



Federation of Canadian Municipalities Municipal Building Retrofits



Section 5 Project Proposal Template

Templates

All templates in this guide are available in text and PDF format on the accompanying CD ROM or on the Knowledge Network at <http://kn.fcm.ca>.

Project Proposal Template

[Municipality X]

[Insert Date]

1.0 INTRODUCTION AND SUMMARY

1.1 Purpose

Sample text

This Project Proposal recommends a course of action for financing and implementing a building renewal project that will enable an investment of resources to improve the maintenance, comfort, safety and energy efficiency of [municipality x]'s corporately owned buildings. This Proposal identifies building-specific energy consumption data, defines specific retrofit measures and their savings potential, outlines a financing and implementation methodology, and ensures that municipal resources are used efficiently and effectively.

1.2 Background

This Project Proposal was undertaken by [municipality x] utilizing the Federation of Canadian Municipalities' Municipal Building Retrofit (MBR) process. It builds upon the Green Leaf™ Eco-rating Program and Action Plan completed on [insert date]. The MBR process enables municipal governments to follow a strategic plan that will make the most of opportunities to save money and reduce waste. Drawing on the experience of other municipal governments that have successfully carried out a range of building retrofits, the MBR process consists of eight steps. At each step, there is an opportunity to assess the information available and to decide whether there is a strong case to proceed.

Modernizing municipal buildings will decrease expenditures and free up needed revenue for other critical functions, all while conserving energy and water. A recent Green Leaf™ Assessment carried out under the auspices of the MBR process found that each and every day [municipality x] postpones energy retrofits, \$[insert amount] is lost in potential savings that could be used to finance building improvements.

1.3 Activities to date

[Municipality x] enrolled in the MBR process and completed the first step by signing a Letter of Commitment on [insert date]. From [insert month-to-month range], staff completed a Green Leaf™ Phase I questionnaire to assess how well prepared [municipality x] is to implement an energy-efficiency program. [If applicable] The Phase 2 assessment was completed on [insert date] by [insert participants]. A post assessment review meeting (Phase 3) was held with [insert names] from FCM and municipal staff including [insert names] on [insert date]. From [insert month-to-month range], information was gathered for the preparation of this Project Proposal.

1.4 Summary of relationship of building retrofit to municipal goals and policies

Recent funding constraints and budget cuts have encouraged [municipality x] to find ways to reduce operational budgets.

[Municipality x]'s environmental policy includes a commitment to increase energy efficiency in municipally owned and operated facilities.

The internal rate of return for energy-efficiency measures is generally within established criteria for municipal investments.

1.5 Recommended next steps

A program of building improvement is recommended. The assessment conducted to date indicates that an investment of \$[insert amount] in the proposed building retrofits, equipment renewal, training, and other project costs would yield annual savings of \$[insert amount], for a simple payback period of [insert number] years. The program will be entirely self-funding and all program costs will be retired by operational cost savings. The details of such a program need to be confirmed by proceeding to the next step in the MBR process. It is recommended that council endorse continued participation in the MBR process, and approve \$[insert amount] from the [insert department] budget for the preparation of a Feasibility Study on the [insert number] municipal buildings identified in this Proposal.

2.0 PARTNERSHIPS

An internal energy-efficiency team [insert name if applicable] was established on [insert date] to oversee the co-ordination of [insert name] retrofit project. Team members collected and evaluated building and energy data and assembled options for prioritizing, financing and implementing retrofits. Each team member plays a specific role as identified in Appendix D.

External partners, as identified in Appendix D, provided various levels of expertise in gathering and assembling information required to prepare this Proposal. Furthermore, various funding and partnership opportunities with [list names] have been made possible through this process that would have otherwise been lost.

3.0 CURRENT SITUATION

3.1 Building portfolio

[Municipality x] has [insert number] buildings that cost \$[insert amount] in energy as indicated in Table 1 below.

Capital plans indicate that the heating, ventilating and air conditioning unit in the Town Hall is scheduled for replacement by the end of next fiscal year as indicated by the accompanying capital plan summarized below. A copy of this plan is provided in Appendix 1.

