

Anatomy of a Bill for Utility-Owned Street Lights

Fixture Charges: The ‘rent’ charged for lights. Rates are set in the tariff according to the type and wattage of the fixture, and are based on utility-estimated costs of the fixture, maintenance, depreciation, taxes, various “system” costs, as well as the utility’s allowed profit.

Energy Supply Charges: Per kWh charges at market price for supply. In New York, supply can be purchased from the utility or from a retail energy supply company.

Volumetric Charges: Per kWh charges that include the System Benefits Charge, NYS Assessment, and other charges (including a portion of the electricity delivery costs).

NYS & Local Taxes and Surcharges.

Figure 8 - Anatomy of a bill for utility-owned lights

of this chapter show the combined savings from lower rates and reduced energy use for each utility’s LED options.

While the rates for LEDs are lower, the conversion has an upfront cost: The PSC has required that municipalities pay the utility for the remaining book value of lights being replaced. When utilities develop street light rates, they assume amortization of the cost of the lights over a certain number of years. If a street light is taken out of service before the end of its useful life, and before the light has been fully depreciated, then the cost of the street light has not been fully recovered through the rates, leaving the utility with “stranded costs” on its books. Unless these costs are recovered from the municipal street light customer, then they are borne by all ratepayers—a burden-shifting practice that the PSC generally frowns upon.

Like many other utility costs, a company’s valuation of its street lights is subject to its own particular accounting practices. As a result, two fixtures that are the same type and age may have different values in different utility territories. The utility-specific sections that follow show widely varying stranded costs from one utility service territory to the next.

The next sections examine in greater detail the LED street light programs of the three Mid-Hudson utilities: O&R, Central Hudson, and NYSEG.

Orange and Rockland Utilities, Inc.

O&R was the first utility in New York to introduce LED options, in 2011. Because the rates were significantly higher than existing lights, and the wattages were similar to the lights they were meant to replace, there was little incentive for local governments to upgrade to LEDs. In 2014, DPS Staff directed the company to develop new options, and in March 2017, the PSC approved seven LED replacement wattages to replace eight common light sizes and types in the service territory. The LEDs have a CCT of 4,000 Kelvin, which is a neutral color temperature. As a result of required changes by

the PSC to the utility’s proposal, the rates for the LEDs are lower than the rates for the existing fixtures.

Fixture wattages:

Table 1, below, shows the O&R LED replacement wattages that fall within, or are close to, optimal wattage ranges in terms of energy savings. With a wide range of utility wattage

Table 1 - O&R LED Replacement Wattages Within Optimal Efficiency Ranges³⁶

Existing fixture	Annual (kWh) energy consumed	Optimal LED replacement range	Annual (kWh) energy consumed: optimal LEDs	Utility LED options within range	Utility LED options outside optimal range	Recommended LED lumens (at 25-30 ft. mounting height)
100w MV	521	15-28w	62-115	23w		1900-2200
70w HPS	443	20-28w	82-115	23w		2500-2800
175w MV	865	15-28w	62-115	23w		2000-2500
100w HPS	582	35-42w	144-172	35w		3800-4200
250w MV	1214	25-54w	103-221	35w, 50w		3500-3800
150w HPS	816	48-54w	197-221	50w		5800-6400
400w MV	1882	35-80w	144-328	35w, 50w, 68w	140w, 200w	11000-12000
250w HPS	1275	85-100w	349-410	103w	140w, 200w	11000-12000

options, communities in O&R territory converting to utility LEDs can reduce energy consumption by as much as 81 percent compared to existing fixtures, depending on which wattages they select as part of their replacement plan. Selecting the appropriate LED to replace an existing light should be a function of the existing lumens and the lumen output of the selected LED fixture. As a general rule, an LED can be selected that produces 50 to 60 percent of the HPS fixture’s lumen output.

Fixture rates:

As shown in Table 2, the rates for O&R’s LEDs are less than the rates for the fixtures they are replacing. When combined with expected reductions in energy use, the savings per fixture are substantial, as indicated in the column on the far right of the table.

³⁶ This table is for evaluative purposes only. Local governments should select utility replacement wattages based on a lighting design plan that takes into local lighting needs and conditions as well as specifications of the utility’s fixtures, including the fixture efficacy. The lower the efficacy of the LED fixture, the higher the wattage has to be in order to obtain a given level of illumination.

