

Rosendale Town-Wide Street Light Assessment
And Options for Improving Efficiency

Town of Rosendale Environmental Commission
December 2013

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Some Key Findings

- The Town and its Lighting Districts are paying Central Hudson over \$47,000 for street lighting, and this cost increases every year. The Town's street lights consume 174, 552 kwh of electricity per year—enough electricity to power 15 single family homes, on average.
- The Commission's field survey, among other things, found that three street lights have broken sensors and run continuously, and that fifteen street lights do not operate at all (and are billed to the Town as if they work).
- A minimum of 12 lights and a maximum of 26 lights were identified as potential candidates for decommissioning.
- If Central Hudson continues to own and maintain Rosendale's street lights, Central Hudson will replace, free of charge at a rate of five percent a year, the town's current stock of inefficient mercury vapor and incandescent lights with comparably sized sodium vapor lights. Once this upgrade process is complete, the town would save \$712.56 in annual energy costs and 21,768 kwh in annual energy use. If the Town also decommissioned 26 lights, total savings through a combination of upgrades and decommissioning would be \$4,705.92 and 47,400 kwh annually.
- If the Town were to purchase LED lights for installation on Central Hudson poles, the Town would potentially save \$37,921.78 annually (excluding maintenance costs) after paying for the purchase and installation of the lights. LED street lights would reduce energy use by 40 percent to 105,072 kwh annually. If the Town were also to decommission a maximum of 26 lights, the Town would realize a total annual cost savings of \$39,027.98 after purchasing and installing the LEDs, and a total annual energy savings of 113,112 kwh. This energy savings is equivalent to the electricity used to power 10 single family homes—a very significant energy savings.
- If the Town secured the same price for LEDs as the Village of Dobbs Ferry, at \$348 per unit, the payback period for this purchase would be 1.8 years for 192 lights. This does not include the cost of installation, which will lengthen the payback period for Rosendale. (The Village of Dobbs Ferry has a Town electrician who installed the LED fixtures over an 18-month period.) The last section of this report identifies several potential options that could reduce the cost of purchasing and installing LEDs.

Rosendale Town-wide Street Light Assessment **And Options for Improving Efficiency**

The Town of Rosendale is a signatory to the New York State Climate Smart Communities Pledge, the goal of which is to reduce greenhouse gas emissions, save taxpayers money, and prepare for the impacts of climate change. Rosendale's Climate Change Task Force had earlier identified the need for a streetlight inventory, and on February 13, 2013, the Rosendale Town Board requested that the Environmental Commission undertake a streetlight assessment. The Commission began work on the assessment at its February 21 meeting and completed its work in December 2013.

The goals of the assessment are to: 1) Make sure the Town's lights are in good working order; 2) identify opportunities to increase efficiency, reduce waste and light pollution, and to enhance the aesthetic appeal of the surrounding community; and 3) ensure that the lights that exist on paper and for which the town is billed are consistent with the facts on the ground.

Background

Street lights serve important municipal and community functions, promoting downtown business and economic development and enhancing safety and security, particularly in the more densely populated areas of town where pedestrian traffic is greatest. Street lighting should at the same time be as efficient and cost-effective as possible and should be located only where needed in order to reduce energy waste and unnecessary costs to taxpayers. A number of lights in Rosendale date back to at least the 1940s and have not been upgraded.¹ The old mercury vapor lights, of which there are currently 33 in town, are about 2.5 times less efficient than sodium vapor and metal halide lights, and many times less efficient than light-emitting diode lights (LEDs), which a number of municipalities in New York are now moving to install because of the economic and energy savings. The Village of Dobbs Ferry, for instance, replaced 700 of its older fixtures with LEDs, saving the town approximately \$115,000 over two years in electricity costs.²

Upgrading municipal streetlights and reducing waste can be both energy-smart and pennywise. By the end of 2013, spending by the Town and its three lighting districts (Rosendale Village, High Falls Park and High Falls) on street lights will total over \$47,000, and this cost increases each year. From the General Fund, \$18,000 was allocated in 2013 to pay for streetlights on town, county, and state roads. Taxpayers in the Village Lighting District pay about \$27,000; in the High Falls Lighting District, about \$1,000; and in High Falls Park, about \$1,700.³

Profile of Rosendale's Lighting Stock (based on Central Hudson records)

According to Central Hudson records, the Town of Rosendale has a total of stock of 192 street lights: 54 lights charged to the Town's General Budget; 122 lights charged to the Rosendale Village Lighting

¹ The earliest map of town street lights found by the Town Clerk is dated 1947.