Table 1: 5 Year Capital Asset Renewal Plan Summary and Proposed MBR Projects

File No.	Building Renewal Project	Project Cost (\$)	FY2002	FY2003	FY2004	FY2005	FY2006	Ref. MBR Project
C-044	1. City Hall							
	1.1 Chiller Replacement	152,946				152,946E		MBR01 – 2004 Chiller Replacement MBR02 – Lighting Retrofits
	1.2 Council Chamber Lighting Upgrade	35,200	35,200DE					
	1.3 Boiler Controls Installation	38,750			38,750E			MBR03 – Building Envelope Renewal
	1.4 Exterior glazing renewal	59,850		25,000DE	34,850E			
	Sub-Total	286,746	35,200	25,000	73,600	152,946		
C-070	2. Recreation Complex							
	2.1 Pool Heater Replacement	17,000	17,000E					MBR03 – Building Envelope Renewal
	2.2 Arena Reflective Ceiling Installation	55,800			55,800C			
	2.3 Roof Renewal	175,000				175,000C		
	2.4 Washroom fixture upgrades	29,750		29,750E				MBR02 – Lighting Retrofits
	2.5 Lighting Retrofit	89,500	89,500DE					
	Sub-Total	367,050	116,500	29,750	55,800	175,000		
C-071	3. Fire Station							MBR04 – Fire Hall Retrofits
	3.1 Overhead Door Replacement	8,900					8,900EC	
	3.2 Furnace Replacement	4,500					4,500E	
	3.3 Roof Reseal	38,400					38,400C	
	Sub-Total	51,800					51,800	
	Plan Total	705,596						
	Total FY2002		151,700					
	Total FY2003			54,750				
	Total FY2004				129,400			
	Total FY2005					327,946		
	Total FY2006						51,800	

LEGEND: A = ACQUISITION D = DESIGN C = CONSTRUCTION E = EQUIPMENT O = OTHER

3.2 Utility expenditures and challenges

Most departments within [municipality x] pay utility bills without verifying costs. The accounting department plans to consolidate the payment system, allowing centralized tracking of bills. This new system will also facilitate tracking energy expenditures. The following table summarizes current utility costs and the level of carbon dioxide emissions on a building-by-building basis. By gathering this information we have determined that [number of buildings] are in need of upgrades to the [list system or equipment]:

Table 2: Municipal Building Portfolio – Energy Use Summary (By Building)

Building: _____.

Area (sq. ft.) _____.

Period: From _____ To _____.

Energy Type	Annual Costs (\$)	% of Cost	Equivalent kWh	% of Energy	CO ₂ Emission ^{[1][2]}
Electricity					
Natural Gas					
Oil					
Propane					
Water					
Renewable					
Other					
Total					

Comments: _____

[1] Use the coefficients table in the guide to calculate your CO₂ emissions or use the CO₂ calculator found on the accompanying CD.
 [2] FYI PCP members should use CO₂ calculations for your municipality's CO₂ inventory.

3.3 Operations expenditures and challenges

Operational expenditures have increased over the past two years. However, the implementation of this Project Proposal will decrease operational expenditures in the following areas [provide list and explain each]:

3.4 Maintenance expenditures and challenges

Heating equipment in [insert names of buildings] is old and requires constant maintenance and attention. New equipment would save time and money on maintenance.

4.0 DATA COLLECTION & ANALYSIS

In Section 3 of this Proposal, we have catalogued the building portfolio together with summary data on our utility expenditures and general building condition. At this stage of the process, we are screening the building stock for those sites that offer the potential for retrofit and those that would potentially yield the greatest energy savings.

The data provided in Section 3 was collected by personnel from [insert department name], under the direction of the Energy-efficiency Committee and the Director of Physical Plant. The assistance of [insert name of utilities] in collecting historical electricity and fuel consumption records was helpful; as well, utility personnel conducted building-by-building electrical metering at the service entrances to generate electrical demand profiles.

To prioritize the buildings in our stock for potential energy savings, comparisons were made between the energy use indices, such as energy and demand intensity for electricity and fuel consumption achieved (kWh/m² and Watts/m² respectively) and benchmarks for similar facilities. Where external benchmarks were not available, these performance indicators were calculated to determine best historical performance as a basis for estimating potential energy savings.

Table 3 below summarizes the energy performance of our building stock.

