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Halifax Regional Council
September 6, 2005

TO: Mayor Kelly and Members of Halifax Regional Council

SUBMITTED BY:



George McLellan, Chief Administrative Officer



Dan English, Deputy Chief Administrative Officer

DATE: September 6, 2005

SUBJECT: **Withdrawal from Service Improvement Reserve - LED Traffic Lights**

ORIGIN

HRM Partners for Climate Protection Commitment to reduce GHG emissions by 20% by 2007
NSPI 2004 General Rate Application
March 2005 NS Energy LED Traffic Light Retrofit Project

RECOMMENDATION

It is recommended that :

1. HRM Council authorize a re-payable withdrawal of \$65,000 from Q310 Service Improvement Reserve to pay for installation of the remainder of LED Traffic Lights currently on hand, purchased through the NS Energy LED Traffic Light Retrofit Assistance Project, to be repaid from energy savings within R827-6607.

BACKGROUND

In early 2005 HRM and Nova Scotia Power staff negotiated a rate for LED Traffic Lights which was put forward and approved as part of the General 2004 rate hearing decision in May 2005. NS Energy, HRM, and NSPI organized a seminar on LED Traffic Lighting for municipalities with traffic lights, in February of 2005, and in February/March 2005 NS Energy offered a LED Traffic Light Retrofit Assistance Project providing 50% funding for LED traffic lights for municipalities. HRM was successful in leveraging \$68,000 through this program, to purchase LEDs. In fact, HRM received 60% of the available funds.

LED traffic lights reduce the energy consumption and greenhouse gas emissions by approximately 90% . HRM has 240 signalized intersections, and 2.5% are completely LED.

HRM's unanticipated success in leveraging \$68,000 provided a total of \$136,000 which was used to purchase enough LED traffic lights to do 25 - 30 intersections. The LEDs were purchased late in March 2005, and HRM has been gradually installing them.

DISCUSSION

Although the number of LEDs for traffic lights has increased, the number of operational staff to install them have not. Additionally, the normal operating requirements of maintaining existing traffic control intersections has not decreased. Delay on installation of the LED traffic lights results in lost energy savings. The energy savings are approximately \$941.02 per year, per intersection. The estimated GHG emission reduction per year, per intersection are 20 tonnes of CO₂e avoided. Converting 30 intersections = 600 tonnes of GHG this is equivalent to the environmental benefit of 1800 trees.

Energy savings (financial):

2005/06 traffic lighting electricity/240 intersections: $\$265,700/240 = \$1,107.08$ per intersection

Conservative assumption of 85% energy efficiency: $\$1,107.08 \times 85\% = \941.02 per intersection

\$65,000 is required to install the remaining LED traffic lights on hand. The annual energy savings from installation of these lights is calculated to be between \$23,525 and \$28,230. (\$941 average per intersection, multiplied by 25, and 30 intersections respectively).

BUDGET IMPLICATIONS

A withdrawal from Q310 Service Improvement Reserve of \$65,000 to finance the installation of the remaining LED traffic lights would be repaid from energy savings within R827-6607. The payback period would be approximately 2.7 years based on the most conservative assumptions.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

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

ALTERNATIVES


HRM could install the LED traffic lights currently on hand as opportunities arise or as funds become available next fiscal year, however this would result in deferred financial savings on electricity.

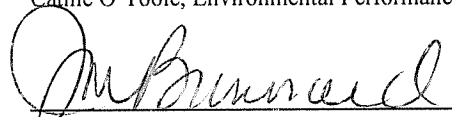
ATTACHMENTS


Feb. 9, 2005 letter to Nancy McNeil, Nova Scotia Utility and Review Board, from NSPI Director of Regulatory Affairs, re: LED Rate

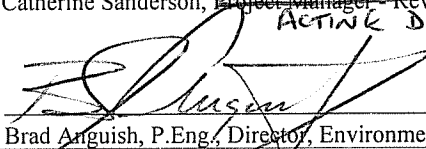
Service Improvement Loan Application

A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/agenda.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: Cathie O'Toole, Environmental Performance Manager (Energy/Utilities) 490-7061


Financial Review: Joan Broussard, Financial Consultant, EMS 490-6267


Financial Review: Catherine Sanderson, ~~Project Manager - Revenue Solutions~~, Financial Services 490-1562
ACTIVE DIRECTOR 6470


Report Approved by: Brad Anguish, P.Eng., Director, Environmental Management Services 490-4825

February 9, 2005

Ms. Nancy McNeil
Regulatory Affairs Officer/Clerk
Nova Scotia Utility and Review Board
1601 Lower Water Street, 3rd Floor
Halifax, NS B3J 3P6

Dear Ms. McNeil:

Re Rates for Light Emitting Diode (LED) Traffic Control Lights

During the recent Rate Case, Halifax Regional Municipality (HRM), in its Final Submission dated December 13, 2004, proposed rates for LED Traffic Control Lights.

