

## COST OF CAPITAL STUDY

### YIELD CAPITALIZATION

2019 Assessment Year

APPENDIX C

## NATURAL GAS DISTRIBUTION

<b>EQUITY RATE</b>		<b>8.00%</b>			
<b>CAPITAL ASSET PRICING MODEL</b>				PAGE	
CAPM Ex Ante	6.84%			4	
<b>DIVIDEND GROWTH MODELS</b>					
Value Line, based on Dividends Growth	8.00%			5	
Value Line, based on Earnings Growth	10.50%			6	
Value Line, based on Return on Equity	7.00%			7	
<b>FCFE GROWTH MODEL Multi Stage</b>	8.00%			8	
		<b>RANGE</b>	6.84 -10.50%		
<b>DEBT RATE</b>		<b>5.00%</b>		9	
<b>MARKET CAPITAL STRUCTURE</b>					
Equity	70%	x	8.00% =	5.60%	3
Debt	30%	x	5.00% = 1.50%		3
Marginal Tax Rate	24%	=	(1-.24) x 1.50%	<u>1.14%</u>	
<b>WEIGHTED AVERAGE COST OF CAPITAL</b>		<b>6.74%</b>			

## SUPPORT FOR GUIDELINE COMPANIES

Washington State Department of Revenue

2019 Assessment Year

Natural Gas Distribution

Capital Structure at Book Value

Company	Ticker	Beta	Fin'l Strength	P/E Ratio	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
Atmos Energy Corp	ato	0.60	A+	24.30	2.1%	5,011,390,381	61.9%		0.0%	3,084,800,000	38.1%	8,096,190,381
Chesapeake Util	cpk	0.70	B++	29.50	1.7%	520,837,731	68.3%		0.0%	241,600,000	31.7%	762,437,731
New Jersey Resources	njr	0.70	A+	26.10	2.4%	1,436,337,319	54.8%		0.0%	1,184,800,000	45.2%	2,621,137,319
NiSource Inc	ni	0.55	B+	32.90	3.1%	5,751,312,996	41.9%	880,000,000	6.4%	7,105,400,000	51.7%	13,736,712,996
NW Natural Gas	nwn	0.65	A	NMF	3.1%	758,615,137	51.1%		0.0%	724,700,000	48.9%	1,483,315,137
South Jersey Industries	sjj	0.85	A	18.20	4.1%	1,295,419,188	50.3%		0.0%	1,281,000,000	49.7%	2,576,419,188
Southwest Gas	swx	0.70	B++	21.10	2.7%	2,095,913,959	49.7%		0.0%	2,123,600,000	50.3%	4,219,513,959
Spire Inc	sr	0.65	B++	22.90	3.0%	2,255,597,306	54.3%		0.0%	1,900,100,000	45.7%	4,155,697,306
UGI Corp	ugi	0.80	B++	21.10	1.9%	3,675,064,274	47.0%		0.0%	4,150,700,000	53.0%	7,825,764,274
ONE Gas Inc	ogs	0.65	A	25.10	2.3%	2,040,648,542	69.5%		0.0%	893,900,000	30.5%	2,934,548,542
<b>Mean</b>		<b>0.69</b>		<b>24.58</b>	<b>2.6%</b>	<b>2,484,113,683</b>	<b>54.9%</b>		<b>0.6%</b>	<b>2,269,060,000</b>	<b>44.5%</b>	<b>4,841,173,683</b>
<b>Harmonic Mean</b>		<b>0.68</b>		<b>23.87</b>	<b>2.49%</b>		<b>53.6%</b>				<b>42.9%</b>	
<b>Median</b>		<b>0.68</b>		<b>24.30</b>	<b>2.57%</b>		<b>52.7%</b>		<b>0.0%</b>		<b>47.3%</b>	
<b>Weighted Mean</b>						<b>24,841,136,831</b>	<b>51.3%</b>		<b>0.0%</b>	<b>22,690,600,000</b>	<b>46.9%</b>	<b>48,411,736,831</b>
<b>Say</b>		<b>0.68</b>										

