BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1300

In the Matter of:	)	
	)	**SUPPLEMENTAL DIRECT**
	)	**TESTIMONY OF**
Application of Duke Energy Progress, LLC	)	**ROGER A. MORIN**
For Adjustment of Rates and Charges Applicable	)	**FOR DUKE ENERGY PROGRESS,**
to Electric Service in North Carolina and	)	**LLC**
Performance-Based Regulation	)	

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND OCCUPATION.

A. My name is Dr. Roger A. Morin. My business address is Georgia State University, Robinson College of Business, University Plaza, Atlanta, Georgia, 30303. I am Emeritus Professor of Finance at the Robinson College of Business, Georgia State University and Professor of Finance for Regulated Industry at the Center for the Study of Regulated Industry at Georgia State University. I am also a principal in Utility Research International, an enterprise engaged in regulatory finance and economics consulting to business and government. I am testifying on behalf of Duke Energy Progress, LLC ("Duke Energy Progress", "DEP", or the "Company").

Q. DID YOU PREVIOUSLY SUBMIT TESTIMONY IN THIS PROCEEDING?

A. Yes, I submitted direct testimony and exhibits on October 6, 2022. My direct testimony presented the results of my analysis of the Company's cost of equity capital ("ROE").

Q. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL TESTIMONY?

A. My supplemental testimony updates my ROE recommendation in view of the appreciable changes that have occurred in capital market conditions since I prepared my direct testimony. As indicated in this update, I estimate that DEP's ROE is 10.4%, up from the 10.2% ROE presented in my direct testimony. My updated ROE estimate is based upon the same proxy group and same methodologies described in my direct testimony. Except as modified in this supplemental testimony, my direct testimony stands.

Q. CAN YOU BRIEFLY DESCRIBE THE BEHAVIOR OF INTEREST RATES SINCE YOU PREPARED YOUR REBUTTAL TESTIMONY?

A. Interest rates have increased. The level of U.S. Treasury 30-year long-term bond yield forecast is 4.3%, versus 3.7% when I prepared my direct testimony. This increase in forecast interest rates increases the CAPM, ECAPM, Historical Risk Premium, and Allowed Risk Premium results in my direct testimony.

The DCF results for the electric utilities have decreased slightly but not sufficiently to offset the increase in interest rates. This can be seen from the summary table below and from my updated exhibits, Exhibit RAM_SUPPLEMENTAL-2 to Exhibit RAM_SUPPLEMENTAL-9. These exhibits mirror the original exhibits and simply contain the updated capital market data on which I base my updated recommendation.

Q. DR. MORIN, WHAT HAS HAPPENED TO ELECTRIC UTILITY BETAS SINCE YOU PREPARED YOUR DIRECT TESTIMONY?

A. They have increased very slightly from 0.87 to 0.89, thus increasing slightly the CAPM and ECAPM results.

Q. DR. MORIN, HAS THE MARKET RISK PREMIUM CHANGED SINCE YOU PREPARED YOUR DIRECT TESTIMONY?

A. Yes, it has decreased slightly from 8.0% to 7.3%, partially offsetting the increase in interest rates in the CAPM and ECAPM analyses.

Q. DR. MORIN, PLEASE SUMMARIZE YOUR UPDATED RESULTS FROM THE VARIOUS METHODOLOGIES.

A. The net result of these capital market changes is a small increase in the cost of common equity. Alongside the original results, the updated cost of common equity estimates as of are summarized in the table below.

METHODOLOGY	ROE RESULTS	
	Original	Updated
DCF Elec Utilities Value Line Growth	9.9%	9.3%
DCF Elec Utilities Analysts Growth	9.3%	9.3%
CAPM	10.8%	11.0%
Empirical CAPM	11.1%	11.2%
Historical Risk Premium Electric	10.2%	10.8%
Allowed Risk Premium	10.2%	10.5%

The updated average ROE result is 10.4%, as is the truncated average result.

Q. DR. MORIN, WHAT IS YOUR FINAL CONCLUSION REGARDING DEP'S COST OF COMMON EQUITY CAPITAL?

A. Based on current capital market conditions and the application of my professional judgment, it is my opinion that a just and reasonable return on the common equity capital of DEP's electric utility operations in the State of North Carolina is now 10.4%.

Q. DOES THIS CONCLUDE YOUR SUPPLEMENTAL DIRECT TESTIMONY?

A. Yes.

Proxy Group for Duke Energy

	Company	Ticker
1	Alliant Energy	LNT
2	Amer. Elec. Power	AEP
3	Ameren Corp.	AEE
4	Avista Corp.	AVA
5	Black Hills	BKH
6	CenterPoint Energy	CNP
7	CMS Energy Corp.	CMS
8	Dominion Energy	D
9	DTE Energy	DTE
10	Edison Int'l	EIX
11	Entergy Corp.	ETR
12	Evergy Inc.	EVRG
13	Eversource Energy	ES
14	FirstEnergy Corp.	FE
15	IDACORP Inc.	IDA
16	NorthWestern Corp.	NWE
17	OGE Energy	OGE
18	Otter Tail Corp.	OTTR
19	Portland General	POR
20	Sempra Energy	SRE
21	Southern Co.	SO

Vertically-Integrated Elec Utilities
DCF Analysis Value Line Growth Rates

Line No.	(1) Company Name	(2) Current Dividend Yield	(3) Projected EPS Growth	(4) % Expected Divid Yield	(5) Cost of Equity
1	Alliant Energy	3.09	6.00	3.28	9.28
2	Amer. Elec. Power	3.64	6.50	3.88	10.38
3	Ameren Corp.	2.74	6.50	2.92	9.42
4	Avista Corp.	4.52	3.00	4.66	7.66
5	Black Hills	3.66	6.00	3.88	9.88
6	CenterPoint Energy	2.43	6.50	2.59	9.09
7	CMS Energy Corp.	3.07	6.50	3.27	9.77
8	Dominion Energy	4.51	5.50	4.76	10.26
9	DTE Energy	3.09	4.50	3.23	7.73
10	Edison Int'l	4.54	16.00	5.27	21.27
11	Entergy Corp.	3.82	4.00	3.97	7.97
12	Evergy Inc.	4.18	7.50	4.49	11.99
13	Eversource Energy	3.20	6.50	3.41	9.91
14	FirstEnergy Corp.	4.05	3.00	4.17	7.17
15	IDACORP Inc.	2.99	4.00	3.11	7.11
16	NorthWestern Corp.	4.54	2.50	4.65	7.15
17	OGE Energy	4.22	6.50	4.49	10.99
18	Otter Tail Corp.	2.95	4.50	3.08	7.58
19	Portland General	3.84	4.50	4.01	8.51
20	Sempra Energy	2.90	7.00	3.10	10.10
21	Southern Co.	4.15	6.50	4.42	10.92
22	WEC Energy Group	3.04	6.00	3.22	9.22
23	Xcel Energy Inc.	2.85	6.00	3.02	9.02
25	**AVERAGE**	**3.57**	**5.89**	**3.78**	**9.67**

