

2024

NATURAL GAS PIPELINE

INDUSTRY

CAPITALIZATION RATE

STUDY



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CAPITALIZATION RATE STUDY
as of January 01, 2024

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CAPITALIZATION RATE CALCULATION
as of January 01, 2024

	<u>CAPITAL STRUCTURE</u>	<u>COST (YIELD)</u>	<u>FLOTATION COST</u>	<u>ADJ COST OF CAPITAL</u>	<u>WEIGHTED COST</u>
DEBT	38.00%	6.40%	1.60%	6.48%	2.46%
PREFERRED	N/A	N/A			N/A
COMMON	<u>62.00%</u>	<u>17.45%</u>	2.60%	17.92%	<u>11.11%</u>
	100.00%	13.25%			13.57%

SELECTED CAPITALIZATION RATE	13.55%
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MARKET CAPITAL STRUCTURE
12/31/2023

CURRENT YEAR ACTUAL	DEBT	EQUITY
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SELECTED COMPARABLE COMPANIES

AVERAGE	40.48%	59.52%
WEIGHTED AVERAGE	43.17%	56.83%
MEDIAN	38.37%	61.63%

PRIOR YEAR ESTIMATED PERCENT EQUITY	63.00%
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	DEBT	PREF.	EQUITY
ESTIMATED MARKET* CAPITAL STRUCTURE	38.00%	0.00%	62.00%

* "The company cost of capital is the expected rate of return that investors demand from the company's assets and operations. Therefore, it must be based on what investors are actually willing to pay for the company's outstanding securities--that is, based on the securities' market value."
 "Fundamentals of Corporate Finance", Richard A. Brealey, Stewart C. Myers, and Alan J. Marcus, McGraw-Hill Co. 1995, p.279

SELECTED COMPARABLE COMPANIES \$ CAPITAL STRUCTURE (VALUE LINE DATA) 12/31/2023	
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COMPANY NAME	L.T. DEBT	PREFERRED STOCK	COMMON STOCK @ MKT. VALUE
Cheniere Energy Part.	15,600.00	0.00	24,591.28
Enbridge Inc.	51,271.50	5,773.26	76,563.03
Energy Transfer LP	47,075.00	0.00	43,402.38
Kinder Morgan Inc.	27,871.00	0.00	39,298.39
National Fuel Gas	2,383.70	0.00	4,605.61
ONEOK Inc.	21,450.00	0.00	40,903.15
Pembina Pipeline	6,952.21	1,645.46	18,904.50
TC Energy Corp.	46,934.10	1,855.00	40,536.33
Williams Cos.	22,772.00	0.00	42,388.11
AVERAGE	26,923.28	1,030.41	36,799.20

Source: Value Line, CD ROM

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**SELECTED COMPARABLE COMPANIES %
CAPITAL STRUCTURE (VALUE LINE DATA)
12/31/2023**

COMPANY NAME	L.T. DEBT	PREFERRED STOCK	COMMON STOCK @ MKT. VALUE
Cheniere Energy Part.	38.81%	0.00%	61.19%
Enbridge Inc.	38.37%	4.32%	57.31%
Energy Transfer LP	52.03%	0.00%	47.97%
Kinder Morgan Inc.	41.49%	0.00%	58.51%
National Fuel Gas	34.10%	0.00%	65.90%
ONEOK Inc.	34.40%	0.00%	65.60%
Pembina Pipeline	25.28%	5.98%	68.74%
TC Energy Corp.	52.54%	2.08%	45.38%
Williams Cos.	34.95%	0.00%	65.05%
AVERAGE	39.11%	1.38%	59.52%
WEIGHTED AVERAGE	41.58%	1.59%	56.83%
MEDIAN	38.37%	0.00%	61.63%

Source: Value Line, CD ROM

ESTIMATED MARKET COST OF DEBT

SELECTED COMPARABLE COMPANIES

AVERAGE MERGENT (MOODY'S) PIPELINE INDUSTRY	6.28%	
AVERAGE BLOOMBERG PIPELINE INDUSTRY	6.40%	
AVERAGE STANDARD & POORS PIPELINE INDUSTRY	5.74%	
		6.14%

