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Item No. 11.4.1
Halifax Regional Council
May 15, 2012

TO: Mayor Kelly and Members of Halifax Regional Council

SUBMITTED BY: Original Signed
for Councillor Barry Dalrymple, Chair, Environment and Sustainability
Standing Committee

DATE: May 1, 2012

SUBJECT: HRM Street Light Review

ORIGIN

The Environment and Sustainability Standing Committee April 16, 2012 meeting.

RECOMMENDATION

It is recommended that Halifax Regional Council direct staff to:

1. Develop an implementation plan for taking ownership and converting all municipal streetlights to Light Emitting Diode (LED) technology in accordance with recent amendments to the Energy-Efficient Appliance Act; and
2. That the Streetlight Conversion Plan be approved by Regional Council prior to implementation.

BACKGROUND

A staff report dated March 9, 2012 was before the Environment and Sustainability Standing Committee at their April 16, 2012 meeting for consideration.

Additional information can be reviewed in the attached March 9, 2012 staff report.

DISCUSSION

During the discussion, staff responded to questions and concerns related to:

- the cost implications identified for a twenty year life cycle evaluation with a ten year implementation period
- the present quality of service received on maintenance of burnt out lights (ie. NSPI and HRM response times and percentage of burnt out lights in urban, suburban and rural areas)
- the disposal of old sodium lights
- Financial opportunities (ie. FCM, the Province or Federal government)
- Concern expressed regarding lighting standard; LEDs not omitting as much light or having a different colour than high pressure sodium lights; the importance of communicating with the public on how HRM will meet lighting standards

Following the April 16th meeting, staff identified the following:

Financial Options

There are a number of financial options for this project which will need to be evaluated once the scope of the project is determined. These options range from HRM borrowing the funds to undertake the project, P3 partnering to third party ownership (other than Nova Scotia Power Inc.). These will be all evaluated to determine the best business model for the Municipality. Potential funding sources to support the project will also be investigated.

Disposal of old fixtures

For the conversion project HRM undertook in 2011 (2,100 fixtures), all fixtures were scrapped. Any parts/materials recycling would have been undertaken by the scrap dealer. For the upcoming conversion project, any revenue associated with the scrapping of streetlight fixtures would be applied against costs associated with the handling of the old fixtures such as removal and offloading to the scrap area.

Maintenance of Lights

As indicated at the April 16th meeting, HRM contracts out its streetlight maintenance for the 13,000 fixtures HRM owns. Nova Scotia Power Inc. (NSPI) maintains the streetlights they own and charges HRM for that service through their power rates. On a per light basis, NSPI maintained streetlights cost about twice as much as HRM contracted streetlight maintenance.

Things to consider include:

1. HRM can contract out maintenance for 38,000 streetlights, as it does for 13,000.
2. Maintenance costs are anticipated to be a small fraction of the \$1.7 million HRM currently pays.
3. HRM per unit costs should expect to increase because coverage is expanded to encompass the entire municipality.

BUDGET IMPLICATIONS

There are no direct budget implications to this report. Future commitment of funds would be outlined in the implementation strategy for approval by Regional Council.

Potential budget implications for LED conversation are outlined in the March 9, 2012 staff report (attached).

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

The Environment and Sustainability Standing Committee meetings are open to the public.

ENVIRONMENTAL IMPLICATIONS

When completed, this project will realize a 51% reduction in streetlight energy consumption in the municipality. This amounts to about 10,000 megawatt hours of energy consumption reduction every year. This would result in the elimination of approximately 7,000 metric tonnes of greenhouse gas emissions annually, which equates to the emissions of about 1,400 passenger cars. In addition, the familiar High Pressure Sodium (HPS) "Cobra Head" fixture design will be replaced with the "full cut-off" design, reducing light pollution and eliminating all light above the horizontal plane, making the fixtures "Dark Sky Compliant".

ALTERNATIVES

As identified in the March 9th staff report:

Because the Province of Nova Scotia has modified its Energy Efficient Appliances Act to include street lights, HRM is required to replace all its fixtures. The Province will provide enacting regulations which define what acceptable technologies can be used to replace existing fixtures and the implementation period permitted to convert those fixtures. As a result, there is no alternative to converting street lights. However, as indicated, there are several ownership alternatives which require consideration.

ATTACHMENTS


Staff Report dated March 9, 2012

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

Report Prepared by: Krista Vining, Legislative Assistant, Municipal Clerks Office, 490-6519
 Angus Doyle, Utilities Coordination Manager, 490-5019

Environment & Sustainability Standing Committee
April 16, 2012

TO: Chair and Members of Environment & Sustainability Standing Committee

 Original Signed

SUBMITTED BY:

Peter Stickings, Acting Director, Planning and Infrastructure

DATE: March 9, 2012

SUBJECT: HRM Street Light Review

ORIGIN

On April 26, 2011, the Environment and Sustainability Standing Committee of the Halifax Regional Municipality (HRM) passed a motion stating:

MOVED by Councillor Nicoll, seconded by Councillor Barkhouse, that the Environment and Sustainability Standing Committee forward the April 26, 2011, staff briefing note to Halifax Regional Council as an information report, identifying that the Standing Committee has requested staff to explore a business case for conversion of all existing street lights, both HRM owned and NSPI owned, to LED technology.