Table 3: Energy Use Indices for Building Portfolio

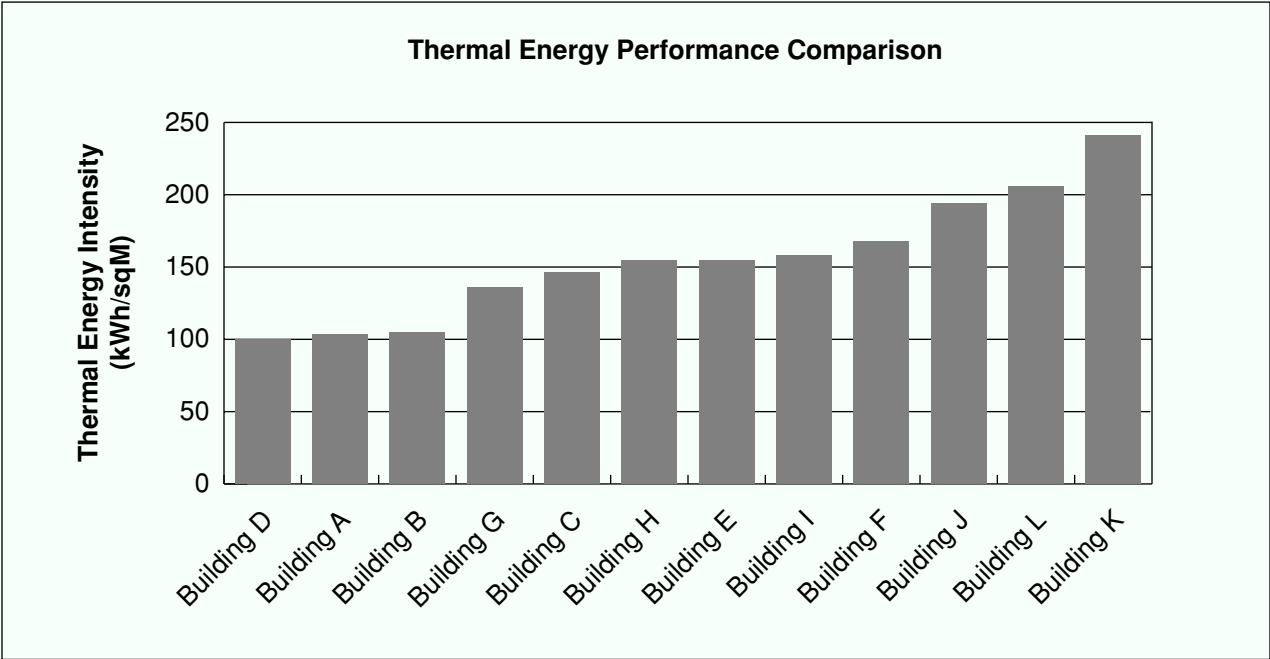
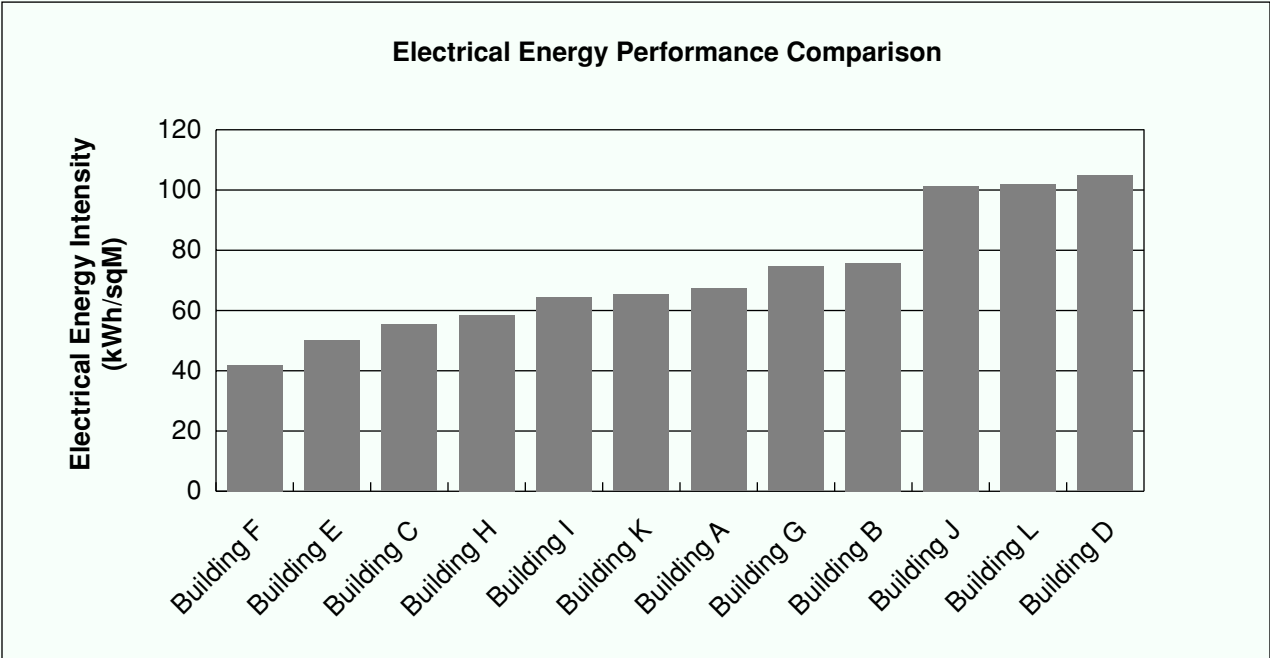
Site	Annual Electricity (kWh)	Natural Gas (GJ)	m ²	Electric Energy kWh/m ²	Natural Gas kWh/m ²	Total Energy (kWh)	Total kWh/m ²	Total Cost (1) (2)
Building A	418,686	2,318	6,214	67	104	1,062,626	171	\$49,011
Building B	447,169	2,221	5,900	76	105	1,064,163	180	\$50,180
Building C	515,902	4,921	9,329	55	147	1,882,956	202	\$77,942
Building D	692,870	2,371	6,606	105	100	1,351,534	205	\$68,654
Building E	390,488	4,344	7,792	50	155	1,597,251	205	\$64,258
Building F	321,781	4,651	7,692	42	168	1,613,829	210	\$62,058
Building G	375,933	2,471	5,043	75	136	1,062,377	211	\$47,319
Building H	427,461	4,058	7,301	59	154	1,554,773	213	\$64,415
Building I	352,237	3,111	5,459	65	158	1,216,473	223	\$51,100
Building J	669,425	4,619	6,604	101	194	1,952,583	296	\$86,121
Building K	457,666	6,088	7,008	65	241	2,148,912	307	\$83,785
Building L	669,709	4,861	6,567	102	206	2,020,095	308	\$88,198
Totals	5,739,327	46,034	81,515			18,527,572		\$793,042

