



Docket No. DG 17-048
Attachment RATES-5
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Liberty Utilities (EnergyNorth Natural Gas) Corp.
Rate Design Analysis and Calculations

Line	F	(A)	Residential				Commercial and Industrial Low Load Factor				Commercial and Industrial High Load Factor				Company Total (M)	Explanation (N)
			Non Heat R-1 (B)	Heat R-3 (C)	Low Income Heat R-4 (D)	Total Heat R-3, R-4 (E)	Low Annual G-41 (F)	Medium Annual G-42 (G)	High Annual G-43 (H)	Low Annual G-51 (I)	Medium Annual G-52 (J)	High Annual G-53 (K)	High Annual G-54 (L)			
			(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)			
1	A. Proforma Normalized Calendar Month Revenues at Current Rates															
2	Company Total Pro Forma Base Revenues (R-4 at R-3 rates)															
3	Company Total Base Revenues (R-4 at R-3 rates)															
4	Winter Customer Revenues															
5	Winter Volumetric Revenues															
6	Total Winter Base Revenues															
7	Summer Customer Revenues															
8	Summer Volumetric Revenues															
9	Total Summer Base Revenues															
10	Company Total Base Revenues															
11	Revenue Shortfall R-4 revenues at R-4, R-3 rates															
12	R-4 Shortfall Recovery Rate															
13	Recovery of R-4 Revenue Shortfall															
14	B. Billing Determinants															
15	Customer Bill Count															
16	Winter Customers															
17	Summer Customers															
18	Total Customers															
19	Delivery Quantities (Weather Normalized Calendarized)															
20	Total Winter Quantities															
21	Head Block Winter Quantities															
22	Tail Block Winter Quantities															
23	Total Summer Quantities															
24	Head Block Summer Quantities															
25	Tail Block Summer Quantities															
26	Total Quantities															
27	C. CLASS REVENUE TARGETS															
28	Cost Study Results															
29	Total Delivery Service Marginal Costs															
30	Total Customer-related Marginal Costs															
31	Total Capacity-related Marginal Costs															
32	Total Class Marginal Costs															
33																
34	Delivery Service Unit Costs - Marginal Unit Costs															
35	Customer Costs															
36	Capacity-Related Costs															
37																
38	Delivery Revenue Requirement															
39	Other Revenue															
40	Special Contract Revenue															
41	Base Rate Revenue Requirement															
42	Current Revenue Shortfall R-4 revenues at -4 R-3 rates															
43	Base Rate Revenue Requirement Plus Current RLAP															
44	Step Adjustment															
45	Total Base Rate Revenue Requirement Plus R-4 IAP and Step Adj															
46	Difference: Revenue Requirement - Total Marginal Costs															
47	Equi-proportional Adjustment Factor															
48	Equi-proportional Adjustment Customer															
49	Equi-proportional Adjustment Capacity-Related															
50	Marginal Cost Constrained to Allowed Revenues															
51																
52	Delivery Service Revenue - Equi-Proportional Revenue Requirement															
53	Total Customer Marginal Costs															
54	Total Capacity-Related Marginal Costs															
55	Total															
56																
57	Delivery Service Unit Costs - Equi-Proportional Revenue Requirement															
58	Customer Costs															
59	Distribution Volumetric Costs															

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Line		Residential				Commercial and Industrial: Low Load Factor			Commercial and Industrial: High Load Factor				Company Total	Explanation