ESTIMATED COST OF DEBT	6.40%
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**CORPORATE BOND YIELD AVERAGES
MERGENT (MOODY'S) CORPORATE BOND YIELDS**

"Ba" Rated

**RATE IN
PERCENT**

YEAR END

Ba1	7.15%
Ba2	7.15%
Ba3	7.15%

"Baa" Rated

**RATE IN
PERCENT**

YEAR END

Baa1	6.15%
Baa2	6.15%
Baa3	6.15%

"A" Rated

**RATE IN
PERCENT**

YEAR END

A1	5.74%
A2	5.74%
A3	5.74%

Source - Mergents Bond Record & S&P Database, January 2024
Used average of 4th Qtr

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

"BB" Rated

**RATE IN
PERCENT**

YEAR END

BB+	7.61%
BB	9.30%
BB-	9.73%

"BBB" Rated

**RATE IN
PERCENT**

YEAR END

BBB+	6.03%
BBB	6.33%
BBB-	6.93%

"A" Rated

**RATE IN
PERCENT**

YEAR END

A+	5.80%
A	5.71%
A-	5.95%

Source - Bloomberg Data Base, 20 Year Maturity, January-2024
Used average of 4th Qtr

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

"BB" Rated

**RATE IN
PERCENT**

YEAR END

BB+	6.58%
BB	6.58%
BB-	6.58%

"BBB" Rated

**RATE IN
PERCENT**

YEAR END

BBB+	5.74%
BBB	5.74%
BBB-	5.74%

"A" Rated

**RATE IN
PERCENT**

YEAR END

A+	5.43%
A	5.43%
A-	5.43%

Source - Capital IQ Standard & Poors Data from Capital IQ, January-2024

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

MERGENT (MOODY'S) RATINGS & YIELDS

COMPANY NAME	MERGENT BOND RATINGS	MERGENT BOND YIELDS
Cheniere Energy Part.	Ba1	7.15%
Enbridge Inc.	Baa1	6.15%
Energy Transfer LP	Baa3	6.15%
Kinder Morgan Inc.	Baa2	6.15%
National Fuel Gas	Baa3	6.15%
ONEOK Inc.	Baa2	6.15%
Pembina Pipeline	n/a	N/A
TC Energy Corp.	Baa3	6.15%
Williams Cos.	Baa2	6.15%
AVERAGE		6.28%

Source - Mergents Bond Record & S&P Database, January 2024

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

S&P RATINGS, BLOOMBERG YIELDS

COMPANY NAME	S&P BOND RATINGS	BLOOMBERG BOND YIELDS
Cheniere Energy Part.	BBB	6.33%
Enbridge Inc.	BBB+	6.03%
Energy Transfer LP	BBB-	6.93%
Kinder Morgan Inc.	BBB	6.33%
National Fuel Gas	BBB-	6.93%
ONEOK Inc.	BBB	6.33%
Pembina Pipeline	BBB	6.33%
TC Energy Corp.	BBB+	6.03%
Williams Cos.	BBB	6.33%
AVERAGE		6.40%

Source - Bloomberg Data Base, 20 Year Maturity, January-2024

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

S&P RATINGS, CAPITAL IQ YIELDS

COMPANY NAME	S&P BOND RATINGS	S&P BOND YIELDS
Cheniere Energy Part.	BBB	5.74%
Enbridge Inc.	BBB+	5.74%
Energy Transfer LP	BBB-	5.74%
Kinder Morgan Inc.	BBB	5.74%
National Fuel Gas	BBB-	5.74%
ONEOK Inc.	BBB	5.74%
Pembina Pipeline	BBB	5.74%
TC Energy Corp.	BBB+	5.74%
Williams Cos.	BBB	5.74%
AVERAGE		5.74%

