

Yellowknife Community Energy Planning Project

Action Area 5 - Financing Options for External Green Energy Projects

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Executive Summary

The City of Yellowknife's interim Community Energy Plan (CEP) recommended investigating a revolving external green fund that would finance energy and climate projects within municipal operations and be replenished through the resulting reductions in energy expenditures. This research is intended to support that recommendation by examining external green financing mechanisms and clarifying the questions that need to be answered for Yellowknife to proceed with one. For the purposes of this research, external green financing mechanisms are defined as the means of providing all or part of the financial resources needed to advance a project where the project proponent is distinct from the administrator and funder of the financing mechanism. It is important to stress that through the course of the research, the scope has expanded to encompass green energy financing mechanisms in general as opposed to just revolving green funds, which are one specific mechanism that can be used to finance green energy projects.

A preliminary list of 28 green financing mechanisms was first prepared to provide a quick look at the models in use in different jurisdictions to help decide which would provide the most valuable package of mechanisms to review in greater detail. The list of 28 was filtered down to the 12 shown in Table 1. It is important to note that this list includes both internal and external funds, and although external mechanisms are the focus of a separate CEP action area, they have many similarities to internal financing mechanisms, and as such are relevant to this discussion. To counter the potential for biases to be introduced due to the small sample size, the financing mechanisms were selected to achieve the following:

- A cross-section of fund types (the list contains five internal, two internal/external, and five external funds).
- A geographic mix of funds with Canadian and Northern focus (9 of 12 funds are based in Canada to ensure local relevance and applicability to Yellowknife).
- A variety of supported project types (some, such as the Toronto Atmospheric fund are open to a broader spectrum of possible projects while others, such as Saskatchewan's High Efficiency Furnace Loans, are very focused).

Name of Financing Mechanism	Type of Mech.	Types of Projects Financed
Edmonton's Energy Management Revolving Fund	Internal	Energy retrofits in city facilities
Stuttgart's Intraction Program	Internal	Energy retrofits in city facilities
Kelowna's Energy Management Program	Internal	Energy retrofits in city facilities
Toronto's Energy Management Program	Internal	Energy retrofits in city facilities
Phoenix's Energy Conservation Savings Reinvestment Plan	Internal	Energy retrofits in city facilities
Toronto's Atmospheric Fund	Both	Energy efficiency, partnership-building, education, and research projects
Oslo's Ekon Fund	Both	Energy efficiency retrofits
GNWT's Municipal Rural Infrastructure Innovation Fund	External	Alternative energy, energy efficiency, behavior change, transportation, and policy
GNWT's Energy Conservation Program	External	Energy or water retrofits in territorial, community, or non-profit buildings.
Yukon's Rural Electrification and Telecommunication Program	External	Grid connection or distributed renewable electricity generation
Yukon's Green Mortgage Program	External	Reduced interest rates on mortgages of energy efficient houses
Saskatchewan's EnergyStar Loan Program	External	Reduced interest loans for EnergyStar furnaces

Table 1 – List of green financing mechanisms reviewed in detail

Answers to the following six questions are needed to properly define a green financing mechanism:

- How is financing made available to project proponents?
- How are the roles and responsibilities assigned to different partners?
- How are projects identified and advanced?
- How is project eligibility defined?
- How is the financing repaid?
- How is program success and sustainability monitored and evaluated?

Based on discussions with various staff familiar with the 12 financing mechanisms, the following key success factors were identified:

- Clearly defined objectives and eligibility requirements
- Clearly defined targets
- Simple, transparent and consistent process
- Council and staff support for financing mechanism and its objectives
- Strong links with project proponents
- Strong partnerships that recognize Municipality's strengths and weakness
- Systems in place to track success
- Conservative assessment of project economics
- Recognition of, but not paralysis from, uncertainty

A review of local context issues revealed a number of active programs, initiatives, and guidelines that need to be accounted for in any program design. Most importantly, is the fact that the City is not permitted to loan money to external proponents through a standard lending model. Apart from finding partners that can fill this role, Yellowknife does appear to have the options of using local improvement charges and establishing an arms length financing organization.

The following five steps are seen as appropriate directions to build upon the general discussion of options provided in this report. Part of the intention of these steps is to help the CEP committee focus their efforts on a single sector (e.g. residential or commercial) or sub-sector (e.g. residential heating or commercial lighting), because the refined focus would provide a more effective starting point than a broad-based, catchall type financing mechanism that has the potential to overtax staff resources.

1. Identify the sectors or sub-sectors where an external green financing mechanism would be most useful by assessing which are in greatest need of support (i.e. insufficient support from current or proposed programs and policies from all levels of government), and which would be best supported by financing as opposed to other policy interventions.

2. For the sectors and sub-sectors that meet the criteria in the first step, assess whether a territorial or Yellowknife focus is more appropriate. A territorial focus has the obvious advantage of involving a major partner that could potentially support the administration and financing of any initiative. The drawbacks of territorial involvement are that the GNWT is at a preliminary stage in considering energy financing initiatives beyond those already supported (see Section 3.3) so progress on a partnership model would likely be slow, and the GNWT will require a territory wide focus to any program. The requirement for a territory wide focus will limit the number of potential target areas for a financing mechanism because certain opportunities will not be amenable to all regions, and this could potentially disqualify target areas considered to be a top priority in Yellowknife.
3. For the selected sector or sub-sector, assess what role(s) Yellowknife (and possibly the GNWT) have an interest in and are well suited to play, and what roles other partners may be needed to support the delivery and financing of a program.
4. Identify the potential partners that could fill those roles and discuss with them their interest in the proposed program and what role(s) they would be willing to fill, and what types of conditions would be required for their participation.
5. Proceed with the detailed design of how the newly scoped financing mechanism should be structured by developing specific answers to all of the remaining questions in Section 4 and formalizing relationships with all partners..

Beyond these general steps, the CEP committee has made a preliminary recommendation that they would like to see a financing mechanism of some kind to target residential and commercial heating. Residential and commercial heating is still quite a broad area and the scope could certainly be further refined without focusing on too small a segment. Some preliminary models that could be used to finance improvements in residential and commercial heating include the following. Yellowknife plays a variety of roles in the different models, but the city is well positioned to play an initiating role in all of them, and none of them are likely to happen without Yellowknife as an initial driving force.

- *A green mortgage program to provide reduced interest rates for efficient homes.* This type of program would be similar to the Yukon's program, and would need to involve a partnership with the Northwest Territories Housing Corporation (NWTHC), and it would probably require a broader focus on efficient construction (i.e. refining the scope further would not be possible) to satisfy the GNWT need to have territorial wide applicability.
- *A local improvement charge (LIC) model to finance improvements in residential or commercial heating systems.* Following an approach similar to the Yukon's remote electrification LIC program, Yellowknife could use LIC's to finance improvements in residential and commercial heating systems. Conceptually the LIC model has three main advantages. 1) It allows the City to play a direct role in financing the types of improvements it wants to support. 2) It associates an energy improvement, which often has long payback periods, with the property as opposed to the owner. 3) The loans are repaid through existing property tax mechanisms.
- *An independent organization to finance improvements in residential and commercial heating systems.* Similar to the Toronto Atmospheric Fund, Yellowknife could provide an

endowment to an existing or new organization mandated to manage that endowment to finance improvements to residential or commercial energy systems in Yellowknife.

- *Partnering with a financial institution to provide heating systems loans.* Similar to the Saskatchewan furnace program, Yellowknife could provide grants for heating systems. This type of model could proceed as soon as all potential partners were satisfied, but it would not allow Yellowknife to play a financing role if the city expected a direct return on investment.
- *Partnering with a utility and/or contractors to promote heating systems.* Similar to the above approach, the primary partner in this model would be the utilities and contractors that have direct ties with customers on heating issues. This model could proceed as soon as a partnership model is agreed to, and the City could also play an administration and outreach role.

The key strengths and weaknesses of these approaches are summarized in Table 1. Within the table a “✓” indicates that the characteristic is required for the given model, a “○” indicates that the characteristic is possible for the given model, and a “✗” indicates that the characteristic is not applicable for the given model.