		Non Heat R-1	Heat R-3	Low Income Heat R-4	Total Heat R-3, R-4	Low Annual G-41	Medium Annual G-42	High Annual G-43	Low Annual G-51	Medium Annual G-52	High Annual G-53	High Annual G-54		
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	
60	Development of Class Revenue Target													
61	Proforma Total Revenues (Base Revenues at Current Rates)													
62	Base Proforma Revenues													
63	Winter Base Revenues	\$463,154	\$24,474,727	\$1,755,963	\$26,230,690	\$8,397,784	\$9,370,436	\$1,745,752	\$891,880	\$1,135,960	\$901,289	\$542,821	\$49,679,766	Line 6
64	Summer Base Revenues	\$382,767	\$12,729,358	\$934,043	\$13,663,401	\$3,569,938	\$3,452,159	\$379,082	\$666,589	\$666,704	\$390,756	\$347,472	\$23,518,867	Line 9
65	Total Proforma Revenues	\$845,921	\$37,204,085	\$2,690,006	\$39,894,091	\$11,967,722	\$12,822,595	\$2,124,834	\$1,558,469	\$1,802,664	\$1,292,045	\$890,293	\$73,198,633	Line 64 + Line 63
66	MCS Revenue Targets at Proposed Rates													
67	Customer-related Adjusted Marginal Costs	\$1,926,671			\$47,196,259	\$5,912,158	\$2,242,043	\$111,955	\$874,306	\$373,092	\$128,211	\$215,860	\$58,980,555	Line 53
68	Capacity-related Adjusted Marginal Costs	\$71,858			\$8,450,500	\$3,321,794	\$4,609,087	\$1,212,147	\$336,215	\$516,177	\$612,915	\$461,631	\$19,592,325	Line 54
69	Total Adjusted Marginal Costs	\$1,998,529			\$55,646,759	\$9,233,952	\$6,851,130	\$1,324,102	\$1,210,521	\$889,270	\$741,127	\$677,491	\$78,572,880	Line 67 + Line 68
70	Proforma base Revenues													
71	Total Potential Increase (decrease) in Base Revenues	\$1,152,608			\$15,752,669	(\$2,733,770)	(\$5,971,465)	(\$800,732)	(\$347,948)	(\$913,394)	(\$550,918)	(\$212,803)	\$5,374,247	Line 55 - Line 65
72	Total Potential Increase (Line 71) as a % of (Current Base Revenues)	136.25%			39.49%	-22.84%	-46.57%	-37.68%	-22.33%	-50.67%	-42.64%	-23.90%	7.34%	Line 71 / Line 65
73														
74	System Average Rate Increase	7.34%			7.34%	7.34%	7.34%	7.34%	7.34%	7.34%	7.34%	7.34%		Line 72, Column (M)
75	Total Base Revenues	\$908,028			\$42,823,116	\$12,846,393	\$13,764,030	\$2,280,839	\$1,672,891	\$1,935,016	\$1,386,907	\$955,659	\$78,572,880	Line 65 x (1 + Line 74)
76	Total increase (decrease) in Base Revenues	\$62,108			\$2,929,026	\$878,671	\$941,435	\$156,005	\$114,423	\$132,352	\$94,862	\$65,365	\$5,374,247	Line 75 - Line 65
77														
78	BASE REVENUE TARGET BEFORE KEENE ADJUSTMENT	\$908,028			\$42,823,116	\$12,846,393	\$13,764,030	\$2,280,839	\$1,672,891	\$1,935,016	\$1,386,907	\$955,659	\$78,572,880	Line 75
79														
80	Revenue Shortfall													
81	Keene Revenue Shortfall	\$38,217			\$78,199	\$129,464	\$84,703	\$0	\$74,685	\$130,894	\$0	\$0	\$536,161	Keene Billing Data tab
82	Annualization Revenue Shortfall	\$0			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	2016 Billing Determinants tab
83	Total Adjusted Proforma Revenue	\$807,704			\$39,815,892	\$11,838,259	\$12,737,892	\$2,124,834	\$1,483,784	\$1,671,770	\$1,292,045	\$890,293	\$72,662,472	Line 65 - Line 81 - Line 82
84	Revised Rate Increase												\$5,910,408	Line 78 - Line 83
85	Adjusted System Average Rate Increase for Rate Design												8.13%	Line 84 / Line 83
86														
87	FINAL BASE REVENUE TARGET	\$873,403			\$43,054,539	\$12,801,189	\$13,774,000	\$2,297,669	\$1,604,476	\$1,807,752	\$1,397,140	\$962,710	\$78,572,880	Line 83 x (1 + Line 85)

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		Non Heat R-1 (B)	Heat R-3 (C)	Low Income Heat R-4 (D)	Total Heat R-3, R-4 (E)	Low Annual G-41 (F)	Medium Annual G-42 (G)	High Annual G-43 (H)	Low Annual G-51 (I)	Medium Annual G-52 (J)	High Annual G-53 (K)	High Annual G-54 (L)	
88	D. RATE DESIGN												
89	Current Customer charge (as Filed)	\$15.27			\$22.10	\$48.36	\$145.08	\$622.61	\$48.36	\$145.08	\$640.74	\$640.74	Company tariffs - 4/2017
