

2022
NATURAL GAS PIPELINE
INDUSTRY
CAPITALIZATION RATE
STUDY



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CAPITALIZATION RATE STUDY
as of January 01, 2022

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CAPITALIZATION RATE CALCULATION
as of January 01, 2022

	<u>CAPITAL STRUCTURE</u>	<u>COST (YIELD)</u>	<u>WEIGHTED COST</u>
DEBT	37.00%	3.49%	1.29%
PREFERRED	N/A	N/A	N/A
COMMON	<u>63.00%</u>	17.30%	<u>10.90%</u>
	100.00%		12.19%

SELECTED CAPITALIZATION RATE

12.20%

**SELECTED COMPARABLE COMPANIES \$
CAPITAL STRUCTURE (VALUE LINE DATA)**

COMPANY NAME	L.T. DEBT	PREFERRED STOCK	COMMON STOCK @ MKT. VALUE
Enbridge Inc.	62,967.00	7,747.00	82,446.71
Enterprise Products	28,132.80	0.00	47,919.57
Kinder Morgan Inc.	30,002.00	0.00	35,960.65
MDU Resources	2,326.72	0.00	6,271.31
MPLX LP	18,253.00	0.00	30,224.11
National Fuel Gas	2,628.69	0.00	5,830.05
ONEOK Inc.	13,640.47	0.00	26,202.85
Pembina Pipeline	10,737.00	2,424.00	16,553.19
TC Energy Corp.	27,660.80	2,818.00	38,276.80
Williams Cos.	20,338.00	0.00	31,612.56
TOTAL	21,668.65	1,298.90	32,129.78

Source: Value Line, CD ROM

**SELECTED COMPARABLE COMPANIES %
CAPITAL STRUCTURE (VALUE LINE DATA)**

COMPANY NAME	L.T. DEBT	PREFERRED STOCK	COMMON STOCK @ MKT. VALUE	
Enbridge Inc.	41.11%	5.06%	53.83%	
Enterprise Products	36.99%	0.00%	63.01%	
Kinder Morgan Inc.	45.48%	0.00%	54.52%	
MDU Resources	27.06%	0.00%	72.94%	
MPLX LP	37.65%	0.00%	62.35%	
National Fuel Gas	31.08%	0.00%	68.92%	
ONEOK Inc.	34.24%	0.00%	65.76%	
Pembina Pipeline	36.13%	8.16%	55.71%	
TC Energy Corp.	40.23%	4.10%	55.67%	
Williams Cos.	39.15%	0.00%	60.85%	
	AVERAGE	36.91%	1.73%	61.36%
	WEIGHTED AVERAGE	39.33%	2.36%	58.31%
	MEDIAN	37.32%	0.00%	62.68%

Source: Value Line, CD ROM

ESTIMATED MARKET COST OF DEBT

SELECTED COMPARABLE COMPANIES

AVERAGE MERGENT (MOODY'S) PIPELINE INDUSTRY	3.37%	
AVERAGE BLOOMBERG PIPELINE INDUSTRY	3.49%	
AVERAGE STANDARD & POORS PIPELINE INDUSTRY	N/A	
		3.43%