Notes:
28 Column 2: Zacks Investment Reports 11/19 /2022
29 Column 3: Value Line Investment Reports 11/2022
30 Column 4 = Column 2 times (1 + Column 3/100)
31 Column 5 = Column 4 + Column 3

Vertically-Integrated Elec Utilities
DCF Analysis Value Line Growth Rates

Line No.	(1) Company Name	(2) Current Dividend Yield	(3) Projected EPS Growth	(4) % Expected Divid Yield	(5) Cost of Equity	(6) Return on Equity
1	Alliant Energy	3.09	6.00	3.28	9.28	9.45
2	Amer. Elec. Power	3.64	6.50	3.88	10.38	10.58
3	Ameren Corp.	2.74	6.50	2.92	9.42	9.57
4	Avista Corp.	4.52	3.00	4.66	7.66	7.90
5	Black Hills	3.66	6.00	3.88	9.88	10.08
6	CenterPoint Energy	2.43	6.50	2.59	9.09	9.22
7	CMS Energy Corp.	3.07	6.50	3.27	9.77	9.94
8	Dominion Energy	4.51	5.50	4.76	10.26	10.51
9	DTE Energy	3.09	4.50	3.23	7.73	7.90
10	Edison Int'l	4.54	16.00	5.27	21.27	
11	Entergy Corp.	3.82	4.00	3.97	7.97	8.18
12	Evergy Inc.	4.18	7.50	4.49	11.99	12.23
13	Eversource Energy	3.20	6.50	3.41	9.91	10.09
14	FirstEnergy Corp.	4.05	3.00	4.17	7.17	7.39
15	IDACORP Inc.	2.99	4.00	3.11	7.11	7.27
16	NorthWestern Corp.	4.54	2.50	4.65	7.15	7.40
17	OGE Energy	4.22	6.50	4.49	10.99	11.23
18	Otter Tail Corp.	2.95	4.50	3.08	7.58	7.75
19	Portland General	3.84	4.50	4.01	8.51	8.72
20	Sempra Energy	2.90	7.00	3.10	10.10	10.27
21	Southern Co.	4.15	6.50	4.42	10.92	11.15
22	WEC Energy Group	3.04	6.00	3.22	9.22	9.39
23	Xcel Energy Inc.	2.85	6.00	3.02	9.02	9.18
25	**AVERAGE**	**3.57**	**5.89**	**3.78**	**9.67**	**9.34**

Notes:
28 Column 2: Zacks Investment Reports 11/19 /2022
29 Column 3: Value Line Investment Reports 11/2022
30 Column 4 = Column 2 times (1 + Column 3/100)
31 Column 5 = Column 4 + Column 3
32 Column 6 = Column 4/0.95 + Column 3

Vertically Integrated Elec Utilities
DCF Analysis Analysts' Growth Forecasts

Line No.	(1) Company Name	(2) Current Dividend Yield	(3) Analysts' Growth Forecast	(4) % Expected Divid Yield	(5) Cost of Equity
1	Alliant Energy	3.09	5.92	3.27	9.19
2	Amer. Elec. Power	3.64	6.20	3.87	10.07
3	Ameren Corp.	2.74	7.20	2.94	10.14
4	Avista Corp.	4.52	5.18	4.75	9.93
5	Black Hills	3.66	5.37	3.86	9.23
6	CenterPoint Energy	2.43	3.53	2.52	6.05
7	CMS Energy Corp.	3.07	8.04	3.32	11.36
8	Dominion Energy	4.51	5.72	4.77	10.49
9	DTE Energy	3.09	6.00	3.28	9.28
10	Edison Int'l	4.54	2.57	4.66	7.23
11	Entergy Corp.	3.82	6.76	4.08	10.84
12	Evergy Inc.	4.18	5.24	4.40	9.64
13	Eversource Energy	3.20	6.21	3.40	9.61
14	FirstEnergy Corp.	4.05	6.70	4.32	11.02
15	IDACORP Inc.	2.99	3.38	3.09	6.47
16	NorthWestern Corp.	4.54	1.74	4.62	6.36
17	OGE Energy	4.22	5.00	4.43	9.43
18	Otter Tail Corp.	2.95	4.50	3.08	7.58
19	Portland General	3.84	5.35	4.05	9.40
20	Sempra Energy	2.90	5.71	3.07	8.78
21	Southern Co.	4.15	4.00	4.32	8.32
22	WEC Energy Group	3.04	6.16	3.23	9.39
23	Xcel Energy Inc.	2.85	6.47	3.03	9.50
25	**AVERAGE**	**3.57**	**5.35**	**3.75**	**9.10**

27 Notes:
28 Column 2, 3: Zacks Investment Research 11/17/22
29 Column 4 = Column 2 times (1 + Column 3/100)
30 Column 5 = Column 4 + Column 3

Vertically-Integrated Elec Utilities Beta Estimates

	(1)	(2)
Line No.	**Company Name**	**Beta**
1	Alliant Energy	0.85
2	Amer. Elec. Power	0.75
3	Ameren Corp.	0.85
4	Avista Corp.	0.90
5	Black Hills	0.95
6	CenterPoint Energy	1.15
7	CMS Energy Corp.	0.80
8	Dominion Energy	0.85
9	DTE Energy	0.95
10	Edison Int'l	0.95
11	Entergy Corp.	0.95
12	Evergy Inc.	0.90
13	Eversource Energy	0.90
14	FirstEnergy Corp.	0.85
15	IDACORP Inc.	0.80
16	NorthWestern Corp.	0.90
17	OGE Energy	1.05
18	Otter Tail Corp.	0.85
19	Portland General	0.85
20	Sempra Energy	0.95
21	Southern Co.	0.95
22	WEC Energy Group	0.80
23	Xcel Energy Inc.	0.80
25	**AVERAGE**	**0.89**

