



Finance Department
Brendan T. O'Connell, Director

MEMORANDUM

TO: Finance Committee (FC)

FROM: Brendan T. O'Connell - Finance Director,
Troy Moon – Sustainability Coordinator

DATE: September 22, 2017

SUBJECT: **Financing Recommendation – City Streetlights LED Conversion**

Executive Summary

In 2016 one of the City Council Common Goals for the Energy and Sustainability Committee was a plan to convert street lights to LED. City Council allocated funding (\$100,000 in FY17, \$500,000 in FY18) in each of the previous two rounds of Capital Improvement Plan project funding towards the conversion. In October, 2016 City staff released a request for proposals for LED streetlight conversion and selected The Efficiency Network Connected Solutions (“TCS”) to assist with the overall project. According to TCS, the overall project cost will be approximately \$8.6M. Furthermore, once all streetlights have been repurchased from Central Maine Power (“CMP”) and converted to LED the City will realize a savings of over \$900,000 per year – a combined reduction in kilowatt hours usage and removal of the lease/maintenance charges from our CMP bills.

To fund the project a total capital outlay of \$8.6M is required. A phased implementation approach is being recommended by City staff and the City Manager, with two \$4M phases in each of the next two years. This will help stagger the debt burden across multiple fiscal years and will also hedge against future replacement of all the LED lights being required at generally the same time. A 10-year, 2.05% municipal lease with Banc of America Public Capital Corp is being recommended for the financing. The interest rate is competitive, the lease will be subject to an annual appropriation clause by City Council, and the annual debt service costs from the lease will be more than offset if the savings projected by TCS are realized.

Additional Analysis - Cost of Streetlight Project

City staff has worked with TCS to develop a scope of work for the streetlight project that incorporates a variety of related lighting and smart cities projects to be implemented during the two phases of the project. The work assigned to each phase and its cost is highlighted below:

Preliminary work:

Purchase of CMP owned streetlight assets \$590,000 (predominantly already allocated CIP Funds)

Project Part 1:

CMP cobra head LED upgrade (new fixtures)	\$1,757,017
CMP flood and shoebox LED upgrade (new fixtures)	\$208,703
Fusing for CMP cobra heads, floods, and shoeboxes	\$343,901
Controls for CMP cobra heads, floods, and shoeboxes	\$544,694
Convert lighting in two parking garages to LED	\$62,633
Selected Smart City and lighting projects	\$1,083,052

These could include:

- Public Wi-Fi (approximately 100 locations)
- City Hall exterior lighting
- Athletic field lighting improvements
- Riverside GC solar charging station for golf carts
- Pilot project for decorative lighting
- Pilot emergency alert system using lights
- Tree trimming, pole painting, project contingency

Total Cost – Phase 1 **\$4,000,000**

Project Part 2:

CMP Holophane LED upgrade (50/50 retrofit/new)	\$421,077
CMP GE Town and Country LED upgrades (70/30 retrofit/new)	\$967,842
Portland decorative LED upgrades (50/50 retrofit/new)	\$602,422
Fusing for CMP Holophane and GE (not currently City owned)	\$71,998
Controls for all decorative lights	\$245,065
Selected Smart City and lighting projects	\$1,691,596

These could include:

- Public WiFi (between 150 – 300 additional locations)
- Athletic field lighting upgrades
- Intelligent traffic controls (Woodford Corner, Allen Corner)
- Electric vehicle charging stations
- Environmental sensors
- Tree trimming, pole painting, project contingency

Total Cost – Phase 2: **\$4,000,000**

Additional Analysis – Savings from Streetlight Project

TCS projects significant annual savings for the City of Portland once this project is completed. These savings result from a significant reduction in kilowatt hours used annually (i.e. the “generation” costs), a small

reduction in delivery costs (the cost charged by CMP to get their electricity to our locations) and a complete removal of the “equipment maintenance charge.” See Exhibit A below for complete breakdown.