## SUPPORT FOR CAPITAL STRUCTURE MARKET VALUE

Washington State Department of Revenue

2019 Assessment Year

Natural Gas Distribution

Capital Structure at Market Value

Company	Ticker	Stock Price	Common Shares	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
Atmos Energy Corp	ato	92.720	116,897,373	10,838,724,425	77.4%	-	0.0%	3,161,679,000	22.6%	14,000,403,425
Chesapeake Util	cpk	81.300	16,378,545	1,331,575,709	80.4%	-	0.0%	323,800,000	19.6%	1,655,375,709
New Jersey Resources	njr	45.670	88,772,393	4,054,235,188	77.8%	-	0.0%	1,158,051,000	22.2%	5,212,286,188
NiSource Inc	ni	25.350	372,494,365	9,442,732,153	53.8%	880,000,000	5.0%	7,228,300,000	41.2%	17,551,032,153
NW Natural Gas	nwn	60.460	28,844,682	1,743,949,445	69.6%	-	0.0%	760,222,000	30.4%	2,504,171,445
South Jersey Industries	sjj	27.800	85,506,217	2,377,072,747	45.0%	-	0.0%	2,910,000,000	55.0%	5,287,072,747
Southwest Gas	swx	76.500	49,431,933	3,781,542,875	63.2%	-	0.0%	2,203,256,000	36.8%	5,984,798,875
Spire Inc	sr	74.080	50,676,192	3,754,092,405	64.4%	-	0.0%	2,074,000,000	35.6%	5,828,092,405
UGI Corp	ugi	53.350	173,844,100	9,274,582,387	69.1%	-	0.0%	4,150,300,000	30.9%	13,424,882,387
ONE Gas Inc	ogs	79.600	52,526,346	4,181,097,142	76.3%	-	0.0%	1,300,000,000	23.7%	5,481,097,142
<b>Mean</b>					<b>67.7%</b>				<b>31.8%</b>	
<b>Harmonic Mean</b>					<b>65.6%</b>				<b>28.9%</b>	
<b>Median</b>					<b>69.4%</b>				<b>30.6%</b>	
<b>Weighted Mean</b>			<b>50,779,604,474</b>	<b>66.0%</b>	<b>880,000,000</b>	<b>1.1%</b>	<b>25,269,608,000</b>	<b>32.8%</b>	<b>76,929,212,474</b>	
<b>Std Dev</b>					<b>11.4%</b>				<b>10.9%</b>	
<b>Coefficient of Variation</b>					<b>16.9%</b>				<b>34.2%</b>	
<b>Say</b>					<b>70%</b>				<b>30%</b>	<b>100%</b>

# SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT CAPITAL ASSET PRICING MODEL

Washington State Department of Revenue  
2019 Assessment Year - Natural Gas Distribution