27 Source: Value Line Investment Reports 11/22

PROSPECTIVE MRP S&P 500

	Company Name	Ticker	% Curr Div Yield	Proj EPS Gth
1	3M Company	MMM	4.5	6.5
2	Abbott Labs.	ABT	1.7	8.0
3	AbbVie Inc.	ABBV	3.8	4.5
4	Accenture Plc	ACN	1.5	12.5
5	Activision Blizzard	ATVI	0.7	12.5
6	Advance Auto Parts	AAP	3.1	16.0
7	AES Corp.	AES	3.2	
8	Aflac Inc.	AFL	3.1	9.0
9	Agilent Technologies	A	0.7	11.5
10	Air Products & Chem.	APD	2.8	11.0
11	Albemarle Corp.	ALB	0.7	15.0
12	Alexandria Real Estate	ARE	3.2	10.0
13	Allegion plc	ALLE	1.6	10.5
14	Alliant Energy	LNT	3.1	6.0
15	Allstate Corp.	ALL	2.8	2.5
16	Altria Group	MO	8.5	5.5
17	Amcor plc	AMCR	3.8	14.0
18	Amer. Elec. Power	AEP	3.5	6.5
19	Amer. Express	AXP	1.4	10.0
20	Amer. Tower 'A'	AMT	2.4	9.0
21	Amer. Water Works	AWK	1.8	3.0
22	Ameren Corp.	AEE	2.8	6.5
23	Ameriprise Fin'l	AMP	2.1	12.5
24	AmerisourceBergen	ABC	1.3	8.5
25	AMETEK Inc.	AME	0.8	10.0
26	Amgen	AMGN	3.3	5.5
27	Amphenol Corp.	APH	1.2	12.5
28	Analog Devices	ADI	1.9	14.0
29	Aon plc	AON	0.8	7.5
30	Apple Inc.	AAPL	0.6	14.0
31	Applied Materials	AMAT	1.0	14.5
32	Archer Daniels Midl'd	ADM	2.1	13.0
33	Assurant Inc.	AIZ	1.8	14.0
34	AT&T Inc.	T	5.4	0.5
35	Atmos Energy	ATO	2.6	7.5
36	Automatic Data Proc.	ADP	2.1	9.0
37	AvalonBay Communities	AVB	3.4	6.5
38	Avery Dennison	AVY	1.8	12.0
39	Baker Hughes	BKR	2.8	
40	Bank of America	BAC	2.6	9.5

	Company Name	Ticker	% Curr Div Yield	Proj EPS Gth
41	Bank of New York Mellc	BK	3.4	6.5
42	Baxter Int'l Inc.	BAX	1.8	10.0
43	Becton Dickinson	BDX	1.5	5.5
44	Berkley (W.R.)	WRB	0.6	15.5
45	Best Buy Co.	BBY	4.5	7.0
46	Bio-Techne Corp.	TECH	0.4	17.5
47	BlackRock Inc.	BLK	3.2	10.0
48	BorgWarner	BWA	1.9	9.5
49	Boston Properties	BXP	4.4	-1.0
50	Broadridge Fin'l	BR	1.7	9.0
51	Brown & Brown	BRO	0.7	8.0
52	Brown-Forman 'B'	BF/B	1.1	14.0
53	C.H. Robinson	CHRW	2.2	8.0
54	Camden Property Trust	CPT	2.9	2.5
55	Campbell Soup	CPB	3.1	5.0
56	Capital One Fin'l	COF	2.1	-1.0
57	Cardinal Health	CAH	3.6	5.0
58	Carrier Global	CARR	1.6	
59	Caterpillar Inc.	CAT	2.7	10.0
60	Cboe Global Markets	CBOE	1.6	10.0
61	CDW Corp.	CDW	1.2	8.5
62	Celanese Corp.	CE	2.4	7.5
63	CenterPoint Energy	CNP	2.5	6.5
64	Chubb Ltd.	CB	1.8	11.0
65	Church & Dwight	CHD	1.1	6.0
66	Cigna Corp.	CI	1.7	9.5
67	Cincinnati Financial	CINF	2.5	7.0
68	Cintas Corp.	CTAS	1.0	13.5
69	Cisco Systems	CSCO	3.4	8.0
70	Citigroup Inc.	C	4.0	5.5
71	Citizens Fin'l Group	CFG	4.5	9.0
72	Clorox Co.	CLX	3.1	4.5
73	CME Group	CME	2.0	8.5
74	CMS Energy Corp.	CMS	3.0	6.5
75	Coca-Cola	KO	2.9	7.5
76	Cognizant Technology	CTSH	1.6	7.5
77	Colgate-Palmolive	CL	2.5	6.5
78	Comcast Corp.	CMCSA	2.6	9.5
79	Comerica Inc.	CMA	3.4	6.0
80	Conagra Brands	CAG	3.8	4.0
81	ConocoPhillips	COP	2.0	20.0
82	Consol. Edison	ED	3.5	4.5
83	Constellation Brands	STZ	1.3	5.0

	Company Name	Ticker	% Curr Div Yield	Proj EPS Gth
84	Constellation Energy	CEG	1.0	
85	Corning Inc.	GLW	3.1	17.5
86	Corteva Inc.	CTVA	1.1	16.5
87	Costco Wholesale	COST	0.7	10.5
88	Crown Castle Int'l	CCI	3.5	12.0
89	CSX Corp.	CSX	1.3	10.5
90	Cummins Inc.	CMI	3.1	8.5
91	CVS Health	CVS	2.3	6.0
92	Danaher Corp.	DHR	0.4	16.5
93	Darden Restaurants	DRI	4.0	19.5
94	Deere & Co.	DE	1.4	15.0
95	Dentsply Sirona	XRAY	1.4	10.0
96	Diamondback Energy	FANG	2.5	
97	Digital Realty Trust	DLR	4.1	-3.5
98	Discover Fin'l Svcs.	DFS	2.2	8.5
99	Dollar General	DG	0.9	10.0
100	Dominion Energy	D	3.6	14.0
101	Domino's Pizza	DPZ	1.1	16.0
102	Dover Corp.	DOV	1.6	8.0
103	Dow Inc.	DOW	5.5	15.0
104	DTE Energy	DTE	3.0	4.5
105	Duke Energy	DUK	3.9	6.0
106	Duke Realty Corp.	DRE	2.0	-2.5
107	DuPont de Nemours	DD	2.4	10.0
108	Eastman Chemical	EMN	3.3	9.5
109	Eaton Corp. plc	ETN	2.4	12.0
110	eBay Inc.	EBAY	1.9	15.5
111	Ecolab Inc.	ECL	1.3	10.5
112	Edison Int'l	EIX	4.6	15.5
113	Electronic Arts	EA	0.6	11.5
114	Elevance Health	ELV	1.1	12.5
115	Emerson Electric	EMR	2.5	10.0
116	Entergy Corp.	ETR	3.9	4.0
117	Equifax Inc.	EFX	0.8	10.0
118	Equinix Inc.	EQIX	2.0	15.0
119	Equity Residential	EQR	3.5	-6.0
120	Essex Property Trust	ESS	3.4	-4.0
121	Everest Re Group Ltd.	RE	2.5	9.5
122	Evergy Inc.	EVRG	3.8	7.5
123	Eversource Energy	ES	3.1	6.0
124	Exelon Corp.	EXC	3.2	3.5
125	Expeditors Int'l	EXPD	1.3	6.5
126	Extra Space Storage	EXR	3.5	4.0

