

**EXH. AEB-5  
DOCKETS UE-22 \_\_\_/UG-22 \_\_\_  
2022 PSE GENERAL RATE CASE  
WITNESS: ANN E. BULKLEY**

**BEFORE THE  
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND  
TRANSPORTATION COMMISSION,**

**Complainant,**

**v.**

**PUGET SOUND ENERGY,**

**Respondent.**

**Docket UE-22 \_\_\_  
Docket UG-22 \_\_\_**

**FOURTH EXHIBIT (NONCONFIDENTIAL) TO THE  
PREFILED DIRECT TESTIMONY OF**

**ANN E. BULKLEY**

**ON BEHALF OF PUGET SOUND ENERGY**

**JANUARY 31, 2022**

## CAPITAL ASSET PRICING MODEL -- CURRENT RISK-FREE RATE &amp; VL BETA

$$K = R_f + \beta (R_m - R_f)$$

$$K = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta \times (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta ( $\beta$ )	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	1.97%	0.85	12.97%	11.00%	11.32%	11.73%
Alliant Energy Corporation	LNT	1.97%	0.85	12.97%	11.00%	11.32%	11.73%
Ameren Corporation	AEE	1.97%	0.85	12.97%	11.00%	11.32%	11.73%
Avista Corporation	AVA	1.97%	0.95	12.97%	11.00%	12.42%	12.56%
Black Hills Corporation	BKH	1.97%	1.00	12.97%	11.00%	12.97%	12.97%
CMS Energy Corporation	CMS	1.97%	0.80	12.97%	11.00%	10.77%	11.32%
Duke Energy Corporation	DUK	1.97%	0.85	12.97%	11.00%	11.32%	11.73%
MGE Energy, Inc.	MGEE	1.97%	0.75	12.97%	11.00%	10.22%	10.91%
NextEra Energy, Inc.	NEE	1.97%	0.90	12.97%	11.00%	11.87%	12.14%
NorthWestern Corporation	NWE	1.97%	0.95	12.97%	11.00%	12.42%	12.56%
Southern Company	SO	1.97%	0.95	12.97%	11.00%	12.42%	12.56%
Wisconsin Energy Corporation	WEC	1.97%	0.80	12.97%	11.00%	10.77%	11.32%
Xcel Energy Inc.	XEL	1.97%	0.80	12.97%	11.00%	10.77%	11.32%
Mean						11.53%	11.89%

## Notes:

[1] Source: Bloomberg Professional, as of November 30, 2021

[2] Source: Value Line

[3] Source: Direct Exhibit AEB-6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

## CAPITAL ASSET PRICING MODEL -- NEAR-TERM PROJECTED RISK-FREE RATE &amp; VL BETA

$$K = R_f + \beta (R_m - R_f)$$

$$K = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta \times (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2022 - Q1 2023)	Beta ( $\beta$ )	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	2.46%	0.85	12.97%	10.51%	11.39%	11.79%
Alliant Energy Corporation	LNT	2.46%	0.85	12.97%	10.51%	11.39%	11.79%
Ameren Corporation	AEE	2.46%	0.85	12.97%	10.51%	11.39%	11.79%
Avista Corporation	AVA	2.46%	0.95	12.97%	10.51%	12.44%	12.58%
Black Hills Corporation	BKH	2.46%	1.00	12.97%	10.51%	12.97%	12.97%
CMS Energy Corporation	CMS	2.46%	0.80	12.97%	10.51%	10.87%	11.39%
Duke Energy Corporation	DUK	2.46%	0.85	12.97%	10.51%	11.39%	11.79%
MGE Energy, Inc.	MGEE	2.46%	0.75	12.97%	10.51%	10.34%	11.00%
NextEra Energy, Inc.	NEE	2.46%	0.90	12.97%	10.51%	11.92%	12.18%
NorthWestern Corporation	NWE	2.46%	0.95	12.97%	10.51%	12.44%	12.58%
Southern Company	SO	2.46%	0.95	12.97%	10.51%	12.44%	12.58%
Wisconsin Energy Corporation	WEC	2.46%	0.80	12.97%	10.51%	10.87%	11.39%
Xcel Energy Inc.	XEL	2.46%	0.80	12.97%	10.51%	10.87%	11.39%
Mean						11.60%	11.94%

## Notes:

[1] Source: Blue Chip Financial Forecasts, Vol. 40, No.12, December 1, 2021, at 2

[2] Source: Value Line

[3] Source: Direct Exhibit AEB-6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

