



CITY OF VANCOUVER

ADMINISTRATIVE REPORT

Date: September 8, 2005
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Meeting Date: September 22, 2005

TO: Standing Committee on City Services and Budgets

FROM: Director of Facilities Design and Management in consultation with the
Director of Finance and the Manager of the Sustainability Group

SUBJECT: Green House Gas Reduction - Award of contract for City Hall Energy
Performance Contract

RECOMMENDATION

- A. THAT, subject to the conditions set out in Recommendations B and C, the General Manager of Corporate Services be authorized to enter into a contract with Ameresco Canada Inc. for energy savings measures work on City Hall Campus facilities, as set out in Table 2 of Appendix "A", at a maximum total capital cost of \$1.82 million plus GST; source of funding to be as follows:
- \$186,000 from existing capital budgets for upgrading work;
 - \$214,354 from grants expected from external agencies; and
 - \$1.42 million from a loan from the Property Endowment Fund to be repaid back with interest from energy cost savings generated from the retrofit projects, on terms to be established by the Director of Finance.
- B. THAT the Director of Legal Services be authorized to execute and deliver on behalf of the City, all legal documents required to implement Recommendation A:
- C. THAT all such legal documents be on terms and conditions satisfactory to the General Manager of Corporate Services and to the Director of Legal Services, and further that no legal rights or obligations will be created or arise by Council's adoption of Recommendations A, B, and C unless and until such legal documents are executed and delivered by the Director of Legal Services.

- D. THAT the Director of Facilities Design and Management report back within one year of the completion of the upgrade work set out in the report and that said report include information about the Greenhouse Gas (GHG) reductions, the financial savings, the payback periods, and the general advisability of undertaking future energy performance contracts for the remaining City facilities, including Parks Board Facilities.

GENERAL MANAGER'S COMMENTS

The General Manager of Corporate Services RECOMMENDS approval of A through D above, noting that these projects are consistent with the City's climate change strategy and are supported by a positive business case.

COUNCIL POLICY

On April 23, 2002, Council adopted the Definition and Principles of Sustainability to guide, prioritize and improve the sustainability of City actions and operations.

On May 2, 2002, Council approved the motion proposed by the Federation of Canadian Municipalities to support the Canadian Government's ratification of the Kyoto Protocol.

On March 25, 2003, Council approved an emission reduction target of 20 percent from 1990 levels for the City of Vancouver, subject to evaluation of the implications of the target to ensure it is realistic. On this same date, Council created the Cool Vancouver Task Force and requested that it report back with a report on the components of a Greenhouse Gas Reduction (GHG) Action Plan for both the corporation and the community.

On June 24, 2003, Council received the Cool Vancouver Task Force's Discussion Paper on GHG Reduction Planning and approved a process to develop GHG Reduction Plans for both the City (Corporate) and the City (Community).

On December 2, 2003, Council:

- received and accepted the Corporate Climate Change Action Plan (CCAP) from the Cool Vancouver Task Force;
- affirmed and approved the 2010 target of a 20 percent reduction in Corporate GHG's;
- requested that Corporate Services and Engineering Services report back by January 2004 on the opportunities that Energy Performance Contracts may offer the City to reduce emissions from its building and facilities; and
- approved the hiring of an Energy Projects Coordinator to assist in developing and implementing energy performance contracts.

On February 24, 2004 Council directed staff to issue a Request for Proposals for energy performance contracting in order to achieve Council's mandated target of 20 percent reduction in GHG by 2010 for a report back on the selection of contractors. Subsequently, Ameresco Canada was selected to undertake an energy audit of City Hall Campus and to recommend energy-savings and GHG reduction measures.

PURPOSE

The purpose of this report is to seek Council's approval for the City to enter into an energy performance contract with Ameresco Canada Inc., and to establish a source of interim funding for this project, which will ultimately be paid for with the energy savings and external grants. The report recommends that the energy performance contract be comprised of twelve energy-savings measures, which are to be implemented in the City Hall Campus buildings.

BACKGROUND

Historically, the City has undertaken capital upgrades and retrofitting of City-owned facilities on an as-needed basis, funded through annual capital budgets. Over the past fifteen years, many successful energy efficiency projects have been completed within City facilities, using a combination of internal funding and BC Hydro Power Smart rebates. While energy efficiency is one of the criteria used in justifying such work, this one-off approach does not necessarily maximize potential energy savings, nor does it allow the City to meet its GHG reduction goal.