Exhibit A – City of Portland Cost Savings Calculation as Provided by TCS

City of Portland - savings calculations

	kWh used prior to upgrade	cost breakdown	Old Rate (per kWh)	Old Cost to City (per yr)	New kWh post upgrade	New Rate (per kWh)	Post upgrade cost (/yr)
Portland CMP cobraheads	3,328,675	generation	\$0.05263	\$175,188	972,423	\$0.05263	\$51,179
		delivery	-	\$952,408		\$0.055332	\$53,806
		equip, maintnc				-	0
Portland decoratives	398,906	generation	\$0.05263	\$20,994	189,214	\$0.05263	\$9,958
		delivery	\$ 0.05529	\$22,057		\$0.055332	\$ 10,470
Portland Garages (2)	369,757	generation	\$0.05263	\$19,460	191,071	\$0.05263	\$10,056
		delivery	\$ 0.06	\$22,185		\$0.06	\$11,464
TOTALS:	4,097,338			\$1,212,293	1,352,708		\$146,933

Note: the \$0.05263/kWh rate is a blended rate, averaging the rates from Streetlight "A" (\$0.05835 from NextEra Energy) and "B" (\$0.469 from Constellation)

Potential Savings: **\$1,065,360**

- the \$0.055293 per kWh is from CMP rate SL, section 2, 'Delivery only'
- the \$0.055332 per kWh is the new CPM tariff rate, effective July 1, 2017 from CMP rate SL, section 2, 'Delivery only'
- the parking garage rate of "\$0.06" rate is estimated; TBD by CMP

As the Finance Director for the City and a practicing CPA professional skepticism must always be used over information provided by third parties. The reduction in kilowatt hours post-conversion to LED streetlights is backed up by a) our existing data from CMP, b) statistical / manufacturer information from the streetlight hardware chosen by TEN and City staff and, c) a full 10 year manufacturer's warranty for the street lights to be installed. In relation to the overall annual savings the total generation costs are relatively minor and we are confident they will be realized. Although the savings in dollars related to generation is relatively minor, the total reduction in kilowatt hours is incredibly significant and should be highlighted as a major potential success of the project as this helps the City achieve its stated goal of conserving energy and reducing greenhouse gas emissions.

The major savings from this project hinges on the total elimination of the nearly \$1M annual “lighting equipment” charge being levied on the City of Portland by CMP. According to TEN and our Sustainability Coordinator Troy Moon, the approximately \$952k annual charge will no longer appear on City utility bills from CMP after the City repurchases all of our own streetlights from CMP. The savings will be easy to measure as it is separately stated on all of our utility bills (see Exhibit B below for example).

Although the City will no longer receive the “lighting equipment charge” on our utility bills, the City will also no longer receive “equipment maintenance” services from CMP and will be required to maintain our own streetlights. This may require a contract with a third-party vendor but after the initial conversion failure rate of LED streetlights is projected by TCS to be very low. Finally, it is worth noting that CMP is a utility, which may set their charges to offset their cost of doing business. Although the City will no longer be paying the \$952k in “equipment maintenance charges” the loss of that revenue at CMP will need to be incorporated into their future charges and the City may see their share of increases. Without consideration of these additional costs, TCS has projected the City will see an annual operating savings of \$1,065,320.

Exhibit B – Sample City of Portland CMP Bill

ST LIGHTS	12/30/16	11/28/16	32		
Account Summary					
Prior balance					\$0.00
Payments received through 01/04/17				\$0.00+	\$0.00
Balance forward					
New charges					
Electricity Delivery: Central Maine Power (see detail below)				\$2,552.26+	
Electricity Supply: NextEra Energy Services ME LLC (see page 3)				\$637.42+ - Electricity	\$3,189.68
Total new charges					
Current Account Balance:				Please pay before 01/31/17	\$3,189.68