**Ex Ante**  
**Ke = Rf + B (Rp)**

<b>Ke = Cost of Equity</b>			<b>6.84%</b>
			to page 1
	Rm =	rate of return	8.65%
	Rf =	risk free rate	3.00%
	Rp =	risk premium	5.65%
	B =	Beta	0.68
			page 7
<b>Rp = Risk Premium</b>			<b>5.65%</b>
			to above
	<b>Shannon Pratt and Roger Grabowski</b>	3.50%-6.00%	
	Cost of Capital, App and Exam, 5th Ed, 2014		
	<b>Dr. Aswath Damodaran</b>	5.96%	chart page 15
	<a href="http://pages.stern.nyu.edu/~adamodar/">http://pages.stern.nyu.edu/~adamodar/</a>	5.65%	adjusted for Rf
	2018 Implied Premium		
	<b>John Graham and Campbell Harvey</b>	6.21%	10 year expected real return
	Duke CFO magazine Global Business Outlook survey -	5.89%-6.54%	95% Interval 10 year expect
	4th Qtr 2018	6.27%	adjusted for Rf
		3.06%	Rf rate used in survey
<b>Rf = Risk Free Rate</b>			<b>3.00%</b>
			to above
	<b>Value Line Investment Survey, Selected Yields January 4, 2019, page 1949</b>		
	as of 12-26-18	US Treasury Securities year end data	
		5 year	2.65%
		10 year	2.81%
		30 year	3.06%
		30 year Zero	3.10%
	<b>Federal Reserve Statistical Release (<a href="http://www.federalreserve.gov/Releases/H15/Current/">http://www.federalreserve.gov/Releases/H15/Current/</a>)</b>		
	as of 12-31-18	Treasury Constant Maturities	
		5 year	2.51%
		10 year	2.69%
		20 year	2.87%
		30 year	3.02%
		20 year TIPS	<u>1.09%</u> 1.78%
		30 year TIPS	<u>1.21%</u> 1.81%
			TIPS inflation indication
<b>Inflation</b>			<b>2.00%</b>
			to appraisal template
	<b>Value Line Investment Survey, Economic Series January 4, 2019, page 1500</b>		
	Consumer Price Index Annual Rate of Change 2021-2023		2.30%
	<b>The Livingston Survey December 21, 2018, page 4, 10</b>		
	Inflation median (measured by the CPI) over next 10 years		2.23%
<b>Gross Domestic Product (GDP) Nominal</b>			<b>3.90%</b>
			real GDP + inflation est
	<b>Federal Reserve Projected Long Run Real GDP Growth</b>		
	Median Projection Value From December 19, 2018 Report		1.90%
	<a href="https://www.federalreserve.gov/monetarypolicy/files/fomcproitabl20181219.pdf">https://www.federalreserve.gov/monetarypolicy/files/fomcproitabl20181219.pdf</a>		
	<b>Congressional Budget Office Real GDP Economic Projections</b>		
	The Budget and Economic Outlook 2019-2029		Table D-1 pg 140
	Average Percentage Change Year to Year	2019-2023	2.18%
	<a href="http://www.cbo.gov/publication/54918">http://www.cbo.gov/publication/54918</a>	2024-2029	1.73%
	<b>Federal Reserve Bank of Philadelphia</b>		
	The Livingston Survey, December 21, 2018, page 4, 10		
	Average Annual Real GDP Growth Rate for Next Ten Years		2.07%
	<a href="https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey">https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey</a>		

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT  
DIVIDEND GROWTH MODEL**

Washington State Department of Revenue

2019 Assessment Year

Natural Gas Distribution

**Based on Dividend Growth**

$$K_e = (D1 / P_o) + G$$

Ke = Cost of Equity  
 D1 = Expected Dividends  
 Po = Current Price  
 G = Sustainable Growth

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Dividend Short Term Growth (G)	Ke Short Term Growth
Atmos Energy Corp	ato	92.72	2.10	2.26%	7.00%	9.26%
Cheapeake Util	cpk	81.30	1.54	1.89%	9.00%	10.89%
New Jersey Resources	njr	45.67	1.17	2.56%	4.00%	6.56%
NiSource Inc	ni	25.35	0.80	3.16%	7.50%	10.66%
NW Natural Gas	nwn	60.46	1.93	3.19%	2.50%	5.69%
South Jersey Industries	sjj	27.80	1.20	4.32%	4.00%	8.32%
Southwest Gas	swx	76.50	2.18	2.85%	5.50%	8.35%
Spire Inc	sr	74.08	2.37	3.20%	4.00%	7.20%
UGI Corp	ugi	53.35	1.04	1.95%	2.50%	4.45%
ONE Gas Inc	ogs	79.60	2.00	2.51%	9.50%	12.01%
<b>Mean</b>						<b>8.34%</b>
<b>Harmonic Mean</b>						<b>7.64%</b>
<b>Median</b>						<b>8.33%</b>
<b>Max</b>						<b>12.01%</b>
<b>Min</b>						<b>4.45%</b>
<b>Std Dev</b>						<b>2.42%</b>
<b>Coefficient of Variation</b>						<b>29.05%</b>
<b>Say</b>						<b>8.00%</b>

