

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Plant-Related Costs: Primary System

1 Regression Results

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3 **Selected Model:** Primary Distribution Plant Additions 2015\$ = F(Normalized Peak Rolling 2 Year Average, Dummy_{2008 to 2009}, Dummy_{2012 to 2013})

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Dependent Variable				
Total Cumulative Annual Distribution Capacity Additions 2015\$ _(2003 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-149,897,422	-9.96	0.0000
Normalized Peak Rolling 2 Year Average	Norm_pk_R2	870,179	11.68	0.0000
Dummy: Years 2008 - 2009	D2008_2009	5,782,365	3.10	0.0127
Dummy: Years 2012 - 2013	D2012_2013	5,533,102	3.01	0.0147
Model Statistics	Model 3.0			
R Squared	0.9457			
Adjusted R Squared	0.9276			
Mean Absolute % Error (MAPE)	7.1256			
Passes ACF/PACF	Yes			

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Marginal Cost Calculation

19 Primary Distribution Plant Additions = - \$ 149,897,422 + \$ 870,179 x Norm_pk_R2 + \$ 5,782,365 x D2008_2009 + \$ 5,533,102 x D2012_2013

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∂ Primary Distribution Plant / ∂ Normalized Peak Demand = \$ 870,179 per MW

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Primary Distribution Plant / Normalized Peak Demand (2013-2015 Average) \$ 385,700 per MW

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Primary Distribution Plant / Normalized Peak Demand (2011-2015 Average) \$ 1,042,790 per MW

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Plant-Related Costs: Secondary System

1 Regression Results

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3 **Selected Model:** Secondary Distribution Plant Additions 2015\$ = F(Normalized Peak Rolling 2 Year Average, Total Usage Lagged 2 years,
Dummy₂₀₀₄₋₂₀₀₇)

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Dependent Variable				
Total Cumulative Annual Distribution Capacity Additions 2015\$ _(2002 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-23,250,121	-12.89	0.0000
Normalized Peak Rolling 2 Year Average	Norm_pk_R2	89,325	5.95	0.0001
Total Usage Lagged 2 years	Tot_Usage_L2	11	3.93	0.0028
Dummy: Years 2004 to 2007	D2004_2007	-928,789	-4.92	0.0006
Model Statistics	Model 2.0			
R_Squared		0.9711		
Adjusted R_Squared		0.9625		
Mean Absolute % Error (MAPE)		5.6596		
Passes ACF/PACF	Yes			

Marginal Cost Calculation

Secondary Distribution Plant Additions = - \$ 23,250,121 + \$ 89,325 x Norm_pk_R2 + \$ 11.4308 x Tot_Usage_L2 - \$ 928,789 x D2004_2007

∂ Secondary Distribution Plant / ∂ Normalized Peak Demand = \$ 89,325 per MW

∂ Secondary Distribution Plant / ∂ Annual Energy = \$ 11.4308 per MWH

Secondary Distribution Plant / Normalized Peak Demand (2013-2015 Average) \$ 76,282 per MW

Secondary Distribution Plant / Normalized Peak Demand (2011-2015 Average) \$ 212,063 per MW

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Plant-Related Costs: Line Transformers

1 Regression Results

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3 **Selected Model:** Line Transformers Plant Additions 2015\$ = F(Normalized Peak Rolling 2 Year Average, Customers Rolling 2 year Average, Dummy₂₀₀₃₋₂₀₀₆)

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5	Dependent Variable				
6	Total Cumulative Annual Distribution Capacity Additions 2015\$ _(2002 - 2015)				
7	Explanatory Variables	Database variable name	Coefficient value	t test	Significance
8	Constant	Constant	-31,969,998	-4.23	0.0022
9	Normalized Peak Rolling 2 Year Average	Norm_pk_R2	64,827	3.63	0.0055
10	Customers Rolling 2 year Average	Customer_R2	664	2.72	0.0235
11	Dummy: Years 2003 and 2006	D2003_2006	-1,025,548	-2.79	0.0212
12	Model Statistics	Model 8.0			
13	R_Squared	0.9833			
14	Adjusted R_Squared	0.9777			
15	Mean Absolute % Error (MAPE)	1.9388			
16	Passes ACF/PACF	Yes			

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19 Marginal Cost Calculation

20 Line Transformers Additions = - \$ 31,969,998 + \$ 64,827 x Norm_pk_R2 + \$ 664.09 x Customer_R2 - \$ 1,025,548 x D2003_2006

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22 ∂ Line Transformers / ∂ Normalized Peak Demand = \$ 64,827 per MW

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24 ∂ Line Transformers / ∂ Customers = \$ 664.09 per customer

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26 Line Transformers / Normalized Peak Demand (2013-2015 Average) \$ 68,983 per MW

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28 Line Transformers / Normalized Peak Demand (2011-2015 Average) \$ 164,971 per MW

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Services and Meters Plant

Line No.	Description	Domestic D	Domestic-Opt. Peak D-10	General TOU G-1	General Long Hour G-2	General Service G-3	Outdoor Lighting M	Limited All Electric T	Ltd Comm Space V	Explanation
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1	Service Costs									
2	Representative Cost	\$ 614.65	\$ 614.65	\$ 747.65	\$ 717.61	\$ 614.65		\$ 614.65	\$ 614.65	WP JDS-MCS-2 Page 1A, Line 12
3	Customers per Service	1.00	1.00	1.00	1.00	1.00		1.00	1.00	2013 MCS per Company
4	Average Service Cost per Customer	\$ 614.65	\$ 614.65	\$ 747.65	\$ 717.61	\$ 614.65		\$ 614.65	\$ 614.65	Line 2 / Line 3
5	Meter Costs									
6	Current Unit Cost for Metering	\$ 77.55	\$ 350.20	\$ 1,111.00	\$ 900.80	\$ 630.20		\$ 195.20	\$ 290.20	Company Data
7	Meters per Customer	1.00	1.00	1.00	1.00	1.00		1.00	1.00	Company Data
8	Average Meter Cost per Customer	\$ 77.55	\$ 350.20	\$ 1,111.00	\$ 900.80	\$ 630.20		\$ 195.20	\$ 290.20	Line 6 x Line 7
9	Total	\$692.20	\$964.85	\$1,858.65	\$1,618.41	\$1,244.85		\$809.85	\$904.85	Line 4 + Line 8

Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study
Street Lighting - Luminaires

Line No.	Luminaires Type Size of Street Light Lumnes Description Replacement Luminaire Type	Sodium Vapor 4000 50W LUM HPS RWY	Sodium Vapor 9600 LUM HPS RWY 100W LUM HPS RWY 100W	Sodium Vapor 27500 LUM HPS RWY 250W LUM HPS RWY 250W	Sodium Vapor 50000 LUM HPS RWY 400W LUM HPS RWY 400W	Sodium Vapor 9,600 (Post Top) LUM HPS POST 100W LUM HPS POST 100W	Sodium Vapor 27,500 (Flood) LUM HPS FLD 250W LUM HPS FLD 250W
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
1	Installation Costs						
2	Equipment, Line Truck Costs						
3	Cost	53.20	53.20	53.20	67.20	63.00	81.20
4	Burden	-	-	-	-	-	-
5	Total Equipment, Line Truck Costs	\$ 53.20	\$ 53.20	\$ 53.20	\$ 67.20	\$ 63.00	\$ 81.20
6	Inventory, Street Light Materials Costs						
7	Cost	206.47	205.77	228.71	329.87	258.99	287.88
8	Burden	64.01	63.79	70.91	102.26	80.28	89.24
9	Total Inventory, Street Light Materials Costs	\$ 270.48	\$ 269.56	\$ 299.62	\$ 432.13	\$ 339.27	\$ 377.12
10	Payroll, Lineworker Costs						
11	Cost	88.20	88.20	88.20	111.41	104.45	134.62
12	Burden	93.49	93.49	93.49	118.09	110.71	142.69
13	Total Payroll, Lineworker Costs	\$ 181.69	\$ 181.69	\$ 181.69	\$ 229.50	\$ 215.16	\$ 277.31
14	Total Installation Costs	\$ 505.37	\$ 504.45	\$ 534.51	\$ 728.83	\$ 617.43	\$ 735.63
15	Fixed Charge Rate	11.89%	11.89%	11.89%	11.89%	11.89%	11.89%
16	Annualized Cost	\$ 60.09	\$ 59.98	\$ 63.55	\$ 86.66	\$ 73.41	\$ 87.47
17	Escalator to Adjust to 2017 Rate Year	3.92%	3.92%	3.92%	3.92%	3.92%	3.92%
18	Adjusted Annualized Cost	\$ 62.45	\$ 62.33	\$ 66.05	\$ 90.06	\$ 76.29	\$ 90.90
19	Installed Luminaires	2,459	1,832	577	247	407	285
20	Total Annual Marginal Cost	\$ 153,557.72	\$ 114,195.05	\$ 38,109.68	\$ 22,244.72	\$ 31,051.73	\$ 25,906.45

Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study
Street Lighting - Luminaires

Line No.	Luminaires Type Size of Street Light Lumnes Description Replacement Luminaire Type	Sodium Vapor 50,000 (Flood) LUM HPS FLD 400W	Incandescent 1000 LUM INC RWY 103W	Mercury Vapor 4000 LUM MV RWY 100W	Mercury Vapor 8000 LUM MV RWY 175W	Mercury Vapor 22000 LUM MV RWY 400W	Mercury Vapor 63000 LUM MV RWY 1000W
	(A)	(H)	(I)	(J)	(K)	(L)	(M)
1	Installation Costs						
2	Equipment, Line Truck Costs						
3	Cost	81.20	53.20	53.20	53.20	53.20	67.20
4	Burden	-	-	-	-	-	-
5	Total Equipment, Line Truck Costs	\$ 81.20	\$ 53.20	\$ 53.20	\$ 53.20	\$ 53.20	\$ 67.20
6	Inventory, Street Light Materials Costs						
7	Cost	294.59	206.47	206.47	205.77	228.71	329.87
8	Burden	91.31	64.01	64.01	63.79	70.91	102.26
9	Total Inventory, Street Light Materials Costs	\$ 385.90	\$ 270.48	\$ 270.48	\$ 269.56	\$ 299.62	\$ 432.13
10	Payroll, Lineworker Costs						
11	Cost	134.62	88.20	88.20	88.20	88.20	111.41
12	Burden	142.69	93.49	93.49	93.49	93.49	118.09
13	Total Payroll, Lineworker Costs	\$ 277.31	\$ 181.69	\$ 181.69	\$ 181.69	\$ 181.69	\$ 229.50
14	Total Installation Costs	\$ 744.41	\$ 505.37	\$ 505.37	\$ 504.45	\$ 534.51	\$ 728.83
15	Fixed Charge Rate	11.89%	11.89%	11.89%	11.89%	11.89%	11.89%
16	Annualized Cost	\$ 88.51	\$ 60.09	\$ 60.09	\$ 59.98	\$ 63.55	\$ 86.66
17	Escalator to Adjust to 2017 Rate Year	3.92%	3.92%	3.92%	3.92%	3.92%	3.92%
18	Adjusted Annualized Cost	\$ 91.98	\$ 62.45	\$ 62.45	\$ 62.33	\$ 66.05	\$ 90.06
19	Installed Luminaires	446	26	83	153	51	1
20	Total Annual Marginal Cost	\$ 41,025.20	\$ 1,623.63	\$ 5,183.12	\$ 9,537.03	\$ 3,368.45	\$ 90.06

Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study
Street Lighting - Luminaires

Line No.	Luminaires Type Size of Street Light Lumnes Description Replacement Luminaire Type	Mercury Vapor 22,000 (Flood) LUM MV FLD 400W LUM HPS FLD 250W	Total Outdoor Lighting (Luminaires)	Explanation
	(A)	(N)	(O)	(P)
1	Installation Costs			
2	Equipment, Line Truck Costs			
3	Cost	81.20		Company Data
4	Burden	-		Company Data
5	Total Equipment, Line Truck Costs	\$ 81.20		Line 3 + Line 4
6	Inventory, Street Light Materials Costs			
7	Cost	287.88		Company Data
8	Burden	89.24		Company Data
9	Total Inventory, Street Light Materials Costs	\$ 377.12		Line 7 + Line 8
10	Payroll, Lineworker Costs			
11	Cost	134.62		Company Data
12	Burden	142.69		Company Data
13	Total Payroll, Lineworker Costs	\$ 277.31		Line 11 + Line 12
14	Total Installation Costs	\$ 735.63		Line 5 + Line 9 + Line 13
15	Fixed Charge Rate	11.89%		Att JDS-MCS-7 Page 1, Col (C), Line 7
16	Annualized Cost	\$ 87.47		Line 14 x Line 15
17	Escalator to Adjust to 2017 Rate Year	3.92%		((1 + Att JDS-MCS-7 Page 1, Col (C), Line 19)^2) - 1
18	Adjusted Annualized Cost	\$ 90.90		Line 16 x (1 + Line 17)
19	Installed Luminaires	24	6,591	Company Data
20	Total Annual Marginal Cost	\$ 2,181.60	\$ 448,074	Line 18 x Line 19

Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study
Street Lighting - Poles and Accessories