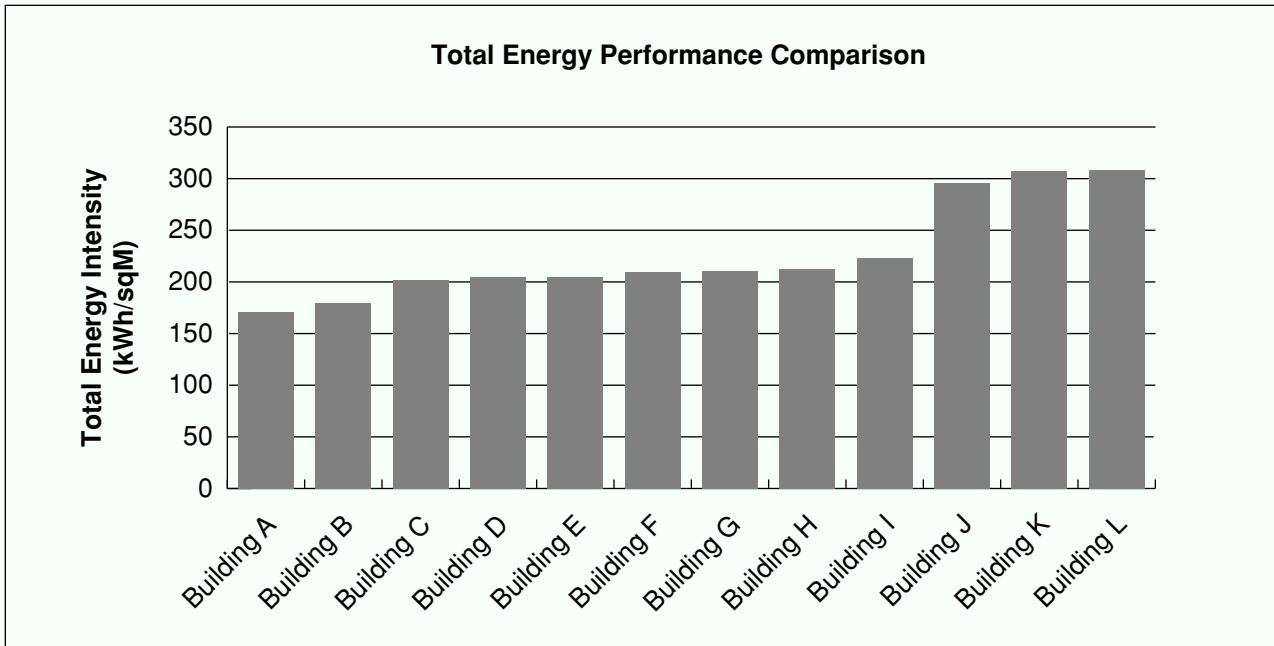
(1) Based on an electricity cost of \$0.07/kWh and gas cost of \$8.50/GJ

(2) This analysis does not include electrical demand and its associated cost.