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT  
DIVIDEND GROWTH MODEL**

Washington State Department of Revenue  
2019 Assessment Year  
Natural Gas Distribution

**Based on Earnings Growth**

**Ke = (D1 / Po) + G**

- Ke = Cost of Equity
- D1 = Expected Dividends
- Po = Current Price
- G = Sustainable Growth

Company	Ticker	Stock Price (Po)	Expected Dividends (D1)	Yield (D1/Po)	Earnings Short Term Growth (G)	Ke Short Term Growth
Atmos Energy Corp	ato	92.72	2.10	2.26%	7.5%	9.76%
Chesapeake Util	cpk	81.30	1.54	1.89%	9.0%	10.89%
New Jersey Resources	njr	45.67	1.17	2.56%	2.5%	5.06%
NiSource Inc	ni	25.35	0.80	3.16%	15.0%	18.16%
NW Natural Gas	nwn	60.46	1.93	3.19%	25.5%	28.69%
South Jersey Industries	sjj	27.80	1.20	4.32%	9.5%	13.82%
Southwest Gas	swx	76.50	2.18	2.85%	8.5%	11.35%
Spire Inc	sr	74.08	2.37	3.20%	5.5%	8.70%
UGI Corp	ugi	53.35	1.04	1.95%	7.0%	8.95%
ONE Gas Inc	ogs	79.60	2.00	2.51%	9.0%	11.51%
<b>Mean</b>						<b>12.69%</b>
<b>Harmonic Mean</b>						<b>10.46%</b>
<b>Median</b>						<b>11.12%</b>
<b>Max</b>						<b>28.69%</b>
<b>Min</b>						<b>5.06%</b>
<b>Std Dev</b>						<b>6.59%</b>
<b>Coefficient of Variation</b>						<b>51.89%</b>

Say **10.50%**

## SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

Washington State Department of Revenue

2019 Assessment Year

Natural Gas Distribution

### Based on Return on Equity

$$K_e = (D1 / P_o) + G$$

**K<sub>e</sub>** = Cost of Equity  
**D1** = Expected Dividends  
**E1** = Expected Earnings  
**P<sub>o</sub>** = Current Price  
**G** = Sustainable Growth  
**b** = Retained Earnings % = (1 - Payout Ratio)  
**ROE** = Return on Equity = (E1 / P<sub>o</sub>)

Company	Ticker	Stock Price (P <sub>o</sub> )	Expected Dividend (D1)	Expected Earnings (E1)	Dividend Yield (D1/P <sub>o</sub> )	Retained Earnings (b)	ROE (E1/P <sub>o</sub> )	Growth (b*ROE)	K <sub>e</sub> Dividends	K <sub>e</sub> Earnings
Atmos Energy Corp	ato	92.720	2.10	4.20	2.3%	52.0%	4.53%	2.36%	4.62%	6.89%
Chesapeake Util	cpk	81.300	1.54	3.35	1.9%	57.0%	4.12%	2.35%	4.24%	6.47%
New Jersey Resources	njr	45.670	1.17	2.00	2.6%	60.0%	4.38%	2.63%	5.19%	7.01%
NiSource Inc	ni	25.350	0.80	1.35	3.2%	37.0%	5.33%	1.97%	5.13%	7.30%
NW Natural Gas	nwn	60.460	1.93	2.45	3.2%	14.0%	4.05%	0.57%	3.76%	4.62%
South Jersey Industries	sjj	27.800	1.20	1.70	4.3%	29.0%	6.12%	1.77%	6.09%	7.89%
Southwest Gas	swx	76.500	2.18	4.20	2.8%	29.0%	5.49%	1.59%	4.44%	7.08%
Spire Inc	sr	74.080	2.37	3.75	3.2%	44.0%	5.06%	2.23%	5.43%	7.29%
UGI Corp	ugi	53.350	1.04	2.80	1.9%	64.0%	5.25%	3.36%	5.31%	8.61%
ONE Gas Inc	ogs	79.600	2.00	3.45	2.5%	44.0%	4.33%	1.91%	4.42%	6.24%
<b>Mean</b>									<b>4.86%</b>	<b>6.94%</b>
<b>Harmonic Mean</b>									<b>4.78%</b>	<b>6.77%</b>
<b>Median</b>									<b>4.87%</b>	<b>7.04%</b>
<b>Max</b>									<b>6.09%</b>	<b>8.61%</b>
<b>Min</b>									<b>3.76%</b>	<b>4.62%</b>
<b>Std Dev</b>									<b>0.69%</b>	<b>1.06%</b>
<b>Coefficient of Variation</b>									<b>14.10%</b>	<b>15.23%</b>
<b>say</b>										<b>7.00%</b>

