06%	2.64%	2.80%
2058.5	3.01%	2.63%	2.64%	2.80%	3.06%	2.64%	2.80%
2059	3.01%	2.63%	2.64%	2.80%	3.06%	2.64%	2.80%
2059.5	3.02%	2.64%	2.65%	2.81%	3.07%	2.65%	2.81%
2060	3.02%	2.64%	2.65%	2.81%	3.07%	2.65%	2.81%

Company	Coupon	Maturity	Face Amount	Market Value	Market Price	YTM	Fund/Source
Canadian National Railway	4.45%	1/20/2049	$1,353,000	$1,862,653	$137.67	2.56%	Vanguard Long-Term Corp
Canadian Pacific Railway	4.80%	8/1/2045	$520,000	$734,532	$141.26	2.53%	iShares Broad USD Inv Grade
CSX Corporation	3.95%	5/1/2050	$2,495,000	$3,103,358	$124.38	2.74%	Vanguard Long-Term Corp
Kansas City Southern	3.50%	5/1/2050	$500,000	$548,773	$109.75	3.00%	TIAA-CREF Bond
Norfolk Southern Corp	3.05%	5/15/2050	$3,275,000	$3,590,396	$109.63	2.58%	Vanguard Long-Term Corp
Union Pacific Corp	3.80%	10/1/2051	$3,681,000	$4,480,101	$121.71	2.75%	Vanguard Long-Term Corp

Fund:

iShares Broad USD Investment Grade Corporate Bond ETF; Dated 12/31/2020

TIAA-CREF Bond Index Fund (Retail); All Holdings As of 11/30/2020

Vanguard Long-Term Corporate Bond Index Fund Admiral Shares (VLTCX); As of 12/31/2020

Indicated Rate of Equity

Model	Rate
CAPM - Ex Post	9.64%
CAPM - Supply Side	8.26%
CAPM - Three Stage Ex Ante	8.16%
CAPM - Damodaran	6.28%
CAPM - Duff & Phelps	8.55%
CAPM - Graham and Harvey	7.50%
CAPM - Fernandez, Apellaniz, and Acin	7.82%
CAPM - BVR Historical, Arithmetic	8.15%
CAPM - BVR Historical, Geometric	6.71%
Empirical CAPM - Ex Post	9.45%
Empirical CAPM - Supply Side	8.11%
Empirical CAPM - Three Stage Ex Ante	8.01%
Empirical CAPM - Damodaran	6.18%
Empirical CAPM - Duff & Phelps	8.41%
Empirical CAPM - Graham and Harvey	7.37%
Empirical CAPM - Fernandez, Apellaniz, and Acin	7.68%
Empirical CAPM - BVR Historical, Arithmetic	8.00%
Empirical CAPM - BVR Historical, Geometric	6.59%
DGM - Dividend Growth	9.35%
DGM - Earnings Growth	11.75%
Two-Stage DGM	9.65%
Three-Stage DGM	3.76%
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 dividend growth model (DGM) using earnings growth and the capital asset pricing model (CAPM) using the ex post equity risk premium. We also relied on the two-stage DGM and the CAPM using the Business Valuation Resources Historical (arithmetic) equity risk premium.

Direct Rate and Growth

	Capital Structure	Rate	Composite
Debt Component	15.00%	2.70%	0.41%
Equity Component	85.00%	4.35%	3.70%
Direct Rate			**4.10%**

Direct Rate	**4.10%**

Yield Rate	9.08%
Direct Rate	4.10%
Implied Industry Growth Rate	**4.98%**

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
Ex Post[2]	7.25%	1.10	7.98%	1.66%	9.64%
Supply Side[3]	6.00%	1.10	6.60%	1.66%	8.26%
Three Stage Ex Ante[4]	5.91%	1.10	6.50%	1.66%	8.16%
Dr. Damodaran ERP[5]	4.20%	1.10	4.62%	1.66%	6.28%
Duff & Phelps[6]	5.50%	1.10	6.05%	2.50%	8.55%
Duke CFO Global Business Outlook[7]	5.31%	1.10	5.84%	1.66%	7.50%
Fernandez, Apellaniz and Acin[8]	5.60%	1.10	6.16%	1.66%	7.82%
BVR - Historical, Arithmetic Mean[9]	5.90%	1.10	6.49%	1.66%	8.15%
BVR - Historical, Geometric Mean[10]	4.59%	1.10	5.05%	1.66%	6.71%

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2020 as determined by Dr. Aswath Damodaran; http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retrieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 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
Ex Post[2]	7.25%	1.10	5.98%	1.81%	1.66%	**9.45%**
Supply Side[3]	6.00%	1.10	4.95%	1.50%	1.66%	**8.11%**
Three Stage Ex Ante[4]	5.91%	1.10	4.88%	1.48%	1.66%	**8.01%**
Dr. Damodaran ERP[5]	4.20%	1.10	3.47%	1.05%	1.66%	**6.18%**
Duff & Phelps[6]	5.50%	1.10	4.54%	1.38%	2.50%	**8.41%**
Duke CFO Global Business Outlook[7]	5.31%	1.10	4.38%	1.33%	1.66%	**7.37%**
Fernandez, Apellaniz and Acin[8]	5.60%	1.10	4.62%	1.40%	1.66%	**7.68%**
BVR - Historical, Arithmetic Mean[9]	5.90%	1.10	4.87%	1.48%	1.66%	**8.00%**
BVR - Historical, Geometric Mean[10]	4.59%	1.10	3.79%	1.15%	1.66%	**6.59%**

Notes:

1 U.S. Treasury on January 4, 2021 - 30-year Coupon Bond Yield, Daily Observations, Retrieved January 13, 2021 from www.federalreserve.gov

2 Historical Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

3 Supply Side Long-Term (1926 - Present) Equity Risk Premium. Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

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

5 Implied Equity Risk Premium on January 1, 2021 as determined by Dr. Aswath Damodaran; Retrieved January 8, 2021 from http://pages.stern.nyu.edu/~adamodar/

6 Duff & Phelps recommended equity risk premium (conditional) Duff & Phelps. (2021). Cost of Capital Navigator. Retrieved February 9, 2021, from https://costofcapital.duffandphelps.com/

7 The CFO Survey (2021). Data & Results December 22, 2020. Mean average annual S&P return over next ten years (6.20%) less annual yield on 10-year Treasury Bonds (0.89%). Retrieved January 13, 2021 from https://www.cfosurvey.org/

8 Fernandez, P., Appellaniz, E., & Acin, I. F. (2020). Survey: Market Risk Premium and Risk-Free Rate Used for 81 Countries in 2020. SSRN Electronic Journal. Retrieved January 14, 2021 from https://ssrn.com/abstract=3560869

9 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using arithmetic mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

10 Business Valuation Resources, Cost of Capital Professional. (2021). Historical ERP, using geometric mean and 20-Year Treasury Securities. Retrieved February 2, 2021 from https://www.bvresources.com/products/faqs/cost-of-capital-professional

Dividend Growth Model

Company	Current Dividend Yield (DY)	Projected Short-term EPS Growth Rate (EG)	Projected Short-term Dividend Growth Rate (DG)	Cost of Equity Earnings Growth DY + EG	Cost of Equity Dividend Growth DY + DG
Canadian National Railway	1.60%	9.50%	7.50%	11.10%	9.10%
Canadian Pacific Railway	0.90%	10.50%	13.50%	11.40%	14.40%
CSX Corporation	1.20%	9.00%	8.00%	10.20%	9.20%
Kansas City Southern	1.00%	11.50%	7.00%	12.50%	8.00%
Norfolk Southern Corp	1.60%	10.50%	8.00%	12.10%	9.60%
Union Pacific Corp	2.00%	10.50%	7.50%	12.50%	9.50%
Mean	1.38%	10.25%	8.58%	11.63%	9.97%
Median	1.40%	10.50%	7.75%	11.75%	9.35%

DGM - Dividend Growth, Indicated Rate	**9.35%**
DGM - Earnings Growth, Indicated Rate	**11.75%**

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

Notes:

Dividend Yield and growth rates provided by Value Line

Two-Stage Dividend Growth Model

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

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

Company	DY Dividend Yield	G1 Short-term Growth Estimate	g Stable Growth	G Average Growth Rate	K_E Cost of Equity
Canadian National Railway	1.60%	9.50%	3.70%	6.60%	9.24%
Canadian Pacific Railway	0.90%	10.50%	3.70%	7.10%	9.19%
CSX Corporation	1.20%	9.00%	3.70%	6.35%	8.49%
Kansas City Southern	1.00%	11.50%	3.70%	7.60%	9.96%
Norfolk Southern Corp	1.60%	10.50%	3.70%	7.10%	9.91%
Union Pacific Corp	2.00%	10.50%	3.70%	7.10%	10.33%
				Mean	9.52%
				Median	9.58%
				Multi-Stage DGM, Indicated Rate	**9.65%**

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

Notes:

Dividend Yield provided by Value Line

Growth Estimates, Next 5 Years for Earnings provided Value Line

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

Three-Stage Dividend Growth Model

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

Company	Year	Canadian National Railway		Canadian Pacific Railway		CSX Corporation		Kansas City Southern		Norfolk Southern Corp		Union Pacific Corp	
Start Price	2020		-107.92		-325.36		-88.20		-184.31		-230.42		-198.00
Expected Dividends	2021		1.84		2.88		1.20		1.76		4.12		4.20
Stage One Growth	2022	9.50%	2.01	10.50%	3.18	9.00%	1.31	11.50%	1.96	10.50%	4.55	10.50%	4.64
Stage One Growth	2023	9.50%	2.21	10.50%	3.52	9.00%	1.43	11.50%	2.19	10.50%	5.03	10.50%	5.13
Stage One Growth	2024	9.50%	2.42	10.50%	3.89	9.00%	1.55	11.50%	2.44	10.50%	5.56	10.50%	5.67
Stage One Growth	2025	9.50%	2.65	10.50%	4.29	9.00%	1.69	11.50%	2.72	10.50%	6.14	10.50%	6.26
Stage Two Growth	2026	8.97%	2.88	9.88%	4.72	8.52%	1.84	10.79%	3.01	9.88%	6.75	9.88%	6.88
Stage Two Growth	2027	8.45%	3.13	9.26%	5.16	8.04%	1.99	10.08%	3.32	9.26%	7.37	9.26%	7.52
Stage Two Growth	2028	7.92%	3.37	8.65%	5.60	7.55%	2.14	9.37%	3.63	8.65%	8.01	8.65%	8.17
Stage Two Growth	2029	7.39%	3.62	8.03%	6.05	7.07%	2.29	8.66%	3.94	8.03%	8.66	8.03%	8.82
Stage Two Growth	2030	6.86%	3.87	7.41%	6.50	6.59%	2.44	7.95%	4.26	7.41%	9.30	7.41%	9.48
Stage Two Growth	2031	6.34%	4.12	6.79%	6.94	6.11%	2.59	7.25%	4.56	6.79%	9.93	6.79%	10.12
Stage Two Growth	2032	5.81%	4.36	6.17%	7.37	5.63%	2.73	6.54%	4.86	6.17%	10.54	6.17%	10.75
Stage Two Growth	2033	5.28%	4.59	5.55%	7.78	5.15%	2.87	5.83%	5.15	5.55%	11.13	5.55%	11.34
Stage Two Growth	2034	4.75%	4.80	4.94%	8.16	4.66%	3.01	5.12%	5.41	4.94%	11.68	4.94%	11.90
Stage Two Growth	2035	4.23%	5.01	4.32%	8.51	4.18%	3.13	4.41%	5.65	4.32%	12.18	4.32%	12.42
Stage Three Growth	2036	3.70%	5.19	3.70%	8.83	3.70%	3.25	3.70%	5.86	3.70%	12.63	3.70%	12.88
Stage Three Growth	2037	3.70%	5.38	3.70%	9.16	3.70%	3.37	3.70%	6.07	3.70%	13.10	3.70%	13.35
Stage Three Growth	2038	3.70%	5.58	3.70%	9.49	3.70%	3.49	3.70%	6.30	3.70%	13.58	3.70%	13.85
Stage Three Growth	2039	3.70%	5.79	3.70%	9.85	3.70%	3.62	3.70%	6.53	3.70%	14.08	3.70%	14.36
Stage Three Growth	2040	3.70%	6.01	3.70%	10.21	3.70%	3.76	3.70%	6.77	3.70%	14.61	3.70%	14.89

Stage Three Growth	2041	3.70%	6.23	3.70%	10.59	3.70%	3.90	3.70%	7.02	3.70%	15.15	3.70%	15.44
Stage Three Growth	2042	3.70%	6.46	3.70%	10.98	3.70%	4.04	3.70%	7.28	3.70%	15.71	3.70%	16.01
Stage Three Growth	2043	3.70%	6.70	3.70%	11.39	3.70%	4.19	3.70%	7.55	3.70%	16.29	3.70%	16.60
Stage Three Growth	2044	3.70%	6.94	3.70%	11.81	3.70%	4.34	3.70%	7.83	3.70%	16.89	3.70%	17.22
Stage Three Growth	2045	3.70%	7.20	3.70%	12.24	3.70%	4.50	3.70%	8.12	3.70%	17.52	3.70%	17.86
Stage Three Growth	2046	3.70%	7.47	3.70%	12.70	3.70%	4.67	3.70%	8.42	3.70%	18.16	3.70%	18.52
Stage Three Growth	2047	3.70%	7.74	3.70%	13.17	3.70%	4.84	3.70%	8.74	3.70%	18.84	3.70%	19.20
Stage Three Growth	2048	3.70%	8.03	3.70%	13.65	3.70%	5.02	3.70%	9.06	3.70%	19.53	3.70%	19.91
Stage Three Growth	2049	3.70%	8.33	3.70%	14.16	3.70%	5.21	3.70%	9.39	3.70%	20.26	3.70%	20.65
Reversion	2050		109.89		437.80		104.50		237.42		215.43		156.83
Implied Cost of Equity			**3.99%**		**3.00%**		**3.46%**		**3.20%**		**4.30%**		**4.83%**

Mean	3.80%
Median	3.73%
Selected Three-Stage DGM Cost of Equity	**3.76%**

Reversion Calculation:

A. Last period's exp. dividends with growth	8.64	14.68	5.40	9.74	21.01	21.41
B. Cost of equity, less long-term growth	2.33%	1.34%	1.80%	1.54%	2.64%	3.17%
C. A / B	370.0	1,094.9	300.0	631.1	795.0	676.2
D. C / ((1 + Cost of Equity) ^ Last Period + 1)	109.89	437.80	104.50	237.42	215.43	156.83

Equity Component of the Direct Rate

Company	Value Line P/E Ratio
Canadian National Railway	24.8
Canadian Pacific Railway	23.2
CSX Corporation	21.7
Kansas City Southern	23.4
Norfolk Southern Corp	21.8
Union Pacific Corp	23.4
Mean	23.05
Median	23.30
Selected Price to Earnings (P/E) Ratio	23.00
Indicated Equity Component of the Direct Rate	**4.35%**

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

Notes:

The Price/Earnings Ratio was downloaded from Value Line.

Beta Analysis

Company	Beta
Canadian National Railway	0.85
Canadian Pacific Railway	1.00
CSX Corporation	1.10
Kansas City Southern	1.10
Norfolk Southern Corp	1.15
Union Pacific Corp	1.10
Beta Mean	1.05
Beta Median	1.10
Unlevered Relevered Beta Mean^	1.04
Indicated Beta	**1.10**

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

Notes:

^See the Unlevering Relevering Beta page for the calculation

Unlevering/Relevering Betas

Unlevering of Betas					
Company	*Value Line* **Actual Income Tax Rate**	*From Capital Structure Page* **Actual Debt in Capital Structure**	*From Capital Structure Page* **Actual Equity in Capital Structure**	*Value Line* **Levered Beta (Published)**	*Formula* **Unlevered Beta**
Canadian National Railway	22.00%	11.35%	88.65%	0.85	0.77
Canadian Pacific Railway	25.00%	13.45%	86.55%	1.00	0.90
CSX Corporation	23.00%	19.29%	80.71%	1.10	0.93
Kansas City Southern	28.00%	17.91%	82.06%	1.10	0.95
Norfolk Southern Corp	23.00%	17.76%	82.24%	1.15	0.99
Union Pacific Corp	24.00%	16.35%	83.65%	1.10	0.96
			Average	**1.05**	

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	24.17%	15.00%	85.00%	0.87
Canadian Pacific Railway	24.17%	15.00%	85.00%	1.02
CSX Corporation	24.17%	15.00%	85.00%	1.05
Kansas City Southern	24.17%	15.00%	85.00%	1.08
Norfolk Southern Corp	24.17%	15.00%	85.00%	1.12
Union Pacific Corp	24.17%	15.00%	85.00%	1.09
			Average	**1.04**

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, 2020 calendar year information for the January 2, 2021 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*	76,644,784,000	15,412,279,300	4.97	Canadian National Railway. 2020 Annual Report, p. 63
Canadian Pacific Railway**	43,760,920,000	5,740,291,700	7.62	Canadian Pacific Railway. 2020 Annual Report, p. 105
CSX Corporation	67,453,151,296	13,110,000,000	5.15	CSX Corporation. 2020 10-K, p. 51
Kansas City Southern	17,251,701,496	4,057,200,000	4.25	Kansas City Southern. 2020 10-K, p. 57
Norfolk Southern Corp	58,523,301,582	14,791,000,000	3.96	Norfolk Southern. 2020 10-K, p. K41
Union Pacific Corp	133,426,035,270	16,958,000,000	7.87	Union Pacific Corporation. 2020 10-K, p. 50
		Average	5.64	

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	16,046,000,000	12,832,000,000	1.25	Canadian National Railway. 2020 Annual Report, p. 107
Canadian Pacific Railway	11,597,000,000	8,951,000,000	1.30	Canadian Pacific Railway. 2020 Annual Report, p. 128
CSX Corporation	21,076,000,000	16,705,000,000	1.26	CSX Corporation. 2020 10-K, p. 95
Kansas City Southern	4,368,600,000	3,770,800,000	1.16	Kansas City Southern. 2020 10-K, p. 73
Norfolk Southern Corp	16,664,000,000	12,681,000,000	1.31	Norfolk Southern. 2020 10-K, p. K51
Union Pacific Corp	31,900,000,000	26,800,000,000	1.19	Union Pacific Corporation. 2020 10-K, p. 73
		Average	1.25	

Application of Capital Structure as determined in the Capitalization Rate Study

	Capital Structure	Market to Book	Composite
Common Equity	85.00%	5.64	4.79
Long-term Debt	15.00%	1.25	0.19

	4.98

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.

19,651,000,000	CAD
0.7843	Exchange Rate
15,412,279,300	USD

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

7,319,000,000	CAD
0.7843	Exchange Rate
5,740,291,700	USD

Appendix F - Three Stage Ex Ante Calculation

Three Stage Ex Ante Equity Risk Premium Calculation

Implied Market Rate Range =	**6.33%**	to	**7.57%**

Mean	6.95%
Median	6.95%
Market Rate Used	**7.57%**
(Less) Risk-Free Rate	1.66%
Equals Equity Risk Premium	**5.91%**

Assumptions:

Stages	**Years**		**Growth**	**Model 1**					**Model 2**			
1st Stage	1-5 years		Constant @:	13.26%			*		10.19%			*
												Linear
2nd Stage	6-15 years		Linear from:	12.51%	to	5.02%		OR	12.51%	to	3.71%	*from*
				Real Growth**					Inflation^			*1st*
3rd Stage	15 years -perpetuity	GDP Growth:	Real and Inflation	1.70%		2.93%		+	2.01%	to	2.09%	*Stage*
												to 3rd
		GDP Growth^^:	Real + Inflation	5.02%				TO	3.71%			*Stage*

	Model 1	Model 2
Implied Market Return	7.57%	6.33%

Year	**Model 1**			**Model 2**		
	Starting Industry		S & P 500	Starting Industry		S & P 500
2020	Start Price†		$ (3,700.65)	Start Price†		$ (3,700.65)
2021	Expected Dividends††		$ 58.73	Expected Dividends††		$ 58.73
2022	1st Stage Growth Rates	13.26%	$ 66.52	1st Stage Growth Rates	10.19%	$ 64.71
2023		13.26%	$ 75.34		10.19%	$ 71.31
2024		13.26%	$ 85.33		10.19%	$ 78.58
2025		13.26%	$ 96.64		10.19%	$ 86.58
2026	2nd Stage Growth Rates	12.51%	$ 108.73	2nd Stage Growth Rates	12.51%	$ 97.41
2027		11.76%	$ 121.52		11.63%	$ 108.74
2028		11.01%	$ 134.90		10.75%	$ 120.44
2029		10.26%	$ 148.75		9.87%	$ 132.32
2030		9.51%	$ 162.90		8.99%	$ 144.22
2031		8.77%	$ 177.18		8.11%	$ 155.92
2032		8.02%	$ 191.39		7.23%	$ 167.19
2033		7.27%	$ 205.30		6.35%	$ 177.81
2034		6.52%	$ 218.68		5.47%	$ 187.53
2035		5.77%	$ 231.29		4.59%	$ 196.14
2036		5.02%	$ 242.90		3.71%	$ 203.42
2037		5.02%	$ 255.10		3.71%	$ 210.96
2038		5.02%	$ 267.90		3.71%	$ 218.79
2039		5.02%	$ 281.35		3.71%	$ 226.91
2040		5.02%	$ 295.48		3.71%	$ 235.33
2041		5.02%	$ 310.31		3.71%	$ 244.06
2042		5.02%	$ 325.89		3.71%	$ 253.11
2043		5.02%	$ 342.25		3.71%	$ 262.50
2044		5.02%	$ 359.43		3.71%	$ 272.24
2045		5.02%	$ 377.47		3.71%	$ 282.34
2046		5.02%	$ 396.42		3.71%	$ 292.82
2047		5.02%	$ 416.32		3.71%	$ 303.68
2048		5.02%	$ 437.22		3.71%	$ 314.95
2049		5.02%	$ 459.17		3.71%	$ 326.63
2050		5.02%	$ 482.22		3.71%	$ 338.75
2051		5.02%	$ 506.42		3.71%	$ 351.32
2052		5.02%	$ 531.85		3.71%	$ 364.35
2053		5.02%	$ 558.54		3.71%	$ 377.87
2054		5.02%	$ 586.58		3.71%	$ 391.89
2055		5.02%	$ 616.03		3.71%	$ 406.43
2056		5.02%	$ 646.95		3.71%	$ 421.50
2057		5.02%	$ 679.43		3.71%	$ 437.14
2058		5.02%	$ 713.54		3.71%	$ 453.36
2059		5.02%	$ 749.36		3.71%	$ 470.18
2060		5.02%	$ 786.98		3.71%	$ 487.62
2061		5.02%	$ 826.48		3.71%	$ 505.71
2062		5.02%	$ 867.97		3.71%	$ 524.48
2063		5.02%	$ 911.54		3.71%	$ 543.93
2064		5.02%	$ 957.30		3.71%	$ 564.11
2065		5.02%	$ 1,005.36		3.71%	$ 585.04
2066		5.02%	$ 1,055.83		3.71%	$ 606.75
2067		5.02%	$ 1,108.83		3.71%	$ 629.26
2068		5.02%	$ 1,164.50		3.71%	$ 652.60
2069		5.02%	$ 1,222.95		3.71%	$ 676.82
2070		5.02%	$ 1,284.35		3.71%	$ 701.93
2071		5.02%	$ 1,348.82		3.71%	$ 727.97
2072		5.02%	$ 1,416.53		3.71%	$ 754.97
2073		5.02%	$ 1,487.64		3.71%	$ 782.98
2074		5.02%	$ 1,562.32		3.71%	$ 812.03
2075		5.02%	$ 1,640.75		3.71%	$ 842.16

2076		5.02%	$ 1,723.11		3.71%	$ 873.40
2077		5.02%	$ 1,809.61		3.71%	$ 905.81
2078		5.02%	$ 1,900.46		3.71%	$ 939.41
2079		5.02%	$ 1,995.86		3.71%	$ 974.26
2080		5.02%	$ 2,096.05		3.71%	$ 1,010.41
2081		5.02%	$ 2,201.27		3.71%	$ 1,047.90
2082		5.02%	$ 2,311.78		3.71%	$ 1,086.77
2083		5.02%	$ 2,427.83		3.71%	$ 1,127.09
2084		5.02%	$ 2,549.71	3rd Stage	3.71%	$ 1,168.91
2085	3rd Stage	5.02%	$ 2,677.70	Growth	3.71%	$ 1,212.27
2086	Growth Rates	5.02%	$ 2,812.12	Rates	3.71%	$ 1,257.25
2087		5.02%	$ 2,953.29		3.71%	$ 1,303.89
2088		5.02%	$ 3,101.55		3.71%	$ 1,352.27
2089		5.02%	$ 3,257.24		3.71%	$ 1,402.44
2090		5.02%	$ 3,420.76		3.71%	$ 1,454.47
2091		5.02%	$ 3,592.48		3.71%	$ 1,508.43
2092		5.02%	$ 3,772.82		3.71%	$ 1,564.39
2093		5.02%	$ 3,962.22		3.71%	$ 1,622.43
2094		5.02%	$ 4,161.12		3.71%	$ 1,682.62
2095		5.02%	$ 4,370.01		3.71%	$ 1,745.05
2096		5.02%	$ 4,589.38		3.71%	$ 1,809.79
2097		5.02%	$ 4,819.77		3.71%	$ 1,876.93
2098		5.02%	$ 5,061.72		3.71%	$ 1,946.56
2099		5.02%	$ 5,315.82		3.71%	$ 2,018.78
2100		5.02%	$ 5,582.68		3.71%	$ 2,093.68
2101		5.02%	$ 5,862.93		3.71%	$ 2,171.35
2102		5.02%	$ 6,157.24		3.71%	$ 2,251.91
2103		5.02%	$ 6,466.34		3.71%	$ 2,335.46
2104		5.02%	$ 6,790.95		3.71%	$ 2,422.10
2105		5.02%	$ 7,131.85		3.71%	$ 2,511.96
2106		5.02%	$ 7,489.87		3.71%	$ 2,605.16
2107		5.02%	$ 7,865.87		3.71%	$ 2,701.81
2108		5.02%	$ 8,260.73		3.71%	$ 2,802.05
2109		5.02%	$ 8,675.42		3.71%	$ 2,906.00
2110		5.02%	$ 9,110.93		3.71%	$ 3,013.81
2111		5.02%	$ 9,568.30		3.71%	$ 3,125.63
2112		5.02%	$ 10,048.62		3.71%	$ 3,241.59
2113		5.02%	$ 10,553.06		3.71%	$ 3,361.85
2114		5.02%	$ 11,082.83		3.71%	$ 3,486.57
2115		5.02%	$ 11,639.19		3.71%	$ 3,615.93
2116		5.02%	$ 12,223.47		3.71%	$ 3,750.08
2117		5.02%	$ 12,837.09		3.71%	$ 3,889.21
2118		5.02%	$ 13,481.51		3.71%	$ 4,033.49
2119		5.02%	$ 14,158.29		3.71%	$ 4,183.14
2120		5.02%	$ 14,869.03		3.71%	$ 4,338.33
2121		5.02%	$ 15,615.46		3.71%	$ 4,499.28
2122		5.02%	$ 16,399.35		3.71%	$ 4,666.21
2123		5.02%	$ 17,222.60		3.71%	$ 4,839.32
2124		5.02%	$ 18,087.17		3.71%	$ 5,018.86
2125		5.02%	$ 18,995.15		3.71%	$ 5,205.06
2126		5.02%	$ 19,948.71		3.71%	$ 5,398.17
2127		5.02%	$ 20,950.13		3.71%	$ 5,598.44
2128		5.02%	$ 22,001.83		3.71%	$ 5,806.14
2129		5.02%	$ 23,106.32		3.71%	$ 6,021.55
2130		5.02%	$ 24,266.26		3.71%	$ 6,244.95
2131		5.02%	$ 25,484.42		3.71%	$ 6,476.64
2132		5.02%	$ 26,763.74		3.71%	$ 6,716.92
2133		5.02%	$ 28,107.28		3.71%	$ 6,966.12
2134		5.02%	$ 29,518.27		3.71%	$ 7,224.56
2135		5.02%	$ 31,000.09		3.71%	$ 7,492.60
2136		Reversion``	$ 100.45		Reversion``	$ 118.69
	Implied Market Return		**7.57%**	**Implied Market Return**		**6.33%**

*S&P 500 Earnings and Estimate Report dated 1/7/2021, http://us.spindices.com/indices/equity/sp-500
**First Quarter 2021 Survey of Professional Forecasters - Philadelphia Federal Reserve Release Date 2/12/2021
^Inflation Range = Federal Reserve, Treasuries Inflation - Indexed
^^GDP Growth = Real growth + Inflation
† Start Price is the S&P 500 Index adjusted close on 1/4/2021, downloaded from Yahoo! Finance
††Expected Dividends downloaded from http://www.cmegroup.com/trading/equity-index/us-index/sp-500-quarterly-dividend-index.html, 1/14/2021

``Reversion Calculation:

A.	Last period's expected dividends, growth applied	32,556.29	7,770.57
B.	Implied Market Risk Premium Less Long-Term Growth	5.91%	4.67%
C.	A / B	550,947.2	166,310.4
D.	C / ((1 + Implied Market Risk Premium) ^ Last Period +1)	100.45	118.69

Appendix G – Guideline Company Selection

Section Contents

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

Market Segment: Electric

Companies Included in the Electric Market Segment

ALLETE Inc.

Company Summary from Value Line:

ALLETE, Inc. is the parent of Minnesota Power, which supplies electricity to 146,000 customers in northeastern MN, & Superior Water, Light & Power in northwestern WI. Electric rev. breakdown: taconite mining/processing, 26%; paper/wood products, 9%; other industrial, 8%; residential, 12%; commercial, 13%; wholesale, 16% other, 16%. ALLETE Clean Energy (ACE) owns renewable energy projects. Acq'd U.S. Water Services 2/15; sold it 3/19. Generating sources: coal & lignite, 30%; wind, 11%; other, 5%; purchased, 54%. Fuel costs: 31% of revs. '19 deprec. rate: 3.3%. Has 1,400 employees.

Additional Company Information from Website:

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

ALLETE Inc. (NYSE:ALE) announced today it has closed on the $270 million sale of U.S. Water Services Inc. to Kurita Water Industries Ltd., a leading international water-management company headquartered in Tokyo, Japan. Based in St. Michael, Minnesota, U.S. Water, an integrated water-solutions company, serves a diverse mix of about 5,000 customers to optimize system performance, reduce water and energy use, and improve efficiency. It was acquired by ALLETE in 2015. Today's sale supports ALLETE's long-term diversification strategy that includes expanding investments in clean-energy opportunities with an average annual earnings growth objective of 5 percent to 7 percent.[2]

Why was the company included?

ALLETE Inc. is the parent company of Minnesota Power, which supplies electricity to customers. This company is similar (and is one of) to the Electric Companies that the State Assessed Section is responsible for valuing. The company engages in providing energy in the upper Midwest.

Alliant Energy Corp.

Company Summary from Value Line:

Alliant Energy Corp., formerly named Interstate Energy, is a holding company formed through the merger of WPL Holdings, IES Industries, and Interstate Power. Supplies electricity, gas, and other services in Wisconsin, Iowa, and Minnesota. Elect. revs. by state: WI, 42%; IA, 57%; MN, 1%. Elect. rev.: residential, 34%; commercial, 29%; industrial, 28%; wholesale, 7%; other, 2%. Fuel sources, 2019:

[1] http://www.allete.com/OurBusinesses, accessed 1/7/2021

[2] http://investor.allete.com/news-releases/news-release-details/allete-closes-270-million-sale-us-water-services-kurita, accessed 1/7/2020

coal, 27%; gas, 34%; other, 39%. Fuel costs: 41% of revs. 2019 depreciation rate: 5.9%. Estimated plant age: 17 years. Has approximately 3,597 employees.

Additional Company Information from Website:
At Alliant Energy, our purpose is to serve customers and build strong communities. We are focused on powering beyond the market challenges of today, while powering what's next in energy. Alliant Energy is a component of NASDAQ. Through its utility subsidiaries Interstate Power and Light Company and Wisconsin Power and Light Company, Alliant Energy provides regulated electric and natural gas service to approximately 960,000 electric and approximately 410,000 natural gas customers in the Midwest. Our corporate headquarters is located in Madison, Wisconsin. An additional general office is in Cedar Rapids, Iowa. We provide inclusive work environments, and are proud to be an Equal Opportunity Employer. We recognize and respect diversity. We appreciate the differences and perspectives a diverse culture brings to the work environment, the company and our customers.[3]

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 the State Assessed Section is responsible for valuing. The company engages in providing energy in the upper Midwest.

Ameren Corporation
Company Summary from Value Line:
Ameren Corporation is a holding company formed through the merger of Union Electric and CIPSCO. Has 1.2 million electric and 127,000 gas customers in Missouri; 1.2 million electric and 813,000 gas customers in Illinois. Discontinued nonregulated power-generation operation in '13. Electric revenue breakdown: residential, 43%; commercial, 32%; industrial, 8%; other, 17%. Generating sources: coal, 63%; nuclear, 23%; hydro & other, 6%; purchased, 8%. Fuel costs: 24% of revenues. '19 reported deprec. rates: 3%-4%. Has 9,300 employees.