² Presentation by Dobbs Ferry Mayor Hartley Connett at the Energy Efficient Streetlight Forum, White Plains, Nov. 7, 2013.

³ Source: Town of Rosendale 2014 Budget.

District; six charged to the High Falls Lighting District; and 15 charged to the High Falls Park Lighting District.⁴ (See Appendix A, the Oct. 2013 Central Hudson street light bill, as an example of a monthly bill to the Town.) The total stock consists of the following light types:

Incandescent: **1 light**

Mercury Vapor (sizes ranging from 7,000 lumens to 20,000 lumens⁵): **33 lights**

Sodium Vapor (sizes ranging from 5,800 lumens to 50,000 lumens): **145 lights**

Metal Halide (sizes ranging from 14,000 lumens to 36,000 lumens): **13 lights**

The energy efficiency of these luminaire types varies considerably. A single 7,000 lumen mercury vapor light consumes an estimated 77 kwh per month while the smaller and more efficient 5,800 lumen sodium vapor light consumes an estimated 32 kwh per month. *A sodium vapor light is about 2.5 times more efficient than a mercury vapor light, and has the additional benefit of not containing toxic mercury.* The size of a light also greatly impacts energy use: A 27,000 lumen sodium vapor light (250 watts) consumes 117 kwh per month compared with the 5,800 lumen fixture (70 watts) which, as mentioned, consumes 32 kwh per month.

Rosendale's street lights are unmetered. The Town is charged a flat fee by Central Hudson based on the average number of hours of use per year (estimated to be 4,000 Burning Hours, according to the current Central Hudson street light tariff) and on the size and type of the luminaire.⁶ Thus, when street lights are not working, the Town is still charged for them as if they were operational. Central Hudson also unknowingly subsidizes energy waste in cases where the street light sensors are not working and streetlights are on during daylight hours. If not reported to Central Hudson, these broken lights can go unnoticed for a long time.

Assessment Methodology

The Rosendale Environmental Commission used the following base documents for its assessment: A list from Central Hudson of the street lights that included type, size, pole number, and street location; and a map of the town's street lights, also provided by Central Hudson. Prior to the Commission starting the assessment, the Supervisor asked the Police Department to verify whether the lights on the list correlated with actual location and whether or not the lights worked. The Department identified 7 non-working lights and was unable to find several lights on the Central Hudson list.⁷ The Police Department's preliminary survey was helpful to the Environmental Commission in cross-checking its findings later on.

The Environmental Commission developed a field survey to:

⁴ Different charges by Central Hudson are applied depending on who owns and maintains the lights (the Town or Central Hudson). Of Rosendale's total lighting stock, one light is Town-owned and maintained, two lights are Town-owned and Central Hudson-maintained, and the remaining 189 are Central Hudson-owned and maintained. See the last section on findings for further discussion of the rate classifications.

⁵ A lumen is the measure of the total "amount" of visible light emitted from a source.

⁶ Public Service Commission No: 15, "Service Classification No. 8: Public Street and Highway Lighting," Central Hudson Gas and Electric Corporation, effective 6/25/04.

⁷ These lights were subsequently identified by the Environmental Commission during its survey.

- verify whether the lights matched the Central Hudson list and whether they worked and were covering the intended areas;
- assess the light quality (glare/light pollution or insufficient brightness); and
- assess whether the size of the light could be reduced or eliminated altogether.

The Commission identified a number of criteria to determine whether the light was necessary for safety, security, or commerce, including whether the light was located at an intersection or by a sharp curve; whether it was located on a street with significant pedestrian traffic or sidewalks; and whether it was located in a business district.⁸ To aid in developing this criteria, the Commission referred to the October 2012 “NYSERDA How-to Guide to Effective Energy-Efficient Street Lighting for Municipal/Appointed Officials,” prepared by NYSERDA and the NYS Public Service Commission, and also consulted with Central Hudson staff. The Town of Esopus had earlier done a street light assessment, and its field sheet was used as a template.