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT  
FREE CASH FLOW TO EQUITY MODEL MULTI STAGE**

Washington State Department of Revenue

2019 Assessment Year

Natural Gas Distribution

Company	Ticker	Stock Price	Expected Earnings	P/E	Payout Ratio	ROE	Ke
Atmos Energy Corp	ato	92.72	4.20	22.08	51.00%	9.00%	7.09%
Chesapeake Util	cpk	81.30	3.35	24.27	45.00%	10.00%	6.91%
New Jersey Resources	njr	45.67	2.00	22.84	58.00%	11.50%	5.88%
NiSource Inc	ni	25.35	1.35	18.78	61.00%	8.00%	8.94%
NW Natural Gas	nwn	60.46	2.45	24.68	79.00%	9.00%	6.39%
South Jersey Industries	sjj	27.80	1.70	16.35	72.00%	10.00%	11.13%
Southwest Gas	swx	76.50	4.20	18.21	56.00%	8.50%	9.47%
Spire Inc	sr	74.08	3.75	19.75	63.00%	8.00%	8.36%
UGI Corp	ugi	53.35	2.80	19.05	37.00%	13.20%	8.52%
ONE Gas Inc	ogs	79.60	3.45	23.07	57.00%	8.50%	6.84%
<b>Mean</b>				<b>20.91</b>	<b>57.90%</b>	<b>9.57%</b>	<b>7.95%</b>
<b>Harmonic Mean</b>				<b>20.55</b>	<b>55.46%</b>	<b>9.34%</b>	<b>7.68%</b>
<b>Median</b>				<b>20.92</b>	<b>57.50%</b>	<b>9.00%</b>	<b>7.72%</b>
<b>Industry Summary</b>				<b>21.00</b>	<b>56.00%</b>	<b>9.30%</b>	
						<b>Say</b>	<b>8.00%</b>



# SUPPORT FOR DEBT RATING AND DEBT YIELD RATE

Washington State Department of Revenue

2019 Assessment Year

Natural Gas Distribution

Company	Ticker	Mergent's Ratings	S&P Ratings
Atmos Energy Corp	ato	A2	A
Chesapeake Util	cpk		B+
New Jersey Resources	njr		BBB+
NiSource Inc	ni	Baa2	BBB+
NW Natural Gas	nwn	A3	A+
South Jersey Industries	sjj		BBB
Southwest Gas	swx	A3	BBB+
Spire Inc	sr	Baa2	A-
UGI Corp	ugi		
ONE Gas Inc	ogs	A2	A
<b>Overall Average Debt Rating</b>		<b>A3</b>	<b>BBB+</b>