Line No.	Poles and Accessories Type Description Replacement Pole and Accessory Type	Overhead Service Wood Poles POLE - WOOD POLE - WOOD	Non-Metallic Standard Fiberglass - Direct Embedded POLE FIBER PT < 25FT POLE FIBER PT < 25FT	Non-Metallic Standard Fiberglass with Foundation < 25 ft. POLE FIBER RWY < 25FT POLE FIBER RWY < 25FT	Metallic Standard Metal Poles - Direct Embedded POLE METAL EMBEDDED POLE METAL EMBEDDED	Metallic Standard Metal Poles with Foundation POLE METAL POLE METAL
	(A)	(B)	(C)	(D)	(E)	(F)
1	Installation Costs					
2	Equipment, Line Truck Costs					
3	Cost	191.94	112.00	28.00	112.00	112.00
4	Burden	-	-	-	-	-
5	Total Equipment, Line Truck Costs	\$ 191.94	\$ 112.00	\$ 28.00	\$ 112.00	\$ 112.00
6	Inventory, Street Light Materials Costs					
7	Cost	220.56	254.84	723.61	254.84	685.21
8	Burden	68.37	79.01	224.32	79.01	212.42
9	Total Inventory, Street Light Materials Costs	\$ 288.93	\$ 333.85	\$ 947.93	\$ 333.85	\$ 897.63
10	Payroll, Lineworker Costs					
11	Cost	290.58	250.61	92.84	250.61	177.62
12	Burden	308.02	265.65	98.41	265.65	188.28
13	Total Payroll, Lineworker Costs	\$ 598.60	\$ 516.26	\$ 191.25	\$ 516.26	\$ 365.90
14	Total Installation Costs	\$ 1,079.47	\$ 962.11	\$ 1,167.18	\$ 962.11	\$ 1,375.53
15	Fixed Charge Rate	11.89%	11.89%	11.89%	11.89%	11.89%
16	Annualized Cost	\$ 128.35	\$ 114.40	\$ 138.78	\$ 114.40	\$ 163.55
17	Escalator to Adjust to 2017 Rate Year	3.92%	3.92%	3.92%	3.92%	3.92%
18	Adjusted Annualized Cost	\$ 133.39	\$ 118.89	\$ 144.23	\$ 118.89	\$ 169.97
19	Installed Luminaires	124	245	129	169	74
20	Total Annual Marginal Cost	\$ 16,540.02	\$ 29,126.92	\$ 18,605.07	\$ 20,091.63	\$ 12,577.82

Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study
Street Lighting - Poles and Accessories

Line No.	Poles and Accessories Poles and Accessories Type Description Replacement Pole and Accessory Type	Total Outdoor Lighting (Poles and Accessories)	Explanation
	(A)	(G)	(H)
1	Installation Costs		
2	Equipment, Line Truck Costs		
3	Cost		Company Data
4	Burden		Company Data
5	Total Equipment, Line Truck Costs		Line 3 + Line 4
6	Inventory, Street Light Materials Costs		
7	Cost		Company Data
8	Burden		Company Data
9	Total Inventory, Street Light Materials Costs		Line 7 + Line 8
10	Payroll, Lineworker Costs		
11	Cost		Company Data
12	Burden		Company Data
13	Total Payroll, Lineworker Costs		Line 11 + Line 12
14	Total Installation Costs		Line 5 + Line 9 + Line 13
15	Fixed Charge Rate		Att JDS-MCS-7 Page 1, Col (C), Line 7
16	Annualized Cost		Line 14 x Line 15
17	Escalator to Adjust to 2017 Rate Year		$((1 + \text{Att JDS-MCS-7 Page 1, Col (C), Line 19})^2) - 1$
18	Adjusted Annualized Cost		Line 16 x (1 + Line 17)
19	Installed Luminaires	741	Company Data
20	Total Annual Marginal Cost	\$ 96,941	Line 18 x Line 19

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Operations Expense: Primary System

1 Regression Results

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3 **Selected Model:** Primary Distribution Non-Customer Operations Expense 2015\$ = F(Normalized Peak Rolling 2 Year Average, Dummy₂₀₁₅,
Dummy₂₀₀₅, Trend₂₀₀₂₋₂₀₁₂)

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Dependent Variable Primary Distribution Non-Customer Operations Expense 2015\$ (2002 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-7,541,695	-4.96	0.0008
Normalized Peak Rolling 2 Year Average	Norm_pk_R2	45,958	6.06	0.0002
Dummy: Year 2015	D2015	-868,327	-2.84	0.0194
Dummy: Year 2005	D2005	-831,145	-3.40	0.0079
Interactive: Trend for 2002 to 2012	I_Trendx2002_2012	-76,899	-5.80	0.0003
Model Statistics	Model 1.0			
R_Squared	0.9124			
Adjusted R_Squared	0.8735			
Mean Absolute % Error (MAPE)	22.3571			
Passes ACF/PACF	Yes			

Marginal Cost Calculation

Primary Distribution Non-Customer Operations Expense = - \$ 7,541,695 + \$ 45,958 x Norm_pk_R2 - \$ 868,327 x D2015
- \$ 831,145 x D2005 + - \$ 76,899 x I_Trendx2002_2012

∂ Primary Distribution Non-Customer Operations Expense / ∂ Normalized Peak Demand = \$ 45,958 per MW

Primary Distribution Non-Customer Operations Expense / Normalized Peak
Demand (2013-2015 Average) \$ 9,152 per MW

Primary Distribution Non-Customer Operations Expense / Normalized Peak
Demand (2011-2015 Average) \$ 7,052 per MW

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Operations Expense: Secondary System

1 Regression Results

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3 **Selected Model:** Secondary Distribution Non-Customer Operations Expense 2015\$ = F(Normalized Peak Rolling 2 year average, Dummy₂₀₁₅, Dummy₂₀₀₅₋₂₀₁₂,
Dummy₂₀₁₁)

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Dependent Variable				
Secondary Distribution Non-Customer Operations Expense 2015\$ _(2002 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-5,419,906	-8.31	0.0000
Normalized Peak Rolling 2 year average	Norm_pk_R2	29,722	8.95	0.0000
Dummy: Year 2015	D2015	-492,637	-3.91	0.0035
Dummy: Years 2005 to 2012	D2005_2012	-368,942	-6.52	0.0001
Dummy: Year 2011	D2011	-286,434	-2.70	0.0244
Model Statistics	Model 2.0			
R_Squared	0.9270			
Adjusted R_Squared	0.8946			
Mean Absolute % Error (MAPE)	47.4281			
Passes ACF/PACF	Yes			

Marginal Cost Calculation

Secondary Distribution Non-Customer Operations Expense = - \$ 5,419,906 + \$ 29,722 x Norm_pk_R2 - \$ 492,637 x D2015 - \$ 368,942 x D2005_2012 - \$ 286,434 x D2011

∂ Secondary Distribution Non-Customer Operations Expense / ∂ Normalized Peak Demand = \$ 29,722 per MW

Secondary Distribution Non-Customer Operations Expense /
Normalized Peak Demand (2013-2015 Average) \$ 3,555 per MW

Secondary Distribution Non-Customer Operations Expense /
Normalized Peak Demand (2011-2015 Average) \$ 2,478 per MW

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Operations Expense: Line Transformers

1 Regression Results

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3 **Selected Model:** Line Transformers Non-Customer Operations Expense 2015\$ = F(Normalized Peak Rolling 2 year average, Dummy₂₀₁₂, Dummy₂₀₁₃₋₂₀₁₄)

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Dependent Variable				
Line Transformers Non-Customer Operations Expense 2015\$ _(2002 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-236,252	-1.66	0.1287
Normalized Peak Rolling 2 year average	Norm_pk_R2	1,401	1.95	0.0801
Dummy: Year 2012	D2012	-82,417	-3.40	0.0068
Dummy: Years 2013 and 2014	D2013_2014	174,204	8.84	0.0000
Model Statistics	Model 1.0			
R_Squared	0.9340			
Adjusted R_Squared	0.9142			
Mean Absolute % Error (MAPE)	29.0142			
Passes ACF/PACF	Yes			

Marginal Cost Calculation

Line Transformers Non-Customer Operations Expense = - \$ 236,252 + \$ 1,401 x Norm_pk_R2 - \$ 82,417 x D2012 + \$ 174,204 x D2013_2014

∂ Line Transformers Non-Customer Operations Expense / ∂ Normalized Peak Demand = \$ 1,401 per MW

Line Transformers Non-Customer Operations Expense /
Normalized Peak Demand (2013-2015 Average) \$ 849 per MW

Line Transformers Non-Customer Operations Expense /
Normalized Peak Demand (2011-2015 Average) \$ 515 per MW

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Maintenance Expense: Primary System

1 Regression Results

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3 **Selected Model:** Primary Distribution Non-Customer Maintenance Expense 2015\$ = F(2 Year Lag in Normal Peak, 1 Year Lag in SAIFI,
Dummy₂₀₁₀, Dummy₂₀₁₃₋₂₀₁₅)

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Dependent Variable				
Primary Distribution Non-Customer Maintenance Expense 2015\$ _(2002 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-3,759,152	-4.37	0.0018
2 Year Lag in Normal Peak	Norm_pk_L2	23,456	5.67	0.0003
1 Year Lag in SAIFI	SAIFI_L1	478,898	3.42	0.0076
Dummy: 2010	D2010	-509,376	-2.32	0.0457
Dummy: 2013 - 2015	D2013_2015	-663,041	-4.59	0.0013
Model Statistics	Model 2.0			
R_Squared	0.8780			
Adjusted R_Squared	0.8238			
Mean Absolute % Error (MAPE)	8.4069			
Passes ACF/PACF	Yes			

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Marginal Cost Calculation

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Primary Distribution Non-Customer Maintenance Expense = - \$ 3,759,152 + \$ 23,456 x Norm_pk_L2 + \$ 478,898 x
SAIFI_L1 - \$ 509,376 x D2010 - \$ 663,041 x D2013_2015

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∂ Primary Distribution Non-Customer Maintenance Expense / ∂ Normalized Peak Demand = \$ 23,456 per MW

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Primary Distribution Non-Customer Maintenance Expense /
Normalized Peak Demand (2013-2015 Average) \$ 5,559 per MW

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Primary Distribution Non-Customer Maintenance Expense /
Normalized Peak Demand (2011-2015 Average) \$ 7,027 per MW

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Maintenance Expense: Secondary System

1 Regression Results

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3 **Selected Model:** Secondary Distribution Non-Customer Maintenance Expense 2015\$ = F(2-Year Lag in Normal Peak, 1 Year Lag in SAIFI, Dummy₂₀₁₃₋₂₀₁₅)

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Dependent Variable				
Secondary Distribution Non-Customer Maintenance Expense 2015\$ _(2002 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-1,968,905	-4.23	0.0017
2 Year Lag in Normal Peak	Norm_pk_L2	10,878	4.81	0.0007
1 Year Lag in SAIFI	SAIFI_L1	267,043	3.89	0.0030
Dummy: 2013 - 2015	D2013_2015	-254,113	-3.32	0.0078
Model Statistics	Model 2.0			
R_Squared	0.7968			
Adjusted R_Squared	0.7358			
Mean Absolute % Error (MAPE)	14.9535			
Passes ACF/PACF	Yes			

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Marginal Cost Calculation

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Secondary Distribution Non-Customer Maintenance Expense = - \$ 1,968,905 + \$ 10,878 x Norm_pk_L2 + \$ 267,043 x SAIFI_L1 - \$ 254,113 x D2013_2015

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∂ Secondary Distribution Non-Customer Maintenance Expense / ∂ Normalized Peak Demand = \$ 10,878 per MW

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Secondary Distribution Non-Customer Maintenance Expense /
Normalized Peak Demand (2013-2015 Average) \$ 2,116 per MW

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Secondary Distribution Non-Customer Maintenance Expense /
Normalized Peak Demand (2011-2015 Average) \$ 2,756 per MW

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Maintenance Expense: Line Transformers

1 Regression Results

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3 **Selected Model:** Line Transformers Non-Customer Maintenance Expense 2015\$ = F(2-Year Lag in Normal Peak, 1 Year Lag in SAIFI, Dummy₂₀₁₃₋₂₀₁₅, Dummy₂₀₁₁₋₂₀₁₂)

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Dependent Variable Line Transformers Non-Customer Maintenance Expense 2015\$ _(2002 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-759,332	-4.81	0.0010
2 Year Lag in Normal Peak	Norm_pk_L2	4,072	4.99	0.0007
1 Year Lag in SAIFI	SAIFI_L1	139,429	5.71	0.0003
Dummy: 2013 - 2015	D2013_2015	-91,298	-3.21	0.0106
Dummy: 2011 - 2012	D2011_2012	112,052	3.54	0.0063
Model Statistics	Model 2.0			
R_Squared	0.9116			
Adjusted R_Squared	0.8723			
Mean Absolute % Error (MAPE)	8.6285			
Passes ACF/PACF	Yes			

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Marginal Cost Calculation

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Line Transformers Non-Customer Maintenance Expense = - \$ 759,332 + \$ 4,072 x Norm_pk_L2 + \$ 139,429 x SAIFI_L1 - \$ 91,298 x D2013_2015 + \$ 112,052 x D2011_2012

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∂ Line Transformers Non-Customer Maintenance Expense / ∂ Normalized Peak Demand = \$ 4,072 per MW

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Line Transformers Non-Customer Maintenance Expense /
Normalized Peak Demand (2013-2015 Average) \$ 999 per MW

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Line Transformers Non-Customer Maintenance Expense /
Normalized Peak Demand (2011-2015 Average) \$ 1,357 per MW

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Distribution Operations and Maintenance Expense: Customer Related

1 Regression Results

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3 **Selected Model:** Customer Related Operations and Maintenance Expense 2015\$ = F(Customers Lagged 1 Year , Dummy₂₀₀₅₋₂₀₀₆,
Dummy₂₀₁₃, Dummy₂₀₁₀, Dummy₂₀₁₂)

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Dependent Variable				
Customer Related Operations and Maintenance Expense 2015\$ (2003 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-3,566,188	-1.43	0.1947
Customers Lagged 1 Year	Customer_L1	142.6596	2.37	0.0495
Dummy: Years 2005 and 2006	D2005_2006	-497,185	-2.84	0.0251
Dummy: Year 2013	D2013	-1,141,012	-4.81	0.0019
Dummy: Year 2010	D2010	-594,859	-2.59	0.0358
Dummy: Year 2012	D2012	-1,026,599	-4.34	0.0034
Model Statistics	Model 1.0			
R_Squared	0.8606			
Adjusted R_Squared	0.7610			
Mean Absolute % Error (MAPE)	4.3077			
Passes ACF/PACF	Yes			