Program	Requires Involvement of...				YK Providing Grants	YK Providing Loans	Legislative Concerns
	GNWT	Financial Institutions	Utilities	Contractors			
A green mortgage program model	✓	○	○	○	○	✗	✗
A local improvement charge model	○	○	○	○	✗	✓	✓
An independent organization	○	○	○	○	○*	○*	✗
Partnering with a financial institution	○	✓	○	○	✓	✗	✗
Partnering with a utility and/or contractors	○	○	✓	✓	✓	✗	✗

* The “○” represents what the money will be used for by the independent organization. Other than endowing the organization, Yellowknife would not be involved in administering individual grants or loans for this option.

Table 1 – Summary of sample approaches to financing residential and commercial heating opportunities.

All of these options offer the potential to successfully reduce greenhouse gas emissions and energy consumption in Yellowknife if designed well. Deciding upon a preferred option requires further consideration of the CEP committee and further discussion with the potential partners to better gauge their interest and ability to participate. Some questions to help shape the decision include:

- How quickly does Yellowknife want to move forward on implementing a financing mechanism?
- How important is partnering with the GNWT in terms of the administrative and financial support they could provide?

- How important is involving other partners in a financing mechanism?
- How much of a financing role does Yellowknife want to play in any external financing mechanism?

Yellowknife Community Energy Planning Project

Financing Options for External Green Energy Projects

Table of Contents

1	Introduction	1
2	Method	5
3	Green Financing Examples	7
3.1	Internal Financing Mechanisms	8
3.2	Internal/External Financing Mechanisms	10
3.3	External Financing Mechanisms	11
4	Key Differences in Financing Options	13
5	Key Factors in Successful Financing Mechanisms	17
6	Local Context	19
7	Next Steps	23
	Appendix A: Research Template	27
	Appendix B: Contacts	28

1 Introduction

The City of Yellowknife's interim Community Energy Plan (CEP) recommended establishing a revolving internal green fund that would finance energy and climate projects within municipal operations and be replenished through the resulting reductions in energy expenditures. This research is intended to support that recommendation by examining green financing mechanisms and showing how a specific mechanism could best be applied within Yellowknife. For the purposes of this research, green financing mechanisms are defined as the means of providing all or part of the financial resources needed to advance a project. The financing could be provided in the form of a loan or grant, and in advance of or after the completion of a project.

It is important to stress that through the course of the research, the scope has expanded to encompass green energy financing mechanisms in general as opposed to just revolving green funds, which are one specific mechanism that can be used to finance green energy projects. The scope is still confined to external projects (i.e. those related to projects outside of municipal operations) because a separate CEP action item study has investigated the potential for internal financing mechanisms. Figure 1 illustrates the greenhouse gas (GHG) emissions and energy expenditures by sector for the community of Yellowknife. All figures are reported from the updated 2004 baseline study. It is important to note that although the 2004 baseline study grouped Institutional and Municipal energy consumption, they have been separated for the purposes of this study so that the Institutional sector would fall under an external financing mechanism.

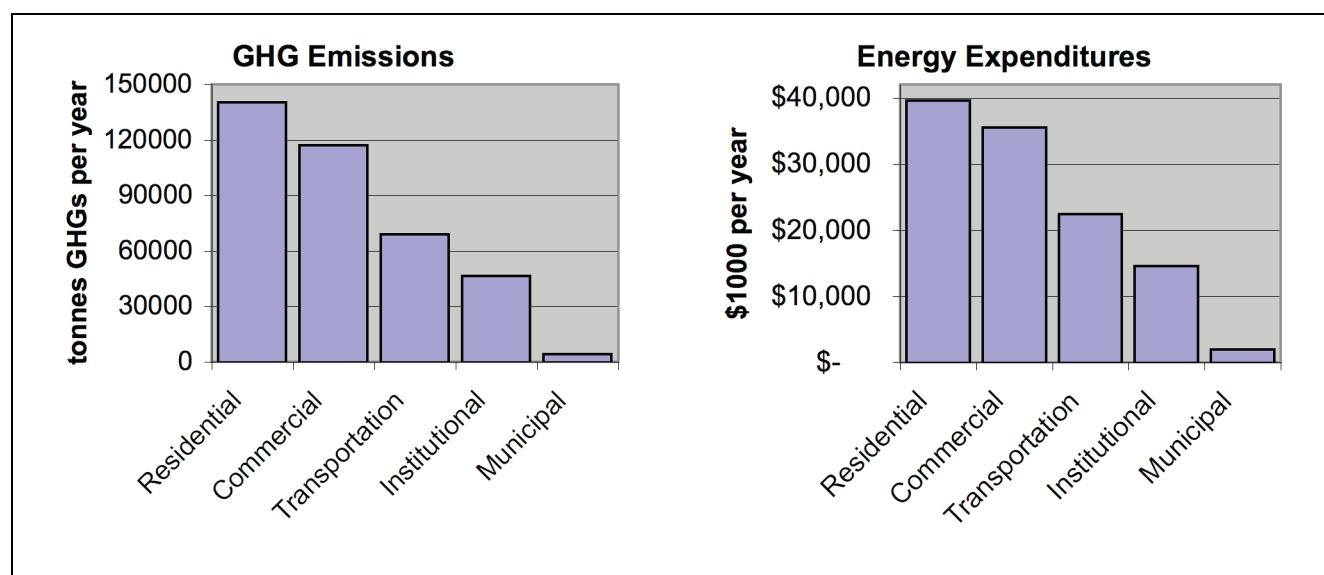


Figure 1 – GHG emissions and energy expenditures for the community of Yellowknife.

Working with the revised scope of financing mechanisms for external green energy projects, the specific objectives of the project are as follows:

- Research various mechanisms that have been used successfully to finance external green energy projects in other municipalities.
- Determine which of those models would be possible, effective, and attractive in a Yellowknife context.
- Indicate the next steps needed for Yellowknife to further explore the concept of establishing a financing mechanism for external green energy projects.

Although financing is an important aspect of project implementation, it is important to remember that it is not the only way a municipality can advance green energy projects. Figure 2 presents a spectrum of policy instruments that can be used to advance projects and some examples of policies that would fit in each category. The stringency, or forcefulness with which they influence choices increases from left to right as they shift from voluntary, information-based approaches to regulatory approaches.

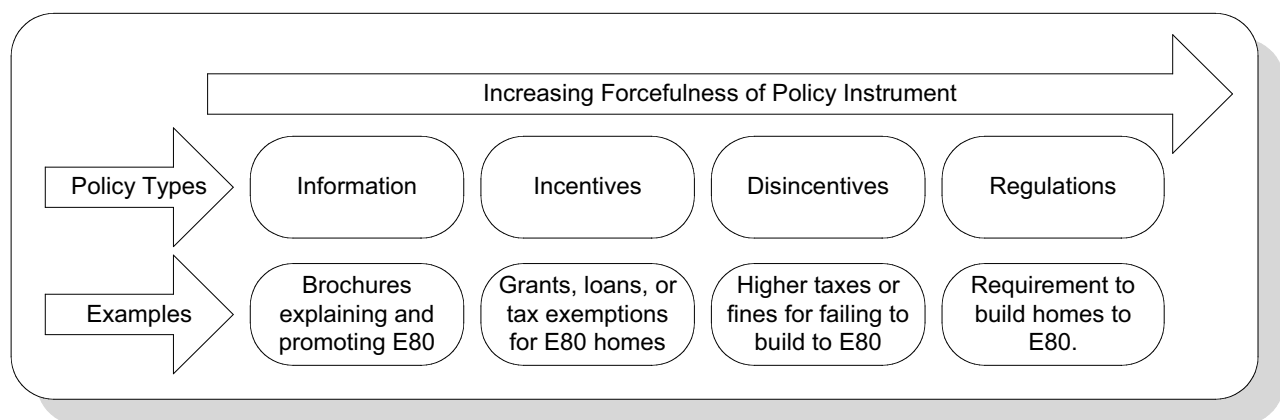


Figure 2 – Types of policy instruments available to achieve green energy goals

A single City initiative or program will often incorporate multiple policy types to achieve a good balance of characteristics from across the policy type spectrum. A comprehensive financing program is a good example of this, because it would draw on elements of the incentives category (in the form of grants and/or loans) and the information category (to advertise and communicate the financing mechanism). Although not the focus of this research, the purpose of introducing these ideas within this report is to encourage Yellowknife to think critically about the projects they are trying to advance and assess whether or not financing is the best way to achieve those goals. For example, financing might be the key approach needed to encourage residential retrofits, whereas building codes might be the best way to ensure new housing is built to a better efficiency standard.