ESTIMATED COST OF DEBT 3.49%

**CORPORATE BOND YIELD AVERAGES
MERGENT (MOODY'S) CORPORATE BOND YIELDS**

"Ba" Rated

RATE IN
PERCENT

YEAR END

Ba1	4.37%
Ba2	4.37%
Ba3	4.37%

"Baa" Rated

RATE IN
PERCENT

YEAR END

Baa1	3.37%
Baa2	3.37%
Baa3	3.37%

"A" Rated

RATE IN
PERCENT

YEAR END

A1	2.82%
A2	2.82%
A3	2.82%

Source - Mergents Bond Record & S&P Database, January 2022

**CORPORATE BOND YIELD AVERAGES
BLOOMBERG CORPORATE BOND YIELDS**

"BB" Rated

RATE IN
PERCENT

YEAR END

BB+	4.95%
BB	5.80%
BB-	5.59%

"BBB" Rated

RATE IN
PERCENT

YEAR END

BBB+	3.14%
BBB	3.60%
BBB-	4.31%

"A" Rated

RATE IN
PERCENT

YEAR END

A+	2.80%
A	2.95%
A-	3.30%

Source - Bloomberg Data Base, 30 Year Maturity, January-2022

**CORPORATE BOND YIELD AVERAGES
S&P BOND YIELDS**

"BB" Rated

RATE IN
PERCENT

YEAR END

BB+

N/A

BB

N/A

BB-

N/A

"BBB" Rated

RATE IN
PERCENT

YEAR END

BBB+

N/A

BBB

N/A

BBB-

N/A

"A" Rated

RATE IN
PERCENT

YEAR END

A+

N/A

A

N/A

A-

N/A

Source - Standard & Poors Data from Mergent Bond Record Database, January-2022

**SELECTED COMPARABLE COMPANIES
CURRENT COST OF CORPORATE DEBT**

MERGENT (MOODY'S) RATINGS & YIELDS

COMPANY NAME	MERGENT BOND RATINGS	MERGENT BOND YIELDS
Enbridge Inc.	Baa1	3.37%
Enterprise Products	N/A	N/A
Kinder Morgan Inc.	Baa2	3.37%
MDU Resources	N/A	N/A
MPLX LP	Baa2	3.37%
National Fuel Gas	Baa3	3.37%
ONEOK Inc.	Baa3	3.37%
Pembina Pipeline	N/A	N/A
TC Energy Corp.	Baa2	3.37%
Williams Cos.	Baa2	3.37%
	AVERAGE	3.37%

Source - Mergents Bond Record & S&P Database, January 2022

**SELECTED COMPARABLE COMPANIES
CURRENT COST OF CORPORATE DEBT**

S&P RATINGS, BLOOMBERG YIELDS

COMPANY NAME	S&P BOND RATINGS	BLOOMBERG BOND YIELDS
Enbridge Inc.	BBB+	3.14%
Enterprise Products	BBB+	3.14%
Kinder Morgan Inc.	BBB	3.60%
MDU Resources	BBB+	3.14%
MPLX LP	BBB	3.60%
National Fuel Gas	BBB-	4.31%
ONEOK Inc.	BBB	3.60%
Pembina Pipeline	BBB	3.60%
TC Energy Corp.	BBB+	3.14%
Williams Cos.	BBB	3.60%
	AVERAGE	3.49%

Source - Bloomberg Data Base, 30 Year Maturity, January-2022

**SELECTED COMPARABLE COMPANIES
CURRENT COST OF CORPORATE DEBT**

S&P RATINGS, S&P YIELDS

COMPANY NAME	S&P BOND RATINGS	S&P BOND YIELDS
Enbridge Inc.	BBB+	N/A
Enterprise Products	BBB+	N/A
Kinder Morgan Inc.	BBB	N/A
MDU Resources	BBB+	N/A
MPLX LP	BBB	N/A
National Fuel Gas	BBB-	N/A
ONEOK Inc.	BBB	N/A
Pembina Pipeline	BBB	N/A
TC Energy Corp.	BBB+	N/A
Williams Cos.	BBB	N/A
	AVERAGE	N/A

Source - Standard & Poors Data from Mergent Bond Record Database, January-2022

COST OF COMMON EQUITY - SUMMARY

MODEL USED

PERCENT

CALCULATED MODELS BASED ON SELECTED COMPARABLE COMPANIES

CAPITAL ASSET PRICING MODEL (EX POST)	11.11%
CAPITAL ASSET PRICING MODEL (EX ANTE)	16.84%
DISCOUNTED CASH FLOW MODEL	18.22%
FERC "TWO STAGE" DCF MODEL	16.27%
BUILD-UP MODEL	11.03%
AVERAGE ALL	14.69%

SELECTED EQUITY RATE

17.30%

**SELECTED COMPARABLE COMPANIES
CAPITAL ASSET PRICING MODEL (EX POST)**

ITEM	RATE
<p>LONG TERM EXPECTED EQUITY RISK PREMIUM: LARGE COMPANY STOCK TOTAL RETURNS MINUS LONG TERM GOVERNMENT BOND INCOME RETURNS. (DUFF & PHELPS 2021 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")</p>	7.40%
RISK ADJUSTMENT FACTOR (Beta)	1.11
ADJUSTED RISK PREMIUM	8.21%
<p>LONG TERM GOVERNMENT BONDS @ 12/31/21 (ST. LOUIS FEDERAL RESERVE - 30YR LT GOVERNMENT BONDS AS FOUND ON THE ST. LOUIS FEDERAL RESERVE WEBSITE)</p>	2.01%
LARGE COMPANY ESTIMATED EQUITY YIELD RATE	10.22%
<p>ADJUSTMENT FOR SIZE PREMIUM* FOR QUANTIFICATION OF SIZE PREMIUM SEE: (DUFF & PHELPS 2021 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")</p>	0.89%
COST OF EQUITY CAPITAL	11.11%

**SELECTED COMPARABLE COMPANIES
CAPITAL ASSET PRICING MODEL (EX ANTE)**

ITEM	RATE
WEIGHTED AVERAGE COST OF EQUITY FOR S&P 500 S&P 500 EXPECTED EQUITY COST MINUS LONG TERM GOVERNMENT BOND INCOME RETURNS. (STANDARD & POOR'S COMPUSTAT & I/B/E/S (S&P 500))	12.56%
RISK ADJUSTMENT FACTOR (Beta)	<u>1.11</u>
ADJUSTED RISK PREMIUM	13.94%
LONG TERM GOVERNMENT BONDS @ 12/31/21 (ST. LOUIS FEDERAL RESERVE - 30YR LT GOVERNMENT BONDS AS FOUND ON THE ST. LOUIS FEDERAL RESERVE WEBSITE)	<u>2.01%</u>
LARGE COMPANY ESTIMATED EQUITY YIELD RATE	15.95%
ADJUSTMENT FOR SIZE PREMIUM* FOR QUANTIFICATION OF SIZE PREMIUM SEE: (DUFF & PHELPS 2021 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")	<u>0.89%</u>
COST OF EQUITY CAPITAL	16.84%