Source - Capital IQ Standard & Poors Data from Capital IQ, January-2024

COST OF COMMON EQUITY - SUMMARY

MODEL USED

PERCENT

CALCULATED MODELS BASED ON SELECTED COMPARABLE COMPANIES

CAPITAL ASSET PRICING MODEL (EX POST)	12.51%
CAPITAL ASSET PRICING MODEL (EX ANTE)	14.91%
DISCOUNTED CASH FLOW MODEL	18.79%
FERC "TWO STAGE" DCF MODEL	16.37%
BUILD-UP MODEL	13.48%
AVERAGE ALL	15.21%

SELECTED EQUITY RATE

17.45%

**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. <i>(KROLL 2023 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")</i></p>	7.17%
RISK ADJUSTMENT FACTOR (Beta)	<u>1.06</u>
ADJUSTED RISK PREMIUM	7.60%
<p>LONG TERM GOVERNMENT BONDS @ 12/31/23 <i>(ST. LOUIS FEDERAL RESERVE - 20YR LT GOVERNMENT BONDS AS FOUND ON THE ST. LOUIS FEDERAL RESERVE WEBSITE)</i></p>	<u>4.25%</u>
LARGE COMPANY ESTIMATED EQUITY YIELD RATE	11.85%
<p>ADJUSTMENT FOR SIZE PREMIUM* FOR QUANTIFICATION OF SIZE PREMIUM SEE: <i>(KROLL 2023 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")</i></p>	<u>0.66%</u>
COST OF EQUITY CAPITAL	12.51%
F-14	

**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. <i>(STANDARD & POOR'S COMPUSTAT & I/B/E/S (S&P 500))</i>	9.43%
RISK ADJUSTMENT FACTOR (Beta)	<u>1.06</u>
ADJUSTED RISK PREMIUM	10.00%
LONG TERM GOVERNMENT BONDS @ 12/31/23 <i>(ST. LOUIS FEDERAL RESERVE - 20YR LT GOVERNMENT BONDS AS FOUND ON THE ST. LOUIS FEDERAL RESERVE WEBSITE)</i>	<u>4.25%</u>
LARGE COMPANY ESTIMATED EQUITY YIELD RATE	14.25%
ADJUSTMENT FOR SIZE PREMIUM* FOR QUANTIFICATION OF SIZE PREMIUM SEE: <i>(KROLL 2023 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")</i>	<u>0.66%</u>
COST OF EQUITY CAPITAL	14.91%
F-15	

**SELECTED COMPARABLE COMPANIES
BUILD-UP MODEL**

CALCULATION OF IMPLIED COST OF EQUITY		RATE
CURRENT COST OF CORPORATE DEBT @ 1/1/2024 (See Exhibit F-6)		6.40%
AVERAGE RISK PREMIUM - COMMON STOCKS OVER AAA & AA CORPORATE BONDS <i>(KROLL 2023 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")</i>	7.17%	
LESS ADJUSTMENT FOR DIFFERENTIAL BETWEEN AAA & Baa BONDS	<u>0.75%</u>	
ADJUSTED RISK PREMIUM		<u>6.42%</u>
IMPLIED COST OF EQUITY		12.82%
ADJUSTMENT FOR SIZE PREMIUM FOR QUANTIFICATION OF SIZE PREMIUM SEE: <i>(KROLL 2023 CRSP DECILES SIZE PREMIA STUDY, "KEY VARIABLES IN ESTIMATING THE COST OF CAPITAL")</i>		<u>0.66%</u>
COST OF EQUITY USING SIZE PREMIUM		13.48%