Once the survey field sheet was created,⁹ the streetlights were then divided into survey areas and assigned to Commission members and four additional volunteers from the community, including Bill Brooks, Tanya Jurcic, Jack Snyder, and Ezra Waltermauer. There were a total of 11 field surveyors in all. The lights were surveyed in both the day and at night to assess all of the required conditions. If residents happened to be nearby while surveys were conducted, surveyors solicited their views on the street lights in their neighborhood.

When the field sheets were completed, surveyors entered the data into a shared google spreadsheet for sorting and analysis.¹⁰ Data on observed lights was compared with Central Hudson records, lights in need of repair were identified, and lights that were candidates for reduced wattage were also identified. A list of potential candidates for decommissioning was drawn up, and surveyors were then asked to return to the field to consult with residents living near the lights to get their opinions. Following these informal consultations, surveyors entered neighbor comments on the spreadsheet, and the Commission further refined the assessment of candidates for decommissioning.¹¹ The field work was completed in October.

Findings

1) Verification of lights, type, and size:

Listed pole numbers and observed numbers were compared. In nearly all cases, observed pole number and listed pole number corresponded. There was one exception: The light at 22 Mountain Rd. is listed as pole no. 167924 with a listed light type of 5,800 sodium vapor (HPS) but the observed number is 167920 and the observed light type is a 2,500 incandescent. Pole no. 167924 is actually located between near #61 Mountain Road and is a 5,800 HPS.

A thorough verification of light type could not be undertaken because surveyors were unable in most cases to find pole labels indicating light fixture information. However, through the surveying process

⁸ See attached sample lighting survey sheet.

⁹ See Appendix B, sample survey sheet.

¹⁰ See Appendix C, survey data spreadsheets.

¹¹ Surveyors were not able to speak with all neighbors. The Commission discussed the need for all residents to be notified and given the opportunity to provide input before any decisions are taken by the Town Board regarding decommissioning.

some surveyors noted that they learned to identify the different light types by color. Light sizes were also obvious in many cases (the difference between a 5,800 lumen sodium vapor and a 27,000 lumen sodium vapor luminaire is readily observable.)

Working condition of lights:

- 1) Three lights were found to have broken sensors and were running continuously at enormous cost in terms of wasted energy. These lights have been reported to Central Hudson.
- 2) Fifteen lights were identified as not operating at all. Of these 15, 9 lights have been identified as candidates for elimination.
- 3) Other problems with specific luminaires were identified, including intermittent lighting, broken parts, decreased brightness due to dirt and bugs in fixture, and sub-optimal pole location (see attached spreadsheet with survey notes.)
- 4) Light on pole number 123391 (Hickory Bush Rd.) cycles on and off and needs repair.
- 5) Light at the Veterans Memorial (CP0111111) needs repair.

Light quality:

Very few lights were shielded and the light quality, particularly that of the older lights, was poor and contributed to glare and light pollution. Fifty lights were identified as contributing to light pollution (light cast directly on residences) and/or were excessively bright. Some residents who saw that the survey was being conducted expressed to the surveyor their desire for shielding the light from their homes.

Surveyors identified 45 lights as candidates for replacement with a lower wattage luminaire; however, 20 of these are sodium vapor lights that are already at their lowest wattage. Another 12 of these lights are mercury vapor lights, which are inefficient and should be replaced. See Appendix D, “Candidates for Wattage Reduction.”

Certain areas lacked lighting uniformity (Springtown Road and Keator Ave.) because of the combination of different luminaire types along the same stretch of road.

The color of light cast by mercury vapor lights and sodium vapor lights is generally considered aesthetically unattractive and of poorer quality relative to metal halide and LEDs.¹²

Candidates for Decommissioning:

Twenty-six street lights were identified as candidates for decommissioning. Twelve of these lights have either been out of operation for some time, or are on rural roads with no residents in the immediate vicinity. These lights would be relatively easy to eliminate. All candidates for decommissioning should be reviewed by the police and fire departments if the Town Board decides to consider decommissioning them. Those lights which need further consideration before elimination (e.g., lights with nearby residences) are noted on the spreadsheet for the Town Board’s review. These lights were included as

¹² “NYSERDA How-to Guide to Effective Energy-Efficient Street Lighting for Municipal/Appointed Officials,” prepared by NYSERDA and the NYS Public Service Commission, October 2010. This was also the common view expressed at the Energy Efficiency Street Light Forum, hosted by the Southern Westchester Energy Action Coalition at Pace Law School on November 7, 2013.

candidates because they were not located at an intersection/sharp curve, in a business district or in an area with significant pedestrian traffic; however, residents in the immediate vicinity may wish to retain the lights for other reasons and should be given an opportunity to provide input.

