

**Environment and Sustainability Standing Committee
July 7, 2011**

TO: Chair and Members of Environment and Sustainability Committee

SUBMITTED BY:



Phillip Townsend, Director, Infrastructure and Asset Management

DATE: April 28, 2011

SUBJECT: Environmental and Social Implications: LED Streetlight Conversion

INFORMATION REPORT

ORIGIN

April 26, 2011, Environment and Sustainability Committee

BACKGROUND

In April, the Province of Nova Scotia announced legislation requiring the conversion of all streetlights to LED technology within a five year time frame. During Committee discussion, staff was directed to investigate and report on environmental and social implications of the technology change.

DISCUSSION

The Environmental and Sustainability Committee requested staff to further investigate the environmental and social implications of the change of streetlights from high pressure sodium (existing) to LED technology.

Energy Savings

It is anticipated that there is a 50% reduction in electricity consumption with LED Streetlights.

The current High Pressure Sodium streetlight consumes approximately 540 KWh. LED lights would consume approximately 270 KWh.

At the end of the 5 years, annual energy savings, using today's unmetered energy rate, would be somewhere between \$500,000 and \$600,000.

Greenhouse Gas Emissions Reductions

Staff calculated savings at approximately 0.5/tonne per fixture. In the Halifax Regional Municipality (HRM), this would equate to the reduction of approximately 20,000 tonnes of GHG's, which is the equivalent of removing approximately 4,000 cars from the streets.

A 20,000 tonne reduction is very significant. Currently, staff is working on a Corporate GHG Reduction Plan from 2012 to 2020, looking for approximately 25% reduction in GHG's. This project would provide approximately 50% of the action needed to meet that commitment.

Life Cycle Assessment of Streetlight Technologies

In 2009, the Mascaro Centre for Sustainable Innovation at the University of Pittsburgh conducted a life cycle assessment on streetlighting technologies. The assessment recommended that the City of Pittsburgh use LED lighting.

The assessment can be found at: http://www.pitt.edu/news2010/Streetlight_Report.pdf

An overview report can be seen at: <http://www.pitt.edu/news2010/Streetlight-Chart.pdf>

The report summarily demonstrates that LEDs have approximately 3 times higher manufacture environmental impacts than the high pressure sodium (HPS) lighting. However, due to the low energy use and longer lifespan of the LEDs, the environmental impact is much lower overall than for the HPS.

This assessment was the best work staff was able to locate on the subject. It should be noted that in Nova Scotia, with virtually all of our electricity coming from coal, our GHGs are more intensive per kilowatt hour than Pittsburgh. This would make LEDs even more preferable from an ecological perspective.

Light Pollution

Light pollution poses a serious threat to wildlife, having negative impacts on plant and animal physiology. Light pollution can also confuse animal navigation, alter competitive interactions, change predator-prey relations, and cause physiological harm. (Wikipedia)

LED Streetlighting greatly minimizes light pollution.

Driving Safety

LED streetlighting has lower glare, which would reduce the impact of glare for night drivers.

Pedestrian and Public Safety

LED Streetlights would be installed to illuminate the sidewalks and streets. Initially, staff was advised of concerns about reduced glow from the fixtures. In order to assess the impacts to public safety, the Community Response Team (Public Safety Office) was engaged. The Community Response Team (CRT) is the lead on Crime Prevention Through Environmental Design (CPTED) for HRM. Lighting is an important element of CPTED in that it assists in natural surveillance; one should have the capability to see and be seen at all times. CRT staff confirmed that LED street lighting provides a quality white light that enables better rendering of colors and compliments security camera systems, making LED lighting an important tool in police investigations. LED street lighting would be a benefit to Public Safety.

The large majority of parks and paths within HRM are currently not illuminated by streetlights. CRT staff do not wish to encourage residents to venture there at night. In fact, we were reminded that parks are subject to By-Law P-600 (no visitors allowed after 10:00 p.m.). Some small parks and paths currently are partially lit due to light pollution from High Pressure Sodium fixtures located on streets near the path entrances. This provides a false sense of security.

HRM periodically receives complaints about the glare effects of street lighting. There may currently be some private property owners that enjoy “lighting” from the glare of some streetlights, however, there are also property owners that will enjoy not having the glare from street lights spilling onto their property.

The following studies that other municipalities have completed on streetlights, supports that the majority of the public prefer the LED lighting:

Welland, Ontario	www.welland.ca/Hottopics/LEDpdf/WellandLEDstreetlightInstallationSummary.pdf
Port Coquitlam	http://www.portcoquitlam.ca/Dynamic/Page5401.aspx
Los Angeles	http://www.nyc.gov/html/unccp/gprb/downloads/pdf/LA_LEDstreetlights.pdf
Boston	http://www.cityofboston.gov/DoIT/Initiatives/publicworks.asp

Waste Management

High Pressure Sodium lamps contain mercury and lead. While the amount per unit is not substantial, the disposal of 40,000 lamps in the retrofit would be substantial. It is important that HRM identify how the removed Cobrahead lamps are being disposed and ensure that the disposal meets the municipality's environmental principles. LED streetlights contain less heavy metals.

From an environmental, economic and social perspective, changing to LED Streetlighting technology is optimal. The key issues for HRM are:

1. Using the decision point to determine whether the municipality should own their own street lights or not;
2. Striking the correct price for a streetlighting rate with Nova Scotia Power.

BUDGET IMPLICATIONS

There are substantial budget implications associated with the conversion of HRM street lights to LED lighting. This report is not intended to address the budget implications. As per Committee direction, a business case is being prepared for the project.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

COMMUNITY ENGAGEMENT

Following Committee deliberation on the Provincial legislation announcement, staff sought input from various environmental NGO's. The organizations supported the change to LED Streetlighting and offered no comments on environmental concerns.

ATTACHMENTS

None

A copy of this report can be obtained online at <http://www.halifax.ca/commcoun/cc.html> then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

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