Additional Company Information from Website?
Ameren Corporation is a Fortune 500 company that trades on the New York Stock Exchange under the symbol AEE. It is the parent company of Ameren Illinois, based in Collinsville, Ill., and Ameren Missouri in St. Louis. Ameren Transmission Company, also based in St. Louis, designs and builds regional transmission projects. Ameren was created by the combination of three Illinois utilities (CIPSCO Incorporated, CILCO Inc. and Illinois Power Company) and Union Electric Company of St. Louis. The name comes from combining the words American and Energy. Employing more than 9,000 personnel, Ameren powers the quality of life for 2.4 million electric customers and more than 900,000 natural gas customers across a 64,000-square-mile area. Ameren Missouri ranks as the largest electric power provider in Missouri, and Ameren Illinois ranks as Illinois' third largest natural gas distribution operation in total number of customers. Ameren companies generate a net capacity of nearly 10,200 megawatts of electricity and own more than 7,500 circuit miles of transmission lines. Ameren's rates are some of the lowest in the nation.[4]

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

[3] https://www.alliantenergy.com/AboutAlliantEnergy/WhoWeAre, accessed 1/7/2021
[4] https://www.ameren.com/company/about-ameren, accessed 1/7/2021

Companies that the State Assessed Section is 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, & West Virginia. Has a transmission subsidiary. Electric revenue breakdown: residential, 42%; commercial, 24%; industrial, 19%; wholesale, 11%; other, 4%. Sold Houston Pipeline '05; commercial barge operation in '15. Generating sources not available. Fuel costs: 33% of revenues. '19 reported depreciation rates (utility): 1.8%-9.5%. Has 16,900 employees.

Additional Company Information from Website:
As one of the largest electric energy companies in the U.S., we power millions of homes and businesses. We're working together with our customers and communities to create the future of energy. We're listening, going beyond customers' expectations and developing innovative solutions to build a future that is boundless for us all. We're continually energized by our team members, their passions, and their drive to make a difference in the communities we serve.[5]

Why was the company included?
American Electric Power Company Inc. provides electricity to customers. This company is similar to the Electric Companies that the State Assessed Section is 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 214,000 electric customers in CO, SD, WY and MT, and 1.1 million gas customers in NE, IA, KS, CO, WY, and AR. Has coal mining sub. Acq'd Cheyenne Light 1/05; utility ops. from Aquila 7/08; SourceGas 2/16. Discont. telecom in '05; oil marketing in '06; gas marketing in '11; gas & oil E&P in '17. Electric rev. breakdown: res'l, 30%; comm'l, 35%; ind'l, 18%; other, 17%. Generating sources: coal, 30%; other, 12%; purch., 58%. Fuel costs: 33% of revs. '19 deprec. rate: 3.2%. Has 2,900 employees.

Additional Company Information from Website:
Black Hills Corporation is a customer focused, growth-oriented utility company with a tradition of exemplary service and a vision to be the energy partner of choice. Based in Rapid City, South Dakota, the company serves over 1.28 million electric and natural gas utility customers in more than 800 communities in Arkansas, Colorado, Iowa, Kansas, Montana, Nebraska, South Dakota and Wyoming. Employees partner to produce results that improve life with energy. [6]

Why was the company included?
Black Hills Corporation provides electric and gas to customers. Electric customers represent 16% of customers and gas customers represent 84% of customers. This company is similar to the Electric

[5] https://www.aep.com/about/, accessed 1/7/2021

[6] https://www.blackhillscorp.com/about, accessed on

Companies that the State Assessed Section is responsible for valuing. The company engages in providing energy in the Midwest.

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

CenterPoint Energy Inc.

Company Summary from Value Line:

CenterPoint Energy, Inc. is a holding company for Houston Electric, which serves 2.5 million customers in Houston and environs, Indiana Electric, which serves 148,000 customers, and gas utilities with 4.6 million customers in Texas, Minnesota, Arkansas, Louisiana, Oklahoma, Indiana, and Ohio. Owns 53.7% of Enable Midstream Partners. Has nonutility operations that are in the process of being sold. Acquired Vectren 2/19. Electric revenue breakdown not available. Fuel costs: 46% of revenues. '19 depreciation rate: 4.3%. Has 14,300 employees.

Additional Company Information from Website:

Our vision to lead the nation in delivering energy, service and value drives our strategy and performance. We have an unwavering commitment to safely and reliably deliver electricity and natural gas to millions of people. Natural Gas We sell and deliver natural gas to more than 4.5 million homes and businesses in eight states: Arkansas, Indiana, Louisiana, Minnesota (including Minneapolis), Mississippi, Ohio, Oklahoma and Texas (including greater Houston area). We are investing in modernizing our natural gas infrastructure and are committed to eliminating cast-iron pipe in all our territories. Electric Transmission and Distribution and Power Generation We maintain the wires, poles and electric infrastructure serving more than 2.5 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. Competitive Energy Businesses Our competitive energy businesses include energy-related services; energy efficiency and sustainability solutions; and owning and operating intrastate natural gas pipeline systems. Our competitive energy businesses' footprint spans more than 20 states. 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 are partnering with HomeServe, a trusted nationwide provider of emergency home repair programs, in our natural gas markets in Arkansas, Louisiana, and Texas (including greater Houston area) to offer our customers service repair plans that reduce the stress and expense from the unexpected.[7]

CenterPoint Energy Inc.'s long-anticipated business transformation plan will include increasing its five-year capital spending plan, selling off gas utilities and owning renewable power projects… The core of the plan is a $3 billion increase to CenterPoint's 2021-2025 capital spending, brining total investment over the period to $16 billion as the company pursues organic growth opportunities in its electric business in Indiana and Texas. [8]

[7] https://www.centerpointenergy.com/en-us/corporate/about-us/company-overview, accessed on 1/6/2021
[8] https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/centerpoint-will-sell-gas-utilities-to-fund-3b-electric-focused-capex-increase-61140601, accessed 186/2021

Why was the company included?
CenterPoint Energy Inc. 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 the State Assessed Section is responsible for valuing. Even though CenterPoint Energy, Inc. and Vectren Corporation recently completed a merger, we are including them as a guideline company as the merger was completed in early 2019.

Also using this company as a guideline company for the Gas Distribution Market Segment. Over 60% of this company's customers are gas distribution 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 1.8 million electric, 1.8 million gas customers. Has 1,234 megawatts of nonregulated generating capacity. Owns EnerBank. Sold Palisades nuclear plant in '07. Electric revenue breakdown: residential, 45%; commercial, 34%; industrial, 15%; other, 6%. Generating sources: coal, 27%; gas, 18%; other, 3%; purchased, 52%. Fuel costs: 41% of revenues. '19 reported deprec. rates: 3.9% electric, 2.9% gas, 10.0% other. Has 8,100 fulltime employees.

Additional Company Information from Website:
CMS Energy Corporation's business strategy is focused primarily on its principal subsidiary, Consumers Energy Company, Michigan's largest electric and natural gas utility, serving 6.7 million of the state's 10 million residents. With our subsidiary, CMS Enterprises Company, we are also engaged in independent power generation in several states. Our business also includes EnerBank® USA, which specializes in providing unsecured home improvement payment option programs for homeowners through nationwide dealer networks. Consumers Energy is one of the nation's largest combination electric and natural gas utilities. CMS Enterprises owns and operates independent power generating plants, natural gas assets and an energy marketing group for the non-utility segment of CMS Energy's business.[9]

Why was the company included?
CMS Energy Corporation provides electricity and gas to customers. Electric customers represent 50% of customers and gas customers represent 50% of customers. This company is similar to the Electric Companies that the State Assessed Section is responsible for valuing. The company serves an electric service territory in the Midwest.

Also using this company as a guideline company for the Gas Distribution Market Segment. 50% of this company's 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, 46%; commercial, 34%; industrial, 13%; other, 7%. Generating sources: coal, 67%; nuclear, 17%; gas, 1%; purchased, 15%. Fuel costs: 54% of revenues. '19 reported deprec. rates: 4.0% electric, 2.7% gas. Has 10,700 employees.

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[9] https://www.cmsenergy.com/about-cms-energy/default.aspx, accessed 1/6/2021

Additional Company Information from Website:
DTE Energy (NYSE: DTE) is a Detroit-based diversified energy company involved in the development and management of energy-related businesses and services nationwide. Its operating units include an electric utility serving 2.2 million customers in Southeastern Michigan and a natural gas utility serving 1.3 million customers in Michigan. The DTE Energy portfolio includes non-utility energy businesses focused on power and industrial projects, natural gas pipelines, gathering and storage, and energy marketing and trading. As one of Michigan's leading corporate citizens, DTE Energy is a force for growth and prosperity in the 450 Michigan communities it serves in a variety of ways, including philanthropy, volunteerism and economic progress. Information about DTE Energy is available on the DTE Energy home page, Twitter account and Facebook page. DTE Energy has more than 10,000 employees in utility and non-utility subsidiaries involved in a wide range of energy-related businesses. The company's growing non-utility businesses are built around the strengths, skills and assets of DTE Energy's electric and gas utilities.[10]

DTE Energy announced October 27, 2020 that the Company's Board of Directors has unanimously authorized management to pursue a plan to spin-off the DTE Midstream business ("Midstream") from DTE Energy. Midstream is the Company's non-utility natural gas pipeline, storage and gathering business. The transaction would transform DTE Energy into a predominantly pure-play regulated electric and natural gas utility. Midstream would become an independent, publicly traded company well positioned for sustainable growth. The separation transaction is not expected to have any adverse impact on DTE Energy's utility operations, customers, or customer rates.[11]

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 the State Assessed Section is responsible for valuing. The company serves an electric service territory in the Midwest.

Entergy Corporation
Company Summary from Value Line:
Entergy Corporation supplies electricity to 2.9 million customers through subsidiaries in Arkansas, Louisiana, Mississippi, Texas, and New Orleans (regulated separately from Louisiana). Distributes gas to 202,000 customers in Louisiana. Has a nonutility subsidiary that owns four nuclear units (two no longer operating). Electric revenue breakdown: residential, 38%; commercial, 26%; industrial, 27%; other, 9%. Generating sources: gas, 40%; nuclear, 28%; coal, 6%; purchased, 26%. Fuel costs: 30% of revenues. '19 reported depreciation rate: 2.8%. Has 13,600 employees.

Additional Company Information from Website:
Entergy Corporation (NYSE: ETR) is an integrated energy company engaged primarily in electric power production and retail distribution operations. Entergy owns and operates power plants with

[10] https://newlook.dteenergy.com/wps/wcm/connect/dte-web/home/about-dte/common/about-dte/about-dte, accessed 1/6/2021
[11] https://www.globenewswire.com/news-release/2020/10/27/2115002/0/en/DTE-Energy-announces-intent-to-spin-off-Midstream-business.html#:~:text=DETROIT%2C%20Oct.&text=The%20transaction%20would%20transform%20DTE,well%20positioned%20for%20sustainable%20growth., accessed 1/6/2021

approximately 30,000 megawatts of electric generating capacity, including 8,000 megawatts of nuclear power. Headquartered in New Orleans, Louisiana, Entergy delivers electricity to 2.9 million utility customers in Arkansas, Louisiana, Mississippi and Texas. Entergy has annual revenues of $11 billion and approximately 13,600 employees.[12]

Why was the company included?
Entergy Corporation provides electricity and gas to customers. Electric customers represent 94% of customers and gas customers represent 6% of customers. This company is similar to the Electric Companies that the State Assessed Section is responsible for valuing. The company serves an electric service territory in Arkansas, Louisiana, Mississippi, New Orleans, and Texas.

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 155,000 customers in Dane County and gas service to 163,000 customers in seven counties in Wisconsin. Electric revenue breakdown, '19: residential, 35%; commercial, 53%; industrial, 3%; other, 9%. Generating sources, '19: coal, 50%; gas, 14%; renewables, 14%; purchased power, 22%. Fuel costs: 34% of revenues. '19 reported depreciation rates: electric, 3.6%; 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 40 consecutive years and have paid dividends for more than 100 years. MGE Energy is the parent company of the following:

- Madison Gas and Electric Company (MGE) provides natural gas and electric service in south-central and western Wisconsin.
- MGE Transco Investment holds an ownership interest in ATC LLC, which invests in transmission assets, primarily within Wisconsin.
- MGEE Transco LLC holds an ownership interest in ATC Holdco, which invests in transmission assets outside ATC LLC service territory.
- MGE Power owns assets in the West Campus Cogeneration Facility in Madison, Wis. and the Elm Road Generating Station in Oak Creek, Wis.
- MAGAEL, LLC holds title to properties acquired for future utility plant expansion.
- Central Wisconsin Development Corporation promotes business growth in MGE's service area.
- MGE Services, LLC provides construction and other services.[13]

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 that the State Assessed Section is responsible for valuing. The company serves an electric service territory in the Midwest.

[12] http://entergy.com/about_entergy/, accessed 1/8/2021
[13] https://www.mgeenergy.com/en/about/about-mge-energy, accessed 1/6/2021

Also using this company as a guideline company for the Gas Distribution Market Segment. Over 50% of this company's customers are gas distribution customers.

NorthWestern Corporation

Company Summary from Value Line:

NorthWestern Corporation (doing business as NorthWestern Energy) supplies electricity & gas in the Upper Midwest and Northwest, serving 443,000 electric customers in Montana and South Dakota and 292,000 gas customers in Montana (85% of gross margin), South Dakota (14%), and Nebraska (1%). Electric revenue breakdown: residential, 39%; commercial, 47%; industrial, 4%; other, 10%. Generating sources: hydro, 34%; coal, 28%; wind, 5%; other, 3%; purchased, 30%. Fuel costs: 25% of revenues. '19 reported deprec. rate: 2.8%. Has 1,500 employees.

Additional Company Information from Website:

NorthWestern Energy has provided reliable and affordable energy to customers in Montana, South Dakota and Nebraska for more than 100 years. Our company got its start in small communities, providing essential service that allowed them to grow and prosper. Today, we are proud to serve 734,800 residential and business customers with electricity and natural gas. With roots in the Montana Power Co. and South Dakota-based Northwestern Public Service Co., NorthWestern Energy took its current form in 2002 when the company bought the Montana Power electric and natural gas transmission and distribution system and became a partial owner of Colstrip Unit 4. Today, the company is a growing, financially sound, investor-owned energy company. Shares in NorthWestern Energy are traded on the Nasdaq under the symbol NWE.[14]

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 the State Assessed Section is 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 865,000 customers in Oklahoma (84% of electric revenues) and western Arkansas (8%); wholesale is (8%). Owns 25.5% of Enable Midstream Partners. Electric revenue breakdown: residential, 40%; commercial, 23%; industrial, 10%; oilfield, 9%; other, 18%. Generating sources: gas, 35%; coal, 15%; wind, 5%; purchased, 45%. Fuel costs: 35% of revenues. '19 reported depreciation rate (utility): 2.7%. Has 2,400 employees.

Additional Company Information from Website:

OGE Energy Corp. is headquartered in Oklahoma City, Oklahoma and is publicly traded on the New York Stock Exchange under the symbol OGE. It is the parent company of Oklahoma Gas and Electric (OG&E), a regulated utility, and holds a 25.6 percent limited partner interest and a 50 percent general partner interest in Enable Midstream Partners, LP, also headquartered in Oklahoma City. Formed in 1902, OG&E is Oklahoma's oldest and largest investor-owned electric utility. We serve more than 858,000 customers in 267 towns and cities in a 30,000 square mile area of Oklahoma and western

[14] http://www.northwesternenergy.com/our-company/about-us, accessed 1/8/2020

Arkansas. The largest city on our system, Oklahoma City, has a metro area population of approximately 1.5 million people. But we also serve towns like Enid, Ardmore, Muskogee, Norman, Durant, Ft. Smith Arkansas, as well as many other smaller communities throughout our service territory. We have approximately 2,200 employees who live and work in the very communities we serve. Our power plants, located throughout Oklahoma, generate electricity using natural gas, coal, wind and solar power. We are extremely proud of the fact that we, as a company, have some of the lowest rates in the entire nation. And, because of our strong system reliability and high customer satisfaction, we're consistently ranked in surveys as one of the highest performing utilities in the nation.[15]

Why was the company included?
OGE Energy Corporation provides electricity to customers. This company is similar to the Electric Companies that the State Assessed Section is 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 132,000 customers in Minnesota (52% of retail electric revenues), North Dakota (38%), and South Dakota (10%). Electric rev. breakdown: residential, 32%; commercial & farms, 36%; industrial, 30%; other, 2%. Generating sources: coal, 45%; wind & hydro, 8%; other, 1%; purchased, 46%. Fuel costs: 14% of revenues. Also has operations in manufacturing and plastics (27% of ’19 operating income). ’19 reported deprec. rate (utility): 2.8%. Has 2,300 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 75-85% of our overall earnings. We expect our manufacturing and plastic pipe businesses will provide 15-25% 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

[15] https://www.oge.com/wps/portal/oge/about-us/companyOverview/!ut/p/z1/jZDNDoJADISfhistCyh4W0VQiAEOBtyLAYMLCbAEUF5fEuJB4w89tc03nUyBQQysTu4FT_pC1Ek5zie2OBuhgztPUw4OmjZSlSi-bweqsyQQTQDBDe414joe2SL1LCvUA0vZrzVgc_T4pSjO0_8A2O_zEbDJ4pkA3bGlG8PyQnOt4k5_Bz5E_GfiAuOlSKd_0jpVDQ6sza5Zm7XyrR3Xed833UpCCYdhkLkQvMzki6gk_CTJRddD_EpCUx2PMRZBFRndAw4p_hs!/dz/d5/L2dBISEvZ0FBIS9nQSEh/, accessed 1/8/2021

differentiation from competitors and sustainable cost advantage. Operates within a stable and growing industry and is able to quickly adapt to changing economic cycles. A strong management team committed to operational excellence.[16]

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 the State Assessed Section is responsible for valuing. The company serves an electric service territory in the Midwest.

WEC Energy Group
Company Summary from Value Line:
WEC Energy Group, Inc. (formerly Wisconsin Energy) is a holding company for utilities that provide electric, gas & steam service in WI & gas service in IL, MN, & MI. Customers: 1.6 mill. elec., 2.9 mill. gas. Acq'd Integrys Energy 6/15. Sold Point Beach nuclear plant in '07. Electric revenue breakdown: residential, 35%; small commercial & industrial, 32%; large commercial & industrial, 21%; other, 12%. Generating sources: coal, 36%; gas, 29%; renewables, 4%; purchased, 31%. Fuel costs: 36% of revenues. '19 reported deprec. rates: 2.3%-3.2%. Has 7,500 employees.

Additional Company Information from Website:
We are one of the nation's largest electric generation and distribution and natural gas delivery holding companies, with the operational expertise and financial resources to serve the Midwest's energy needs safely, reliably and responsibly. Our subsidiaries focus on reliable service, customer satisfaction and shareholder value. Together, we provide energy services to more than 4.5 million customers in Wisconsin, Illinois, Michigan and Minnesota. Our combined assets allow operating efficiencies across 70,600 miles of electric distribution lines, 50,700 miles of natural gas distribution and transmission lines, and 7,100 megawatts of reliable power plant capacity. Our family of companies is committed to delivering world-class reliability and the very best customer care anywhere. Customers are the heart of our business, and we work every day to help grow and support communities where we provide vital energy services. As a Fortune 500 company, we value and develop our employees who are making a difference in a mission that matters.[17]

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

Also using this company as a guideline company for the Gas Distribution Market Segment. Over 60% of this company's customers are gas distribution customers.

Xcel Energy Inc.
Company Summary from Value Line:
Xcel Energy Inc. is the parent of Northern States Power, which supplies electricity to Minnesota, Wisconsin, North Dakota, South Dakota & Michigan & gas to Minnesota, Wisconsin, orth Dakota &

[16] https://www.ottertail.com/investors/corporate-profile/default.aspx, accessed 1/8/2021
[17] https://www.wecenergygroup.com/about/aboutus.htm, accessed 1/8/2021

Michigan; P.S. of Colorado, which supplies electricity & gas to Colorado; & Southwestern Public Service, which supplies electricity to Texas & New Mexico. Customers: 3.7 mill. elec., 2.1 mill. gas. Elec. rev. breakdown: res'l, 31%; sm. comm'l & ind'l, 36%; lg. comm'l & ind'l, 18%; other, 15%. Generating sources not avail. Fuel costs: 39% of revs. '19 reported depr. rate: 3.3%. Has 11,300 empls.

Additional Company Information from Website:
Xcel Energy is a major U.S. electricity and natural gas company, with operations in 8 Western and Midwestern states. Xcel Energy provides a comprehensive portfolio of energy-related products and services to 3.7 million electricity customers and 2.1 million natural gas customers through its regulated operating companies. Company headquarters are located in Minneapolis.[18]

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 the State Assessed Section is responsible for valuing. The company serves an electric service territory in the Midwest.

Companies Not Included in the Electric Market Segment

AVANGRID Inc.
Company Summary from Value Line:
AVANGRID Inc. (formerly Iberdrola USA, Inc.), is a diversified energy and utility company that serves 2.3 million electric customers in New York, Connecticut, and Maine and 1 million gas customers in New York, Connecticut, Massachusetts & Maine. Has a nonregulated generating subsidiary focused on wind power, with 7.2 gigawatts of capacity. Revenue breakdown by customer class not available. Generating sources not available. Fuel costs: 24% of revenues. '19 reported depr. rate (utility): 2.9%. Iberdrola owns 81.5% of stock. Has 6,600 employees.

Additional Company Information from Website:
AVANGRID, Inc. (NYSE: AGR) is a leading, sustainable energy company with $36 billion in assets and operations in 24 U.S. states. AVANGRID has two primary lines of business: Avangrid Networks and Avangrid Renewables. Avangrid Networks owns eight electric and natural gas utilities, serving 3.2 million customers in New York and New England. Avangrid Renewables owns and operates 7.5 gigawatts of electricity capacity, primarily through wind power, with a presence in 22 states across the United States. AVANGRID employs approximately 6,500 people. AVANGRID supports the U.N.'s Sustainable Development Goals and was awarded Compliance Leader Verification by Ethisphere, a prestigious third party verification of its ethics and compliance program.[19]

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

[18] https://investors.xcelenergy.com/corporate-information/corporate-profile/default.aspx, accessed 1/8/2021
[19] https://www.avangrid.com/wps/portal/avangrid/aboutus, accessed on 1/7/2021

- Strategic transaction furthers AVANGRID's growth in both clean energy distribution and transmission - expands leadership position in renewables
- All Cash Offer for PNM Resources shares at $50.30 per share – $8.3 billion enterprise value transaction
- Creates one of biggest clean energy companies in the US with ten regulated utilities in six states and third largest renewables company with operations in 24 states
- Majority shareholder IBERDROLA supports the transaction and has provided a funding commitment letter[20]

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

Avista Corporation
Company Summary from Value Line:
Avista Corporation (formerly The Washington Water Power Company) supplies electricity & gas in eastern Washington & northern Idaho. Supplies electricity to part of Alaska & gas to part of Oregon. Customers: 410,000 electric, 361,000 gas. Acq'd Alaska Electric Light and Power 7/14. Sold Ecova energy-management sub. 6/14. Electric rev. breakdown: residential, 39%; commercial, 33%; industrial, 11%; wholesale, 8%; other, 9%. Generating sources: gas & coal, 34%; hydro, 30%; purch., 36%. Fuel costs: 33% of revs. '19 reported depr. rate (Avista Utilities): 3.3%. Has 1,900 employees.

Additional Company Information from Website:
We are an energy company involved in the production, transmission and distribution of energy as well as other energy-related businesses. Avista Utilities is our operating division, providing electricity to nearly 340,000 customers and natural gas to about 300,000 customers across 30,000 square miles and four northwestern states. Alaska Energy and Resources Company, an Avista subsidiary, provides retail electric service in the city and borough of Juneau through its subsidiary Alaska Electric Light and Power Company. Avista's history of innovations rooted in the renewable energy we've generated since our founding in 1889.[21]

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[20] https://www.avangrid.com/wps/portal/avangrid/pressroom/pressrelease/2020/20-10%20pnm%20merger%20announcement/!ut/p/z1/rZJRa8IwEMe_ii8-lktiTbvHIIrTdYKzs82LZE2sHSapNdN9_KU-CcPqYAkcF7j78b__BThkwI04VaVwlTVi7985p5sBTsbTcIReERuHiC0XyfMoxWQxjWB9KcCLeIznMUniOZkgNqMrNkEzjOgQ-CP96MZh6LH-jgLejX8HDrwwrnY7yEXZbOpGHY-NtbqPfqVqr8RR9RHxt40BRr3a6J5WTamanjDGfplCaWVci62LSkJeSKkoLqJAECKCcBjSQFAqg1iGpBiGkfzYSj8GvyjtMvLeKLm3IrppxROG9alSZ0iNbbRf7dsfJU4RzO5tw3-X6vNw4Mx7ao1T3w6y_zTV80mTjJLSKxduF1RmayG75kDWctrYxal1mqY6HtBlfF5td_vTC2M_hVjeBw!!/dz/d5/L2dBISEvZ0FBIS9nQSEh/?current=true&urile=wcm%3Apath%3A%2Fagr_pressroom%2Fpressroom%2Fpressrelease%2F2020%2F20-10%2Bpnm%2Bmerger%2Bannouncement, accessed 1/7/2021

[21] https://investor.avistacorp.com/, accessed 1/7/2021

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

Consolidated Edison Inc.
Company Summary from Value Line:
Consolidated Edison, Inc. is a holding company for Consolidated Edison Company of New York, Inc. (CECONY), which sells electricity, gas, and steam in most of New York City and Westchester County. Also owns Orange and Rockland Utilities (O&R), which operates in New York and New Jersey. Has 3.7 million electric, 1.2 million gas customers. Pursues competitive energy opportunities through three wholly owned subsidiaries. Entered into midstream gas joint venture 6/16. Purchases most of its power. Fuel costs: 21% of revenues. ’19 reported depreciation rates: 3.0%- 3.2%. Has 14,900 employees.

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.[22]

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

Dominion Energy Inc.
Company Summary from Value Line:
Dominion Energy, Inc. (formerly Dominion Resources) is a holding company for Virginia Power, North Carolina Power, & South Carolina E&G, which serve 3.4 mill. customers in VA, SC, & NC. Serves 3.4 mill. gas customers in OH, WV, UT, SC, & NC. Other ops. incl. independent power production. Acq’d Questar 9/16; SCANA 1/19. Elec. rev. breakdown: residential, 46%; commercial, 32%; industrial, 7%; other, 15%. Generating sources: gas, 41%; nuclear, 29%; coal, 8%; other, 5%; purchased, 17%. Fuel costs: 28% of revs. ’19 reported deprec. rates: 2.4%-4.6%. Has 19,100 empls.

Additional Company Information from Website:
We operate in 16 states, offering safe, clean, reliable and affordable energy to nearly 7 million customers. Headquartered in Richmond, VA, we invest in communities where we live and work, and protect our natural resources. Our goal is to shape the future of energy in America. We provide the reliable, affordable energy customers require to power every part of their day, 24 hours a day, 7 days a week. Our operating segments include Dominion Energy Virginia, Dominion Energy South Carolina, Gas Distribution, and Contracted Assets. [23]

[22] https://www.coned.com/en/about-us/company-information, accessed 1/7/2021
[23] https://www.dominionenergy.com/our-company, accessed 1/7/2021

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

Duke Energy Corporation
Company Summary from Value Line:
Duke Energy Corporation is a holding company for utilities with 7.6 mill. elec. customers in NC, FL, IN, SC, OH, & KY, and 1.6 mill. gas customers in OH, KY, NC, SC, and TN. Owns independent power plants & has 25% stake in National Methanol in Saudi Arabia. Acq'd Progress Energy 7/12; Piedmont Natural Gas 10/16; discontinued most int'l ops. in '16. Elec. rev. breakdown: residential, 44%; commercial, 28%; industrial, 14%; other, 14%. Generating sources: gas, 29%; nuclear, 29%; coal, 22%; other, 1%; purchased, 19%. Fuel costs: 30% of revs. '19 reported deprec. rate: 3.1%. Has 28,800 employees.

Additional Company Information from Website:
We are one of the largest electric power holding companies in the United States, providing electricity to 7.7 million retail customers in six states. We have approximately 51,000 megawatts of electric generating capacity in the Carolinas, the Midwest and Florida – and natural gas distribution services serving more than 1.6 million customers in Ohio, Kentucky, Tennessee and the Carolinas. Our commercial business owns and operates diverse power generation assets in North America, including a portfolio of renewable energy assets. We are transforming our customers' experience, modernizing our energy grid, generating cleaner energy and expanding our natural gas infrastructure to create a smarter energy future for our customers.[24]

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

Edison International (formerly SCECorp)
Company Summary from Value Line:
Edison International (formerly SCECorp) is a holding company for Southern California Edison Company (SCE), which supplies electricity to 5.1 mill. customers in a 50,000-sq.-mi. area in central, coastal, & southern CA (excl. Los Angeles & San Diego). Edison Energy is an energy svcs. co. Disc. Edison Mission Energy (independent power producer) in '12. Elec. rev. breakdown: residential, 39%; commercial, 43%; industrial, 4%; other, 14%. Generating sources: nuclear, 8%; gas, 7%; hydro, 5%; purchased, 80%. Fuel costs: 39% of revs. '19 reported depr. rate: 3.6%. Has 12,500 empls.

Additional Company Information from Website:
At Edison International, our vision is to lead the transformation of the electric power industry toward a clean energy future. Through our subsidiaries, we generate and distribute electric power, as well as provide energy services and technologies, including renewable energy. With 130+ years of innovation in our history, our company is well-positioned and prepared for the work that lies ahead as we focus on

[24] https://www.duke-energy.com/our-company/about-us, accessed 1/7/2021

opportunities in clean energy, efficient electrification, the grid of the future, and customer choice to strengthen and grow our business.[25]

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

El Paso Electric Company
Company Summary from Value Line:
Not available.

Additional Company Information from Website:
El Paso Electric Company (EPE) announced September 29, 2019 that its shareholders approved the previously announced Agreement and Plan of Merger (the "Agreement") pursuant to which the Company will be purchased by the Infrastructure Investments Fund ("IIF"), a private investment vehicle advised by J.P. Morgan Investment Management Inc.[26]

El Paso Electric is no longer a publicly traded electric utility. It's now owned by the JPMorgan Chase-tied Infrastructure Investments Fund, or IIF, which on June 1, 2019 agreed to buy the 117-year-old electric utility for $4.3 billion, including assuming $1.5 billion of the utility's debt. Dated July 29, 2020 and updated on July 31, 2020.[27]

Why was the company not included?
No longer publicly traded.

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, 37%; commercial, 35%; industrial, 12%; wholesale, 7%; other, 9%. Generating sources: coal, 54%; nuclear, 17%; purchased, 29%. Fuel costs: 25% of revenues. '19 reported deprec. rate: 3%. Has 5,200 employees.

Additional Company Information from Website:
Evergy Inc. (NYSE: EVRG), through its operating subsidiaries Kansas City Power & Light Company (KPC&L) and Westar Energy, Inc., provides clean, safe, reliable energy to 1.6 million customers in Kansas and Missouri. By combining KCP&L and Westar Energy, Inc. in 2018, a leading energy company was created that provides value to shareholders and a stronger company for customers. As a

[25] https://www.edison.com/home/about-us/our-companies.html, accessed 1/7/2021
[26] https://www.epelectric.com/company/news/el-paso-electric-company-shareholders-approve-agreement-to-be-purchased-by-the-infrastructure-investments-fund-an-investment-vehicle-advised-by-jp-morgan-investment-management-inc, accessed 1/7/2020
[27] https://www.elpasotimes.com/story/news/2020/07/29/el-paso-electric-sale-completed-to-jpmorgan-tied-fund/5532839002/, accessed 1/7/2021

combined company, our mission is to empower a better future. Today, half of the power supplied by Evergy comes from clean sources, creating more reliable energy with less impact to the environment. And as the industry evolves, we will continue to innovate and adopt new technologies that give our customers better ways to manage their energy use.[28]

Great Plains Energy Incorporated, which serves customers as KCP&L, and Westar Energy, Inc. announced on May 24, 2018 that they received final regulatory approval from the Kansas Corporation Commission and Missouri Public Service Commission to combine. The stock-for-stock merger of equals creates a holding company of approximately $15 billion equity value, which will be named Every, Inc. Its principal business will be conducted by the operating companies today known as Westar and KCP&L.[29]

Why was the company not included?
This company is located in the Electric Utility (Central) Value Line Industry. This company was recently created through the merger of Great Plains Energy Incorporated and Westar Energy, Inc. in 2018. The department will consider this company as a guideline company in the future, after several years of financials are available.

