

Orange and Rockland Utilities, Inc.

Street Light - Annual LED Benefit / (Cost) Analysis

New LED Fixtures

Fixture Watts	Lumens	Annual kWh (1)	Total Capital Costs (2)	Annual Fixture Charge	Estimated Annual Volumetric Charges (3)	Estimated Total Annual Charges
35	3,900	144	\$894.75	\$198.04	\$9.85	\$207.89
50	5,000	205	907.51	200.86	14.08	214.94
68	7,250	279	975.56	215.92	19.15	235.07
103	12,000	422	1,075.42	238.03	29.00	267.03
140	16,000	574	1,282.66	283.89	39.42	323.31
200	22,000	820	1,602.57	354.70	56.31	411.01

Comparable Tariffed Fixture	Fixture Watts	Lumens	Annual kWh (1)	Inventory (4)	Annual Fixture Charge (5)	Estimated Annual Volumetric Charges (3)	Estimated Total Annual Charges	Annual LED Benefit/(Cost)
4,000 MV	127	4,000	521	8,309	\$151.56	\$35.76	\$187.32	(\$20.57)
5,800 SV	108	5,800	443	7,039	168.84	30.41	199.25	(15.69)
7,900 MV	211	7,900	865	5,168	183.72	59.41	243.13	8.06
9,500 SV	142	9,500	582	3,155	184.32	39.98	224.30	(10.77)
12,000 MV	296	12,000	1214	159	240.72	83.34	324.06	57.04
16,000 SV	199	16,000	816	841	219.00	56.03	275.03	8.01
22,500 MV	459	22,500	1882	539	307.80	129.24	437.04	113.73
27,500 SV	311	27,500	1275	624	292.56	87.57	380.13	(30.89)

Annual LED Benefit / (Cost)		
Annual Fixture Charge	Annual Volumetric Charge	Total
(\$46.48)	\$25.90	(\$20.57)
(32.02)	16.33	(15.69)
(32.20)	40.26	8.06
(31.60)	20.84	(10.77)
2.69	54.34	57.04
(19.03)	27.03	8.01
23.91	89.82	113.73
(62.14)	31.25	(30.89)

25,834

12 Month Average Lights in Service
% Comparable to Total

27,586

94%

Existing LED Fixtures

Fixture Watts	Lumens	Annual kWh (1)	Total Capital Costs (2)	Annual Fixture Charge	Estimated Annual Volumetric Charges (3)	Estimated Total Annual Charges
74	5,380	303	\$1,242.37	\$274.97	\$20.84	\$295.81
101	9,365	414	1,401.71	310.24	28.44	338.68

\$22.91

Comparable Tariffed Fixture	Fixture Watts	Lumens	Annual kWh (1)	Inventory (4)	Annual Fixture Charge (5)	Estimated Annual Volumetric Charges (3)	Estimated Total Annual Charges	Annual LED Benefit/(Cost)
5,890 LED	74	5,890	303	60	224.88	\$20.84	\$245.72	(\$50.09)
9,365 LED	101	9,365	414	44	248.76	28.44	277.20	(61.48)

Annual LED Benefit / (Cost)		
Annual Fixture Charge	Annual Volumetric Charge	Total
(\$50.09)	\$ -	(\$50.09)
(61.48)	-	(61.48)

- 1 Based on 4,100 burn hours per year (PSC No 3 - Electricity, Original Leaf 282).
kWh = (Total Wattage / 1000) X (Monthly Burn Hours)
- 2 Material and labor.
- 3 Volumetric Rate per kWh = \$0.06867
Weighted on burn hours for the 12 months ended February 29, 2016.
Includes SBC/RPS, ECA, TACS, TSAS, MFC, MSC.
- 4 12 Month Average Lights in Service (Ending Feb 2016). Comparable light fixtures chosen account for 94% of total population of 27,586 lights.
- 5 Currently Approved Annual Fixture Charge.

Attachment 2

Orange & Rockland Utilities, Inc.

Service Classification No. 4 – Public Street Lighting – Company Owned LED Rate Development

Methodology: The Company first analyzed which of its currently tariffed fixtures had the highest percentage of installs in its service territory. The eight currently tariffed fixtures chosen account for 94% of the current installs in the Company's service territory. The Company then chose six new LED fixtures with comparable lumen outputs as potential replacements for these fixtures.

The Company researched prices and is planning to purchase the six new LED fixtures presented in this filing from three separate vendors. Because specifications and prices of each new LED fixture vary by vendor across the six new lumen classes, the Company first developed an average price per fixture per each new lumen class. The Company then performed a fixed charge study based on the average price of each lumen class to determine the annual cost of providing service over the assumed book life of the installed LED fixture. This type of study seeks to capture the costs that the installation imposes on the electric system, including depreciation, cost of removal, cost of capital, and federal and state income taxes. The resulting stream of annual fixed charges is "levelized" into an equivalent stream of annual revenue requirement over the book life of the installed equipment, with such levelized annual revenue requirement becoming the rate to be charged to the end use customer.

Assumptions: The following assumptions were utilized in the development of the proposed new LED rates under Service Classification No. 4 – Public Street Lighting – Company Owned:

- Capital structure/cost of capital – reflects a common equity ratio of 48% and the currently authorized ROE of 9%.
- Federal and State income tax rates – were set at 35% and 6.5%, respectively.
- Book depreciation – the depreciation rate of 10% was based on an estimated life span of the LED fixtures of 15 years and a 50% removal cost.
- Tax life – reflects the current 7 year classification for Street Lights found in the Company's 2015 Master Tax Depreciation Guide.
- Capital cost – was based on estimated average material costs for each respective new lumen class plus a flat amount per fixture for installation. A 24- month average rate associated with Stores Overhead was also included in the capital costs and includes NYS Sales Tax, A&G (both labor and non-labor) and Fringe Rates associated with Stores Handling.
- Property Tax – was based on property tax percentage across all Company property.
- Annual O&M – was based on the three-year average O&M associated with street lighting plant divided by YE 2015 Street Lighting Plant in service.

Orange and Rockland Utilities, Inc.**Rate Impact of Increase in Annual No-Cost Street Lighting Replacements
Summary****Impact on Luminaire Charge
For All Luminaires Under Service Classification No. 4**

Based on Replacement of 25% of Luminaires

	Scenario 1			
	Current Options - MV or SV Arm & Head (Capital)			
	Carrying Cost (\$/year)	Annual Cost \$ Per Luminaire	Monthly Cost \$ Per Luminaire	Annual Cost as a % of 2015 SC No. 4 Delivery Rev Req.*
Year 1	\$1,417,487	\$51.38	\$4.28	36.5%
Year 2	2,717,853	98.52	8.21	33.5%
Year 3	3,946,865	143.07	11.92	31.7%
Year 4	5,116,255	185.47	15.46	30.1%
Year 5	6,234,396	226.00	18.83	28.8%

Scenario Definitions:

Scenario 1 - Sodium or Mercury Vapor - Installation of Arm and Head

Scenario 2 - LED Options - Installation of Arm and Head

	Scenario 2			
	L.E.D. Arm & Head (Capital)			
	Carrying Cost (\$/year)	Annual Cost \$ Per Luminaire	Monthly Cost \$ Per Luminaire	Annual Cost as a % of 2015 SC No. 4 Delivery Rev Req.*
	\$1,846,514	\$66.94	\$5.58	47.6%
	3,540,458	128.34	10.70	43.7%
	5,141,451	186.38	15.53	41.3%
	6,664,778	241.60	20.13	39.3%
	8,121,344	294.40	24.53	37.5%

* Percentage increase to all SC No. 4 Luminaire Charges.