SELECTED COMPARABLE COMPANIES	
DISCOUNTED CASH FLOW MODEL	

COMPANY NAME	PROJECTED GROWTH IN EARNINGS	EXPECTED DIVIDEND YIELD	EST. COST OF EQUITY
Cheniere Energy Part.	11.50%	6.92%	18.42%
Enbridge Inc.	5.50%	7.86%	13.36%
Energy Transfer LP	7.00%	9.96%	16.96%
Kinder Morgan Inc.	17.50%	6.82%	24.32%
National Fuel Gas	18.00%	4.08%	22.08%
ONEOK Inc.	15.00%	5.76%	20.76%
Pembina Pipeline	11.50%	6.06%	17.56%
TC Energy Corp.	12.00%	7.79%	19.79%
Williams Cos.	10.50%	5.34%	15.84%
AVERAGE	12.06%	6.73%	18.79%
DCF COST OF EQUITY CAPITAL			
18.79%			
Source: Value Line, CD ROM			

**SELECTED COMPARABLE COMPANIES
VALUE LINE INFORMATION DATA**

COMPANY NAME	BETA	SAFETY	FINANCIAL STRENGTH
Cheniere Energy Part.	0.95	3.00	7.00
Enbridge Inc.	0.85	3.00	4.00
Energy Transfer LP	1.10	3.00	5.00
Kinder Morgan Inc.	1.10	3.00	6.00
National Fuel Gas	0.85	3.00	5.00
ONEOK Inc.	1.50	3.00	5.00
Pembina Pipeline	1.05	3.00	4.00
TC Energy Corp.	1.05	3.00	4.00
Williams Cos.	1.10	3.00	6.00
AVERAGE	1.06	3.00	5.11
RELATIVE VALUE LINE SAFETY RANKING			1.00
RELATIVE VALUE LINE FINANCIAL STRENGTH			1.02
SELECTED VALUE LINE BETA			1.06
Source: Value Line, CD ROM			
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SELECTED COMPARABLE COMPANIES FERC "TWO STAGE" DCF MODEL	
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[illegible]

COMPANY NAME	GDP REAL GROWTH	ANNUAL INFLATION	DIVIDEND YIELD	COST OF EQUITY
Cheniere Energy Part.	2.46%	2.33%	6.92%	11.71%
Enbridge Inc.	2.46%	2.33%	7.86%	12.65%
Energy Transfer LP	2.46%	2.33%	9.96%	14.75%
Kinder Morgan Inc.	2.46%	2.33%	6.82%	11.61%
National Fuel Gas	2.46%	2.33%	4.08%	8.87%
ONEOK Inc.	2.46%	2.33%	5.76%	10.55%
Pembina Pipeline	2.46%	2.33%	6.06%	10.85%
TC Energy Corp.	2.46%	2.33%	7.79%	12.58%
Williams Cos.	2.46%	2.33%	5.34%	10.13%
AVERAGE	2.46%	2.33%	6.73%	11.52%
AVERAGE STAGE TWO ESTIMATE WEIGHTED @ 1/3			11.52%	3.84%
AVERAGE STAGE ONE ESTIMATE (FROM EXHIBIT F-17) WEIGHTED AT 2/3			18.79%	<u>12.53%</u>
TWO STAGE COST OF EQUITY CAPITAL				16.37%

Source: Value Line, CD ROM

NATURAL GAS AND LIQUID PIPELINES

2024 Capitalization Rate Study

for Natural Gas and Liquid Pipeline Operating Property

FLOTATION COSTS

	Rate	Divisor
For Long Term Debt	1.60%	98.78%
For Common Stock	2.60%	97.40%

The common definitions of market value all assume a sale of the subject property, which implies the existence of a market.

Appraisal Institute, *The Appraisal of Real Estate*, 14th ed., (Chicago, IL: 2013), p. 380.

To demonstrate the need for adjusting the market-determined return on equity for flotation costs, consider the following simple example. Shareholders invest \$100 of capital on which they expect to earn a return of 10% or \$10, but the company nets \$95 because of issuance costs. It is obvious that the company will have to earn more than 10% on its net book investment (rate base) of \$95 to provide investors with a \$10 return on the money actually invested. To provide the same earnings of \$10 on a reduced capital base of \$95 clearly requires a return higher than the shareholder expected return of 10%, namely $\$10/\$95=10.53\%$. This is because only the net proceeds from an equity issue are used to add to the rate base on which the investor earns.