	Company Name	Ticker	% Curr Div Yield	Proj EPS Gth
127	FactSet Research	FDS	0.9	10.0
128	Fastenal Co.	FAST	2.6	8.5
129	Federal Rlty. Inv. Trust	FRT	4.2	
130	FedEx Corp.	FDX	2.0	10.5
131	Fifth Third Bancorp	FITB	3.7	11.0
132	First Republic Bank	FRC	0.7	11.0
133	FirstEnergy Corp.	FE	4.2	7.5
134	FMC Corp.	FMC	2.1	11.0
135	Fortive Corp.	FTV	0.5	11.5
136	Fortune Brands Home	FBHS	1.7	10.5
137	Fox Corp. 'A'	FOXA	1.4	11.0
138	Franklin Resources	BEN	4.6	4.0
139	Gallagher (Arthur J.)	AJG	1.2	16.0
140	Garmin Ltd.	GRMN	2.7	8.0
141	Gen'l Dynamics	GD	2.3	8.5
142	Gen'l Mills	GIS	2.9	3.5
143	Genuine Parts	GPC	2.5	9.0
144	Gilead Sciences	GILD	4.7	13.5
145	Global Payments	GPN	0.8	17.0
146	Globe Life Inc.	GL	0.8	8.5
147	Goldman Sachs	GS	3.1	5.0
148	Grainger (W.W.)	GWW	1.5	8.5
149	Hartford Fin'l Svcs.	HIG	2.4	8.5
150	Hasbro Inc.	HAS	3.4	9.0
151	HCA Healthcare	HCA	1.3	11.0
152	Healthpeak Properties	PEAK	4.6	17.0
153	Henry (Jack) & Assoc.	JKHY	1.0	9.0
154	Hershey Co.	HSY	1.7	7.0
155	Hess Corp.	HES	1.4	
156	Hewlett Packard Ent.	HPE	3.5	7.5
157	Home Depot	HD	2.6	9.0
158	Honeywell Int'l	HON	2.2	11.0
159	Hormel Foods	HRL	2.2	8.0
160	Horton D.R.	DHI	1.3	13.0
161	Howmet Aerospace	HWM	0.2	17.0
162	HP Inc.	HPQ	3.0	12.5
163	Humana Inc.	HUM	0.7	10.5
164	Hunt (J.B.)	JBHT	0.9	11.5
165	Huntington Bancshs.	HBAN	4.9	12.5
166	Huntington Ingalls	HII	2.3	10.0
167	IDEX Corp.	IEX	1.3	10.5
168	Illinois Tool Works	ITW	2.6	11.0
169	Ingersoll Rand Inc.	IR	0.2	

	Company Name	Ticker	% Curr Div Yield	Proj EPS Gth
170	Int'l Business Mach.	IBM	5.1	3.0
171	Int'l Flavors & Frag.	IFF	2.6	7.5
172	Int'l Paper	IP	4.3	12.5
173	Intel Corp.	INTC	3.6	2.5
174	Intercontinental Exch.	ICE	1.5	6.5
175	Interpublic Group	IPG	4.0	10.0
176	Intuit Inc.	INTU	0.6	17.5
177	Invesco Ltd.	IVZ	4.5	11.5
178	Iron Mountain	IRM	5.4	11.0
179	Jacobs Engineering	J	0.7	12.0
180	Johnson & Johnson	JNJ	2.6	8.0
181	Johnson Ctrls. Int'l plc	JCI	2.8	12.5
182	JPMorgan Chase	JPM	3.8	7.0
183	Juniper Networks	JNPR	2.9	9.0
184	Kellogg	K	3.4	3.5
185	Keurig Dr Pepper	KDP	2.2	12.0
186	KeyCorp	KEY	4.3	9.0
187	Kimberly-Clark	KMB	3.5	5.5
188	Kimco Realty	KIM	3.9	8.5
189	Kinder Morgan Inc.	KMI	6.4	19.0
190	Kraft Heinz Co.	KHC	4.2	3.0
191	Kroger Co.	KR	2.2	6.5
192	L3Harris Technologies	LHX	2.0	18.5
193	Laboratory Corp.	LH	1.2	1.5
194	Lam Research	LRCX	1.3	17.0
195	Lamb Weston Holdings	LW	1.3	5.0
196	Lauder (Estee)	EL	1.0	14.0
197	Leidos Hldgs.	LDOS	1.4	9.0
198	Lennar Corp.	LEN	2.0	9.0
199	Lilly (Eli)	LLY	1.2	11.5
200	Lincoln Nat'l Corp.	LNC	3.7	11.5
201	Linde plc	LIN	1.7	12.0
202	LKQ Corp.	LKQ	1.9	11.0
203	Lockheed Martin	LMT	2.9	7.0
204	Loews Corp.	L	0.4	16.0
205	Lowe's Cos.	LOW	2.2	12.5
206	Lumen Technologies	LUMN	9.1	1.5
207	LyondellBasell Inds.	LYB	5.3	3.5
208	M&T Bank Corp.	MTB	3.0	8.0
209	Marathon Petroleum	MPC	2.6	
210	MarketAxess Holdings	MKTX	1.0	10.5
211	Marsh & McLennan	MMC	1.5	11.5
212	Martin Marietta	MLM	0.8	5.5

	Company Name	Ticker	% Curr Div Yield	Proj EPS Gth
213	Masco Corp.	MAS	2.1	8.5
214	MasterCard Inc.	MA	0.6	13.5
215	McCormick & Co.	MKC	1.8	6.0
216	McDonald's Corp.	MCD	2.2	10.5
217	McKesson Corp.	MCK	0.6	11.5
218	Medtronic plc	MDT	3.0	8.0
219	Merck & Co.	MRK	3.1	8.0
220	MetLife Inc.	MET	3.3	5.0
221	Microchip Technology	MCHP	1.7	10.0
222	Microsoft Corp.	MSFT	1.0	16.5
223	Mid-America Apt.	MAA	2.9	
224	Mondelez Int'l	MDLZ	2.3	8.0
225	Moody's Corp.	MCO	1.0	8.0
226	Morgan Stanley	MS	3.8	9.0
227	Motorola Solutions	MSI	1.5	8.0
228	MSCI Inc.	MSCI	1.0	14.5
229	Nasdaq Inc.	NDAQ	1.4	6.0
230	NetApp Inc.	NTAP	3.0	8.0
231	Newell Brands	NWL	4.6	
232	Newmont Corp.	NEM	4.2	9.5
233	News Corp. 'A'	NWSA	1.2	
234	NextEra Energy	NEE	2.2	12.5
235	NiSource Inc.	NI	3.3	9.5
236	Nordson Corp.	NDSN	1.0	12.0
237	Norfolk Southern	NSC	2.1	10.5
238	Northern Trust Corp.	NTRS	2.9	8.0
239	Northrop Grumman	NOC	1.5	6.5
240	NortonLifeLock Inc.	NLOK	2.0	9.5
241	NRG Energy	NRG	3.9	-10.5
242	Nucor Corp.	NUE	1.7	-0.5
243	NXP Semi. NV	NXPI	1.9	12.0
244	Occidental Petroleum	OXY	0.9	
245	Old Dominion Freight	ODFL	0.4	10.5
246	Omnicom Group	OMC	4.1	6.5
247	ONEOK Inc.	OKE	6.4	11.5
248	Oracle Corp.	ORCL	1.8	9.0
249	Otis Worldwide	OTIS	1.6	
250	PACCAR Inc.	PCAR	3.4	9.5
251	Packaging Corp.	PKG	3.6	11.0
252	Paramount Global	PARA	3.7	7.5
253	Parker-Hannifin	PH	2.0	13.5
254	Paychex Inc.	PAYX	2.6	9.5
255	Pentair plc	PNR	1.7	12.5