The remainder of this report is structured as follows:

- Section 2 describes the research approach.
- Section 3 discusses the different green financing approaches reviewed for this research.
- Section 4 breaks the different approaches into their key components.
- Section 5 presents some key success factors for any green financing mechanism.

- Section 6 discusses several local context issues that will influence any Yellowknife green financing decisions.
- Section 7 presents next steps in the process for Yellowknife.

2 Method

The research was conducted according to the following seven-step approach:

1. Drafts of the templates that were used to review existing green financing mechanisms and a draft outline for the final report were prepared. These were submitted to, and reviewed by the CEP committee.
2. A project kick-off meeting was held to ensure that the project team, clients, and other stakeholders were in agreement regarding the objectives of the project and the proposed steps.
3. A preliminary list of known green financing mechanisms was compiled and prioritized for the CEP to indicate which mechanisms would be reviewed in greater detail. The list was refined to ensure that an adequate cross-section of financing mechanism characteristics were captured in the review.
4. The selected funds were reviewed in detail to better understand how other jurisdictions finance green energy projects. The review was conducted using published municipal reports and email and telephone correspondence with municipal staff.
5. Key staff members with the city and the Government of the Northwest Territories (GNWT) were interviewed to determine which of the mechanisms reviewed were applicable to Yellowknife given any legislative constraints that might not exist in other jurisdictions.
6. A presentation was made to the CEP committee to provide preliminary recommendations and receive feedback on the interim findings.
7. The finalized recommendations were provided to the CEP committee.

3 Green Financing Examples

A preliminary list of green financing mechanisms was first prepared to quickly look at the models used in different jurisdictions to help decide which would be the most valuable to review in greater detail. As shown in Table 2, a total of 28 mechanisms were identified, and they were subsequently categorized according to the type of mechanism (internal, external, or both) and the type of projects being financed. Also worth noting is the Alliance to Save Energy paper titled “Funds for Energy Efficiency Projects”, which includes a brief review of almost 100 municipal and state level energy efficiency financing mechanisms.¹ The report is a useful resource for basic information, and contains many US and European examples not captured below.

Name of Financing Mechanism	Type of Mech.	Types of Projects Financed
Edmonton's Energy Management Revolving Fund	Internal	Energy retrofits in city facilities
Stuttgart's Intraction Program	Internal	Energy retrofits in city facilities
Kelowna's Energy Management Program	Internal	Energy retrofits in city facilities
Toronto's Energy Management Program	Internal	Energy retrofits in city facilities
Phoenix's Energy Conservation Savings Reinvestment Plan	Internal	Energy retrofits in city facilities
Toronto's Atmospheric Fund	Both	Energy efficiency, partnership-building, education, and research projects
Oslo's Ekon Fund	Both	Energy efficiency retrofits
GNWT's Municipal Rural Infrastructure Innovation Fund	External	Alternative energy, energy efficiency, behavior change, transportation, and policy
GNWT's Energy Conservation Program	External	Energy or water retrofits in territorial, community, or non-profit buildings.
Yukon's Rural Electrification and Telecommunication Program	External	Grid connection or distributed renewable electricity generation
Yukon's Green Mortgage Program	External	Reduced interest rates on mortgages of energy efficient houses
Saskatchewan's EnergyStar Loan Program	External	Reduced interest loans for EnergyStar furnaces
Penrith's Sustainability Revolving Fund	Internal	Energy and resource conservation projects
Harvard's Revolving Environmental Fund	Internal	Projects which minimize environmental impact
Manly's GHG Challenge Reinvestment Fund	Internal	Energy efficiency projects
Moreland's Sustainable Energy Management Reserve Fund	Internal	Energy retrofits in city facilities
Newcastle's Revolving Energy Fund	Internal	Energy retrofits in city facilities
Halton's Healthy Community Fund	Both	Healthy living, public/personal safety, service delivery improvements
Sacramento's Conservation Power Financing Program	Both	Electrical efficiency measures
Bronx Initiative for Energy and the Environment	External	Energy efficiency projects for businesses
California's Energy Efficiency Financing Program	External	Energy efficiency projects, water consumption
Maine State Revolving Loan Fund (SRF)	External	Construction of wastewater facilities
Missouri's Energy Revolving Fund	External	Energy efficiency projects
Montana Department of Environmental Quality Alternative Energy Revolving Loan Program	External	Alternative energy projects
Ohio Energy Efficiency Revolving Loan Fund	External	Energy efficiency, renewable energy projects
Scotland's green fund	External	Energy efficiency projects
Texas LoanSTAR Revolving Loan Program	External	Energy efficiency retrofits
The Penelec Sustainable Energy Fund of the Community Foundation for the Alleghenies	External	Renewable energy, energy conservation and efficiency, and RE business initiatives

Table 2 – Initial list of green financing mechanisms considered for further review

¹ Available at <http://www.ase.org/section/topic/financingee/>.

Working from this list of 28, the 12 shaded financing mechanisms were selected for more detailed review². It is important to note that this list includes both internal and external funds, and although external mechanisms are the focus of a separate CEP action area, they have many similarities to internal financing mechanisms, and as such are relevant to this discussion. A relatively limited review of 12 financing mechanisms cannot be considered comprehensive, but was all that was feasible given the available resources for the project. To counter the potential for biases to be introduced due to the small sample size, the financing mechanisms were selected to achieve the following:

- A cross-section of fund types (the list contains five internal, two internal/external, and five external funds).
- A geographic mix of funds with Canadian and Northern focus (9 of 12 funds are based in Canada to ensure local relevance and applicability to Yellowknife)³.
- A variety of supported project types (some, such as the Toronto Atmospheric fund are open to a broader spectrum of possible projects while others, such as Saskatchewan's High Efficiency Furnace Loans, are very focused).

Each of the selected financing mechanisms is described in brief below. These descriptions are intended to provide an overview of each mechanism and highlight any interesting features. A copy of the research template used to collect information about each mechanism and contact information for each of the mechanisms can be found in Appendices A and B respectively.

3.1 Internal Financing Mechanisms

Edmonton's Energy Management Revolving Fund

Operating since 1995, the program is designed to finance energy retrofits in municipal facilities. Since its inception, the fund has grown from \$1 million to \$5 million to help meet the demand for projects. The initial seed funding was set aside following a budget surplus. Cost savings have always been the funds' objective, and these are now limited to projects with simple paybacks between 5 and 10 years because the Alberta ME First! program is available to finance projects with shorter-term paybacks. The ME first! program was launched in September 2003 by Alberta Municipal Affairs and Alberta Environment as is a four-year, \$100 million interest-free loan program designed to help municipalities achieve energy savings, reduce greenhouse gas emissions, and replace conventional energy sources with renewable or alternative sources. In addition to the ME First! program, departments are able to access additional funds by: 1) making additional budget requests for projects with acceptable paybacks that don't fit within the annual availability of the fund, and 2) treating the energy retrofits as facility upgrades, which have a

² The Toronto Energy Management Program, Phoenix Reinvestment Plan, Oslo Ekon Fund, and GNWT Energy Conservation Program were not mentioned in April 20, 2006 correspondence with the CEP committee but were included in the final list for detailed review because they were discovered later in the process and deemed particularly relevant and/or had readily available documentation.

³ Most examples from US jurisdictions were not included because US cities are able to draw upon federal and state tax-exempt or partially tax-exempt bonds, which is not an applicable model in Canada. The Phoenix fund was included because documentation describing the fund was found when researching one of the other selected models.

separate budget allocation.