The following figures provide a graphical comparison of building performance.

Figures 1, 2 and 3: Energy Performance of Building Portfolio





5.0 ENERGY SAVINGS SUMMARY

As noted above, our analysis of energy use indices for the building portfolio has identified those buildings that have the greatest potential for energy savings. When industry benchmarks are applied to these buildings, it is possible to provide a preliminary estimate of the savings that will accrue from the indicated retrofits. It is important to note that these are preliminary estimates only that have not been subjected to any rigorous engineering analysis. The accuracy of savings calculations will increase with the analysis that will occur in the Feasibility Study stage of the retrofit process.

The table and graph below summarize the savings potential if the indicated target energy use indices are achieved. We can prioritize the buildings for retrofits on the basis of the potential savings (see Section 9 of this Proposal).

Table 4: Savings Potential in Building Portfolio

Site	Target Annual Electricity (kWh)	Target Natural Gas (GJ)	m ²	Target Electric Energy, kWh/m ²	Target Natural Gas kWh/m ²	Target Energy (kWh)	Target kWh/m ²	Target Cost (1)	Total Projected Savings kWh/Year	Total Projected Savings \$/Year (2)
Building A	403,910	2,318	6,214	65	104	1,047,850	169	\$47,977	14,776	\$1,034
Building B	383,500	2,221	5,900	65	105	1,000,494	170	\$45,724	63,669	\$4,457
Building C	515,902	4,921	9,329	55	147	1,882,956	202	\$77,942	0	\$0
Building D	429,390	2,371	6,606	65	100	1,088,054	165	\$50,211	263,480	\$18,444
Building E	390,488	4,207	7,792	50	150	1,559,288	200	\$63,097	37,963	\$1,162
Building F	321,781	4,153	7,692	42	150	1,475,581	192	\$57,828	138,248	\$4,230
Building G	327,795	2,471	5,043	65	136	1,014,239	201	\$43,949	48,138	\$3,370
Building H	427,461	3,942	7,301	59	150	1,522,611	209	\$63,431	32,162	\$984
Building I	352,237	2,948	5,459	65	150	1,171,087	215	\$49,711	45,386	\$1,389
Building J	429,260	3,566	6,604	65	150	1,419,860	215	\$60,358	532,723	\$25,763
Building K	455,520	3,784	7,008	65	150	1,506,720	215	\$64,051	642,192	\$19,734
Building L	426,855	3,546	6,567	65	150	1,411,905	215	\$60,020	608,190	\$28,178
Totals	4,864,099	40,448	81,515			16,100,645		\$684,298	2,426,928	\$108,744

(1) Based on an electricity cost of \$0.07/kWh and gas cost of \$8.50/GJ
 (2) This analysis does not include electrical demand and its associated cost.

6.0 LOCAL ECONOMIC IMPACTS

It has been estimated elsewhere (American Council for an Energy Efficient Economy) that a direct correlation exists between energy-efficiency expenditures and job creation, with between 49 and 70 jobs created per \$1 million of project expenditure depending on the extent of private investment in the project. These estimates assume that a significant proportion of the costs associated with the proposed retrofits will be spent in [municipality x] in the form of goods and services. They further assume that the job creation includes direct effects related to the execution of the project itself (the on-site jobs for contractors, labour, suppliers, etc.), indirect effects (the off-site jobs in organizations that support the project execution), and induced effects (as spending in the community in general grows due to the project-related revenues that find their way into the hands of residents).

As a matter of policy, procurement of goods and services will favour local suppliers and service providers. Our preliminary estimate is that the total project value of \$[insert estimate] will generate [insert estimate] person-years of employment in [municipality x].

7.0 IMPLEMENTATION OPTIONS

There are various methods for implementing the proposed retrofit projects. The selection of an option can make a difference in how long it takes to implement a project, on the co-benefits of the project, and the amount of energy and cost savings that are realized. To ensure that the most appropriate implementation option is selected three different approaches are outlined in this section.