	Company Name	Ticker	% Curr Div Yield	Proj EPS Gth
256	PepsiCo Inc.	PEP	2.6	6.0
257	PerkinElmer Inc.	PKI	0.2	5.0
258	Pfizer Inc.	PFE	3.1	6.5
259	Philip Morris Int'l	PM	5.6	5.0
260	Pinnacle West Capital	PNW	5.0	0.5
261	PNC Financial Serv.	PNC	3.7	12.0
262	Pool Corp.	POOL	1.0	14.0
263	PPG Inds.	PPG	2.0	4.0
264	PPL Corp.	PPL	3.5	-0.5
265	Price (T. Rowe) Group	TROW	4.1	8.0
266	Principal Fin'l Group	PFG	4.0	6.5
267	Procter & Gamble	PG	2.6	6.5
268	Progressive Corp.	PGR	0.4	6.5
269	Prologis	PLD	2.6	6.0
270	Prudential Fin'l	PRU	5.0	5.0
271	Public Serv. Enterprise	PEG	3.7	4.0
272	Public Storage	PSA	2.6	8.0
273	PulteGroup Inc.	PHM	1.4	11.0
274	PVH Corp.	PVH	0.2	13.5
275	Qualcomm Inc.	QCOM	2.0	19.0
276	Quanta Services	PWR	0.2	16.0
277	Quest Diagnostics	DGX	2.0	3.5
278	Ralph Lauren	RL	3.1	12.5
279	Raymond James Fin'l	RJF	1.4	14.5
280	Raytheon Technologies	RTX	2.3	7.0
281	Realty Income Corp.	O	4.3	6.0
282	Regency Centers Corp.	REG	4.0	12.5
283	Regions Financial	RF	3.7	10.0
284	Republic Services	RSG	1.4	12.5
285	ResMed Inc.	RMD	0.7	13.5
286	Robert Half Int'l	RHI	2.1	10.5
287	Rockwell Automation	ROK	2.1	9.5
288	Rollins Inc.	ROL	1.1	9.5
289	Roper Tech.	ROP	0.6	3.5
290	Ross Stores	ROST	1.6	13.5
291	S&P Global	SPGI	0.9	12.5
292	Schwab (Charles)	SCHW	1.3	9.0
293	Seagate Technology plc	STX	3.4	15.0
294	Sealed Air	SEE	1.4	10.0
295	Sempra Energy	SRE	3.1	7.5
296	Sherwin-Williams	SHW	1.0	11.5
297	Simon Property Group	SPG	6.8	3.0
298	Skyworks Solutions	SWKS	2.1	14.5

	Company Name	Ticker	% Curr Div Yield	Proj EPS Gth
299	Smith (A.O.)	AOS	1.9	11.5
300	Smucker (J.M.)	SJM	3.2	4.0
301	Snap-on Inc.	SNA	3.0	-16.0
302	Southern Co.	SO	3.8	6.5
303	Stanley Black & Decker	SWK	2.9	8.5
304	Starbucks Corp.	SBUX	2.5	16.5
305	State Street Corp.	STT	3.6	9.5
306	STERIS plc	STE	0.8	11.5
307	Stryker Corp.	SYK	1.4	8.5
308	Synchrony Financial	SYF	2.6	6.0
309	Sysco Corp.	SYY	2.2	16.5
310	Tapestry Inc.	TPR	3.0	15.0
311	Target Corp.	TGT	2.8	12.0
312	TE Connectivity	TEL	1.8	10.5
313	Teleflex Inc.	TFX	0.5	10.0
314	Teradyne Inc.	TER	0.4	9.0
315	Texas Instruments	TXN	2.8	9.0
316	Textron Inc.	TXT	0.1	10.5
317	Thermo Fisher Sci.	TMO	0.2	10.0
318	TJX Companies	TJX	1.9	17.0
319	Tractor Supply	TSCO	1.9	12.5
320	Trane Technologies plc	TT	2.0	
321	Travelers Cos.	TRV	2.4	6.5
322	Truist Fin'l	TFC	4.1	6.5
323	Tyson Foods 'A'	TSN	2.2	4.5
324	U.S. Bancorp	USB	4.3	6.0
325	UDR Inc.	UDR	3.4	10.5
326	Union Pacific	UNP	2.4	9.5
327	United Parcel Serv.	UPS	3.3	11.0
328	UnitedHealth Group	UNH	1.3	12.0
329	Universal Health `B'	UHS	0.7	9.0
330	V.F. Corp.	VFC	4.2	11.0
331	Valero Energy	VLO	3.6	12.5
332	Ventas Inc.	VTR	3.8	10.5
333	Verisk Analytics	VRSK	0.7	13.5
334	Verizon Communic.	VZ	5.3	3.0
335	VICI Properties	VICI	4.4	8.5
336	Visa Inc.	V	0.8	13.5
337	Vornado R'lty Trust	VNO	7.1	-20.5
338	Vulcan Materials	VMC	1.0	8.5
339	Wabtec Corp.	WAB	0.7	9.5
340	Walgreens Boots	WBA	4.9	5.0
341	Walmart Inc.	WMT	1.7	7.5

	Company Name	Ticker	% Curr Div Yield	Proj EPS Gth
342	Waste Management	WM	1.7	8.0
343	WEC Energy Group	WEC	3.1	6.0
344	Wells Fargo	WFC	2.5	11.5
345	Welltower Inc.	WELL	3.1	3.5
346	West Pharmac. Svcs.	WST	0.2	17.0
347	WestRock Co.	WRK	2.4	20.0
348	Weyerhaeuser Co.	WY	2.0	8.0
349	Whirlpool Corp.	WHR	4.2	7.0
350	Williams Cos.	WMB	5.2	8.5
351	Willis Towers Wat. plc	WTW	1.6	8.0
352	Xcel Energy Inc.	XEL	3.0	6.0
353	Xylem Inc.	XYL	1.5	9.0
354	Yum! Brands	YUM	1.9	10.5
355	Zimmer Biomet Hldgs.	ZBH	0.9	5.5
356	Zions Bancorp.	ZION	3.0	8.0
357	Zoetis Inc.	ZTS	0.7	11.0
	AVERAGE		**2.4**	**9.1**