Individual departments/facilities and the building engineering division are all able to advance possible projects to the 10-member energy management committee that determines project priorities. The committee is comprised of department heads for public works, buildings, engineering, and finance, and facility managers. If the audited projects provide an acceptable payback, the financing is provided and repaid from general revenues. Although not a universal opinion, some Edmonton staff expressed concern that the project costs and savings were being estimated too optimistically resulting in a situation where fund's financial sustainability was being overstated.

Stuttgart's Intraction Program

In 1995, Stuttgart's energy management department (12 staff) established the intraction program to provide a mechanism to facilitate energy retrofits of city buildings. The intraction model operates by arranging internal loans between the benefiting department and the environment department which provides the financing. The interest free loans are based on energy audits completed by the energy management department. The energy management department also assumes responsibility for monitoring the energy and cost savings. Results from the monitoring program are used to set subsequent energy budgets for the benefiting department to the levels they would have been without any energy improvements. This approach allows the benefiting departments to directly realize the energy savings and therefore pay off the internal loan. The city's construction department is also involved in the system, as they are responsible for arranging any retrofit work when external contractors are required.

Kelowna's Energy Management Program

Operating since 1996, Kelowna's program is intended to reduce energy costs in city buildings, and has successfully spurred retrofits in more than 80 buildings for an estimated annual savings of 4 million kWh (\$170,000). The program is based on an energy management committee which is comprised of staff from relevant departments and the local gas and electric utilities. The committee prioritizes projects based on their potential to reduce energy costs and proposes the top projects to Council for approval each year. Unlike other programs, there is no set allocation for retrofit work, and all project funding must be approved by Council. Although a potential source of project delays, in practice the council approval system has resulted in a relatively steady flow of projects being identified. The flow of projects has slowed more recently as committee focus has shifted to the development of a sustainable building pilot project for the residential sector. Historically, the program has resulted in 1 to 2 year simple paybacks on investment, but they will proceed with paybacks of up to five years.

In addition to the regular meetings of the energy management committee, a second key component of the program's success is the close involvement of Fortis BC, the local electric utility. Fortis BC works closely with the city to identify projects and also provides rebates to the city for successful projects that are subsequently used to finance future studies on other retrofit opportunities. Although the program was designed to focus on both electricity and gas, the close involvement and strong support of Fortis BC has resulted in electricity savings being the program's primary focus.

Toronto's Energy Management Program

Although Toronto has been engaged in improving the energy efficiency in its' buildings for over 15 years, their current initiative is based on a loan of \$35 million. The loan has been obtained from a variety of sources (including the Federation of Canadian Municipalities) with interest rates ranging from 3.5% to 5%. The city is intending to spend the \$35 million over six years (starting in 2004), which they expect will result in annual savings of \$4.3 million once all of the projects are complete. The main criteria for potential projects is having a payback of eight years or less, but the initiative is also embedded within the city's overall climate change strategy. The City tracks actual energy savings using consumption meters and pays off the loan based on those confirmed savings.

Phoenix's Energy Conservation Savings Reinvestment Plan

In 1984, Phoenix established the Energy Conservation Savings Reinvestment Plan to finance energy retrofits in city facilities and help municipal departments pay for the incremental costs of new energy-efficient equipment. In addition to supporting retrofits, the fund helped finance a district cooling system and a thermal storage system for the new Phoenix City Hall, as well as small-scale cogeneration, solar, air volume, and waste water systems. Part of the fund also goes toward research into new technologies and approaches to energy efficiency.

The fund was established with seed money from state oil overcharge funds, and currently has a limit of \$750,000 per year. Energy savings are established by comparing energy consumption before and after a retrofit, for the first year the improvement is in place. For the following ten years, half of this amount replenishes the plan, while the other half goes into the City's general fund. Minor problems that have been encountered by the plan include underestimating the turnover of stock and buildings, and building leases not being renewed. These are both problems because the economic justification for a project is based on a certain lifespan (or turnover time), and if this is overestimated, there is less time to accrue energy savings and repay the capital investment.

3.2 Internal/External Financing Mechanisms

Toronto's Atmospheric Fund

Established in 1993 through the \$20 million sale of downtown land for development, the fund is focused on a broad range of projects including those that: reduce GHG emissions throughout Toronto, improve local air quality, improve local carbon sinks, provide public education on these issues, and facilitate partnerships between different sectors. The fund is self-sustaining in that it now operates independently from the city and does not require any ongoing funding to support projects. Four staff members are employed by the fund to ensure efficient and adequate administration, and a board of directors comprised of City Councilors and independent citizens oversees them. A particularly interesting component of the fund is that it provides a mix of loans and grants to recipients. Interest earned on the initial endowment and project loans are used to both grow the fund and provide grants to research and advocacy type projects that are unable to directly demonstrate paybacks. The loan stream of the fund charges relatively high interest rates to reflect the longer paybacks associated with projects being financed and the risk that the

projects may or may not be successful in the long term. Examples of financed projects include the wind turbine at Exhibition Place, seed financing for Toronto's car-sharing service, and capital to finance energy efficiency retrofits in two Toronto artists' facilities.

Oslo's Ekon Fund

In 1982, Oslo established the Ekon Fund to finance energy efficiency retrofits throughout the City. A surcharge on electricity initiated at the same time provides an ongoing input to the fund amounting to approximately \$0.0015 / kWh. This financing mechanism is comparable to the public benefits charges used commonly throughout Europe and in many US states, but it appears to be relatively unique for municipalities. Currently, the efficiency surcharge charge adds approximately \$9 million dollars per year to the fund. The fund provides grants for energy audits and an additional grant to cover approximately 15 percent of project costs. The fund is also able to provide a loan for the remaining 85% of project costs. Ongoing payments from the efficiency surcharge and loan repayments led to a situation where the city was not able to identify enough projects on an annual basis to spend the available capital.⁴

3.3 External Financing Mechanisms

GNWT's Municipal Rural Infrastructure Innovation Fund

The innovation program is a component of a general infrastructure fund that was initiated in January 2005 as a three way cost sharing partnership between the Federal, Territorial, and Municipal governments. The broader fund consists of \$32 million (not including municipal contributions), and although it was initially designated for any green infrastructure program, the entire fund has been allocated towards water and sewer projects. The innovation component of the fund accounts for \$2.8 million and is only available to tax-based communities to support projects focusing on renewable energy, transportation, and air and soil quality. Because the program is relatively new and the focus to date has been concentrated on the general infrastructure fund (\$32 million being used for water and sewer projects), no projects have been funded from the innovation fund yet.

GNWT's Energy Conservation Program

Operating for over 20 years, the program is intended to support energy retrofits in buildings or assets that are owned or leased by territorial or community funded departments, boards or agencies, or non-profit organizations. The program provides grants to eligible projects of up to \$50,000, working within a total budget of \$400,000 per year for the past five years. The funded projects (described in greater detail in Section 6) have been achieving simple paybacks of approximately 2 years, but projects are eligible for funding if they can demonstrate a five-year or better simple payback. In addition to the retrofits themselves, the program is also available to finance feasibility studies for retrofit work within the same types of buildings.

⁴ The International Council for Environmental Initiatives, whom provided the information about the Ekon Fund, was asked about the current status of the fund and how Oslo resolved the dilemma of having too much available capital, but no answer was provided.

Yukon's Rural Electrification and Telecommunication Program

Operating since 1984, this program was established to provide loans to pay for electricity and telecommunication services to near-grid communities and houses in the Yukon. Of relevance to this research is that the program is intended to help communities move away from diesel generated electricity and will also finance distributed renewable electricity systems in addition to grid connection. The program has financed approximately 600 grid connections since its inception, and approximately 30 of those have included the installation of a renewable electricity source (mostly solar). Loans of up to 25% of the assessed property value can be provided.