Financial and Energy Savings from Decommissioning and Wattage Reduction of Identified Lights:

Scenario 1:

If all 12 of the easy-to-eliminate lights were decommissioned, the total financial savings to the Town would be \$1,956.96 annually and the total energy savings would be 8,820 kwh annually.¹³

Scenario 2:

If all 26 lights were decommissioned, the total financial savings would be \$4,061.50 annually and the total energy savings would be 14,736 kwh annually.¹⁴

If all 13 lights identified for wattage reduction were replaced with 5,800 lumen lights, the financial savings to the town would be \$473.40 annually and the energy savings would be 11,064 kwh annually. (One 50,000 HPS at \$226.68 and 2,208 kwh per year + 7 27,000 HPS lights at \$1,356.60 and 9,828kwh per year + 516,000 lumen lights at \$829.20 and 4,020 kwh per year – 13 5,800 HPS lights at \$146.04 and 32 kwh each per year = cost and energy savings.)

Total possible savings through wattage reduction and decommissioning under Scenario 1:
\$2,430.36 and 19,844 kwh annually.

Total possible savings through wattage reduction and decommissioning under Scenario 2:
\$4,534.90 and 25,800 kwh annually.

Upgrade Options for the Town of Rosendale

The Town’s upgrade options are tied to the service classifications under the current Central Hudson tariff. There are three service classifications under this tariff: “Rate A” (company-owned and maintained), “Rate B” (company-owned and Town-maintained, and “Rate C” (Town-owned and maintained). Nearly all of Rosendale’s street lights (189 of 192) are classified as Rate A. Two lights in the Rosendale Village Lighting District are classified as Rate B and one light paid for out of the Town’s General Fund is classified as Rate C.

Option 1: Remaining in Service Classification A

Under the Town’s current service classification of Rate A (for all but three lights), its upgrade options are limited to what Central Hudson offers under the current tariff. Central Hudson will replace, at no charge, less efficient incandescent and mercury vapor lights with more efficient sodium vapor and metal halide lights. These upgrades can include shielding to reduce light pollution. (Central Hudson will *not*

¹³ The cost savings was calculated by multiplying the number of lights times the cost per light type per month times 12. The energy savings was calculated by multiplying the number of lights times the kwh per light type per month times 12. Of the 13 lights, 9 are sodium vapor 5800, 1 is a mercury vapor 7000, one is a mercury vapor 20000, and two are mercury vapor 27000, each with different cost and energy use values. See Appendix A for data on cost and energy use per light type.

¹⁴ Calculated the same way as above. Of the 26 lights, 21 are sodium vapor 5800, two are mercury vapor 7000, one is a mercury vapor 20000, and two are mercury vapor 27000.

provide shielding to existing sodium vapor or metal halide lights.) Central Hudson will not upgrade to LED or solar-powered lights.

According to the Central Hudson tariff, “no more than 5% of the Company Owned lights in any municipality shall be replaced in any year unless otherwise approved by the Company in writing.”¹⁵ The Town Board must formally request upgrades each year until the entire stock of mercury vapor and incandescent lights is replaced. William Cotting, Central Hudson’s Supervisor for New Business & Commercial Account Services, indicated in a telephone conversation with Rosendale Environmental Commission Chairwoman Jen Metzger that accelerating the change-over was a possibility.

If the Town replaced its current stock of 33 mercury vapor lights and one incandescent light with comparably sized sodium vapor lights, the town’s total annual savings from upgrades under Rate A would be \$712.56 in energy costs and 21,768 kwh in energy saved.¹⁶

In addition to replacing its existing stock of mercury vapor lights and one incandescent, the Town could also decommission lights. (Central Hudson would remove the existing lights and associated hardware at no charge.)

Total savings through a combination of upgrades and decommissioning 26 lights would be: \$4,705.92 and 47,400 kwh annually.¹⁷

Option 2: Switching to Service Classification C and Upgrading to LEDs

The Town could change its service classification under the tariff from “A” (Central Hudson-owned and maintained street lights) to “C” (Town-owned and maintained street lights) by purchasing LEDs and installing them on Central Hudson-owned (and CH-Verizon jointly-owned) poles.