## CAPITAL ASSET PRICING MODEL -- LONG-TERM PROJECTED RISK-FREE RATE &amp; VL BETA

$$K = R_f + \beta (R_m - R_f)$$

$$K = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta \times (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2023 - 2027)	Beta ( $\beta$ )	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	3.40%	0.85	12.97%	9.57%	11.53%	11.89%
Alliant Energy Corporation	LNT	3.40%	0.85	12.97%	9.57%	11.53%	11.89%
Ameren Corporation	AEE	3.40%	0.85	12.97%	9.57%	11.53%	11.89%
Avista Corporation	AVA	3.40%	0.95	12.97%	9.57%	12.49%	12.61%
Black Hills Corporation	BKH	3.40%	1.00	12.97%	9.57%	12.97%	12.97%
CMS Energy Corporation	CMS	3.40%	0.80	12.97%	9.57%	11.06%	11.53%
Duke Energy Corporation	DUK	3.40%	0.85	12.97%	9.57%	11.53%	11.89%
MGE Energy, Inc.	MGEE	3.40%	0.75	12.97%	9.57%	10.58%	11.18%
NextEra Energy, Inc.	NEE	3.40%	0.90	12.97%	9.57%	12.01%	12.25%
NorthWestern Corporation	NWE	3.40%	0.95	12.97%	9.57%	12.49%	12.61%
Southern Company	SO	3.40%	0.95	12.97%	9.57%	12.49%	12.61%
Wisconsin Energy Corporation	WEC	3.40%	0.80	12.97%	9.57%	11.06%	11.53%
Xcel Energy Inc.	XEL	3.40%	0.80	12.97%	9.57%	11.06%	11.53%
Mean						11.72%	12.03%

## Notes:

[1] Source: Blue Chip Financial Forecasts, Vol. 40, No. 12, December 1, 2021, at 14

[2] Source: Value Line

[3] Source: Direct Exhibit AEB-6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

## CAPITAL ASSET PRICING MODEL -- CURRENT RISK-FREE RATE &amp; BLOOMBERG BETA

$$K = R_f + \beta (R_m - R_f)$$

$$K = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta \times (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta ( $\beta$ )	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	1.97%	1.01	12.97%	11.00%	13.11%	13.08%
Alliant Energy Corporation	LNT	1.97%	1.04	12.97%	11.00%	13.38%	13.28%
Ameren Corporation	AEE	1.97%	0.96	12.97%	11.00%	12.52%	12.63%
Avista Corporation	AVA	1.97%	0.98	12.97%	11.00%	12.77%	12.82%
Black Hills Corporation	BKH	1.97%	1.22	12.97%	11.00%	15.44%	14.82%
CMS Energy Corporation	CMS	1.97%	0.99	12.97%	11.00%	12.85%	12.88%
Duke Energy Corporation	DUK	1.97%	0.98	12.97%	11.00%	12.75%	12.80%
MGE Energy, Inc.	MGEE	1.97%	0.79	12.97%	11.00%	10.67%	11.24%
NextEra Energy, Inc.	NEE	1.97%	1.01	12.97%	11.00%	13.03%	13.02%
NorthWestern Corporation	NWE	1.97%	1.27	12.97%	11.00%	15.93%	15.19%
Southern Company	SO	1.97%	1.11	12.97%	11.00%	14.14%	13.85%
Wisconsin Energy Corporation	WEC	1.97%	0.99	12.97%	11.00%	12.85%	12.88%
Xcel Energy Inc.	XEL	1.97%	0.99	12.97%	11.00%	12.91%	12.92%
Mean						13.26%	13.19%

## Notes:

[1] Source: Bloomberg Professional, as of November 30, 2021

[2] Source: Bloomberg Professional, based on 10-year weekly returns

[3] Source: Direct Exhibit AEB-6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