Eversource Energy
Company Summary from Value Line:
Eversource Energy (formerly Northeast Utilities) is the parent of utilities with 3.2 mill. electric, 870,000 gas, 229,000 water customers. Supplies power to most of Connecticut and gas to part of Connecticut; supplies power to 3/4 of New Hampshire's population; supplies power to western Massachusetts and parts of eastern MA & gas to central & eastern MA; supplies water to CT, MA, & NH. Acq'd NSTAR 4/12; Aquarion 12/17; Columbia Gas 10/20. Electric rev. breakdown: residential, 54%; commercial, 37%; industrial, 5%; other, 4%. Fuel costs: 36% of revs. '19 reported deprec. rate: 3.0%. Has 8,200 employees.

Additional Company Information from Website:
The approximately 9,000 men and women of Eversource bring a strong commitment to providing safe, reliable and sustainable electric, gas and water service. Serving the neighborhoods where we live and work. Coming together in good weather and bad. Taking care of problems before they're problems. Heading out in the storm when others head home. Connecting you to solutions for savings. Working together for a better tomorrow. In 2012, Northeast Utilities and its operating companies Connecticut Light & Power, Public Service of New Hampshire, Western Massachusetts Electric and Yankee Gas merged with NSTAR Electric & Gas to better serve New England. On December 4, 2017, Eversource closed the deal on an acquisition of Aquarion Water Company, making Eversource the only electric company in the U.S. that also owns a water utility. Aquarion serves 230,000 water customers in Connecticut, Massachusetts and New Hampshire. Combined, we power the possible for New England.[30]

[28] https://investors.evergy.com/about-evergy/company-information, accessed 1/8/2021
[29] http://www.evergyinc.com/news-releases/news-release-details/merger-great-plains-energy-and-westar-energy-approved-paving-way, accessed 2/20/2019
[30] https://www.eversource.com/content/general/about/about-us/about-us/welcome-to-eversource, accessed 1/8/2021

Eversource Energy has completed its $1.1 billion acquisition of the Columbia Gas of Massachusetts business from its former parent company, NiSource Inc. 10/13/2020.[31]

Why was the company not included?
This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as those companies that are located in or directly next to Minnesota. In addition, this company was recently involved in an acquisition.

Exelon Corporation
Company Summary from Value Line:
Exelon Corporation is a holding company for Commonwealth Edison, PECO Energy, Baltimore Gas and Electric, Pepco, Delmarva Power, & Atlantic City Electric. Has 8.9 mill. elec., 1.3 mill. gas customers. Has nonregulated generating & energymarketing ops. Acq'd Constellation Energy 3/12; Pepco Holdings 3/16. Elec. rev. breakdown: res'l, 54%; small comm'l & ind'l, 16%; large comm'l & ind'l, 17%; other, 13%. Generating sources: nuclear, 65%; other, 10%; purch., 25%. Fuel costs: 45% of revs. '19 depr. rates: 2.8%-7.4% elec., 2.0% gas. Has 32,700 empls.

Additional Company Information from Website:
We are a FORTUNE 100 company that works in every stage of the energy business: power generation, competitive energy sales, transmission and delivery. As the nation's leading competitive energy provider, Exelon does business in 48 states, D.C., and Canada and had 2019 revenues of $34 billion. We employ approximately 33,400 people nationwide. Exelon's family of companies represents every stage of the energy value chain. Exelon's six utilities deliver electricity and natural gas to approximately 10 million customers in Delaware, the District of Columbia, Illinois, Maryland, New Jersey and Pennsylvania through its Atlantic City Electric, BGE, ComEd, Delmarva Power, PECO and Pepco subsidiaries. Exelon is one of the largest competitive U.S. power generators, with more than 31,000 megawatts of nuclear, gas, wind, solar and hydroelectric generating capacity comprising one of the nation's cleanest and lowest-cost power generation fleets. The company's Constellation business unit provides energy products and services to approximately 1.8 million residential, public sector and business customers, including more than two-thirds of the Fortune 100.[32]

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

FirstEnergy Corporation
Company Summary from Value Line:
FirstEnergy Corp. is a holding company for Ohio Edison, Pennsylvania Power, Cleveland Electric, Toledo Edison, Metropolitan Edison, Penelec, Jersey Central Power & Light, West Penn Power, Potomac Edison, & Mon Power. Provides electric service to 6.1 million customers in OH, PA, NJ, WV, MD, & NY. Acq'd Allegheny Energy 2/11. Electric revenue breakdown: residential, 61%; commercial,

[31] https://www.bostonglobe.com/2020/10/13/business/eversource-completes-purchase-columbia-gas/, accessed 1/8/2021

[32] http://www.exeloncorp.com/company/about-exelon, accessed 1/8/2021

25%; industrial, 13%; other, 1%. Purchases most of its power. Fuel costs: 31% of revenues. '19 reported depreciation rate: 2.7%. Has 12,300 employees.

Additional Company Information from Website:
We are a forward-thinking electric utility powered by a diverse team of employees committed to making customers' lives brighter, the environment better and our communities stronger. FirstEnergy (NYSE: FE) is dedicated to safety, reliability and operational excellence. Headquartered in Akron, Ohio, FirstEnergy includes one of the nation's largest investor-owned electric systems, more than 24,500 miles of transmission lines that connect the Midwest and Mid-Atlantic regions, and a regulated generating fleet with a total capacity of 3,780 megawatts.[33]

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

Fortis Inc.
Company Summary from Value Line:
Fortis Inc.'s main focus is electricity, hydroelectric, and gas utility operations (both regulated and nonregulated) in the United States, Canada, and the Caribbean. Has 2 mill. electric, 1.3 mill. gas customers. Owns UNS Energy (Arizona), Central Hudson (New York), FortisBC Energy (British Columbia), FortisAlberta (Central Alberta), and Eastern Canada (Newfoundland). Sold commercial real estate and hotel property assets in 2015. Acquired ITC Holdings 10/16. Fuel costs: 29% of revenues. '19 reported deprec. rate: 2.6%. Has 9,000 employees.

Additional Company Information from Website:
Fortis Inc. has its origin in the formation of St. John's Electric Light Company in 1885 in the province now known as Newfoundland and Labrador. That company eventually became Newfoundland Light & Power Co. Limited which became the first wholly owned subsidiary of Fortis Inc. Fortis was created as a holding company in 1987 with the mission to expand and diversify. Today, Fortis is a leader in the North American utility industry with assets of $56 billion and 2019 revenue of $8.8 billion. Our 9,000 employees serve utility customers in five Canadian provinces, nine U.S. states and three Caribbean countries.[34]

Why was the company not included?
This company is similar to the Electric Companies that the State Assessed Section is responsible for valuing. This company is in the Electric Utility (Central) Value Line Industry. This company trades on the Toronto and New York Stock Exchanges. All data provided by Value Line is in Canadian Dollars, making conversion to US dollars necessary. Since there are enough comparable companies, will not use to limit the number of additional calculations that can decrease the reliability of the data.

[33] https://www.firstenergycorp.com/about.html, accessed 1/8/2021
[34] https://www.fortisinc.com/about-us, accessed 1/8/2021

Hawaiian Electric Industries Inc.

Company Summary from Value Line:

Hawaiian Electric Industries, Inc. is the parent company of Hawaiian Electric Company, Inc. (HECO), American Savings Bank (ASB), and Pacific Current. HECO & its subs., Maui Electric Co. (MECO) & Hawaii Electric Light Co. (HELCO), supply electricity to 465,000 customers on Oahu, Maui, Molokai, Lanai, & Hawaii. Operating companies' systems are not interconnected. Elec. rev. breakdown: residential, 31%; commercial, 33%; lg. light & power, 35%; other, 1%. Generating sources: oil, 54%; purch., 46%. Fuel costs: 47% of revs. '19 reported deprec. rate (utility): 3.2%. Has 3,800 employees.

Additional Company Information from Website:

For more than 125 years, Hawaiian Electric has provided the energy that has fueled our islands' growth and prosperity. Hawaiian Electric serve 95 percent of Hawaii. With that great privilege comes great responsibility. We have a shared kuleana to serve our customers, care for our communities, and lead the way to a clean energy future for our islands. We are creating strong partnerships within our communities to achieve a 100 percent renewable energy future, the most ambitious clean energy goal in the nation. Today, we are providing cleaner, smarter and more reliable service for our customers. And we are committed to continuing our progress to meet our ambitious goals. In the end, we know the true measure of our success lies in the energy future we leave for generations to come.[35]

Why was the company not included?

This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as those companies that are 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 580,000 customers throughout a 24,000-square-mile area in southern Idaho and eastern Oregon (population: 1.2 million). Most of the company's revenues are derived from the Idaho portion of its service area. Revenue breakdown: residential, 39%; commercial, 22%; industrial, 13%; irrigation, 10%; other, 16%. Generating sources: hydro, 45%; coal, 16%; gas, 11%; purchased, 28%. Fuel costs: 33% of revenues. '19 reported depreciation rate: 2.9%. Has 2,000 employees.

Additional Company Information from Website:

Boise, Idaho-based IDACORP is a holding company comprised of Idaho Power Company, a regulated electric utility; IDACORP Financial, a holder of affordable housing projects and other real estate investments; and Ida-West Energy, an operator of small hydroelectric generation projects that satisfy the requirements of the Public Utility Regulatory Policies Act of 1978. IDACORP was formed Oct. 1, 1998, following approval by Idaho Power shareholders, the Federal Energy Regulatory Commission and the public utility commissions of Idaho, Oregon, Nevada and Wyoming (states where IDACORP has conducted business or has holdings). Under the holding company structure, Idaho Power Company is the primary subsidiary. This regulated utility, created in 1916, is dedicated to providing quality electric service to more than 580,000 general business customers in a 24,000-square-mile service area in southern Idaho and eastern Oregon. The backbone of the company's generation portfolio is a series of 17 hydropower plants it owns and operates on the Snake River and its tributaries. Idaho Power also

[35] http://www.hei.com/CustomPage/Index?keyGenPage=1073751873, accessed 1/8/2021

owns three natural gas-fired power plants and a partial interest in three coal-fired generating plants. IDACORP's common stock is traded on the New York Stock Exchange under the trading symbol "IDA".[36]

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

MDU Resources Group Inc.
Company Summary from Value Line:
MDU Resources Group, Inc. is a regulated energy delivery and construction materials and services company. Segments: construction materials and contracting (41% of '19 revs; 37% of '19 op. inc.), construction services (35%, 26%), natural gas distribution (16%, 14%); electric (7%, 13%) and pipeline (1%, 10%). Utilities sell gas & electricity in northwest and upper midwest U.S. Construction materials has 1.1 billion tons of construction reserves. Has about 13,360 employees

Additional Company Information from Website:
A strong infrastructure is the heart of our economy. It is the natural gas and electricity that power business, industry and our daily lives. It is the pipes and wires that connect our homes, factories, offices and stores to bring them to life. It is the transportation network of roads, highways and airports that keeps our economy moving. Infrastructure is our business. We provide essential products and services through our two lines of business: regulated energy delivery and construction materials and services. 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 is a multibillion-dollar corporation with operations, customers and employees across the country. We have more than 13,000 employees during peak construction season and are authorized to conduct business in 44 states. MDU Resources is the largest publicly traded company headquartered in North Dakota. Our stock has traded since 1948 under the symbol MDU on the New York Stock Exchange. We have paid dividends uninterrupted to our shareholders for 82 years. We have increased dividends 29 consecutive years, a feat accomplished by fewer than 90 of the U.S.-listed companies. Our commitment to paying dividends is reflected in our membership in the S&P High-Yield Dividend Aristocrats index.[37]

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

[36] http://www.idacorpinc.com/about-us/at-a-glance, accessed 1/8/2021
[37] https://www.mdu.com/our-company/overview/default.aspx, accessed 1/8/2021

NextEra Energy Inc.

Company Summary from Value Line:

NextEra Energy, Inc. (formerly FPL Group, Inc.) is a holding company for Florida Power & Light Company (FPL) and Gulf Power, which provide electricity to 5.6 million customers in eastern, southern, & northwestern Florida. NextEra Energy Resources is a nonregulated power generator with nuclear, gas, & renewable ownership. Has 60.8% stake in NextEra Energy Partners. Rev. breakdown: residential, 55%; commercial, 35%; industrial & other, 10%. Generating sources: gas, 73%; nuclear, 22%; other, 3%; purch., 2%. Fuel costs: 23% of revs. '19 reported depr. Rate (util.): 3.9%. Has 14,800 employees.

Additional Company Information from Website:

NextEra Energy, Inc. (NYSE: NEE) is a leading clean energy company headquartered in Juno Beach, Florida. NextEra Energy owns two electric companies in Florida: Florida Power & Light Company, which serves more than 5 million customer accounts in Florida and is the largest rate-regulated electric utility in the United States as measured by retail electricity produced and sold; and Gulf Power Company, which serves approximately 470,000 customers in eight counties throughout northwest 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."[38]

NextEra Energy Inc. recently made a takeover approach to Duke Energy Corp., according to people familiar with the matter, testing the waters for what would be a $60 billion-plus combination of two Southern utilities. Duke rebuffed the approach but NextEra is still interested in pursuing a deal, some of the people said. There is no guarantee NextEra will do so and if it does, that a deal would result.[39]

NextEra Energy Inc announced 11/2/2020 that a subsidiary of NextEra Energy Resources, LLC has entered into agreements to sell a 90% interest in a 1,000 megawatt (MW) portfolio of long-term contracted renewables assets (the portfolio) and a 100% interest in a 100-MW solar-plus-storage project for approximately $1.3 billion in total proceeds, including tax equity, and subject to working capital and other adjustments. The portfolio is being acquired by NextEra Energy Partners, LP (NYSE: NEP) and a consortium of private infrastructure investors led by KKR (the investors) in two separate transactions.[40]

Why was the company not included?

This company is located in the Electric Utility (East) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as those companies that are 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. Also, the company announced that sale of interests in contracted renewable assets.

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[38] http://www.investor.nexteraenergy.com, accessed 1/8/2021

[39] https://www.wsj.com/articles/nextera-energy-made-takeover-approach-to-duke-energy-11601422006?mod=article_inline, accessed 1/8/2021

[40] http://www.investor.nexteraenergy.com/news-and-events/news-releases/2020/11-02-2020-222338600, accessed 1/8/2021

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, 72% of 2019 revs., develops, constructs, owns, and operates geothermal power plants that sell electricity. Under the product segment, 26% of revs., the company designs and manufactures power units for geothermal plants and power units for recovered generation. Other revs., 2%. Employs about 1,300.

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), with the objective of becoming 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's current generating portfolio is spread globally in the U.S., Guatemala, Guadeloupe, Honduras, Indonesia and Kenya. Ormat also intends to expand its operations and provide energy management and energy storage solutions, by leveraging its core capabilities and global presence as well as through its Viridity Energy Solutions, Inc. subsidiary, a Philadelphia-based company with nearly a decade of expertise and leadership in demand response, energy management and storage. 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.[41]

Why was the company not included?

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

PG&E Corporation (Pacific Gas and Electric Company Inc.)

Company Summary from Value Line:

Not available.

Additional Company Information from Website:

Pacific Gas and Electric Company, incorporated in California in 1905, is one of the largest combined natural gas and electric energy companies in the United States. Based in San Francisco, the company is a subsidiary of PG&E Corporation. There are approximately 23,000 employees who carry out Pacific Gas and Electric Company's primary business—the transmission and delivery of energy. The company provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California. Pacific Gas and Electric Company and other energy companies in the state are regulated by the California Public Utilities Commission. The CPUC was created by the state Legislature in 1911. Fast Facts Service area stretches from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada in the east. 106,681 circuit miles of electric distribution lines

[41] https://investor.ormat.com/corporate-profile/default.aspx, accessed 1/8/2021

and 18,466 circuit miles of interconnected transmission lines. 42,141 miles of natural gas distribution pipelines and 6,438 miles of transmission pipelines. 5.1 million electric customer accounts.[42]

PG&E Corporation and its primary operating subsidiary, Pacific Gas and Electric Company filed voluntary petitions under Chapter 111 of the U.S. Bankruptcy Code in the United States Bankruptcy Court for the Northern District of California on January 29, 2019.[43]

PG&E Corporation (the "Corporation") and Pacific Gas and Electric Company (the "Utility," together "PG&E") announced July 1, 2020 that PG&E has emerged from Chapter 11, successfully completing its restructuring process and implementing PG&E's Plan of Reorganization ("Plan") that was confirmed by the United States Bankruptcy Court on June 20, 2020.[44]

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as those companies that are located in or directly next to Minnesota. Also, this company recently emerged from Chapter 11 Bankruptcy.

Pinnacle West Capital Corporation
Company Summary from Value Line:
Pinnacle West Capital Corporation is a holding company for Arizona Public Service Company (APS), which supplies electricity to 1.3 million customers in most of Arizona, except about half of the Phoenix metro area, the Tucson metro area, and Mohave County in northwestern Arizona. Discontinued SunCor real estate subsidiary in ’10. Electric revenue breakdown: residential, 51%; commercial, 38%; industrial, 5%; other, 6%. Generating sources: nuclear, 28%; gas & other, 28%; coal, 24%; purchased, 20%. Fuel costs: 30% of revenues. ’19 reported deprec. rate: 2.8%. Has 6,200 employees.

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

[42] https://www.pge.com/en_US/about-pge/company-information/profile/profile.page, accessed 1/8/2021
[43] https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20190129_pge_files_for_reorganization_under_chapter_11, accessed 2/20/2019
[44] https://www.pgecorp.com/news/press_releases/Release_Archive2020/200701press_release.shtml, accessed 1/8/2021

development, and provides millions of dollars in direct financial assistance to customers struggling to pay their bills.[45]

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

PNM Resources Inc.
Company Summary from Value Line:
PNM Resources, Inc. is a holding company with two regulated electric utilities. Public Service Company of New Mexico (PNM) serves 532,000 customers in north central New Mexico, including Albuquerque and Santa Fe. Texas-New Mexico Power Company (TNMP) transmits and distributes power to 257,000 customers in Texas. Electric revenue breakdown: residential, 40%; commercial, 35%; industrial, 6%; other, 19%. Generating sources not available. Fuel costs: 28% of revenues. ’19 reported depreciation rates: 2.5%-7.9%. Has 1,700 employees.

Additional Company Information from Website:
PNM Resources is an energy holding company based in Albuquerque, N.M., with 2019 consolidated operating revenues of $1.5 billion. Through its regulated utilities, PNM and TNMP, PNM Resources has 2,811 megawatts of generation capacity and provides electricity to approximately 790,000 homes and businesses in New Mexico and Texas. PNM Resources is publicly traded on the New York Stock Exchange as PNM. PNM Resources strives to create enduring value for customers, communities and shareholders built on a foundation of Environmental, Social and Governance Principles. At the core of our business we are focused on our Vision, our Purpose and our Values.[46]

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

- Strategic transaction furthers AVANGRID’s growth in both clean energy distribution and transmission - expands leadership position in renewables
- All Cash Offer for PNM Resources shares at $50.30 per share – $8.3 billion enterprise value transaction
- Creates one of biggest clean energy companies in the US with ten regulated utilities in six states and third largest renewables company with operations in 24 states
- Majority shareholder IBERDROLA supports the transaction and has provided a funding commitment letter[47]

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[45] http://www.pinnaclewest.com/about-us/default.aspx, accessed 1/8/2021

[46] https://www.pnmresources.com/about-us.aspx, accessed 1/8/2021

[47] https://www.avangrid.com/wps/portal/avangrid/pressroom/pressrelease/2020/20-10%20pnm%20merger%20announcement/!ut/p/z1/rZJRa8IwEMe_ii8-lktiTbvHIIrTdYKzs82LZE2sHSapNdN9_KU-CcPqYAkcF7j78b__BThkwI04VaVwlTVi7985p5sBTsbTcIReERuHiC0XyfMoxWQxjWB9KcCLeIznMUniOZkgNqMrNkEzjOgQ-CP96MZh6LH-jgLejX8HDrwwrnY7yEXZbOpGHY-NtbqPfqVqr8RR9RHxt40BRr3a6J5WTamanjDGfplCaWVci62LSkJeSKkoLqJAECKCcBjSQFAqg1iGpBiGkfzY

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as those companies that are located in or directly next to Minnesota. Also, PNM Resources and AVANGRID Inc. recently announced a merger; all cash offer for PNM Resources shares at $50.30 per share - $8.3 billion enterprise value transaction. AVANGRID Inc. is in the Electric Utility (East) Value Line Industry.

Portland General Electric Company
Company Summary from Value Line:
Portland General Electric Company (PGE) provides electricity to 901,000 customers in 52 cities in a 4,000-square-mile area of Oregon, including Portland and Salem. The company is in the process of decommissioning the Trojan nuclear plant, which it closed in 1993. Electric revenue breakdown: residential, 47%; commercial, 30%; industrial, 9%; other, 14%. Generating sources: gas, 36%; coal, 19%; wind, 8%; hydro, 6%; purchased, 31%. Fuel costs: 29% of revenues. ’19 reported depreciation rate: 3.6%. Has 2,900 employees.

Additional Company Information from Website:
Portland General Electric Company is an investor-owned utility in Northwest Oregon engaged in the generation, transmission and distribution of electricity to 901,000 residential, commercial and industrial customers in 51 cities and seven counties. We’re committed to providing shareholders with easy access to information about the company. As Oregon's largest utility, PGE is expanding to keep pace with the economic growth in northwest Oregon. See the PGE service territory. PGE offers a diverse mix of resources that includes hydropower, coal and gas combustion, wind and solar, as well as key transmission resources. Our power plants have a combined generating capacity of more than 3,800 megawatts. [48]

Why was the company not included?
This company is located in the Electric Utility (West) Value Line Industry. We are limiting the guideline companies for electric to the Electric Utility (Central) Value Line Industry as well as those companies that are 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 (formerly Pennsylvania Power & Light Company), which distributes electricity to 1.4 million customers in eastern & central PA. Acq’d Kentucky Utilities and Louisville Gas and Electric (1.3 mill. customers) 11/10. Has electric distribution sub. in U.K. (7.9 mill. customers). Sold gas distribution subsidiary in ’08. Spun off power-generating subsidiary in ’15. The company no longer breaks out data on electric operating statistics. Fuel costs: 18% of revs. ’19 reported depr. rate: 2.8%. Has 12,300 empls.

Sj8GvyjtMvLeKLm3IrppxROG9alSZ0iNbbRf7dsfJU4RzO5tw3-X6vNw4Mx7ao1T3w6y_zTV80mTjJLSKxduF1RmayG75kDWctrYxal1mqY6HtBlfF5td_vTC2M_hVjeBw!!/dz/d5/L2dBISEvZ0FBIS9nQSEh/?current=true&urile=wcm%3Apath%3A%2Fagr_pressroom%2Fpressroom%2Fpressrelease%2F2020%2F20-10%2Bpnm%2Bmerger%2Bannouncement, accessed 1/7/2021

[48] https://investors.portlandgeneral.com/?_ga=2.127402757.96222047.1610120276-359187513.1610120276, accessed 1/8/2021

Additional Company Information from Website:
PPL Corporation and our family of companies provide essential energy services to more than 10 million customers in the United States and the United Kingdom. We provide an outstanding service experience for our customers, consistently ranking among the best utilities in the U.S. and the U.K. As one of the largest regulated utility companies in the United States, we understand the electricity we provide is vital to our customers and communities. To that end, we are investing about $14 billion over the next five years in new infrastructure and technology that will create a smarter, more reliable and resilient energy grid for generations to come. As the energy grid evolves, so do we. Our companies are addressing new challenges head-on and are finding ways to accommodate new technologies, distributed generation and renewable power sources on our grid. We are also taking steps to reduce our environmental impact and advance a cleaner, more balanced energy mix. We are a positive force in the cities and towns where we do business, and the spirit of volunteerism and philanthropy runs deep at PPL. Our more than 12,000 employees generously volunteer their time and energy to help others. We also partner with hundreds of nonprofit organizations to enhance educational programs, help develop the workforce and revitalize our communities. PPL is committed to providing essential energy in extraordinary ways, and we deliver.[49]

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

Public Service Enterprise Group, Inc.
Company Summary from Value Line:
Public Service Enterprise Group Incorporated is a holding company for Public Service Electric and Gas Company (PSE&G), which serves 2.3 million electric and 1.8 million gas customers in New Jersey, and PSEG Power LLC, a nonregulated power generator with nuclear, gas, and coal-fired plants in the Northeast. PSEG Energy Holdings is involved in renewable energy. The company no longer breaks out data on electric and gas operating statistics. Fuel costs: 33% of revenues. '19 reported depreciation rates (utility): 1.9%-2.5%. Has 13,000 employees.

Additional Company Information from Website:
The Public Service Corporation was formed in 1903, by amalgamating more than 400 gas, electric and transportation companies in New Jersey. Thomas McCarter was named the Corporation's first president and held the position until 1939. Internally, Public Service consolidated its gas and electric interests into Public Service Electric and Gas, and its transportation interests into Public Service Coordinated Transport (later Transport of New Jersey). Concerns about the concentration of economic power resulted in federal and state actions requiring the breakup of utilities. In 1943, Public Service once again became a stand-alone company, and was renamed Public Service Electric and Gas Company (PSE&G) in 1948.[50]

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[49] https://www.pplweb.com/who-we-are/about-us/, accessed 1/8/2021

[50] https://corporate.pseg.com/aboutpseg/companyinformation, accessed 1/8/2021

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

Sempra Energy
Company Summary from Value Line:
Sempra Energy is a holding co. for San Diego Gas & Electric Company, which sells electricity & gas mainly in San Diego County, & Southern California Gas Company, which distributes gas to most of Southern California. Owns 80% of Oncor (acq'd 3/18), which distributes electricity in Texas. Customers: 5.2 million electric, 6.9 million gas. Electric revenue breakdown not available. Purchases most of its power; the rest is gas. Has nonutility subsidiaries, incl. IEnova (67% owned) in Mexico. Sold commodities business in '10. Power costs: 25% of revenues. '19 reported deprec. rates: 2.5%-6.6%. Has 14,000 employees.

Additional Company Information from Website:
Sempra Energy is an energy infrastructure company focused on connecting millions through the power of people, ideas and innovation. Our 18,000+ employees pride themselves as leaders in the energy industry, serving over 35 million consumers worldwide. From our San Diego, CA headquarters to our operations throughout North America, we are making great strides in developing forward-thinking energy solutions and positively impacting the communities we serve by delivering energy with purpose. With more than $60 billion in total assets in 2019, combined with informed and impactful strategies and an inspiring mission, our strong financial performance will keep us on the path for sustainable long-term growth.[51]

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

Southern Company
Company Summary from Value Line:
The Southern Company, through its subs., supplies electricity to 4.3 mill. customers in GA, AL, and MS. Also has a competitive generation business. Acq'd AGL Resources (renamed Southern Company Gas, 4.3 mill. customers in GA, NJ, IL, VA, & TN) 7/16. Sold Gulf Power 1/19. Electric rev. breakdown: residential, 37%; commercial, 30%; industrial, 19%; other, 14%. Retail revs. by state: GA, 56%; AL, 38%; MS, 6%. Generating sources: gas, 47%; coal, 20%; nuclear, 15%; other, 9%; purchased, 9%. Fuel costs: 34% of revs. '19 reported depr. rates (util.): 2.6%-3.7%. Has 27,900 empls.

Additional Company Information from Website:
Southern Company (NYSE: SO) is a leading energy company serving 9 million customers through our subsidiaries. We provide clean, safe, reliable and affordable energy through electric operating companies in three states, natural gas distribution companies in four states, a competitive generation company serving wholesale customers across America, a leading distributed energy infrastructure company, a fiber optics network and telecommunications services. Southern Company brands are known

[51] http://www.sempra.com/about-us, accessed 1/8/2021

for excellent customer service, high reliability and affordable prices below the national average. For more than a century, we have been building the future of energy and developing the full portfolio of energy resources, including carbon-free nuclear, advanced carbon capture technologies, natural gas, renewables, energy efficiency and storage technology. Through an industry-leading commitment to innovation and a low-carbon future, Southern Company and its subsidiaries develop the customized energy solutions our customers and communities require to drive growth and prosperity. Our uncompromising values ensure we put the needs of those we serve at the center of everything we do and govern our business to the benefit of our world.[52]

NextEra Energy, Inc. (NYSE: NEE) has completed its previously announced acquisition of Gulf Power Company from Southern Company (NYSE: SO) on January 1, 2019.[53]

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

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 2019: 66%, residential; 27%, commercial; 5%, industrial; and 2% other. The company sold Atmos Energy Marketing, 1/17.

Additional Company Information from Website:
Atmos Energy Corporation is the nation's largest fully regulated, natural gas-only distributor of safe, clean, efficient and affordable energy. As part of our vision to be the safest provider of natural gas services, we are modernizing our business and our infrastructure while continuing to invest in safety, innovation, environmental sustainability and our communities. An S&P 500 company headquartered in Dallas, Atmos Energy serves more than 3 million distribution customers in over 1,400 communities across eight states and manages proprietary pipeline and storage assets, including one of the largest intrastate natural gas pipeline systems in Texas.[54]

[52] https://www.southerncompany.com/about-us.html, accessed 1/8/2021
[53] http://www.investor.nexteraenergy.com/news-and-events/news-releases/2019/01-01-2019-062635309, accessed 1/7/2020
[54] https://www.atmosenergy.com/company/about-atmos-energy, accessed 1/6/2021

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 the State Assessed Section is responsible for valuing.

Black Hills Corporation
Company Summary from Value Line:
Black Hills Corporation is a holding company for Black Hills Energy, which serves 214,000 electric customers in CO, SD, WY and MT, and 1.1 million gas customers in NE, IA, KS, CO, WY, and AR. Has coal mining sub. Acq'd Cheyenne Light 1/05; utility ops. from Aquila 7/08; SourceGas 2/16. Discont. telecom in '05; oil marketing in '06; gas marketing in '11; gas & oil E&P in '17. Electric rev. breakdown: res'l, 30%; comm'l, 35%; ind'l, 18%; other, 17%. Generating sources: coal, 30%; other, 12%; purch., 58%. Fuel costs: 33% of revs. '19 deprec. rate: 3.2%. Has 2,900 employees.

Additional Company Information from Website:
Black Hills Corporation is a customer focused, growth-oriented utility company with a tradition of exemplary service and a vision to be the energy partner of choice. Based in Rapid City, South Dakota, the company serves over 1.28 million electric and natural gas utility customers in more than 800 communities in Arkansas, Colorado, Iowa, Kansas, Montana, Nebraska, South Dakota and Wyoming. Employees partner to produce results that improve life with energy. [55]

Why was the company included?
Black Hills Corporation provides electric and gas to customers. Electric customers represent 16% of customers and gas customers represent 84% of customers. This company is similar to the Gas Distribution Companies that the State Assessed Section is responsible for valuing. The company engages in providing gas distribution services.

Also using this company as a guideline company for the Electric Market Segment.

CenterPoint Energy Inc.
Company Summary from Value Line:
CenterPoint Energy, Inc. is a holding company for Houston Electric, which serves 2.5 million customers in Houston and environs, Indiana Electric, which serves 148,000 customers, and gas utilities with 4.6 million customers in Texas, Minnesota, Arkansas, Louisiana, Oklahoma, Indiana, and Ohio. Owns 53.7% of Enable Midstream Partners. Has nonutility operations that are in the process of being sold. Acquired Vectren 2/19. Electric revenue breakdown not available. Fuel costs: 46% of revenues. '19 depreciation rate: 4.3%. Has 14,300 employees.

Additional Company Information from Website:
Our vision to lead the nation in delivering energy, service and value drives our strategy and performance. We have an unwavering commitment to safely and reliably deliver electricity and natural gas to millions of people. Natural Gas We sell and deliver natural gas to more than 4.5 million homes and businesses in eight states: Arkansas, Indiana, Louisiana, Minnesota (including Minneapolis), Mississippi, Ohio, Oklahoma and Texas (including greater Houston area). We are investing in modernizing our natural gas infrastructure and are committed to eliminating cast-iron pipe in all our territories. Electric Transmission and Distribution and

[55] https://www.blackhillscorp.com/about, accessed on

Power Generation We maintain the wires, poles and electric infrastructure serving more than 2.5 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. Competitive Energy Businesses Our competitive energy businesses include energy-related services; energy efficiency and sustainability solutions; and owning and operating intrastate natural gas pipeline systems. Our competitive energy businesses' footprint spans more than 20 states. 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 are partnering with HomeServe, a trusted nationwide provider of emergency home repair programs, in our natural gas markets in Arkansas, Louisiana, and Texas (including greater Houston area) to offer our customers service repair plans that reduce the stress and expense from the unexpected.[56]

CenterPoint Energy Inc.'s long-anticipated business transformation plan will include increasing its five-year capital spending plan, selling off gas utilities and owning renewable power projects… The core of the plan is a $3 billion increase to CenterPoint's 2021-2025 capital spending, brining total investment over the period to $16 billion as the company pursues organic growth opportunities in its electric business in Indiana and Texas. [57]

Why was the company included?
CenterPoint Energy Inc. provides electricity and gas to customers. Electric customers represent 35% of customers and gas customers represent 65% of customers. This company is similar to the Gas Distribution Companies that the State Assessed Section is responsible for valuing. The company engages in providing gas distribution services in Minnesota.

Also using this company as a guideline company for the Electric Market Segment.

Chesapeake Utilities Corporation
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 2019: Regulated Energy, 71.5%; Unregulated Energy, 32.1%; Other, 3.6%.

