



Cost of Capital Study January 1, 2016

Industry: Electric Utility Industry			SIC: 4912
Equity:			Reference
Risk Adjusted Models			
	CAPM	8.68%	Page 5
Dividend Growth Models			
	DGM or DCF Model (Dividend Growth)	9.25%	Page 7
	DGM or DCF Model (Earnings Growth)	8.75%	Page 7
	DGM or DCF Model (b * ROE = Growth)	7.75%	Page 7
Estimated Cost of Equity Capital		9.50%	
Debt:			
Estimated Cost of Debt Capital		5.50%	Page 3
<hr/> Cost of Capital Summary <hr/>			
Capital Component	Market Capital Structure	Cost of Capital	Before-Tax Weighted Average Cost of Capital
Debt	38.00%	5.50%	2.09%
Equity	62.00%	9.50%	5.89%
TOTAL	100.00%		7.98%
		Rounded	8.00%

Cost of Capital Study

January 1, 2016

Staff Recommendation

Industry: Electric Utility Industry			SIC: 4912
Equity:	Direct Rate		Reference
	Estimated Cost of Equity Capital	5.63%	Page 8
Debt:			
	Estimated Cost of Debt Capital	5.00%	Page 9
Cost of Capital Summary			
			Before-Tax Weighted Average
Capital Componer	Market Capital Structure	Cost of Capital	Cost of Capital
Debt	38.00%	5.00%	1.90%
Equity	62.00%	5.63%	3.49%
TOTAL	100.00%		5.39%
		Rounded	5.50%

Cost of Capital Study
January 1, 2016
Analysis of the Market Capital Structure

Industry: Electric Utilities - Central								SIC: 4912
Company Name	Stock Symbol	Debt (\$ mil)	Debt %	Stock Price	Shares Outstanding	Equity (\$ mil)	Equity %	Total Capital (\$ mil)
ALLETE	ALE	1,568.7	38.81%	50.36	49.1	2,473	61.19%	4,041.5
Alliant Energy	LNT	3,522.2	33.87%	60.58	113.5	6,876	66.13%	10,398.1
Amer. Elec. Power	AEP	17,740.9	39.18%	56.09	491.1	27,544	60.82%	45,284.4
Ameren Corp.	AEE	6,120.0	37.97%	41.21	242.6	9,998	62.03%	16,117.9
CenterPoint Energy	CNP	8,009.0	49.18%	19.29	429	8,275	50.82%	16,283.8
Cleco Corp.	CNL	1,267.7	28.27%	53.18	60.5	3,217	71.73%	4,485.0
CMS Energy Corp.	CMS	8,559.0	47.37%	34.31	277.2	9,510	52.63%	18,068.5
DTE Energy	DTE	8,835.0	38.25%	79.45	179.5	14,262	61.75%	23,096.7
Empire Dist. Elec.	EDE	803.2	43.72%	23.77	43.5	1,034	56.28%	1,837.0
Energy Corp.	ETR	12,529.8	49.30%	71.91	179.2	12,886	50.70%	25,415.7
G't Plains Energy	GXP	3,745.1	48.06%	26.21	154.4	4,047	51.94%	7,791.9
ITC Holdings	ITC	3,928.6	41.73%	35.36	155.1	5,485	58.27%	9,413.7
MGE Energy	MGEE	391.0	21.39%	41.40	34.7	1,437	78.61%	1,827.6
OGE Energy	OGE	2,645.6	30.82%	29.73	199.7	5,937	69.18%	8,583.0
Otter Tail Corp.	OTTR	445.9	29.56%	28.04	37.9	1,063	70.44%	1,508.5
Vectren Corp.	VVC	1,722.8	32.91%	42.42	82.8	3,512	67.09%	5,234.9
Westar Energy	WR	4,186.4	32.74%	38.13	225.5	8,599	67.26%	12,785.2
Wisconsin Energy	WEC	3,302.0	32.06%	49.48	141.4	6,997	67.94%	10,298.5
Mean:		94,285	37.51%			7,397	62.49%	12,360
Median:			38.11%				61.89%	
Market Capital Structure Estimate:		Debt:	38.00%			Equity:	62.00%	

Stock Price = 2015 Average Closing Price

Data Source: Value Line Investment Survey

Cost of Capital Study
January 1, 2016
Capital Asset Pricing Model (CAPM)