The projects are financed using a local improvement charge (LIC) mechanism, which provides a loan to the homeowner, which is attached to the property as opposed to the owner. The loan is paid off over a period of up to 15 years at a rate 0.25% above Canada's prime lending rate. LIC's are used throughout Canada to finance sewer and sidewalk replacements, and the approach allows homeowners to comfortably proceed with an investment even if they are not certain they'll be living there long enough to realize the payoff. For a much more detailed discussion of LIC's and how they could be used to finance energy efficiency and renewable energy, please see the 2005 analysis prepared by the Pembina Institute (available at www.pembina.org).

Yukon's Green Mortgage Program

Established in 1999 by the Yukon Housing Corporation (YHC), the program provides reduced interest mortgages to homes that are able to meet the Yukon's GreenHomes certification. The certification can be applied to new or existing homes, and requires the home to achieve an EnerGuide for houses rating of 80 or better, be built using 75% local materials, be built by a Yukon resident, and have a certified ventilation system. Since its inception, the program has certified 43 homes (approximately 1,200 homes have been built in that time). The program has access to an annual budget of \$2.5 million, and can provide mortgages up to \$200,000. Payback terms can be set up to 25 years, and the interest rate is set at 1% less than the average of comparable rates from the five major banks. If interest payments cause the fund to grow, the additional funds are directed into the Senior Management Fund, which is a separate YHC fund that supports seniors to build houses.

Saskatchewan's EnergyStar Loan Program

This program was established in 2001 as a five-year partnership between Natural Resources Canada (NRCan), SaskEnergy, SaskPower, and TD Bank to provide prime rate loans for EnergyStar furnaces. Although no longer operational, the program successfully financed approximately 12,000 furnace installations in what amounted to a grant of approximately \$500 per installation. Financing was provided by NRCan (\$200), SaskEnergy (\$200), and SaskPower (\$100), but the program's success was largely based on the way it was able to leverage each partner's strengths. NRCan provided technical expertise and the support for the EnerGuide audits that were required to apply for a loan, SaskEnergy and SaskPower provided the direct access to customers and suppliers, and TD Bank provided the financial expertise. As mentioned, the program is no longer operational, and none of the partners interviewed could provide a clear explanation as to why the partnership (that they all deemed successful) was not continued.

4 Key Differences in Financing Options

This section attempts to strip out the key components of the different financing mechanisms that were reviewed and describe the primary differences between them.

How is financing made available to project proponents?

There are two steps involved in answering this question:

1. Defining the way in which capital is generated to finance projects (four options were identified). For all of these, the partner or partners providing the capital can vary depending on the types of projects being financed and the partners that are involved.
 - An *interest fund* operates by having a significant endowment set aside so that future projects can be financed solely by the interest generated from the endowment. The advantage of this model is that project loans or grants do not need to be repaid to the fund because it is able to sustain itself. The disadvantage is that a much larger amount of initial financing is required and setting those funds aside has an associated opportunity cost.
 - A *revolving fund* operates by setting aside sufficient funds such that the ongoing repayment of loans is enough to continually finance the demands for new loans. The fund needs to be sufficient to account for escalating costs due to inflation, and other costs associated with projects such as feasibility studies.
 - An *annual allocation* operates by setting aside a certain amount of funds each year to finance the specified projects. The key difference between an annual allocation and a revolving fund is that the annual allocation is typically set aside from general revenues, whereas the renewal of a revolving fund is directly linked to the savings generated by financed projects.
 - A *program* is somewhat different from the three previous models because it is established with an explicit intent to expire within a certain time period or after a specific amount of money has been distributed. A program could be renewed, but that is not the explicit intent when it is established.
2. Deciding how much financing is made available to project proponents. The two options identified were a fixed allocation mechanism where roughly the same amount of financing is available every year and projects are identified and selected to use up that amount, and a variable allocation mechanism where the amount of financing is dependant on the eligible projects identified in a given year.

How are the roles and responsibilities assigned to different partners?

Regardless of size, a municipality's resources and expertise are finite, and given that the scope of even a well defined external financing mechanism can be large, it is important to recognize these

limitations and clarify which roles the municipality will be responsible for and which will fall upon other partners. There are two key steps needed to provide this clarity:

1. Defining the roles needed for a specific financing mechanism. These can include: providing the capital, guaranteeing the capital, administering the financing, advertising the mechanism, installing or providing a product, evaluating effectiveness, coordinating partners, and administering the program.
2. Defining the partners and assigning them to the different roles. The specific roles assigned to a given partner will be depend on the types of projects being financed, the types of roles that the municipality wants to play, and the strengths, weaknesses, and interests of the other potential partners. Types of partners could include other levels of government, banks, local contractors, utilities, and housing corporations.

How are projects identified and advanced?

Given that all proponents are external to the city and are typically assumed to take responsibility for their projects, this question is not as critical as in the case of an internal financing mechanism where various groups within the city's administration hold this responsibility. Despite this, there is still one important step involved in answering this question:

1. Defining the scope and scale of approaches used to incent a stream of projects. This step largely amounts to the types of advertising, promotion, and communications used to let potential proponents know about a financing mechanism and how it could potentially support their projects. Some key variables that help shape the answer to this question are how much effort is put into advertising, whether the advertising targets specific groups or broader populations, what advertising mediums are utilized, and whether a personalized or general message is employed.

How is project eligibility defined?

There were four steps involved in answering this question:

1. Defining the objective of the financing mechanism. The options are whether to focus on reducing GHGs or on reducing energy expenditures. This is a particularly important question in Yellowknife because the most expensive energy source is electricity while the energy source with the highest GHG intensity is fuel oil⁵. Therefore, setting GHG reductions as the primary objective would direct most of the focus to projects that reduce oil consumption, while setting cost reductions as the primary objective would direct most of the focus to projects that reduce electricity consumption. Where financing mechanisms have been established to be self-sustaining from energy expenditure savings, energy savings are typically set as the primary objective (although GHG reductions can often be a secondary objective). Where financing mechanisms have been established without the need for energy savings to offset the cost of investments, then GHG reductions can be set as a primary objective.

⁵ It is important to note that this situation exists in Yellowknife due to excess hydro-electric capacity, which resulted from two mine shutdowns. If electricity demand continues to grow, new sources of supply will be needed and there is no guarantee that they will have as low a GHG emissions intensity. For example, if new supply needs were met with diesel generation, the incremental (or marginal) electricity supply would have the highest cost and GHG intensity.

2. Selecting the types of proponents that are able to submit projects for consideration. The two basic options identified are those that limit eligibility to projects external to city operations and those that finance a combination of internal and external projects. Combined approaches can vary from those that accept a very broad range of internal and external projects (e.g. Toronto's Atmospheric Fund) to those that provide a limited extension of an internal financing mechanism by making institutional buildings eligible.
3. Determining the types of projects that will be eligible for financing. The two options identified are to explicitly declare certain types of projects eligible or allow any types of projects so long as they help achieve the financing mechanisms objectives. An example of the first option would be a mechanism designed to only finance furnace retrofits, while an example of the second option would be a mechanism that financing any projects the reduce GHGs from the residential sector.
4. Figuring out the information that needs to be available to fairly assess a potential project. For capital projects, this information can potentially include: the expected capital costs, the current and anticipated energy consumption, energy expenditures, and GHG emissions, the expected life of the project, a discussion of similar types of projects previously supported by the municipality, and a discussion of potential risks. Ideally, all of these variables are included in the assessment so that a proper life cycle cost analysis can be conducted⁶. In cases where a project has a high degree of replicability, the information is typically generic, whereas in larger projects, the information needs to be collected on a case-by-case basis, usually through energy audits. For non-capital projects (e.g. a climate change education program), the assessment will by necessity be more indirect in any attempt to link project activities to specific energy or climate objectives.

How is the financing repaid?