Reducing greenhouse gas emissions from the City's own facilities is an important part of the City's commitment to reduce its own corporate greenhouse gas emissions by twenty percent of its 1990 levels by 2010 (a 9,000 tonne reduction). This will be achieved by undertaking capital upgrade projects that retrofit City facilities with more energy-efficient technologies, resulting in a more energy-efficient operation.

Staff believe that this goal will be best achieved by a combination of City-administered, self-funded minor projects (Phase 1), and third-party energy performance contracts (Phase 2). While Council authorized a number of Phase 1 projects totalling approximately \$1,500,000, this report proposes a Phase 2 project for a third-party energy performance contract.

The Director of Facilities Design and Management estimates that there is potentially up to \$20 million of capital upgrade work on City-owned buildings that could be done in the future using third-party energy performance contracts. This project is intended to be a means of assessing the benefits of using this approach. If Council approves the recommendations of this report, staff will evaluate this project delivery method in terms of effectiveness, ease of administration, GHG reductions, and financial savings achieved, and report back to Council as soon as feasible on the advisability of entering into more energy performance contracts or alternative plans in the future in order to achieve the City's GHG reduction goals.

DISCUSSION

Energy Performance Contracts

An energy performance contract is a agreement that establishes a relationship between the owner of building facilities (in this case, the City) and an energy performance contractor (in this case, Ameresco) whereby the energy performance contractor is required to provide the following services for a fixed fee:

- Energy-savings assessment. Provide a list of proposed energy-saving measures, with an estimate of capital cost, GHG reduction, and a supporting business case including financial savings and financial payback.

- Project management. Act as a general contractor for the agreed to capital upgrades and retrofit work.
- Materials sourcing. Assist the City in procuring the most appropriate materials and technologies at the best possible price for the energy-savings measures that are implemented.
- Grant applications. Assist the City in applying for applicable grants for this work.
- Capital cost guarantee. Provide a guaranteed ceiling on the up-front capital cost for the work.
- Energy savings guarantee. Provide the City a guarantee of the ongoing annual energy savings associated with the retrofit work. This provides the City some certainty regarding the payback periods and the business case for the capital work undertaken.

As an alternative to a third-party energy performance contract, the City could opt to undertake the capital upgrade and retrofit work in-house, without engaging a third-party contractor. However, an energy performance contractor brings several benefits to the project, including expertise and resources that are not currently available in the City, a fixed price for the work and the savings guarantee.

City Hall Campus Energy Performance Project

As directed by Council in February 2004, staff, through a request for proposals from Energy Performance Contractors, selected Ameresco Canada Inc. ("Ameresco") to provide a detailed proposal to carry out work in the City Hall Campus, comprised of:

- City Hall Main Building - 453 West 12th Avenue,
- City Hall East Wing - 2675 Yukon Street, and
- City Hall West 10th Avenue Annex - 515 West 10th Avenue.

Ameresco submitted a feasibility report for this energy performance project in July 2005, a summary of which is attached as Appendix A.

Table 1 of Appendix A summarizes Ameresco's analysis of each of twenty-three potential energy-savings measures for the City Hall Campus energy performance project, which are projected to result in energy savings in natural gas, electricity and water consumption.

The list in Table 2 of Appendix A is a subset of the measures listed in Table 1, made up of the ten energy saving measures that Ameresco is recommending that the City undertake at this time (plus one which has already been completed, but is included to keep track of GHG reduction).

The business case developed by Ameresco shows the benefits of:

- (a) using a holistic approach and implementing each measure now as part of the contract (the one-time cost and ongoing annual savings associated with implementing each retrofit measure now); and
- (b) avoiding the cost of implementing each measure in a piece meal fashion sometime in the future, (as separate one-off projects and one-time cost with ongoing annual savings associated with implementing each retrofit measure independently).