Table 2 - Per Fixture Savings from LED Conversion: O&R⁴⁷

Existing Fixture	Annual fixture charge	Estimated annual supply & volumetric charges	Total annual estimated cost per fixture	LED replacement (watts)	Annual fixture charge	Estimated annual supply and volumetric charges	Total annual fixture costs	Total per fixture additional savings/(costs) of utility LEDs
100w MV	\$ 151.56	\$ 35.78	\$ 187.34	23w	119.48	\$ 6.45	\$ 125.93	\$ 61.40
70w HPS	\$ 168.84	\$ 30.42	\$ 199.26	23w	119.48	\$ 6.45	\$ 125.93	\$ 73.33
175w MV	\$ 183.72	\$ 59.40	\$ 243.12	23w	119.48	\$ 6.45	\$ 125.93	\$ 117.19
100w MV	\$ 151.56	\$ 35.78	\$ 187.34	35w	120.84	\$ 9.89	\$ 130.73	\$ 56.61
70w HPS	\$ 168.84	\$ 30.42	\$ 199.26	50w	122.16	\$ 14.08	\$ 136.24	\$ 63.02
175w MV	\$ 183.72	\$ 59.40	\$ 243.12	68w	134.88	\$ 19.16	\$ 154.04	\$ 89.08
100w HPS	\$ 184.32	\$ 39.97	\$ 224.29	68w	134.88	\$ 19.16	\$ 154.04	\$ 70.25
250w MV	\$ 240.72	\$ 83.37	\$ 324.09	103w	142.08	\$ 28.98	\$ 171.06	\$ 153.03
150w HPS	\$ 219.00	\$ 56.03	\$ 275.03	103w	142.08	\$ 28.98	\$ 171.06	\$ 103.98
400w MV	\$ 307.80	\$ 129.24	\$ 437.04	140w	156.12	\$ 39.42	\$ 195.54	\$ 241.50
250w HPS	\$ 292.56	\$ 87.55	\$ 380.11	200w	212.76	\$ 56.31	\$ 269.07	\$ 111.04

Stranded Costs:

O&R will upgrade a small percentage of the lights (two percent of its inventory in the service territory) free-of-charge on an annual basis. Beyond this, municipal customers looking to upgrade to utility LEDs will have to pay \$165 in stranded costs for each existing light being replaced.³⁷ The requirement to pay the stranded costs adds a significant upfront cost to conversion to utility LEDs. The PSC, in its order approving the utility's LED options, directed the company to apply the proceeds from any sale of street light systems to municipalities to its depreciation account for street lights, which will help reduce the costs of upgrading to LEDs. The PSC also encouraged O&R to consider offering incentives to offset stranded asset costs, and municipalities should check with the utility to see whether any incentive programs are available.

Conversion timeframe:

O&R is only obligated under its tariff to upgrade 20% of its entire service territory inventory each year. Individual municipal requests will be granted on a first-come, first-serve basis.³⁸

³⁷ This amount represents the average undepreciated value of existing lights at the time the tariff provisions were approved, in March 2017, but should be expected to change each year with further depreciation.

³⁸ NYS Public Service Commission, *Order Approving Tariff Amendments with Modifications*, In the Matter of the Tariff Filing by Orange and Rockland Utilities, Inc., to Update Service Classification No. 4 – Public Street Lighting –Company Owned – to Incorporate LED Options Contain in P.S.C. No. 3 – Electricity (Case 16-E-0226), Effective March 10, 2017.

Conclusion:

O&R’s LED options will provide financial benefit to municipalities after the stranded costs are paid off, due to a combination of lower rates relative to existing lights and to energy savings from LEDs (a bill reduction of up to 40 percent for a typical municipality, according to the cost analysis in Chapter 5.)

Central Hudson Gas & Electric - Fortis, Inc.

Central Hudson first made LED street lights available in July 2015, and just over a year later, proposed a second round of LED options that were approved with modifications by the PSC in March 2017.³⁹ In response to feedback from communities, Central Hudson’s second-round options have a lower Correlated Color Temperature (CCT) of 3,000 Kelvin, which emit a “warmer” light color than the 4,000 Kelvin LEDs offered in 2015. The 4,000 Kelvin lights will continue to be installed until the company’s inventory is depleted, unless the municipality requests a full conversion to the warmer LEDs.

Fixture wattages:

As indicated in Table 3, Central Hudson’s second round LED wattage options (shown in black) represent a significant improvement over the company’s first-round options (shown in red) in terms of energy savings. Nearly all utility LEDs fall within the optimal efficiency range as replacements for existing lights. The exceptions are the possible replacements for the 150-watt HPS and 250-watt MV fixture, which have higher wattages than the optimal range. Local governments will still see sizeable energy savings compared to existing lights, though less than they would if lower-

Table 3 - Central Hudson LED Replacement Within Optimal Efficiency Ranges⁴⁰

Existing fixtures	Annual (kWh) energy consumed	Optimal LED replacement range	Annual (kwh) consumed: Optimal range	Utility LED Options within optimal range	Utility LED Options outside optimal range	Recommended LED lumens (at 25-30 ft. mounting height)
70w HPS	344	20-28w	80-112	21w	39w	2500-2800
100w MV	504	15-28w	60-112	21w	39w	1900-2200
175w MV	832	15-28w	80-112	21w	39w	2000-2500
150w HPS	720	48-54w	192-216		65w, 82w	5800-6400
250w MV	1184	25-54w	100-216		65w, 82w	3500-3800
250w HPS	1264	85-100w	340-400	93w, 95w		11000-12000
400w MV	1820	35-80w	140-320	65w	93w, 95w	11000-12000
400w HPS	1984	85-120w	340-480	95w	153w, 155w	11000-12000
1000w HPS	4656	85-120w	340-480	95w	153w, 155w	11000-12000
1000w MV	4320	85-120w	340-480	95w	153w, 155w	11000-12000

³⁹ New York State Public Service Commission, *Order Approving Addition of LED Street Lighting Options with Modifications*, Case 16-E-00616, effective date March 10, 2017.

⁴⁰ This table is for evaluative purposes only. Local governments should select utility replacement wattages based on a lighting design plan that takes into local lighting needs and conditions as well as specifications of the utility’s fixtures, including the fixture efficacy. The lower the efficacy of the LED fixture, the higher the wattage has to be in order to obtain a given level of illumination.