Additional Company Information from Website:
Chesapeake Utilities distributes natural gas to approximately 60,000 residential, commercial and industrial customers in Delaware and Maryland. Our Delaware Division serves southern New Castle County and is the only natural gas distribution system serving Delaware's Kent and Sussex Counties. Our Maryland Division operates the only natural gas distribution system, with the exception of one municipal system, on Maryland's Eastern Shore. Chesapeake Utilities is the natural gas distribution subsidiary of Chesapeake Utilities Corporation (NYSE: CPK), a diversified utility company engaged in

[56] https://www.centerpointenergy.com/en-us/corporate/about-us/company-overview, accessed on 1/6/2021
[57] https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/centerpoint-will-sell-gas-utilities-to-fund-3b-electric-focused-capex-increase-61140601, accessed 1/6/2021

natural gas distribution, transmission and marketing; electric distribution; propane gas distribution and wholesale marketing; advanced information services and other related services.[58]

Why was the company included?
This company consists of two units: Regulated Energy and Unregulated Energy. The Unregulated Energy Unit accounted for over 50% of the company's 2018 revenues. However, for the 2019 revenues, the Unregulated Energy accounted for only 32.1% of revenues and the Regulated Energy accounted for 71.5% of revenues. The Regulated Energy segment is similar to the companies that the State Assessed Section is responsible for valuing.

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 1.8 million electric, 1.8 million gas customers. Has 1,234 megawatts of nonregulated generating capacity. Owns EnerBank. Sold Palisades nuclear plant in '07. Electric revenue breakdown: residential, 45%; commercial, 34%; industrial, 15%; other, 6%. Generating sources: coal, 27%; gas, 18%; other, 3%; purchased, 52%. Fuel costs: 41% of revenues. '19 reported deprec. rates: 3.9% electric, 2.9% gas, 10.0% other. Has 8,100 fulltime employees.

Additional Company Information from Website:
CMS Energy Corporation's business strategy is focused primarily on its principal subsidiary, Consumers Energy Company, Michigan's largest electric and natural gas utility, serving 6.7 million of the state's 10 million residents. With our subsidiary, CMS Enterprises Company, we are also engaged in independent power generation in several states. Our business also includes EnerBank® USA, which specializes in providing unsecured home improvement payment option programs for homeowners through nationwide dealer networks. Consumers Energy is one of the nation's largest combination electric and natural gas utilities. CMS Enterprises owns and operates independent power generating plants, natural gas assets and an energy marketing group for the non-utility segment of CMS Energy's business.[59]

Why was the company included?
CMS Energy Corporation provides electricity and gas to customers. Electric customers represent 50% of customers and gas customers represent 50% of customers. This company is similar to the Gas Distribution Companies that the State Assessed Section is responsible for valuing. The company engages in providing gas distribution services.

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 155,000 customers in Dane County and gas service to 163,000 customers in seven counties in Wisconsin. Electric revenue breakdown, '19: residential, 35%; commercial, 53%; industrial, 3%; other, 9%. Generating sources, '19: coal, 50%; gas, 14%; renewables, 14%; purchased power, 22%. Fuel costs: 34% of revenues. '19 reported depreciation rates: electric, 3.6%; gas, 2.1%; nonregulated, 2.3%. Has about 700 employees.

[58] http://www.chpk.com/about-us/about-us/, accessed 1/6/2021
[59] https://www.cmsenergy.com/about-cms-energy/default.aspx, accessed 1/6/2021

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 40 consecutive years and have paid dividends for more than 100 years. MGE Energy is the parent company of the following:

- Madison Gas and Electric Company (MGE) provides natural gas and electric service in south-central and western Wisconsin.
- MGE Transco Investment holds an ownership interest in ATC LLC, which invests in transmission assets, primarily within Wisconsin.
- MGEE Transco LLC holds an ownership interest in ATC Holdco, which invests in transmission assets outside ATC LLC service territory.
- MGE Power owns assets in the West Campus Cogeneration Facility in Madison, Wis. and the Elm Road Generating Station in Oak Creek, Wis.
- MAGAEL, LLC holds title to properties acquired for future utility plant expansion.
- Central Wisconsin Development Corporation promotes business growth in MGE's service area.
- MGE Services, LLC provides construction and other services.[60]

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 Gas Distribution Companies that the State Assessed Section is responsible for valuing. The company engages in providing gas distribution services.

Also using this company as a guideline company for the Electric Market Segment.

New Jersey Resources Corporation
Company Summary from Value Line:
New Jersey Resources Corp. is a holding company providing retail/wholesale energy svcs. to customers in NJ, and in states from the Gulf Coast to New England, and Canada. New Jersey Natural Gas had 547,600 cust. at 9/30/19. Fiscal 2019 volume: 232 bill. cu. ft. (17% interruptible, 17% res., 9% commercial & elec. utility, 40% capacity release programs). N.J. Natural Energy subsidiary provides unregulated retail/wholesale natural gas and related energy svcs. 2019 dep. rate: 2.6%. Has 1,108 empls.
Additional Company Information from Website:
New Jersey Resources - New Jersey Resources (NJR), a Fortune 1000 company that, through its subsidiaries, provides safe and reliable natural gas and clean energy services, including transportation, distribution, asset management and home services. It is composed of five primary businesses:
New Jersey Natural Gas - New Jersey Natural Gas (NJNG), NJR’s principal subsidiary, operates and maintains over 7,500 miles of natural gas transportation and distribution infrastructure to serve over half a million customers in New Jersey’s Monmouth, Ocean, Morris, Middlesex and Burlington counties..
NJR Energy Services - NJR Energy Services (NJRES) manages a diversified portfolio of natural gas transportation and storage assets and provides physical natural gas services and customized energy solutions to its customers across North America. NJR Clean Energy Ventures - NJR Clean Energy Ventures (NJRCEV) invests in, owns and operates solar projects with a total capacity of nearly 300 megawatts, providing residential and commercial customers with low-carbon solutions. NJR Midstream

[60] https://www.mgeenergy.com/en/about/about-mge-energy, accessed 1/6/2021

- NJR Midstream serves customers - from local distributors and producers to electric generators and wholesale marketers - through its ownership of Leaf River Energy Center, Adelphia Gateway Pipeline Project and 50 percent equity ownership in Steckman Ridge natural gas storage facilities, as well as its 20 percent equity interest in the planned PennEast Pipeline Project. NJR Home Services - NJR Home Services (NJRHS) provides service contracts as well as heating, central air conditioning, water heaters, standby generators, solar and other indoor and outdoor comfort products to residential homes throughout New Jersey. NJR Service Corporation - NJR Service Corporation provides the NJR family of subsidiaries with shared support services, including communications, financial, administrative, auditing, legal and technological expertise.[61]

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 the State Assessed Section is 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: 472,000 electric in Indiana, 3.5 million gas in Indiana, Ohio, Pennsylvania, Kentucky, Virginia, Maryland, Massachusetts through its Columbia subsidiaries. Revenue breakdown, 2019: electrical, 33%; gas, 67%; other, less than 1%. Generating sources, 2018: coal, 69.4%; purchased & other, 30.6%. 2019 reported depreciation rates: 2.9% electric, 2.2% gas. Has 8,087 employees.

Additional Company Information from Website:
We're a leading natural gas and electric utility company. Our over 7,500 employees ensure Columbia Gas and NIPSCO customers have the energy they need across seven states. Focused on strategically investing in our energy infrastructure – between $1.8 billion - $1.8 billion annually through 2020 – we will be able to meet our customer commitments for the next 100 years. 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.[62]

Why was the company included?
NiSource Inc. provides electricity and gas to customers. This company is similar to the Gas Distribution Companies that the State Assessed Section is 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 174 Bcf of natural gas supply in 2019, compared to 180 Bcf in 2018. Total volumes delivered by customer (fiscal 2019): transportation, 56.6%; residential, 32.5%; commercial & industrial, 10.3%; other, .6%. ONE Gas has around 3,600 employees.

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[61] https://www.njresources.com/about/our-companies.aspx, accessed 1/6/2021
[62] https://www.nisource.com/company, accessed 1/6/2021

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 million customers in Oklahoma, Kansas and Texas. ONE Gas is headquartered in Tulsa, Okla., and its divisions include Oklahoma Natural Gas, the largest natural gas distributor in Oklahoma; Kansas Gas Service, the largest in Kansas, and Texas Gas Service, the third largest in Texas, 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.[63]

Why was the company included?
ONE Gas Inc. provides natural gas to customers. This company is similar to the Gas Distribution Companies that the State Assessed Section is responsible for valuing.

South Jersey Industries Inc.
Company Summary from Value Line:
South Jersey Industries, Inc. is a holding company. The company distributes natural gas in New Jersey and Maryland. South Jersey Gas rev. mix '19: residential, 47%; commercial, 23%; cogen. and electric gen., 12%; industrial, 18%. Acq. Elizabethtown Gas and Elkton Gas, 7/18. Nonutil. operations include South Jersey Energy, South Jersey Resources Group, South Jersey Exploration, Marina Energy, South Jersey Energy Service Plus, and SJI Midstream. Has about 1,100 employees.

Additional Company Information from Website:
SJI (NYSE: SJI), an energy services holding company based in Folsom, NJ, delivers energy services to its customers through three primary subsidiaries. SJI Utilities, SJI's regulated natural gas utility business, delivers safe, reliable, affordable natural gas to approximately 700,000 South Jersey Gas and Elizabethtown Gas customers. SJI's non-utility businesses within South Jersey Energy Solutions promote efficiency, clean technology and renewable energy by providing customized wholesale commodity marketing and fuel management services; and developing, owning and operating on-site energy production facilities. SJI Midstream houses the company's interest in the PennEast Pipeline Project.[64]

Why was the company included?
South Jersey Industries provides gas to customers. This company is similar to the Gas Distribution Companies that the State Assessed Section is responsible for valuing.

Southwest Gas Holdings Inc.
Company Summary from Value Line:
Southwest Gas Holdings Inc. is the parent holding company of Southwest Gas and Centuri Construction Group. Southwest Gas is a regulated gas distributor serving about 2.0 million customers in sections of Arizona, Nevada, and California. Centuri provides construction services. 2018 margin mix: residential and small commercial, 85%; large commercial and industrial, 3%; transportation, 12%. Total throughput: 2.2 billion therms. Has 8,632 employees.

[63] http://www.onegas.com/en/About.aspx, accessed 1/7/2021
[64] https://www.sjindustries.com/about-sji/company-overview, accessed 1/7/2021

Additional Company Information from Website:
Southwest Gas Holdings, Inc. is a holding company with business interests in two major business segments – Natural Gas Operations and Utility Infrastructure Services. Driven by the values of safety, service, and reliability, we pursue excellence and innovation to enhance our reputation as a trusted provider of natural gas and construction services. Southwest Gas Holdings, Inc. is comprised of the following two business segments: Natural Gas Operations - Southwest Gas Corporation is engaged in the business of purchasing, distributing, and transporting natural gas in portions of Arizona, California, and Nevada, serving over 2 million customers. Southwest Gas is the largest distributor of natural gas in Arizona and Nevada, serving large metropolitan areas including Phoenix, Tucson, and Las Vegas. In addition, Southwest Gas serves customers in portions of California, including the Lake Tahoe area, and the high desert and mountain areas in San Bernardino County. Southwest Gas also owns Paiute Pipeline Company, which owns and operates an interstate pipeline system that extends from the Idaho-Nevada border to the California-Nevada state line near the north and south ends of Lake Tahoe. Paiute also operates a peak shaving LNG storage facility near Lovelock, Nevada. Southwest Gas Corporation is dedicated to building positive relationships with customers, regulators, and the general public. Further, Southwest Gas is committed to earning customers' trust by delivering natural gas safely and reliably. Utility Services Enterprise - Centuri Group, Inc. is a comprehensive utility services enterprise dedicated to delivering a diverse array of solutions to North America's gas and electric providers. This growing network of well-established brands include NPL, NPL Canada, Neuco, Canyon Pipeline, Linetec Services, and National Powerline. Centuri Group, Inc. operates in major markets across the United States and Canada.[65]

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 the State Assessed Section is 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 2019: 3.4 bill. Revenue mix for regulated operations: residential, 68%; commercial and industrial, 23%; transportation, 6%; other, 3%. Has about 3,536 employees.

Additional Company Information from Website:
Every day we serve more than 1.8 million customers making us the fifth largest publicly traded natural gas company in the country. We help families and business owners fuel their daily lives through our gas utilities serving Alabama, Mississippi and Missouri. Our natural gas-related businesses include Spire Marketing, Spire STL Pipeline and Spire Storage. We are committed to transforming our business and pursuing growth through 1) growing organically, 2) investing in infrastructure, 3) advancing through innovation.[66]

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[65] https://www.swgas.com/en/about-us, accessed 1/7/2021

[66] https://www.spireenergy.com/about-spire, accessed 1/7/2021

Why was the company included?
Spire Inc. provides gas to customers. This company is similar to the Gas Distribution Companies that the State Assessed Section is responsible for valuing.

WEC Energy Group
Company Summary from Value Line:
WEC Energy Group, Inc. (formerly Wisconsin Energy) is a holding company for utilities that provide electric, gas & steam service in WI & gas service in IL, MN, & MI. Customers: 1.6 mill. elec., 2.9 mill. gas. Acq'd Integrys Energy 6/15. Sold Point Beach nuclear plant in '07. Electric revenue breakdown: residential, 35%; small commercial & industrial, 32%; large commercial & industrial, 21%; other, 12%. Generating sources: coal, 36%; gas, 29%; renewables, 4%; purchased, 31%. Fuel costs: 36% of revenues. '19 reported deprec. rates: 2.3%-3.2%. Has 7,500 employees.

Additional Company Information from Website:
We are one of the nation's largest electric generation and distribution and natural gas delivery holding companies, with the operational expertise and financial resources to serve the Midwest's energy needs safely, reliably and responsibly. Our subsidiaries focus on reliable service, customer satisfaction and shareholder value. Together, we provide energy services to more than 4.5 million customers in Wisconsin, Illinois, Michigan and Minnesota. Our combined assets allow operating efficiencies across 70,600 miles of electric distribution lines, 50,700 miles of natural gas distribution and transmission lines, and 7,100 megawatts of reliable power plant capacity. Our family of companies is committed to delivering world-class reliability and the very best customer care anywhere. Customers are the heart of our business, and we work every day to help grow and support communities where we provide vital energy services. As a Fortune 500 company, we value and develop our employees who are making a difference in a mission that matters.[67]

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 the State Assessed Section is responsible for valuing. The company engages in providing gas distribution services in Minnesota.

Also using this company as a guideline company for the Electric Market Segment.

Companies Not Included in the Gas Distribution Market Segments

Adams Resources and Energy Inc.
Company Summary from Value Line:
Adams Resources & Energy, Inc. is primarily engaged in the business of crude oil marketing, transportation, and storage in various crude oil and natural gas basins in the lower 48 states of the US. The crude oil marketing segment consists of the operations of its subsidiary, GulfMark Energy, Inc. The transportation segment consists of the operations of its subsidiary, Service Transport Company (STC). STC transports liquid chemicals and, to a lesser extent, dry bulk on a "for hire" basis throughout the continental U.S., and into Canada and Mexico. In October 2020, GulfMark Energy acquired the outstanding equity interests of

[67] https://www.wecenergygroup.com/about/aboutus.htm, accessed 1/8/2021

Victoria Express Pipeline, LLC (VEX) and certain related pipeline terminal facility assets from EnLink Midstream Operating, L.P. for $20 million. VEX Pipeline System complements Adams' existing storage terminal and dock at the Port of Victoria, where it now control 450,000 barrels of storage with three docks. Has 664 employees.

Additional Company Information from Website:
Adams Resources & Energy, Inc. (NYSE AMERICAN:AE) ("Adams" or "AE") is primarily engaged in the business of crude oil marketing, transportation and storage and tank truck transportation of liquid chemicals and dry bulk through its two wholly-owned subsidiaries GulfMark Energy, Inc. ("GulfMark") and Service Transport Company ("Service Transport").GulfMark markets crude oil and performs transportation services for other customers. Activity is concentrated primarily onshore in Texas, Oklahoma, North Dakota, Michigan and Louisiana. GulfMark operates over 260 tractor-trailer rigs and maintains approximately 164 pipeline inventory locations and injection stations. GulfMark has the ability to barge oil from four oil storage facilities along the intercoastal waterway of Texas and Louisiana and maintains 425,000 barrels of storage capacity at dock facilities to access waterborne markets for its products. Service Transport transports liquid and dry bulk chemicals throughout the continental United States, Canada and Mexico. Service Transport operates 300 tractors of which 250 are Company owned and 50 are independent owner-operator units. The Company also owns and operates 550 tank trailers. Service Transport operates truck terminals in Houston, Freeport, Corpus Christi, and Nederland, Texas as well as Baton Rouge (St. Gabriel), Louisiana, St. Rose, Louisiana and Mobile (Saraland), Alabama.[68]

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 the State Assessed Section is responsible for valuing.

AltaGas Canada Inc.
Company Summary from Value Line:
Not available.

Additional Company Information from Website:
We are a North American energy infrastructure company with a focus on owning and operating assets that provide clean and affordable energy to our customers. Our talented team, nearly 3,000 strong, leverages the strength of our assets and expertise along the energy value chain to connect customers with premier energy solutions – from the well sites of upstream producers to the doorsteps of homes and businesses, to new markets around the world. We transact more than 1.5 Bcf/d of natural gas, including natural gas gathering and processing, natural gas liquids (NGL) extraction and fractionation, transmission, storage, natural gas and NGL marketing. We provide producers with an opportunity to move natural gas and NGLs to premium overseas markets through the Ridley Island Propane Export Terminal, and through our ownership interest in Petrogas and the Ferndale Terminal. We also have investments in natural gas pipelines, both in operation and under development, in Canada and the U.S. We deliver clean and affordable natural gas to approximately 1.6 million customers' homes and businesses' through regulated natural gas distribution utilities across five jurisdictions in the United States, and two regulated natural gas storage utilities in the United States. Although no longer core to our strategy, we continue to maintain a small portfolio of power assets including

[68] https://www.adamsresources.com/about-us/, accessed 1/6/2021

695 MW of operational gross capacity from natural gas-fired power generation and energy storage assets located in facilities in Alberta, Canada, as well as nine states and the District of Columbia in the United States. The Power business also includes energy efficiency contracting and WGL's retail power marketing business. With infrastructure assets in some of the fastest growing energy markets in North America, including prominent positions in the Montney basin and utilities operations in five states, we are developing an integrated footprint capable of delivering sustained value to shareholders and customers alike.[69]

Why was the company not included?
Company's initial public offering was on 10/25/2018. Company's operations are located in Western Canada. Will consider this company as a guideline company after several years of established financials.

Northwest Natural Holding Company
Company Summary from Value Line:
Northwest Natural Holding Co. distributes natural gas to 1000 communities, 750,000 customers, in Oregon (89% of customers) and in southwest Washington state. Principal cities served: Portland and Eugene, OR; Vancouver, WA. Service area population: 3.7 mill. (77% in OR). Company buys gas supply from Canadian and U.S. producers; has transportation rights on Northwest Pipeline system. Owns local underground storage. Rev. breakdown: residential, 37%; commercial, 22%; industrial, gas transportation, 41%. Employs 1,167.

Additional Company Information from Website:
NW Natural is a local distribution company that currently provides natural gas service to approximately 2.5 million people in more than 140 communities through nearly 770,000 meters in Oregon and Southwest Washington with one of the most modern pipeline systems in the nation.[70]

March 2, 2020, NW Natural Water Company, LLC (NW Natural Water), a wholly owned subsidiary of Northwest Natural Holding Company (NYSE:NWN), has completed the acquisition of T&W Water Service Company in Conroe, Texas. The sale was approved by the Public Utility Commission of Texas in close cooperation with sellers and stakeholders. Currently, T&W serves approximately 9,200 people through 3,700 connections in the Houston- The Woodlands-Sugar Land metropolitan area.[71]

Why was the company not included?
Northwest Natural Gas Company provides gas to customers. This company is similar to the Gas Distribution Companies that the State Assessed Section is responsible for valuing. However, this company was involved in an acquisition that was completed on March 2, 2020. We will not include them as a guideline in the 2021 Capitalization Rate Study.

RGC Resources Inc.
Company Summary from Value Line:
RGC Resources, Inc. is an energy services company primarily engaged in the regulated sale and distribution of natural gas to approximately 62,000 residential, commercial, and industrial customers in Roanoke, Virginia and the surrounding localities through its Roanoke Gas Company subsidiary. Natural gas service is provided at rates and for terms and conditions set by the Virginia State Corporation

[69] https://www.altagas.ca/about/overview-altagas, accessed 1/6/2020
[70] https://www.nwnatural.com/about-us/the-company/overview, accessed 1/6/2020
[71] https://ir.nwnaturalholdings.com/news/news-details/2020/NW-Natural-Water-Completes-Acquisition-of-Texas-Water-Utility/default.aspx, accessed 1/6/2021

Commission (SCC). Resources also provides certain unregulated services through Roanoke Gas and its other subsidiaries. The unregulated operations represent less than 2% of total revenues and margin of Resources on an annual basis. The company's utility operations are regulated by the SCC, which oversees the terms, conditions, and rates to be charged to customers for natural gas service, safety standards, extension of service, accounting, and depreciation. Has 106 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.[72]

Why was the company not included?
RGC Resources Inc. provides gas to customers. This company is similar to the Gas Distribution Companies that the State Assessed Section is responsible for valuing. However, the company is the only Gas Distribution Guideline company with limited analysts' estimates available.

Star Group L.P. (formerly Star Gas Partners, L.P.)
Company Summary from Value Line:
Star Group, L.P. is a full service provider specializing in the sale of home heating and air conditioning products and services to residential and commercial home heating oil and propane customers. 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, 2020 served approximately 443,000 full service residential and commercial home heating oil and propane customers and 64,000 customers on a delivery only basis. It also sells gasoline and diesel fuel to approximately 26,500 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 26,500 service contracts for natural gas and other heating systems. Kestrel Heat, LLC is Star's general partner. Has 3446 employees.

Additional Company Information from Website:
Star Group, L.P. is a full service energy provider specializing in the sale of home heating and air conditioning products and services to residential and commercial customers. The Company also services and sells heating and air conditioning equipment and for certain areas, provides plumbing services. In addition, Star sells diesel fuel, gasoline and home heating oil on a delivery-only basis. Star is the nation's largest retail distributor of home heating oil, based upon sales volume, operating throughout the Northeast and Mid-Atlantic. Star Group, is a limited partnership that has approved an election to be treated as a corporation for U.S. federal income tax purposes effective November 1, 2017. Common units, representing limited partner interests in the Company, are listed and trade on the New York Stock Exchange ("NYSE") under the symbol "SGU." For Company activity through October 31, 2017, our unitholders are required to report for U.S. federal income tax purposes their allocable share of our income, gains, losses, deductions and credits, regardless of whether we make cash distributions.[73]

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[72] https://www.rgcresources.com/about/, accessed 1/6/2020

[73] http://www.stargrouplp.com/investor-relations, accessed 1/7/2021

Why was the company not included?
This company's business segments include sale of home heating and air conditioning products and services to residential and commercial home heating oil and propane customers. These business segments are different that the business segments of the companies that the State Assessed Section is responsible for valuing.

UGI Corporation
Company Summary from Value Line:
GI Corp. operates six business segments: AmeriGas Propane (accounted for 24.3% of net income in 2018), UGI International (19.3%), Gas Utility (20.7%), Midstream & Marketing (27.4%), and Corp. & Other (8.3%). UGI Utilities distributes natural gas and electricity to over 642,000 customers mainly in Pennsylvania; 26%-owned AmeriGas Partners is the largest U.S. propane marketer, serving about 1.3 million users in 50 states. Acquired remaining 80% interest in Antargaz (3/04); Energy Transfer Partners (1/12). Vanguard Group owns 10.3% of stock; Blackrock, 9.8%; Officers/ directors, 2.4% (12/18 proxy). Has 7,700 empls.

Additional Company Information from Website:
UGI Corporation is an international energy distribution and services company that provides superior service in delivering a range of energy products. 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 134 consecutive years.[74]

Why was the company not included?
This company's non-gas utility segments accounted for most of their net income. Their gas utility segment only accounted for 20.7% of their net income. Unregulated business segments are different from the companies that the State Assessed Section is responsible for valuing.

Market Segment: Gas Transmission Pipeline and Fluid Transportation Pipeline

Companies Included in the Gas Transmission Pipeline Market Segment

Enbridge Inc.
Company Summary from Value Line:
Enbridge Inc., is a leader in energy transportation and distribution in North America and int'l. As a transporter of energy, it operates the world's longest crude oil and liquids pipeline system. The company also has international operations and a growing involvement in natural gas transmission and midstream businesses. As a distributor of energy, it owns and operates Canada's largest natural gas distribution

[74] https://www.ugicorp.com/company/corporate-information/about-ugi/default.aspx, accessed 1/7/2021

company, and provides services in Ontario, Quebec, New Brunswick, and New York State. Owns 38.9% of Noverco. In '17, Merged with Spectra Energy Corp. (SE). Employs. 11,300.
Enbridge Inc., is a leader in energy transportation and distribution in North America

Additional Company Information from Website:
Enbridge's vision is to be the leading energy delivery company in North America. We deliver the energy people need and want—to heat their homes, to keep their lights on, to keep them mobile and connected. We operate across North America, fueling the economy and people's quality of life. We move about 25% 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 work collaboratively every day to provide safe, reliable energy. Enbridge connects energy supply with growing markets in North America through our three core businesses: Liquids pipelines, Natural gas pipelines, Utilities and power. Enbridge was named to the Thomson Reuters Top 100 Global Energy Leaders in 2018; we were selected to Bloomberg's 2019 and 2020 Gender Equality Index; and we have been ranked among the Best 50 Corporate Citizens in Canada for 18 years running, through 2020. 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.[75]

At Enbridge, we connect people to the energy they need to fuel their quality of life. Enbridge operates the world's longest and most complex crude oil and liquids transportation system, with approximately 17,127 miles (27,564 kilometers) of active crude pipeline across North America—including 8,627 miles (13,883 km) of active pipe in the United States, and 8,500 miles (13,681 km) of active pipe in Canada.[76]

Enbridge's natural gas pipelines connect North America's most prolific natural gas supply basins to the continent's largest demand centers—New York, Chicago, Boston, Toronto, Vancouver and Seattle—and to liquefied natural gas (LNG) and Mexico export markets as well. Unrivaled in the industry due to its scale, scope and connectivity, Enbridge's natural gas network moves about 19% of all gas consumed in the U.S. Our gas transmission and midstream pipelines cover about 23,850 miles (about 38,375 kilometers) in 30 U.S. states, five Canadian provinces and offshore in the Gulf of Mexico. They stretch from the far northeast corner of British Columbia to the southern tip of Texas, across to Florida and up into New England and the Atlantic provinces.[77]

Why was the company included?
Enbridge Inc. transports 19% of the natural gas consumed in the U.S. with 23,850 miles of gas transmission and midstream pipelines in 30 U.S. states, five Canadian provinces and offshore in the Gulf of Mexico. This company is similar to the Gas Transmission Pipeline Companies that the State Assessed Section is responsible for valuing. Enbridge Inc. also has 17,127 miles of active crude pipelines across North America.

[75] https://www.enbridge.com/about-us accessed 1/11/2021
[76] https://www.enbridge.com/About-Us/Liquids-Pipelines.aspx, accessed 1/11/2021
[77] https://www.enbridge.com/About-Us/Natural-Gas-Transmission-and-Midstream.aspx, accessed 1/11/2021

Kinder Morgan Inc.

Company Summary from Value Line:

Kinder Morgan, Inc. is one of the largest energy infrastructure companies in North America. It transports natural gas, refined petroleum products, crude oil, condensate and carbon dioxide among other products using its more than 83,000 miles of pipelines. Its 147 terminals handle various commodities, including gasoline, diesel fuel, chemicals, ethanol, metals and petroleum coke. The company employs more than 11,000 individuals. Sold Kinder Morgan Canada, 12/18.

Additional Company Information from Website:

Kinder Morgan is one of the largest energy infrastructure companies in North America. We own an interest in or operate approximately 83,000 miles of pipelines and 147 terminals. Our pipelines transport natural gas, gasoline, crude oil, carbon dioxide (CO_2) and more. Our terminals store and handle renewable fuels, petroleum products, chemicals, vegetable oils and other products.[78]

With approximately 70,000 miles of natural gas pipelines, we own an interest in or operate the largest natural gas network in North America. Our pipelines serve major consuming domestic markets and transport approximately 40 percent of the natural gas consumed in the United States. Our pipelines are also connected to every important natural gas resource play and supply area in the United States, including the Eagle Ford, Marcellus, Bakken, Utica, Uinta Permian, Haynesville, Fayetteville and Barnett.[79]

Kinder Morgan is the largest independent transporter of petroleum products in North America, transporting approximately 2.4 million barrels per day. The great majority of these products are transported through our Products Pipelines business, which moves gasoline, jet fuel, diesel, natural gas liquids and condensate through about 9,500 miles of pipelines. We also have approximately 65 liquids terminals in this business segment that store fuels and offer blending services for ethanol and biofuels. Our Products Pipelines assets are strategically located in the West, Southeast and Midwestern United States, as well as Canada, and we have a number of exciting growth opportunities in this segment.[80]

Why was the company included?

Kinder Morgan Inc. owns an interest in or operates approximately 83,000 miles of natural gas pipelines and 147 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 the State Assessed Section is responsible for valuing. The company is the parent company for one of the companies that the State Assessed Section is responsible for valuing.

ONEOK Inc.

Company Summary from Value Line:

ONEOK, Inc. is a leading midstream service provider. It owns premier natural gas liquids systems connecting supply in the Mid-Continent, Permian, and Rocky Mountain regions with key market centers. Has three operating segments: natural gas liquids, natural gas gathering and processing, and natural gas pipelines. Completed separation of natural gas distribution business in February of 2014. Has 2,882 employees.

[78] https://www.kindermorgan.com/, accessed 1/11/2021
[79] https://www.kindermorgan.com/Operations/Natural-Gas/Index, accessed 1/11/2021
[80] https://www.kindermorgan.com/Operations/Products/Index, accessed 1/11/2021

Additional Company Information from Website:
We are a leading midstream service provider and own one of the nation's premier natural gas liquids systems, connecting NGL supply in the Rocky Mountain, Mid-Continent and Permian regions with key market centers and an extensive network of natural gas gathering, processing, storage and transportation assets. We apply our core capabilities of gathering, processing, fractionating, transporting, storing and marketing natural gas and NGLs through vertical integration across the midstream value chain to provide our customers with premium services while generating consistent and sustainable earnings growth. Our primary business strategy is to maintain prudent financial strength and flexibility while growing our profits, fee-based earnings and dividends per share with a focus on safe, reliable, environmentally responsible, legally compliant and sustainable operations for our customers, employees, contractors and the public through the following: Operate in a safe, reliable, environmentally responsible and sustainable manner – environmental, safety and health issues continue to be a primary focus for us, and our emphasis on personal and process safety has produced improvements in the key indicators we track. We also continue to look for ways to reduce our environmental impact by conserving resources and utilizing more efficient technologies. Maintain prudent financial strength and flexibility while growing our fee-based earnings, dividends per share and cash flows from operations in excess of dividends paid – we operate primarily fee-based businesses in each of our three reportable segments. We continue to invest in organic growth projects to expand in our existing operating regions and provide a broad range of services to crude oil and natural gas producers and end-use markets. Manage our balance sheet and maintain investment-grade credit ratings – we seek to maintain investment-grade credit ratings. Attract, select, develop, motivate, challenge and retain a diverse group of employees to support strategy execution – we continue to execute on our recruiting strategy that targets professional and field personnel in our operating areas. We also continue to focus on employee development efforts with our current employees and monitor our benefits and compensation package to remain competitive.[81]

Why was the company included?
ONEOK Inc.'s operations include an integrated network of NGL and natural gas pipelines. This company is similar to the Gas Transmission Pipeline Companies that the State Assessed Section is responsible for valuing. The company is the parent company for one of the companies that the State Assessed Section is responsible for valuing.

Williams Companies Inc.
Company Summary from Value Line:
The Williams Companies, Inc., gathers, processes, and transports natural gas throughout the United States. It also performs gas marketing services. Business segments include Transmission & Gulf of Mexico, Northeast G&P, West, and other. Acquired Access Midstream Partners, 7/14; WPX Energy, 1/12. I.P.O. for Williams Partners L.P., 8/05; Williams Pipeline Partners L.P., 1/08. Reaquired Williams Pipeline Partners L.P. 10/18. Has about 5,425 employees.

Additional Company Information from Website:
Williams handles 30% of the natural gas in the United States that is used every day to heat our homes, cook our food and generate our electricity. Williams works closely with customers to provide the necessary infrastructure to serve growing markets and safely deliver natural gas products to reliably fuel the clean energy economy. With interstate natural gas pipelines and gathering & processing operations throughout the country, we reliably deliver value to our employees, investors, customers and

[81] http://www.oneok.com/about-us/what-we-do, accessed 1/11/2021

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.[82]

Why was the company included?
Williams Companies Inc. handles 30% of the natural gas in the United States. This company is similar to the Gas Transmission Pipeline Companies that the State Assessed Section is responsible for valuing.