Ameresco concluded that the recommended measures cumulatively:

- result in an annual savings of 320 tonnes of greenhouse gas emissions, which represents a reduction of 18% from 1990 levels (or 89% of the 20% target);
- represent a total investment by the City of \$1.82 million (with a portion to be offset with grants from external agencies and/or existing NNR funding),
- will generate annual savings of approximately \$120,756 (based on current utility rates);
- results in a simple payback of 11.7 years; and
- have a strong business case justification, with a positive net present value of \$240,257

FINANCIAL IMPLICATIONS

There are three potential sources of funding, totalling \$1.82 million, for the recommended measures (Appendix A):

- capital funding that exists in current budgets (\$186,000) for capital upgrades for four of the twelve measures recommended;
- grants from external agencies (BC Hydro and NRCan) based on energy savings are estimated by Ameresco to be \$214,354 (if necessary, interim funding financing from internal sources will be arranged for this item).; and
- energy cost savings that result from the retrofit work from the retrofit work that can be utilized to support interim financing during the payback period. This includes savings from existing budgets and additional savings that result from avoided increases in energy costs in the future.

The measures that are being proposed have a range of payback periods, depending on the capital cost and savings generated by each. It is estimated that interim financing will have a term of approximately sixteen years. The financial model anticipates that the budgets for these energy costs will continue to increase as the price of natural gas and electricity continues to increase in the future, increasing the savings and shortening the payback period.

To date, interim financing for energy projects has been provided from the Property Endowment Fund, with terms similar to loans other internally financed projects. Although an sixteen year term for these loans is beyond normal internal lending practice, it is recommended that this be the source of the requested financing, with the loans to be on terms acceptable to the Director of Finance.

ENVIRONMENTAL IMPLICATIONS

The following are the annual improvements to the environment as a result of this project;

- GHG reduction of 320 tonnes
- Electrical energy savings of 1,148,278 kWh
- Natural Gas savings of 4,196 GJ
- Water savings of 15,080 m³

CONCLUSION

This report recommends that the City enter into an energy performance contract with Ameresco Canada Ltd, which will involve twelve energy-saving measures on the City Hall Campus buildings. A \$1.82 million investment by the City will have a positive financial return (investment paid off within sixteen years, with a positive overall net present value of \$240,257), as well as annual GHG reduction 320 tonnes. This project will be used to evaluate the use of third party energy performance contractors for future energy-savings retrofit projects. Staff will report back on measures to be considered for the remaining City Hall facilities, including Parks Board facilities.

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Appendix - A

Feasibility Study Summary Energy Performance Contracting Program City Hall Campus

For

The City of Vancouver

Submitted by



The following information summarizes the results of the Feasibility Study conducted by Ameresco Canada for an Energy Performance Contracting program for the City Hall campus. Table 1 below summarizes the cost, savings and emissions reductions from all of the measures analyzed during the study.

Table 1

Measure	Annual Savings	Total Cost	Net Cost	Simple Payback	Busines Case (NPV)	Emissions Reductions Tonne CO2
West Annex Lighting Retrofit	\$ 5,760	\$ 178,023	\$ 168,569	29.3	-\$ 36,645	6
West Annex DDC Upgrade	\$ 12,488	\$ 120,930	\$ 23,751	1.9	\$ 78,538	40
West Annex Cooling Tower VFD	\$ 938	\$ 6,950	\$ 5,329	5.7	\$ 3,429	1
West Annex new cooling tower	\$ 103	\$ 143,170	\$ 143,051	1,387.8	-\$ 20,932	0
West Annex water conservation	\$ 68	\$ 417	\$ 417	6.1	\$ 142	-
West Annex Elevator Upgrade	\$ 1,098	\$ 487,890	\$ 485,994	442.6	-\$ 125,652	1
West Annex Boiler Replacement (Done)	\$ 2,585	\$ -	\$ -	-	\$ -	16
West Annex Lighting Switching Only	\$ 1,188	\$ 33,353	\$ 32,770	27.6	\$ 21,551	2
Training	\$ -	\$ 50,000	\$ 50,000	-	-\$ 47,170	-
Feasibility Study	\$ -	\$ 19,000	\$ 800	-	-\$ 32	-
CH Tower Lighting Retrofit	\$ 16,709	\$ 357,977	\$ 245,325	14.7	-\$ 47,736	6
CH Tower Lighting Redesign	\$ 21,380	\$ 508,783	\$ 381,183	17.8	-\$ 6,656	8
East Wing Lighting Retrofit	\$ 11,712	\$ 144,203	\$ 112,581	9.6	\$ 9,421	4
East Wing Lighting Redesign	\$ 13,062	\$ 348,877	\$ 312,936	24.0	-\$ 38,474	5
City Hall DDC Upgrade	\$ 33,623	\$ 148,730	\$ 118,722	3.5	\$ 171,568	59
East Wing Induction Unit changes	\$ 15,021	\$ 100,080	\$ 87,424	5.8	\$ 41,827	90
CH VFD on Pump AP1	\$ 2,204	\$ 13,205	\$ 9,400	4.3	\$ 8,496	3
	\$ -	\$ -	\$ -	-	\$ -	-
East Wing Washroom Upgrade	\$ 1,190	\$ 227,265	\$ 227,265	191.0	-\$ 54,715	-
CH Tower Washroom Upgrade	\$ 1,360	\$ 292,706	\$ 192,706	141.7	-\$ 28,415	-
CH Domestic water cooling upgrades	\$ 1,854	\$ 76,450	\$ 76,184	41.1	-\$ 57,263	0
East Wing Induction unit DDC	\$ 827	\$ 305,800	\$ 304,975	368.7	-\$ 217,703	4
CH Tower laminated glass	\$ 2,118	\$ 2,128,760	\$ 2,127,034	1,004.4	-\$ 78,007	13
Geothermal System	\$ 22,356	\$ 1,314,940	\$ 1,292,640	57.8	-\$ 1,043,313	198
CH Tower double pane glass	\$ 7,855	\$ 2,049,329	\$ 2,042,926	260.1	-\$ 55,188	48
Boiler Replacement City Hall	\$ 14,978	\$ 528,060	\$ 459,850	30.7	\$ 17,339	92