The implementation option may have a bearing on how the project is financed. In Section 8 various financing options are discussed and shortly following that, a recommended course of action is presented.

7.1 Option 1: Internal implementation

Implementing the retrofit project internally will save [municipality x] \$[insert amount] in contracting costs. Further, [municipality x] has successfully completed an internal retrofit on [insert building and date]. Energy savings from this project total \$[insert amount]. Staff has learned from this experience and is excited to work on this new retrofit project.

or

[Municipality x] is short staffed and does not have the capacity or experience to self-implement.

7.2 Option 2: Third-party services

A general contractor will be retained to manage the project on behalf of [municipality x]. The third-party contractor will provide a high level of expertise to assist [municipality x] to oversee the implementation of the retrofit project.

7.3 Option 3: Energy services company (external implementation)

Energy services companies (ESCOs) provide a wide range of services that can be tailored to meet [municipality x]'s needs. Typical ESCO services include: energy audits, project financing, and construction management services. There are additional costs associated with this option for risk management if a performance guarantee for the building retrofit is included in the project contract. However, the time frame to implement this project will be greatly reduced, such that savings are realized earlier and the additional costs are offset. Furthermore, [municipality x] has worked successfully with [insert ESCO name] on [insert project name and date]. [Municipality x] does not have the time or resources to oversee a retrofit project. Therefore, we propose to retain [insert name of ESCO] to execute this project, and to enter into negotiations towards an energy performance contract.

or

While [municipality x] has had previous experience with ESCOs, our analysis of this project indicates that we have the required expertise and resources to implement the project with internal management. Further, the risks involved appear to be manageable without a performance guarantee, and the required capital can be secured through the municipality's own sources. Therefore, we do not propose to use an ESCO for this project.

8.0 FINANCING OPTIONS

Several options for financing the proposed retrofit projects have been explored. These include internal financing with available capital, debt financing through [municipality x]'s borrowing opportunities, and leasing from the vendors where appropriate. Similar financing mechanisms can be employed in the event that the retrofits are managed by an ESCO.

8.1 Internal

Internal financing, that is, the use of [municipality x]'s own resources to implement the retrofit projects, is an option whether the project is managed by the municipality or by an ESCO or other third party. Internal financing of the proposed retrofits is predicated on the availability of operating budgets (for example, maintenance budgets) and capital funds (for example, for capital replacement and building renewal). This option offers the advantage of avoiding any debt on the balance sheet, and the avoidance of financing costs.

Based on the preliminary costs associated with the prospective retrofits as summarized in Section 9 below, and advice provided by Finance regarding the availability of operating and capital budget, we recommend that the internal financing option [be/not be] employed in this retrofit program.

8.2 Debt-financing

[Municipality x] has the option of borrowing or raising capital through bond issues in the same way as it does to meet other capital needs, and may do so whether the project is internally or externally managed. Borrowed capital may comprise the whole project cost or a portion of it. Borrowing places the debt on the balance sheet and introduces the additional cost of borrowing. Current regulations pertaining to debts incurred by the municipality need to be considered. We recommend that the proposed retrofits [be/not be] debt-financed.

8.3 Lease and lease-to-purchase

Various equipment leasing and lease-to-purchase arrangements are possible for the new technology installed in the proposed retrofits. As with debt-financing, these structures place debt on the balance sheet and there are costs of borrowing to be borne. However, the upfront costs of acquiring the equipment are avoided, which may improve the viability of the project. We recommend that the leasing options [be/not be] employed in this retrofit program.

8.4 ESCO-managed

The services provided by the ESCO can be unbundled or used as a comprehensive package that includes project financing. As noted above, our choice to use an ESCO does not preclude our providing financing through one of the options discussed. The ESCO may or may not be in a position to secure financing at a more attractive rate than [municipality x] itself. We recommend that this ESCO-managed project [utilize/not utilize] financing arranged by the ESCO.

Based on the analysis conducted in the development of this Proposal, we recommend that the selected projects be financed through [insert option].

9.0 COST-BENEFIT ANALYSIS METHOD

Cost-benefit analysis has both qualitative and quantitative aspects. Qualitative benefits arising from the proposed retrofits include co-benefits such as:

- Improved indoor air quality
- Improved worker productivity and reduced absenteeism
- Economic benefits to the community as discussed in Section 6.