There were five steps involved in answering this question:

1. Deciding how much of the financing the proponent is expected to repay. Options ranges from a pure grant model, where no repayment is expected to pure loan models, where a full repayment (possibly including interest) is expected. Combination approaches are also possible, where a portion of the financing is a grant and the remainder needs to be repaid.
2. Structuring the repayment mechanism for loan-based approaches. The two options identified are a standard repayment model where the loan is linked directly to the project proponent and a local improvement charge (LIC) model, where the loan is linked to the project. If the proponent and project (e.g. homeowner and house) remain linked for the amortization period of the loan, both options are identical from the proponent and financier's perspectives. If the proponent and the project separate prior to the amortization period (e.g. a homeowner sells their home prior to paying off a heat-pump loan), an LIC model automatically transfers the loan to the new owner of the project, whereas in a standard repayment model, the loan remains linked with the original proponent.
3. Setting the interest rate applied to loan-based mechanisms. A wide range of options was identified, starting at no interest rate and increasing to upward of 15%. The interest rate can

⁶ Calculating the cost of a system or product over its entire life span including upfront planning, development, and capital costs, production costs, operating and maintenance costs, energy costs, disposal or salvage costs, and environmental remediation costs.

be set to account for the following costs: the borrowing rate, inflation, program administration, advertising, feasibility studies, monitoring an evaluation, risk, and revenue generation. The models that have interest free loans typically included a separate mechanism to add to the fund in order to account for some or all of these costs.

4. Defining the amortization period for loan-based mechanisms. The options ranged from three to fifteen years (proponents could select even shorter terms if desired), where the length of time that a municipality is willing to wait for investments to be repaid dictates the number of potential projects and the amount of money that needs to be set aside to ensure the mechanisms sustainability. In other words, the longer the acceptable payback, the more projects that will meet the threshold, and the more capital that will be tied up in those projects. If part of the project financing is provided in the form of a grant, the effective acceptable payback becomes even longer and a greater variety of projects will meet the threshold.
5. Determining how defaulted loans are dealt with for loan-based mechanisms. This is a complex and challenging topic to deal with, but three general options were identified: requiring an external guarantor of the loan, guaranteeing the loan with City (or other partner) funds, having the ability to take equity from the proponent. For the third option, this depends entirely on the nature of the project, and can range from foreclosing on a mortgage to assuming an ownership role in a renewable energy venture.

How is program success and sustainability monitored and evaluated?

There were two steps involved in answering this question:

1. Assess how successful a project has been and how the actual results compare with earlier estimates. A variety of options were observed, ranging from those that do not conduct any follow-up analysis and simply base any reported savings on the estimated values, to those that look at the energy consumption for a year to provide a comparison with the anticipated energy savings, and finally to those that rely on a combination of actual energy consumption and energy modeling to adjust the observed data so that it accounts for changes in climate and facility use. Similarly to the discussion on assessing the eligibility of projects, the appropriateness of different approaches will depend on the scale and replicability of a project.
2. Determining the timeframe over which the monitoring and evaluation is conducted (if at all). Although many cities and their partners conduct short-term evaluations regarding the effectiveness of the projects being financed, none of the examples reviewed for this research evaluated the long-term sustainability of those energy savings. Undertaking this degree of analysis is certainly possible, and would simply require revisiting a sampling of projects several years after completion and reiterating the same evaluations conducted on a shorter timeframe. Despite the feasibility, cities seem to prefer focusing on a short-term analysis and projecting those results over the life of the asset.

5 Key Factors in Successful Financing Mechanisms

The following section describes a number of key factors that have been identified throughout the reviewed financing mechanisms. For the purposes of this section, they have been positioned in terms of success factors, but in all cases, the inverse of a factor could be taken as a mistake to avoid when designing a financing mechanism.

Clearly defined objectives and eligibility requirements

To minimize confusion regarding the types of projects that a financing mechanism is intended to support it is important to have clear objectives and eligibility requirements. The objectives will likely be defined in terms of reductions in energy expenditures or GHG emission reductions, and can often include a combination of the two. Clearly defined eligibility requirements will include the specific types of projects allowed (or not allowed), the range and types of costs that can be financed, and the allowable time for payback.

Clearly defined targets

Targets are important because they ensure that there are agreed upon benchmarks that will be used to measure a financing mechanism's success. In cases where targets are not present it becomes too easy to claim success regardless of how much has actually been accomplished. A target can be set in terms of the number of projects to be financed, the dollar value to be financed, the energy savings to be achieved, or the GHG reductions to be realized.

Simple, transparent and consistent process

From the perspective of a project proponent, it is critical to set clear guidelines for the project submission process. This builds upon the previous points of having clear objectives and eligibility requirements that represent a first line of filters for potential projects. Once it is clear that a project is eligible it is important to have clear steps and timelines.

Council and staff support for financing mechanism and its objectives

These two key pieces of institutional support help build a foundation on short-term successes and ensure that the mechanism has the longer-term backing to sustain itself in the face of changing short-term priorities. A key mistake to avoid is assuming that a mechanism has long-term security simply because it has been approved and is in place. There are many examples where revolving funds and other pools of financing have been "raided" for other priorities, and much of this can be attributed to a lack of understanding and support.

Strong links with project proponents

The way that links are created and sustained will depend on the nature of the proponents, but regardless of the approach, it is critical that the links be strong so that proponents are aware of the financing mechanism and its goals, and how it can support their projects. A criticism of some of the external financing mechanisms reviewed is that these links were often quite weak because little was done to advertise or promote the mechanism. For example, the Yukon's Green Mortgage Program has been advertised on the Yukon's website, but no directed efforts have been made to inform developers and homeowners about the program. As discussed, less than 4% of housing starts in the Yukon are taking advantage of the program.

Strong partnerships that recognize Municipality's strengths and weakness

Larger municipalities often have the resources to play a variety of roles, but in smaller communities it is important to recognize which roles are appropriate and where supporting partners might be beneficial. In these locations, municipalities are well served to cultivate those relationships and build programs that reflect the existing strengths and weaknesses.

Systems in place to track success

In order to make sure that all of the partners involved are comfortable with the reported successes of a financing mechanism, it is critical to have a data system in place that allows for energy consumption, energy expenditures, and GHG emissions to be accurately evaluated. In the case of larger projects, this will often mean site specific monitoring and evaluations, whereas in smaller, dispersed projects, only a sampling of projects will be reviewed so that those results can be extrapolated to the entire population.

Conservative assessment of project economics

A successful financing mechanism is one that achieves its objects and is able to sustain itself if desired. This factor helps achieve both of those needs by ensuring that projects are assessed with conservative estimates of capital costs and energy prices. All of these numbers are uncertain quantities when a project is being evaluated, so it is important to account for the fact that costs could be higher or lower than the best estimate.

Recognition of, but not paralysis from, uncertainty

Estimates of energy savings (and corresponding cost savings) are inevitably uncertain for several reasons. Actual energy consumption is dependant on a number of factors that are likely to change from the conditions under which the opportunity may have been studied (e.g. climate changing from year to year). The uncertainty is further complicated by the fact that energy prices also change, so even though savings may be real in comparison with what energy costs would have been without improvements, they may still be higher than the expenditures prior to improvements. These uncertainties cannot be resolved and although it is important to recognize and account for them (using conservative assessments of project economics for example), the irresolvability should not be used as an excuse to avoid action. If the financing mechanism is built around reliable projects the energy and cost savings will be realized on average over the long term.

6 Local Context

Understanding the local context is important for two key reasons when considering the design and implementation of a green financing mechanism:

1. It helps identify where existing policy and legislative constraints may make it impossible to apply certain models that have worked well in other communities. These constraints could come from municipal, territorial, and federal governments, and the findings can either point to ways in which a financing mechanism would need to be redesigned or a constraint would need to be adjusted.
2. It helps identify any relevant programs or initiatives that are already operating in the community so that any new financing mechanism can be designed to operate in cooperation. The other programs do not need to be operated by the local government and they do not need to be financing mechanisms.

Policy and Legislative Constraints

From a borrowing perspective, there are few legal constraints on the amount of funds that Yellowknife can access that would be encountered prior to the point that political constraints would limit access. The *Cities, Towns, and Villages Act* of the GNWT limits Yellowknife to taking on no more than \$160 million in debt and \$9 million in debt servicing charges. Current city policy limits these figures even further, with a debt limit of \$90 million and a debt-servicing limit of \$3 million. Although these limits provide few restrictions on borrowing that would ever be approached in practice, Yellowknife is only permitted to borrow funds to support projects within municipal operations.