Companies Included in the Fluid Transportation Pipeline Market Segment

Holly Energy Partners L.P.
Company Summary from Value Line:
Holly Energy Partners, L.P. is a publicly held master limited partnership (MLP) that owns and operates petroleum product and crude oil pipelines, terminal, tankage & loading, and refineries that support Holly Frontier's (HFC) operations in the midcontinent, southwest, and northwest US and Alon USA's refinery in TX. Has two segments: Pipelines and Terminals, which transports light refined products from HFC's Navajo refinery and Alon USA's TX refinery to customers; and Refinery Processing Unit, which supports HFC's daily refining operations.

Additional Company Information from Website:
Holly Energy Partners, L.P. ("HEP") is a Delaware limited partnership formed in early 2004 by HollyFrontier and is headquartered in Dallas, Texas. HEP provides petroleum product and crude oil transportation, terminalling, storage and throughput services to the petroleum industry, including HollyFrontier Corporation subsidiaries. The Partnership, through its subsidiaries and joint ventures, owns and/or operates petroleum product and crude gathering pipelines, tankage and terminals in Texas, New Mexico, Washington, Idaho, Oklahoma, Utah, Nevada, Wyoming and Kansas as well as refinery processing units in Kansas and Utah. Business Highlights: Our assets are located in attractive high-growth markets; Revenues are mainly fee based revenues with limited commodity risk; A substantial part of our business operates under long-term contracts with minimum volume commitments; Strategic relationship with HollyFrontier; Experienced management team with a proven track record[83]

Why was the company included?
Holly Energy Partners owns and operates petroleum product and crude oil pipelines, terminal, tankage & loading, and refineries. This company is similar to the Fluid Transportation Pipeline Companies that the State Assessed Section is responsible for valuing.

Magellan Midstream Partners L.P.
Company Summary from Value Line:
Magellan Midstream Partners, L.P., engages in the transportation, storage, and distribution of hydrocarbons and related products, largely in the U.S. Gulf coast and upper midwest regions. Segments: Refined products (69% of 2019 Revs., 55% of operating income) has 9,800 miles of pipeline and 53 terminals; Crude oil (24%, 37%) has 2,200 miles of pipeline and storage capacity of 23 million barrels; Marine storage (7%, 8%) has capacity of 31 million barrels. Acq'd. Longhorn Pipeline, 7/09; storage and pipeline assets from BP, 9/10. Employs 1,802.

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[82] https://co.williams.com/our-company/, accessed 1/11/2021

[83] http://www.hollyenergy.com/about-us/corporate-structure/default.aspx, accessed 1/11/2021

Additional Company Information from Website:
Magellan Midstream Partners, L.P. is a publicly traded partnership that primarily transports, stores and distributes refined petroleum products and crude oil based in Tulsa, Okla. Formerly a part of Williams Companies, Magellan began trading as Williams Energy Partners in February 2001. In September 2003, we changed our name to Magellan Midstream Partners and began trading under the stock ticker MMP. In 2004, Magellan purchased significant assets from Shell, including more than 3,000 miles of refined product pipelines as well as terminals and storage capacity. In 2009, we bought the Longhorn Pipeline running from Houston to El Paso. The reversal of this line has played a key part in Magellan's move into the crude oil business. In 2010, Magellan purchased another 100 miles of pipeline and 7.8 million barrels of storage from BP. In 2013, Magellan acquired approximately 800 miles of refined petroleum products pipeline, four terminals and 1.7 million barrels of storage from Plains All American Pipeline. This purchase added assets in Colorado, New Mexico, South Dakota and Wyoming. Today, Magellan has a 9,800-mile refined products pipeline system with 54 connected terminals as well as 25 independent terminals not connected to our pipeline system and two marine storage terminals (one of which is owned through a joint venture). In addition, we own approximately 2,200 miles of crude oil pipelines and storage facilities with an aggregate storage capacity of about 37 million barrels, of which 25 million are used for contract storage. Approximately 1,000 miles of these pipelines, the condensate splitter and 30 million barrels of this storage capacity (including 22 million barrels used for contract storage) are wholly-owned, and the remainder is owned through joint ventures.[84]

Why was the company included?
Magellan Pipeline is an oil pipeline, storage and transportation company. This company is similar to, and is one of, the Fluid Transportation Pipeline Companies that the State Assessed Section is responsible for valuing.

MPLX L.P.
Company Summary from Value Line:
MPLX, LP is a diversified, growth-oriented master limited partnership (MLP) formed in 2012 by Marathon Petroleum Corporation to own, operate, develop and acquire midstream energy infrastructure assets. It is engaged in the gathering, processing, storage, marketing, and transportation of natural gas, crude oil, and other refined petroleum products. MPLX's assets consist of a network of common carrier crude oil and products pipelines located in the Midwest and Gulf Coast regions of the US. Has no direct employees.

Additional Company Information from Website:
MPLX is a diversified, growth-oriented master limited partnership formed in 2012 by MPC to own, operate, develop and acquire midstream energy infrastructure assets. We are engaged in the gathering, processing and transportation of natural gas; the gathering, transportation, fractionation, storage and marketing of NGLs; the transportation, storage and distribution of crude oil and refined petroleum products; as well as refining logistics and fuels distribution services. MPLX provides services in the midstream sector across the hydrocarbon value chain through our Logistics and Storage and Gathering and Processing segments.[85]

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[84] https://www.magellanlp.com/AboutUs/Default.aspx, accessed 1/11/2021
[85] http://www.mplx.com/About_MPLX/, accessed 1/11/2021

MPLX transports, distributes, stores and markets crude oil, refined products and other hydrocarbon-based products throughout the U.S. These assets consist of a network of wholly and jointly-owned common carrier crude oil and refined product pipelines and associated storage assets, refined product terminals, storage caverns, refinery integrated tank farm assets including rail and truck racks, a marine business, export terminals, and wholesale and fuels distribution businesses.[86]

Why was the company included?
This company is similar to the Fluid Transportation Pipeline Companies that the State Assessed Section is responsible for valuing. The company engages in the common transportation of refined petroleum products.

NuStar Energy L.P.
Company Summary from Value Line:
NuStar Energy L.P., is engaged in the transportation of petroleum products and anhydrous ammonia, as well as the terminalling, storage, and marketing of petroleum products. On 12/31/19 assets included 9,960 miles of pipeline and terminal and storage facilities, providing 74 million barrels of storage capacity. Three reportable segments: Pipelines (66% of segment operating income in 2019), Storage (30%), and Fuels Marketing (4%). Valero accounted for 28% of pipeline revenue in 2019. Has 1,441 employees.

Additional Company Information from Website:
Since it went public in 2001, NuStar Energy L.P. has grown from 160 employees to about 1,500 today; from $387 million in assets to $6 billion; and from $100 million in revenues to $2 billion. As a result of its growth, NuStar currently has approximately 10,000 miles of pipeline and 73 terminal and storage facilities that store and distribute crude oil, refined products and specialty liquids. The partnership's combined system has approximately 72 million barrels of storage capacity at its facilities, and NuStar has operations in the United States, Canada and Mexico. Known for its special caring and sharing culture, NuStar has been ranked as one of FORTUNE's "100 Best Companies to Work For" 11 times, recognized with many national safety awards, and lauded for its tremendous commitment to community service. NuStar Energy L.P. is an Equal Opportunity/Affirmative Action Employer including Women, Minorities, Veterans and Individuals with Disabilities.[87]

Why was the company included?
NuStar Energy LP is engaged in the transportation of petroleum products and anhydrous ammonia, as well as the terminal ling, storage, and marketing of petroleum products. This company is similar to, and is one of, the Fluid Transportation Pipeline Companies that the State Assessed Section is responsible for valuing.

Phillips 66 Partners L.P.
Company Summary from Value Line:
Phillips 66 Partners LP is engaged in the ownership, operation, development, and acquisition of crude oil, refined petroleum, and natural gas liquids pipelines and terminals. As of 12/31/18, it had interests in more than 5,173 miles of pipelines with a gross capacity of approximately 3,045 million barrels per day

[86] https://www.mplx.com/About_MPLX/Logistics_and_Storage/, accessed 1/11/2021
[87] http://www.nustarenergy.com/Company, accessed 1/11/2020

(MBD). It also owns more than 25 terminals and other storage assets. Phillips 66 Partners LP is managed by the executives of its general partners, Phillips 66 Partners GP LLC.

Additional Company Information from Website:
Phillips 66 Partners (NYSE: PSXP) began trading on the New York Stock Exchange on July 23, 2013. Headquartered in Houston, Texas, Phillips 66 Partners is a growth-oriented, traditional master limited partnership formed by Phillips 66 to own, operate, develop and acquire primarily fee-based crude oil, refined petroleum product and natural gas liquids ("NGL") pipelines and terminals and other transportation and midstream assets. [88]

Why was the company included?
Phillips 66 Partners is engaged in the ownership, operation, development, and acquisition of crude oil, refined petroleum, and natural gas liquids pipelines and terminals. This company is similar to the Fluid Transportation Pipeline Companies that the State Assessed Section is responsible for valuing.

Plains All American Pipeline L.P.
Company Summary from Value Line:
Plains All American Pipeline, L.P., is a publicly traded master limited partnership which operates through various subsidiaries. It engages in the transportation, storage, terminating, and marketing of crude oil, refined products, and liquefied petroleum gas. As of December 31, 2019, the company owned or leased 18,535 miles of active pipelines and gathering systems. Storage capacity 35 million barrels of natural gas liquids (NGL) storage facilities; About 79 millions barrels of crude oil and refined product. Also owns 825 trailers (primarily in Canada); 50 transport storage barges and 20 tugs. Has 5,000 employees.

Additional Company Information from Website:
Plains is a publicly-traded master limited partnership that owns and operates midstream energy infrastructure and provides logistics services for crude oil, natural gas liquids (NGL) and natural gas. We own an extensive network of pipeline transportation, terminalling, storage and gathering assets in key crude oil and NGL producing basins and transportation corridors and at major market hubs in the United States and Canada. On average, PAA handles more than 6 million barrels per day of crude oil and NGL in its Transportation segment. The company is headquartered in Houston, Texas.[89]

Why was the company included?
Plains All American Pipeline LP owns an extensive network of pipeline transportation, terminalling, storage, and gathering assets. This company is similar to the Fluid Transportation Pipeline Companies that the State Assessed Section is responsible for valuing.

Companies Not Included in the Gas Transmission Pipeline or Fluid Transportation Pipeline Market Segments

[88] https://www.phillips66partners.com/, accessed 1/11/2020
[89] https://www.plainsallamerican.com, accessed 1/11/2021

Antero Midstream Corporation

Company Summary from Value Line:

Antero Midstream Corporation was created in March of 2019 when majority owner Antero Resources merged Antero Midstream Partners with AMGP, which was the General Partner and holder of the MLP's incentive distribution rights. The new entity owns and operates an integrated system of natural gas gathering pipelines, compression stations, processing and fractionation plants in the Marcellus and Utica Shales. Also owns water handling and treatment infrastructure that delivers fresh water and wastewater handling services for well completion operations.

Additional Company Information from Website:

Antero Midstream Corporation owns and operates midstream energy assets servicing rich gas production in two of the lowest cost natural gas and natural gas liquids (NGL) basins in North America: the Marcellus Shale and Utica Shale.
MMcf/d of low pressure gathering: 3,051 in 3Q 2020
Bbl/d fresh water delivery: 111,000 in 3Q 2020
Gathering and Processing: Over 300 miles of gathering pipeline and 1.0 Bcf/d processing capacity
Water Handling And Treatment: Over 275 miles of fresh water pipeline and 60,000 Bbl/d wastewater treatment capacity.[90]

Why was the company not included?

Created in March 2019. Will consider after established financials.

Antero Resources Corporation

Company Summary from Value Line:

Antero Resources Corporation is an energy company engaged in the exploration and development of natural gas, NGLs, and oil properties in the Appalachian Basin. Holds 541,447 acres in parts of West Virginia, Ohio, and Pennsylvania. 2019 proved reserves: 18,893 bcfe consisting of 11,500 bcfe of natural gas, 1,192 mmbbl NGLs, and 42 mmbbl oil. Net daily production averaged 3,185 mmcfe per day in 2019. Employees: 545. Depreciation rate: 6.9%.

Additional Company Information from Website:

Antero Resources Corporation is an independent oil and natural gas company engaged in the exploration, development, and production of natural gas, NGLs, and oil properties located in the Appalachian Basin. Headquartered in Denver, Colorado, we are focused on creating value through the development of our large portfolio of repeatable, low cost, liquids-rich drilling opportunities in two of the premier North American shale plays, the Marcellus and the Utica shales. Due to its market leading firm transportation portfolio and midstream ownership through Antero Midstream, Antero is the most integrated NGL and natural gas business in the U.S.[91]

Why was the company not included?

This company is involved in exploration and development, which is not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

[90] https://www.anteromidstream.com/, accessed 2/2/2021
[91] https://www.anteroresources.com/about-us, accessed 2/2/2021

Blueknight Energy Partners L.P.

Company Summary from Value Line:

In August 2019, Blueknight Energy Partners, LP received a buyout offer from Ergon, Inc. The proposal calls for Ergon to acquire all the common units of Blueknight for $1.35 per share in cash. The proposal is subject to approval by Blueknight unitholders. We have suspended the company's ranks as a result of this development. Blueknight provides integrated terminalling, gathering, and transportation services for companies engaged in the production of liquid asphalt and crude oil. The company has four operating segments: asphalt terminalling services, crude oil terminalling services, crude oil pipeline services; and crude oil trucking services. Its portfolio of assets consist of: 8.8 million barrels of liquid asphalt storage located at 53 terminals; 6.9 million barrels of above-ground crude oil storage capacity, approximately 6.6 million barrels of which are located at the Cushing Interchange terminalling facility in Cushing, Oklahoma; 655 miles of crude oil pipeline and 65 crude oil transportation vehicles deployed. Has 270 employees.

Additional Company Information from Website:

Blueknight Energy Partners, L.P. is a publicly traded master limited partnership formed in July 2007. Blueknight owns and operates a diversified portfolio of complementary midstream energy assets. The depth of our experience in the midstream energy business is second to none. Our strategically located assets allow us to be a leading provider of midstream services in the energy industry. We provide services to our customers by focusing on two operational areas: Product terminalling (Liquid asphalt and Crude oil) and Crude oil logistics (Pipeline transportation and Trucking). Our general partner, Blueknight Energy Partners G.P., L.L.C., is owned by affiliates of Ergon, Inc. based in Jackson, MS. Ergon is a privately held company formed in 1954 with over 2,500 employees globally. Ergon and its subsidiaries are engaged in a wide range of operations. Ergon is an exceptional company with a solid track record and a like-minded disciplined approach to management. We know the importance of optimizing commercial opportunities for our customers, starting with the consistent delivery of safe and reliable solutions. Our customers include independent oil and gas producers, petroleum product wholesalers and distributors, refiners and energy traders.[92]

Why was the company not included?

This company focuses on two operational areas: 1. Product Terminalling (which includes liquid asphalt and crude oil) and 2. Crude Oil Logistics (which includes pipeline transportation and trucking). These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

BP Midstream Partners L.P.

Company Summary from Value Line:

BP Midstream Partners, LP is a fee-based, growth-oriented master limited partnership recently formed by BP Pipelines, an indirect wholly owned subsidiary of BP, to own, operate, develop and acquire pipelines and other midstream assets. The company's assets consist of interests in entities that own crude oil, natural gas, refined products and diluent pipelines serving as key infrastructure for BP and other customers to transport onshore crude oil production to BP's Whiting Refinery and offshore crude oil and natural gas production to key refining markets and trading and distribution hubs. BP Midstream owns one onshore crude oil pipeline system, one onshore refined products pipeline system, one onshore diluent pipeline system, interests in four

[92] http://www.bkep.com/about, accessed 2/2/2021

offshore crude oil pipeline systems and an interest in one offshore natural gas pipeline system. Its onshore crude oil pipeline, BP2, indirectly links Canadian crude oil production with BP's Whiting Refinery.

Additional Company Information from Website:
We are a fee-based, growth-oriented master limited partnership formed by BP Pipelines (which is an indirect wholly owned subsidiary of BP), to own, operate, develop and acquire pipelines and other midstream assets. Our assets consist of interests in entities that own crude oil, natural gas, refined products and diluent pipelines, and refined products terminals, serving as key infrastructure for BP and its affiliates and other customers to transport onshore and offshore production to key refining markets and trading and distribution hubs.[93]

Why was the company not included?
This company's initial public offering was 10/16/2017.[94] Consider this company in the future after it has at least three to five years of financial data available (only 2017, 2018, and 2019 are available. 2017 is only a partial year). Consider the location of the assets and the type of assets before including as a guideline company.

Brigham Minerals
Company Summary from Value Line:
Brigham Minerals owns and operates a portfolio of mineral and royalty interests in the United States. The company's primary geographical operations are in the Permian Basin in West Texas and New Mexico, the Anadarko Basin of Oklahoma, the Denver-Julesburg Basin in Colorado, and the Williston Basin in North Dakota. As of December 31, 2019, Brigham had mineral and royalty interests in approximately 82,200 net mineral acres and owned 4,908 horizontal wells (4,424 oil/484 natural gas). Has about 41 employees.

Additional Company Information from Website:
Based in Austin, TX and founded in 2012 by Bud Brigham, Brigham Minerals is focused on acquiring oil and gas mineral rights across the U.S. As of 2019, Brigham Minerals is traded on the New York Stock Exchange as MNRL. The Brigham name has always enjoyed an exceptional reputation in the oil industry and is known for standing with landowners. We pride ourselves on our honest dealings and extensive industry experience, which allows us to pay top dollar for a person's minerals. Sellers then realize the true value of their assets, helping them maximize returns.[95]

Why was the company not included?
Brigham Minerals is focused on acquiring oil and gas mineral rights. This business segment is not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Cabot Oil and Gas Corp
Company Summary from Value Line:
Cabot Oil & Gas develops, exploits, and explores oil & gas properties, primarily in Appalachia, east and south Texas, and Oklahoma. In 2019, produced 865.3 Bcfe of natural gas, 19% more than 2018. The

[93] https://www.bp.com/en/global/bp-midstream-partners.html, accessed 1/11/2021
[94] https://www.bp.com/en_us/bp-us/media-room/press-releases/bp-midstream-partners-lp-launches-initial-public-offering.html, accessed 10/17/2017
[95] https://www.brighamminerals.net/, accessed 2/3/2021

company had yearend 2019 proved reserves of approximately 12.9 Tcfe (in ’18: 11.6 Tcfe, 11% increase). Had 274 employees at 12/31/19.

Additional Company Information from Website:
Cabot Oil & Gas Corporation is an independent oil and gas company engaged in the exploration, development, and production of natural gas properties exclusively onshore in the United States. As of December 31, 2019, the Company had approximately 12.9 Tcfe of total proved reserves. Cabot’s 2019 net production was 100% natural gas from the Marcellus Shale in northeastern Pennsylvania. The Company’s success in developing abundant unconventional supplies of natural gas helps to support the goal of reducing total greenhouse gas emissions while achieving energy independence in the United States. Cabot strives to enhance shareholder value through the commodity price cycles by maintaining a disciplined approach to returns-focused capital allocation.[96]

Why was the company not included?
Company’s development, exploitation, and exploration of oil and gas properties is not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

California Resources Corp
Company Summary from Value Line:
Value Line not available.

Additional Company Information from Website:
California Resources Corporation (NYSE: CRC) is an oil and natural gas exploration and production company committed to environmentally sustainable and responsible development of properties exclusively in the State of California. CRC explores for, produces, gathers, processes and markets crude oil, natural gas and natural gas liquids. CRC has a large portfolio of lower-risk conventional opportunities in each of California’s four major oil and gas basins: San Joaquin, Los Angeles, Ventura and Sacramento. CRC is California’s largest oil and natural gas producer with the state’s most diverse operations. The company’s highly-qualified workforce typically comprises more than 2,500 employees and contractors who specialize in applying advanced technology to operate the state’s critical energy infrastructure in a safe, efficient and environmentally responsible manner under California’s leading standards.[97]

Why was the company not included?
Company’s exploration and production of crude oil, natural gas, and natural gas liquids properties in California is not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Callon Petroleum Co.
Company Summary from Value Line:
Callon Petroleum Company is an independent oil and natural gas company focused on the acquisition, exploration and development of high-quality assets in the leading oil plays of South and West Texas. The company’s activities are primarily focused on horizontal development in the Midland and Delaware Basins, both of which are part of the larger Permian Basin in West Texas. As of December 31, 2019,

[96] http://www.cabotog.com/about-cabot/, accessed 2/2/2021
[97] https://crc.com/about-crc, accessed 2/21/2021

Callon owned 173,922 gross (116,784 net) acres in the Permian Basin, all of which was located in the Midland and Delaware Basins. Average net production from its Permian Basin properties increased approximately 22% to 40,287 Boe/d in 2019 from 32,926 Boe/d in 2018. In October 2020, Callon announced $170 million in asset monetizations and $300 million issuance of secured second lien notes. Cash proceeds enhance liquidity and advance deleveraging initiatives. In November 2020, the company announced an upsized debt exchange. Has 475 employees.

Additional Company Information from Website:
Callon Petroleum is an independent oil and natural gas company focused on the acquisition, exploration and development of high-quality assets in the leading oil plays of West and South Texas.[98] We entered the Permian Basin in 2009 with the acquisition of approximately 8,800 net acres for $16 million. Through continued execution of our acquisition, delineation, and rationalization strategies, we focused our footprint on approximately 75,000 net acres in the Midland and Delaware Basins. In 2019, we completed our merger with Carrizo Oil & Gas and expanded our core footprint to approximately 200,000 net acres in the Permian Basin and Eagle Ford Shale. Our size allows us to efficiently pivot our business and capitalize on new opportunities. As a company operating the vast majority of our acreage, we have the flexibility to modify development plans to appropriately address continuously-changing industry conditions and commodity price cycles. We have also proven our ability to move quickly to capitalize on opportunities to acquire new acreage and integrate into our operations, positioning us for additional consolidation of assets in the future.[99]

Why was the company not included?
Company's development of unconventional onshore oil and natural gas reserves is not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Centennial Resource Development Inc.
Company Summary from Value Line:
We do not have access to the Value Line Tear Sheet.

Additional Company Information from Website:
Centennial Resource Development is an independent oil producer with assets in the core of the Delaware Basin, a sub-basin of the Permian Basin in West Texas. With approximately 80,100 net acres and 2,400 drilling locations, we are pursuing a growth strategy grounded in technical leadership, strong well results, attractive investment returns and a conservative balance sheet. Centennial is headquartered in Denver, Colorado.[100]

Why was the company not included?
Company's development of unconventional oil and gas reserves is not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

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[98] https://www.callon.com/about-callon, accessed 2/2/2021
[99] https://www.callon.com/operations, accessed 2/2/2021
[100] http://www.cdevinc.com/, accessed 2/2/2021

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 642 employees.

Additional Company Information from Website:

Cheniere Energy, Inc. (NYSE American: LNG) (Cheniere), is a Houston-based energy company primarily engaged in LNG-related businesses. We own and operate the Sabine Pass LNG receiving terminal and Creole Trail Pipeline located in Louisiana, through our general partner ownership interest in and management agreements with Cheniere Energy Partners, L.P. (NYSE American: CQP) (Cheniere Partners). Cheniere Partners is developing, constructing and operating a liquefaction project at the Sabine Pass LNG terminal (the "SPL Project") adjacent to the existing regasification facilities for up to six trains, with expected aggregate nominal production capacity, which is prior to adjusting for planned maintenance, production reliability and potential overdesign, of approximately 27.0 mtpa of LNG. Train 1 commenced operations in May 2016, Train 2 commenced operations in September 2016, Train 3 commenced operations in March 2017 and Train 4 in October of 2017, and Train 5 in February 2019. All regulatory approvals have been received to construct and operate Train 6, and FID was reached in June 2019. Cheniere is operating and constructing additional liquefaction facilities near Corpus Christi, Texas (the "Corpus Christi LNG terminal"). The first two stages of Corpus Christi LNG terminal is being designed for three trains, with expected aggregate nominal production capacity, which is prior to adjusting for planned maintenance, production reliability and potential overdesign, of approximately 13.5 mtpa of LNG, three LNG storage tanks with capacity of approximately 13.5 Bcfe and two marine berths. Construction began on the first two trains in May 2016, with Train 1 coming online in Feburary of 2019. Train 2 produced first LNG in June 2019 and is expected to be substantially complete ahead of schedule. Cheniere reached FID on Train 3 in 2018, and construction is progressing. Cheniere has additionally filed its Stage 3 application for 7 midscale trains totaling 9.5 mtpa of additional capacity. Cheniere is also engaged in the LNG and natural gas marketing business. Through its subsidiary, Cheniere Marketing, LLC (together with its subsidiaries, “Cheniere Marketing”), it is developing a portfolio of long-, medium- and short-term SPAs offering LNG on an FOB or DAT basis. Cheniere Marketing has purchased LNG from the SPL Project and other locations worldwide and transported and unloaded commercial LNG cargoes. Cheniere Marketing is expected to have access to excess LNG from the SPL Project and the Corpus Christi LNG terminal not sold under long-term sale and purchase agreements to third parties. Cheniere continues to evaluate the energy markets for additional development and/or marketing opportunities that would leverage the existing platform and strategically fit within the Cheniere organization.[101]

Why was the company not included?

This company is mainly located in the Gulf Coast. The Gulf Coast is a different market than the market of the companies for which the State Assessed Section is responsible for valuing.

[101] https://lngir.cheniere.com/company-information, accessed 2/2/2021

Cheniere Energy Partners L.P.

Company Summary from Value Line:

Cheniere Energy Partners, L.P., through its subsidiary, Sabine Pass Liquefaction, LLC (SPL), is developing, constructing, and operating natural gas liquefaction (NGL) facilities at the Sabine Pass LNG terminal located in Cameron Parish, Louisiana. The company also owns a 94-mile pipeline that connects the Sabine Pass LNG terminal with a number of large interstate pipelines via its subsidiary, Cheniere Creole Trail Pipeline, L.P. (CTPL). Finally, through the Sabine Pass LNG, L.P. (SPLNG) subsidiary, Cheniere owns and operates regasification facilities at the Sabine Pass LNG terminal.

Additional Company Information from Website:

Cheniere Energy Partners, L.P. (NYSE American: CQP) (Cheniere Partners) is a Delaware limited partnership formed by Cheniere Energy, Inc. Through wholly owned subsidiaries, it owns and operates the Sabine Pass LNG receiving terminal and the Creole Trail Pipeline located in western Cameron Parish, Louisiana on the Sabine-Neches Waterway. Its primary business objectives are to generate stable cash flows sufficient to pay the initial quarterly distribution to unitholders and, over time, to increase quarterly cash distributions. Cheniere Partners is developing, constructing and operating a liquefaction project at the Sabine Pass LNG terminal (the "SPL Project") adjacent to the existing regasification facilities for up to six trains, with expected aggregate nominal production capacity, which is prior to adjusting for planned maintenance, production reliability and potential overdesign, of approximately 27.0 mtpa of LNG. Train 1 commenced operations in May 2016, Train 2 commenced operations in September 2016, Train 3 commenced operations in March 2017 and Train 4 in October of 2017, and Train 5 in February 2019. All regulatory approvals have been received to construct and operate Train 6, and FID was reached in June 2019.[102]

Why was the company not included?

This company is mainly located in the Gulf Coast. The Gulf Coast is a different market than the market of the companies for which the State Assessed Section is responsible for valuing.

Chesapeake Energy Corp

Company Summary from Value Line:

We do not have access to the Value Line Tear Sheet.

Additional Company Information from Website:

Chesapeake's portfolio includes high-quality unconventional oil and natural gas assets in top U.S. onshore plays. Our value-driven strategy focuses on continuously generating capital efficiencies and operating with low, industry-leading production and G&A costs, along with a disciplined approach to liquidity. The safety of our employees, contractors, the public and the environment is our number one priority and reflects our commitment to conducting our business responsibly and living our core values. With innovative employees and advanced technical resources, we are creating a differential investment for our shareholders.[103]

A judge authorized Chesapeake Energy Corp. to exit bankruptcy and cut $7 billion in debt through a financial restructuring that transfers control of the company to investment firms that own the oil-and-gas producer's high-ranking debt. Judge David Jones of the U.S. Bankruptcy Court in Houston said

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[102] https://cqpir.cheniere.com/company-information, accessed 2/2/2021

[103] http://www.chk.com/about, accessed 2/2/2021

Wednesday he would confirm the fracking pioneer's chapter 11 plan, ruling against a more junior creditor group that argued during a nearly monthlong trial that they would be shortchanged in the restructuring.[104]

Why was the company not included?
Company is an independent exploration company engaged in the acquisition and development of properties for the production of oil, natural gas, and natural gas liquids. These exploration and production business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Cimarex Energy Co
Company Summary from Value Line:
Cimarex Energy Co. is an independent oil & gas exploration and production company. Its operations are mainly located in the Mid-Continent (Oklahoma, the Texas Panhandle, and Kansas), and the Permian Basin. 2019 production total 81,010 barrels of oil equivalent (MBOE), including 205.8 mmcfe gas and 46.6 thousand barrels of liquids. Proved oil and gas reserves totaled 591,195 barrels of oil equivalent. Acquired Resolute Energy, 3/19. 2019 depreciation rate: 4.0%. Has about 987 employees.

Additional Company Information from Website:
Cimarex is an exploration and production company with operations in Oklahoma, Texas and New Mexico. The majority of our activity is currently in the Permian Basin and the Anadarko Basin in Western Oklahoma. We pride ourselves on a strong technical team. The cornerstone to the Cimarex approach is detailed pre- and post-drill economic evaluation of after-tax rate of return on invested capital for every well drilled. We continually strive to maximize cash flow from producing properties for reinvestment in drill-bit driven growth opportunities.[105]

Why was the company not included?
Company is an exploration and production company. These exploration and production business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Clean Energy Fuels Corp
Company Summary from Value Line:
Clean Energy Fuels Corp. provides natural gas as an alternative fuel for vehicle fleets in the United States and Canada. It designs, builds, finances, and operates fueling stations and supplies compressed natural gas and liquefied natural gas. It serves over 1,000 fleet customers operating over 48,000 natural gas vehicles in various markets, including public transit, refuse hauling, airports, taxis, and trucking. It owns, operates, and supplies about 550 natural gas fueling stations. The company also constructs fueling stations and sells or leases the stations to customers. Has about 710 employees.

Additional Company Information from Website:
Clean Energy is changing the way the world fuels its vehicles. Reducing pollution from the transportation industry is an important goal for our nation, and we at Clean Energy know just how

[104] https://www.wsj.com/articles/fracking-pioneer-chesapeake-energy-cleared-to-exit-bankruptcy-11610588562, accessed 2/2/2021
[105] https://www.cimarex.com/about-cimarex/about-cimarex-overview/default.aspx, accessed 2/2/2021

realistic and attainable that goal is with natural gas fuel. Moving forward in our thinking as well as in our vehicles means a safer, healthier planet for all of us. This change is happening. Natural gas is abundant and economically viable and is increasingly being adopted as transportation fuel by countries around the world.[106]

Why was the company not included?
This company provides natural gas an alternative fuel for vehicle fleets. This business segment is not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

CNX Midstream Partners L.P.
Company Summary from Value Line:
No Value Line.

Additional Company Information from Website:
On September 28, 2020, CNX Resources Corporation (CNX) completed the acquisition of all the outstanding common units representing limited partner interests in CNX Midstream Partners LP (CNXM) that it did not already own, and announced that CNXM is no longer a publicly traded company.[107]

Why was the company not included?
No longer publicly traded.

CNX Resources Corp
Company Summary from Value Line:
CNX Resources Corp. is one of the largest independent natural gas exploration, development and production companies, with operations centered in the major shale formations of the Appalachian basin. It produced 507.1 bcfe of natural gas in 2018. Proved natural gas reserves: 7.9 trillion cubic feet at 12/31/18. Bought Dominion Resources' Appalachian gas operations, 4/10. Spun off CONSOL Energy 11/17. Has 564 employees.

Additional Company Information from Website:
CNX is a leader in the natural gas industry and one of the largest independent natural gas exploration, development and production companies in the Appalachian Basin. We have access to 8.43 trillion cubic feet equivalents of proved clean-burning natural gas reserves. With a leading acreage footprint in both the Marcellus and Utica shales, CNX is at the forefront of providing the energy to power America for generations to come.