Morin, Roger A., *Regulatory Finance, Utilities Cost of Capital*, (Arlington, VA: Public Utilities Reports, Inc., 1994), p. 166.

Flotation costs occur when new issues of stock or debt are sold to the public. The firm usually incurs several kinds of flotation or transaction costs, which reduces the actual proceeds received by the firm. Some of these are direct out-of-pocket outlays, such as fees paid to underwriters, legal expenses, and prospectus preparation costs. Because of this reduction in proceeds, the firm's required returns on these proceeds equate to a higher return to compensate for the additional costs. Flotation costs can be accounted for either by amortizing the cost, thus reducing the cash flow to discount, or by incorporating the cost into the cost of capital. Because flotation costs are not typically applied to operating cash flow, one must incorporate them into the cost of capital.

Pratt, Shannon P., *Cost of Capital, Estimation and Applications*, (New York: John Wiley & Sons, Inc. 1998) p. 176.

When new shares are sold to the public, the firm usually incurs several kinds of flotation or transaction costs...These costs may be incorporated into investment decisions in two ways. Assume that the total costs are a fraction, F, of the price, P₀, of the shares in the absence of the issue. The first method is to incorporate the total dollar transaction costs, FP₀, as a negative cash flow in the computation of the initial cost of the investment, C₀, when carrying out a net present value (NPV) analysis. The second method is to incorporate the costs directly into the discount rate applicable to the future cash flow stream...

Patterson, Cleveland S., *The Cost of Capital, Theory and Estimation*, (Westport, CT: Quorum Books, 1995), p. 27.

Note: Divisor for Debt = $100\% - (1.60\% \times 76.00\%) = 98.78\%$
 Divisor for Equity = $100\% - 2.60\% = 97.40\%$

**Natural Gas and Liquid Pipelines
2024 Capitalization Rate Study
for Natural Gas and Liquid Pipeline Operating Property**

ISSUANCE COSTS ASSOCIATED WITH COMMON STOCK

Issuer	Prospectus Date	Common Shares	Price to Public	Gross Proceeds to Issuer	Issuance Costs			Net Proceeds to Issuer	Issuance Cost %
					Underwriting	Other Exp.*	Total		
		a	b	c (a x b)	d	e	f (d + e)	g (c - f)	h (c - g) ÷ c)
1 Williams Companies	01/11/17	65,000,000	\$ 29.00	\$ 1,885,000,000	\$ 42,412,500	\$ 500,000	\$ 42,912,500	\$ 1,842,087,500	2.28%
2 Williams Companies	07/17/14	53,000,000	\$ 57.00	\$ 3,021,000,000	\$ 83,077,500	\$ 500,000	\$ 83,577,500	\$ 2,937,422,500	2.77%
3 Enbridge Inc	09/06/23	89,490,000	\$ 44.70	\$ 4,000,203,000	\$ 130,028,970	\$ 2,500,000	\$ 132,528,970	\$ 3,867,674,030	3.31%
4 Enterprise Products	12/16/20	117,850,000	\$ 21.54	\$ 2,538,489,000	\$ 50,769,780	\$ 500,000	\$ 51,269,780	\$ 2,487,219,220	2.02%
5 Magellan Midstream	05/04/17	10,200,000	\$ 73.53	\$ 750,006,000	\$ 15,000,000	\$ 250,000	\$ 15,250,000	\$ 734,756,000	2.03%
6 ONEOK	07/01/20	33,355,570	\$ 29.98	\$ 1,000,000,000	\$ 20,000,000	\$ 129,800	\$ 20,129,800	\$ 979,870,200	2.01%
7 ONEOK	06/15/20	26,000,000	\$ 32.00	\$ 832,000,000	\$ 16,640,000	\$ 650,000	\$ 17,290,000	\$ 814,710,000	2.08%
8 Plains All American	12/01/16	25,286,581	\$ 29.66	\$ 750,000,000	\$ 15,000,000	\$ -	\$ 15,000,000	\$ 735,000,000	2.00%
9 Western Midstream	06/05/15	2,000,000	\$ 58.20	\$ 116,400,000	\$ 3,492,000	\$ 200,000	\$ 3,692,000	\$ 112,708,000	3.17%
10 MDU Resources	02/22/19	3,800,000	\$ 39.50	\$ 150,100,000	\$ 4,864,000	\$ 400,000	\$ 5,264,000	\$ 144,836,000	3.51%
11 National Fuel Gas	05/29/20	22,000,000	\$ 12.90	\$ 283,800,000	\$ 9,933,000	\$ 390,000	\$ 10,323,000	\$ 273,477,000	3.64%
12 Energy Transfer	12/09/21	86,956,522	\$ 7.65	\$ 665,217,393	\$ 13,319,448	\$ 350,000	\$ 13,669,448	\$ 651,547,945	2.05%
13 NuStar Energy	09/06/12	6,200,000	\$ 48.94	\$ 303,428,000	\$ 10,163,800	\$ 300,000	\$ 10,463,800	\$ 292,964,200	3.45%
								Average (rounded)	2.60%