Source: Value Line Investment Survey 11/2022

ELECTRIC UTILITIES CAPM AND ECAPM RESULTS

Line No.	Company Name	Risk-Free Rate (1)	Beta (2)	MRP (3)	CAPM Cost of Equity (4)	Flotation Cost (5)	CAPM ROE (6)	ECAPM Cost of Equity (7)	Flotation Cost **(8)**	ECAPM ROE (9)
									0	
1	Alliant Energy	4.30%	0.85	7.30%	10.51%	0.20%	10.71%	10.78%	0.20%	10.98%
2	Amer. Elec. Power	4.30%	0.75	7.30%	9.78%	0.20%	9.98%	10.23%	0.20%	10.43%
3	Ameren Corp.	4.30%	0.85	7.30%	10.51%	0.20%	10.71%	10.78%	0.20%	10.98%
4	Avista Corp.	4.30%	0.90	7.30%	10.87%	0.20%	11.07%	11.05%	0.20%	11.25%
5	Black Hills	4.30%	0.95	7.30%	11.24%	0.20%	11.44%	11.33%	0.20%	11.53%
6	CenterPoint Energy	4.30%	1.15	7.30%	12.70%	0.20%	12.90%	12.42%	0.20%	12.62%
7	CMS Energy Corp.	4.30%	0.80	7.30%	10.14%	0.20%	10.34%	10.51%	0.20%	10.71%
8	Dominion Energy	4.30%	0.85	7.30%	10.51%	0.20%	10.71%	10.78%	0.20%	10.98%
9	DTE Energy	4.30%	0.95	7.30%	11.24%	0.20%	11.44%	11.33%	0.20%	11.53%
10	Edison Int'l	4.30%	0.95	7.30%	11.24%	0.20%	11.44%	11.33%	0.20%	11.53%
11	Entergy Corp.	4.30%	0.95	7.30%	11.24%	0.20%	11.44%	11.33%	0.20%	11.53%
12	Evergy Inc.	4.30%	0.90	7.30%	10.87%	0.20%	11.07%	11.05%	0.20%	11.25%
13	Eversource Energy	4.30%	0.90	7.30%	10.87%	0.20%	11.07%	11.05%	0.20%	11.25%
14	FirstEnergy Corp.	4.30%	0.85	7.30%	10.51%	0.20%	10.71%	10.78%	0.20%	10.98%
15	IDACORP Inc.	4.30%	0.80	7.30%	10.14%	0.20%	10.34%	10.51%	0.20%	10.71%
16	NorthWestern Corp.	4.30%	0.90	7.30%	10.87%	0.20%	11.07%	11.05%	0.20%	11.25%
17	OGE Energy	4.30%	1.05	7.30%	11.97%	0.20%	12.17%	11.87%	0.20%	12.07%
18	Otter Tail Corp.	4.30%	0.85	7.30%	10.51%	0.20%	10.71%	10.78%	0.20%	10.98%
19	Portland General	4.30%	0.85	7.30%	10.51%	0.20%	10.71%	10.78%	0.20%	10.98%
20	Sempra Energy	4.30%	0.95	7.30%	11.24%	0.20%	11.44%	11.33%	0.20%	11.53%
21	Southern Co.	4.30%	0.95	7.30%	11.24%	0.20%	11.44%	11.33%	0.20%	11.53%
22	WEC Energy Group	4.30%	0.80	7.30%	10.14%	0.20%	10.34%	10.51%	0.20%	10.71%
23	Xcel Energy Inc.	4.30%	0.80	7.30%	10.14%	0.20%	10.34%	10.51%	0.20%	10.71%
26	**AVERAGE**						**11.02%**			**11.22%**

Notes: Column (1): Risk-free rate
Column (2): see Exhibit RAM-5
Column (3): Market Risk Premium
Column (4): Column (1) + Column (2) x Column (3)
Column (5): Flotation cost allowance
Column (6): Column (4) + Column (5)
Column (7): Column (1) + 0.25 x Column (3) + 0.75 x Column (2) x Column (3) + Column (8)

2021 Utility Industry Historical Risk Premium

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Line No	Year	Long-Term Government Bond Yield	Long-Term Government Income Component Bond Yield	20 year Maturity Bond Value	Gain/Loss	Interest	Bond Total Return	S&P Utility Index Return	Utility Equity Risk Premium Over Bond Returns	Utility Equity Risk Premium Over Bond Return Income Component
1	1931	4.07%	3.33%	1,000.00						
2	1932	3.15%	3.69%	1,135.75	135.75	40.70	17.64%	-0.54%	-18.18%	-4.23%
3	1933	3.36%	3.12%	969.60	-30.40	31.50	0.11%	-21.87%	-21.98%	-24.99%
4	1934	2.93%	3.18%	1,064.73	64.73	33.60	9.83%	-20.41%	-30.24%	-23.59%
5	1935	2.76%	2.81%	1,025.99	25.99	29.30	5.53%	76.63%	71.10%	73.82%
6	1936	2.56%	2.77%	1,031.15	31.15	27.60	5.88%	20.69%	14.81%	17.92%
7	1937	2.73%	2.66%	973.93	-26.07	25.60	-0.05%	-37.04%	-36.99%	-39.70%
8	1938	2.52%	2.64%	1,032.83	32.83	27.30	6.01%	22.45%	16.44%	19.81%
9	1939	2.26%	2.40%	1,041.65	41.65	25.20	6.68%	11.26%	4.58%	8.86%
10	1940	1.94%	2.23%	1,052.84	52.84	22.60	7.54%	-17.15%	-24.69%	-19.38%
11	1941	2.04%	1.94%	983.64	-16.36	19.40	0.30%	-31.57%	-31.87%	-33.51%
12	1942	2.46%	2.46%	933.97	-66.03	20.40	-4.56%	15.39%	19.95%	12.93%
13	1943	2.48%	2.44%	996.86	-3.14	24.60	2.15%	46.07%	43.92%	43.63%
14	1944	2.46%	2.46%	1,003.14	3.14	24.80	2.79%	18.03%	15.24%	15.57%
15	1945	1.99%	2.34%	1,077.23	77.23	24.60	10.18%	53.33%	43.15%	50.99%
16	1946	2.12%	2.04%	978.90	-21.10	19.90	-0.12%	1.26%	1.38%	-0.78%
17	1947	2.43%	2.13%	951.13	-48.87	21.20	-2.77%	-13.16%	-10.39%	-15.29%
18	1948	2.37%	2.40%	1,009.51	9.51	24.30	3.38%	4.01%	0.63%	1.61%
19	1949	2.09%	2.25%	1,045.58	45.58	23.70	6.93%	31.39%	24.46%	29.14%
20	1950	2.24%	2.12%	975.93	-24.07	20.90	-0.32%	3.25%	3.57%	1.13%
21	1951	2.69%	2.38%	930.75	-69.25	22.40	-4.69%	18.63%	23.32%	16.25%
22	1952	2.79%	2.66%	984.75	-15.25	26.90	1.17%	19.25%	18.08%	16.59%
23	1953	2.74%	2.84%	1,007.66	7.66	27.90	3.56%	7.85%	4.29%	5.01%
24	1954	2.72%	2.79%	1,003.07	3.07	27.40	3.05%	24.72%	21.67%	21.93%
25	1955	2.95%	2.75%	965.44	-34.56	27.20	-0.74%	11.26%	12.00%	8.51%
26	1956	3.45%	2.99%	928.19	-71.81	29.50	-4.23%	5.06%	9.29%	2.07%
27	1957	3.23%	3.44%	1,032.23	32.23	34.50	6.67%	6.36%	-0.31%	2.92%
28	1958	3.82%	3.27%	918.01	-81.99	32.30	-4.97%	40.70%	45.67%	37.43%
29	1959	4.47%	4.01%	914.65	-85.35	38.20	-4.71%	7.49%	12.20%	3.48%
30	1960	3.80%	4.26%	1,093.27	93.27	44.70	13.80%	20.26%	6.46%	16.00%
31	1961	4.15%	3.83%	952.75	-47.25	38.00	-0.92%	29.33%	30.25%	25.50%
32	1962	3.95%	4.00%	1,027.48	27.48	41.50	6.90%	-2.44%	-9.34%	-6.44%

