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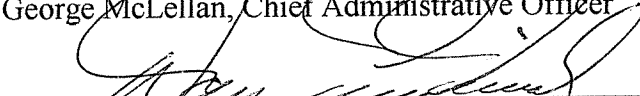


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Halifax Regional Council  
October 5, 2004

**TO:** Mayor Kelly and Members of Halifax Regional Council

**SUBMITTED BY:**   
George McLellan, Chief Administrative Officer

  
Dan English, Deputy Chief Administrative Officer

**DATE:** October 5, 2004

**SUBJECT:** HRM District Energy Project

**ORIGIN**

On July 19<sup>th</sup> the Halifax Regional Municipality hosted an Energy and Environment Roundtable to bring together representatives from the federal and provincial levels of government, utilities, consulting engineers, environmental groups, and facilities with large electrical loads in an effort to identify areas of opportunity for partnerships. There was a particular focus on district energy and co-generation.

At HRM Regional Council on September 7, 2004 Council passed a motion giving approval for HRM to pursue a high level feasibility study for a District Energy project, and for HRM to Chair a multi-stakeholder project steering committee.

**RECOMMENDATIONS**

It is recommended:

- that Council grant approval for HRM to submit the Expression of Interest jointly with the Provincial Department of Energy to the OE Secretariat, the evaluation committee that evaluates submissions to the NR Canada Opportunities Envelope.

## BACKGROUND

Over the past fifteen years, there have been many feasibility studies conducted around the district energy concept; which failed to come to fruition due to a variety of circumstances. Conditions in Halifax have changed enough to warrant another look at this concept. The proximity of the natural gas distribution system in Dartmouth; the purported need for additional electrical generation capacity on the peninsula; the age, capacity and capital requirements of key anchor facilities; the increased focus on green house gas emission reductions; potential for eventual legislative enforcement of Kyoto protocols, and the existence of funding programs through the Federal level of government and Federation of Canadian Municipalities may make the viability of this project greater now than ever before.

With encouragement and support from the Department of Environment (federal), Department of Energy (provincial), Atlantic Canada Opportunities Agency and the Federation of Canadian Municipalities, HRM has formed a multi-stakeholder steering committee and engaged an engineering consulting firm to conduct preliminary (high level) technical and economic feasibility studies which would enable us to be in a position to decide mid-October whether we have a business case that is sound enough to warrant an application to the NR Canada Opportunities Envelope. The first step in the submission process, is an Expression of Interest, the final and more detailed application is due October 31<sup>st</sup>. Submitting an Expression of Interest, or even the formal application, in no way obliges HRM to move forward on this project. Pending the results of the technical and economic feasibility, and support from key stakeholders, staff will return to Council of the Whole later in the Fall to fully explain the project and present a recommendation on if, and how, this project should move forward.

## DISCUSSION

The high-level technical concept currently being examined is a district energy co-generation facility in peninsula Halifax to provide cooling, heat and power. We envision a 15 - 40 Mwh facility with either two gas-fired turbines or gas fired reciprocating engines; serving universities, hospitals and major office complexes. Other options we may consider include the possibility of building on existing infrastructure and a configuration using two plants; and a dual fuel co-gen facility able to use both natural gas and bio-mass.

Depending upon the size of the project in terms of energy capacity and annual production, our preliminary research indicates this has the potential to have one of the largest green house gas emission reduction of any co-gen district energy project currently operating in Canada. Any district energy or co-gen facility based on a gas fired combined heat and power approach (CHP) on the Halifax peninsula irrespective of size, would have a significant impact in air quality, of a greater magnitude per dollar spent, as this region has air quality that is significantly worse than other Canadian cities. Primarily, this is due to the proximity of a major emitter, and use of bunker C fuel oil to power the heating facilities of the major university and hospital complexes. It is anticipated this project will reduce GHG emissions by 200,000 – 300,000 metric tonnes per year. Sulphur dioxide, NOx and particulate emissions will also be substantially reduced. This project would bring

natural gas to Halifax, and enable a faster roll out of the natural gas distribution system into the surrounding residential market.

Economic and social benefits as a result of this project may include some urban revitalization and street scape improvement opportunities. Also, some aesthetic, operational, financial and environmental opportunities may exist to warrant under-grounding some existing overhead services or improving the street scape in conjunction with this project.

Additionally, this is a reinvestment in the community of funds that would otherwise flow out of the Province and Canada to markets where commodities are purchased to produce electricity or heating oil.

**BUDGET IMPLICATIONS**

The high-level feasibility work currently being conducted is part of a project called District Energy already approved and funded by FCM (two years ago) which has recently been re-initiated.

**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**

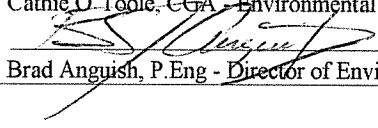
Key stakeholders have indicated that a leadership role by the municipality is in their opinion, necessary to conduct a balanced analysis, and possibly make this project a reality. If HRM chooses not to take a leadership role, the alternative choice is to wait until either environmental regulations or economics make a district energy project attractive enough for another organization to initiate.

**ATTACHMENTS**

Expression of Interest - Submission to the Opportunities Envelope (OE) Secretariat

Additional copies of this report, and information on its status, can be obtained by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Cathie O'Toole, CGA - Environmental Performance Manager (Energy & Utilities)

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

## Submission of Interest: HRM District Energy Project

### Proponent Information

This submission is being submitted by the Province of Nova Scotia and the Halifax Regional Municipality for the 2005/2006 fiscal year.