RECOMMENDATION

It is recommended that the Environment and Sustainability Standing Committee recommend to Regional Council that:

1. HRM develop an implementation plan for taking ownership and converting all municipal streetlights to Light Emitting Diode (LED) technology in accordance with recent amendments to the Energy-Efficient Appliance Act; and
2. The Streetlight Conversion Plan be approved by Regional Council prior to implementation.

BACKGROUND

The Halifax Regional Municipality has approximately 40,500 street lights within the municipality. Of this total, Nova Scotia Power owns and maintains approximately 27,300 and HRM owns and maintains approximately 13,200. HRM has owned all the street lights within the former City of Halifax boundary since amalgamation. In June, 2011, the province amended its Energy Efficient Appliances Act to include street lights among the list of energy inefficient appliances in Nova Scotia. The Department of Energy was tasked with developing regulations around acceptable replacement technologies (i.e. LED) and the required implementation time period. These regulations are anticipated to be implemented by the end of June, 2012.

As a result of the new regulations, municipalities will be obligated to pay Nova Scotia Power for any remaining value in the fixtures the utility owns, regardless who replaces them with LED technology. Provincially, the utility estimates the value of all the streetlights at approximately \$23 million. On a prorated basis, and using the NSPI valuation, HRM will be expected to pay NSPI approximately \$5.2 million, in today's dollars, for the remaining value in the existing utility owned fixtures in the municipality.

With the enactment of the Energy Efficient Appliances Act Amendment in 2011, the existing mostly High Pressure Sodium (HPS) fixtures have to be removed and new LED fixtures have to be installed. As a result, municipalities have been given the opportunity to examine the comparative economics of financing the purchase of new streetlights and taking ownership of all street lights in their jurisdictions, or paying for them through a monthly capital rate which is included in the Full Service Unmetered Streetlight Rate. As indicated, the Environment and Sustainability Standing Committee directed staff to examine the economics of options available to the municipality.

DISCUSSION

In 2012, HRM is forecasting to pay Nova Scotia Power \$5.11 million for street light service. Of this amount:

- \$0.96 million is the estimated cost to lease the 27,300 street lights the utility owns in the municipality;
- \$1.43 million is the estimated expense to maintain those same fixtures; and
- \$2.72 million is the estimated power and energy consumption charges associated with all HRM fixtures, including those owned by HRM.

In addition, over the past five years, HRM has spent, on average, approximately \$300,000 annually on relamping and street light repair work. This is in addition to the costs associated with the municipality's Street Lighting Department which consists of three journeyman electricians who focus on managing maintenance contractors, scoping out new street light requests, reviewing subdivision street light layouts, maintaining all underground street light installations in the urban core, and responding to maintenance requests and emergencies.

The enactment of the most recent amendment to the Energy-Efficient Appliances Act requires NSPI, as well as all other owners of street lights, to replace all inefficient fixtures with LED technology over the next number of years. For HRM, this will amount to approximately \$30 million of capital expenditure to convert all 38,000 light fixtures. Fortunately, the energy consumption of LED fixtures will reduce by 50 percent to 60 percent. In addition, maintenance costs are anticipated to be significantly reduced. LED street lights are designed with a life expectancy of approximately twenty years. This compares to a five year life for components of existing fixtures such as lamps and photo cells. With ten year fixture warranties, maintenance costs (in the intermediate term) should be limited to warranty work.

HRM's experience with LED street lights is only three years old. Experience is from participation in a pilot project in 2009 and a purchase of 2,080 replacement fixtures in 2010. Over that time, LED fixture prices have dropped significantly and depending on conversion schedules, additional reductions are anticipated. Maintenance costs have been limited to replacing, on average, one fixture each month, or about a 0.5 percent outage rate, with fixtures being replaced by the manufacturer.

Three scenarios were examined to determine the best direction for the municipality to take with respect to the level of investment in LED fixtures:

1. **Status Quo** – Nova Scotia Power would maintain ownership of the approximate 27,000 fixtures they presently own and maintain. HRM would replace the approximate 11,000 fixtures which need to be converted to LED technology;
2. **NSPI Owns all HRM Street Lights (All NSPI)** – NS Power would take over HRM owned street lights and replace all 38,000 fixtures; and
3. **HRM Owns all HRM Street Lights (All HRM)** – HRM would take over all NS Power owned street lights and replace all 38,000 fixtures.