## CAPITAL ASSET PRICING MODEL -- NEAR-TERM PROJECTED RISK-FREE RATE &amp; BLOOMBERG BETA

$$K = R_f + \beta (R_m - R_f)$$

$$K = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta \times (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2022 - Q1 2023)	Beta ( $\beta$ )	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	2.46%	1.01	12.97%	10.51%	13.11%	13.07%
Alliant Energy Corporation	LNT	2.46%	1.04	12.97%	10.51%	13.36%	13.26%
Ameren Corporation	AEE	2.46%	0.96	12.97%	10.51%	12.54%	12.64%
Avista Corporation	AVA	2.46%	0.98	12.97%	10.51%	12.78%	12.83%
Black Hills Corporation	BKH	2.46%	1.22	12.97%	10.51%	15.33%	14.74%
CMS Energy Corporation	CMS	2.46%	0.99	12.97%	10.51%	12.85%	12.88%
Duke Energy Corporation	DUK	2.46%	0.98	12.97%	10.51%	12.76%	12.81%
MGE Energy, Inc.	MGEE	2.46%	0.79	12.97%	10.51%	10.77%	11.32%
NextEra Energy, Inc.	NEE	2.46%	1.01	12.97%	10.51%	13.03%	13.01%
NorthWestern Corporation	NWE	2.46%	1.27	12.97%	10.51%	15.80%	15.09%
Southern Company	SO	2.46%	1.11	12.97%	10.51%	14.09%	13.81%
Wisconsin Energy Corporation	WEC	2.46%	0.99	12.97%	10.51%	12.85%	12.88%
Xcel Energy Inc.	XEL	2.46%	0.99	12.97%	10.51%	12.91%	12.93%
Mean						13.24%	13.18%

## Notes:

[1] Source: Blue Chip Financial Forecasts, Vol. 40, No.12, December 1, 2021, at 2

[2] Source: Bloomberg Professional, based on 10-year weekly returns

[3] Source: Direct Exhibit AEB-6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

## CAPITAL ASSET PRICING MODEL -- LONG-TERM PROJECTED RISK-FREE RATE &amp; BLOOMBERG BETA

$$K = R_f + \beta (R_m - R_f)$$

$$K = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta \times (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2023 - 2027)	Beta ( $\beta$ )	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	3.40%	1.01	12.97%	9.57%	13.10%	13.06%
Alliant Energy Corporation	LNT	3.40%	1.04	12.97%	9.57%	13.33%	13.24%
Ameren Corporation	AEE	3.40%	0.96	12.97%	9.57%	12.57%	12.67%
Avista Corporation	AVA	3.40%	0.98	12.97%	9.57%	12.80%	12.84%
Black Hills Corporation	BKH	3.40%	1.22	12.97%	9.57%	15.12%	14.58%
CMS Energy Corporation	CMS	3.40%	0.99	12.97%	9.57%	12.86%	12.89%
Duke Energy Corporation	DUK	3.40%	0.98	12.97%	9.57%	12.78%	12.83%
MGE Energy, Inc.	MGEE	3.40%	0.79	12.97%	9.57%	10.97%	11.47%
NextEra Energy, Inc.	NEE	3.40%	1.01	12.97%	9.57%	13.02%	13.01%
NorthWestern Corporation	NWE	3.40%	1.27	12.97%	9.57%	15.55%	14.90%
Southern Company	SO	3.40%	1.11	12.97%	9.57%	13.99%	13.73%

Wisconsin Energy Corporation	WEC	3.40%	0.99	12.97%	9.57%	12.86%	12.89%
Xcel Energy Inc.	XEL	3.40%	0.99	12.97%	9.57%	12.92%	12.93%
Mean						13.22%	13.16%

## Notes:

[1] Source: Blue Chip Financial Forecasts, Vol. 40, No. 12, December 1, 2021, at 14

[2] Source: Bloomberg Professional, based on 10-year weekly returns

[3] Source: Direct Exhibit AEB-6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

## CAPITAL ASSET PRICING MODEL -- CURRENT RISK-FREE RATE &amp; VALUE LINE LT AVERAGE BETA

$$K = R_f + \beta (R_m - R_f)$$

$$K = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta \times (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta ( $\beta$ )	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	1.97%	0.73	12.97%	11.00%	10.01%	10.75%
Alliant Energy Corporation	LNT	1.97%	0.73	12.97%	11.00%	9.94%	10.70%
Ameren Corporation	AEE	1.97%	0.72	12.97%	11.00%	9.89%	10.66%
Avista Corporation	AVA	1.97%	0.73	12.97%	11.00%	10.00%	10.74%
Black Hills Corporation	BKH	1.97%	0.86	12.97%	11.00%	11.43%	11.81%
CMS Energy Corporation	CMS	1.97%	0.68	12.97%	11.00%	9.45%	10.33%
Duke Energy Corporation	DUK	1.97%	0.62	12.97%	11.00%	8.79%	9.83%
MGE Energy, Inc.	MGEE	1.97%	0.66	12.97%	11.00%	9.23%	10.16%
NextEra Energy, Inc.	NEE	1.97%	0.69	12.97%	11.00%	9.56%	10.41%
NorthWestern Corporation	NWE	1.97%	0.70	12.97%	11.00%	9.67%	10.49%
Southern Company	SO	1.97%	0.58	12.97%	11.00%	8.35%	9.50%
Wisconsin Energy Corporation	WEC	1.97%	0.63	12.97%	11.00%	8.84%	9.88%
Xcel Energy Inc.	XEL	1.97%	0.64	12.97%	11.00%	8.95%	9.96%
Mean						9.55%	10.40%

