



Chautauqua's Street Light Modernization Project

CPOA Outdoor Lighting
Committee

May, 2016

Background – The charter of the CPOA Outdoor Lighting Committee is to help Chautauqua transition to modern lighting, especially street lights, by providing expert support to Chautauqua Utility District (CUD) and Chautauqua Institution (CI). This Committee started in 2009 and identified the need to replace the outdated National Grid lights (some still use incandescent bulbs) that are high glare, low efficiency, and have high maintenance cost. It set requirements for new street lights: low glare, low light trespass, high efficiency, long life, low maintenance (LEDs), Dark Sky friendly and with an esthetic design to match Chautauqua's early 20th Century ambiance. The Committee is composed of CPOA members, who include 2 award winning lighting experts (retired from GE Lighting), a retired utility executive from Duke Energy, plus two more Ad Hoc experts. We have been coordinating activities closely with the CUD (Tom Cherry) and the CI (John Shedd). The Committee has been maintaining communications with National Grid to facilitate purchase of the existing lights, to be replaced by modern lights that meet the above requirements. Candidate lights were selected and 4 demo lights were erected on Pratt starting in January, 2012. Sunday night Lighting Tours were conducted over the last 4 summers to view demonstration lights. Articles providing street lighting information were developed and printed in the Chautauquan Daily. Public opinion surveys were used to select the preferred street light option, the Neri 804 Heritage luminaire. There have been 6 of these new Neri LED street lights installed on upper Root and N Lake Drive. We successfully solicited funding for first 16 new LED street lights. Recently, our Committee has developed: 1) Detailed recommendations for luminaire replacements; 2) Street Light Installation Plans, and 3) Affordability Assessment. The Committee's efforts communicating with National Grid have yielded a draft Purchase Agreement, which when negotiated will enable the CUD to purchase replacements for all of these outdated lights.

Introduction – The CPOA has worked closely with the Chautauqua Utility District (CUD) and the Chautauqua Institution (CI) in gathering information, developing technical and financial details, interfacing with Neri to provide technical and cost details, securing financial support from CPOA members, and communicating with National Grid (NG). Much of the technical work has been done by our expert lighting consultants: 1) Naomi Miller, a Senior Staff Scientist at the Pacific Northwest National Lab, is the US Department of Energy Gateway Project Leader for the Pratt string replacement to demonstrate advanced technology efficacy; 2) Rita Koltai, Stanford, CA, has provided illumination predictions for the new Neri luminaires to determine proper spacing (~80 ft.) for adequate light coverage, and "CI Luminaire Replacement Recommendations"; 3) Terry McGowen (CPOA member),

award winning retiree from GE Lighting, a founding member of the International Dark Sky Association, has provided technical details on lighting, including Dark Sky criteria to get CI tentative approval; 4) Jim Dakin (CPOA member), award winning retiree from GE Lighting, attends Light Fair, aids with discussions with Neri; and 5) Rich Osborne (CPOA member), recent retired executive from Duke Energy, has led the financial analysis to determine affordability and bond options to fund the new lights.

Installment Plans – Using inputs from CUD and National Grid inventory and lighting facilities schematic, the Committee developed two options for installing the new lights:

- 1) Regional –starts around Amphitheater and works outward – one option uses LED cobra head replacements (saves \$92K vs full Neri replacement), and
- 2) Strings – uses NG circuits for possible efficiency for metering, disconnect boxes.

Both start with the DOE Gateway Project – 10 lights on Pratt (Ames – Hurst). They are followed by 5 phases (could be years or less) with 45-50 lights/phase @\$90-100K. The selected plan will guide the installation of the lighting equipment. The installation period will depend on equipment availability, and installation resources.

National Grid Interactions – Interfacing with the power utility company, NG, to negotiate terms of transfer of current street lighting facilities, has been a long arduous process. With much patience and prodding, we have gotten them to provide (last Fall):