Marginal Cost Calculation

Customer Related Operations and Maintenance Expense = - \$ 3,566,188 + \$ 142.6596 x Customer_L1
- \$ 497,185 x D2005_2006 - \$ 1141012.2126 x D2013 - \$ 594859.1376 x D2010 - \$ 1026599.3467 x D2012

∂ Customer Related Operations and Maintenance Expense / ∂ Customer = \$ 142.6596 per Customer

Customer Related Operations and Maintenance Expense /
Customer (2013-2015 Average) \$ 50.43 per Customer

Customer Related Operations and Maintenance Expense /
Customer (2011-2015 Average) \$ 47.89 per Customer

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Class Weighted Customer Plant Related Expense

Customer Weightings					Customer Weightings		
Line No.	Customer Groups	Test Year Number of Customers	Service and Meter Plant per customer	Total Cost	Relative Weight Per Customer	System Average Marginal Cost per Customer	Weighted Marginal Cost Per Customer
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
		Company Data	Att JDS-MCS-2 Page 1, Line 9	Col (B) x Col (C)	Col (C) Line (n) / Line 10	Col (G) Line 9	Col (E) x Col (F)
1	D	34,933	\$ 692.20	\$ 24,180,208	0.873	\$ 50.43	\$44.03
2	D-10	440	\$ 964.85	\$ 424,125	1.217	\$ 50.43	\$61.37
3	G-1	136	\$ 1,858.65	\$ 253,381	2.344	\$ 50.43	\$118.22
4	G-2	872	\$ 1,618.41	\$ 1,410,695	2.041	\$ 50.43	\$102.94
5	G-3	5,650	\$ 1,244.85	\$ 7,033,660	1.570	\$ 50.43	\$79.18
6	M	N/A					
7	T	1,092	\$ 809.85	\$ 884,541	1.021	\$ 50.43	\$51.51
8	V	18	\$ 904.85	\$ 16,390	1.141	\$ 50.43	\$57.55
9	Total	43,141		\$ 34,203,000			\$50.43
10	Avg Cost per Customer \$792.82						

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Customer Accounts

1 Regression Results

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3 **Selected Model:** Customer Accounts 2015\$ = F(Customers 2 Year Rolling Average, Dummy₂₀₁₅, Dummy₂₀₁₀₋₂₀₁₃)

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Dependent Variable				
Customer Accounts 2015\$ _(2003 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-4,578,411	-1.38	0.2019
Customers 2 Year Rolling Average	Customer_R2	156.1471	1.93	0.0861
Dummy: Year 2015	D2015	867,194	3.14	0.0119
Dummy: Years 2010 through 2013	D2010_2013	-488,106	-2.68	0.0254
Model Statistics	Model 3.0			
R_Squared	0.7805			
Adjusted R_Squared	0.7073			
Mean Absolute % Error (MAPE)	9.9737			
Passes ACF/PACF	Yes			

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19 Marginal Cost Calculation

20 Customer Accounts = - \$ 4,578,411 + \$ 156.1471 x Customer_R2 + \$ 867,194 x D2015 - \$ 488,106 x D2010_2013

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22 ∂ Customer Accounts / ∂ Customer = \$ 156.1471 per Customer

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24 Customer Accounts / Customer (2013-2015 Average) \$ 55.11 per Customer

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26 Customer Accounts / Customer (2011-2015 Average) \$ 45.34 per Customer

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Class Weighted Customer Accounting Expense

Line No.	Customer Groups	Test Year Number of Customers	% of total Customers	Relative Weight Per Customer	Marginal Unit Cost	Marginal Cost Per Customer
	(A)	(B)	(C)	(D)	(E)	(F)
		Att JDS-MCS-5 Page 2, Col (B)	Col (B) Line (n) / Col (B) Line 9	2013 MCS per Company	Att JDS-MCS-5 Page 3, Line 24	Col (D) x Col (E)
1	D	34,933	80.97%	1.00	\$ 55.11	\$ 55.11
2	D-10	440	1.02%	1.00	\$ 55.11	\$ 55.11
3	G-1	136	0.32%	2.00	\$ 55.11	\$ 110.23
4	G-2	872	2.02%	1.50	\$ 55.11	\$ 82.67
5	G-3	5,650	13.10%	1.00	\$ 55.11	\$ 55.11
6	M	N/A				
7	T	1,092	2.53%	1.00	\$ 55.11	\$ 55.11
8	V	18	0.04%	1.00	\$ 55.11	\$ 55.11
9	Total	43,141			\$ 55.11	

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Class Weighted Bad Debt Accounts Expense

Line No.	Customer Groups	2015 Write Offs	Percent of Total	Bad Debt Accounts Expense	Total Normalized Distribution Revenues	Bad Debt Expense Percentage
	(A)	(B)	(C)	(D)	(E)	(F)
		Company Data	Col (B) Line (n) / Col (B) Line 9	Col (C) Line (n) x Col (D) Line 9	Company Data	Col (D) / Col (E)
1	D	\$ 1,131,435	81.43%	\$ 755,936	\$ 16,525,628	4.57%
2	D-10	\$ 10,481	0.75%	\$ 7,003	\$ 242,048	2.89%
3	G-1	\$ 21,873	1.57%	\$ 14,614	\$ 8,103,482	0.18%
4	G-2	\$ 71,766	5.17%	\$ 47,948	\$ 4,444,615	1.08%
5	G-3	\$ 120,782	8.69%	\$ 80,697	\$ 4,376,842	1.84%
6	M	\$ 2,468	0.18%	\$ 1,649	\$ 856,890	0.19%
7	T	\$ 30,626	2.20%	\$ 20,462	\$ 756,106	2.71%
8	V	\$ -	0.00%	\$ -	\$ 15,462	0.00%
9	Total	\$ 1,389,431	100.00%	\$ 928,309	\$ 35,321,073	2.63%

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Administrative and General Expense - Marginal Loading Factors

1 Regression Results

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3 **Selected Model:** Administrative and General Expense 2015\$ = F(Total Utility Plant, Total O&M Expense Excl. A&G, Real 2015\$, 1 Year Lag, Dummy₂₀₁₂, Dummy₂₀₁₃,
Dummy₂₀₁₅, Total O&M Expense Excl. A&G, Real 2015\$₂₀₀₅₋₂₀₀₉)

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Dependent Variable Total Administrative and General Expense 2008\$ _(1999 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-1,031,492	-0.58	0.5767
Total Utility Plant	Util_Plt	0.0244	3.82	0.0034
Total O&M Expense Excl. A&G, Real 2015\$, 1 Year Lag	OM_Real_xAG_L1	0.0461	2.04	0.0684
Dummy: 2012	D2012	5,850,318	8.60	0.0000
Dummy: 2013	D2013	4,426,136	6.05	0.0001
Dummy: 2015	D2015	-4,065,197	-4.29	0.0016
Interactive: 2005 - 2009 x Total O&M Expense Excl. A&G, Real 2015\$, 1 Year Lag	I2005_2009xOM_Real_xAG_L1	-0.0212	-4.03	0.0024
Model Statistics	Model 2.0			
R_Squared		0.9545		
Adjusted R_Squared		0.9272		
Mean Absolute % Error (MAPE)		8.2174		
Passes ACF/PACF		Yes		

Marginal Cost Calculation

Total Administrative and General Expense = - \$ 1,031,492 + \$ 0.0244 x Util_Plt + \$ 0.0461 x OM_Real_xAG_L1 + \$ 5,850,318 x D2012 + \$ 4,426,136 x D2013 - \$ 4065196.6214 x D2015 - \$ 0.0212 x I2005_2009xOM_Real_xAG_L1

∂ Total Administrative and General Expense / ∂ O&M excl. A&G = \$ 0.0461 per \$ of O&M (2015\$)

∂ Total Administrative and General Expense / ∂ Plant = \$ 0.0244 per \$ of Plant (2015\$)

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Materials and Supplies Expense - Marginal Loading Factors

1 Regression Results

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3 **Selected Model:** Materials and Supplies 2008\$ = F(Total Electric Plant In Service , Dummy₂₀₀₉)

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5	Dependent Variable				
6	Materials and Supplies Expense 2015\$ _(2002 - 2015)				
7					
8	Explanatory Variables	Database variable name	Coefficient value	t test	Significance
9	Constant	Constant	-1,734,992	-2.37	0.0373
10	Total Electric Plant In Service	Util_Plt	0.0260	4.57	0.0008
11	Dummy: Year 2009	D2009	8,536,600	12.50	0.0000
12	Model Statistics	Model 1.0			
13	R_Squared	0.9408			
14	Adjusted R_Squared	0.9300			
15	Mean Absolute % Error (MAPE)	71.5959			
16	Passes ACF/PACF	Yes			

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Marginal Cost Calculation

19 Materials and Supplies Expense = - \$ 1,734,992 + \$ 0.0260 x Util_Plt + \$ 8,536,600 x D2009

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21 ∂ Materials and Supplies Expense / ∂ Plant = \$ 0.0260 per \$ Plant (2015\$)

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal General Plant - Marginal Loading Factors

Regression Results

Selected Model: General Plant = F(Total Utility Plant, excluding General Plant, Dummy₂₀₀₆₋₂₀₀₈, Dummy₂₀₀₉₋₂₀₁₃)

Dependent Variable General Plant (2002 - 2015)				
Explanatory Variables	Database variable name	Coefficient value	t test	Significance
Constant	Constant	-3,107,168	-2.51	0.0309
Total Utility Plant, excluding General Plant	Util_Plt_xGen_Plt	0.1026	10.10	0.0000
Dummy: 2006 - 2008	D2006_2008	-2,022,896	-2.76	0.0201
Dummy: 2009 - 2013	D2009_2013	-3,815,032	-6.00	0.0001
Model Statistics	Model 2.0			
R_Squared	0.9262			
Adjusted R_Squared	0.9040			
Mean Absolute % Error (MAPE)	7.3982			
Passes ACF/PACF	Yes			

Marginal Cost Calculation

General Plant = - \$ 3,107,168 + \$ 0.1026 x Util_Plt_xGen_Plt - \$ 2,022,896 x D2006_2008 - \$ 3,815,032 x D2009_2013

∂ General Plant / ∂ Plant excl. General Plant = \$ 0.1026 per \$ Plant (2015\$)

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Summary of Levelized Fixed Charge Rates

Line No.	Description	Engineer's Fixed Charge Rate	Economist's Fixed charge Rate	Explanation
	(A)	(B)	(C)	(D)
1	Fixed Charge Rate Results			
2	Levelized Cost for:		Over Book Life	
3	Primary and Secondary Cap-related Dist.	14.09%	11.15%	Att JDS-MCS-7 Page 3, Line 13
4	Line Transformers Investment	14.07%	11.25%	Att JDS-MCS-7 Page 4, Line 13
5	Services Investment	13.78%	10.75%	Att JDS-MCS-7 Page 5, Line 13
6	Meters Investment	15.62%	13.36%	Att JDS-MCS-7 Page 6, Line 13
7	Street Lighting Investment	14.47%	11.89%	Att JDS-MCS-7 Page 7, Line 13
8	Cost of Capital			
9	Debt	5.88%	45.00%	WP JDS-MCS-7 Page 1, Line 1
10	Preferred	0.00%	0.00%	WP JDS-MCS-7 Page 1, Line 2
11	Common	10.30%	55.00%	WP JDS-MCS-7 Page 1, Line 3
12	Other	0.00%	0.00%	WP JDS-MCS-7 Page 1, Line 4
13	Weighted Cost of Capital		8.31100%	
14	After Tax Cost of New Capital		7.26%	WP JDS-MCS-7 Page 1, Line 10
15	Incremental Tax Rate		39.61%	WP JDS-MCS-7 Page 1, Line 6
16	Tax Effectuated Cost of Capital		12.03%	WP JDS-MCS-7 Page 1, Line 5
17	Property Tax Rate		3.13%	WP JDS-MCS-7 Page 1, Line 9
18	Gross Receipts Tax Rate		0.00%	WP JDS-MCS-7 Page 1, Line 11
19	Inflation Rate		1.94%	WP JDS-MCS-7 Page 1, Line 12
20	Property Tax Escalation Rate		2.50%	WP JDS-MCS-7 Page 1, Line 13

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Levelized Fixed Charge Analysis, Input Data