A potential source of capital available to the city that would not require borrowing is the Federal Government gas tax funds (see below). A second alternative to access capital that arose during the course of the research was the ability to draw on tax exempt or partially tax-exempt bonds. This option is unfortunately only relevant to US cities, and is not applicable in a Yellowknife context.

From a lending perspective, there is a critical constraint that will significantly limit the City's ability to play a lending role in any financing mechanism. Based on discussions with Dave Devana,⁷ Yellowknife will not tolerate the liability associated with loans to projects outside the scope of municipal operations, which essentially makes it impossible for the City to directly provide the capital for a financing mechanism or secure loans where another organization is providing the capital.

Apart from involving a separate partner to play the financing role, two potential options were identified that could allow Yellowknife to maneuver around this constraint.

- The City has been willing to finance local improvements for sidewalks and water and sewer infrastructure, and based on the Yukon's remote electrification program, the LIC concept could provide an acceptable mechanism to finance energy efficiency or

⁷ Director, Corporate Services, City of Yellowknife

renewable energy investments. These investments are paid for by the city and partially recovered through local improvement charges that are applied to the benefiting resident's property taxes. The attractiveness of this option within Yellowknife staff and council has not been assessed and the legality of approach within the NWT has not been studied in detail.⁸

- The City could establish and provide seed financing for an arm's length organization that would play the City's role in a financing mechanism. This approach would be similar to the way in which Toronto established the Toronto Atmospheric fund with taxpayer funds, and has allowed TAF to evolve and operate independently since then. The attractiveness of this option within Yellowknife staff and council has not been assessed

Relevant Programs and Initiatives Currently Operating in Yellowknife

There are several programs already operating in Yellowknife that could potentially overlap with the intended audiences of an external financing mechanism, and as such, should be accounted for in the design of that mechanism:

- Northland Utility and Ecology North's appliance rebates (\$75 to customers who install either an ENERGY STAR qualified refrigerator and/or front-loading clothes washer).
- CMHC's "Mortgage Loan Insurance Refund" (a 10% refund on mortgage loan insurance premiums, and an extended amortization to a maximum of 35 years to individuals who use CMHC-insured financing to purchase an energy efficient home or renovate an existing home to make it more energy efficient⁹)
- NRCan's "EnerGuide for Existing Homes"¹⁰
- NRCan's "EnerGuide for New Homes"¹⁰

In addition to these externally operated programs, two CEP action areas should be accounted for in the design of an external financing mechanism. First, the development of an energy efficiency bylaw for new buildings provides significant focus to the new buildings sector, such that additional financing may not be needed. Second, the specific strategies stemming from the CEP action area intended to increase the use of transit could overlap or complement any financing approaches for which transportation projects are eligible.

Although not exactly an existing program, the Federal gas tax transfers are a particularly relevant flow of funds that could be used to support any green financing mechanism considered by Yellowknife. Projects designed to reduce energy consumption and/or GHG emissions would

⁸ As discussed in the 2005 Pembina concept study on the use of LIC's for energy efficiency and renewable energy, the legality of this application of LIC's is not explicitly permitted or prevented within the relevant pieces of legislation. Detailed conversations between the interested municipality and their provincial or territorial government are required to confirm the legality before proceeding with this option.

⁹ For additional information, see <http://www.cmhc-schl.gc.ca/en/hoficlincl/moloin/moloinbr/homoloin/upload/Energy-Efficient-Homes.pdf>.

¹⁰ The future of the EnerGuide program is uncertain due to a variety of cuts made to Federal climate change initiatives in the 2006 budget. Although there may be some short-term interruptions and the specific branding may change, it seems reasonable to expect that some sort of federal or territorial program will continue to provide support for energy improvements in existing residential and commercial buildings. This assessment is based on the relative success of the existing EnerGuide program, the high level of expertise built up by the Office of Energy Efficiency, and recent comments by the Minister of Natural Resources Canada indicating that a existing building retrofit program will be included in a new climate change plan.

certainly satisfy the sustainability objectives of the gas tax transfers, although the lending constraints would still need to be accounted for. Table 3 presents funding schedule for Yellowknife's gas tax funds until 2010.

	Year				
	05/06	06/07	07/08	08/09	09/10
Gas tax contributions to Yellowknife (\$ Million)	\$1.34	\$1.34	\$1.80	\$2.25	\$4.52

Table 3 – Gas tax contributions to Yellowknife

A final relevant initiative relates to the GNWT's current energy plan process, within which they have expressed interest in exploring how they could support or implement external green financing mechanisms in the NWT. In considering possible approaches, the GNWT's key concern is making sure that any program has relevance for the entire GNWT and not just a specific municipality or region. This focus significantly limits the potential partners for a financing mechanism because only NWT Power Corporation and NWT Housing Corporation have a presence through the NWT. Additionally, the economics of projects vary considerably throughout the NWT due to differences the costs of energy, installation, shipping, and maintenance costs, which will make it more difficult to take advantage of some of the advantages provided by Yellowknife's relatively high density of opportunities. Although these concerns do not prevent Yellowknife from partnering with the GNWT to establish a financing mechanism, they do limit the range of opportunities and also potentially slow down the timing in relation to a Yellowknife alone approach.

7 Next Steps

At a presentation to the CEP committee on May 16, 2006, the committee's preference was to maintain a broad focus on the types of partnerships and models that could be used to implement an external financing mechanism in Yellowknife, and stay away from a more detailed analysis of any specific mechanism. Based on that context, the following five steps are seen as appropriate directions to build upon the general discussion of options provided in this report. Part of the intention of these steps is to help the CEP committee focus their efforts on a single sector or sub-sector, because the refined focus would provide a more effective starting point than a broad-based, catchall type financing mechanism that has the potential to overtax staff resources. A successful starting point could certainly be expanded in the future as staff and Council, and other partners become familiar with each other and the operations of a financing mechanism.

1. Identify the sectors or sub-sectors where an external green financing mechanism would be most useful by assessing which are in greatest need of support (i.e. insufficient support from current programs or identified action areas), and which would be best supported by financing as opposed to other policy interventions. This step does not require a complex or time consuming process as Yellowknife already has a completed baseline analysis to provide a rough indication of where the greatest potential is and there is a relatively clear picture of the programs and action areas currently addressing different segments of that potential. All that remains is an assessment as to whether or not the existing initiatives are sufficient for each segment and whether or not any gaps would be effectively filled by a financing mechanism.
2. For the sectors and sub-sectors that meet the criteria in the first step, assess whether a territorial or Yellowknife focus is more appropriate. A territorial focus has the obvious advantage of involving a major partner that could potentially support the administration and financing of any initiative. The drawbacks of territorial involvement are that the GNWT is at a preliminary stage in considering energy financing initiatives beyond those already supported (see Section 3.3) so progress on a partnership model would likely be slow, and the GNWT will require a territory wide focus to any program. The requirement for a territory wide focus will limit the number of potential target areas for a financing mechanism because certain opportunities will not be amenable to all regions, and this could potentially disqualify target areas considered to be a top priority in Yellowknife.
3. For the selected sector or sub-sector, assess what role(s) Yellowknife (and possibly the GNWT) have an interest in and are well suited to play, and what roles may need to be filled by other partners to support the delivery and financing of a program.
4. Identify the potential partners that could fill those roles and discuss with them their interest in the proposed program and what role(s) they would be willing to fill, and what types of conditions would be required for their participation.
5. Proceed with the detailed design of how the newly scoped financing mechanism should be structured by developing specific answers to all of the remaining questions in Section 4 and formalizing relationships with all partners.

Since the May 16th presentation, the CEP committee has made a preliminary recommendation that they would like to see a financing mechanism of some kind to target residential and commercial heating. Residential and commercial heating is still quite a broad area and the scope could certainly be further refined without focusing on too small a segment. Examples of further refinement could be to just focus on one of the two sectors or to just focus on heating and ventilation equipment. In addition to the potential to further refine the scope, the committee could also consider the potential involvement of the GNWT to decide how important their involvement is to the project and if the selected target area is amenable to that decision.