Central Maine Power Delivery Service Account Detail

Prior balance for Central Maine Power delivery				\$0.00	
Payments received				\$0.00+	\$0.00
Balance forward					
Current delivery charges					
Delivery Charges: Street Lights					
Sodium Enclosed 70W	222 units @	\$10.20			
Delivery Service	222 units @	\$1.88		\$417.36+	
Lighting Equipment	222 units @	\$8.32		\$1,847.04+	
Sodium Enclosed 100W	2 units @	\$11.28			
Delivery Service	2 units @	\$2.54		\$5.08+	
Lighting Equipment	2 units @	\$8.74		\$17.48+	
Sodium Flood 250W	2 units @	\$17.99			
Delivery Service	2 units @	\$5.92		\$11.84+	
Lighting Equipment	2 units @	\$12.07		\$24.14+	
Sodium Cut Off 70W	21 units @	\$10.92			
Delivery Service	21 units @	\$1.88		\$39.48+	
Lighting Equipment	21 units @	\$9.04		\$189.84+	
Delivery Service Charge				\$473.76+ - Delivery	
Lighting Equipment Charge				\$2,078.50+ - Equipment	
Total current delivery charges					\$2,552.26
Central Maine Power account balance					\$2,552.26

As demonstrated on the example bill, the lighting equipment charge of \$2,078.50 accounts for about 65% of the monthly streetlighting cost. This cost will no longer be assessed once the City purchases the existing lighting equipment.

Specifics – Municipal Lease Finance Recommendation and Annual Debt Service Costs

City staff solicited financing proposals from several different vendors and Bank of America had the lowest interest rate proposal for the project – 10 years at a fixed 2.05%. Under the scenario as provided to the vendor, the City would finance the first \$4M of the project in October 2017, with the first annual lease payments not due until FY19, subject to approval of the FY19 budget by City Council. The total cost of the first \$4M lease in the FY19 through FY28 operating budgets would only be approximately \$446k annually, significantly less than the overall \$1.065M project savings projections from TEN. Keep in mind, due to the phased approach of this project, a second \$4M lease would be brought to City Council in FY19, and that lease would add an additional \$450-\$550k in annual debt service costs to future City budgets (depending on interest rates). In

total, it is estimated that the \$8M of leases would add between \$900k and \$1M to the City operating budgets for each of the next 10 years. However, these lease payments are less than the projected annual savings from TEN.

Bank of America has provided a term sheet for the finance package with the following amortization plan for repayment over the course of ten years. Please note that it calls for semi-annual payments so there would be two payments per year. (Total of 20)

Sample 10 Year Amortization

Total Project Costs	4,000,000.00
Repayment Term (semi-annual)	20
Interest Rate	2.050%
Closing/Funding Date (est.)	10/20/17
Average Life	5.679

Pmt. No.	Year No.	Payment Date	Funding Amount	Payment Amount	Interest Portion	Principal Portion	Outstanding Balance
0		10/20/2017	4,000,000.00				4,000,000.00
1	1	7/15/2018		223,284.32	60,361.11	162,923.21	3,837,076.79
2	1	1/15/2019		223,284.32	39,330.04	183,954.28	3,653,122.51
3	2	7/15/2019		223,284.32	37,444.51	185,839.81	3,467,282.70
4	2	1/15/2020		223,284.32	35,539.65	187,744.67	3,279,538.03
5	3	7/15/2020		223,284.32	33,615.26	189,669.05	3,089,868.98
6	3	1/15/2021		223,284.32	31,671.16	191,613.16	2,898,255.81
7	4	7/15/2021		223,284.32	29,707.12	193,577.20	2,704,678.62
8	4	1/15/2022		223,284.32	27,722.96	195,561.36	2,509,117.26
9	5	7/15/2022		223,284.32	25,718.45	197,565.87	2,311,551.39
10	5	1/15/2023		223,284.32	23,693.40	199,590.92	2,111,960.47
11	6	7/15/2023		223,284.32	21,647.59	201,636.72	1,910,323.75
12	6	1/15/2024		223,284.32	19,580.82	203,703.50	1,706,620.25
13	7	7/15/2024		223,284.32	17,492.86	205,791.46	1,500,828.79
14	7	1/15/2025		223,284.32	15,383.50	207,900.82	1,292,927.97
15	8	7/15/2025		223,284.32	13,252.51	210,031.81	1,082,896.16
16	8	1/15/2026		223,284.32	11,099.69	212,184.63	870,711.53
17	9	7/15/2026		223,284.32	8,924.79	214,359.53	656,352.00
18	9	1/15/2027		223,284.32	6,727.61	216,556.71	439,795.29
19	10	7/15/2027		223,284.32	4,507.90	218,776.42	221,018.87
20	10	1/15/2028		223,284.32	2,265.44	221,018.87	0.00
				4,465,686.36	465,686.36	4,000,000.00	