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
									Utility	Utility
		Long-Term	Long-Term	20 year				S&P	Equity	Equity
33	1963	4.17%	3.89%	970.35	-29.65	39.50	0.99%	12.36%	11.37%	8.47%
34	1964	4.23%	4.15%	991.96	-8.04	41.70	3.37%	15.91%	12.54%	11.76%
35	1965	4.50%	4.19%	964.64	-35.36	42.30	0.69%	4.67%	3.98%	0.48%
36	1966	4.55%	4.49%	993.48	-6.52	45.00	3.85%	-4.48%	-8.33%	-8.97%
37	1967	5.56%	4.59%	879.01	-120.99	45.50	-7.55%	-0.63%	6.92%	-5.22%
38	1968	5.98%	5.50%	951.38	-48.62	55.60	0.70%	10.32%	9.62%	4.82%
39	1969	6.87%	5.96%	904.00	-96.00	59.80	-3.62%	-15.42%	-11.80%	-21.38%
40	1970	6.48%	6.74%	1,043.38	43.38	68.70	11.21%	16.56%	5.35%	9.82%
41	1971	5.97%	6.32%	1,059.09	59.09	64.80	12.39%	2.41%	-9.98%	-3.91%
42	1972	5.99%	5.87%	997.69	-2.31	59.70	5.74%	8.15%	2.41%	2.28%
43	1973	7.26%	6.51%	867.09	-132.91	59.90	-7.30%	-18.07%	-10.77%	-24.58%
44	1974	7.60%	7.27%	965.33	-34.67	72.60	3.79%	-21.55%	-25.34%	-28.82%
45	1975	8.05%	7.99%	955.63	-44.37	76.00	3.16%	44.49%	41.33%	36.50%
46	1976	7.21%	7.89%	1,088.25	88.25	80.50	16.87%	31.81%	14.94%	23.92%
47	1977	8.03%	7.14%	919.03	-80.97	72.10	-0.89%	8.64%	9.53%	1.50%
48	1978	8.98%	7.90%	912.47	-87.53	80.30	-0.72%	-3.71%	-2.99%	-11.61%
49	1979	10.12%	8.86%	902.99	-97.01	89.80	-0.72%	13.58%	14.30%	4.72%
50	1980	11.99%	9.97%	859.23	-140.77	101.20	-3.96%	15.08%	19.04%	5.11%
51	1981	13.34%	11.55%	906.45	-93.55	119.90	2.63%	11.74%	9.11%	0.19%
52	1982	10.95%	13.50%	1,192.38	192.38	133.40	32.58%	26.52%	-6.06%	13.02%
53	1983	11.97%	10.38%	923.12	-76.88	109.50	3.26%	20.01%	16.75%	9.63%
54	1984	11.70%	11.74%	1,020.70	20.70	119.70	14.04%	26.04%	12.00%	14.30%
55	1985	9.56%	11.25%	1,189.27	189.27	117.00	30.63%	33.05%	2.42%	21.80%
56	1986	7.89%	8.98%	1,166.63	166.63	95.60	26.22%	28.53%	2.31%	19.55%
57	1987	9.20%	7.92%	881.17	-118.83	78.90	-3.99%	-2.92%	1.07%	-10.84%
58	1988	9.19%	8.97%	1,000.91	0.91	92.00	9.29%	18.27%	8.98%	9.30%
59	1989	8.16%	8.81%	1,100.73	100.73	91.90	19.26%	47.80%	28.54%	38.99%
60	1990	8.44%	8.19%	973.17	-26.83	81.60	5.48%	-2.57%	-8.05%	-10.76%
61	1991	7.30%	8.22%	1,118.94	118.94	84.40	20.33%	14.61%	-5.72%	6.39%
62	1992	7.26%	7.26%	1,004.19	4.19	73.00	7.72%	8.10%	0.38%	0.84%
63	1993	6.54%	7.17%	1,079.70	79.70	72.60	15.23%	14.41%	-0.82%	7.24%
64	1994	7.99%	6.59%	856.40	-143.60	65.40	-7.82%	-7.94%	-0.12%	-14.53%
65	1995	6.03%	7.60%	1,225.98	225.98	79.90	30.59%	42.15%	11.56%	34.55%
66	1996	6.73%	6.18%	923.67	-76.33	60.30	-1.60%	3.14%	4.74%	-3.04%
67	1997	6.02%	6.64%	1,081.92	81.92	67.30	14.92%	24.69%	9.77%	18.05%
68	1998	5.42%	5.83%	1,072.71	72.71	60.20	13.29%	14.82%	1.53%	8.99%
69	1999	6.82%	5.57%	848.41	-151.59	54.20	-9.74%	-8.85%	0.89%	-14.42%
70	2000	5.58%	6.50%	1,148.30	148.30	68.20	21.65%	59.70%	38.05%	53.20%