Gas Reserves	Estimated Net Proved Reserves (MMcfe)	Net Producing Wells (including oil and gob wells)	Total Net Acres [1]
Marcellus	6,401,288	397	563,689

[106] https://www.cleanenergyfuels.com/about-us/, accessed 2/2/2021
[107] https://www.cnxmidstream.com/investor-information, accessed 2/2/2021

Gas Reserves	Estimated Net Proved Reserves (MMcfe)	Net Producing Wells (including oil and gob wells)	Total Net Acres [1]
Utica	910,667	55	259,000
CBM	1,103,724	3,943	2,430,743
Other	9,988	115	981,717
Total	**8,425,667**	**4,510**	**4,235,149**

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On September 28, 2020, CNX Resources Corporation (CNX) completed the acquisition of all the outstanding common units representing limited partner interests in CNX Midstream Partners LP (CNXM) that it did not already own, and announced that CNXM is no longer a publicly traded company.[109]

Why was the company not included?
Company is an exploration, development, and production company. These exploration and production business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Concho Resources Inc.
Company Summary from Value Line:
Concho Resources, Inc. engages in the acquisition, development, exploitation, and exploration of oil and natural gas properties. The company's principal operating areas are focused in the Permian Basin of southeast New Mexico and west Texas. As of 12/31/19, estimated proved reserves were 1,002 mmboe (apr. 69% oil and 31% natural gas). Has 1,453 employees.

Additional Company Information from Website:
ConocoPhillips (NYSE: COP) announced January 15, 2021 that it has completed its acquisition of Concho Resources ("Concho") (NYSE: CXO) following approval by shareholders of both companies. In accordance with the terms of the merger agreement, each share of Concho common stock was converted into the right to receive 1.46 shares of ConocoPhillips common stock at the effective time of the merger.[110]

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[108] https://www.cnx.com/operations, accessed 2/2/2021
[109] https://www.cnxmidstream.com/investor-information, accessed 2/2/2021
[110] https://www.conocophillips.com/news-media/story/conocophillips-completes-acquisition-of-concho-resources/, accessed 2/2/2021

Why was the company not included?
Company engages exploration and production of oil and natural gas properties. These exploration and production business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing. No longer publicly traded.

CONSOL Energy
Company Summary from Value Line:
Not available.

Additional Company Information from Website:
Coal powers our daily life, and we are committed to providing that resource to communities across the nation. We strive to do our jobs safely, compliantly and in a way that positively impacts the communities in which we live and work. The CONSOL Energy that we know today holds some of the best coal assets in the world. We own and operate the Pennsylvania Mining Complex, the Baltimore Marine Terminal, and control over 1 billion tons of undeveloped reserves.[111]

Why was the company not included?
Company is a producer and exporter of coal. This is not a similar market segment to the main business segments of the companies the State Assessed Section is responsible for valuing.

Crestwood Equity Partners L.P.
Company Summary from Value Line:
Crestwood Equity Partners, LP is engaged in development, acquisition, ownership or control, and operation of primarily fee-based assets and operations within the energy midstream sector. Its portfolio of assets are located in the Marcellus Shale, Bakken Shale, Delaware Permian Basin, PRB Niobrara Shale, Barnett Shale, and Fayetteville Shale. Crestwood offers infrastructure solutions across the value chain to service premier liquids-rich natural gas and crude oil shale plays across the US. Operating assets, including those of its joint ventures, primarily include: natural gas facilities with approximately 3.3 Bcf/d of gathering capacity; NGL facilities with approximately 2.6 MMBbls of storage capacity; and crude oil facilities with approximately 150,000 Bbls/d of gathering capacity. The partnership is a holding company and all of its consolidated operating assets are owned through its subsidiary, Crestwood Midstream. Has 894 employees.

Additional Company Information from Website:
Crestwood Equity Partners LP (NYSE: CEQP) is a publicly traded master limited partnership that owns and operates midstream assets located primarily in the Bakken Shale, Delaware Basin, Powder River Basin, Marcellus Shale and Barnett Shale. Our operations and financial results are divided into three segments that include Gathering & Processing, Storage & Transportation and Marketing, Supply & Logistics. Across our three segments Crestwood is engaged in the gathering, processing, treating, compression, storage and transportation of natural gas; storage, transportation, terminalling and marketing of NGLs; gathering, storage, transportation, terminalling and marketing of crude oil; and gathering and disposal of produced water. Our goal is to create long-term value for our unitholders by delivering increasing distributable cash flow through organic expansion, development projects and acquisitions, while at the same time ensuring the ongoing stability of our business. We aim to provide

[111] http://www.consolenergy.com/operations, accessed 2/2/2021

the highest quality of customer service while maintaining focus on safety, diversity & inclusion, environmental stewardship and building long-term community partnerships in the areas we operate.[112]

Why was the company not included?
This company is involved in three business segments: gathering and processing; storage and transportation; and marketing, supply, and logistics. The company's transportation services are small lines in key areas. The business segment is not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

CrossAmerica Partners L.P.
Company Summary from Value Line:
CrossAmerica Partners, LP is a wholesale distributor of motor fuels and owner and lessee of real estate used in the retail distribution of motor fuels. Its general partner, CrossAmerica GP LLC, is a subsidiary of CST Brands, Inc., one of the largest independent retailers of motor fuels and convenience merchandise in North America. The company's wholesale segment includes the wholesale distribution of motor fuel to lessee dealers, independent dealers, commission agents, DMS, CST and company operated retail sites. The Retail segment includes the sale of convenience merchandise items, the retail sale of motor fuel at company operated retail sites and the retail sale of motor fuel at retail sites operated by commission agents. With a geographic footprint covering 34 states, the partnership has well-established relationships with several major oil brands, including ExxonMobil, BP, Shell, Chevron, Sunoco, Valero, Gulf, Citgo, Marathon and Phillips 66.

Additional Company Information from Website:
Formed in 2012, CrossAmerica Partners LP, is a publicly traded master limited partnership that is a leading wholesale distributor of motor fuels, convenience store operator and owner and lessee of real estate used in the retail distribution of motor fuels. CrossAmerica Partners distributes branded and unbranded petroleum for motor vehicles in the United States to approximatley 1,800 locations and owns or leases approximately 1,100 sites. Units of CrossAmerica Partners are traded on the New York Stock Exchange under the symbol "CAPL." The Partnership has well-established relationships with several major oil brands, including ExxonMobil, BP, Shell, Chevron, Sunoco, Valero, Gulf, Citgo, Marathon and Phillips 66. CrossAmerica Partners ranks as one of ExxonMobil's largest distributors by fuel volume in the United States and in the top 10 for additional brands. Our geographic footprint covers 34 states: Alabama, Arkansas, Colorado, Delaware, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia and Wisconsin. The 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. CrossAmerica Partners is headquartered in Allentown, Pennsylvania. Its downtown location plays an integral part in the revitalization of the Lehigh Valley region's largest city.[113]

[112] http://www.crestwoodlp.com/about-us/, accessed 2/2/2021

[113] https://www.crossamericapartners.com/about-us/who-we-are/page.aspx?id=1002, accessed 2/2/2021

Why was the company not included?
This company is a wholesale distributor of motor fuels. Also, 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 the State Assessed Section is responsible for valuing.

DCP Midstream L.P.
Company Summary from Value Line:
DCP Midstream, LP (formerly DCP Midstream Partners, LP) was formed through a January, 2017 merger with DCP Midstream, LLC. It owns, operates, and develops a diversified portfolio of domestic midstream energy assets, including more than 60 plants and 64,000 miles of natural gas and natural gas liquids (NGLs) pipelines. It is the nation's largest NGL producer and natural gas processor. Has two primary segments: Gathering & Processing and Logistics & Marketing.

Additional Company Information from Website:
DCP Midstream, LP (NYSE: DCP) is a midstream master limited partnership, with a diversified portfolio of assets, engaged in the business of gathering, compressing, treating, processing, transporting, storing and selling natural gas; producing, fractionating, transporting, storing and selling NGLs and recovering and selling condensate. DCP owns and operates more than 60 plants and 64,000 miles of natural gas and natural gas liquids pipelines, with operations in 9 states across major producing regions and leads the midstream segment as the largest natural gas liquids producer, the largest natural gas processor and one of the largest marketers in the U.S. Denver, Colorado based DCP is managed by its general partner, DCP Midstream GP, LP, which is managed by its general partner, DCP Midstream GP, LLC, which is 100% owned by DCP Midstream, LLC. DCP Midstream, LLC is a joint venture between Phillips 66 and Enbridge.[114]

Why was the company not included?
This company's main business segments are gathering, processing and logistics, and marketing. Natural gas liquids pipelines appear to be a smaller portion of business. NGL pipelines are in the Gulf Coast, Colorado, Kansas, Texas, Oklahoma, and New Mexico. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Delek Logistics Partners L.P.
Company Summary from Value Line:
Delek Logistics Partners, LP owns and operates logistics and marketing assets for crude oil, and intermediate and refined products in the United States. The company consists of assets, including pipelines and trucks and ancillary assets that provide crude oil gathering and crude oil, intermediate and finished products transportation, and storage services primarily in support of the Tyler and El Dorado refineries, as well as offers crude oil and other products transportation services to third parties. Its pipelines and transportation segment consists of approximately 400 miles of crude oil pipelines, 16 miles of refined product pipelines, an approximately 600-mile crude oil gathering system, and associated crude oil storage tanks with an aggregate of approximately 1.4 million barrels of active shell capacity. In addition to these operating systems, Delek owns or leases 125 tractors and 166 trailers used to haul primarily crude oil and other products for related and third parties.

[114] http://ir.dcpmidstream.com/investor-overview, accessed 2/2/2021

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 Texas for Delek and third parties, primarily in support of Delek’s refineries in Tyler, Texas and El Dorado, Arkansas.[115]

Why was the company not included?
This company is mainly located in the Texas, Louisiana, Arkansas, and Tennessee area. This operating area is a different market than the market of the companies for which the State Assessed Section is responsible for valuing.

Devon Energy Corp.
Company Summary from Value Line:
Devon Energy Corp. is a North American oil, NGL, and gas exploration and production company. It has properties in the Delaware Basin, Eagle Ford, Powder River Basin, and the STACK in the Anadarko Basin. Sold operations in Canada, 6/19. 2019 production: 119 MMboe, including 219 Bcf gas and 83 Mbbls liquids. Proved reserves at 12/31/19: 757 mill. Bbls. of oil equiv., including 487 MMbls liquids and 1,621 bcf natural gas. Has about 1,800 emplys.

Additional Company Information from Website:
Devon Energy Corporation is a leading independent oil and natural gas exploration and production company. Devon's operations are focused onshore in the United States. The company's portfolio of oil and gas properties provides stable, environmentally responsible production and a platform for future growth. Pro forma for the Devon and WPX merger, the company’s 2019 daily production was approximately 287,000 barrels of oil, more than 110,000 barrels of natural gas liquids and about 850 million cubic feet of natural gas.[116]

Devon Energy Corp. (NYSE: DVN) today announced it has entered into a definitive agreement to sell its assets in the Barnett Shale to Banpu Kalnin Ventures (BKV) for $770 million. This transaction is subject to customary terms and conditions and is expected to close in the second quarter of 2020. Devon expects no incremental cash taxes associated with the divestiture of these assets.[117]

Devon Energy Corporation (“Devon”) (NYSE: DVN) and WPX Energy, Inc. (“WPX”) (NYSE: WPX) announced January 7, 2021, the successful completion of their previously announced all-stock merger of equals, creating a leading energy producer in the U.S., with an asset base underpinned by a premium acreage position in the economic core of the Delaware Basin. The combined company will operate under the name Devon Energy and be headquartered in Oklahoma City.[118]

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[115] http://www.deleklogistics.com/investor-relations, accessed 2/2/2021
[116] https://www.devonenergy.com/about-us, accessed 2/2/2021
[117] https://www.devonenergy.com/news/2019/Devon-Energy-Announces-Sale-of-Barnett-Shale-for-770-Million-Announces-New-1-Billion-Share-Repurchase-Program, accessed 1/7/2020
[118] https://www.wpxenergy.com/about/our-expertise, accessed 2/3/2021

Why was the company not included?
Company is a gas exploration and production company. These exploration and production business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Enable Midstream Partners L.P.
Company Summary from Value Line:
Enable Midstream Partners, LP owns natural gas and crude oil infrastructure assets. It has two segments: Gathering & Processing and Transportation & Storage. Enable's assets include 14,000 miles of gathering pipelines, 15 major processing plants with 2.6 billion cubic feet per day of capacity, 7,800 miles of interstate pipelines, 2,300 miles of intrastate pipelines, and eight storage facilities. 2019 depr. rate: 2.9%. Has approximately 1,600 employees. CenterPoint Energy owns 53.7% of shares out.; OGE Energy, 25.5%; off. and dir., less than 1% (2019 10-K).

Additional Company Information from Website:
Enable Midstream (NYSE:ENBL) is a publicly traded master limited partnership formed in May 2013 that owns, operates and develops strategically located natural gas and crude oil infrastructure assets. [119]

We operate a large scale, fully integrated portfolio of midstream energy infrastructure assets including: Approximately 14,000 miles of natural gas, crude oil, condensate and produced water gathering pipelines; 15 major processing plants with 2.6 Bcf/d of processing capacity; Approximately 7,800 miles of interstate natural gas pipelines; Approximately 2,200 miles of intrastate natural gas pipelines; 8 natural gas storage facilities with 84.5 Bcf of storage capacity.[120]

Why was the company not included?
This company began trading on April 11, 2014. This company performs a substantial amount of gathering and processing functions. Most of the assets are located in Oklahoma, Arkansas, Louisiana, and Texas. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Energy Transfer L.P. (formerly known as Energy Transfer Equity, L.P.)
Company Summary from Value Line:
Energy Transfer, LP (ET) is a master limited partnership that owns a diversified portfolio of energy assets in the U.S. Its core operations include complementary natural gas midstream, intrastate and interstate transportation and storage assets; crude oil, natural gas liquids and refined product transportation and terminaling assets. Energy Transfer also owns the Lake Charles LNG Company. On a consolidated basis, the ET family owns and operates approximately 86,000 miles of natural gas pipeline. Acquired Energy Transfer Partners, 10/18. Has about 12,812 employees.

Additional Company Information from Website:
At Energy Transfer, the continuity of safe and reliable services to our customers and the safety of our employees is of the utmost importance. As concerns intensify related to the Coronavirus (COVID-19), we are closely monitoring information from a number of sources including the CDC and the World

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[119] https://investors.enablemidstream.com/overview/default.aspx/, accessed 2/2/2021
[120] https://www.enablemidstream.com/company/operations/, accessed 2/2/2021

Health Organization. We have been actively managing the business risk associated with the virus and have taken a number of measures to ensure we are able to continue the safe and reliable operations of our systems. Energy Transfer is one of the largest and most diversified midstream energy companies in the country with approximately 90,000 miles of pipelines traversing 38 states transporting the oil and gas products that make our lives possible. $588MM - SPENT TO MAINTAIN AND IMPROVE OUR ASSETS IN 2019. 90K - MILES OF ENERGY INFRASTRUCTURE NATIONWIDE. ~30% - OF OUR NATION'S NATURAL GAS AND CRUDE OIL MOVED ON OUR PIPELINES. [121]

Why was the company not included?
This company's business segments include natural gas midstream, intrastate and interstate transportation and storage assets; crude oil, natural gas liquids and refined produce transportation and terminating assets. This company is similar to the Gas Transmission Pipeline Companies that the State Assessed Section is responsible for valuing. However, we are limiting the guideline companies to corporations.

Enerplus Corporation
Company Summary from Value Line:
Enerplus Corporation engages in the exploration and development of crude oil and natural gas in the U.S. (Montana, North Dakota, Pennsylvania, West Virginia, and Wyoming) and Canada (Alberta, British Columbia, and Saskatchewan). Average daily production in 2019: crude oil, 49.704 bbls; natural gas liquids, 4,929 bbls; natural gas, 278.451 mcf; total, 101.042 boe. At 12/31/19 proved plus probable reserves (in the U.S. and Canada): 239.4 Mboe, including: 117.6 Mbbls of crude oil and natural gas liquids, 683.6 Mmcf of natural gas. Has 383 employees.

Additional Company Information from Website:
We are focused on the development of high-quality North American oil and natural gas assets. Today, our portfolio includes light oil assets in the Williston Basin (North Dakota and Montana), a position in the Marcellus natural gas shale play (northeast Pennsylvania) as well as a group of oil assets under secondary and tertiary recovery in western Canada.

2020E Production	
BOE/Day	90,000 - 91,000
2020E Production Mix	
Liquids	56%
Natural Gas	44%

[122]

Why was the company not included?
This company's main business segments are exploration and development of crude oil and natural gas. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

[121] https://www.energytransfer.com, accessed 2/2/2021
[122] https://www.enerplus.com/operations/overview-operations.cfm, accessed 2/2/2021

EnLink Midstream LLC

Company Summary from Value Line:
EnLink Midstream, LLC provides midstream energy services in the United States. It operates throughout Texas, Oklahoma, and Louisiana. The company gathers, compresses, treats, processes, transports, stores, and sells natural gas. It also fractionates, transports, stores, and sells natural gas liquids and crude oil. Midstream energy assets include about 12,000 miles of pipelines, 21 natural gas processing plants and seven fractionators. Has 1,449 employees.

Additional Company Information from Website:
EnLink Midstream reliably operates a differentiated midstream platform that is built for long-term, sustainable value creation. EnLink's best-in-class services span the midstream value chain, providing natural gas, crude oil, condensate, and NGL capabilities. Our integrated asset platforms are strategically located in premier production basins and core demand centers, including the Permian Basin, Oklahoma, North Texas, and the Gulf Coast. EnLink's focus is on a strong financial foundation and a commitment to execution excellence to drive attractive returns and significant value for our employees, customers, and investors. Headquartered in Dallas, EnLink is publicly traded through EnLink Midstream, LLC (NYSE: ENLC).[123]

Why was the company not included?
This company is mainly located in the Gulf Coast. The Gulf Coast is a different market than the market of the companies for which the State Assessed Section is responsible for valuing.

Enterprise Products Partners LP

Company Summary from Value Line:
Enterprise Products Partners, LP, is a leading integrated provider of natural gas and natural gas liquids (NGLs) processing, fractionation, transportation, and storage services in the U.S. and Canada. All management, administrative, and operating functions are performed by EPCO and its 7,300 employees. Assets include about 50,000 miles of pipelines, 260 MMBbls of storage capacity for liquids and 14 Bcf for natural gas. Four segments: NGL Pipeline (49% of 2019 revenues); Crude Oil Pipelines, (25%); Petrochemical & Refined Products, (13%); Natural Gas Pipelines, (13%).

Additional Company Information from Website:
Enterprise Products Partners L.P. is one of the largest publicly traded partnerships and a leading North American provider of midstream energy services to producers and consumers of natural gas, natural gas liquids ("NGLs"), crude oil, refined products and petrochemicals. Our services include: natural gas gathering, treating, processing, transportation and storage; NGL transportation, fractionation, storage and import and export terminals; crude oil gathering, transportation, storage and terminals; petrochemical and refined products transportation, storage and terminals; and a marine transportation business that operates primarily on the United States inland and Intracoastal Waterway systems.[124]

Why was the company not included?
This company is similar to the Gas Transmission Pipeline Companies that the State Assessed Section is responsible for valuing. However, the department is using corporations, not partnerships as guideline companies in the Gas Transmission Pipeline market segment.

[123] https://www.enlink.com/our-company/, accessed 1/11/2021

[124] http://www.enterpriseproducts.com/about-us, accessed 1/11/2021

EOG Resources Inc.

Company Summary from Value Line:

EOG Resources, Inc. engages in the exploration, development, and production of natural gas and crude oil. Utilizes producing basins in the U.S., Canada, China, and offshore Trinidad. In 2019, total net proved natural gas reserves were 5.4 trillion cubic feet equivalent, and net proved crude oil and natural gas liquids reserves were 5,023 million barrels. Est'd pretax present value of reserves: $31.8 billion. Has 2,900 employees.

Additional Company Information from Website:

EOG Resources, Inc. (NYSE:EOG) is one of the largest crude oil and natural gas exploration and production companies in the United States with proved reserves in the United States, Trinidad and China. EOG's business strategy is to maximize the rate of return on investment of capital by controlling operating and capital costs and maximizing reserve recoveries. EOG strives to maintain the lowest possible operating cost structure that is consistent with efficient, safe and environmentally responsible operations.[125]

Why was the company not included?

EOG Resources Inc. main business segments include exploration and production of natural gas and crude oil. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

EQM MidStream Partners L.P.

Company Summary from Value Line:

Not available.

Additional Company Information from Website:

Equitrans Midstream Corporation (ETRN) and EQM Midstream Partners, LP (EQM) announced 6/17/2020 that ETRN has completed the acquisition of all of the outstanding common units representing limited partner interests in EQM (EQM common units) that it did not already own. As a result of the transaction, EQM common units have been suspended from trading on the New York Stock Exchange. In addition, ETRN and EQM announced that EQM has completed the redemption of $600 million aggregate principal amount of outstanding EQM Series A Perpetual Convertible Preferred Units and that all remaining EQM Series A Perpetual Convertible Preferred Units were exchanged for ETRN Series A Perpetual Convertible Preferred Shares.[126]

Why was the company not included?

No longer publicly traded.

EQT Corporation

Company Summary from Value Line:

EQT Corporation is a natural gas producer with emphasis in the Appalachian Basin. It is the largest producer of natural gas in the U.S., based on average daily volumes, with 17.5 trillion cubic feet equivalent of proved reserves across 1.3 million acres (including 1.1 million acres in the Marcellus play). Reserves, 17,469 Bcfe.

[125] https://www.eogresources.com/static/FactSheet_2020-ceb08dec967c98e5a55b4fffae5aae0c.pdf, accessed 2/2/2021

[126] https://ir.equitransmidstream.com/news/news-details/2020/ETRN-and-EQM-Announce-Completion-of-Merger-and-Restructuring-Transactions/default.aspx, accessed 1/11/2021

2019 production, 1,508 Bcfe. Spunoff Equitrans Midstream, 11/18. Acquired Rice Energy, 11/17. Has about 645 employees.

Additional Company Information from Website:
EQT Corporation is a leading independent natural gas producer with an evolutionary focus on our future. EQT has operations in Pennsylvania, West Virginia and Ohio and is dedicated to responsibly developing our world-class asset base in the core of the Appalachian Basin. EQT is making strides toward becoming the best producer by creating long-term value for all stakeholders, including employees, landowners, communities, industry partners and investors.[127]

Why was the company not included?
EQT Corporation is a natural gas producer. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Equitrans Midstream Corporation
Company Summary from Value Line:
Not available.

Additional Company Information from Website:
KEY INVESTMENT HIGHLIGHTS
Leading footprint in the Appalachian Basin. Premier gathering, transmission and water infrastructure positioned to benefit from core development in the Marcellus / Utica Shales. One of the largest natural gas gatherers in the United States. Stable cash flows backed by long-term contracts. Greater than 70% of revenue forecasted from firm / MVC contracts once MVP is placed in-service. Gathering agreement executed with EQT in February 2020 creates 15-year MVC gathering contract. 14-year weighted average firm transmission & storage contract life. Significant organic growth projects support long-term growth. MVP project, together with the Hammerhead and Equitrans Expansion projects, are expected to add approximately $320 MM of incremental annual adjusted EBITDA once MVP is in-service. Disciplined capital structure. Intend to utilize excess retained free cash flow to reduce debt; targeting a <4.0x leverage ratio. Ample liquidity available through EQM's $3.0 B revolver. Total transformation reshapes ETRN. Single public C-Corp. Commercial alignment with EQT enables optimized drilling plans and creates significant midstream capital efficiencies. New dividend and capital allocation policy strengthens balance sheet.[128]

Equitrans Midstream Corporation (NYSE:ETRN), one of the largest natural gas gatherers and transmission pipeline operators in the United States , with a premier asset footprint in the Marcellus and Utica Shale region, today announced that it has completed the previously announced spin-off from EQT Corporation (NYSE: EQT). As a standalone publicly traded company, Equitrans Midstream's common stock begins "regular-way" trading today on the NYSE under the symbol "ETRN."[129]

Equitrans Midstream Corporation (ETRN) and EQM Midstream Partners, LP (EQM) announced 6/17/2020 that ETRN has completed the acquisition of all of the outstanding common units representing

[127] https://www.eqt.com, accessed 1/11/2021
[128] https://ir.equitransmidstream.com/why-invest/Investment-Highlights/default.aspx, accessed 1/11/2021
[129] https://ir.equitransmidstream.com/news/news-archives/news-details/2018/Equitrans-Midstream-Launches-as-a-Strong-Standalone-Midstream-Company-with-a-Premier-Asset-Footprint/default.aspx, accessed 3/6/2019

limited partner interests in EQM (EQM common units) that it did not already own. As a result of the transaction, EQM common units have been suspended from trading on the New York Stock Exchange. In addition, ETRN and EQM announced that EQM has completed the redemption of $600 million aggregate principal amount of outstanding EQM Series A Perpetual Convertible Preferred Units and that all remaining EQM Series A Perpetual Convertible Preferred Units were exchanged for ETRN Series A Perpetual Convertible Preferred Shares.[130]

Why was the company not included?
Began trading on New York Stock Exchange on 11/13/2018. Consider after financials are established. Also involved in acquisition during 2020 if Value Line becomes available.

Extraction Oil & Gas Inc.
Company Summary from Value Line:
We do not have access to the Value Line Tear Sheet.

Additional Company Information from Website:
Extraction Oil & Gas operates in the Greater Wattenberg Field of Colorado's Denver-Julesburg (DJ) Basin, targeting development of the Codell and Niobrara formations. The Wattenberg Field, discovered in 1970, was historically a major gas field. It produced over 4.0 trillion cubic feet (TCF) of natural gas from the J Sand, Codell and Niobrara formations from nearly 20,000 wells. In 2009, operators began experimenting with multi-stage horizontal completion techniques in the Niobrara chalk. The early results were significant and the development of the field immediately began to evolve from vertical infill drilling to a horizontal resource play. Today, operators now see outstanding results in the Niobrara A, B and C benches as well as the Codell sandstone. Extraction is focused on the western portion of the field where both the Niobrara and Codell are productive.[131]

Why was the company not included?
Extraction Oil & Gas Inc. is an exploration and production company. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Ferrellgas Partners L.P.
Company Summary from Value Line:
Ferrellgas Partners L.P., through its operating partnership, Ferrellgas, L.P., and subsidiaries, serves propane customers in all 50 states, the District of Columbia, and Puerto Rico, and provides midstream services to major energy companies in the US. Its operations primarily include the distribution and sale of propane and related equipment and supplies. Sales from propane distribution are generated principally from transporting propane purchased from third parties to propane distribution locations and then to tanks on customers' premises or to portable propane tanks delivered to nationwide and local retailers. Sales from portable tank exchanges, nationally branded under the name Blue Rhino, are generated through a network of independent and partnership-owned distribution outlets. Ferrellgas conducts crude oil logistics operations and related activity under the Bridger Logistics tradename, as well as water solutions operations, under its midstream operations segment.

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[130] https://ir.equitransmidstream.com/news/news-details/2020/ETRN-and-EQM-Announce-Completion-of-Merger-and-Restructuring-Transactions/default.aspx, accessed 1/11/2021
[131] https://extractionog.com/where-we-operate/, accessed 2/2/2021

Additional Company Information from Website:
Our company was founded in 1939 by a hard-working family in Atchison, Kansas. In 1939 a loaf of bread cost eight cents, Lou Gehrig announced his retirement from the New York Yankees, and the film The Wizard of Oz had just made its box office debut. Although a lot has changed since then, the values and work ethic that propelled a small company forward after the Great Depression still persist today. Throughout almost a century of innovation and treating customers with respect, we've grown to become one of the nation's largest employee-owned propane leaders. Our story is a testament to the livelihood of the American dream, and we are proud to fuel the lives of customers all over America.[132]

Why was the company not included?
This company's main business segment is propane, which is a different business segment of the companies for with the State Assessed Section is responsible for valuing.

Genesis Energy L.P.
Company Summary from Value Line:
Genesis Energy, LP is a growth-oriented master 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. Genesis' operations are primarily located in Texas, Louisiana, Arkansas, Mississippi, Alabama, Florida, Wyoming and the Gulf of Mexico. Has 2200 employees.

Additional Company Information from Website:
Genesis Energy is a publicly traded, master limited partnership headquartered in Houston, Texas. We own and operate midstream assets in four business segments offshore pipeline transportation, sodium minerals and sulfur services, onshore facilities and transportation, and marine transportation. Our operations are located primarily in the Gulf Coast region of the United States, Wyoming, and the Gulf of Mexico. Our primary business strategy is to provide an integrated suite of services to refiners, crude oil and natural gas producers, and industrial and commercial enterprises. Our businesses include supporting long lived, world class oil developments of integrated and large independent energy companies in the Gulf of Mexico, producing, transporting, and marketing bulk and specialty chemicals with no known substitutes and providing strategic transportation into refinery centric demand centers. We remain steadfast in our mission to provide long term value for our stakeholders without ever losing our strong commitment to operating in a safe, reliable, and responsible manner. At Genesis Energy, we focus on further integrating these considerations into our business strategy every day.[133]

Why was the company not included?
This company's main business segments are grouped in four divisions: offshore pipeline transportation, refinery services, marine transportation, and onshore facilities and transportation. These market

[132] https://www.ferrellgas.com/our-company/, accessed 2/2/2021
[133] http://genesisenergy.com/about/, accessed 2/2/2021

segments are not similar enough to the market segments of the companies for which the State Assessed Section is 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. It 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 US and Canada to the east and west coasts. As of September 30, 2020, the partnership had a portfolio of 1,550 owned, leased and/or supplied gasoline stations, including 283 directly operated convenience stores, primarily in the Northeast. Has 2540 employees.

Additional Company Information from Website:

With approximately 1,550 locations primarily in the Northeast, Global Partners is one of the region's largest independent owners, suppliers and operators of gasoline stations and convenience stores. Global also owns, controls or has access to one of the largest terminal networks in New England and New York, through which it distributes gasoline, distillates, residual oil and renewable fuels to wholesalers, retailers and commercial customers. In addition, Global engages in the transportation of petroleum products and renewable fuels by rail from the mid-continental U.S. and Canada. Global, a master limited partnership, trades on the New York Stock Exchange under the ticker symbol "GLP."[134]

Why was the company not included?

This company is one of the largest distributors of gasoline, distillates, residual oil and renewable fuels to wholesalers, retailers, and commercial customers in New England and New York. This company also owns, supplies, and operates gasoline stations and convenience stores. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Green Plains Partners L.P.

Company Summary from Value Line:

Green Plains Partners, L.P. provides fee based fuel storage and transportation services by owning, operating, developing and acquiring ethanol and fuel storage tanks, terminals, transportation assets, and other related assets and businesses. The company was formed by Green Plains, Inc., a vertically integrated ethanol producer, to support its marketing and distribution activities as its primary downstream logistics provider. The company generates a substantial portion of its revenues under fee-based commercial agreements with Green Plains Trade for receiving, storing, transferring and transporting ethanol and other fuels, which are supported by minimum volume or take-or-pay capacity commitments. Green Plains owns 39 ethanol storage facilities at or near 17 ethanol production plants in

[134] https://apnews.com/press-release/business-wire/business-consumer-products-and-services-diseases-and-conditions-retail-and-wholesale-massachusetts-306ca089be18401a83a13fcaaa754d6b, accessed 2/2/2021

Indiana, Illinois, Iowa, Michigan, Minnesota, Nebraska, Tennessee, Texas, and Virginia, and which have a current combined ethanol production capacity of roughly 1.5 billion gallons annually. Has 40 employees.

Additional Company Information from Website:
Green Plains Partners LP is a fee-based, limited partnership formed by our parent, Green Plains Inc., to provide ethanol and fuel storage, terminal and transportation services by owning, operating, developing and acquiring ethanol and fuel storage tanks, terminals, transportation assets and other related assets and businesses. We intend to seek opportunities to grow our business by pursuing organic projects and acquisitions of complementary assets from third parties in cooperation with our parent.[135]

Why was the company not included?
This company's main operating segments are ethanol storage, fuel terminals, and transportation. The transportation segment includes railcars. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Hess Midstream Partners LP
Company Summary from Value Line:
Hess Midstream LP, a midstream company, owns, operates, develops, and acquires midstream assets. The company 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. Its Gathering segment owns a system of gathering pipelines that compress and move crude oil and natural gas from remote wells to processing and storage facilities. The Processing & Storage segment owns the Tioga Gas Plant located north of the Missouri River and owns 50% of the Little Missouri Four gas processing plant south of the Missouri River. This segment also owns a propane storage terminal in Minnesota. The Terminaling & Export segment operates integrated, interconnected terminal facilities that provide flexibility for export. This segment includes a truck and pipeline terminal, a rail terminal and rail cars, and a header system.