90	Calculated Increase	8.13%			8.13%	8.13%	8.13%	8.13%	8.13%	8.13%	8.13%	8.13%	Rate design Input
91	Marginal Cost Considerations: Current customer charge vs MCS customer costs	28.87%			42.76%	83.60%	133.07%	337.48%	83.05%	143.96%	201.30%	97.84%	Rate design Input
92	Consistency Consideration: Proposed % Increase	-2.55%			-32.67%	8.13%	8.13%	8.13%	8.13%	8.13%	8.13%	8.13%	Order Input
93	Proposed Customer Charge	\$14.88			\$14.88	\$52.29	\$156.88	\$673.25	\$52.29	\$156.88	\$692.86	\$692.86	(Line 89) x (1 + Line 92)
94	Proposed Customer charge as a % of MCS unit costs	28.14%			28.14%	90.4%	143.9%	364.9%	89.8%	155.7%	217.7%	105.8%	Line 93 / Line 58
95	Customer Charge Revenue, Proposed Customer Charge												
96	Winter Period Customer Revenues	\$317,516			\$6,979,382	\$2,895,570	\$1,665,719	\$196,971	\$428,244	\$308,579	\$133,167	\$110,003	Line 93 * Line 16
97	Summer Period Customer Revenues	\$317,755			\$6,851,345	\$2,844,337	\$1,637,411	\$192,730	\$425,110	\$303,737	\$131,366	\$107,277	Line 93 * Line 17
98	Total Customer Charge revenue	\$635,271			\$13,830,727	\$5,739,907	\$3,303,130	\$389,701	\$853,354	\$612,316	\$264,533	\$217,280	Line 96 + Line 97
99	Remaining Revenues	\$238,133			\$29,223,612	\$7,061,283	\$10,470,870	\$1,907,968	\$751,122	\$1,195,436	\$1,132,608	\$745,430	Line 87 - Line 98
100	Total Volumetric Revenue Requirement												Line 99
101													
102	Current Volumetric Rates as Filed												
103	Winter Period Variable Rates												
104	Head Block	\$0.2018	\$0.3495	\$0.1398	\$0.3495	\$0.3965	\$0.3606	\$0.2216	\$0.2390	\$0.2052	\$0.1434	\$0.0547	Company tariffs - 4/2017
105	Tail Block	\$0.2018	\$0.2892	\$0.1156	\$0.2892	\$0.2663	\$0.2402	\$0.2216	\$0.1553	\$0.1367	\$0.1434	\$0.0547	Company tariffs - 4/2017
106	Summer Period Variable Rates												
107	Head Block	\$0.2018	\$0.3495	\$0.1398	\$0.3495	\$0.3965	\$0.3606	\$0.1013	\$0.2390	\$0.1487	\$0.0688	\$0.0297	Company tariffs - 4/2017
108	Tail Block	\$0.2018	\$0.2892	\$0.1156	\$0.2892	\$0.2663	\$0.2402	\$0.1013	\$0.1553	\$0.0845	\$0.0688	\$0.0297	Company tariffs - 4/2017
109													
110	Target Percent Increase for Volumetric Rates					8.13%	8.13%	8.13%	8.13%	8.13%	8.13%	8.13%	Line 85
111													
112	Annual Average Volumetric Rate	\$0.3085			\$0.5042								(Line 100) / (Line 20 + Line 23)
113	Annual Average Head Block Rate				\$0.5042								Line 112
114	Annual Average Tail Block Rate				\$0.5042								Line 113
115	Winter Period Tail Block Rate % of Head Block Rate				100%								Line 114 / Line 113
116	Summer Period Tail Block Rate % of Head Block Rate				100%								Rate design Input or Line 115
117													
118	Base Rates with R-4 Discount Included												
119	Monthly Customer Charge	\$14.88	\$14.88	\$5.95	\$14.88	\$52.29	\$156.88	\$673.25	\$52.29	\$156.88	\$692.86	\$692.86	Line 93
120	Winter Period Variable Rates												
121	Head Block	\$0.3085	\$0.5042	\$0.2017	\$0.5042	\$0.4288	\$0.3899	\$0.2396	\$0.2584	\$0.2219	\$0.1551	\$0.0591	Line 113 or Line 104 x (1 + Line 110)
122	Tail Block	\$0.3085	\$0.5042	\$0.2017	\$0.5042	\$0.2880	\$0.2597	\$0.2396	\$0.1679	\$0.1478	\$0.1551	\$0.0591	Line 114 or Line 105 x (1 + Line 110)
123	Summer Period Variable Rates												
124	Head Block	\$0.3085	\$0.5042	\$0.2017	\$0.5042	\$0.4288	\$0.3899	\$0.1095	\$0.2584	\$0.1608	\$0.0744	\$0.0321	Line 113 or Line 107 x (1 + Line 110)
125	Tail Block	\$0.3085	\$0.5042	\$0.2017	\$0.5042	\$0.2880	\$0.2597	\$0.1095	\$0.1679	\$0.0914	\$0.0744	\$0.0321	Line 114 or Line 108 x (1 + Line 110)

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		Non Heat R-1 (B)	Heat R-3 (C)	Low Income Heat R-4 (D)	Total Heat R-3, R-4 (E)	Low Annual G-41 (F)	Medium Annual G-42 (G)	High Annual G-43 (H)	Low Annual G-51 (I)	Medium Annual G-52 (J)	High Annual G-53 (K)	High Annual G-54 (L)		