Cash Flow Analysis:

As indicated, project savings will cover the annual finance costs and should allow some additional savings in the operational budget during the life of the lease agreement. TCS ran a cash flow analysis which demonstrates a comparison of savings versus financing costs. The financing scenario assumes phase two projects would be financed over nine years instead of ten so that the entire project is paid off in ten years and that the interest rate for Phase 2 is comparable to the 2.05% offered by Bank of America for Phase 1.

YEAR	PROJECT SAVINGS				PROJECT FINANCING COSTS			NET CASHFLOW
	UTILITY SAVINGS	UTILITY SAVINGS	TRANSFER OF OWNERSHIP	GUARANTEE D DOLLAR SAVINGS AMOUNTS	DEBT SERVICE PHASE 1	DEBT SERVICE PHASE 2	TOTAL DEBT SERVICE	
	PART 1	PART 2	SAVINGS ⁽²⁾					
Year 1	\$210,983	\$0	\$738,439	\$949,422	(\$446,472)	0	(\$446,472)	\$502,950
Year 2	\$215,202	\$107,601	\$753,208	\$1,076,011	(\$446,472)	(\$491,232)	(\$937,704)	\$138,308
Year 3	\$219,506	\$109,753	\$768,272	\$1,097,532	(\$446,472)	(\$491,232)	(\$937,704)	\$159,828
Year 4	\$223,896	\$111,948	\$783,638	\$1,119,482	(\$446,472)	(\$491,232)	(\$937,704)	\$181,779
Year 5	\$228,374	\$114,187	\$799,310	\$1,141,872	(\$446,472)	(\$491,232)	(\$937,704)	\$204,168
Year 6	\$232,942	\$116,471	\$815,297	\$1,164,709	(\$446,472)	(\$491,232)	(\$937,704)	\$227,006
Year 7	\$237,601	\$118,800	\$831,603	\$1,188,004	(\$446,472)	(\$491,232)	(\$937,704)	\$250,300
Year 8	\$242,353	\$121,176	\$848,235	\$1,211,764	(\$446,472)	(\$491,232)	(\$937,704)	\$274,060
Year 9	\$247,200	\$123,600	\$865,199	\$1,235,999	(\$446,472)	(\$491,232)	(\$937,704)	\$298,295
Year 10	\$252,144	\$126,072	\$882,503	\$1,260,719	(\$446,472)	(\$491,232)	(\$937,704)	\$323,015
TOTAL	\$2,310,201	\$1,049,609	\$8,085,704	\$11,445,514	(\$4,464,719)	(\$4,421,087)	(\$8,885,806)	\$2,559,709

As indicated, project savings exceed costs by over \$2.5 million over the life of the lease. If the savings attributed to the project fail to materialize, TCS has agreed to reimburse the City for the amount of the shortfall as part of its guaranteed savings contract.

This project offers the City an excellent opportunity to improve public safety by improving the overall quality of light in the City while conserving energy and financial resources. We would be happy to answer any questions you may have about it.