In its Reply to Closing Arguments, dated December 22, 2004, NSPI recommended that the LED rate issue be addressed through a process that is already in place to address a number of HRM issues. Since December 22, NSPI and HRM have continued to work on the LED rate issue, and have now reached agreement, subject to UARB approval.

We have agreed that service to these lights will be supplied as an unmetered service. We have agreed as well that for all LED lights which are less than 30 watts, one of two rates will apply:

- a) If the light operates continuously, the monthly charge will be \$0.38 per light per month.
- b) If the light does not operate continuously, the monthly charge will be \$0.24 per light per month.

The first of these rates was developed based on the average wattage of continuously operating LED's currently used by HRM. The second was developed using metered data from a traffic control intersection which is one hundred percent LED. The existing Miscellaneous Small Loads rate was applied to this data to develop the proposed rates. Details of the development of these rates are attached.

As noted in U-56 of the Rate Case, NSPI currently has unpublished rates for LED's. The rates proposed here will be published, and will replace the unpublished rates.

Ms. McNeil
February 9, 2005
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HRM and NSPI have agreed that, subject to UARB approval, these rates will be effective February 1, 2005. Since they were developed using the existing Miscellaneous Small Loads rate, we have agreed that they will be subject to any adjustments to Unmetered Rates which may result from the Board's Rate Case decision.

As noted during the hearing, LED's are just beginning to be utilized. The proposed rates will allow customers such as HRM to assess the business case for large scale replacement of existing incandescent traffic control light with LED's. Such replacement will reduce energy consumption and produce savings for customers.

For 2005, NSPI expects that any conversion to LED's will have an insignificant effect on its revenue requirement or rates to other customers, so no other aspect of NSPI's rate application will need adjustment if these rates are approved. NSPI respectfully requests Board approval of these LED rates.

Yours truly,
Mel Whalen
Director
Regulatory Affairs and Rates

c: All Rate Case Interveners

Development of Rates for Light Emitting Diodes (LED's)

LED lighting technology involves very small wattage requirements and the amount of energy consumed is also small. Most LEDs require substantially less than 30W. NSPI therefore believes it is most efficient to use LED rates based on a typical wattage and apply the one rate to all LEDs less than 30W, rather than have specific rates for specific wattages. However, since some LED's will operate continuously and some will not, it is proposed that there be one rate for continuous-operation LEDs and another for non-continuous-operation LEDs.

The proposed LED traffic signal light rates were developed in the following way:

Rate for LED's – Non-Continuous Operation

This rate was developed using twelve months of whole-intersection metering data for the Wright Ave & MacDonald Ave intersection in Burnside. This intersection is populated entirely with LED traffic signals. The rate was developed as follows:

1. The total number of LEDs, their wattage, function and continuous/non-continuous operating status was noted.
2. The energy for the actual continuous-operation LEDs installed at the intersection was calculated by multiplying their wattages times the hours covered by the metering data. This energy was then subtracted from the whole-intersection metered data, yielding the energy required by the non-continuous-operation LEDs. The sum of the continuous-operation LED wattages was subtracted from the average metered demand for the entire intersection to yield the average demand required by non-continuous LEDs. The energy and demand associated with the non-continuous LED's were then used with the current Miscellaneous Small Loads Rate to calculate the monthly cost of operation for the intersection. This was then divided by the number of non-continuous-operation LEDs to arrive at the monthly charge of 24¢/month/LED for this type of LED.

Details of the calculation of this rate are shown in Table 1.

Rate for LED's - Continuous Operation

HRM currently uses 9 watt and 6 watt LED's in applications where operation is continuous. The average wattage of these LEDs (7.5W) was used to calculate the annual energy consumption, and this annual consumption was divided by twelve to arrive at a monthly energy consumption. The existing Miscellaneous Small Loads Rate was then applied to this monthly energy and demand to calculate the monthly rate of 38¢/month/LED.

Details of the calculation of this rate are shown in Table 2.

These two rates will apply to any wattage of LED up to a maximum of 30W. Rates for LEDs greater than 30W will be determined on an individual basis using the Miscellaneous Small Loads Rate. LED rates, like all unmetered rates, will be subject to any changes that result from UARB decisions regarding rates.