Line No.	Variable	Primary and Secondary Capacity - Related Distribution Plant	Line Transformers	Services	Meters	Street Lighting	Explanation
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
1	Plant Data						
2	Capitalized Cost	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	
3	Book Life	40	37	45	22	30	Att JDS-MCS-7 Page 9, Col (C)
4	Salvage Value	-25%	-30%	-43%	-15%	-30%	Att JDS-MCS-7 Page 9, Col (D)
5	MACRS Life	20	20	20	20	20	
6	Capital Structure						
7	Debt Ratio	45.00%	45.00%	45.00%	45.00%	45.00%	Att JDS-MCS-7 Page 1, Col (C), Line 9
8	Preferred Ratio	0.00%	0.00%	0.00%	0.00%	0.00%	Att JDS-MCS-7 Page 1, Col (C), Line 10
9	Common Ratio	55.00%	55.00%	55.00%	55.00%	55.00%	Att JDS-MCS-7 Page 1, Col (C), Line 11
10	Other	0.00%	0.00%	0.00%	0.00%	0.00%	Att JDS-MCS-7 Page 1, Col (C), Line 12
11	Cost of Capital						
12	Debt Cost	5.88%	5.88%	5.88%	5.88%	5.88%	Att JDS-MCS-7 Page 1, Col (B), Line 9
13	Preferred Cost	0.00%	0.00%	0.00%	0.00%	0.00%	Att JDS-MCS-7 Page 1, Col (B), Line 10
14	Common Cost	10.30%	10.30%	10.30%	10.30%	10.30%	Att JDS-MCS-7 Page 1, Col (B), Line 11
15	Other	0.00%	0.00%	0.00%	0.00%	0.00%	Att JDS-MCS-7 Page 1, Col (B), Line 12
16	Wtd Cost Of Capital	8.31%	8.31%	8.31%	8.31%	8.31100%	(Line 7 x Line 12) + (Line 8 x Line 13) + (Line 9 x Line 14) + (Line 10 x Line 15)
17	After Tax Cost of Capital	7.26%	7.26%	7.26%	7.26%	7.26%	Att JDS-MCS-7 Page 1, Col (C), Line 14
18	Tax Data						
19	Tax Rate	39.61%	39.61%	39.61%	39.61%	39.61%	Att JDS-MCS-7 Page 1, Col (C), Line 15
20	ITC Rate	0.00%	0.00%	0.00%	0.00%	0.00%	WP JDS-MCS-7 Page 1, Line 7
21	Revenue Tax Rate	0.00%	0.00%	0.00%	0.00%	0.00%	WP JDS-MCS-7 Page 1, Line 8
22	Property Tax Rate	3.13%	3.13%	3.13%	3.13%	3.13%	Att JDS-MCS-7 Page 1, Col (C), Line 17
23	Property Insurance	0.35%	0.35%	0.35%	0.35%	0.35%	WP JDS-MCS-7 Page 2, Line 3
24	Property Tax Basis	Dep Bal	Dep Bal	Dep Bal	Dep Bal	Dep Bal	
25	Misc. Data						
26	Inflation Rate	1.94%	1.94%	1.94%	1.94%	1.94%	Att JDS-MCS-7 Page 1, Col (C), Line 19
27	Prop Tax Escalation Rate	2.50%	2.50%	2.50%	2.50%	2.50%	Att JDS-MCS-7 Page 1, Col (C), Line 20
28	Return on Rate Base calculation	EOY	EOY	EOY	EOY	EOY	

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Levelized Fixed Charge Analysis
Primary and Secondary Capacity Related Distribution

Line No.	Item	-- Current Dollars -- (Engineer's FCR)		-- Constant Dollars -- (Economist's FCR)	
		Current Levelized Dollars	Percent Of Capital Investment	Constant Levelized Dollars	Percent Of Capital Investment
	(A)	(B) Att JDS- MCS-7 Page 8A	(C) Col (B) x 0.001	(D) Att JDS- MCS-7 Page 8A	(E) Col (D) x 0.001
1	Interest On Debt	\$14.66	1.47%	\$11.61	1.16%
2	Return On Preferred	\$0.00	0.00%	\$0.00	0.00%
3	Return On Common	\$31.39	3.14%	\$24.85	2.48%
4	Return	\$46.05	4.60%	\$36.46	3.65%
5	Depreciation	\$31.19	3.12%	\$24.69	2.47%
6	Income Tax	\$16.14	1.61%	\$12.78	1.28%
7	Deferred Taxes	\$4.45	0.44%	\$3.52	0.35%
8	Income Tax	\$20.59	2.06%	\$16.30	1.63%
9	Revenue Tax	\$0.00	0.00%	\$0.00	0.00%
10	Property Tax	\$38.93	3.89%	\$30.82	3.08%
11	Property Insurance	\$4.13	0.41%	\$3.27	0.33%
12	Other	\$43.06	4.31%	\$34.09	3.41%
13	Total Revenue Required	\$140.89	14.09%	\$111.54	11.15%

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Levelized Fixed Charge Analysis
Line Transformers Investment

Line No.	Item	Current Dollars (Engineer's FCR)		Constant Dollars (Economist's FCR)	
		Current Levelized Dollars	Percent Of Capital Investment	Constant Levelized Dollars	Percent Of Capital Investment
	(A)	(B) Att JDS-MCS-7 Page 8B	(C) Col (B) x 0.001	(D) Att JDS-MCS-7 Page 8B	(E) Col (D) x 0.001
1	Interest On Debt	\$14.19	1.42%	\$11.34	1.13%
2	Return On Preferred	\$0.00	0.00%	\$0.00	0.00%
3	Return On Common	\$30.38	3.04%	\$24.29	2.43%
4	Return	\$44.57	4.46%	\$35.63	3.56%
5	Depreciation	\$35.14	3.51%	\$28.09	2.81%
6	Income Tax	\$16.55	1.66%	\$13.23	1.32%
7	Deferred Taxes	\$3.37	0.34%	\$2.70	0.27%
8	Income Tax	\$19.93	1.99%	\$15.93	1.59%
9	Revenue Tax	\$0.00	0.00%	\$0.00	0.00%
10	Property Tax	\$37.12	3.71%	\$29.68	2.97%
11	Property Insurance	\$3.96	0.40%	\$3.17	0.32%
12	Other	\$41.09	4.11%	\$32.85	3.28%
13	Total Revenue Required	\$140.72	14.07%	\$112.51	11.25%

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Levelized Fixed Charge Analysis
Services Investment

Line No.	Item	Current Dollars (Engineer's FCR)		Constant Dollars (Economist's FCR)	
		Current Levelized Dollars	Percent Of Capital Investment	Constant Levelized Dollars	Percent Of Capital Investment
	(A)	(B) Att JDS- MCS-7 Page 8C	(C) Col (B) x 0.001	(D) Att JDS- MCS-7 Page 8C	(E) Col (D) x 0.001
1	Interest On Debt	\$14.19	1.42%	\$11.07	1.11%
2	Return On Preferred	\$0.00	0.00%	\$0.00	0.00%
3	Return On Common	\$30.37	3.04%	\$23.70	2.37%
4	Return	\$44.56	4.46%	\$34.77	3.48%
5	Depreciation	\$31.67	3.17%	\$24.71	2.47%
6	Income Tax	\$15.88	1.59%	\$12.40	1.24%
7	Deferred Taxes	\$4.04	0.40%	\$3.15	0.32%
8	Income Tax	\$19.92	1.99%	\$15.55	1.55%
9	Revenue Tax	\$0.00	0.00%	\$0.00	0.00%
10	Property Tax	\$37.66	3.77%	\$29.39	2.94%
11	Property Insurance	\$4.00	0.40%	\$3.12	0.31%
12	Other	\$41.66	4.17%	\$32.51	3.25%
13	Total Revenue Required	\$137.81	13.78%	\$107.55	10.75%

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Levelized Fixed Charge Analysis
Metering Equipment

Line No.	Item	Current Dollars (Engineer's FCR)		Constant Dollars (Economist's FCR)	
		Current Levelized Dollars	Percent Of Capital Investment	Constant Levelized Dollars	Percent Of Capital Investment
	(A)	(B) Att JDS-MCS-7 Page 8D	(C) Col (B) x 0.001	(D) Att JDS-MCS-7 Page 8D	(E) Col (D) x 0.001
1	Interest On Debt	\$14.31	1.43%	\$12.24	1.22%
2	Return On Preferred	\$0.00	0.00%	\$0.00	0.00%
3	Return On Common	\$30.64	3.06%	\$26.20	2.62%
4	Return	\$44.95	4.50%	\$38.44	3.84%
5	Depreciation	\$52.27	5.23%	\$44.70	4.47%
6	Income Tax	\$20.10	2.01%	\$17.19	1.72%
7	Deferred Taxes	(\$0.00)	0.00%	(\$0.00)	0.00%
8	Income Tax	\$20.10	2.01%	\$17.18	1.72%
9	Revenue Tax	\$0.00	0.00%	\$0.00	0.00%
10	Property Tax	\$35.10	3.51%	\$30.01	3.00%
11	Property Insurance	\$3.81	0.38%	\$3.26	0.33%
12	Other	\$38.91	3.89%	\$33.27	3.33%
13	Total Revenue Required	\$156.22	15.62%	\$133.59	13.36%

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Levelized Fixed Charge Analysis
Street Lighting Investment

Line No.	Item	Current Dollars (Engineer's FCR)		Constant Dollars (Economist's FCR)	
		Current Levelized Dollars	Percent Of Capital Investment	Constant Levelized Dollars	Percent Of Capital Investment
	(A)	(B) Att JDS-MCS-7 Page 8E	(C) Col (B) x 0.001	(D) Att JDS-MCS-7 Page 8E	(E) Col (D) x 0.001
1	Interest On Debt	\$13.71	1.37%	\$11.27	1.13%
2	Return On Preferred	\$0.00	0.00%	\$0.00	0.00%
3	Return On Common	\$29.36	2.94%	\$24.13	2.41%
4	Return	\$43.07	4.31%	\$35.39	3.54%
5	Depreciation	\$43.33	4.33%	\$35.61	3.56%
6	Income Tax	\$17.73	1.77%	\$14.57	1.46%
7	Deferred Taxes	\$1.52	0.15%	\$1.25	0.13%
8	Income Tax	\$19.26	1.93%	\$15.82	1.58%
9	Revenue Tax	\$0.00	0.00%	\$0.00	0.00%
10	Property Tax	\$35.24	3.52%	\$28.96	2.90%
11	Property Insurance	\$3.79	0.38%	\$3.12	0.31%
12	Other	\$39.03	3.90%	\$32.08	3.21%
13	Total Revenue Required	\$144.69	14.47%	\$118.90	11.89%

Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream

Primary and Secondary Capacity Related Distribution

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Taxes	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
	1000.00						0.00	0.00								
1	966.31	25.57	0.00	54.74	37.50	3.750%	31.19	2.50	84.34	33.41		31.30	3.54	182.24	18.22%	169.90
2	918.88	24.31	0.00	52.05	72.19	7.219%	31.19	16.24	45.20	17.90		32.08	3.61	177.39	17.74%	154.18
3	873.60	23.12	0.00	49.49	66.77	6.677%	31.19	14.09	46.37	18.37		32.88	3.68	172.82	17.28%	140.03
4	830.30	21.97	0.00	47.04	61.77	6.177%	31.19	12.11	47.31	18.74		33.71	3.75	168.50	16.85%	127.29
5	788.83	20.87	0.00	44.69	57.13	5.713%	31.19	10.27	48.06	19.04		34.55	3.82	164.43	16.44%	115.81
6	749.06	19.82	0.00	42.43	52.85	5.285%	31.19	8.58	48.61	19.25		35.41	3.90	160.59	16.06%	105.44
7	710.86	18.81	0.00	40.27	48.88	4.888%	31.19	7.01	48.99	19.41		36.30	3.97	156.95	15.70%	96.08
8	674.12	17.84	0.00	38.19	45.22	4.522%	31.19	5.56	49.21	19.49		37.21	4.05	153.52	15.35%	87.61
9	637.61	16.87	0.00	36.12	44.62	4.462%	31.19	5.32	46.38	18.37		38.14	4.13	150.14	15.01%	79.88
10	601.10	15.91	0.00	34.05	44.61	4.461%	31.19	5.32	42.97	17.02		39.09	4.21	146.78	14.68%	72.81
11	564.59	14.94	0.00	31.98	44.62	4.462%	31.19	5.32	39.53	15.66		40.07	4.29	143.45	14.34%	66.34
12	528.09	13.97	0.00	29.92	44.61	4.461%	31.19	5.32	36.12	14.31		41.07	4.37	140.14	14.01%	60.42
13	491.58	13.01	0.00	27.85	44.62	4.462%	31.19	5.32	32.68	12.95		42.10	4.46	136.86	13.69%	55.01
14	455.07	12.04	0.00	25.78	44.61	4.461%	31.19	5.32	29.27	11.59		43.15	4.54	133.61	13.36%	50.07
15	418.56	11.08	0.00	23.71	44.62	4.462%	31.19	5.32	25.83	10.23		44.23	4.63	130.39	13.04%	45.55
16	382.06	10.11	0.00	21.64	44.61	4.461%	31.19	5.32	22.42	8.88		45.33	4.72	127.19	12.72%	41.43
17	345.55	9.14	0.00	19.58	44.62	4.462%	31.19	5.32	18.98	7.52		46.47	4.81	124.03	12.40%	37.66
18	309.04	8.18	0.00	17.51	44.61	4.461%	31.19	5.32	15.57	6.17		47.63	4.91	120.89	12.09%	34.22
19	272.53	7.21	0.00	15.44	44.62	4.462%	31.19	5.32	12.14	4.81		48.82	5.00	117.79	11.78%	31.09
20	236.03	6.25	0.00	13.37	44.61	4.461%	31.19	5.32	8.72	3.45		50.04	5.10	114.71	11.47%	28.22
21	208.36	5.51	0.00	11.80	22.31	2.231%	31.19	(3.52)	28.42	11.26		51.29	5.20	112.74	11.27%	25.86
22	189.52	5.01	0.00	10.74	0.00		31.19	(12.35)	48.97	19.40		52.57	5.30	111.85	11.19%	23.92
23	170.68	4.52	0.00	9.67	0.00		31.19	(12.35)	47.20	18.70		53.89	5.40	111.01	11.10%	22.13
24	151.85	4.02	0.00	8.60	0.00		31.19	(12.35)	45.43	18.00		55.23	5.51	110.19	11.02%	20.48
25	133.01	3.52	0.00	7.54	0.00		31.19	(12.35)	43.67	17.30		56.61	5.62	109.42	10.94%	18.96
26	114.18	3.02	0.00	6.47	0.00		31.19	(12.35)	41.90	16.60		58.03	5.72	108.67	10.87%	17.56
27	95.34	2.52	0.00	5.40	0.00		31.19	(12.35)	40.13	15.90		59.48	5.84	107.97	10.80%	16.26
28	76.51	2.02	0.00	4.33	0.00		31.19	(12.35)	38.37	15.20		60.97	5.95	107.31	10.73%	15.07
29	57.67	1.53	0.00	3.27	0.00		31.19	(12.35)	36.60	14.50		62.49	6.06	106.68	10.67%	13.97
30	38.84	1.03	0.00	2.20	0.00		31.19	(12.35)	34.83	13.80		64.05	6.18	106.10	10.61%	12.95
31	20.00	0.53	0.00	1.13	0.00		31.19	(12.35)	33.07	13.10		65.65	6.30	105.55	10.56%	12.01
32	1.17	0.03	0.00	0.07	0.00		31.19	(12.35)	31.30	12.40		67.30	6.42	105.05	10.50%	11.14
33	(17.67)	(0.47)	0.00	(1.00)	0.00		31.19	(12.35)	29.53	11.70		0.00	0.00	29.06	2.91%	2.87
34	(36.50)	(0.97)	0.00	(2.07)	0.00		31.19	(12.35)	27.77	11.00		0.00	0.00	26.80	2.68%	2.47
35	(55.34)	(1.46)	0.00	(3.14)	0.00		31.19	(12.35)	26.00	10.30		0.00	0.00	24.53	2.45%	2.11
36	(74.18)	(1.96)	0.00	(4.20)	0.00		31.19	(12.35)	24.23	9.60		0.00	0.00	22.27	2.23%	1.78
37	(93.01)	(2.46)	0.00	(5.27)	0.00		31.19	(12.35)	22.46	8.90		0.00	0.00	20.00	2.00%	1.49
38	(111.85)	(2.96)	0.00	(6.34)	0.00		31.19	(12.35)	20.70	8.20		0.00	0.00	17.74	1.77%	1.24

Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream
Primary and Secondary Capacity Related Distribution

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Taxes	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
39	(130.68)	(3.46)	0.00	(7.40)	0.00		31.19	(12.35)	18.93	7.50		0.00	0.00	15.47	1.55%	1.00
40	(247.59)	(6.55)	0.00	(14.03)	247.59		31.19	85.71	(239.62)	(94.91)		0.00	0.00	1.41	0.14%	0.09
41	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
42	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
43	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
44	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
45	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
46	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
47	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
48	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
49	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
50	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
51	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
52	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
53	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
54	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
55	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
56	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
57	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
58	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
59	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
60	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
61	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
62	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
63	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
64	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
65	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
Total		\$ 323.98	\$ -	\$ 693.63	\$ 1,247.59		\$ 1,247.59	\$ (0.00)	\$ 1,148.58	\$ 454.95	\$ -	\$ 1,507.10	\$154.99	\$ 4,382.24	438.22%	\$ 1,822.40
Present Worth		\$ 189.64	\$ -	\$ 406.02	\$ 548.67		\$ 403.44	\$ 57.53	\$ 527.09	\$ 208.78	\$ -	\$ 503.54	\$ 53.45	\$ 1,822.40	182.24%	\$ 1,040.55
Levelized		\$ 14.66	\$ -	\$ 31.39	\$ 42.42		\$ 31.19	\$ 4.45	\$ 40.75	\$ 16.14	\$ -	\$ 38.93	\$ 4.13	\$ 140.89	14.09%	
Payment Current																
Levelized		\$ 11.61	\$ -	\$ 24.85	\$ 33.58		\$ 24.69	\$ 3.52	\$ 32.26	\$ 12.78	\$ -	\$ 30.82	\$ 3.27	\$ 111.54	11.15%	
Payment Constant																

Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream
Line Transformers Investment

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Taxes	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
	1000.00						0.00	0.00								
1	963.93	25.51	0.00	54.61	37.50	3.750%	35.14	0.94	88.06	34.88		31.30	3.54	185.90	18.59%	173.31
2	914.12	24.19	0.00	51.78	72.19	7.219%	35.14	14.68	48.70	19.29		32.08	3.61	180.76	18.08%	157.11
3	866.45	22.93	0.00	49.08	66.77	6.677%	35.14	12.53	49.64	19.66		32.88	3.68	175.90	17.59%	142.54
4	820.76	21.72	0.00	46.50	61.77	6.177%	35.14	10.55	50.36	19.95		33.71	3.75	171.30	17.13%	129.41
5	776.92	20.56	0.00	44.01	57.13	5.713%	35.14	8.71	50.89	20.16		34.55	3.82	166.94	16.69%	117.58
6	734.77	19.44	0.00	41.62	52.85	5.285%	35.14	7.02	51.21	20.28		35.41	3.90	162.81	16.28%	106.90
7	694.19	18.37	0.00	39.33	48.88	4.888%	35.14	5.44	51.37	20.35		36.30	3.97	158.89	15.89%	97.26
8	655.06	17.33	0.00	37.11	45.22	4.522%	35.14	3.99	51.36	20.35		37.21	4.05	155.17	15.52%	88.56
9	616.16	16.30	0.00	34.91	44.62	4.462%	35.14	3.76	48.32	19.14		38.14	4.13	151.50	15.15%	80.61
10	577.28	15.27	0.00	32.70	44.61	4.461%	35.14	3.75	44.68	17.70		39.09	4.21	147.86	14.79%	73.34
11	538.38	14.25	0.00	30.50	44.62	4.462%	35.14	3.76	41.02	16.25		40.07	4.29	144.24	14.42%	66.70
12	499.50	13.22	0.00	28.30	44.61	4.461%	35.14	3.75	37.38	14.81		41.07	4.37	140.65	14.06%	60.64
13	460.60	12.19	0.00	26.09	44.62	4.462%	35.14	3.76	33.72	13.36		42.10	4.46	137.08	13.71%	55.10
14	421.72	11.16	0.00	23.89	44.61	4.461%	35.14	3.75	30.08	11.92		43.15	4.54	133.55	13.35%	50.04
15	382.82	10.13	0.00	21.69	44.62	4.462%	35.14	3.76	26.43	10.47		44.23	4.63	130.03	13.00%	45.43
16	343.94	9.10	0.00	19.48	44.61	4.461%	35.14	3.75	22.79	9.03		45.33	4.72	126.55	12.66%	41.22
17	305.04	8.07	0.00	17.28	44.62	4.462%	35.14	3.76	19.13	7.58		46.47	4.81	123.10	12.31%	37.38
18	266.16	7.04	0.00	15.08	44.61	4.461%	35.14	3.75	15.49	6.14		47.63	4.91	119.68	11.97%	33.88
19	227.26	6.01	0.00	12.87	44.62	4.462%	35.14	3.76	11.83	4.69		48.82	5.00	116.29	11.63%	30.69
20	188.37	4.98	0.00	10.67	44.61	4.461%	35.14	3.75	8.20	3.25		50.04	5.10	112.93	11.29%	27.78
21	158.32	4.19	0.00	8.97	22.31	2.231%	35.14	(5.08)	27.68	10.96		51.29	5.20	110.66	11.07%	25.38
22	137.10	3.63	0.00	7.77	0.00		35.14	(13.92)	48.00	19.01		52.57	5.30	109.49	10.95%	23.42
23	115.88	3.07	0.00	6.56	0.00		35.14	(13.92)	46.01	18.22		53.89	5.40	108.36	10.84%	21.60
24	94.67	2.50	0.00	5.36	0.00		35.14	(13.92)	44.02	17.43		55.23	5.51	107.26	10.73%	19.94
25	73.45	1.94	0.00	4.16	0.00		35.14	(13.92)	42.03	16.65		56.61	5.62	106.20	10.62%	18.40
26	52.23	1.38	0.00	2.96	0.00		35.14	(13.92)	40.03	15.86		58.03	5.72	105.17	10.52%	16.99
27	31.01	0.82	0.00	1.76	0.00		35.14	(13.92)	38.04	15.07		59.48	5.84	104.18	10.42%	15.69
28	9.79	0.26	0.00	0.55	0.00		35.14	(13.92)	36.05	14.28		60.97	5.95	103.23	10.32%	14.49
29	(11.43)	(0.30)	0.00	(0.65)	0.00		35.14	(13.92)	34.06	13.49		0.00	0.00	33.76	3.38%	4.42
30	(32.64)	(0.86)	0.00	(1.85)	0.00		35.14	(13.92)	32.07	12.70		0.00	0.00	31.21	3.12%	3.81
31	(53.86)	(1.43)	0.00	(3.05)	0.00		35.14	(13.92)	30.08	11.92		0.00	0.00	28.66	2.87%	3.26
32	(75.08)	(1.99)	0.00	(4.25)	0.00		35.14	(13.92)	28.09	11.13		0.00	0.00	26.11	2.61%	2.77
33	(96.30)	(2.55)	0.00	(5.46)	0.00		35.14	(13.92)	26.10	10.34		0.00	0.00	23.55	2.36%	2.33
34	(117.52)	(3.11)	0.00	(6.66)	0.00		35.14	(13.92)	24.11	9.55		0.00	0.00	21.00	2.10%	1.94
35	(138.73)	(3.67)	0.00	(7.86)	0.00		35.14	(13.92)	22.12	8.76		0.00	0.00	18.45	1.85%	1.59
36	(159.95)	(4.23)	0.00	(9.06)	0.00		35.14	(13.92)	20.13	7.97		0.00	0.00	15.90	1.59%	1.27
37	(300.00)	(7.94)	0.00	(17.00)	300.00		35.14	104.91	(293.01)	(116.06)		0.00	0.00	(0.94)	-0.09%	(0.07)
38	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
39	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00

Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream
Line Transformers Investment

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Taxes	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
40	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
41	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
42	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
43	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
44	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
45	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
46	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
47	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
48	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
49	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
50	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
51	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
52	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
53	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
54	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
55	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
56	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
57	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
58	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
59	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
60	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
61	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
62	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
63	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
64	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
65	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
Total		\$ 289.48	\$ -	\$ 619.77	\$ 1,300.00		\$ 1,300.00	\$ 0.00	\$1,026.28	\$ 406.51	\$ -	\$ 1,247.61	\$130.02	\$ 3,993.40	399.34%	\$ 1,792.71
Present Worth Levelized		\$ 180.77	\$ -	\$ 387.02	\$ 556.10		\$ 447.62	\$ 42.97	\$ 532.40	\$ 210.88	\$ -	\$ 472.93	\$ 50.50	\$ 1,792.71	179.27%	\$ 1,048.32
Payment Current		\$ 14.19	\$ -	\$ 30.38	\$ 43.65		\$ 35.14	\$ 3.37	\$ 41.79	\$ 16.55	\$ -	\$ 37.12	\$ 3.96	\$ 140.72	14.07%	
Levelized Payment		\$ 11.34	\$ -	\$ 24.29	\$ 34.90		\$ 28.09	\$ 2.70	\$ 33.41	\$ 13.23	\$ -	\$ 29.68	\$ 3.17	\$ 112.51	11.25%	

**Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream
Services Investment**

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Taxes	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
1	1000.00						0.00	0.00								
2	966.02	25.56	0.00	54.73	37.50	3.750%	31.67	2.31	84.79	33.58		31.30	3.54	182.69	18.27%	170.32
3	918.30	24.30	0.00	52.02	72.19	7.219%	31.67	16.05	45.62	18.07		32.08	3.61	177.80	17.78%	154.54
4	872.73	23.09	0.00	49.44	66.77	6.677%	31.67	13.90	46.77	18.52		32.88	3.68	173.19	17.32%	140.34
5	829.14	21.94	0.00	46.97	61.77	6.177%	31.67	11.92	47.68	18.88		33.71	3.75	168.84	16.88%	127.55
6	787.39	20.83	0.00	44.61	57.13	5.713%	31.67	10.09	48.40	19.17		34.55	3.82	164.73	16.47%	116.02
7	747.33	19.77	0.00	42.34	52.85	5.285%	31.67	8.39	48.92	19.38		35.41	3.90	160.86	16.09%	105.62
8	708.85	18.76	0.00	40.16	48.88	4.888%	31.67	6.82	49.28	19.52		36.30	3.97	157.19	15.72%	96.22
9	671.81	17.78	0.00	38.06	45.22	4.522%	31.67	5.37	49.47	19.59		37.21	4.05	153.72	15.37%	87.73
10	635.02	16.80	0.00	35.97	44.62	4.462%	31.67	5.13	46.62	18.46		38.14	4.13	150.30	15.03%	79.97
11	598.22	15.83	0.00	33.89	44.61	4.461%	31.67	5.13	43.17	17.10		39.09	4.21	146.91	14.69%	72.87
12	561.42	14.86	0.00	31.80	44.62	4.462%	31.67	5.13	39.71	15.73		40.07	4.29	143.54	14.35%	66.38
13	524.63	13.88	0.00	29.72	44.61	4.461%	31.67	5.13	36.27	14.37		41.07	4.37	140.20	14.02%	60.45
14	487.83	12.91	0.00	27.64	44.62	4.462%	31.67	5.13	32.81	13.00		42.10	4.46	136.89	13.69%	55.02
15	451.04	11.93	0.00	25.55	44.61	4.461%	31.67	5.13	29.37	11.63		43.15	4.54	133.60	13.36%	50.06
16	414.24	10.96	0.00	23.47	44.62	4.462%	31.67	5.13	25.91	10.26		44.23	4.63	130.34	13.03%	45.54
17	377.45	9.99	0.00	21.38	44.61	4.461%	31.67	5.13	22.46	8.90		45.33	4.72	127.12	12.71%	41.40
18	340.65	9.01	0.00	19.30	44.62	4.462%	31.67	5.13	19.00	7.53		46.47	4.81	123.91	12.39%	37.63
19	303.86	8.04	0.00	17.21	44.61	4.461%	31.67	5.13	15.56	6.16		47.63	4.91	120.74	12.07%	34.18
20	267.06	7.07	0.00	15.13	44.62	4.462%	31.67	5.13	12.10	4.79		48.82	5.00	117.61	11.76%	31.04
21	230.27	6.09	0.00	13.04	44.61	4.461%	31.67	5.13	8.66	3.43		50.04	5.10	114.50	11.45%	28.17
22	202.31	5.35	0.00	11.46	22.31	2.231%	31.67	(3.71)	28.33	11.22		51.29	5.20	112.49	11.25%	25.80
23	183.18	4.85	0.00	10.38	0.00		31.67	(12.54)	48.85	19.35		52.57	5.30	111.57	11.16%	23.86
24	164.06	4.34	0.00	9.29	0.00		31.67	(12.54)	47.06	18.64		53.89	5.40	110.69	11.07%	22.07
25	144.94	3.84	0.00	8.21	0.00		31.67	(12.54)	45.26	17.93		55.23	5.51	109.84	10.98%	20.42
26	125.81	3.33	0.00	7.13	0.00		31.67	(12.54)	43.47	17.22		56.61	5.62	109.03	10.90%	18.89
27	106.69	2.82	0.00	6.04	0.00		31.67	(12.54)	41.67	16.51		58.03	5.72	108.25	10.83%	17.49
28	87.57	2.32	0.00	4.96	0.00		31.67	(12.54)	39.88	15.80		59.48	5.84	107.51	10.75%	16.19
29	68.44	1.81	0.00	3.88	0.00		31.67	(12.54)	38.09	15.09		60.97	5.95	106.81	10.68%	15.00
30	49.32	1.30	0.00	2.79	0.00		31.67	(12.54)	36.29	14.38		62.49	6.06	106.15	10.62%	13.90
31	30.20	0.80	0.00	1.71	0.00		31.67	(12.54)	34.50	13.67		64.05	6.18	105.53	10.55%	12.88
32	11.07	0.29	0.00	0.63	0.00		31.67	(12.54)	32.71	12.95		65.65	6.30	104.95	10.50%	11.94
33	(8.05)	(0.21)	0.00	(0.46)	0.00		31.67	(12.54)	30.91	12.24		0.00	0.00	30.70	3.07%	3.26
34	(27.18)	(0.72)	0.00	(1.54)	0.00		31.67	(12.54)	29.12	11.53		0.00	0.00	28.40	2.84%	2.81
35	(46.30)	(1.23)	0.00	(2.62)	0.00		31.67	(12.54)	27.32	10.82		0.00	0.00	26.10	2.61%	2.41
36	(65.42)	(1.73)	0.00	(3.71)	0.00		31.67	(12.54)	25.53	10.11		0.00	0.00	23.80	2.38%	2.05
37	(84.55)	(2.24)	0.00	(4.79)	0.00		31.67	(12.54)	23.74	9.40		0.00	0.00	21.50	2.15%	1.72
38	(103.67)	(2.74)	0.00	(5.87)	0.00		31.67	(12.54)	21.94	8.69		0.00	0.00	19.20	1.92%	1.43
39	(122.79)	(3.25)	0.00	(6.96)	0.00		31.67	(12.54)	20.15	7.98		0.00	0.00	16.90	1.69%	1.18
40	(141.92)	(3.76)	0.00	(8.04)	0.00		31.67	(12.54)	18.35	7.27		0.00	0.00	14.60	1.46%	0.95

**Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream
Services Investment**

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Taxes	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
40	(161.04)	(4.26)	0.00	(9.12)	0.00		31.67	(12.54)	16.56	6.56		0.00	0.00	12.30	1.23%	0.74
41	(180.16)	(4.77)	0.00	(10.21)	0.00		31.67	(12.54)	14.77	5.85		0.00	0.00	10.00	1.00%	0.56
42	(199.29)	(5.27)	0.00	(11.29)	0.00		31.67	(12.54)	12.97	5.14		0.00	0.00	7.70	0.77%	0.41
43	(218.41)	(5.78)	0.00	(12.37)	0.00		31.67	(12.54)	11.18	4.43		0.00	0.00	5.40	0.54%	0.26
44	(237.53)	(6.29)	0.00	(13.46)	0.00		31.67	(12.54)	9.38	3.72		0.00	0.00	3.10	0.31%	0.14
45	(425.00)	(11.25)	0.00	(24.08)	425.00		31.67	155.80	(433.20)	(171.59)		0.00	0.00	(19.45)	-1.94%	(0.83)
46	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
47	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
48	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
49	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
50	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
51	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
52	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
53	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
54	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
55	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
56	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
57	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
58	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
59	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
60	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
61	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
62	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
63	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
64	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
65	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
Total		\$ 286.97	\$ -	\$614.40	\$ 1,425.00		\$ 1,425.00	\$ 0.00	\$1,017.39	\$ 402.99	\$ -	\$ 1,439.81	\$148.57	\$ 4,317.74	431.77%	\$ 1,816.54
Present Worth		\$ 187.00	\$ -	\$400.36	\$ 551.81		\$ 417.42	\$ 53.23	\$ 528.57	\$ 209.37	\$ -	\$ 496.40	\$ 52.77	\$ 1,816.54	181.65%	\$ 1,041.24
Levelized Payment Current		\$ 14.19	\$ -	\$ 30.37	\$ 41.86		\$ 31.67	\$ 4.04	\$ 40.10	\$ 15.88	\$ -	\$ 37.66	\$ 4.00	\$ 137.81	13.78%	
Levelized Payment		\$ 11.07	\$ -	\$ 23.70	\$ 32.67		\$ 24.71	\$ 3.15	\$ 31.29	\$ 12.40	\$ -	\$ 29.39	\$ 3.12	\$ 107.55	10.75%	

Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream

Metering Equipment

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Tax	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
	1000.00						0.00	0.00								
1	953.58	25.23	0.00	54.02	37.50	3.750%	52.27	(5.85)	104.23	41.28		31.30	3.54	201.80	20.18%	188.13
2	893.42	23.64	0.00	50.61	72.19	7.219%	52.27	7.89	63.89	25.31		32.08	3.61	195.41	19.54%	169.84
3	835.40	22.10	0.00	47.33	66.77	6.677%	52.27	5.74	63.87	25.30		32.88	3.68	189.31	18.93%	153.40
4	779.37	20.62	0.00	44.15	61.77	6.177%	52.27	3.76	63.61	25.20		33.71	3.75	183.46	18.35%	138.59
5	725.17	19.19	0.00	41.08	57.13	5.713%	52.27	1.92	63.17	25.02		34.55	3.82	177.86	17.79%	125.26
6	672.67	17.80	0.00	38.11	52.85	5.285%	52.27	0.23	62.52	24.77		35.41	3.90	172.48	17.25%	113.25
7	621.74	16.45	0.00	35.22	48.88	4.888%	52.27	(1.34)	61.72	24.45		36.30	3.97	167.32	16.73%	102.42
8	572.26	15.14	0.00	32.42	45.22	4.522%	52.27	(2.79)	60.73	24.06		37.21	4.05	162.35	16.24%	92.65
9	523.02	13.84	0.00	29.63	44.62	4.462%	52.27	(3.03)	56.72	22.47		38.14	4.13	157.44	15.74%	83.77
10	473.78	12.54	0.00	26.84	44.61	4.461%	52.27	(3.04)	52.11	20.64		39.09	4.21	152.55	15.25%	75.67
11	424.54	11.23	0.00	24.05	44.62	4.462%	52.27	(3.03)	47.48	18.81		40.07	4.29	147.69	14.77%	68.30
12	375.30	9.93	0.00	21.26	44.61	4.461%	52.27	(3.04)	42.87	16.98		41.07	4.37	142.85	14.29%	61.59
13	326.06	8.63	0.00	18.47	44.62	4.462%	52.27	(3.03)	38.24	15.15		42.10	4.46	138.04	13.80%	55.48
14	276.82	7.32	0.00	15.68	44.61	4.461%	52.27	(3.04)	33.63	13.32		43.15	4.54	133.26	13.33%	49.93
15	227.58	6.02	0.00	12.89	44.62	4.462%	52.27	(3.03)	29.00	11.49		44.23	4.63	128.50	12.85%	44.89
16	178.34	4.72	0.00	10.10	44.61	4.461%	52.27	(3.04)	24.39	9.66		45.33	4.72	123.78	12.38%	40.31
17	129.10	3.42	0.00	7.31	44.62	4.462%	52.27	(3.03)	19.76	7.83		46.47	4.81	119.08	11.91%	36.16
18	79.87	2.11	0.00	4.52	44.61	4.461%	52.27	(3.04)	15.15	6.00		47.63	4.91	114.41	11.44%	32.39
19	30.62	0.81	0.00	1.73	44.62	4.462%	52.27	(3.03)	10.53	4.17		48.82	5.00	109.78	10.98%	28.97
20	(18.61)	(0.49)	0.00	(1.05)	44.61	4.461%	52.27	(3.04)	5.92	2.34		0.00	0.00	50.03	5.00%	12.31
21	(59.02)	(1.56)	0.00	(3.34)	22.31	2.231%	52.27	(11.87)	24.43	9.68		0.00	0.00	45.17	4.52%	10.36
22	(150.00)	(3.97)	0.00	(8.50)	150.00		52.27	38.71	(111.80)	(44.28)		0.00	0.00	34.23	3.42%	7.32
23	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
24	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
25	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
26	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
27	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
28	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
29	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
30	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
31	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
32	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
33	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
34	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
35	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
36	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
37	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
38	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
39	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00

Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream
Metering Equipment

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Tax	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
40	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
41	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
42	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
43	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
44	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
45	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
46	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
47	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
48	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
49	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
50	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
51	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
52	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
53	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
54	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
55	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
56	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
57	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
58	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
59	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
60	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
61	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
62	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
63	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
64	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
65	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
Total		\$ 234.73	\$ -	\$502.54	\$ 1,150.00		\$ 1,150.00	\$ (0.00)	\$ 832.16	\$ 329.62	\$ -	\$ 749.51	\$ 80.39	\$ 3,046.79	304.68%	\$ 1,691.00
Present Worth		\$ 154.90	\$ -	\$331.65	\$ 565.76		\$ 565.81	\$ (0.02)	\$ 549.22	\$ 217.55	\$ -	\$ 379.90	\$ 41.21	\$ 1,691.00	169.10%	\$ 1,074.99
Levelized Payment Current \$		\$ 14.31	\$ -	\$ 30.64	\$ 52.27		\$ 52.27	\$ (0.00)	\$ 50.74	\$ 20.10	\$ -	\$ 35.10	\$ 3.81	\$ 156.22	15.62%	
Levelized Payment Constant \$		\$ 12.24	\$ -	\$ 26.20	\$ 44.70		\$ 44.70	\$ (0.00)	\$ 43.39	\$ 17.19	\$ -	\$ 30.01	\$ 3.26	\$ 133.59	13.36%	

Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream

Street Lighting Investment

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Tax	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
	1000.00						0.00	0.00								
1	958.98	25.37	0.00	54.33	37.50	3.750%	43.33	(2.31)	95.79	37.94		31.30	3.54	193.51	19.35%	180.40
2	904.21	23.93	0.00	51.22	72.19	7.219%	43.33	11.43	55.96	22.17		32.08	3.61	187.77	18.78%	163.20
3	851.60	22.53	0.00	48.24	66.77	6.677%	43.33	9.28	56.45	22.36		32.88	3.68	182.31	18.23%	147.73
4	800.96	21.19	0.00	45.37	61.77	6.177%	43.33	7.30	56.70	22.46		33.71	3.75	177.12	17.71%	133.80
5	752.16	19.90	0.00	42.61	57.13	5.713%	43.33	5.46	56.76	22.48		34.55	3.82	172.16	17.22%	121.25
6	705.06	18.66	0.00	39.94	52.85	5.285%	43.33	3.77	56.62	22.43		35.41	3.90	167.44	16.74%	109.94
7	659.53	17.45	0.00	37.36	48.88	4.888%	43.33	2.20	56.32	22.31		36.30	3.97	162.92	16.29%	99.73
8	615.45	16.28	0.00	34.87	45.22	4.522%	43.33	0.75	55.85	22.12		37.21	4.05	158.61	15.86%	90.52
9	571.61	15.12	0.00	32.38	44.62	4.462%	43.33	0.51	52.33	20.73		38.14	4.13	154.34	15.43%	82.12
10	527.77	13.96	0.00	29.90	44.61	4.461%	43.33	0.51	48.23	19.10		39.09	4.21	150.10	15.01%	74.45
11	483.92	12.80	0.00	27.41	44.62	4.462%	43.33	0.51	44.11	17.47		40.07	4.29	145.89	14.59%	67.46
12	440.09	11.64	0.00	24.93	44.61	4.461%	43.33	0.51	40.01	15.85		41.07	4.37	141.70	14.17%	61.09
13	396.24	10.48	0.00	22.45	44.62	4.462%	43.33	0.51	35.88	14.21		42.10	4.46	137.54	13.75%	55.28
14	352.40	9.32	0.00	19.96	44.61	4.461%	43.33	0.51	31.78	12.59		43.15	4.54	133.41	13.34%	49.99
15	308.56	8.16	0.00	17.48	44.62	4.462%	43.33	0.51	27.66	10.96		44.23	4.63	129.30	12.93%	45.17
16	264.72	7.00	0.00	15.00	44.61	4.461%	43.33	0.51	23.56	9.33		45.33	4.72	125.22	12.52%	40.78
17	220.88	5.84	0.00	12.51	44.62	4.462%	43.33	0.51	19.43	7.70		46.47	4.81	121.18	12.12%	36.79
18	177.04	4.68	0.00	10.03	44.61	4.461%	43.33	0.51	15.33	6.07		47.63	4.91	117.16	11.72%	33.17
19	133.20	3.52	0.00	7.55	44.62	4.462%	43.33	0.51	11.21	4.44		48.82	5.00	113.17	11.32%	29.87
20	89.36	2.36	0.00	5.06	44.61	4.461%	43.33	0.51	7.11	2.81		50.04	5.10	109.22	10.92%	26.87
21	54.35	1.44	0.00	3.08	22.31	2.231%	43.33	(8.33)	26.12	10.35		51.29	5.20	106.36	10.64%	24.40
22	28.18	0.75	0.00	1.60	0.00		43.33	(17.16)	45.98	18.21		52.57	5.30	104.59	10.46%	22.37
23	2.01	0.05	0.00	0.11	0.00		43.33	(17.16)	43.52	17.24		53.89	5.40	102.86	10.29%	20.51
24	(24.16)	(0.64)	0.00	(1.37)	0.00		43.33	(17.16)	41.07	16.27		0.00	0.00	40.43	4.04%	7.51
25	(50.33)	(1.33)	0.00	(2.85)	0.00		43.33	(17.16)	38.61	15.29		0.00	0.00	37.28	3.73%	6.46
26	(76.49)	(2.02)	0.00	(4.33)	0.00		43.33	(17.16)	36.16	14.32		0.00	0.00	34.13	3.41%	5.51
27	(102.66)	(2.72)	0.00	(5.82)	0.00		43.33	(17.16)	33.70	13.35		0.00	0.00	30.99	3.10%	4.67
28	(128.83)	(3.41)	0.00	(7.30)	0.00		43.33	(17.16)	31.25	12.38		0.00	0.00	27.84	2.78%	3.91
29	(155.00)	(4.10)	0.00	(8.78)	0.00		43.33	(17.16)	28.79	11.40		0.00	0.00	24.69	2.47%	3.23
30	(300.00)	(7.94)	0.00	(17.00)	300.00		43.33	101.67	(284.81)	(112.81)		0.00	0.00	7.25	0.73%	0.89
31	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
32	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
33	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
34	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
35	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
36	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
37	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
38	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
39	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00