**SELECTED COMPARABLE COMPANIES
BUILD-UP MODEL**

CALCULATION OF IMPLIED COST OF EQUITY	RATE
CURRENT COST OF CORPORATE DEBT @ 1/1/2022 (See Exhibit F-8)	3.49%
AVERAGE RISK PREMIUM - COMMON STOCKS OVER AAA & AA CORPORATE BONDS (DUFF & PHELPS 2021 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")	7.40%
LESS ADJUSTMENT FOR DIFFERENTIAL BETWEEN AAA & Baa BONDS	<u>0.75%</u>
ADJUSTED RISK PREMIUM	<u>6.65%</u>
IMPLIED COST OF EQUITY	10.14%
ADJUSTMENT FOR SIZE PREMIUM FOR QUANTIFICATION OF SIZE PREMIUM SEE: (DUFF & PHELPS 2021 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")	<u>0.89%</u>
COST OF EQUITY USING SIZE PREMIUM	11.03%

**SELECTED COMPARABLE COMPANIES
DISCOUNTED CASH FLOW MODEL**

COMPANY NAME	PROJECTED GROWTH IN EARNINGS	EXPECTED DIVIDEND YIELD	EST. COST OF EQUITY
Enbridge Inc.	6.50%	8.61%	15.11%
Enterprise Products	7.50%	8.99%	16.49%
Kinder Morgan Inc.	19.00%	7.42%	26.42%
MDU Resources	14.50%	2.83%	17.33%
MPLX LP	8.00%	9.63%	17.63%
National Fuel Gas	19.50%	2.96%	22.46%
ONEOK Inc.	12.00%	6.86%	18.86%
Pembina Pipeline	7.50%	8.87%	16.37%
TC Energy Corp.	8.00%	6.39%	14.39%
Williams Cos.	10.50%	6.61%	17.11%
AVERAGE	11.30%	6.92%	18.22%
DCF COST OF EQUITY CAPITAL			18.22%

Source: Value Line, CD ROM

**SELECTED COMPARABLE COMPANIES
VALUE LINE INFORMATION DATA**

COMPANY NAME	BETA	SAFETY	FINANCIAL STRENGTH
Enbridge Inc.	0.90	3.00	4.00
Enterprise Products	1.10	3.00	4.00
Kinder Morgan Inc.	1.15	3.00	6.00
MDU Resources	1.10	3.00	4.00
MPLX LP	1.05	3.00	5.00
National Fuel Gas	0.85	3.00	5.00
ONEOK Inc.	1.50	3.00	5.00
Pembina Pipeline	1.15	3.00	4.00
TC Energy Corp.	1.05	3.00	4.00
Williams Cos.	1.20	3.00	6.00
AVERAGE	1.11	3.00	4.70
RELATIVE VALUE LINE SAFETY RANKING			1.00
RELATIVE VALUE LINE FINANCIAL STRENGTH			0.94
SELECTED VALUE LINE BETA			1.11

Source: Value Line, CD ROM

**SELECTED COMPARABLE COMPANIES
FERC "TWO STAGE" DCF MODEL**

LONG TERM (STAGE TWO) ESTIMATES

COMPANY NAME	GDP REAL GROWTH	ANNUAL INFLATION	DIVIDEND YIELD	COST OF EQUITY
Enbridge Inc.	3.08%	2.37%	8.61%	14.06%
Enterprise Products	3.08%	2.37%	8.99%	14.44%
Kinder Morgan Inc.	3.08%	2.37%	7.42%	12.87%
MDU Resources	3.08%	2.37%	2.83%	8.28%
MPLX LP	3.08%	2.37%	9.63%	15.08%
National Fuel Gas	3.08%	2.37%	2.96%	8.41%
ONEOK Inc.	3.08%	2.37%	6.86%	12.31%
Pembina Pipeline	3.08%	2.37%	8.87%	14.32%
TC Energy Corp.	3.08%	2.37%	6.39%	11.84%
Williams Cos.	3.08%	2.37%	6.61%	12.06%
AVERAGE	3.08%	2.37%	6.92%	12.37%
AVERAGE STAGE TWO ESTIMATE WEIGHTED @ 1/3			12.37%	4.12%
AVERAGE STAGE ONE ESTIMATE (FROM EXHIBIT F-21) WEIGHTED AT 2/3			18.22%	<u>12.15%</u>
TWO STAGE COST OF EQUITY CAPITAL				16.27%

Source: Value Line, CD ROM