A twenty year life cycle evaluation with a ten year implementation period, was undertaken to capture all cost impacts of each scenario. The results of the evaluation are summarized below:

Status Quo	\$70,064,760
All NSPI	\$84,942,850
All HRM	\$60,403,490

This suggests that there is a significant advantage for HRM to take over all street lights in the municipality. The municipality would realize approximately \$10 million in savings over a twenty year period if HRM replaced all 38,000 municipal street lights rather than just the 11,000 it presently owns (which need conversion). With the most recent fixture costs and anticipated cost of debt, it is anticipated that a simple payback could be achieved in a range of 8.5 years to 11.5 years, depending on the quantities converted annually, and the conversion period. At the completion of a conversion process which would be fully financed by HRM, the following annual cost reductions would be realized:

- \$1.6 million, which reflects a 50 percent reduction in energy charges (escalated at 2 percent annually starting in 2012). This will be realized regardless who owns the fixtures;
- \$1.7 million reflecting an anticipated reduction of the streetlight maintenance charge. Again, this reduction is anticipated regardless who owns the fixtures, due to the anticipated long life coupled with low maintenance aspects of the LED street light fixtures; and
- \$0.96 million related to the capital charge attributable to LED streetlights.

All HRM Scenario	Energy Cost	Maintenance Cost	Capital Cost	Total Operating Cost
2012	\$2,724,613	\$1,720,237	\$960,892	\$5,405,144
2023	\$1,600,772	\$0	\$0	\$1,600,536

The economic evaluation did not factor in any long term maintenance cost for the LED street lights. Due to the nature of the LED technology and design, no bulbs exist and the light sources are designed for a twenty year life cycle. As a result, during the warranty period, which could range from eight to ten years, the only anticipated maintenance will be warranty related fixture replacements. It is assumed that the cost to the municipality will be minimal and that there should be little difference in cost between NSPI and HRM.

The maintenance cost associated with the remaining life of fixtures is unknown due to the fact that the technology is relatively new. However, given that the devices are designed to reliably operate for twenty years, maintenance costs are expected to be significantly lower than the cost of maintaining the present technology. Based on present maintenance costs, HRM pays, through rates, on average approximately \$48.00/fixture annually for all NSPI owned street lights. This compares to approximately \$23.00/fixture which HRM pays for contract relamping and repair work of the fixtures the municipality owns. This excludes an allowance for staff and overhead. It is also important to recognize that HRM's costs reflect an urban/suburban setting while NSPI maintains urban, suburban and rural areas. Therefore, for this evaluation, maintenance of the street light system was estimated to be similar for all alternatives, and no amount was projected.

Proposed Implementation Plan Activities

This plan will include:

- Engaging Nova Scotia Power (NSPI) to confirm quantities, types and location of street lights in all areas of the municipality;
- Developing a detailed cost estimate for the procurement and installation of replacement LED fixtures for all HRM's approximate 38,000 street lights;
- Identifying funding options and opportunities associated with implementation of this five to ten year project;
- Update the Municipal Design Guidelines to reflect LED street light requirements in accordance with provincial law; and

- Identify staffing impacts necessary to undertake and manage this conversion and new installations.

BUDGET IMPLICATIONS

The implementing of the amendment to the Energy-Efficient Appliances Act to include existing street lights will have a significant budget impact on HRM. This legislation requires all municipalities to switch streetlights to LED technology, regardless of who owns the fixtures. The capital cost will depend on the option chosen by HRM. It will cost approximately \$9 million, if the municipality funds only the 11,000 fixtures it owns and require conversion. The remaining fixtures will be financed through the monthly capital charge in the Unmetered Rate for streetlights. HRM would expect to pay approximately \$30 million, if it funds all 38,000 fixtures in the municipality requiring conversion. This will be offset, when the conversion is completed, by annual operational savings, which include maintenance charges, both HRM owned fixture maintenance costs and NSPI owned fixture maintenance costs. These costs are in the order of \$1.8 million annually. Additionally, due to the efficiency of the LED fixture, energy charges are anticipated to reduce by approximately 50 percent, which will amount to approximately \$1.6 million when conversion is completed.

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

None

ALTERNATIVES

Because the Province of Nova Scotia has modified its *Energy Efficient Appliances Act* to include street lights, HRM is required to replace all its fixtures. The Province will provide enacting regulations which define what acceptable technologies can be used to replace existing fixtures and the implementation period permitted to convert those fixtures. As a result, there is no alternative to converting street lights. However, as indicated, there are several ownership alternatives which require consideration.

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.

Report Prepared by: Angus Doyle, Utilities Coordination Manager, 490-5019

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Report Approved by: Richard MacLellan, Manager, Energy and Environment, 490-6056

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Financial Approval by: Greg Keefe, Interim Director of Finance/CFO, 490-6308