Direct quantitative benefits arise from:

- Reductions in energy and other utility costs
- Reductions in maintenance costs due to the installation of new equipment as part of the proposed retrofits.

Our method for assessing the direct quantitative benefits, at this stage of the project development, is the calculation of simple payback period. It is appropriate to use this method since we do not have engineering level costs and savings for the proposed retrofits, and for this reason it is not yet possible to provide return on investment data with a high degree of accuracy.

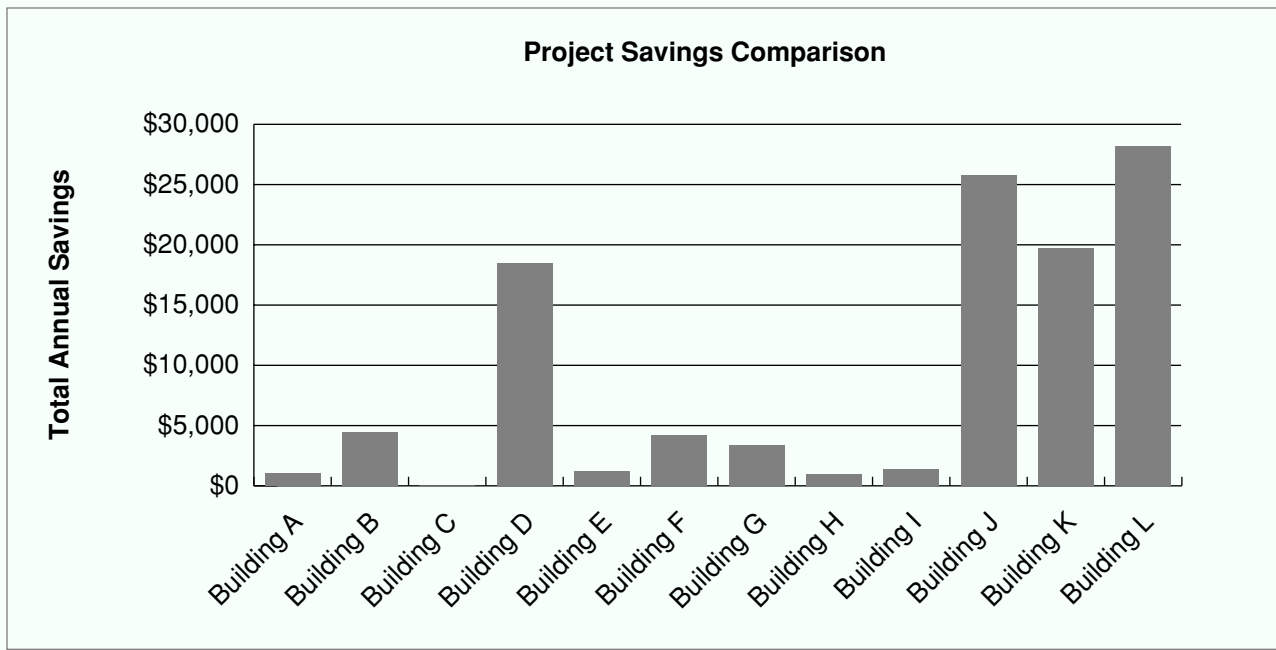
However, our preliminary estimates of the project cost and the savings returned, as summarized in Section 5, allow us to estimate the simple payback period for the proposed measures. The initial screening of alternative projects is based on their relative simple paybacks. Table 4 below summarizes the simple payback periods of the proposed retrofits.

Table 5: Simple Payback Periods for Proposed Projects

Site	Total Projected Savings \$/year	Estimated Project Cost \$	Simple Payback Period, Years	Rank
Building A	\$1,034	\$1,551	1.5	4
Building B	\$4,457	\$10,251	2.3	6
Building C	\$0	n/a	n/a	n/a
Building D	\$18,444	\$106,973	5.8	10
Building E	\$1,162	\$581	0.5	1
Building F	\$4,230	\$31,725	7.5	11
Building G	\$3,370	\$3,370	1.0	3
Building H	\$984	\$492	0.5	1
Building I	\$1,389	\$2,083	1.5	4
Building J	\$25,763	\$77,289	3.0	7
Building K	\$19,734	\$69,069	3.5	8
Building L	\$28,178	\$135,255	4.8	9
Totals	\$108,744	\$438,640	4.0	

We recommend that consideration be given to bundling projects. As noted above, all retrofits together have a combined simple payback period of four years.