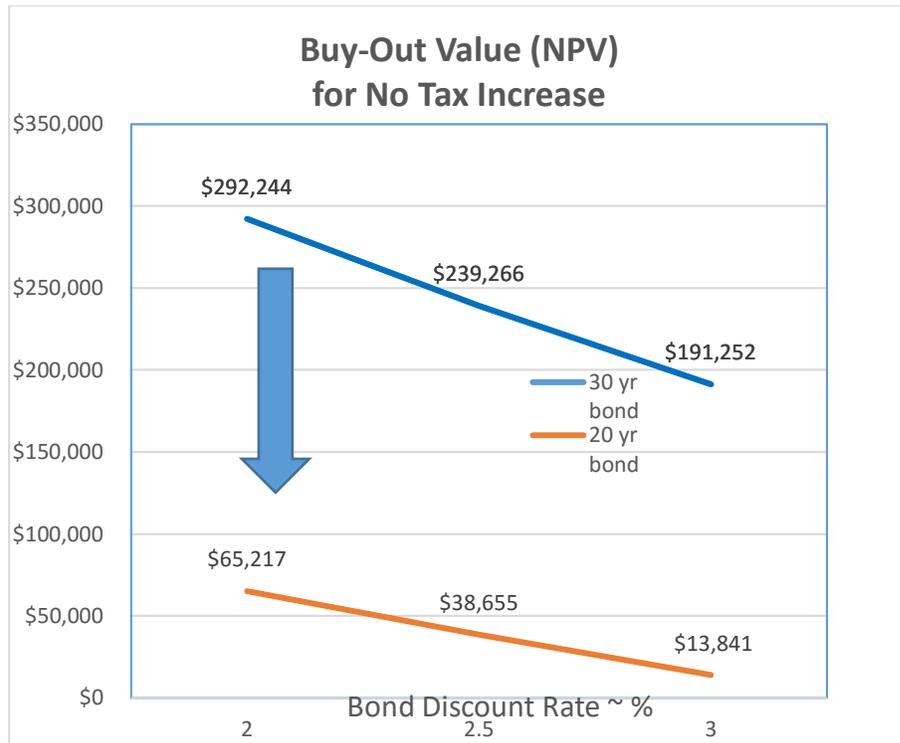
- 1) Schedule SL2 – which delineates Standard, Closed, and Obsolete Charges,
- 2) Detailed inventory of circuits, poles, posts, cement bases, luminaires, and lamps, and
- 3) Schematic of existing NG street lighting facilities in CI.

On April 11, 2016, they delivered a draft Purchase Agreement. We have reviewed and submitted questions, comments for resolution. This included a purchase price of \$85K for all of the hardware. What wasn't quantifiable at this time was NG's Separation and Reconfiguration Work charges.

Affordability Analysis – We used a Net Present Value analysis to determine what we could pay NG for their old facilities, **without raising taxes**. The analysis looked at 20 and 30 year bonds with discount rates of 2, 2.5, and 3% to fund acquisition (Region B Install Plan @ \$382K from Neri quotes/actuals) and installation (\$88K from Ahlstrom Schaeffer estimate). Analysis was done for 1 and 5 year installation of the 243 lights. The key components are the annual expenses and income. The analysis used Present Value sums of annual expenses: 1) NG leasing cost of \$40K/yr. becomes << \$10K/yr. for maintenance with CUD ownership, and 2) Energy cost of \$15K/yr. becomes \$5K/yr. with CUD ownership of high efficiency LED lighting (average Wattage 145W -> 35.5W). This provides about \$40K of tax revenue which previously would go to NG and now will be available to the CUD to fund the annual bond payments which are all < \$40K in the various bond scenarios in the table below.

The present value of these was combined with the Tax income (kept constant) at \$55K/yr, to yield the Net Present Value, which is the amount that we can afford to pay NG for their lighting facilities. The results are shown on the next chart. NG asked for \$85K for facilities (equipment) – charges for Separation and Reconfiguration are not quantifiable yet.

Bottom line is that **the Project looks feasible without a tax increase!!**



Analysis results indicate that we can afford to pay NG from \$65,217 to \$292,244 **without raising taxes** with a 20 yr. to 30 yr., 2% bond (area between the 2 lines, indicated by the blue arrow).

NPV Results and Bond Values/Payments					
20 yr Bond*					
	2% Bond Value*		2.5% Bond Value		3% Bond Value
NPV	Annual Payment	NPV	Annual Payment	NPV	Annual Payment
\$65,217	(\$535,119)	\$38,655	(\$508,557)	\$13,841	(\$483,743)
	(\$32,726)		(\$32,622)		(\$32,515)
30 yr Bond*					
	2% Bond Value		2.5% Bond Value		3% Bond Value
NPV	Annual Payment	NPV	Annual Payment	NPV	Annual Payment
\$292,244	(\$762,146)	\$239,266	(\$709,168)	\$191,252	\$ (661,154)
	(\$34,030)		(\$33,882)		(\$33,732)
*NG buy-out(NPV)+build-out(\$470K)=Bond value					

Summary - Based on CPOA Outdoor Lighting Committee’s cooperative efforts with CUD and CI over the last 5 years:

- ▶ Set requirements for street lights that enhance the Chautauqua experience,
- ▶ Use of lighting experts to select, specify, negotiate lighting that meets our requirements,
- ▶ Education by CHQ Daily articles, by Sunday night tours,
- ▶ Demo lights, and CPOA surveys with very large majority for the selected light,
- ▶ Installation Planning and Affordability Analysis to avoid/minimize tax increase,
- ▶ Communications/discussions, early negotiations with National Grid, and
- ▶ Solicited received donations from CHQ Property Owners to support first 15-20 lights.

We recommend that CUD put the Street Light Modernization Project up for a vote in August!!