CAPM ==> $K_e = R_f + (\beta * ERP)$

Industry: Electric Utilities - Central	SIC: 4912
Risk-Free Rate (R_f)	3.50%
Beta (β)	0.75
Equity Risk Premium (ERP): ($R_m - R_f$)	6.90%
Adjusted Equity Risk Premium: ($\beta * ERP$)	5.18%
Cost of Equity Capital - CAPM	8.68%
Morningstar SBBi Presentation 1926 - 2015	
Long-Term Government Bonds - Income Return ¹	5.00%
Intermediate Term US Treasury Coupon Note Yield (5-Year) ¹	4.50%
Short-Term US Treasury Bill Yield (30-Day) ¹	3.50%
Long-Term Horizon Expected Equity Risk Premium ² (Large Compay Stock Total Return - Long-Term US Government Bond Income)	6.90%
¹ SBBi Summary Statistics of Annual Returns (1926-2015), Arithmetic Mean, p. 6	
² Building Blocks for Expected Return Construction (1926-2015), p. 7	
Federal Interest Rates - IRS.gov, January 2016 Weighted Average Rates	
Long Term Treasury (30 year) ¹	3.12%
Composite Corporate Bonds ²	4.32%
¹ http://www.irs.gov/Retirement-Plans/Weighted-Average-Interest-Rate-Table	
² http://www.irs.gov/Retirement-Plans/Composite-Corporate-Bond-Rate-Table	
The ValueLine Investment Survey, Selected Yields, Page 3821, January , 2016	
U.S. Treasury Securities:	
5-year	1.79%
10-year	2.31%
30-year	3.04%
30-year Zero	3.17%
Federal Reserve Statistical Release (http://www.federalreserve.gov/Releases/H15/20160104/) 1/2016	
Treasury constant Maturities:	
5-year	1.78%
10-year	2.29%
20-year	2.66%
30-year	3.01%
Risk-Free Rate of Return R_f Estimate:	3.50%

Cost of Capital Study
January 1, 2016
Beta (β) Analysis

Industry: Electric Utilities - Central		SIC: 4912
Company Name	Stock Symbol	Beta "β"
ALLETE	ALE	0.80
Alliant Energy	LNT	0.80
Amer. Elec. Power	AEP	0.70
Ameren Corp.	AEE	0.75
CenterPoint Energy	CNP	0.85
Cleco Corp.	CNL	0.70
CMS Energy Corp.	CMS	0.75
DTE Energy	DTE	0.75
Empire Dist. Elec.	EDE	0.70
Entergy Corp.	ETR	0.70
G't Plains Energy	GXP	0.80
ITC Holdings	ITC	0.70
MGE Energy	MGEE	0.70
OGE Energy	OGE	0.95
Otter Tail Corp.	OTTR	0.85
Vectren Corp.	VVC	0.80
Westar Energy	WR	0.70
Wisconsin Energy	WEC	0.75
Mean:		0.76
Median:		0.75
Beta (β) Estimate:		0.75

NMF = Not Meaningful

Data Source: Value Line Investment Survey

Cost of Capital Study
January 1, 2016
Dividend Growth Model (DGM or DCF)

$$\text{DGM or DCF Model} \implies K_e = \frac{D_1}{P_0} + g$$

where
K_e = Cost of Equity
D₁ = Expected Dividends
P₀ = Current Price
g = Sustainable Growth