Service Improvement Loan Application

a) Schedule of Repayments

Principle: \$65,000
Interest: 2.75%
Term: 3 years
Payments to commence: October 2005
Monthly payment: \$1,882.68
Sum of all payments: \$67,776.48
Interest over term of loan: \$2,776.48

b) Repayment Account - R827 - 6607

c) Justification for Loan

To finance installation of LED traffic lights purchased through the 2005 NS Energy LED Traffic Light Retrofit Assistance Project. The loan will pay for contract crews to install LED lights in approximately 25 - 30 intersections.

d) Anticipated Benefits/Savings

Financial benefits are estimated to be savings of \$23,525 - \$28,230 per year.
Environmental benefits are estimated to be 500 - 600 tonnes of CO₂e emissions reduced per year.
Public safety will be positively impacted as intersections with LED traffic lights can operate on battery back up during power outages.

e) Timeline for Realization of the Savings

The estimated payback period for the \$65,000 loan is 2.7 - 3 years. The financial, environmental, and public safety benefits will continue to accrued over the lifetime of the LED traffic lights installed.

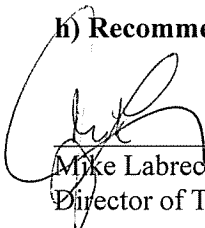
f) Contingency Account

A contingency account is not required as there is zero risk that savings will not be achieved. The technology is proven, and the Utility and Review Board have approved a rate for LED Traffic Lighting as developed by Nova Scotia Power and the Halifax Regional Municipality.

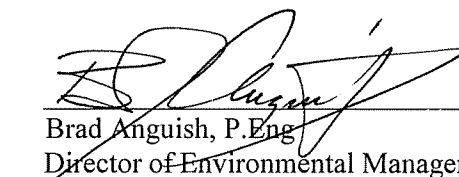
g) Project Management Team

Mike Phillipone, Transportation Public Works
Cathie O'Toole, Environmental Management Services

h) Recommendation by Directors:



Mike Labrecque, P.Eng
Director of Transportation Public Works



Brad Anguish, P.Eng
Director of Environmental Management Services

Loan Amortization

Inputs

Loan Principal Amount	\$65,000.00
Annual Interest Rate	2.75%
Loan Period in Years	3
Base Year of Loan	2005
Base Month of Loan	10

Key Figures

Annual Loan Payments	\$22,592.16
Monthly Payments	\$1,882.68
Interest in First Calendar Year	\$432.47
Interest Over Term of Loan	\$2,776.48
Sum of All Payments	\$67,776.48

Payments in First 12 Months

Year	Month	Balance	Payments	Principal	Interest	Cumulative Principal	Cumulative Interest	Ending Balance
	Oct	\$65,000.00	\$1,882.68	\$1,734.57	\$148.11	\$1,734.57	\$148.11	\$63,265.43
	Nov	\$63,265.43	\$1,882.68	\$1,738.52	\$144.16	\$3,473.09	\$292.27	\$61,526.91
	Dec	\$61,526.91	\$1,882.68	\$1,742.48	\$140.20	\$5,215.57	\$432.47	\$59,784.43
2006	Jan	\$59,784.43	\$1,882.68	\$1,746.45	\$136.23	\$6,962.02	\$568.70	\$58,037.98
	Feb	\$58,037.98	\$1,882.68	\$1,750.43	\$132.25	\$8,712.45	\$700.95	\$56,287.55
	Mar	\$56,287.55	\$1,882.68	\$1,754.42	\$128.26	\$10,466.87	\$829.21	\$54,533.13
	Apr	\$54,533.13	\$1,882.68	\$1,758.42	\$124.26	\$12,225.29	\$953.47	\$52,774.71
	May	\$52,774.71	\$1,882.68	\$1,762.43	\$120.25	\$13,987.72	\$1,073.72	\$51,012.28
	Jun	\$51,012.28	\$1,882.68	\$1,766.44	\$116.24	\$15,754.16	\$1,189.96	\$49,245.84
	Jul	\$49,245.84	\$1,882.68	\$1,770.47	\$112.21	\$17,524.63	\$1,302.17	\$47,475.37
	Aug	\$47,475.37	\$1,882.68	\$1,774.50	\$108.18	\$19,299.13	\$1,410.35	\$45,700.87
	Sep	\$45,700.87	\$1,882.68	\$1,778.54	\$104.14	\$21,077.67	\$1,514.49	\$43,922.33

Yearly Schedule of Balances and Payments

Year	Balance	Payments	Principal	Interest	Cumulative Principal	Cumulative Interest	Ending Balance
2006	\$59,784.43	\$22,592.16	\$21,227.52	\$1,364.64	\$26,443.09	\$1,797.11	\$38,556.91
2007	\$38,556.91	\$22,592.16	\$21,805.32	\$786.84	\$48,248.41	\$2,583.95	\$16,751.59
2008	\$16,751.59	\$16,944.12	\$16,751.59	\$192.53	\$65,000.00	\$2,776.48	\$0.00