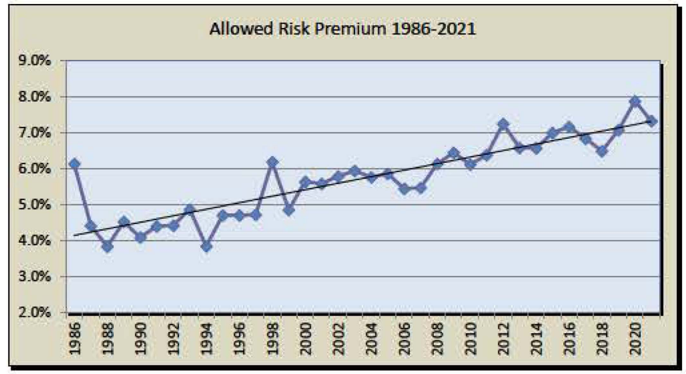
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
									Utility	Utility
		Long-Term	Long-Term	20 year				S&P	Equity	Equity
71	2001	5.75%	5.53%	979.95	-20.05	55.80	3.57%	-30.41%	-33.98%	-35.94%
72	2002	4.84%	5.59%	1,115.77	115.77	57.50	17.33%	-30.04%	-47.37%	-35.63%
73	2003	5.11%	4.80%	966.42	-33.58	48.40	1.48%	26.11%	24.63%	21.31%
74	2004	4.84%	5.02%	1,034.35	34.35	51.10	8.54%	24.22%	15.68%	19.20%
75	2005	4.61%	4.69%	1,029.84	29.84	48.40	7.82%	16.79%	8.97%	12.10%
76	2006	4.91%	4.68%	962.06	-37.94	46.10	0.82%	20.95%	20.13%	16.27%
77	2007	4.50%	4.86%	1,053.70	53.70	49.10	10.28%	19.36%	9.08%	14.50%
78	2008	3.03%	4.45%	1,219.28	219.28	45.00	26.43%	-28.99%	-55.42%	-33.44%
79	2009	4.58%	3.47%	798.39	-201.61	30.30	-17.13%	11.94%	29.07%	8.47%
80	2010	4.14%	4.25%	1,059.45	59.45	45.80	10.52%	5.49%	-5.03%	1.24%
81	2011	2.55%	3.82%	1,247.89	247.89	41.40	28.93%	19.88%	-9.05%	16.06%
82	2012	2.46%	2.46%	1,014.15	14.15	25.50	3.96%	1.29%	-2.67%	-1.17%
83	2013	3.78%	2.88%	815.92	-184.08	24.60	-15.95%	13.26%	29.21%	10.38%
84	2014	2.46%	3.41%	1,207.53	207.53	37.80	24.53%	28.61%	4.08%	25.20%
85	2015	2.68%	2.47%	966.11	-33.89	24.60	-0.93%	1.38%	2.31%	-1.09%
86	2016	2.72%	2.30%	993.86	-6.14	26.80	2.07%	16.27%	14.20%	13.97%
87	2017	2.54%	2.67%	1,028.09	28.09	27.20	5.53%	12.11%	6.58%	9.44%
88	2018	2.84%	2.82%	954.46	-45.54	25.40	-2.01%	4.11%	6.12%	1.29%
89	2019	2.25%	2.55%	1,094.60	94.60	28.40	12.30%	31.48%	19.18%	28.93%
90	2020	1.37%	1.53%	1,153.49	153.49	22.50	17.60%	0.05%	-17.55%	-1.48%
91	2021	1.88%	1.73%	915.31	-84.69	13.70	-7.10%	4.20%	11.30%	2.47%
93	**Mean**								**5.5%**	**6.3%**

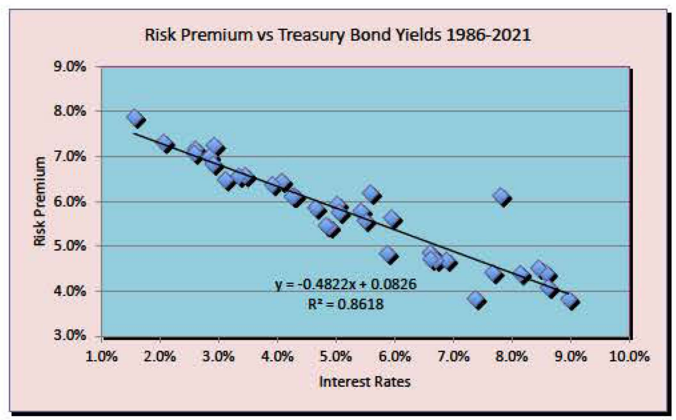
95 Source: Bloomberg Web site: Standard & Poors Utility Stock Index % Annual Change, Jan. to Dec.
96 Long-Term Government Bond yield data from Duff & Phelps 2022 Valuation Yearbook Appendices A7 and A9

ALLOWED RISK PREMIUM ANALYSIS

Line	Date	Treasury Bond Yield[1] (1)	Authorized Electric Returns[2] (2)	Indicated Risk Premium (3)
1	1986	7 80%	13 93%	6 1%
2	1987	8 58%	12 99%	4 4%
3	1988	8 96%	12 79%	3 8%
4	1989	8 45%	12 97%	4 5%
5	1990	8 61%	12 70%	4 1%
6	1991	8 14%	12 54%	4 4%
7	1992	7 67%	12 09%	4 4%
8	1993	6 60%	11 46%	4 9%
9	1994	7 37%	11 21%	3 8%
10	1995	6 88%	11 58%	4 7%
11	1996	6 70%	11 40%	4 7%
12	1997	6 61%	11 33%	4 7%
13	1998	5 58%	11 77%	6 2%
14	1999	5 87%	10 72%	4 9%
15	2000	5 94%	11 58%	5 6%
16	2001	5 49%	11 07%	5 6%
17	2002	5 42%	11 21%	5 8%
18	2003	5 02%	10 96%	5 9%
19	2004	5 05%	10 81%	5 8%
20	2005	4 65%	10 51%	5 9%
21	2006	4 88%	10 32%	5 4%
22	2007	4 83%	10 30%	5 5%
23	2008	4 28%	10 41%	6 1%
24	2009	4 07%	10 52%	6 5%
25	2010	4 25%	10 37%	6 1%
26	2011	3 91%	10 29%	6 4%
27	2012	2 92%	10 17%	7 3%
28	2013	3 45%	10 03%	6 6%
29	2014	3 34%	9 91%	6 6%
30	2015	2 84%	9 84%	7 0%
31	2016	2 60%	9 77%	7 2%
32	2017	2 90%	9 74%	6 8%
33	2018	3 11%	9 60%	6 5%
34	2019	2 58%	9 66%	7 1%
35	2020	1 56%	9 44%	7 9%
36	2021	2 06%	9 38%	7 3%
	Average	**5.25%**	**10.98%**	**5.73%**

Sources:
1 Fed Reserve Board of Governors H 15 Release, 30-Yr Treasury rate
2 S&P Global Intelligence (Regulatory Research Associates)
Major Rate Case Decisions 1986-2021





IF YIELD =	4 3%
THEN RP =	6 2%
Ke =	10 5%