Under this scenario, the Town would apply to Central Hudson to attach LED fixtures to its poles. Once approval is received, Central Hudson will remove existing luminaires and associated hardware. The town would purchase and install the LED fixtures. There would be a one-time pre-attachment survey cost of \$8.18 per pole (\$1,570.56 for 192 lights). Going forward, the Town would pay a yearly pole rental charge of \$6.39 for Central Hudson-owned poles or \$3.19 for poles jointly-owned by Central Hudson and Verizon. (Many poles are jointly-owned, and the Town would need to contact Verizon about attaching the new fixtures.)

If the Town owned and maintained the lights, the Town would pay Central Hudson only for the electricity (delivery and supply charges) plus pole rental.

The delivery charge for each light is based on the light emitting diode fixture delivery rate statement in

¹⁵ “Service Classification #8: Public Street and Highway Lighting,” PSC No. 15 (Electricity), Central Hudson Gas & Electric, 11/01/01 (Effective Date): Leaf 223.

¹⁶ The calculation of financial savings was made by adding up the costs of the Town’s mercury vapor lights (26 7,000 lumens at \$166.02 each + 2 15,000 lumens at \$210.12 each + 4 20,000 lumens at \$210.12 each) and one incandescent light (2,500 lumens at \$159.24 each) and subtracting the sum of the costs of more efficient lights of comparable sizes (5,800 lumen sodium vapor at \$149.24 each, 16,000 lumen sodium vapor at \$165.87 each). The calculation of energy savings was done the same way, substituting annual kwh per luminaire for the price. The source of data on price and energy use is the Town’s Central Hudson bill for street lights, dated October 31, 2013.

¹⁷ The cost and electricity usage of 3 mercury vapor lights suggested for elimination have been subtracted from the total savings from upgrades to eliminate double-counting.

the Central Hudson tariff effective 8/26/10. These rates are currently an annual charge of \$20.83 for lights in the 70-80 watt range, \$25.47 for lights in the 100-110 watt range and \$42.45 for lights in the 210-220 watt range. Assuming that Rosendale would replace all 5,800 -7,000 lumen lights with 80 watt LEDs, and all lights at or above 14,000 lumens with 110 LEDs, the annual costs to the Town of owning LEDs at current prices and rates are as follows:

Delivery charge for:

125 80 watt LEDs (\$20.83 per light): \$2,603.75

67 110 watt LEDs (\$25.47 per light): \$1,706.49

TOTAL DELIVERY CHARGE: \$4,310.24

Supply Charge at \$.05294¹⁸ per kwh for:

125 80 watt LEDs: \$2,117.60 (\$16.94 per light)

67 110 watt LEDs: \$1,560.67 (\$23.29 per light)¹⁹

(The annual kwh supply charge is based on the LED fixture wattage divided by 1,000, times 4,000 Burning Hours per year.)

TOTAL SUPPLY CHARGE: \$3,678.27

Pole rental (192 poles):²⁰ \$1,226.88

Total annual cost of Central Hudson charges for Town-owned and maintained LEDs: \$9,215.39.

This compares with 2013 Central Hudson charges of \$47,137.44.

With Town-owned and maintained LED street lights, the town would save \$37,921.78 (excluding any annual maintenance costs) at 2013 rates after purchase and installation of the lights, and the town would reduce its energy use by 105,072 kwh²¹-- about a 40 percent reduction.

Note that for the three-year Central Hudson rate period, the cost of street lights under the current Central Hudson rate plan increased each year by between \$5 and \$7 per light depending upon light size and type.²² This increasing expense for the Town over time is a further incentive to upgrade to LEDs and assume ownership and maintenance.

¹⁸ Rate effective at the Nov. 8, 2013. Source: http://www.centralhudson.com/pdf/mpc_nov2013.pdf

¹⁹ The supply charge is calculated by multiplying the annual kwh per light by the per kwh rate by the total number of lights. Under the Central Hudson tariff, the annual kilowatt hours(kwh) of a light is determined by the following formula:

Annual kwh = Fixture wattage divided by 4,000 Burning Hours Per Year.

²⁰ This assumes pole rental is the same for CH-owned poles and poles owned jointly by Verizon.