Mergent's Bond Record January 2019, page 250				
Corporate	Aaa	Aa	A	Baa
October	4.14%	4.28%	4.46%	5.07%
November	4.22%	4.37%	4.53%	5.22%
December	4.02%	4.20%	4.37%	5.13%
<b>4th Qtr Average</b>	<b>4.13%</b>	<b>4.28%</b>	<b>4.45%</b>	<b>5.14%</b>
Public Utilities	Aaa	Aa	A	Baa
October		4.31%	4.45%	4.91%
November		4.40%	4.52%	5.03%
December		4.25%	4.37%	4.92%
<b>4th Qtr Average</b>		<b>4.32%</b>	<b>4.45%</b>	<b>4.95%</b>
Industrials	Aaa	Aa	A	Baa
October	4.14%	4.24%	4.45%	5.22%
November	4.22%	4.34%	4.53%	5.42%
December	4.02%	4.16%	4.36%	5.34%
<b>4th Qtr Average</b>	<b>4.13%</b>	<b>4.25%</b>	<b>4.45%</b>	<b>5.33%</b>

		Ave YTM	Med YTM
<b>S&amp;P's Long Term Bond Yield</b>	<b>BBB+</b>	5.15%	5.08%
<b>Moody's Long Term Bond Yield</b>	<b>Baa1</b>	5.03%	4.98%

Bloomberg Dec 2018	20y	25Y	30Y
<b>BBB+</b>	5.03%	5.05%	4.96%

<b>Debt Yield Rate</b>	<b>5.00%</b>
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## SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

Washington State Department of Revenue

2019 Assessment Year

Natural Gas Distribution

Company	Ticker	Stock Price	2018		2019		2018		2019	
			Actual Earnings Ratio (EPS/P)		Projected Earnings Ratio (PEPS/P)		Cash Flow Ratio (CF/P)		Projected Cash Flow Ratio	
Atmos Energy Corp	ato	92.72	4.00	4.3%	4.20	4.5%	7.24	7.8%	7.35	7.9%
Chesapeake Util	cpk	81.30	3.10	3.8%	3.35	4.1%	6.15	7.6%	6.55	8.1%
New Jersey Resources	njr	45.67	2.74	6.0%	2.00	4.4%	3.74	8.2%	3.05	6.7%
NiSource Inc	ni	25.35	1.30	5.1%	1.35	5.3%	2.85	11.2%	3.00	11.8%
NW Natural Gas	nwn	60.46	2.20	3.6%	2.45	4.1%	4.75	7.9%	5.25	8.7%
South Jersey Industries	sjj	27.80	1.62	5.8%	1.70	6.1%	2.60	9.4%	2.70	9.7%
South Jersey Industries	sjj	27.80	1.62	5.8%	4.20	15.1%	2.60	9.4%	9.05	32.6%
Southwest Gas	swx	76.50	3.95	5.2%	3.75	4.9%	8.50	11.1%	7.10	9.3%
Spire Inc	sr	74.08	4.33	5.8%	2.80	3.8%	7.55	10.2%	5.50	7.4%
UGI Corp	ugi	53.35	2.74	5.1%	2.80	5.2%	5.40	10.1%	5.50	10.3%
ONE Gas Inc	ogs	79.60	3.25	4.1%	3.45	4.3%	6.35	8.0%	6.90	8.7%
		<b>Mean</b>		<b>5.0%</b>		<b>5.6%</b>		<b>9.2%</b>		<b>11.0%</b>
		<b>Harmonic Mean</b>		<b>4.8%</b>		<b>4.9%</b>		<b>9.0%</b>		<b>9.3%</b>
		<b>Median</b>		<b>5.1%</b>		<b>4.5%</b>		<b>9.4%</b>		<b>8.7%</b>
		<b>Max</b>		<b>6.0%</b>		<b>15.1%</b>		<b>11.2%</b>		<b>32.6%</b>
		<b>Min</b>		<b>3.6%</b>		<b>3.8%</b>		<b>7.6%</b>		<b>6.7%</b>
		<b>Std Dev</b>		<b>0.9%</b>		<b>3.2%</b>		<b>1.4%</b>		<b>7.3%</b>
		<b>Coefficient of Variation</b>		<b>17.6%</b>		<b>57.2%</b>		<b>14.9%</b>		<b>66.2%</b>