Industry: Electric Utilities - Central												SIC: 4912
Company Name	Stock Symbol	Stock Price P ₀	Expected Dividend D ₁	Dividend Yield (D ₁ / P ₀)	Dividend Growth g	Earnings Growth g				(Dividends) K _e	(Earnings) K _e	g=(b * ROE) K _e
							b	ROE	g=(b * ROE)			
ALLETE	ALE	50.36	2.10	4.17%	3.50%	4.00%	40.09%	8.97%	3.60%	7.67%	8.17%	7.77%
Alliant Energy	LNT	60.58	2.35	3.88%	6.50%	5.50%	35.04%	10.22%	3.58%	10.38%	9.38%	7.46%
Amer. Elec. Power	AEP	56.09	2.30	4.10%	5.00%	4.50%	39.95%	9.85%	3.94%	9.10%	8.60%	8.04%
Ameren Corp.	AEE	41.21	1.73	4.20%	3.50%	5.00%	33.22%	8.74%	2.90%	7.70%	9.20%	7.10%
CenterPoint Energy	CNP	19.29	1.04	5.39%	4.50%	0.00%	33.22%	13.43%	4.46%	9.89%	5.39%	9.85%
Cleco Corp.	CNL	53.18	1.65	3.10%	3.00%	2.00%	27.22%	7.98%	2.17%	6.10%	5.10%	5.27%
CMS Energy Corp.	CMS	34.31	1.26	3.67%	6.50%	6.00%	38.67%	13.28%	5.14%	10.17%	9.67%	8.81%
DTE Energy	DTE	79.45	3.04	3.83%	5.50%	4.50%	9.00%	9.07%	0.82%	9.33%	8.33%	4.64%
Empire Dist. Elec.	EDE	23.77	1.04	4.38%	2.50%	2.50%	33.86%	8.56%	2.90%	6.88%	6.88%	7.27%
Entergy Corp.	ETR	71.91	3.44	4.78%	2.50%	2.50%	41.92%	10.39%	4.36%	7.28%	7.28%	9.14%
G't Plains Energy	GXP	26.21	1.08	4.12%	5.50%	4.50%	27.00%	5.78%	1.56%	9.62%	8.62%	5.68%
ITC Holdings	ITC	35.36	0.83	2.35%	12.00%	10.00%	60.83%	14.62%	8.89%	14.35%	12.35%	11.24%
MGE Energy	MGEE	41.40	1.20	2.90%	4.00%	7.00%	43.87%	10.33%	4.53%	6.90%	9.90%	7.43%
OGE Energy	OGE	29.73	1.19	4.00%	9.50%	3.00%	39.40%	10.15%	4.00%	13.50%	7.00%	8.00%
Otter Tail Corp.	OTTR	28.04	1.25	4.46%	1.50%	6.00%	21.11%	9.68%	2.04%	5.96%	10.46%	6.50%
Vectren Corp.	VVC	42.42	1.62	3.82%	5.00%	9.00%	35.48%	11.71%	4.15%	8.82%	12.82%	7.97%
Westar Energy	WR	38.13	2.01	5.27%	8.00%	6.00%	40.08%	13.31%	5.33%	13.27%	11.27%	10.61%
Wisconsin Energy	WEC	49.48	1.52	3.07%	4.50%	4.50%	36.24%	7.98%	2.89%	7.57%	7.57%	5.96%
Mean:				3.97%	5.17%	4.81%	35.34%	10.23%	3.74%	9.14%	8.78%	7.71%
Median:				4.05%	4.75%	4.50%	35.86%	10.00%	3.77%	8.96%	8.61%	7.61%
Cost of Equity Capital - DCF K_e Estimate:										9.25%	8.75%	7.75%

NMF = Not Meaningful
b = (1 - payout ratio) = Retention Ratio
ROE = Return on Book Equity
Stock Price = 2015 Average Closing Price

Data Source: Value Line Investment Survey

Support for Market Multiples
Electric Utilities - Central
2016 Assessment Year

Industry Overall				
Company Name	Ticker	\$Stock\$ Average	Earnings	P/E Multiple
ALLETE	ALE	50.36	3.38	14.90
Alliant Energy	LNT	60.58	3.38	17.92
Amer. Elec. Power	AEP	56.09	3.59	15.62
Ameren Corp.	AEE	41.21	2.4	17.17
CenterPoint Energy	CNP	19.29	1.42	13.58
Cleco Corp.	CNL	53.18	2.2	24.17
CMS Energy Corp.	CMS	34.31	1.89	18.15
DTE Energy	DTE	79.45	4.44	17.89
Empire Dist. Elec.	EDE	23.77	1.55	15.33
Entergy Corp.	ETR	71.91	5.77	12.46
G't Plains Energy	GXP	26.21	1.37	19.13
ITC Holdings	ITC	35.36	1.54	22.96
MGE Energy	MGEE	41.40	2.06	20.10
OGE Energy	OGE	29.73	1.69	17.59
Otter Tail Corp.	OTTR	28.04	1.56	17.97
Vectren Corp.	VVC	42.42	2.39	17.75
Westar Energy	WR	38.13	2.59	14.72
Wisconsin Energy	WEC	49.48	2.09	23.67
Mean:				17.84
Median:				17.82
Weighted Mean:				17.23
P/E Estimate:				17.8
Equity Rate:				5.63%

Stock Price = 2015 Average Closing Price

Note: Units per share comparisons

Data Source: ValueLine Investment Survey

Cost of Capital Study
January 1, 2016
Direct Debt Rate Calculation

Industry: Electric Utilities - Central		
Direct Capitalization Debt Rate		
Interest Expense		\$ 4,469.8
Total Value of Debt (TVD)		\$ 89,322.9
Current Yield = Interest Expense/TVD		5.00%

\$ (millions)

Data Source: ValueLine Investment Survey