This research has not allocated significant time to compare and contrast the types of models that could help Yellowknife target residential and commercial heating, but some preliminary ideas are provided here to help spur further discussion. It is also important to stress that given the recommendation to start any approach with a limited scope, a financing mechanism to support heating systems should be the City's only external financing endeavor until a program is successfully operating. The preliminary models that could be used to finance improvements in residential and commercial heating include the following. Yellowknife plays a variety of roles in the different models, but the City is well positioned to play an initiating role in all of them, and none of them are likely to happen without Yellowknife as an initial driving force.

- *A green mortgage program to provide reduced interest rates for efficient homes.* This type of program would be similar to the Yukon's program, and would need to involve a partnership with the Northwest Territories Housing Corporation (NWTHC). It would probably require a broader focus on efficient construction (i.e. refining the scope further would not be possible) to satisfy the GNWT need to have territorial wide applicability. Yellowknife could not help finance the mortgage rate reductions of such a program if their investment needed to be repaid, but they could play a financing role if repayment was not required. There are no immediate barriers to establishing this type of program, but discussion with NWTHC and GNWT could take some time.
- *A local improvement charge model to finance improvements in residential or commercial heating systems.* Following an approach similar to the Yukon's remote electrification LIC program, Yellowknife could use LIC's to finance improvements in residential and commercial heating systems. With a broad focus, the loans would be based on standard modeling approaches such as EnerGuide for Houses. The scope could also be focused on a single sector or on specific technologies such as wood pellet stoves or boilers. Conceptually the LIC model has three main advantages. 1) It allows the City to play a direct role in financing the types of improvements it wants to support. 2) It associates an energy improvement, which often has long payback periods, with the property as opposed to the owner. 3) The loans are repaid through existing property tax mechanisms. Yellowknife's ability to implement this type of mechanism under current GNWT legislation is not clear and would require detailed discussions with the GNWT before proceeding.
- *An independent organization to finance improvements in residential and commercial heating systems.* Similar to the Toronto Atmospheric Fund, Yellowknife could provide an endowment to an existing or new organization mandated to manage that endowment to finance improvements to residential or commercial energy systems in Yellowknife. This is another option to deal with the restrictions on City lending, but it would probably entail

the greatest institutional challenges in terms of figuring out how to structure the organization. The political acceptability of this model has not been assessed, nor has the ability to use gas tax funds to finance a separate organization. As with the LIC approach, there is considerable potential to refine the scope of eligible projects so that either a single sector or a suite of technologies could be the focus.

- *Partnering with a financial institution to provide heating systems loans.* Similar to the Saskatchewan furnace program, Yellowknife could provide financing for heating systems. This type of model could proceed as soon as all potential partners were satisfied, but it would not allow Yellowknife to play a financing role if the City expected a return on investment. The City would potentially be well suited to help administer the partnership and lead the community outreach and advertising. If Yellowknife also wanted the mechanism to provide lower interest rate loans, they could give a grant to the financial institution on the condition that it be used to offer lower rates (e.g. the way NRCan, SaskEnergy, and SaskPower provided funds to TD Bank in Saskatchewan’s EnergyStar Loan program). Utilities could also be useful partners in this type of model to potentially further lower the interest rate and also help provide a direct link to potential customers.
- *Partnering with a utility and/or contractors to promote heating systems.* Similar to the above approach, the primary partner in this model would be the utilities and contractors that have direct ties with customers on heating issues. This model could proceed as soon as a partnership model is agreed to, and the City could also play an administration and outreach role. If Yellowknife also wanted to subsidize the cost of the heating systems, they could provide financing to the utilities or directly to the customers, but they would not be permitted to provide any financing in the form of loans.

The key strengths and weaknesses of these approaches are summarized in Table 4. Within the table a “✓” indicates that the characteristic is required for the given model, a “○” indicates that the characteristic is possible for the given model, and a “✗” indicates that the characteristic is not applicable for the given model. As shown in the table, there are ample opportunities for partnerships, as all of the partners are either a “yes” or a “maybe” for all of the example models.

Program	Requires Involvement of...				YK Providing Grants	YK Providing Loans	Legislative Concerns
	GNWT	Financial Institutions	Utilities	Contractors			
A green mortgage program model	✓	○	○	○	○	✗	✗
A local improvement charge model	○	○	○	○	✗	✓	✓
An independent organization	○	○	○	○	○*	○*	✗
Partnering with a financial institution	○	✓	○	○	✓	✗	✗
Partnering with a utility and/or contractors	○	○	✓	✓	✓	✗	✗

* The “O” represents what the money will be used for by the independent organization. Other than endowing the organization, Yellowknife would not be involved in grants or loans for this option.

Table 4 – Summary of sample approaches to financing heating systems.

All of these options offer the potential to successfully reduce greenhouse gas emissions and energy consumption in Yellowknife if designed well. Deciding upon a preferred option requires further consideration of the CEP committee and further discussion with the potential partners to better gauge their interest and ability to participate. Some questions to help shape the decision include:

- How quickly does Yellowknife want to move forward on implementing a financing mechanism?
- How important is partnering with the GNWT in terms of the administrative and financial support they could provide?
- How important is involving other partners in a financing mechanism?
- How much of a financing role does Yellowknife want to play in any external financing mechanism?

Appendix A: Research Template

Fund Overview

How long has the fund been in place?
What are the primary goals of the fund?
What projects have been funded (number, type, scale...)?
What results have been achieved (i.e. energy and GHG reduction)?

Partners and Roles

Who are the key public and private sector partners in the fund?
What roles do they each play?

Accessing Capital

How is the fund financed (e.g. endowment interest or budget allocation)?
If the fund includes an endowment, how large is it?
If the fund includes an endowment, how is it managed?
Why was this particular funding model chosen?
What is the annual allocation for projects?
What happens if an annual allocation is not fully utilized?
What happens if an annual allocation is over-utilized?
Has the fund had any unforeseen financing requirements?
Have there been any additional challenges in accessing capital?

Selecting Projects

How have projects been solicited?
What types of projects are eligible?
What size projects are eligible?
What groups are eligible for funding?
What metrics are used to compare projects?
What time frames do the projects run for?
Are multiple year funding commitments possible?
Have there been any additional challenges to selecting projects?

Financing Projects

Does financing include loans and/or grants?
For loans, what interest rate and amortization period is used?
Are loans repaid by the loan recipient or other sources (e.g. general revenue)?
How many projects have defaulted on loans?
What is the penalty for defaulted loans?
What happens after a loan / project is paid off? (back to the city, back to the department, back to the fund, other)

Monitoring and Evaluating the Fund

How are a project's energy savings and GHG reductions evaluated?
What happens if the reductions are less than anticipated?
What happens if the reductions are greater than anticipated?
What processes are in place to adjust selection procedures as needed?
What processes are in place to communicate fund successes?
Have there been any additional challenges to monitoring and evaluation?

Miscellaneous Questions

How many people are responsible for administering the fund?
What roles do those people fill?
What are the overhead costs of the fund?
What are the advertising costs of the fund?

Appendix B: Contacts

Name of Financing Mechanism	Contact	Email	Phone
Edmonton's Energy Management Revolving Fund	Marc Brostrom		(780) 496 5992
Stuttgart's Intraction Program	Dr. Volker Kienzlen	u360500@stuttgart.de	
Kelowna's Energy Management Program	Kelly Hughson		(250) 717-0809
Toronto's Energy Management Program	Jim Kamstra		(416) 392-8954
Phoenix's Energy Conservation Savings Reinvestment Plan	Ewa Ciuk (ICLEI)	Ewa.ciuk@iclei.org	
Toronto's Atmospheric Fund	Mary Pickering		(416)392-1217
Oslo's Ekon Fund	Ewa Ciuk (ICLEI)	Ewa.ciuk@iclei.org	
GNWT's Municipal Rural Infrastructure Innovation Fund	Olivia Lee		(867) 873-7238
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