Source:

**Say**

**5.0%**

**5.0%**

**9.0%**

**9.5%**

Actual earnings: Value Line / Q4 average stock price

Estimated Earnings: Value Line / Q4 average stock price

Actual Cash Flow: Value Line / Q4 average stock price

Estimated Cash Flow: Value Line / Q4 average stock price

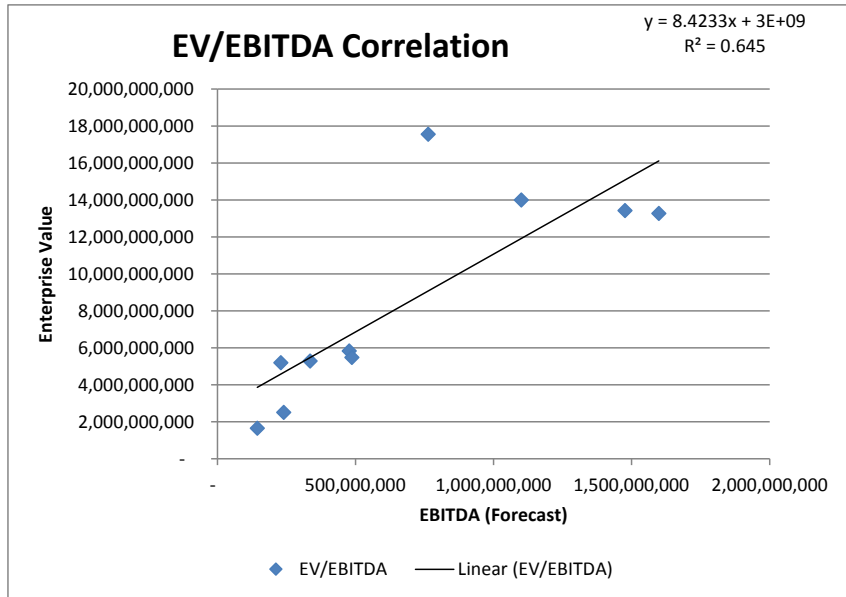
# SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

Washington State Department of Revenue

2019 Assessment Year

Natural Gas Distribution

Company	Ticker	Stock Price	Enterprise Value	EBITDA Historical	Annual Change VL	EBITDA Forecast	EV / EBITDA Forecast	Revenue Forecast	EV / Sales Forecast	Cash Flow Forecast	Debt Service	EV / CF Forecast
Atmos Energy Corp	ato	92.72	14,000,403,425	1,084,217,000	1.52%	1,100,689,910	12.72	3,115,314,990	4.49	859,195,692	158,083,950	13.76
Chesapeake Util	cpk	81.30	1,655,375,709	135,422,000	6.50%	144,229,935	11.48	729,664,180	2.27	107,279,470	16,190,000	13.41
New Jersey Resources	njr	45.67	5,193,182,188	281,777,000	-18.45%	229,791,404	22.60	2,725,312,465	1.91	270,755,799	57,902,550	15.80
NiSource Inc	ni	25.35	17,551,032,153	725,500,000	5.26%	763,684,211	22.98	5,512,916,602	3.18	1,117,483,095	361,415,000	11.87
NW Natural Gas	nwn	60.46	2,504,171,445	217,318,000	10.53%	240,193,579	10.43	797,555,457	3.14	151,434,581	38,011,100	13.22
South Jersey Industries	sjj	27.80	5,287,072,747	323,560,000	3.85%	336,004,615	15.74	1,496,358,798	3.53	230,866,786	145,500,000	14.05
Southwest Gas	swx	76.50	5,828,092,405	448,100,000	6.47%	477,094,706	12.22	2,792,904,215	2.09	447,358,994	110,162,800	10.45
Spire Inc	sr	74.08	13,424,882,387	1,569,300,000	-5.96%	1,475,765,563	9.10	1,948,499,582	6.89	359,800,963	103,700,000	28.96
UGI Corp	ugi	53.35	13,268,882,387	1,569,300,000	1.85%	1,598,361,111	8.30	7,892,522,140	1.68	956,142,550	207,515,000	11.40
ONE Gas Inc	ogs	79.60	5,481,097,142	448,484,000	8.66%	487,329,071	11.25	1,699,227,293	3.23	362,431,787	65,000,000	12.82
<b>Mean</b>							<b>13.68</b>		<b>3.24</b>			<b>14.57</b>
<b>Harmonic Mean</b>							<b>12.28</b>		<b>2.75</b>			<b>13.56</b>
<b>Median</b>							<b>11.85</b>		<b>3.16</b>			<b>13.31</b>
<b>Std Dev</b>							<b>5.21</b>		<b>1.54</b>			<b>5.27</b>
<b>Coefficient of Variation</b>							<b>0.38</b>		<b>0.48</b>			<b>0.36</b>
<b>Say</b>							<b>10.00</b>		<b>3.00</b>			<b>14.00</b>