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Environmental Management Services  
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### Project Description

A two phase project to 1) Conduct a financial and technical feasibility study plus formulate recommendations for a D.E. entity from a business perspective; and 2) develop the technical design and construct a district energy co-generation facility in peninsula Halifax to provide cooling, heat and power. Funding from the Opportunities Envelope is being requested for phase 2 of the project, and it is expected that the phase 1 of the project will be finished prior to the Opportunities Envelope 2005/2006 funding deadline.

The project will consist of a 15 - 40 Mwh facility with either two gas-fired turbines or gas fired reciprocating engines; serving universities, hospitals and major office complexes. Over the past fifteen years, there have been many feasibility studies conducted around the district energy concept; which failed to come to fruition due to a variety of circumstances. Conditions in Halifax have changed enough to warrant another look at this concept. The proximity of the natural gas distribution system in Dartmouth; the purported need for additional electrical generation capacity on the peninsula; the age, capacity and capital requirements of key anchor facilities; the increased focus on green house gas emission reductions and eventual legislative enforcement of Kyoto protocols, and the existence of funding programs through the Federal level of government and Federation of Canadian Municipalities may make the viability of this project greater now than ever before.

## **Overview of Activities**

HRM is one of the founding members of the Federation of Canadian Municipalities 20% Club, and has in place a corporate green house gas reduction plan, based on the 5 milestones of “Partners for Climate Change”. Over the next several months, we hope to have achieved all of the 5 key milestones. Air quality and GHG reductions, are recognized as an important priority by both our residents and Council.

On July 19<sup>th</sup> the Halifax Regional Municipality hosted an Energy and Environment Roundtable to bring together representatives from the federal and provincial levels of government, utilities, consulting engineers, environmental groups, and facilities with large electrical loads in an effort to identify areas of opportunity for partnerships. There was a particular focus on district energy and co-generation.

With encouragement and support from the Department of Environment (federal), Department of Energy (provincial), Atlantic Canada Opportunities Agency and the Federation of Canadian Municipalities, HRM has formed a multi-stakeholder steering committee and engaged an engineering consulting firm to conduct preliminary (high level) technical and economic feasibility studies which would enable us to be in a position to decide mid-October whether we have a business case that is sound enough to warrant an application to the NR Canada Opportunities Fund.

## **Expected Results**

Depending upon the size of the project in terms of energy capacity and annual production, our preliminary research indicates this has the potential to have one of the largest green house gas emission reductions of any co-gen district energy project currently operating in Canada. Any district energy or co-gen facility based on a gas fired combined heat and power approach (CHP) on the Halifax peninsula irrespective of size, would have a significant impact on GHG emissions and have significant ancillary benefits in terms of air quality improvements. Primarily, this is due to the proximity of a major emitter (electrical utility), and the current use of bunker C fuel oil to power the heating facilities of the major university and hospital complexes. It is anticipated this project will reduce GHG emissions by 200,000 – 300,000 metric tonnes per year. Sulphur dioxide, NOx and particulate emissions will also be substantially reduced. This project would bring natural gas to Halifax, and enable a faster roll out of the natural gas distribution system into the surrounding residential market.

Further ancillary economic and social benefits as a result of this project may include some urban revitalization and streetscape improvement opportunities. Also, some aesthetic, operational, financial and environmental opportunities may exist to warrant under-grounding some existing overhead services while we are working in the streets. Additionally, this project will allow funds to be reinvested in the community that would otherwise flow out of the Province and Canada.

### **Partnership Information**

Individuals and organization who will be directly involved in managing and delivering the initiative include:

Provincial Department of Energy  
Allan Parker, Manager, Climate Change  
424-8175

Provincial Department of Energy  
Allan Crandlemire, Manager, Gas Marketing & Distribution  
(902) 424-6829

Halifax Regional Municipality  
Cathie O'Toole, Environmental Performance Manager (Energy & Utilities)  
(902) 490-6422

Halifax Regional Municipality  
Stephen King, Environmental Performance Manager (Land & Air)  
(902) 490-6188

The Steering Committee for the Project includes representatives from Environment Canada (Steve Szabo 426-7984 and Marc Sheeran 426-8524) and the Atlantic Canada Opportunities Agency (Catherine Blewett 426-5135) Private sector partners currently include Heritage Gas (Harvey Fedyk, Senior Engineer(902) 466-2003), however if the District Energy project goes forward, it is likely that Nova Scotia Power Inc., Emera, or another private sector electrical utility could become a partner or co-owner.

### **Funding Summary**

Phase 1 – Detailed technical and financial feasibility study - \$200 k

Phase 2 - Technical design and construction \$50 - \$100 m

Depending upon the size of the project (15 – 40 Mwh), the cost could range from \$15 - \$40 million dollars for the plant itself, plus linkages between the heating/cooling plant and buildings, plus related infrastructure. We hope to have a preliminary technical concept and economic feasibility analysis prepared by mid-October and will be able to better assess the dollar value of the project at that time. We anticipate the ultimate project being funded as a public/private partnership; with potential contributions hopefully from the NR Canada Opportunities Fund, the Federation of Canadian Municipalities, the Provincial level of government, the Halifax Regional Municipality, and private sector contributors.

Phase 1 – FCM/HRM and the Provincial Department of Energy are able to provide the funds necessary to conduct the feasibility study.

Phase 2 – Pending economic feasibility, various financing models would be evaluated and we would determine the amount needed from the Opportunities Envelope based on the model that is chosen.

HRM has experience in leading and participating in multi-stakeholder public/private partnerships, such as the Climate Smart project.