* Estimates of non underwriting related expenses are separately disclosed within each prospectus.

1 [Williams 1.11.17 Common Stock Issuance](#)
2 [Williams 7.17.14 Common Stock Issuance](#)
3 [Enbridge 9.06.23 Common Stock Issuance](#)
4 [Enterprise 12.16.20 Common Stock Issuance](#)
5 [Magellan Midstream 5.04.17 Common Stock Issuance](#)
6 [ONEOK 7.01.20 Common Stock Issuance](#)
7 [ONEOK 6.15.20 Common Stock Issuance](#)

8 [Plains All American 12.01.16 Common Stock Issuance](#)
9 [Western Midstream 6.05.15 Common Stock Issuance](#)
10 [MDU 2.22.19 Common Stock Issuance](#)
11 [National Fuel Gas 5.29.20 Common Stock Issuance](#)
12 [Energy Transfer 12.09.21 Common Stock Issuance](#)
13 [NuStar 9.06.12 Common Stock Issuance](#)

**Natural Gas and Liquid Pipelines
2024 Capitalization Rate Study
for Natural Gas and Liquid Pipeline Operating Property**

ISSUANCE COSTS ASSOCIATED WITH NATURAL GAS AND LIQUID PIPELINES LONG-TERM DEBT (LIMITED TO 30 YEAR BONDS)