Additional Company Information from Website:
Hess Midstream (NYSE: HESM) is a fee-based, growth-oriented midstream company that owns, operates, develops and acquires 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.[136]

Hess Midstream Partners LP (NYSE: HESM) (the "Company" or "HESM") announced December 16, 2019 that the Company has completed its previously announced acquisition of Hess Infrastructure Partners LP ("HIP"), IDR simplification and conversion from a master limited partnership into an "Up-C" structure by merging with Hess Midstream LP ("Hess Midstream"), an entity taxed as a corporation for U.S. federal income tax purposes. At the effective time of the transaction, each HESM common unit held by Hess Midstream Partners LP public unitholders converted on a one-for-one basis into a newly issued Class A share representing a limited partner interest in Hess Midstream. Based on the number of

[135] http://www.greenplainspartners.com/about, accessed 2/2/2021
[136] https://hessmidstream.gcs-web.com/investors, accessed 2/2/2021

Why was the company not included?
Hess Midstream Partners LP focuses on processing natural gas and fractionating natural gas (NGLs). These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Martin Midstream Partners L.P.
Company Summary from Value Line:
Martin Midstream Partners, L.P. is a publicly traded limited partnership with a diverse set of operations focused primarily in the US Gulf Coast region. Its four primary business lines include: natural gas services, including liquids transportation and distribution services and natural gas storage; terminalling and storage services for petroleum products and by-products, including the refining of naphthenic crude oil, blending and packaging of finished lubricants; sulfur and sulfur-based products processing, manufacturing, marketing and distribution; and marine transportation services for petroleum products and byproducts. The petroleum products and by-products the company collects, transports, stores and markets are produced by oil and gas companies. It owns and operates: 19 marine shore-based terminal facilities and 14 specialty terminal facilities; 31 inland marine tank barges, 17 inland push boats and one offshore tug, and barge unit that transport petroleum products and by-products.

Additional Company Information from Website:
Martin Midstream Partners L.P. is a publicly traded limited partnership with a diverse set of operations focused primarily in the United States Gulf Coast region. Our four primary business lines include: terminalling, processing, storage, and packaging services for petroleum products and by-products; land and marine transportation services for petroleum products and by-products, chemicals, and specialty products; sulfur and sulfur-based products processing, marketing, manufacturing, and distribution; natural gas liquids marketing, distribution, and transportation services. The petroleum products and by-products we collect, transport, store, and market are produced primarily by major and independent oil and gas companies who often turn to third parties, such as us, for the transportation and disposition of these products. In addition to these major and independent oil and gas companies, our primary customers include independent refiners, large chemical companies, fertilizer manufacturers and other wholesale purchasers of these products. We operate primarily in the U.S. Gulf Coast region, which is a major hub for petroleum refining, natural gas gathering and processing and support services for the exploration and production industry.[137]

Why was the company not included?
This company is mainly located in the Gulf Coast. The Gulf Coast is a different market than the market of the companies for which the State Assessed Section is responsible for valuing.

MDU Resources Group Inc.
Company Summary from Value Line:
MDU Resources Group, Inc. is a regulated energy delivery and construction materials and services company. Segments: construction materials and contracting (41% of ’19 revs; 37% of ’19 op. inc.), construction services (35%, 26%), natural gas distribution (16%, 14%); electric (7%, 13%) and pipeline (1%, 10%). Utilities sell gas & electricity in northwest and upper midwest U.S. Construction materials has 1.1 billion tons of construction reserves. Has about 13,360 employees.

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[137] http://www.martinmidstream.com/about-us/default.aspx, accessed 1/11/2021

Additional Company Information from Website:
A strong infrastructure is the heart of our economy. It is the natural gas and electricity that power business, industry and our daily lives. It is the pipes and wires that connect our homes, factories, offices and stores to bring them to life. It is the transportation network of roads, highways and airports that keeps our economy moving. Infrastructure is our business. We provide essential products and services through our two lines of business: regulated energy delivery and construction materials and services. 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 is a multibillion-dollar corporation with operations, customers and employees across the country. We have more than 13,000 employees during peak construction season and are authorized to conduct business in 44 states. MDU Resources is the largest publicly traded company headquartered in North Dakota. Our stock has traded since 1948 under the symbol MDU on the New York Stock Exchange. We have paid dividends uninterrupted to our shareholders for 82 years. We have increased dividends 29 consecutive years, a feat accomplished by fewer than 90 of the U.S.-listed companies. Our commitment to paying dividends is reflected in our membership in the S&P High-Yield Dividend Aristocrats index.[138]

Why was the company not included?
MDU Resources Group Inc. largest business segment is construction materials and contracting, and second largest business segment is construction services. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

National Fuel Gas Company
Company Summary from Value Line:
National Fuel Gas Company is engaged in the production, gathering, transportation, distribution, and marketing of natural gas & oil. Exploration/Production (36.7% of '19 profit), Pipeline/Storage (24.3%), Gathering (19.2%), Utility (20.0%), Energy Marketing and Other (-0.2%). NFG has a large position in the Marcellus Shale basin in western NY & PA and oil reserves in CA. Proved reserves as of 9/30/19: 24,837 Mbbl of oil & 2,950 MMcf of natural gas. Employs 2,105.

Additional Company Information from Website:
National Fuel Gas Company (NYSE: NFG) is a diversified, integrated energy company with a complementary mix of natural gas assets located in the heart of the prolific Appalachian basin and supplemented by quality oil-producing assets in California. From the bottom of the wellbore to the customer's burner tip, National Fuel has structured our collective group of businesses in a unique manner that leverages our vast upstream resources, valuable midstream footprint and reliable downstream operations to position us as a responsible player in America's energy renaissance. [139]

As one of the earliest gas utility companies in the United States, National Fuel is a diversified energy organization headquartered in Western New York that operates an integrated collection of natural gas and oil assets across four business segments: exploration and production, pipeline and storage, gathering, and utility.[140]

[138] https://www.mdu.com/our-company/overview/default.aspx, accessed 2/2/2021
[139] https://www.nationalfuel.com/corporate/an-integrated-energy-company/, accessed 2/3/2021
[140] https://www.natfuel.com/aboutus.aspx, accessed 2/2/2021

Why was the company not included?
National Fuel Gas Company's largest business segment is exploration and production. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

New Fortress Energy, Inc.
Company Summary from Value Line:
New Fortress Energy, Inc. is an integrated gas-to-power company that seeks to use ''stranded'' natural gas to satisfy the world's large and growing power needs by delivering customized energy solutions to its customers. The company has expertise in power, infrastructure, transportation and liquefied natural gas (LNG) and operate liquefaction facilities, onshore and offshore regasification terminals, pipelines, and power plants. The company also has an established logistics chain. NFE is majority owned by a fund managed by an affiliate of Fortress Investment Group. Has 201 employees.

Additional Company Information from Website:
We want to light the world. Billions of people around the planet lack access to affordable power. Electricity should not be a luxury good. Our mission is to provide capital, expertise and vision to address this problem while also making positive and meaningful impacts on communities and the environment. New Fortress Energy was founded in 2014 by Wes Edens, with the belief that access to affordable, reliable, cleaner energy is not a privilege, but a human right. Universal access to energy can impact major world issues, from education to poverty reduction to gender equality. Creating that access – in an environmentally responsible way – is our fundamental mission. We identify places around the world where affordable, reliable, cleaner energy is in short supply. We build and operate LNG import terminals and facilities to supply natural gas locally, creating access to a better energy source.[141]

Why was the company not included?
New Fortress Energy seeks to use "stranded" natural gas to satisfy the world's large and rowing power needs by delivering customized energy solutions to its customers. The company has four operations in the Caribbean, one operation in Europe, 2 operations in Latin America, and two operations in the United States (developing liquefaction assets in Pennsylvania and a liquefier in Florida). The assets in the United States are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

NGL Energy Partners LP
Company Summary from Value Line:
NGL Energy Partners, LP, together with its subsidiaries, engages in the crude oil logistics, water solutions, liquids, retail propane, and refined products and renewables businesses. The company purchases crude oil from producers and transports it to refineries for resale at pipeline injection stations, storage terminals, barge loading facilities, rail facilities, refineries, and other trade hubs; and provides storage, terminaling, trucking, marine, and pipeline transportation services. It is involved in the treatment and disposal of wastewater generated from crude oil and natural gas production operations; disposal of solids, such as tank bottoms, drilling fluids, and drilling muds. It supplies natural gas liquids to retailers, wholesalers, refiners, and petrochemical plants in the United States and Canada through its 21 terminals. It sells propane, distillates, and equipment and supplies to end users consisting of residential, agricultural, commercial, and industrial customers. Has 1400 employees.

[141] https://www.newfortressenergy.com/about, accessed 2/3/2021

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 refinery; Wastewater from the wellhead to treatment for disposal, recycle or discharge; Natural Gas Liquids from fractionators / hubs to refineries and end users; Refined Products from refiners to customers.[142]

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 the State Assessed Section is responsible for valuing.

Noble Midstream Partners L.P.
Company Summary from Value Line:
Noble Midstream Partners, LP is a growth oriented Delaware master limited partnership formed to own, operate, develop, and acquire a wide range of domestic midstream infrastructure assets. It provides crude oil, natural gas, and water-related midstream services through long term, fixed-fee contracts. The company's current focus areas are in the Denver-Julesburg (DJ) Basin in Colorado and the Southern Delaware Basin position of the Permian Basin (Delaware Basin) in Texas. In November 2020, Noble Midstream Partners, LP announced that its general partner, Noble Midstream GP, LLC, has appointed a new CEO and new members to its board of directors. As a result of the completed Chevron Corporation acquisition of Noble Energy, Inc. on October 5, 2020, Chevron has acquired control of Noble Midstream GP, LLC and now holds approximately 63% of outstanding Limited Partner units. Has 240 employees.

Additional Company Information from Website:
Noble Midstream Partners is a growth-oriented master limited partnership formed by Noble Energy to own, operate, develop and acquire midstream infrastructure assets. Our assets reside in two of the most resilient oil basins in the United States: the DJ Basin in Colorado and the Delaware Basin in Texas. In these areas, we provide crude oil, natural gas and water-related midstream services for Noble Energy and third parties. In the DENVER-JULESBURG BASIN (DJ BASIN) in Colorado, we have acreage dedications spanning approximately 300,000 acres (235,000 dedicated acres from Noble and 65,000 from a third party). We have approximately 111,000 dedicated acres in Reeves County in the DELAWARE BASIN where we will provide crude oil, natural gas and water-related midstream services under long-term, fixed fee contracts. In addition to these existing operations and acreage dedications, Noble Energy has granted us rights of first refusal (ROFR) on a combination of midstream assets. Retained assets include natural gas gathering and processing facilities serving the East Pony area in the DJ Basin and approximately 31,000 acres in Webb and Dimmit Counties in the Eagle Ford Shale area of South Texas. Noble Midstream Partners owns and operates the Advantage Pipeline, a 16-inch common carrier crude oil pipeline serving the southern Delaware Basin (assets owned by joint venture with Plains All American Pipeline).[143]

[142] http://www.nglenergypartners.com/about-ngl/, accessed 2/2/2021
[143] http://www.nblmidstream.com/about-us/, accessed 2/2/2021

Why was the company not included?
Noble Midstream Partners business segments include operations and acreage dedications in the DJ Basin and Delaware Basin, natural gas gathering and processing facilities. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing. However, Noble Midstream Partners has co-ownership of a common carrier pipeline with Plains All American Pipeline. The department reviews Plains All American Pipeline as a guideline company.

Oasis Midstream Partners LP
Company Summary from Value Line:
Oasis Midstream Partners, LP is a growth oriented, fee-based master limited partnership formed by its sponsor, Oasis Petroleum Inc., to own, develop, operate and acquire a diversified portfolio of midstream assets in North America that are integral to the oil and natural gas operations of Oasis Petroleum and are strategically positioned to capture volumes from other producers. Its current midstream operations are performed exclusively within the Williston Basin, one of the most prolific crude oil producing basins in North America. The company expects to grow acquisitively through accretive, dropdown acquisitions, as well as organically as Oasis Petroleum continues to develop its acreage. Additionally, it expects to grow by offering services to third parties and through acquisitions of midstream assets from third parties. Oasis Midstream Partners LP was founded in 2013 and is based in Houston, Texas.

Additional Company Information from Website:
We are a premier gathering and processing master limited partnership formed by Oasis (NASDAQ: OAS), to own, develop, operate and acquire a diversified portfolio of midstream assets in North America. Our current assets are located in the heart of the oil rich Bakken and Permian Basins and are integral to the oil and natural gas operations of Oasis. Our assets are also strategically positioned to capture volumes from other producers. Our management team has extensive expertise in the oil and gas industry and has a proven track record of identifying, acquiring and executing large, repeatable development programs across North America.[144]

Why was the company not included?
Oasis Midstream Partners LP is primarily focused on production gathering and gas processing. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Ovinitiv Inc. (Formerly Encana Corporation)
Company Summary from Value Line:
Ontiv Inc. (formerly Encana Corporation) is a North American energy producer focused on developing natural gas, oil, and NGL resource plays. Its core holdings are in the Permian (Texas), Anadarko (Oklahoma), and Montney (British Columbia, Canada) basins. Total proved reserves ('19 10-K), 2,189 million barrels of oil equivalent. 2019 Production; 563.4 million barrels of oil equivalent per day, including 576 million cubic feet equivalent of natural gas, 50,200 barrels of NGL, and 60,000 barrels of oil. Has 2,570 employees.

[144] https://www.oasismidstream.com/, accessed 2/3/2021

Additional Company Information from Website:
Kimmeridge Energy Management Co. said it's prepared to nominate directors to the board of Ovintiv Inc. if the oil and gas producer fails to take the necessary steps to improve its performance and restore investor confidence. The private equity firm, which said it owns a 2.4% stake in Ovintiv, argues in a new 18-page presentation that the company is falling behind its peers as a result of its misguided spending, expensive acquisitions, poor governance and inadequate environmental stewardship. Kimmeridge also outlines a strategy to address investor concerns by better aligning executive compensation with performance, selling non-core assets and shifting spending to the Permian Basin, among other measures.[145]

Encana Corp. says it has completed its corporate reorganization under the new name Ovintiv Inc. The shake-up also includes technically moving the company to be U.S.-based, though the company says the move won't change how the Calgary-based company runs its day-to-day activities. Company CEO Doug Suttles said in announcing the change that the domicile move to the U.S. would give the company access to larger pools of investment in U.S. index funds and passively managed accounts, as well as better align it with its U.S. peers.[146]

Why was the company not included?
Encana is an energy producer focused on developing natural gas, oil, and natural gas liquid plays. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Paramount Resources Ltd.
Company Summary from Value Line:
We do not have access to the Value Line Tear Sheet.

Additional Company Information from Website:
Paramount Resources Ltd. is an independent, publicly traded, liquids-focused Canadian energy company that explores for and develops both conventional and unconventional petroleum and natural gas reserves and resources. The Company also pursues longer-term strategic exploration and pre-development plays and holds a portfolio of investments in other entities. Paramount's principal properties are located in Alberta and British Columbia. The Company's Class A common shares are listed on the Toronto Stock Exchange under the symbol "POU". The Company's operations are organized into the following three regions: the Grande Prairie Region, located in the Peace River Arch area of Alberta, which is focused on Montney developments at Karr and Wapiti; the Kaybob Region, located in west-central Alberta, which is focused on Montney and Duvernay developments at Kaybob, Smoky River, Pine Creek and Ante Creek; and the Central Alberta and Other Region, which includes Duvernay development plays in Central Alberta at Willesden Green and the East Shale Basin, lands and production in British Columbia and approximately 180,000 acres of fee simple land and various associated royalty interests.[147]

[145] https://www.bloomberg.com/news/articles/2021-01-14/oil-driller-ovintiv-faces-proxy-battle-threat-from-kimmeridge/, accessed 2/2/2021
[146] https://globalnews.ca/news/6459797/encana-completes-ovintiv-rebrand-denver-suttles-energy/, accessed 2/2/2021
[147] http://www.paramountres.com/about-us, accessed 2/2/2021

Why was the company not included?
Paramount Resources Ltd.'s main business segments include exploration, developing, producing, and marketing natural gas, oil, and natural gas liquids. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

PBF Logistics L.P.
Company Summary from Value Line:
PBF Logistics, LP is a fee-based, growth oriented master limited partnership formed by PBF Energy, Inc. to own or lease, operate, develop and acquire crude oil and refined petroleum products terminals, pipelines, storage facilities, and similar logistics assets. The company operates in two segments: Transportation and Terminaling, and Storage. The company's assets include Delaware City rail unloading terminal, a light crude oil rail unloading terminal, which serves Delaware City and Paulsboro refineries; Toledo truck unloading Terminal, that serves Toledo refinery; Delaware City west heavy unloading rack, a heavy crude oil unloading facility, which serves Delaware City refinery; and a terminaling facility that consists of 27 propane storage bullets and a truck loading facility. Its storage facility consists of 30 tanks for storing crude oil, refined products, and intermediates. The company was founded in 2012 and is based in Parsippany, New Jersey. Has 92 employees.

Additional Company Information from Website:
PBF Logistics LP, headquartered in Parsippany, New Jersey, is a fee-based, growth-oriented master limited partnership formed by PBF Energy to own or lease, operate, develop and acquire crude oil and refined petroleum products, terminals, pipelines, storage facilities and similar logistics assets.[148]

Why was the company not included?
This company's business segments are transporting & terminaling and storage. Transportation assets include rail. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

PDC Energy Inc.
Company Summary from Value Line:
PDC Energy, Inc. is a domestic independent exploration and production company that produces, develops, acquires, and explores for crude oil, natural gas, and natural gas liquids, with primary operations in the Wattenberg Field in Colorado and the Delaware Basin in Texas. As of Dec. 31, 2019, the company owned an interest in approximately 2,650 gross producing wells, of which approximately 1272 were horizontal. Production of 49.4 MMboe from continuing operations for the year ended December 2019, an increase of 23% compared to 2018. Has 540 employees.

Additional Company Information from Website:
PDC Energy follows a simple and effective business strategy of maximizing margins and cash flow while maintaining a strong balance sheet and solid debt metrics. The Company is focused on horizontal drilling and low-risk organic development of oil and natural gas reserves from shales and tight reservoir rocks.

GEOGRAPHICAL DIVERSITY

[148] http://www.pbflogistics.com/, accessed 2/3/2021

We currently operate in two geographically distinct areas of the country, with primary interests in the Wattenberg Field and Delaware Basin. Denver – Julesburg Basin: Core Wattenberg Field – Weld County, Colorado; Permian Basin: Delaware Basin – Reeves County, West Texas. EMPHASIS ON OIL AND NGL - Our focus is on horizontal Niobrara and Codell development in the liquid-rich Wattenberg Field, where liquid content in new horizontal wells is expected to average 50% – 75% of the production stream. In the Delaware Basin, the Company is primarily targeting Wolfcamp A and B development where we expect the Eastern acreage block to be 70-80% liquids and the Central block 60-70% liquids. DRILLING AND DEVELOPMENT - Annual production for 2019 averaged 135,000 Boe per day and proved reserves at year-end 2019 totaled 611 MMboe.[149]

Why was the company not included?
PDC Energy, Inc.'s main business segments are exploration and production of crude oil, natural gas, and natural gas liquids. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Pembina Pipeline Corporation
Company Summary from Value Line:
Pembina Pipeline Corp. gathers, processes, and transports oil and natural gas in Western Canada. It owns and operates an integrated system of pipelines, gas gathering and processing facilities, and an oil and NGL infrastructure and logistics line. Acquired Veresen, '17; Kinder Morgan Canada, '19. 2019 net volumes (operating income): Conventional Pipelines: 36% (54%); Oil Sands Pipelines: 40% (9%); Transmission Pipelines: 24% (37%). Daily 2019 liquids throughput: 2.521 billion barrels; Oil Sands & Heavy Oil, 51%; Conventional Pipelines, 36%; Midstream NGLs, 7%; Gas Services, 6%. Has 1,539 employees.

Additional Company Information from Website:
Pembina Pipeline Corporation is a leading energy transportation and midstream service provider that has been serving North America's energy industry for more than 65 years. A Calgary-based company, Pembina owns an integrated system of pipelines that transport crude oil, natural gas and natural gas liquids produced primarily in Western Canada, as well as gas gathering and processing facilities, and an oil and natural gas liquids infrastructure and logistics business. Pembina's integrated assets and commercial operations provide a full spectrum of midstream and marketing services to the energy sector.[150]

Why was the company not included?
Pembina Pipeline Corporation's business segments include transporting oil and natural gas and operating an integrated system of pipelines. Because midstream NGLs only accounted for 7% of the company's net volumes, we are not including the company as a guideline for the gas transmission pipeline market segment. Because the company is incorporated and not a partnership, we are not including this company as a guideline for the fluid transportation pipeline market segment. We will continue to review this company for use as a guideline company in futures studies.

[149] http://www.pdce.com/operations-overview/, accessed 2/3/2021
[150] http://www.pembina.com, accessed 1/11/2021

Plains GP Holdings L.P.

Company Summary from Value Line:

Plains GP Holdings, L.P., a limited partnership, does not directly own any operating assets. Its principal source of cash flow is from its indirect investment in Plains All American Pipeline, L.P. (PAA) and an approximate 55% limited partnership of Plains AAP, L.P.. PAA is a publicly traded master limited partnership that owns and operates midstream energy infrastructure and provides logistics services for crude oil, natural gas liquids, and natural gas. It owns an extensive network of pipeline, terminalling, storage, and gathering assets. PAA has 5,000 employees.

Additional Company Information from Website:

Plains GP Holdings (NYSE: PAGP) is a publicly traded entity that owns a non-economic controlling general partner interest in PAA and an indirect limited partner interest in PAA, one of the largest energy infrastructure and logistics companies in North America.[151]

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.

QEP Resources Inc.

Company Summary from Value Line:

QEP Resources, Inc. is an independent crude oil and natural gas exploration and production company with operations in two regions of the United States: the Southern Region (primarily in Texas) and the Northern Region (primarily in North Dakota). It sells oil and condensate and natural gas liquids volumes to refiners, marketers, midstream service providers, and other companies. In addition, QEP sells gas volumes to wholesale marketers, industrial users, local distribution companies, midstream service providers, and utility companies. In September 2020, QEP completed its redemption of its 6.875% senior notes due 2021 in the aggregate principal amount of $275.3 million. In November 2020, the NYSE notified the company that the average closing price of its stock over the prior 30-consecutive trading day period was below $1.00 per share, which is the minimum average share price for continued listing.

Additional Company Information from Website:

With a proud legacy and an exciting future, QEP Resources is a leading independent crude oil and natural gas exploration and production company focused on two of the most prolific resource plays in the continental United States — the Permian Basin in Texas and the Williston Basin in North Dakota. Our portfolio of low-cost, high-quality resource plays provides a solid foundation for sustainable growth with 382.3 MMboe of year-end 2019 proved reserves. Our total 2019 production of 32,210.3 Mboe consisted of approximately 67% crude oil. Headquartered in Denver, Colorado, QEP is an S&P SmallCap 600 Index member company and its common shares trade on the New York Stock Exchange under the ticker symbol QEP.[152]

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[151] https://www.plainsallamerican.com/, accessed 1/11/2021

[152] http://www.qepres.com/about/, accessed 2/3/2021

Why was the company not included?
QEP Resources Inc.'s business segments include exploration, development, and production of natural gas, oil, and natural gas liquids. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

San Juan Basin Royalty Trust
Company Summary from Value Line:
San Juan Basin Royalty Trust operates as an express trust. The principal asset of the trust is royalty. Its underlying properties include: the working, royalty, and other oil and natural gas interests (75%) owned by Southland Royalty Company in properties located in the San Juan Basin of northwestern New Mexico. The trust does not operate the underlying properties and does not carry on any business activity. The trust is a widely held fixed investment trust and is classified as a non-mortgage widely held fixed investment trust for federal income tax purposes. Burlington Resources Oil & Gas Company, LP is the principal operator of the underlying properties. The trustee of the trust is Compass Bank, which is a subsidiary of Banco Bilbao Vizcaya Argentaria, S.A. The function of the trustee is to collect the net proceeds attributable to the Royalty, to pay all expenses and charges of the trust, and distribute the remaining available income to the unit holders.

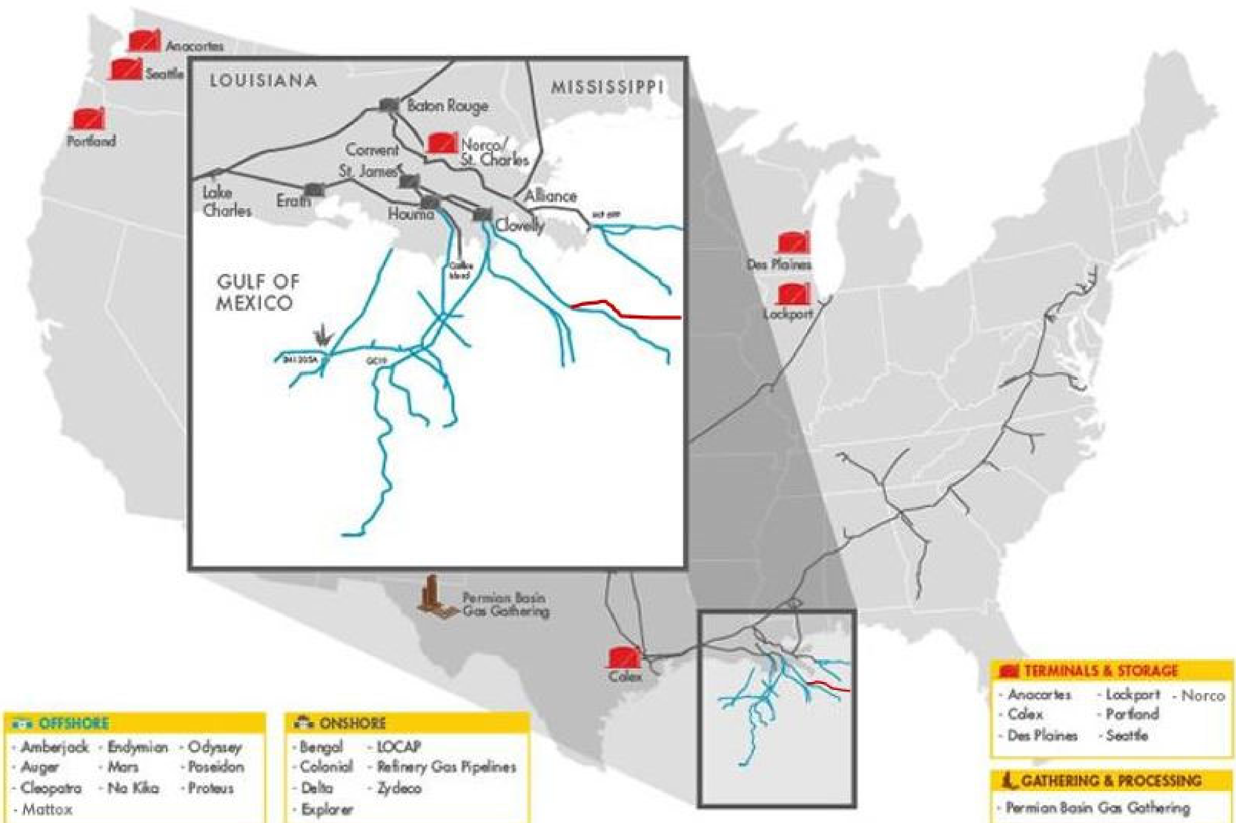
Additional Company Information from Website:
The Trust was established in November 1980 by Trust indenture between Southland Royalty and The Fort Worth National Bank. Pursuant to the indenture, Southland Royalty conveyed to the Trust a 75% net overriding royalty interest (equivalent to a net profit interest) carved out of Southland Royalty's oil and gas leasehold and royalty interest in the San Juan Basin of northwestern New Mexico. This net overriding royalty interest (the "Royalty") is the principal asset of the Trust. Under the Trust indenture, Compass Bank (successor trustee) as Trustee, has the primary function of collecting monthly net proceeds ("Royalty Income") attributable to the Royalty and making the monthly distributions to the Unit Holders after deducting administrative expenses and any amounts necessary for cash reserves. The San Juan Basin Royalty Trust is a New York Stock Exchange-listed entity, with Units trading under the symbol "SJT".[153]

Why was the company not included?
San Juan Basin Royalty Trust's principal asset is a royalty. The underlying properties include: the working, royalty, and other oil and natural gas interests. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Shell Midstream Partners L.P.
Company Summary from Value Line:
Shell Midstream Partners, L.P. was formed in March 2014 and is a subsidiary of Shell Pipeline Company LP. It owns and operates pipelines and other midstream assets, including refined products terminals and processing facilities. It operates both onshore and offshore pipelines that originate in Louisiana, Mississippi, and the Gulf of Mexico. Its processing terminals are in Washington, Oregon, Michigan, Illinois, and Texas.

[153] http://www.sjbrt.com/Home/default.aspx, accessed 2/3/2021

Additional Company Information from Website:
Shell Midstream Partners, L.P., headquartered in Houston, owns, operates, develops and acquires pipelines and other midstream and logistics assets. Shell Midstream Partner, L.P.'s assets include interests in entities that own (a) crude oil and refined products pipelines and terminals that serve as key infrastructure to (i) transport onshore and offshore crude oil production to Gulf Coast and Midwest refining markets and (ii) deliver refined products from those markets to major demand centers and (b) storage tanks, docks, truck and rail racks and other infrastructure used to stage and transport intermediate and finished products. Our assets also include interests in entities that own natural gas and refinery gas pipelines that transport offshore natural gas to market hubs and deliver refinery gas from refineries and plants to chemical sites along the Gulf Coast.[154]



[155]

Why was the company not included?
This company is mainly services the Gulf Coast (including offshore assets), the Gulf Coast to New York City, and the Gulf Coast to the Midwest. The Explorer pipeline system from the Gulf Coast to the Midwest transports gasoline, diesel, fuel oil, and jet fuel from the US Gulf Coast to Hammon, IL. The Explorer pipeline system is the company's only asset that is similar to the companies the State Assessed Property Section is responsible for valuing. The Explorer pipeline system is not a large enough portion of the company's overall business segments (Shell Midstream Partners L.P. only owns 2.62% ownership interest in Explorer).

[154] https://www.shellmidstreampartners.com/investor-relations, accessed 2/3/2021
[155] https://www.shellmidstreampartners.com/overview-assets, accessed 2/3/2021

Southwestern Energy Company
Company Summary from Value Line:
Southwestern Energy Company is primarily engaged in the exploration & production of natural gas and oil. Exploration & production property locations include the Marcellus Shale. Also has E&P activities in Colorado. At 12/19, the company owned 12,721 billion cubic feet equivalent of total proven natural gas and oil reserves. Sold utility Arkansas Western Gas Co., 7/08. Had 923 employees at 12/31/19.

Additional Company Information from Website:
Southwestern Energy is an independent energy company focused on responsibly developing America's abundant supply of natural gas, oil and natural gas liquids to fuel economic growth. Our high-quality, large-scale assets are concentrated across more than 786,000 net acres in the Appalachia Basin. Our primary business is the exploration for and production of natural gas, oil and natural gas liquids, with our ongoing operations focused on the development of unconventional natural gas reservoirs located in Pennsylvania, West Virginia and Ohio. Our operations in northeast Pennsylvania, referred to as "Northeast Appalachia", are primarily focused on the Marcellus Shale, and our operations in West Virginia, Ohio and southwest Pennsylvania, referred to as "Southwest Appalachia", are focused on the Marcellus Shale, the Utica and the Upper Devonian reservoirs. We are also focused on creating and capturing additional value through our marketing business and provide certain oilfield products and services, principally serving our E&P operations through vertical integration.[156]

Why was the company not included?
Southwestern Energy Company main business segments include exploration and production of natural gas and oil. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Sprague Resources L.P.
Company Summary from Value Line:
Sprague Resources LP engages in the purchase, storage, distribution, and sale of refined petroleum products and natural gas in the United States and Canada. The company purchases and sells various refined products, such as heating oil, diesel fuel, residual fuel oil, kerosene, jet fuel, gasoline, and asphalt to wholesale, retail, and commercial customers. Its wholesale customers consist of approximately 1,100 home heating oil retailers, and diesel fuel and gasoline resellers; and commercial customers include federal and state agencies, municipalities, regional transit authorities, drill sites, large industrial companies, real estate management companies, hospitals, educational institutions, and asphalt paving companies. It purchases natural gas from natural gas producers and trading companies and sells and distributes natural gas to approximately 14,000 commercial and industrial customer locations. It engages in coal marketing and distribution; and commercial trucking activities. Has 665 employees.

Additional Company Information from Website:
Throughout our history, Sprague has focused relentlessly on exceeding customer expectations—moving their businesses forward with our insights, knowledge and wide-ranging strategic experience. We strive every day to be a premier energy partner. With a deep understanding of each customer's unique energy needs, we create custom-tailored solutions that give them greater control over their natural gas, fuel, electricity and materials handling costs. Founded in 1870 as a distributor of coal and petroleum-based products, today Sprague is one of the largest independent suppliers of energy products and related

[156] https://www.swn.com/about/, accessed 2/3/2021

services in the Northeast. Our strategically located refined products and materials handling terminals, coupled with our natural gas pipeline capacity, give us unprecedented access to energy products and services. We market products to over 20,000 retail, commercial, industrial, utility and wholesale customers. Our goal is to consistently exceed your expectations and earn your business with every interaction. We work tirelessly to provide you with the knowledge and tools to administer your energy buying and reporting needs—all to help your business thrive.[157]

Why was the company not included?
This company purchases and sells various refined products and purchases, sells and distributes natural gas. The company also offloads, stores, and prepares for delivery of customer owned products. The company engages in the marketing and distribution of coal. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Suburban Propane Partners L.P.
Company Summary from Value Line:
Suburban Propane Partners, L.P., is a master limited partnership (MLP) that markets and distributes propane, fuel oil, and other refined fuels in the U.S., operating in Propane; Fuel Oil and Refined Fuels; Natural Gas and Electricity; and Heating, Ventilation, and Air Conditioning (HVAC). As of 9/28/19, serves about 1.0 million active propane customers through roughly 700 locations in 41 states, concentrated on the east and west coasts of the United States. Sold approximately 427 million gallons of propane and 30.0 million gallons of fuel oil in fiscal 2019. Has 3,369 employees.