The Net Cost figures reflect the estimated net capital required after taking into account anticipated utility and government incentives (Recoveries) as well as any internal funding already approved by the City.

Recommended Project

Table 2 below summarizes the list of measures that are recommended to be included in the project scope presented to City Council for approval. These measures were recommended due to their attractive business case (NPV) on an individual bases, their contribution to maximizing GHG emissions reductions within a reasonable financial payback for the combined project scope and/or their impact on occupant comfort.

Table 2

Measure	Annual Savings	Total Cost	Net Cost	Simple Payback	Business Case (NPV)	Emissions Reduction Tonne CO2
West Annex Lighting Retrofit	\$ 5,760	\$ 178,023	\$ 168,569	29.27	-\$ 36,645	6
West Annex DDC Upgrade	\$ 12,488	\$ 120,930	\$ 23,751	1.90	\$ 78,538	40
West Annex Cooling Tower VFD	\$ 938	\$ 6,950	\$ 5,329	5.68	\$ 3,429	1
West Annex water conservation	\$ 68	\$ 417	\$ 417	6.13	\$ 142	-
West Annex Boiler Replacement (Done)	\$ 2,585	\$ -	\$ -	-	\$ -	16
Training	\$ -	\$ 50,000	\$ 50,000	-	-\$ 47,170	-
Feasibility Study	\$ -	\$ 19,000	\$ 800	-	-\$ 32	-
CH Tower Lighting Redesign	\$ 21,380	\$ 508,783	\$ 381,183	17.83	-\$ 6,656	8
East Wing Lighting Retrofit	\$ 11,712	\$ 144,203	\$ 112,581	9.61	\$ 9,421	4
City Hall DDC Upgrade	\$ 33,623	\$ 148,730	\$ 118,722	3.53	\$ 171,568	59
East Wing Induction Unit changes	\$ 15,021	\$ 100,080	\$ 87,424	5.82	\$ 41,827	90
CH VFD on Pump AP1	\$ 2,204	\$ 13,205	\$ 9,400	4.27	\$ 8,496	3
Boiler Replacement City Hall	\$ 14,978	\$ 528,060	\$ 459,850	30.70	\$ 17,339	92
Total	\$ 120,756	\$ 1,818,380	\$ 1,418,026	11.7	\$ 240,257	320

Financial Summary

Table 3 below summarizes the financials for the above noted recommended project scope.

Table 3

Total Project Cost	\$ 1,818,380	Business Case: 10-year NPV	\$ 240,257
Estimated Incentives	\$ 214,354	Business Case: 20-year NPV	\$ 352,255
Existing Funding	\$ 186,000	GHG Reduction Target (Tonne CO2)	361
Net Project Cost	\$ 1,418,026	Estimated GHG Reduction (Tonne CO2)	320
Annual Savings	\$ 120,756	% of Reduction Target	89%
Simple Payback	11.7	Reduction From 1990	18%