126	Low Income Discount and RLIAP Calculation													
127	Base Revenues before Low Income Discount													
128	Monthly Customer Charge			\$949,021										Line 119 * Line 18
129	Winter Period Variable Rates													Line 121 * Line 21
130	Head Block			\$1,179,865										Line 122 * Line 22
131	Tail Block			\$396,008										
132	Summer Period Variable Rates													Line 124 * Line 24
133	Head Block			\$275,789										Line 125 * Line 25
134	Tail Block			\$77,348										Σ Line 128 to Line 134
135	Total Base Revenue before Low Income Discount			\$2,878,011									\$2,878,011	
137	Low Income Discount % of Distribution Rates			60.00%										Rate Design Input: Docket DG 14-180
138	Total Low Income Revenue Shortfall			\$1,726,806	\$1,726,806								\$1,726,806	Line 137 x Line 135
139	Low Income RLIAP (\$/therm)												\$0.0167	Line 138 / Line 26
140	RLIAP Revenues	\$8,253	\$578,719	\$40,899	\$619,618	\$237,172	\$367,336	\$96,627	\$41,936	\$80,446	\$99,851	\$175,568	\$1,726,806	Line 26 * Line 139 Col (M)
141	Increase in RLIAP Rate												\$0.0007	Line 139 - Line 12
142	Base Rates Revenue Proof													
143														
144	Customer Charge Revenues													
145	Winter	\$317,516	\$6,500,679	\$191,481	\$6,692,160	\$2,895,570	\$1,665,719	\$196,971	\$428,244	\$308,579	\$133,167	\$110,003	\$12,747,329	Line 16 * Line 119
146	Summer	\$317,755	\$6,381,027	\$188,127	\$6,569,154	\$2,844,337	\$1,637,411	\$192,730	\$425,110	\$303,737	\$131,366	\$107,277	\$12,528,877	Line 17 * Line 119
147	Delivery Quantities													
148	Winter	\$163,004	\$22,397,974	\$630,349	\$23,028,323	\$6,025,811	\$8,395,039	\$1,690,782	\$488,029	\$833,352	\$841,434	\$476,972	\$41,942,745	Line 121 x Line 21 + Line 22 x Line 122
149	Summer	\$75,129	\$4,896,848	\$141,247	\$5,038,095	\$1,035,472	\$2,075,831	\$217,187	\$263,092	\$362,084	\$291,174	\$268,458	\$9,626,522	Line 124 x Line 24 + Line 25 x Line 125
150														
151	Total Base Revenues	\$673,403	\$40,176,529	\$1,151,204	\$41,327,733	\$12,801,189	\$13,774,000	\$2,297,669	\$1,604,476	\$1,807,752	\$1,397,140	\$962,710	\$76,848,073	Σ Line 145 to Line 149
152	Total Base plus RLIAP Revenues	\$681,656	\$40,755,248	\$1,192,104	\$41,947,351	\$13,038,361	\$14,141,335	\$2,394,297	\$1,646,412	\$1,888,198	\$1,496,991	\$1,138,278	\$78,572,889	Line 140 + Line 152
153	Truncation Difference Compared to Revenue Requirement													
154	Base Revenues plus Low Income RLIAP Revenues													
155	Class Rate Impact Calculations												\$0	Line 153 - Line 78
156														
157	Increase in Base Revenues, R-4 revenues at R-3 rates	\$27,482	\$2,972,444	\$188,005	\$3,160,449	\$833,467	\$951,405	\$172,835	\$46,007	\$5,088	\$105,096	\$72,417	\$5,374,247	Line 152 - Line 10 + Line 138
158	Percent Increase in Base Revenues, R-4 revenues at R-3 rates	3.25%	7.99%	6.99%	7.92%	6.96%	7.42%	8.13%	2.95%	0.28%	8.13%	8.13%	7.34%	Line 152 / Line 65
159	Increase in Base Revenues, R-4 Revenues at R-4 Rates	\$27,482	\$2,972,444	\$75,277	\$3,047,721	\$833,467	\$951,405	\$172,835	\$46,007	\$5,088	\$105,096	\$72,417	\$5,261,519	Line 152 - Line 10
160	Percent Increase in R-4 Shortfall Recovery	\$539	\$37,779	\$2,670	\$40,449	\$15,483	\$23,980	\$6,308	\$2,738	\$5,252	\$6,518	\$11,461	\$112,728	Line 140 - Line 13
161	Net Increase	\$28,021	\$3,010,223	\$77,947	\$3,088,170	\$848,950	\$975,385	\$179,143	\$48,745	\$10,340	\$111,614	\$83,878	\$5,374,247	Σ Line 159 to Line 160
162	Percent Increase in Base Revenues, R-4 revenues at R-4 rates	3.28%	7.98%	7.00%	7.95%	6.96%	7.41%	8.09%	3.05%	0.55%	8.06%	7.96%		Line 161 / (Σ Line 10, - Line 11, Line 13)