²¹ Current annual usage (174,552 kwh) – LED annual usage (69,480 kwh) = 105,072 kwh saved. LED usage is calculated by applying the Central Hudson formula for determining annual kwh to 67 110-watt LEDs (29,480 kwh) and 125 80-watt LEDs (40,000 kwh) for a total of 69,480 kwh.

²² See the Central Hudson tariff, PSC 15 Electricity, “Public Street and Highway Lighting,” Central Hudson Gas & Electric Corporation, Effective 6/18/2010.)

Option 3: Decommissioning Lights and Upgrading Remaining LEDs under Rate C:

If the Town decommissioned all 26 lights identified as possible candidates for elimination, the costs would be reduced further.

Delivery charge for:

104 80 watt LEDs (\$20.83 per light): \$2,166.32

64 110 watt LEDs (\$25.47 per light): \$1,630.08

TOTAL DELIVERY CHARGE: \$3,775.57

Supply Charge at \$.05294²³ per kwh for:

104 80 watt LEDs: \$1,761.76 (\$16.94 per light)

64 110 watt LEDs: \$1,490.56 (\$23.29 per light)²⁴

(The annual kwh supply charge is based on the LED fixture wattage divided by 1,000, times 4,000 Burning Hours per year.)

TOTAL SUPPLY CHARGE: \$3,235.38

Pole rental (166 poles):²⁵ \$1,060.74

Total annual cost of LEDs (excluding maintenance) with decommissioning of 26 lights:
\$8,109.46

Total cost savings annually: \$39,027.98.

Total energy saved annually: 113,112 kwh. This energy savings is equivalent to the amount of electricity used to power 10 single family homes—a significant energy savings.²⁶

Cost of LEDs and Payback Period

The cost of LED street lights for Rosendale will depend upon type, vendor, and other factors and will need to be researched. To give an idea of the cost and payback period, the Village of Dobbs Ferry paid \$348.00 per unit and the Town of Eastchester paid approximately \$300 per unit.²⁷ If we assume that Rosendale pays the same amount per unit as Dobbs Ferry, Rosendale would pay \$66,816 for 192 street

²³ Rate effective at the Nov. 8, 2013. Source: http://www.centralhudson.com/pdf/mpc_nov2013.pdf

²⁴ The supply charge is calculated by multiplying the annual kwh per light by the per kwh rate by the total number of lights. Under the Central Hudson tariff, the annual kilowatt hours(kwh) of a light is determined by the following formula:

Annual kwh = Fixture wattage divided by 4,000 Burning Hours Per Year.

²⁵ This assumes pole rental is the same for CH-owned poles and poles owned jointly by Verizon.

²⁶ The average single family home in the U.S. consumes 11,319 kwh annually. U.S. Environmental Protection Agency, Green Power Partnership: www.epa.gov/greenpower/pubs/calcmeth.htm

²⁷ This was the price of the units purchased by the Village of Dobbs Ferry, and this same unit price may or may not be obtained by the town of Rosendale.

lights, or \$57,420 if 26 lights are decommissioned. The payback period on this investment would be:

Purchase cost (192 lights for \$66,816) divided by annual energy savings (\$37,921.38) = 1.8 years.

If, additionally, 26 lights were decommissioned, the payback period would be 1.5 years.²⁸

Two important qualifiers:

- 1) This analysis does not include any maintenance costs. Moreover, the LED lights in the Village of Dobbs Ferry were installed by the Village electrician. Installation would be an additional cost for the Town of Rosendale.
- 2) The Village of Dobbs Ferry got a very good price for LEDs and there is no guarantee that Rosendale could secure the same price, or would want the same type of LED fixture.

Maintenance Costs of LEDs

While the Environmental Commission did not obtain estimates of maintenance costs for LED street lights, we can report that municipal officials participating in the November 2013 Energy Efficient Street Light Forum in White Plains, whose municipalities have already upgraded to LEDs, stated that the costs of maintaining LED street lights were lower than the costs of maintaining the older fixtures. The lifespan of LEDs is estimated to be around 15 years—significantly longer than other light types—reducing the service costs.

It is also important to note that the Town pays Central Hudson a significant sum of money per year to own and operate the street lights. Under the town's current "Rate A" street light classification, in which Central Hudson owns and maintains the lights, the Town is charged, for example, \$149.25 per 5,800 lumen sodium vapor light. Under Rate C, in which the Town would own and maintain the lights, this same light would cost \$22.53 annually—*less than a sixth of the cost of Rate A*. The Town may very well be able to find a private contractor to service its street lights at less cost.

