

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.<sup>39</sup> 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 Ranges<sup>40</sup>

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

<sup>39</sup> 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.

<sup>40</sup> 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.

wattage choices were offered. If the fixtures selected by the utility have an efficacy of less than 100, higher wattages would be necessary to achieve the same level of illumination. Municipalities pursuing utility upgrades should request the specifications of the utility fixtures to inform their LED replacement plan and ensure appropriate illumination levels. It is important to note the recommended wattages are based on typical mounting heights of 25 to 30 feet above the roadway. High mast lights and lights mounted higher than 35 feet must be adjusted based on the light loss from the higher placement.

**Fixture Rates:**

As Table 4 below illustrates, Central Hudson’s rates for both the first- and second-round LED options are in nearly every case lower than the rates for the older fixtures.<sup>56</sup> And when energy savings are taken into account, the utility LEDs deliver cost savings to municipal customers for all street light types and sizes.

Table 4 - Per Fixture Savings from LED Conversion: Central Hudson(July 2017-July 2018)<sup>56</sup>

Existing Fixture	12-month fixture charges	Estimated annual supply & volumetric charges	Total estimated costs: existing fixtures	Utility LED replacement	12-month fixture charge	Estimated annual supply & volumetric charges	Total per fixture costs	Total per fixture savings/(costs) from utility LEDs
70w HPS	\$ 169.55	\$ 1.53	\$ 171.08	21w	\$ 137.43	\$ 5.10	\$ 142.53	\$ 28.55
100w MV	\$ 174.17	\$ 1.15	\$ 175.32	21w	\$ 137.43	\$ 5.10	\$ 142.53	\$ 32.79
175w MV	\$ 188.62	\$ 1.53	\$ 190.15	21w	\$ 137.43	\$ 5.10	\$ 142.53	\$ 47.62
70w HPS	\$ 169.55	\$ 1.53	\$ 171.08	39w	\$ 152.23	\$ 9.46	\$ 161.69	\$ 9.38
100w MV	\$ 174.17	\$ 1.15	\$ 175.32	39w	\$ 152.23	\$ 9.46	\$ 161.69	\$ 13.62
175w MV	\$ 188.62	\$ 1.15	\$ 189.77	239w	\$ 152.23	\$ 9.46	\$ 161.69	\$ 28.07
150w HPS	\$ 188.44	\$ 3.67	\$ 192.11	65w	\$ 143.89	\$ 15.77	\$ 159.66	\$ 32.44
250w MV	\$ 204.61	\$ 1.91	\$ 206.52	65w	\$ 143.89	\$ 15.77	\$ 159.66	\$ 46.86
150w HPS	\$ 188.44	\$ 3.67	\$ 192.11	82w	\$ 171.61	\$ 19.90	\$ 191.51	\$ 0.60
250w MV	\$ 204.61	\$ 1.91	\$ 206.52	82w	\$ 171.61	\$ 19.90	\$ 191.51	\$ 15.01
250w HPS	\$ 228.48	\$ 6.49	\$ 234.97	95w	\$ 164.81	\$ 23.05	\$ 187.86	\$ 47.11
400w MV	\$ 238.72	\$ 2.67	\$ 241.39	95w	\$ 164.81	\$ 23.05	\$ 187.86	\$ 53.53
250w HPS	\$ 228.48	\$ 6.49	\$ 234.97	93w	\$ 207.53	\$ 22.57	\$ 230.10	\$ 4.88
400w MV	\$ 238.72	\$ 2.67	\$ 241.39	93w	\$ 207.53	\$ 22.57	\$ 230.10	\$ 11.30
400w HPS	\$ 257.66	\$ 6.49	\$ 264.15	155w	\$ 218.83	\$ 37.61	\$ 256.44	\$ 7.71
1000w HPS	\$ 426.68	\$ 6.49	\$ 433.17	155w	\$ 218.83	\$ 37.61	\$ 256.44	\$ 176.73
1000w MV	\$ 350.24	\$ 6.49	\$ 356.73	155w	\$ 218.83	\$ 37.61	\$ 256.44	\$ 100.29
400w HPS	\$ 257.66	\$ 6.49	\$ 264.15	153w	\$ 304.34	\$ 37.12	\$ 341.46	\$ (77.31)
1000w HPS	\$ 426.68	\$ 6.49	\$ 433.17	153w	\$ 304.34	\$ 37.12	\$ 341.46	\$ 91.71
1000w MV	\$ 350.24	\$ 6.49	\$ 356.73	153w	\$ 304.34	\$ 37.12	\$ 341.46	\$ 15.27

It is important to note that the rates in the table are for rates effective in 2017. Rates for all fixtures (conventional and LED) increased by 3.8 percent per year every year between July 2015 and July 2017. The rates will change again when the next rate plan is adopted for July 2018-July 2021.<sup>41</sup>