## Notes:

[1] Source: Bloomberg Professional, as of November 30, 2021

[2] Source: Direct Exhibit AEB-5

[3] Source: Direct Exhibit AEB-6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

## CAPITAL ASSET PRICING MODEL -- NEAR-TERM PROJECTED RISK-FREE RATE &amp; VALUE LINE LT AVERAGE BETA

$$K = R_f + \beta (R_m - R_f)$$

$$K = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta \times (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30- year U.S. Treasury bond yield (Q1 2022 - Q1 2023)	Beta ( $\beta$ )	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	2.46%	0.73	12.97%	10.51%	10.15%	10.85%
Alliant Energy Corporation	LNT	2.46%	0.73	12.97%	10.51%	10.08%	10.80%
Ameren Corporation	AEE	2.46%	0.72	12.97%	10.51%	10.03%	10.76%
Avista Corporation	AVA	2.46%	0.73	12.97%	10.51%	10.13%	10.84%
Black Hills Corporation	BKH	2.46%	0.86	12.97%	10.51%	11.50%	11.87%
CMS Energy Corporation	CMS	2.46%	0.68	12.97%	10.51%	9.61%	10.45%
Duke Energy Corporation	DUK	2.46%	0.62	12.97%	10.51%	8.98%	9.97%

MGE Energy, Inc.	MGEE	2.46%	0.66	12.97%	10.51%	9.40%	10.29%
NextEra Energy, Inc.	NEE	2.46%	0.69	12.97%	10.51%	9.71%	10.53%
NorthWestern Corporation	NWE	2.46%	0.70	12.97%	10.51%	9.82%	10.60%
Southern Company	SO	2.46%	0.58	12.97%	10.51%	8.56%	9.66%
Wisconsin Energy Corporation	WEC	2.46%	0.63	12.97%	10.51%	9.03%	10.01%
Xcel Energy Inc.	XEL	2.46%	0.64	12.97%	10.51%	9.13%	10.09%
Mean						9.70%	10.52%

## Notes:

[1] Source: Blue Chip Financial Forecasts, Vol. 40, No.12, December 1, 2021, at 2

[2] Source: Direct Exhibit AEB-5

[3] Source: Direct Exhibit AEB-6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

## CAPITAL ASSET PRICING MODEL -- LONG-TERM PROJECTED RISK-FREE RATE &amp; VALUE LINE LT BETA

$$K = R_f + \beta (R_m - R_f)$$

$$K = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta \times (R_m - R_f)$$

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]
		Projected 30-year U.S. Treasury bond yield (2023 - 2027)	Beta ( $\beta$ )	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	3.40%	0.73	12.97%	9.57%	10.40%	11.04%
Alliant Energy Corporation	LNT	3.40%	0.73	12.97%	9.57%	10.34%	11.00%
Ameren Corporation	AEE	3.40%	0.72	12.97%	9.57%	10.29%	10.96%
Avista Corporation	AVA	3.40%	0.73	12.97%	9.57%	10.39%	11.03%
Black Hills Corporation	BKH	3.40%	0.86	12.97%	9.57%	11.63%	11.96%
CMS Energy Corporation	CMS	3.40%	0.68	12.97%	9.57%	9.91%	10.67%
Duke Energy Corporation	DUK	3.40%	0.62	12.97%	9.57%	9.33%	10.24%
MGE Energy, Inc.	MGEE	3.40%	0.66	12.97%	9.57%	9.72%	10.53%
NextEra Energy, Inc.	NEE	3.40%	0.69	12.97%	9.57%	10.00%	10.74%
NorthWestern Corporation	NWE	3.40%	0.70	12.97%	9.57%	10.10%	10.82%
Southern Company	SO	3.40%	0.58	12.97%	9.57%	8.95%	9.96%
Wisconsin Energy Corporation	WEC	3.40%	0.63	12.97%	9.57%	9.38%	10.28%
Xcel Energy Inc.	XEL	3.40%	0.64	12.97%	9.57%	9.48%	10.35%
Mean						9.99%	10.74%

## Notes:

[1] Source: Blue Chip Financial Forecasts, Vol. 40, No. 12, December 1, 2021, at 14

[2] Source: Direct Exhibit AEB-5

[3] Source: Direct Exhibit AEB-6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])