At the Feasibility Study stage, as data becomes more refined and viable projects have been identified, we will employ life-cycle cost analysis methods.



10.0 MONITORING AND VERIFICATION

The central purpose of monitoring and verification for [municipality x] is to verify the energy savings achieved to [satisfy internal financial accounting and reporting requirements]

or

[meet the terms of third-party contracts for project implementation and management, including energy performance contracts].

A secondary, although in the long term no less important, purpose of the techniques associated with monitoring and verification is to ensure that savings are maximized and sustained through ongoing management control of the use of energy, a technique known as energy monitoring and targeting (M&T).

For the purpose of this retrofit [insert title] [municipality x] will use the following monitoring and verification strategy:

- *[A “whole building” approach to energy monitoring will be employed to determine variance from baseline performance as determined prior to the project. This approach will include adjustments for significant changes in energy determinants such as weather and building occupancy.]*

or

- *[“Retrofit isolation” is possible for the retrofits contemplated in this Proposal, and it is our intention at this point to develop this monitoring and verification strategy more fully for the proposed project.]*

The estimated cost for monitoring and verification in this project is \$[insert amount], representing approximately [insert value] per cent of the total project value.

11.0 TRAINING

The proposed retrofits have implications for the work demands of operating and maintenance staff, as well as the behaviours of building occupants. For this reason, we advocate the integration of staff training into the retrofit projects. Our preliminary analysis indicates the following needs for staff training:

- Operating staff need system-specific training for the operation of all new technologies being installed in the retrofits
- Maintenance staff need training that focuses on the energy-efficiency implications of proper maintenance of these and other existing systems in the buildings they maintain
- General staff occupying the buildings, including clerical, supervisory and management personnel comprising the indoor staff, need training to heighten their awareness of energy efficiency as a priority of [municipality x] and an appreciation of the energy and cost consequences of their day-to-day work-related activities.

Various sources of training workshops, courses, and awareness development sessions exist in our community. We recommend a provisional budget of \$[insert amount] be reserved as a part of the overall capitalization of this project for training. We further propose to engage Human Resources in the clarification of training needs and the procurement of appropriate training services to meet those needs.

12.0 RECOMMENDATIONS

To summarize, in the foregoing we have made the following recommendations:

1. A program of building improvement is recommended for the following facilities owned and operated by [municipality x]: [provide list]
2. It is recommended that council endorse continuing participation in the MBR process to execute the proposed retrofits.
3. It is recommended that [municipality x] council approve \$[insert estimated amount] to conduct a detailed Feasibility Study on the buildings listed above to confirm the details of a retrofit program.
4. It is recommended, based on preliminary cost and savings data, that project financing by [insert option] be fully explored.
5. It is recommended that the bundling of retrofits be fully considered with the objective of maximizing the capture of energy savings within the financial constraints that apply.
6. It is recommended that [insert name of ESCO, contractor, or other third-party company] be retained by [municipality x] to conduct the required Feasibility Study.
7. It is recommended that a “whole building” strategy for monitoring and savings verification be developed concurrently with the Feasibility Study.
8. It is recommended that [municipality x] secure the necessary services and resources to begin an assessment of the training needs of personnel, and commit to the implementation of required training programs at the earliest opportunity.

13.0 CONCLUSION

This Proposal builds on the information developed in previous steps of the MBR process. It utilizes and adds to information obtained in the Green Leaf™ Assessment, and refines and expands the directions described in the Action Plan.

In this Proposal we have presented more refined data concerning the performance of facilities owned and operated by this municipality. Our objectives in doing so are to:

- Screen the building portfolio and identify those buildings that offer the greatest potential for energy savings through retrofits
- Refine our knowledge of those buildings in terms of energy and cost performance and to estimate the savings that can accrue from retrofitting them
- Clarify the steps that need to be taken to move the retrofit program to its conclusion
- Obtain a commitment of resources from council to proceed to the Feasibility Study stage.

These objectives have been met as follows:

- Sections 1 and 2 present background for the Proposal, linking it to previous actions within the MBR process, and recommend continuing the process to the Feasibility Study stage.
- Sections 3, 4, 5 and 9 develop the information needed to select those buildings in the portfolio that should be studied further for retrofit possibilities, by providing energy use indices that have been compared to benchmarks for similar facilities.
- Sections 6, 7, 8, 10 and 11 address issues that need to be resolved and decisions that need to be made regarding the execution of retrofit projects.