#### Stranded Costs:

When the PSC approved Central Hudson's first LED options in 2015, the Commission required that municipalities pay the average remaining net book value at the time of \$117 per light in stranded costs for the old lights if requesting an upgrade. The following year, Central Hudson began to install LEDs whenever a street light required routine maintenance without charging customers for the stranded costs. By October 2016, Central Hudson had converted over 10 percent of its inventory, and proposed to the PSC that LEDs become the company's standard fixture.<sup>42</sup> The PSC, however, ruled against this proposal and reaffirmed its original ruling that municipalities must pay the stranded costs of existing lights. Local governments are permitted to pay off this one-time cost through their bill savings from reduced energy use over a maximum period of five years. In 2017, the stranded costs increased to \$152 per light, in part because the new LEDs increased the total undepreciated value of the company's entire inventory of street lights. The cost analysis in Chapter 5 finds that a municipality with a typical portfolio of lights will see a payback period of three years on these stranded costs, thanks to bill savings of around 30 percent. The PSC has encouraged Central Hudson 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:

For municipalities wishing to convert to utility LEDs, Central Hudson is obligated under its tariff to upgrade a minimum of 15 percent of a community's street lights annually, and no more than 25 percent annually for the entire service territory.<sup>43</sup> The utility maintains discretion over the pace of a community's conversion to LEDs, based on its assessment of available utility personnel and resources. While a full conversion could take a maximum of seven years under the tariff, the utility could agree to an accelerated replacement schedule for a municipality on a case-by-case basis.

#### Conclusion:

Central Hudson's new 3,000 Kelvin options will be a welcome improvement for many municipalities looking for "warmer" street lighting, and the addition of a 21-watt option will ensure that residential areas will not be over-lit and will also maximize energy savings. Most of the utility's 3,000 Kelvin LED wattages fall within the optimal energy savings range, with the important exception of replacements for the 150-watt HPS and 250-watt MV lights. Overall, however, energy savings compared to existing

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<sup>41</sup> Central Hudson Gas and Electric, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Central Hudson Gas & Electric Corporation for Electric Service*, Case 17-E-0459, Forecasting and Rates Panel, Schedule of Exhibits, Exhibit (FRP-14\_), Schedule H: p. 1.

<sup>42</sup> Central Hudson Gas and Electric, October 27, 2016.

<sup>43</sup> Central Hudson Gas & Electric Corporation, Service Classification No. 8, Public Street and Highway Lighting, Tariff Leaf 223, August 13 2015 (effective date), <https://www2.dps.ny.gov/ETS/jobs/display/download/5910214.pdf>.

lights will be substantial. Once an LED conversion is complete and the stranded costs of the existing lights are paid off, communities would see a sizeable reduction in their street light bills.

### New York State Electric & Gas – Avangrid Company (formerly known as Iberdrola)

In November 2017, the PSC approved a proposal by NYSEG to add LED options, making a number of valuable modifications to NYSEG’s original proposal that expanded the utility’s offerings, reduced the rates, and improved energy savings. At the Commission’s direction, NYSEG offers customers a choice of LED color temperatures, including 4,000 Kelvin (a neutral color temperature) or 3,000 Kelvin (a warmer light). Four wattage options are available to replace 15 light types and wattages in the service territory.

#### Fixture wattages:

As shown in Table 5, below, the LED wattages fall within optimal ranges as replacements for most existing light types and sizes. One notable exception is the LED replacement for the 100w HPS, which accounts for about 30 percent of NYSEG’s 87,000 street lights across the state.<sup>44</sup> It is possible that, once a community-level lighting assessment is undertaken, municipalities may determine that the 25w LED is an appropriate substitute for the 100w HPS—particularly in residential neighborhoods. The replacement option for the 150-watt HPS, which account for about 14% of the lights in the service territory, is also higher than the optimal wattage range.

Table 5 - NYSEG LED Replacement Wattages Within Optimal Efficiency Ranges <sup>45</sup>

Existing fixtures	Annual (kWh) energy consumed	Optimal LED replacement range (watts)	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)
50w HPS	244	20-28w	84-118	25w		1900-2200
70w HPS	350	20-28w	84-118	25w		2500-2800
70w MH	400	20-28w	84-118	25w		2500-2800
100w HPS	493	35-42w	147-177		67w	3800-4200
100w MH	506	20-28w	84-118	25w		3800-4200
100w MV	535	15-28w	63-118	25w		1900-2200
150w HPS	720	48-54w	202-228		67w	5800-6400
175w MV	885	20-28w	84-118	25w		2000-2400
175w MH	885	48-54w	202-228		67w	5800-6400
250w MV	1230	25-54w	105-228	25w		3500-3800
250w MH	1319	90-100w	379-421		113w	11000-12000
250w HPS	1319	85-100w	358-421		113w	11000-12000
400w MV	1938	35-80w	147-337	67w		11000-12000
400w MH	2048	90-120w	379-506	113w	166w	11000-12000
400w HPS	2048	85-120w	358-506	113w	166w	11000-12000

<sup>44</sup> NYSEG’s territory extends well beyond the Mid-Hudson region.

<sup>45</sup> 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