Additional Company Information from Website:
Headquartered in Whippany, New Jersey, Suburban Propane is a nationwide marketer and distributor of a diverse array of products to meet the energy needs of our customers. Specializing in propane, heating oil and refined fuels, as well as the marketing of natural gas and electricity in deregulated markets. With nearly 3,300 full-time employees, Suburban Propane maintains business operations in 41 states, providing prompt, reliable service to approximately 1 million residential, commercial, industrial and agricultural customers through 700 locations.[158]

Why was the company not included?
This company specializes in marketing and distributing fuel oil and refined fuels as well as the marketing of natural gas and electricity in deregulated markets. These specializations are not the same market segments as the companies in which the State Assessed Section is responsible for valuing.

Summit Midstream Partners L.P.
Company Summary from Value Line:
In May 2020, Summit Midstream Partners, LP (SMLP) entered into a definitive agreement with Energy Capital Partners II, LLC (ECP) to acquire Summit Midstream Partners, LLC, as well as 5.9 million SMLP common units owned separately by ECP, for $35 million in cash plus warrants covering 10 million SMLP common units. Due to this news, the company ranks were suspended. Summit Midstream Partners, LP focuses on owning, developing, and operating midstream energy infrastructure assets primarily shale formations in the continental United States. The company provides natural gas gathering, compression, treating, and processing services, as well as crude oil and produced water gathering

[157] https://www.spragueenergy.com/about, accessed 2/3/2021
[158] https://www.suburbanpropane.com/about/, accessed 2/3/2021

services. It owns an ownership interest in Ohio Gathering, which owns and operates natural gas gathering and condensate stabilization facility in the Utica Shale in southeastern Ohio. It serves natural gas and crude oil producers. Summit Midstream Partners, LP was founded in 2009.

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 six 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 Permian Basin, which includes the Bone Spring and Wolfcamp formations in New Mexico;
- the Fort Worth Basin in Texas, which includes the Barnett Shale formation; and
- the Piceance Basin in Colorado, which includes the liquids-rich Mesaverde formation as well as the emerging Mancos and Niobrara Shale formations.

Our systems and the basins they serve are as follows:

- the Mountaineer Midstream system, which serves the Appalachian Basin;
- the Bison Midstream system, which serves the Williston Basin;
- the Polar & Divide system, which serves the Williston Basin;
- the DFW Midstream system, which serves the Fort Worth Basin;
- the Grand River system, which serves the Piceance Basin;
- the Summit Utica system, which serves the Appalachian Basin;
- the Niobrara G&P system, which serves the DJ Basin; and
- the Summit Permian system, which serves the northern Delaware Basin.

SMLP has an equity investment in and operates Double E Pipeline, LLC, which is developing natural gas transmission infrastructure that will provide transportation service from multiple receipt points in the Delaware Basin to various delivery points in and around the Waha Hub in Texas. SMLP also has an equity investment in Ohio Gathering, which operates extensive natural gas gathering and condensate stabilization infrastructure in the Utica Shale in Ohio. We generate a substantial majority of our revenue under primarily long-term and fee-based gathering agreements with our customers. The majority of our gathering agreements are underpinned by areas of mutual interest (“AMIs”) and minimum volume commitments (“MVCs”). Our AMIs provide that any production drilled by our customers within the AMIs will be shipped on our gathering systems. The MVCs are designed to ensure that we will generate a minimum amount of gathering revenue over the life of each respective gathering agreement. The fee-based nature of the majority of the gathering agreements enhances the stability of our cash flows and limits our direct commodity price exposure. Since our formation in 2009, our management team has established a track record of executing this strategy through the acquisition and subsequent development of DFW Midstream, Grand River, Bison Midstream, Polar & Divide, Mountaineer Midstream, Summit Utica, Niobrara G&P, Summit Permian, and Double E Pipeline.[159]

Why was the company not included?
This company's main business segments are natural gas gathering, treating and compression services. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Tallgrass Energy LP (formerly known as Tallgrass Energy GP, L.P.)
Company Summary from Value Line:
Not available.

Additional Company Information from Website:
At a special meeting today (April 16, 2020), shareholders of Tallgrass Energy, LP (NYSE: TGE) ("TGE") voted to approve the merger transaction in which Blackstone Infrastructure Partners, together with affiliates of Enagas, GIC, NPS and USS, will acquire all of the outstanding Class A shares of TGE held by the public for $22.45 in cash per Class A share.

The merger transaction is expected to close on April 17, 2020. Beginning on April 17, 2020, TGE's Class A shares will no longer be publicly traded.[160]

Why was the company not included?
No longer publicly traded.

Targa Resources Corporation
Company Summary from Value Line:
Targa Resources is a leading provider of midstream services and is one of the largest independent midstream energy companies in N.A. It operates a diversified portfolio of midstream energy assets. Targa is engaged in the business of gathering, compressing, treating, processing, and selling natural gas, along with storing, fractionating, treating, transporting, and selling NGLs. Plant natural gas inlet 4,438.2 MMcf/d; Gross NGL production, 505.4 MBbl/d; Crude oil gathered 172.6 MBbl/d (all as of 12/31/19). 2019 depr. rate: 4.9%. Has 2,680 employees.

Additional Company Information from Website:
We are primarily engaged in the business of: Gathering, compressing, treating, processing and selling natural gas Transporting, storing, fractionating, treating and selling natural gas liquids ("NGL") and NGL products, including services to liquefied petroleum gas ("LPG") exporters Gathering, storing, terminaling and selling crude oil As an energy infrastructure company focused on the transportation and storage of energy products, our operations are essential to the delivery of energy efficiently, safely and reliably across the United States. At Targa Resources, we invest hundreds of millions of dollars each year to build new and expanded assets to deliver energy products that sustain and enhance quality of life. We strive to conduct our business safely and with integrity, creating lasting benefits to our stakeholders,

[159] http://www.summitmidstream.com/about, accessed 2/3/2021
[160] https://www.businesswire.com/news/home/20200416005571/en/Tallgrass-Energy-LP-Shareholders-Approve-Merger-at-Special-Shareholder-Meeting-Closing-Expected-on-April-17-2020, accessed 1/11/2021

including our investors, lenders, customers, employees, business partners, regulators and the communities in which we live and work.[161]

Why was the company not included?
Targa Resources Corporation has several other main business segments besides common carrier transportation of gas or fluids. These include, selling, services to LPG exporters, gathering, compressing, treating, processing, fractionating, etc. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

TC Energy Corporation (formerly known as TransCanada Corporation)
Company Summary from Value Line:
TC Energy Corp, formerly known as TransCanada Corp., operates the most extensive natural gas pipeline system in North America. The company's 57,500 mi. of natural gas pipelines supply more than 25% of clean burning natural gas consumed in North America, and it has gas storage facilities with a 653 bill. Cubic capacity. It has 3,000 mi. of liquids pipeline (Keystone). Its three major segments are natural gas pipelines (72% of '19 revenues), oil pipelines (22%), and power/storage (6%). Has 7,305 employees.

Additional Company Information from Website:
We're more than a pipeline company. Approximately 7,300 people strong, TC Energy is a vital part of modern life. Thanks to a safe, stable network of natural gas and crude oil pipelines, along with nuclear power facilities, wherever life happens — we're there. For more than 65 years, TC Energy has proudly operated pipelines, storage facilities and power-generation plants that support life in Canada, the U.S. and Mexico. Our facilities operate safely, reliably and quietly. Explore our core operations below. Natural Gas - Safe operation of 93,300 km (57,900 miles) of pipeline and natural gas storage. Oil and Liquids - Safe operation of approximately 4,900 km (3,000 miles) of pipeline. Power and Storage - Approximately 4,200 megawatts of capacity and more than 650 billion cubic feet (Bcf) of natural gas storage.[162]

TC Energy Corporation (TSX, NYSE: TRP) (TC Energy) today announced it has entered into a definitive agreement and plan of merger to acquire all the outstanding common units of TC PipeLines, LP (NYSE: TCP) (TCP or the Partnership) not beneficially owned by TC Energy or its affiliates in exchange for TC Energy common shares. Pursuant to the agreement, TCP common unitholders would receive 0.70 common shares of TC Energy for each issued and outstanding publicly-held TCP common unit. This represents a 19.5 per cent premium to the TCP closing price before the original offer as of October 2, 2020. The conflicts committee, composed of independent directors of the Partnership's general partner, after consultation with its independent legal and financial advisors, unanimously approved the merger agreement and determined it to be in the best interests of the Partnership and its unaffiliated unitholders. Subsequently, the board of directors of the Partnership's general partner approved the merger agreement and determined it to be fair and reasonable and in the best interests of the Partnership. The transaction is expected to close late in the first quarter or early in the second quarter of 2021 subject to the approval by the holders of a majority of outstanding common units of TCP and customary regulatory approvals. Upon closing, TCP will be wholly-owned by TC Energy and will cease to be a publicly-held master limited partnership.[163]

[161] https://ir.targaresources.com/investor-relations, accessed 1/6/2020
[162] https://www.tcenergy.com/about/, accessed 1/11/2021
[163] https://www.globenewswire.com/news-release/2020/12/15/2145167/0/en/TC-Energy-announces-definitive-agreement-to-acquire-all-outstanding-common-units-of-TC-PipeLines-LP.html, accessed 1/11/2021

Why was the company not included?
TC Energy Corp's assets include 57,500 miles of natural gas pipelines. This company is similar to the Gas Transmission Pipeline Companies that the State Assessed Section is responsible for valuing. The company is the parent company for one of the companies that the State Assessed Section is responsible for valuing. However, this company is currently involved in an acquisition of TC PipeLines, L.P.

TC PipeLines L.P.
Company Summary from Value Line:
In October 2020, TC PipeLines, LP (TCP) received a non-binding offer from TC Energy Corporation to acquire all of the outstanding common units of TCP not beneficially owned by TC Energy or its affiliates in exchange for common shares of TC Energy. TCP common unitholders would receive 0.650 common shares of TC Energy for each issued and outstanding publicly-held TCP common unit, representing an implied value of US$27.31 per common unit. Due to this news, the company's ranks were suspended. TC PipeLines, LP acquires, owns, and participates in the management of energy infrastructure assets in North America. It owns interests in six natural gas interstate pipeline systems, through which it transports approximately 9.1 billion cubic feet of natural gas per day from producing regions and import facilities to market hubs and consuming markets, primarily in the western and midwestern US. It serves large utilities, local distribution companies, and natural gas marketers and producing companies.

Additional Company Information from Website:
TC PipeLines, LP is a Delaware master limited partnership. TC PipeLines, LP was formed by TransCanada PipeLines Limited, a wholly owned subsidiary of TC Energy Corporation (TC Energy), to acquire, own and actively participate in the management of United States-based natural gas pipelines and related assets. Our common units trade on the New York Stock Exchange (NYSE) under the symbol TCP. We are managed by our general partner, TC PipeLines GP, Inc. (TC PipeLines GP), which is indirectly wholly owned by TC Energy, one of the largest energy infrastructure companies in North America. TC Energy subsidiaries also operate our natural gas pipeline systems, apart from Iroquois' assets and PNGTS' joint facilities, which are partially owned by third parties and operated by separate management.[164]

TC Energy Corporation (TSX, NYSE: TRP) (TC Energy) announced December 15, 2020, that it has entered into a definitive agreement and plan of merger to acquire all the outstanding common units of TC PipeLines, LP (NYSE: TCP) (TCP or the Partnership) not beneficially owned by TC Energy or its affiliates in exchange for TC Energy common shares. Pursuant to the agreement, TCP common unitholders would receive 0.70 common shares of TC Energy for each issued and outstanding publicly-held TCP common unit. This represents a 19.5 per cent premium to the TCP closing price before the original offer as of October 2, 2020. The conflicts committee, composed of independent directors of the Partnership's general partner, after consultation with its independent legal and financial advisors, unanimously approved the merger agreement and determined it to be in the best interests of the Partnership and its unaffiliated unitholders. Subsequently, the board of directors of the Partnership's general partner approved the merger agreement and determined it to be fair and reasonable and in the best interests of the Partnership. The transaction is expected to close late in the first quarter or early in the second quarter of 2021 subject to the approval by the holders of a majority

[164] http://www.tcpipelineslp.com/about/, accessed 1/11/2021

of outstanding common units of TCP and customary regulatory approvals. Upon closing, TCP will be wholly-owned by TC Energy and will cease to be a publicly-held master limited partnership.[165]

Why was the company not included?
This company is similar to the Gas Transmission Pipeline Companies that the State Assessed Section is responsible for valuing. However, the department is using corporations, not partnerships as guideline companies in the Gas Transmission Pipeline market segment. In addition, the company is currently involved in an acquisition by its parent company.

TransMontaigne Partners L.P.
Company Summary from Value Line:
Not available.

Additional Company Information from Website:
TransMontaigne Partners L.P. (NYSE:TLP) (the Partnership, we, us, our) announced that at the special meeting of the Partnership's common unitholders held earlier today, February 26, 2019, the Partnership's unitholders voted to approve the previously announced merger of the Partnership and an indirect subsidiary of ArcLight Energy Partners Fund VI, L.P. ("ArcLight"), pursuant to the Agreement and Plan of Merger dated November 25, 2018 (the "Merger Agreement"), between the Partnership, TLP Finance Holdings, LLC (the "Purchaser") and certain other related parties thereto, with the Partnership surviving as a wholly owned subsidiary of an affiliate of ArcLight Energy Partners (the "Merger Proposal").[166]

Why was the company not included?
No longer publicly traded.

Western Midstream Partners LP (Formerly known as Western Gas Equity Partners, L.P.)
Company Summary from Value Line:
Western Midstream Partners, LP (formed by the merger between Western Gas Partners and its general partner Western Gas Equity in 2/19) is a growth-oriented master limited partnership. It is engaged in the acquisition, ownership, development, and operation of midstream pipeline assets. Pipelines are located in the Rocky Mountains (9,397 miles), Texas/NM (6,276), 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:
Western Midstream Partners, LP is a growth-oriented Delaware master limited partnership formed to acquire, own, develop and operate midstream energy assets. With midstream assets located in the Rocky Mountains, North-central Pennsylvania and Texas, WES is engaged in the business of gathering, compressing, treating, processing, and transporting natural gas; gathering, stabilizing and transporting

[165] https://www.globenewswire.com/news-release/2020/12/15/2145167/0/en/TC-Energy-announces-definitive-agreement-to-acquire-all-outstanding-common-units-of-TC-PipeLines-LP.html, accessed 1/11/2021
[166] https://www.businesswire.com/news/home/20190226005986/en/TransMontaigne-Partners-L.P.-Announces-Unitholder-Approval-and-Effective-Date-of-Purchase-of-its-Outstanding-Common-Units-by-an-Affiliate-of-ArcLight-Energy-Partners/, accessed 2/3/2021

condensate, natural gas liquids and crude oil; and gathering and disposing of produced water for its customers.[167]

Why was the company not included?
This company's main business segments include gathering and treating. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing. Also, recently involved in a merger with a related company.

World Fuel Services Corp.
Company Summary from Value Line:
World Fuel Services Corp., a leading global fuel logistics company, is engaged in the worldwide marketing and sale of marine, aviation, and land fuel products and related services. Its Marine segment offers fuel and related services to maritime customers, including international container and tanker fleets among others. The Aviation segment provides aviation fuel to commercial airlines, and others. The Land segment provides fuel and related services to petroleum distributors among others. Has more than 5,000 employees.

Additional Company Information from Website:
World Fuel Services (NYSE: INT) is 91 on the Fortune 500* list. We provide energy procurement advisory services, supply fulfillment, and transaction and payment management solutions to commercial and industrial customers, principally in the aviation, marine and land transportation industries.[168]

Why was the company not included?
This company is a global fuel distributor. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

WPX Energy Inc.
Company Summary from Value Line:
WPX Energy, Inc. is an independent oil and natural gas exploration and production company. It predominately operates in the Delaware Basin in Texas and New Mexico and the Williston Basin in North Dakota. At Dec. 31, 2019, WPX's proven reserves amounted to 528 MMboe (bcfe); 23% of the reserves were natural gas, 56% crude oil, and 21% natural gas liquids. Spun off from The Williams Co. in 12/11. Sold Apco 10/14. Employed 590 at 12/31/19.

Additional Company Information from Website:
Devon Energy Corporation ("Devon") (NYSE: DVN) and WPX Energy, Inc. ("WPX") (NYSE: WPX) announced January 7, 2021, the successful completion of their previously announced all-stock merger of equals, creating a leading energy producer in the U.S., with an asset base underpinned by a premium acreage position in the economic core of the Delaware Basin. The combined company will operate under the name Devon Energy and be headquartered in Oklahoma City.[169]

Why was the company not included?
No longer publicly traded.

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[167] http://www.westernmidstream.com/About/, accessed 1/11/2021
[168] https://www.wfscorp.com/about-us, accessed 2/3/2021
[169] https://www.wpxenergy.com/about/our-expertise, accessed 2/3/2021

Market Segment: Railroads

Companies Included in the Railroad Market Segment

Canadian National Railway Company
Company Summary from Value Line:
Canadian National Railway operates Canada's largest railroad system with 20,000 route miles spanning East-West across Canada and North-South to the Gulf of Mexico through the U.S. Midwest. Acquired BC Rail and GLT mid-'04; EJ&E 1/09. Petroleum & Chemicals, 20% of '19 revenues; Metals & Minerals, 11%; Forest Products, 12%; Intermodal, 25%; Coal, 4%; Grain & Fertilizer, 16%; Automotive, 6%; Other, 6%. 2019 labor costs: 20% of revenue. 2018 operating ratio: 62.5%. Has about 26,000 employees.

Additional Company Information from Website:
CN is a true backbone of the economy whose team of approximately 24,000 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. At CN, we take pride in being regarded internationally as one of the best-performing transportation and logistics companies. Our commitment is to create value for both customers and shareholders by deepening customer engagement, leveraging the strength of our franchise and delivering Operational and Service Excellence.[170]

Why was the company included?
This company is similar to (and is the parent of) the railroad companies that the State Assessed Section is responsible for valuing. The company engages in railroad transportation services.

Canadian Pacific Railway Limited
Company Summary from Value Line:
Canadian Pacific Railway Limited provides rail and intermodal freight transportation services over a 12,500-mile network from Montreal to Vancouver. It extends into the U.S. midwest and northeast via Soo Line, Delaware & Hudson, and DM&E (purchased 10/4/07) subsidiaries. Alliances with other carriers extend market reach beyond its owned network. Grain shipments 22%, of 2019 freight revenue; intermodal, 21%; chemicals/plastics, 20%; coal, 9%; other, 28%. Operating ratio in 2019: 62.0%. Employs 12,938 as of 12/31/19.

Additional Company Information from Website:
Founded in 1881 to connect Canada, today we deliver transportation solutions that connect North America and the world. By doing this safely and efficiently, we create long-term sustainable value for our shareholders and the broader economy. We are grounded in the foundations of precision scheduled railroading. We operate safely, optimize assets, control costs, provide service and develop people. These are the foundations that have led CP's turnaround from 2012 to today – taking us from industry laggard to industry leader. From our multi-year strategic and business plans to our daily operations and sales and

[170] https://www.cn.ca/en/about-cn/, accessed 1/8/2021

marketing playbooks, everything we do is driven by, and tested against, our purpose, our values and the foundations of precision scheduled railroading. We are environmental stewards who believe in re-investing in our business for long-term, sustainable and low-cost growth.[171]

Why was the company included?
This company is similar to (and is the parent of) the Railroad Companies that the State Assessed Section is responsible for valuing. The company engages in railroad transportation services.

CSX Corporation
Company Summary from Value Line:
CSX Corporation provides rail, intermodal transportation, and rail-to-truck transload services. Has about 21,000 route miles in 23 states and two Canadian provinces, with links to more than 240 short-line railroads. Connects the Northeast, Midwest, and Canada with the Southeast. Principal freight: coal, fertilizer, chemicals, automobiles & parts, agricultural products, and intermodal cargo. Sold CSX World Terminals 2/05. 2019 rail operating ratio: 58.4%. Had about 21,000 employees, as of 12/31/19.

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. 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.[172]

Why was the company included?
This company is similar to the Railroad Companies that the State Assessed Section is responsible for valuing. The company engages in railroad transportation services.

Kansas City Southern Inc.
Company Summary from Value Line:
Kansas City Southern, Inc. is a holding company that has railroad investments in the U.S., Mexico, and Panama. Kansas City Southern, its primary holding, serves the central and south central U.S. Kansas City Southern de Mexico serves northeastern and central Mexico, as well as the port cities of Lazaro Cardenas, Tampico, and Veracruz. Panama Canal Railway (50% stake) provides ocean-to-ocean service along the Panama Canal. 2019 rail operating ratio: 63.2%. Has 7,040 employees.

[171] https://www.cpr.ca/en/about-cp/our-purpose, accessed 1/8/2021
[172] https://www.csx.com/index.cfm/about-us/company-overview/, accessed 1/8/2021

Additional Company Information from Website:
KCS is a complete network of capabilities, possibilities and advantages for businesses and shippers of all sizes. You produce it or need it and we can ship it. From accordions to zippers, KCS can ship your cargo. We are a full-service railroad capable of shipping anything from the tiniest plastic pieces to the largest machinery. Liquid or metal. Large or small. Finished or Unfinished. We've got your shipment needs covered.[173]

Why was the company included?
This company is similar to the Railroad Companies that the State Assessed Section is 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. '19 freight revenue mix: coal, 15%; intermodal, 25%; agriculture/ consumer prod./gov't, 30%; metals/construction, 13%; other, 17%. Labor costs: about 24% of revenue. Operating ratio: 64.7%. Has 24,587 employees;

Additional Company Information from Website:
Norfolk Southern Corporation (NYSE: NSC) is one of the nation's premier transportation companies. Its Norfolk Southern Railway Company subsidiary operates approximately 19,500 route miles in 22 states and the District of Columbia, serves every major container port in the eastern United States, and provides efficient connections to other rail carriers. Norfolk Southern is a major transporter of industrial products, including chemicals, agriculture, and metals and construction materials. In addition, the railroad operates the most extensive intermodal network in the East and is a principal carrier of coal, automobiles, and automotive parts.[174]

Why was the company included?
This company is similar to the Railroad Companies that the State Assessed Section is responsible for valuing. The company engages in railroad transportation services.

Union Pacific Corporation
Company Summary from Value Line:
Union Pacific Corporation owns Union Pacific Railroad, the largest railroad in the United States in both track miles and total revenues, with nearly 32,236 route miles serving the western two-thirds of the United States. '19 railroad revenue mix: Premium 31%; Agricultural Products, 22%; Industrial, 29%; Energy, 18%. About 10% of its sales from Mexico. Divested Overnite Transportation in 11/03. '19 RR operating ratio: 60.6%. Has about 37,483 employees.

Additional Company Information from Website:
Union Pacific Corporation (NYSE:UNP) is one of America's leading transportation companies. Its principal operating company, Union Pacific Railroad, is North America's premier railroad franchise,

[173] https://www.kcsouthern.com/en-us/why-choose-kcs/work-with-us/what-we-ship, accessed 1/8/2021
[174] http://www.nscorp.com/content/nscorp/en/about-ns/corporate-profile.html, accessed 1/8/2021

covering 23 states across the western two-thirds of the United States. VISION: Build America for all generations by connecting our nation's businesses and communities to each other and the world. PURPOSE: The people of Union Pacific deliver North America's safest, most reliable and most efficient supply chain solutions. VALUES: Passion for Performance. Passion, determination and expertise drive our safety, customer experience and financial results. High Ethical Standards. Our reputation will always be a source of pride for our employees and a bond with our customers, shareholders and communities. Work as a Team. We work together, embrace diversity and create opportunity for all. We promote an inclusive environment where people from varied backgrounds can be their best, reflect the communities where we live and work, and deliver a competitive advantage. Union Pacific Railroad Fast Facts (For Full Year 2019) Route Miles 32,200; Employees 37,000; Annual Payroll $3.8 billion; Capital Spending $3.2 billion; Capital Spending 2010-2019 $35 billion; Locomotives 7,700; Customers 10,000.[175]

Why was the company included?
This company is one of the Railroad Companies that the State Assessed Section is responsible for valuing. The company engages in railroad transportation services.

Companies Not Included in the Railroad Market Segment

GATX Corporation
Company Summary from Value Line:
GATX Corp. specializes in tank car, freight car, and locomotive leasing. The company owns or has an interest in 146,729 railcars, and manages 323 railcars for third-party owners. Specialty unit finances marine and industrial equipment. The company sold in February of 2020 the American Steamship unit, which provided waterborne transportation of dry bulk commodities. Invests in joint ventures that complement existing businesses. Has about 2,165 employees.

Additional Company Information from Website:
GATX Corporation, founded in 1898, is the leading global railcar lessor. We strive to be recognized as the finest railcar leasing company in the world by our customers, our shareholders, our employees, and the communities where we operate. We own railcar fleets in North America, Europe, and Asia. In addition, we jointly own one of the largest aircraft spare engine lease portfolios in the world. We operate through three business segments: Rail North America, Rail International, and Portfolio Management.[176]

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 the State Assessed Section is responsible for valuing.

Genesee & Wyoming Inc.
Company Summary from Value Line:
Not available.

[175] https://www.up.com/aboutup/corporate_info/uprrover/index.htm, accessed 1/8/2021
[176] http://www.gatx.com/wps/wcm/connect/GATX/GATX_SITE/Home/About/, accessed 1/8/2021

Additional Company Information from Website:
Genesee & Wyoming Inc. owns or leases 116 freight railroads worldwide (collectively "G&W" or the "company")* organized in locally managed operating regions with 7,300 employees serving 3,000 customers. G&W's four North American regions serve 42 U.S. states and four Canadian provinces and include 113 short line and regional freight railroads with more than 13,000 track-miles. G&W's UK/Europe Region includes the U.K.'s largest rail maritime intermodal operator and second-largest freight rail provider, as well as regional rail services in Continental Europe. G&W subsidiaries and joint ventures also provide rail service at more than 30 major ports, rail-ferry service between the U.S. Southeast and Mexico, transload services, contract coal loading and railcar switching and repair.[177]

Genesee & Wyoming Inc. (G&W) (NYSE:GWR) announced December 30, 2019 the completion of its previously announced sale to affiliates of Brookfield Infrastructure and GIC. Under the terms of the sale, each issued and outstanding share of G&W common stock converted into the right to receive $112 in cash. As a result of the completion of the sale, G&W's common stock ceased trading on the NYSE prior to market open today and will no longer be listed for trading on the NYSE.[178]

Why was the company not included?
No longer publicly traded.

Greenbrier Companies Inc.
Company Summary from Value Line:
The Greenbrier Companies, Inc. designs, manufactures, repairs, and markets railroad freight cars and related equipment in North America, South America, and Europe. It also manufactures ocean-going marine barges. The company operates in three business segments: Manufacturing (84% of 2019 revenues); Wheel Services, Refurbishment & Parts (12%); Leasing & Services (4%). Inc.: OR. At 8/31/20, its backlog consisted of 24,600 railcars. Has about 17,100 employees.

Additional Company Information from Website:
We are one of the leading designers, manufacturers and marketers of railroad freight car equipment in North America and Europe. We manufacture railcars in Brazil and are a manufacturer and marketer of marine barges in North America. Through our European manufacturing operations, we also deliver railcars for the Saudi Arabian market. We are a leading provider of wheel services, parts, leasing and other services to the railroad and related transportation industries in North America and a provider of railcar repair, refurbishment and retrofitting services in North America. Through other unconsolidated affiliates we produce rail and industrial castings, tank heads and other components. We operate an integrated business model in North America that combines freight car manufacturing, wheel services, repair, refurbishment, retrofitting, component parts, leasing and fleet management services. Our model is designed to provide customers with a comprehensive set of freight car solutions utilizing our substantial engineering, mechanical and technical capabilities as well as our experienced commercial personnel. We believe our integrated model is difficult to duplicate and provides greater value for our customers.[179]

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[177] https://www.gwrr.com/about_us, accessed 1/8/2021
[178] https://ir.gwrr.com/press-release/acquisitions-investments/genesee-wyoming-announces-completion-sale-brookfield, accessed 1/7/2020
[179] http://www.gbrx.com/about-us/, accessed 1/8/2021

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 the State Assessed Section is responsible for valuing.

FreightCar America Inc.
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, 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. Has 496 employees.

Additional Company Information from Website:
FreightCar America's unequalled engineering, innovation, and efficient production facilities contribute to our strong position in the North American freight car industry. At our purpose-built facility, our skilled teams turn steel into commerce, merging decades of collective expertise with modern automated technology, and backing it up with superior service and support. Since 1901, at FreightCar America we listen, we evaluate, we solve. Our engineers design and manufacture steel, stainless steel, aluminum and hybrid freight cars to transport a variety of bulk commodities and containerized freight, including open top hoppers, covered hoppers, gondolas, intermodal flat cars, box cars, and more to come. We listen to our customers and deliver a customer-focused process at every level. This includes after-sale product support, spare parts, and technical assistance wherever our products are in service. FreightCar America's generations of employees are dedicated to continuous improvement and have made us a leading builder of steel, stainless steel, aluminum and hybrid steel aluminum freight cars. As we build upon our long history of constructing highly productive freight cars, we understand that our future is built on quality over quantity, and we must remain focused on meeting and exceeding customer expectations throughout the entire process.[180]

Why was the company not included?
FreightCar America manufactures freight cars, supplies railcar parts, leases freight cars, and provides railcar maintenance, repairs, and management. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

Trinity Industries Inc.
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 are: Railcar Manufacturing (railcars and component parts), Railcar Leasing, and Railcar Services. Spun off the Energy Equipment, Construction Products,

[180] https://freightcaramerica.com/about-us/, accessed 1/8/2021

and Inland Barge divisions in November of 2018. '19 depreciation rate: 3.4% of revenues. Has about 15,600 employees.

Additional Company Information from Website:
Trinity Industries is a premier provider of railcar products and services in North America On November 1, 2018, Trinity Industries separated into two independent public companies. Trinity is now primarily focused on railcar-related products and services, while the spin-off company is focused on infrastructure-related products. Trinity Industries, Inc. owns an integrated platform of market-leading businesses that provide railcar products and services in North America marketed under the trade name TrinityRail®. The TrinityRail integrated platform is designed to optimize the ownership and usage of railcars, enabling customers to devote more resources to their core competencies. Trinity also owns a leading business engaged in manufacturing highway products and a logistics business that serves Trinity's internal needs and other industrial companies. Trinity reports its financial results in three principal segments: the Railcar Leasing and Management Services Group the Rail Products Group, and the All Other Group (which includes our highway products and logistics businesses). Our common stock is traded on the New York Stock Exchange under the symbol TRN.[181]

Why was the company not included?
Trinity Industries Inc. manufactures railcars and provides a variety of services to the fright market. These business segments are not similar to the main business segments of the companies the State Assessed Section is responsible for valuing.

USD Partners L.P.
Company Summary from Value Line:
USD Partners, LP is a fee-based, growth oriented master limited partnership formed by US Development Group LLC, to acquire, develop and operate midstream infrastructure and complementary logistics solutions for crude oil, biofuels and other energy-related products. It generates substantially all of its operating cash flows from multi-year, take-or-pay contracts with primarily investment grade customers, including major integrated oil companies, refiners and marketers. The company's network of crude oil terminals facilitates the transportation of heavy crude oil from Western Canada to key demand centers across North America. USD's operations include railcar loading and unloading, storage and blending in onsite tanks, inbound and outbound pipeline connectivity, truck transloading, as well as other related logistics services. It also provides its customers with leased railcars and fleet services to facilitate the transportation of liquid hydrocarbons and biofuels by rail.

Additional Company Information from Website:
USD Partners LP is a fee-based, growth oriented master limited partnership formed in 2014 by US Development Group LLC to acquire, develop and operate energy-related logistics assets, including rail terminals and other high-quality and complementary midstream infrastructure. In addition, we provide our customers with railcars and fleet services related to the transportation of liquid hydrocarbons and biofuels by rail. We generate substantially all of our operating cash flow from multi-year, take-or-pay contracts. Rail transportation of energy-related products provides flexible access to key demand centers on a relatively low fixed-cost basis with faster physical delivery, while preserving the specific quality of customer products over long distances.[182]

[181] https://www.trin.net/home/default.aspx, accessed 1/8/2021
[182] https://investor.usdpartners.com/investors/investor-center-home/default.aspx, accessed 1/8/2021

Why was the company not included?
USD Partners LP'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 the State Assessed Section is 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 (66% of 2019 revs) manufactures and services components used in freight trains; the Transit division (34%) makes products for passenger vehicles, e.g., subways and buses. Acquired GE transportation assets (2/19). Foreign revenues: 50%.

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.[183]

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 the State Assessed Section is responsible for valuing.

[183] https://www.wabteccorp.com/about-wabtec, accessed 1/8/2021