Liberty Utilities (Granite State Electric) Corp. - Development of Revenue Requirements Stream
Street Lighting Investment

Year No.	Rate Base	Interest On Debt	Return On Preferred	Return On Common	Tax Depreciation	Tax Depreciation Rate	Book Depreciation	Deferred Tax	Taxable Income	Income Tax Payable	Revenue Tax	Property Tax	Property Insurance	Annual	% of	Present
														Revenue Requirements	Original Investment Revenue	Worth Of Revenue
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
40	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
41	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
42	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
43	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
44	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
45	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
46	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
47	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
48	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
49	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
50	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
51	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
52	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
53	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
54	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
55	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
56	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
57	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
58	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
59	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
60	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
61	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
62	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
63	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
64	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
65	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00%	0.00
Total		\$ 250.33	\$ -	\$535.95	\$ 1,300.00		\$ 1,300.00	\$ (0.00)	\$ 887.49	\$ 351.53	\$ -	\$ 957.29	\$101.39	\$ 3,496.50	349.65%	\$ 1,749.09
Present Worth		\$ 165.76	\$ -	\$354.89	\$ 570.30		\$ 523.82	\$ 18.41	\$ 541.19	\$ 214.37	\$ -	\$ 425.96	\$ 45.87	\$ 1,749.09	174.91%	\$ 1,064.00
Levelized Payment Current \$		\$ 13.71	\$ -	\$ 29.36	\$ 47.18		\$ 43.33	\$ 1.52	\$ 44.77	\$ 17.73	\$ -	\$ 35.24	\$ 3.79	\$ 144.69	14.47%	
Levelized Payment Constant \$		\$ 11.27	\$ -	\$ 24.13	\$ 38.77		\$ 35.61	\$ 1.25	\$ 36.79	\$ 14.57	\$ -	\$ 28.96	\$ 3.12	\$ 118.90	11.89%	

Liberty Utilities (Granite State Electric) Corp. Marginal Cost Study
Development of Weighted Plant Book Lives and Salvage

Line No.	Description	2015 Plant Balance	Average Service Life	Net Salvage Value
	(A)	(B) WP JDS-MCS-7 Page 9, Col (B)	(C) WP JDS-MCS-7 Page 9, Col (C)	(D) WP JDS-MCS-7 Page 9, Col (D)
1	Distribution Investment - Primary and Secondary Capacity Related			
2	360 Land and Land Rights	\$1,662,249	0	0%
3	361 Structures and Improvements	\$2,568,121	41	-5%
4	362 Station Equipment	\$21,382,737	41	-15%
5	363 Storage Battery Equipment	\$0	0	0%
6	364 Poles, Towers and Fixtures	\$36,295,074	40	-30%
7	365 Overhead Conductors and Devices	\$50,307,110	40	-28%
8	366 Underground Conduit	\$6,063,522	55	-10%
9	367 Underground Conductors and Devices	\$11,812,295	41	-30%
10	Total Distribution Primary and Secondary Capacity-Related	\$130,091,108	40	-25%
11	368 Line Transformers	\$21,142,179	37	-30%
12	369 Services	\$9,589,773	45	-43%
13	370 Meters	\$4,706,087	22	-15%
14	373 Street Lighting and signal systems	\$4,780,064	30	-30%

Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study

Summary of Marginal Capacity Costs

Line No.		Primary - Peak Demand	Source	Secondary - Peak Demand	Source	Line Transformers - Peak Demand	Source
1	Plant Investment						
2	Marginal Distribution Capacity Costs	\$385,700	Att JDS-MCS-1 Page 1, Line 24	\$76,282	Att JDS-MCS-1 Page 2, Line 26	\$68,983	Att JDS-MCS-1 Page 3, Line 26
3	Marginal General Plant Loading Factor	10.26%	Att JDS-MCS-6 Page 3, Line 22	10.26%	Att JDS-MCS-6 Page 3, Line 22	10.26%	Att JDS-MCS-6 Page 3, Line 22
4							
5	Total Marginal Plant Investment	\$425,278	Line 2 x (1 + Line 3)	\$84,110	Line 2 x (1 + Line 3)	\$76,062	Line 2 x (1 + Line 3)
6							
7	Fixed Carrying Charge Rate	11.15%	Att JDS-MCS-7 Page 1, Col (C), Line 3	11.15%	Att JDS-MCS-7 Page 1, Col (C), Line 3	11.25%	Att JDS-MCS-7 Page 1, Col (C), Line 4
8							
9	Levelized, Annualized Cost of Marginal Plant Investment	\$47,433	Line 5 x Line 7	\$9,381	Line 5 x Line 7	\$8,557	Line 5 x Line 7
10							
11	Operations and Maintenance Expenses						
12	Marginal Operating Expense	\$9,152	Att JDS-MCS-4 Page 1, Line 25	\$3,555	Att JDS-MCS-4 Page 2, Line 25	\$849	Att JDS-MCS-4 Page 3, Line 24
13	Marginal Maintenance Expense	\$5,559	Att JDS-MCS-4 Page 4, Line 25	\$2,116	Att JDS-MCS-4 Page 5, Line 24	\$999	Att JDS-MCS-4 Page 6, Line 25
14							
15	Total Marginal O&M Expense	\$14,711	Line 12 + Line 13	\$5,671	Line 12 + Line 13	\$1,848	Line 12 + Line 13
16							
17	Administrative and General Expenses						
18	Marginal Plant related A&G per \$ of Marginal Plant Investment	2.44%	Att JDS-MCS-6 Page 1, Line 27	2.44%	Att JDS-MCS-6 Page 1, Line 27	2.44%	Att JDS-MCS-6 Page 1, Line 27
19	Plant related A&G Expense	\$10,375	Line 5 x Line 18	\$2,052	Line 5 x Line 18	\$1,856	Line 5 x Line 18
20							
21	Marginal Non-Plant related A&G per \$ of Marginal O&M Expense	4.61%	Att JDS-MCS-6 Page 1, Line 25	4.61%	Att JDS-MCS-6 Page 1, Line 25	4.61%	Att JDS-MCS-6 Page 1, Line 25
22	Non-Plant related A&G Expense	\$678	Line 15 x Line 21	\$261	Line 15 x Line 21	\$85	Line 15 x Line 21
23							
24	Total A&G Expense	\$11,053	Line 19 + Line 22	\$2,313	Line 19 + Line 22	\$1,941	Line 19 + Line 22
25							
26	Marginal Working Capital Calculations						
27	Marginal M&S and Prepayments per \$ of Marginal Plant Investment	2.60%	Att JDS-MCS-6 Page 2, Line 21	2.60%	Att JDS-MCS-6 Page 2, Line 21	2.60%	Att JDS-MCS-6 Page 2, Line 21
28	M&S Cost	\$11,078	Line 5 x Line 27	\$2,191	Line 5 x Line 27	\$1,981	Line 5 x Line 27
29							
30	Cash Working Capital Allowance Rate	7.53%	27.5 Days / 365	7.53%	27.5 Days / 365	7.53%	27.5 Days / 365
31	Working Cash O&M Allowance	\$1,108	Line 15 x Line 30	\$427	Line 15 x Line 30	\$139	Line 15 x Line 30
32			(Line 28 + Line 31) x Tax Effectuated Cost of Capital, Att JDS-MCS-7 Page 1, Col (C), Line 16		(Line 28 + Line 31) x Tax Effectuated Cost of Capital, Att JDS-MCS-7 Page 1, Col (C), Line 16		(Line 28 + Line 31) x Tax Effectuated Cost of Capital, Att JDS-MCS-7 Page 1, Col (C), Line 16
33	Revenue Requirement for Working Capital	\$1,466		\$315		\$255	
34	Total Marginal Cost per MW	\$74,663	Σ Lines 9, 15, 24, 32	\$17,680	Σ Lines 9, 15, 24, 32	\$12,601	Σ Lines 9, 15, 24, 32
35	Escalator to Adjust to 2017 Rate Year	3.92%	((1 + Att JDS-MCS-7 Page 1, Col (C), Line 19)^2) - 1	3.92%	((1 + Att JDS-MCS-7 Page 1, Col (C), Line 19)^2) - 1	3.92%	((1 + Att JDS-MCS-7 Page 1, Col (C), Line 19)^2) - 1
36	Total Adjusted Marginal Cost per MW	\$77,592	Line 34 x (1 + Line 35)	\$18,374	Line 34 x (1 + Line 35)	\$13,096	Line 34 x (1 + Line 35)

Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study

Calculation of Loss-Adjusted Marginal Costs

Line No.	Description	Marginal Costs	Explanation
1	Loss Factors		
2	Distribution - Primary	3.80%	Company Data
3	Distribution - Secondary	6.90%	Company Data
4			
5	Marginal Costs to Serve - Transmission Level per kW		
6	Distribution - Primary	\$77.59	Att JDS-MCS-8 Page 1, Line 36 / 1000
7	Distribution - Secondary	\$18.37	Att JDS-MCS-8 Page 1, Line 36 / 1000
8	Distribution - Line Transformers	\$13.10	Att JDS-MCS-8 Page 1, Line 36 / 1000
9			
10	Marginal Costs to Serve per kW: Distribution Primary Customer		
11	Distribution - Primary Component	\$80.54	(1 + Line 2) x Line 6
12	Total	\$80.54	
13			
14	Marginal Costs to Serve per kW: Distribution Secondary Customer		
15	Distribution - Primary Component	\$82.95	(1 + Line 3) x Line 6
16	Distribution - Secondary Component	\$19.64	(1 + Line 3) x Line 7
17	Distribution - Line Transformer Component	\$14.00	(1 + Line 3) x Line 8
18	Total	\$116.59	Σ Lines 15 - 17

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Calculation of Marginal Capacity Costs by Rate Class

Line No.	Description	Domestic D	Domestic-Opt. Peak D-10	General TOU G-1	General Long Hour G-2	General Service G-3	Outdoor Lighting M	Limited All Electric T	Ltd Comm Space V	Explanation
1	(A) Marginal Capacity Costs	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
2	Marginal Costs to Serve per kW: Distribution Primary Customer									
3	Distribution - Primary Component	\$ 80.54	\$ 80.54	\$ 80.54	\$ 80.54	\$ 80.54		\$ 80.54	\$ 80.54	Att JDS-MCS-8 Page 2, Line 11
4	Distribution - Secondary Component	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	
5	Distribution - Line Transformer Component	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	
6	Total	\$ 80.54	\$ 80.54	\$ 80.54	\$ 80.54	\$ 80.54	N/A	\$ 80.54	\$ 80.54	Σ Lines 3 - 5
7	Marginal Costs to Serve per kW: Distribution Secondary Customer									
8	Distribution - Primary Component	\$ 82.95	\$ 82.95	\$ 82.95	\$ 82.95	\$ 82.95		\$ 82.95	\$ 82.95	Att JDS-MCS-8 Page 2, Line 15
9	Distribution - Secondary Component	\$ 19.64	\$ 19.64	\$ 19.64	\$ 19.64	\$ 19.64		\$ 19.64	\$ 19.64	Att JDS-MCS-8 Page 2, Line 16
10	Distribution - Line Transformer Component	\$ 14.00	\$ 14.00	\$ 14.00	\$ 14.00	\$ 14.00		\$ 14.00	\$ 14.00	Att JDS-MCS-8 Page 2, Line 17
11	Total	\$ 116.59	\$ 116.59	\$ 116.59	\$ 116.59	\$ 116.59	N/A	\$ 116.59	\$ 116.59	Σ Lines 8 - 10
12	Voltage Weighting Analysis									
13	Non coincident peak (kW) served at:									
14	Primary Voltage	-	-	39,001	81	-	-	-	-	Company Data
15	Secondary Voltage	75,742	1,586	40,741	32,896	22,616	1,077	4,578	78	Company Data
16	Total	75,742	1,586	79,741	32,977	22,616	1,077	4,578	78	Σ Lines 14 - 15
17	Percent of Non coincident peak (kW)									
18	Primary Voltage	0.00%	0.00%	48.91%	0.25%	0.00%	0.00%	0.00%	0.00%	Line 14 / Line 16
19	Secondary Voltage	100.00%	100.00%	51.09%	99.75%	100.00%	100.00%	100.00%	100.00%	Line 15 / Line 16
20	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	Σ Lines 18 - 19
21	Voltage Weighted Marginal Capacity Costs									
22	Marginal Costs to Serve per kW: Distribution Customer									
23	Distribution - Primary Component	\$ 82.95	\$ 82.95	\$ 81.77	\$ 82.94	\$ 82.95		\$ 82.95	\$ 82.95	Line 3 x Line 18 + Line 8 x Line 19
24	Distribution - Secondary Component	\$ 19.64	\$ 19.64	\$ 10.04	\$ 19.59	\$ 19.64		\$ 19.64	\$ 19.64	Line 4 x Line 18 + Line 9 x Line 19
25	Distribution - Line Transformer Component	\$ 14.00	\$ 14.00	\$ 7.15	\$ 13.96	\$ 14.00		\$ 14.00	\$ 14.00	Line 5 x Line 18 + Line 10 x Line 19
26	Total	\$ 116.59	\$ 116.59	\$ 98.96	\$ 116.50	\$ 116.59	N/A	\$ 116.59	\$ 116.59	Σ Lines 23 - 25

**Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study**

Summary of Marginal Customer Costs

Line No.	Description	Domestic D	Domestic-Opt. Peak D-10	General TOU G-1	General Long Hour G-2	General Service G-3	Outdoor Lighting M	Limited All Electric T	Ltd Comm Space V	Explanation
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
	Plant Investment									
1	Meters	\$ 77.55	\$ 350.20	\$1,111.00	\$ 900.80	\$ 630.20		\$ 195.20	\$ 290.20	Att JDS-MCS-2 Page 1, Line 8
2	General Plant Loading Factor	10.26%	10.26%	10.26%	10.26%	10.26%		10.26%	10.26%	Att JDS-MCS-6 Page 3, Line 22
3	Unit Costs and Loading Factor	\$ 85.51	\$ 386.14	\$1,225.01	\$ 993.24	\$ 694.87		\$ 215.23	\$ 319.98	Line 1 + (Line 1 x Line 2)
4	Fixed Charge Rate	13.36%	13.36%	13.36%	13.36%	13.36%		13.36%	13.36%	Att JDS-MCS-7 Page 1, Col (C), Line 6
5	Meter Carrying Costs	\$ 11.42	\$ 51.58	\$ 163.65	\$ 132.69	\$ 92.83		\$ 28.75	\$ 42.75	Line 3 x Line 4
6	Services	\$ 614.65	\$ 614.65	\$ 747.65	\$ 717.61	\$ 614.65		\$ 614.65	\$ 614.65	Att JDS-MCS-2 Page 1, Line 4
7	General Plant Loading Factor	10.26%	10.26%	10.26%	10.26%	10.26%		10.26%	10.26%	Att JDS-MCS-6 Page 3, Line 22
8	Unit Costs and Loading Factor	\$ 677.72	\$ 677.72	\$ 824.37	\$ 791.25	\$ 677.72		\$ 677.72	\$ 677.72	Line 6 + (Line 6 x Line 7)
9	Fixed Charge Rate	10.75%	10.75%	10.75%	10.75%	10.75%		10.75%	10.75%	Att JDS-MCS-7 Page 1, Col (C), Line 5
10	Services Carrying Costs	\$ 72.89	\$ 72.89	\$ 88.66	\$ 85.10	\$ 72.89		\$ 72.89	\$ 72.89	Line 8 x Line 9
11	Total Plant Carrying Costs	\$ 84.31	\$ 124.47	\$ 252.31	\$ 217.78	\$ 165.71		\$ 101.64	\$ 115.63	Line 5 + Line 10
12	A&G Exp Plant-Related Loading Factor	2.44%	2.44%	2.44%	2.44%	2.44%		2.44%	2.44%	Att JDS-MCS-6 Page 1, Line 27
13	Annualized Cost	\$ 102.93	\$ 150.42	\$ 302.30	\$ 261.32	\$ 199.20	N/A	\$ 123.42	\$ 139.97	(Line 12) x (Line 3 + Line 8) + Line 11
	Operating Expenses									
14	Plant Related O&M \$/Customer	\$ 44.03	\$ 61.37	\$ 118.22	\$ 102.94	\$ 79.18		\$ 51.51	\$ 57.55	Att JDS-MCS-5 Page 2, Col (G)
15	Customer Acctg & Mkg Expenses	\$ 55.11	\$ 55.11	\$ 110.23	\$ 82.67	\$ 55.11		\$ 55.11	\$ 55.11	Att JDS-MCS-5 Page 4, Col (F)
16	A&G Exp Non-Plant Loading Factor	4.61%	4.61%	4.61%	4.61%	4.61%		4.61%	4.61%	Att JDS-MCS-6 Page 1, Line 25
17	Total O&M Expense	\$ 103.71	\$ 121.85	\$ 238.97	\$ 194.16	\$ 140.48	N/A	\$ 111.54	\$ 117.86	Line 15 + Line 16 + ((Line 15 + Line 16) x Line 17)
	Working Capital- \$/Customer									
18	Materials & Supplies + Prepayments Rate	2.60%	2.60%	2.60%	2.60%	2.60%		2.60%	2.60%	Att JDS-MCS-6 Page 2, Line 21
19	M&S Cost	\$ 19.88	\$ 27.71	\$ 53.38	\$ 46.48	\$ 35.75		\$ 23.26	\$ 25.99	Line 20 x (Line 3 + Line 8)
20	Working Cash O&M Allowance	\$ 7.81	\$ 9.18	\$ 18.00	\$ 14.63	\$ 10.58		\$ 8.40	\$ 8.88	(Line 18) x (Att JDS-MCS-8 Page 1, Line 30)
21	Total Working Capital	\$ 27.69	\$ 36.89	\$ 71.39	\$ 61.11	\$ 46.34		\$ 31.66	\$ 34.87	Line 21 + Line 22
22	Working Capital Rev. Requirement	\$ 3.33	\$ 4.44	\$ 8.59	\$ 7.35	\$ 5.57	N/A	\$ 3.81	\$ 4.19	Line 23 x (Att JDS-MCS-7 Page 1, Col (C), Line 16)
23	Annual Customer Related Cost \$/Customer	\$ 209.97	\$ 276.71	\$ 549.86	\$ 462.83	\$ 345.25	N/A	\$ 238.77	\$ 262.02	Line 13 + Line 18 + Line 24
24	Escalator to Adjust to 2017 Rate Year	3.92%	3.92%	3.92%	3.92%	3.92%		3.92%	3.92%	((1 + Att JDS-MCS-7 Page 1, Col (C), Line 19)^2) - 1
25	Annual Customer Related Cost	\$218.20	\$287.56	\$571.43	\$480.98	\$358.79	N/A	\$248.13	\$272.30	Line 25 x (1 + Line 26)

Liberty Utilities (Granite State Electric) Corp.
Marginal Cost Study

Summary of Marginal Cost Estimates

Line No.	Description	Domestic D (B)	Domestic-Opt. Peak D-10 (C)	General TOU G-1 (D)	General Long Hour G-2 (E)	General Service G-3 (F)	Outdoor Lighting M (G)	Limited All Electric T (H)	Ltd Comm Space V (I)	Total Company (J)	Explanation (K)
1	Uncollectible Factor	4.57%	2.89%	0.18%	1.08%	1.84%		2.71%	0.00%		Att JDS-MCS-5 Page 5, Col (F)
2	Customer Charge \$'s per month										
3	Monthly Customer Charge w/o Uncollectibles	\$ 18.18	\$ 23.96	\$ 47.62	\$ 40.08	\$ 29.90		\$ 20.68	\$ 22.69		(Att JDS-MCS-9 Page 1, Line 27)/12
4	Adjustment for Uncollectibles	0.83	0.69	0.09	0.43	0.55		0.56	0.00		Line 1 x Line 3
5	Monthly Customer Charge Incl. Uncollectibles	\$ 19.02	\$ 24.66	\$47.71	\$40.51	\$30.45		\$ 21.24	\$ 22.69		Line 3 + Line 4
6	Demand Charge \$'s per kW										
7	Distribution Demand Charge - Primary Component	82.95	82.95	81.77	82.94	82.95		82.95	82.95		Att JDS-MCS-8 Page 3, Line 23
8	Distribution Demand Charge - Secondary Component	19.64	19.64	10.04	19.59	19.64		19.64	19.64		Att JDS-MCS-8 Page 3, Line 24
9	Distribution Demand Charge - Line Transformer Component	14.00	14.00	7.15	13.96	14.00		14.00	14.00		Att JDS-MCS-8 Page 3, Line 25
10	Adjustment for Uncollectibles	\$5.33	\$3.37	\$0.18	\$1.26	\$2.15		\$3.16	\$0.00		(Line 7 + Line 8 + Line 9) x Line 1
11	Demand Charge Incl. Uncollectibles	\$121.92	\$119.96	\$99.14	\$117.75	\$118.74		\$119.74	\$116.59		Σ line 7 to Line 10
12	Energy Charge \$'s per kWh										
13	Distribution Energy Charge - Primary Component	0.00000	0.00000	0.00000	0.00000	0.00000		0.00000	0.00000		
14	Distribution Energy Charge - Secondary Component	0.00000	0.00000	0.00000	0.00000	0.00000		0.00000	0.00000		
15	Distribution Energy Charge - Line Transformer Component	0.00000	0.00000	0.00000	0.00000	0.00000		0.00000	0.00000		
16	Adjustment for Uncollectibles	0.00000	0.00000	0.00000	0.00000	0.00000		0.00000	0.00000		(Line 13 + Line 14 + Line 15) x Line 1
17	Energy Charge Incl. Uncollectibles	0.00000	0.00000	0.00000	0.00000	0.00000		0.00000	0.00000		Σ line 13 to Line 16
18	Billing Determinants (2015)										
19	Customers	34,933	440	136	872	5,650		1,092	18	43,141	Company Data
20	Non coincident peak (kW)	75,742	1,586	79,741	32,977	22,616	1,077	4,578	78	218,396	Company Data
21	Annual Energy Usage (kWh)	273,818,052	5,571,935	384,717,541	155,032,095	90,016,335	4,538,274	17,379,770	316,195	931,390,198	Company Data
22	Total Marginal Costs										
23	Total Customer-related	\$7,971,114	\$130,064	\$78,041	\$423,773	\$2,064,646		\$278,354	\$4,932	\$10,950,924	Line 5 x Line 19 x 12
24	Total Capacity-related: Demand										
25	Demand Distribution Primary	6,569,819	135,332	6,532,142	2,764,644	1,910,494		390,035	6,509	18,308,975	(1 + Line 1) x Line 7 x Line 20
26	Demand Distribution Secondary	1,555,757	32,047	801,664	653,108	452,412		92,362	1,541	3,588,890	(1 + Line 1) x Line 8 x Line 20
27	Demand Distribution Line Transformer	1,108,822	22,841	571,364	465,484	322,444		65,828	1,098	2,557,881	(1 + Line 1) x Line 9 x Line 20
28	Total Capacity-related: Demand	\$ 9,234,398	\$ 190,220	\$ 7,905,169	\$ 3,883,235	\$ 2,685,350		\$ 548,225	\$ 9,148	\$ 24,455,746	Σ line 25 to Line 27
29	Total Capacity-related: Energy										
30	Energy Distribution Primary	-	-	-	-	-		-	-	-	(1 + Line 1) x Line 13 x Line 21
31	Energy Distribution Secondary	-	-	-	-	-		-	-	-	(1 + Line 1) x Line 14 x Line 21
32	Energy Distribution Line Transformer	-	-	-	-	-		-	-	-	(1 + Line 1) x Line 15 x Line 21
33	Total Capacity-related: Energy	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	Σ line 30 to Line 32
34	Customer Subtotal	\$7,971,114	\$130,064	\$78,041	\$423,773	\$2,064,646		\$278,354	\$4,932	\$10,950,924	Line 23
35	Distribution Subtotal	9,234,398	190,220	7,905,169	3,883,235	2,685,350		548,225	9,148	24,455,746	Line 25 + Line 26 + Line 27 + Line 30 + Line 31 + Line 32
36	Marginal Cost for Fixtures						545,016			545,016	Att JDS-MCS-3 Page 1, 2 and 3, Line 20 + Att JDS-MCS-3 Page 4 and 5, Line 20
37	Total Annual Marginal Cost Excl. Fixtures	\$ 17,205,512	\$ 320,284	\$ 7,983,210	\$ 4,307,009	\$ 4,749,996	\$ -	\$ 826,579	\$ 14,081	\$ 35,406,670	Σ line 34 to Line 35
38	Share of Total Annual Marginal Cost Excl. Fixtures	48.59%	0.90%	22.55%	12.16%	13.42%	0.00%	2.33%	0.04%	100.00%	Col (n) / Col (J)
39	Total Annual Marginal Cost Incl. Fixtures	\$ 17,205,512	\$ 320,284	\$ 7,983,210	\$ 4,307,009	\$ 4,749,996	\$ 545,016	\$ 826,579	\$ 14,081	\$ 35,951,686	Σ line 34 to Line 36
40	Share of Total Annual Marginal Cost Incl. Fixtures	47.86%	0.89%	22.21%	11.98%	13.21%	1.52%	2.30%	0.04%	100.00%	Col (n) / Col (J)