Advantages and Disadvantages of LEDs

Advantages

- 1) The main advantage of LED street lights are their superior energy efficiency and long lifetime compared with other technologies. The City of Yonkers reduced its carbon footprint by 10% by switching to LED street lights.²⁹ LED street lights are 40-75 percent more efficient than conventional street lights, reducing greenhouse gas emissions, energy costs, and maintenance costs.³⁰
- 2) LED street lights operate efficiently even in cold weather, unlike other street light types.
- 3) LEDs do not contain toxic substances like mercury or lead, unlike some other lighting technologies (including the Town's mercury vapor street lights).

²⁸ 166 lights for \$57,768 divided by \$39,027.98 in energy savings

²⁹ Presentation by Brad Tito, Director of Sustainability, Cit of Yonkers, at the Energy Efficiency Street Light Forum in White Plains, NY.

³⁰ Courtney Strong, Inc., "Municipal Opportunities from NYSERDA Programs," Webinar, Nov. 19, 2013, www.courtneystrong.com.

- 4) LED street lights are less attractive to insects (which fill the luminaries and darken a number of Rosendale's existing street lights!)
- 5) LED light renders color better than other lighting types (a red car parked under an LED street light looks like a red car; if parked under a sodium vapor light, the color is difficult to make out).³¹
- 6) LED street lights provide better control of lighting.³²

Disadvantages

- 1) There is a risk of glare and visual discomfort from LED lights because of their relatively high luminance. Shielding is important. (Many of the town's existing lights, using conventional lighting technologies without the benefit of shielding, were found to have light pollution and glare issues, as well.) It would be valuable to visit villages of a similar size to Rosendale that have made the switch to LEDs to get a better sense of the light quality and style choices.
- 2) LED street lights only provide directional lighting and must point downward. This is an advantage in that it can reduce glare common in other light types; however, it may limit the design choices. If the Town were to consider, for example, historical lamp-style lights for Main Street, LEDs would not be appropriate. There are, however, historical lamp-like LED lights available with downward lighting. Woodland Pond in New Paltz has attractive street and parking lights in this style.
- 3) LED street lights may increase light pollution in some areas because they are brighter than the lights they are replacing, and may negatively impact wildlife. It is important to make sure that street light models are International Dark Sky Association-compliant.

Opportunities to reduce the costs to the town of purchasing LEDs

If Rosendale were to pursue a conversion to LED street lights, there are several opportunities/options for reducing the cost of the purchase, described below.

Municipal Street Light Buyers Group

The Town could participate in a municipal buyers group to negotiate a discounted price with a street light supplier. The Village of Dobbs Ferry wrote a contract for 300 more units than it needed, and the neighboring town of Hastings purchased lights off of this contract. There are several municipalities in our area that have expressed an interest in upgrading their streetlights, including the Town of New Paltz and the City of Kingston, and they may be interested in forming a buyers group.

NYSERDA Environmental Facilities Program Funding

NYSERDA offers financial incentives to upgrade street lights through its Environmental Facilities Program. Under this program, performance-based incentive rates for electric efficiency in our area are \$.12/kwh. Municipalities must qualify for an incentive of at least 30%, and can meet this threshold by combining with other municipalities pursuing street light upgrades. The total incentive cannot exceed

³¹ Energy Efficiency Street Light Forum, sponsored by the Southern Westchester Energy Action Coalition, Pace Law School, White Plains, November 7, 2013.

³² ³² Courtney Strong, Inc., "Municipal Opportunities from NYSERDA Programs," webinar, Nov. 19, 2013, www.courtneystrong.com.

50% of the project cost.

Energy Performance Contract

Another option is to convert to LEDs under an energy performance contract with a vendor, which was the route taken by the City of Yonkers. Yonkers makes 10 annual payments under a lease agreement, and will then purchase the lights for one dollar at the end of the 10-year period. Under the contract, the city is guaranteed energy and financial savings that far exceed annual payments. The agreement includes a 12-year LED warranty and replacement parts warrantee.

* * *

The Commission would like to express its appreciation to William Cotting, Supervisor for New Business & Commercial Account Services, Central Hudson Gas & Electric, for his prompt and valuable assistance in obtaining needed information for this assessment. The Commission would also like to thank the Rosendale Police Department for its initial survey of the lights.