Issuer	Prospectus Date	Gross Bond Issue	Price to Public	Gross Proceeds to Issuer	Issuance Costs			Net Proceeds to Issuer	Issuance Cost %
					Underwriting	Other Exp.*	Total		
		a	b	c (a x b)	d	e	f (d + e)	g (c - f)	h (a - g) ÷ a)
1 Williams Companies	08/03/22	\$ 750,000,000	0.99954	\$ 749,655,000	\$ 6,562,500	\$ 1,714,286	\$ 8,276,786	\$ 741,378,214	1.15%
2 Williams Companies	10/07/21	\$ 650,000,000	0.99833	\$ 648,914,500	\$ 5,687,500	\$ 1,300,000	\$ 6,987,500	\$ 641,927,000	1.24%
3 Williams Companies	06/20/14	\$ 650,000,000	0.99773	\$ 648,524,500	\$ 5,687,500	\$ 171,053	\$ 5,858,553	\$ 642,665,947	1.13%
4 Enbridge Inc	11/08/23	\$ 1,250,000,000	0.99870	\$ 1,248,375,000	\$ 10,937,500	\$ 1,785,714	\$ 12,723,214	\$ 1,235,651,786	1.15%
5 Enbridge Inc	06/25/21	\$ 500,000,000	0.99754	\$ 498,769,924	\$ 4,375,000	\$ 179,582	\$ 4,554,582	\$ 494,215,342	1.16%
6 Enbridge Inc	11/14/19	\$ 500,000,000	0.98845	\$ 494,224,924	\$ 4,375,000	\$ 73,750	\$ 4,448,750	\$ 489,776,174	2.04%
7 Enterprise Products	09/08/21	\$ 1,000,000,000	0.99170	\$ 991,700,000	\$ 8,750,000	\$ 1,780,000	\$ 10,530,000	\$ 981,170,000	1.88%
8 Enterprise Products	01/07/20	\$ 1,000,000,000	0.99413	\$ 994,130,000	\$ 8,750,000	\$ 1,566,667	\$ 10,316,667	\$ 983,813,333	1.62%
9 Kinder Morgan	07/25/22	\$ 750,000,000	0.99634	\$ 747,255,000	\$ 5,625,000	\$ 3,500,000	\$ 9,125,000	\$ 738,130,000	1.58%
10 Kinder Morgan	02/09/21	\$ 750,000,000	0.99744	\$ 748,080,000	\$ 5,625,000	\$ 2,000,000	\$ 7,625,000	\$ 740,455,000	1.27%
11 MPLX	02/06/23	\$ 500,000,000	0.99536	\$ 497,680,000	\$ 4,375,000	\$ 1,573,000	\$ 5,948,000	\$ 491,732,000	1.65%
12 MPLX	08/10/22	\$ 1,500,000,000	0.98982	\$ 1,484,730,000	\$ 13,125,000	\$ 4,000,000	\$ 17,125,000	\$ 1,467,605,000	2.16%
13 MPLX	11/09/18	\$ 1,500,000,000	0.98031	\$ 1,470,465,000	\$ 13,125,000	\$ 3,333,333	\$ 16,458,333	\$ 1,454,006,667	3.07%
14 Magellan Midstream	08/09/19	\$ 500,000,000	0.99910	\$ 499,550,000	\$ 4,375,000	\$ 750,000	\$ 5,125,000	\$ 494,425,000	1.12%
15 Magellan Midstream	01/11/19	\$ 500,000,000	0.99371	\$ 496,855,000	\$ 4,375,000	\$ 750,000	\$ 5,125,000	\$ 491,730,000	1.65%
16 ONEOK	08/11/23	\$ 1,750,000,000	0.99507	\$ 1,741,372,500	\$ 15,312,500	\$ 4,233,333	\$ 19,545,833	\$ 1,721,826,667	1.61%
17 ONEOK	05/06/20	\$ 300,000,000	0.99632	\$ 298,896,000	\$ 2,625,000	\$ 560,000	\$ 3,185,000	\$ 295,711,000	1.43%
18 ONEOK	03/09/20	# \$ 100,000,000	0.99125	\$ 99,125,000	\$ 875,000	\$ 200,000	\$ 1,075,000	\$ 98,050,000	1.95%
Average (rounded)									1.60%

* Estimates of non underwriting related expenses are separately disclosed within each prospectus. In certain instances, these estimated expense amounts were allocated across two bond issues.

1 Williams 8.03.22 LT Debt Issuance	10 Kinder Morgan 2.09.21 LT Debt Issuance
2 Williams 10.07.21 LT Debt Issuance	11 MPLX 2.06.23 LT Debt Issuance
3 Williams 6.20.14 LT Debt Issuance	12 MPLX 8.10.22 LT Debt Issuance
4 Enbridge 11.08.23 LT Debt Issuance	13 MPLX 11.09.18 LT Debt Issuance
5 Enbridge 6.25.21 LT Debt Issuance	14 Magellan Midstream 8.08.19 LT Debt Issuance
6 Enbridge 11.14.19 LT Debt Issuance	15 Magellan Midstream 1.11.19 LT Debt Issuance
7 Enterprise 9.08.21 LT Debt Issuance	16 ONEOK 8.11.23 LT Debt Issuance
8 Enterprise 1.07.20 LT Debt Issuance	17 ONEOK 5.06.20 LT Debt Issuance
9 Kinder Morgan 7.25.22 LT Debt Issuance	18 ONEOK 3.09.20 LT Debt Issuance