Forecast EV/EBITDA By Rank

Guideline Companies	EV/EBITDA forecast	
UGI Corp	8.30	
Spire Inc	9.10	<b>9.95 Harmonic Mean</b>
NW Natural Gas	10.43	<b>10.11 Low Average</b>
ONE Gas Inc	11.25	<b>10.43 Low Median</b>
Chesapeake Util	11.48	<b>10.00 Say</b>
Southwest Gas	12.22	<b>16.04 High Harmonic Mean</b>
Atmos Energy Corp	12.72	<b>17.25 High Average</b>
South Jersey Industries	15.74	<b>15.74 High Median</b>
New Jersey Resources	22.60	<b>16.00 Say</b>
NiSource Inc	22.98	

## SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

2019 Assessment Year

Natural Gas Distribution

Company	Ticker	Stock Price	Revenues	Multiple	Cash Flow	Multiple	Earnings	Multiple	Book Value	Multiple
Atmos Energy Corp	ato	92.720	28.00	3.31	7.24	12.81	4.00	23.18	42.87	2.16
Chesapeake Util	cpk	81.300	41.45	1.96	6.15	13.22	3.10	26.23	31.80	2.56
New Jersey Resources	njr	45.670	33.24	1.37	3.74	12.21	2.74	16.67	16.18	2.82
NiSource Inc	ni	25.350	13.74	1.84	2.85	8.89	1.30	19.50	15.44	1.64
NW Natural Gas	nwn	60.460	25.40	2.38	4.75	12.73	2.20	27.48	26.30	2.30
South Jersey Industries	sjj	27.800	16.65	1.67	2.60	10.69	1.62	17.16	15.15	1.83
Southwest Gas	swx	76.500	54.85	1.39	8.50	9.00	3.95	19.37	42.40	1.80
Spire Inc	sr	74.080	38.78	1.91	7.55	9.81	4.33	17.11	44.51	1.66
UGI Corp	ugi	53.350	43.94	1.21	5.40	9.88	2.74	19.47	21.14	2.52
ONE Gas Inc	ogs	79.600	31.10	2.56	6.35	12.54	3.25	24.49	38.85	2.05
		<b>Mean</b>		<b>1.96</b>		<b>11.18</b>		<b>21.07</b>		<b>2.14</b>
		<b>Harmonic Mean</b>		<b>1.80</b>		<b>10.94</b>		<b>20.43</b>		<b>2.07</b>
		<b>Median</b>		<b>1.88</b>		<b>11.45</b>		<b>19.49</b>		<b>2.11</b>
		<b>Max</b>		<b>3.31</b>		<b>13.22</b>		<b>27.48</b>		<b>2.82</b>
		<b>Min</b>		<b>1.21</b>		<b>8.89</b>		<b>16.67</b>		<b>1.64</b>
		<b>Say</b>		<b>1.90</b>		<b>11.00</b>		<b>20.00</b>		<b>2.10</b>