

POLICY REPORT ENVIRONMENT

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TO: Vancouver City Council

FROM: General Managers of Corporate Services, Engineering Services,
Community Services and Park Board, in consultation with the Manager of
Sustainability

SUBJECT: Initiative to Improve the Energy Efficiency of City-Owned and City-
Occupied Buildings

RECOMMENDATIONS

- A. THAT Council direct staff to issue a Request For Proposal for Energy Performance Contracting Services associated with improving the energy efficiency of City-owned and City-occupied buildings in order to meet Council's mandated target of a 20 percent reduction in Greenhouse Gas Emissions (GHG) by 2010; for report back to Council on the selection of the Contractor.
- B. THAT staff report back to Council, and the Park Board for their buildings, once the Energy Service Contractor has completed the facility audits with the terms of the contract prior to commencing energy retrofit projects; said terms to be satisfactory to the Directors of Legal Services and Finance.

GENERAL MANAGERS' COMMENTS

The General Managers of Corporate Services, Engineering Services, Community Services and Park Board RECOMMEND approval of A and B.

CITY MANAGER'S COMMENTS

The City Manager recommends approval of the foregoing.

COUNCIL POLICY

On October 16, 1990, Council approved in principle the Clouds of Change Recommendation to reduce the City's carbon dioxide emissions by 20 percent as part of the actions to address global climate change issues, subject to future reports on costs and trade-offs involved in achieving the objectives and targets.

In 1995, the City joined the Federation of Canadian Municipalities' "20 percent Club," which became the Partners for Climate Protection Program in 1998.

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

On May 2, 2002, Council unanimously 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 Greenhouse Gas Reduction Planning and approved a target of 6 percent below 1990 emissions levels for the City (community) as a whole. Council also approved a process to develop GHG Reduction Plans for both the City (Corporate) and the Community.

On December 2, 2003, Council:

- received and accepted the Corporate Climate Change Action Plan 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 buildings and facilities;
- approved the hiring of an Energy Projects Coordinator to assist in developing and implementing Energy Performance Contracts.

SUMMARY

The City has committed to reducing its Corporate Greenhouse Gas emissions by 20 percent of 1990 levels by 2010 (9,000 tonnes reduction). Achieving this goal within the next six years requires a significant reduction of emissions from civic facilities (4,650 tonnes). Staff has concluded that the most practical and cost-effective way to meet this goal in the short time available is through Energy Performance Contracts. This approach has been used successfully by the University of British Columbia and the City of Burnaby and is presently being considered by other municipalities.

Staff believe that utilizing the services of Energy Performance Contractor(s) will enable the City to realize significant, guaranteed energy savings with minimum capital cost outlay or additional staff, and would enable the City to meet its target reduction in the time available.

PURPOSE

The purpose of this report is to seek Council's approval to develop one or more Energy Performance Contracts as a means to improve the energy efficiency of City-owned and City-occupied buildings so as to achieve the target of a 20 percent reduction in GHG emissions by 2010. This involves evaluating the expertise of potential Energy Performance Contractors (EPC), conducting a comprehensive energy audit of the City's facilities to determine the scope of the work; negotiating and defining appropriate contract terms and assessing risks, financial commitments, and potential cost savings.

BACKGROUND

The Corporate Climate Change Action Plan focused on five specific areas for GHG reduction, including: civic building; the City's fleet; street and park lighting and traffic control signals, corporate waste reduction and landfill operation, and Corporate demand side management. The City's corporate GHG emissions in 1990 are estimated to have been 46,000 tonnes. It is estimated that approximately 50 percent of the City's corporate emissions come from the energy used in the operation of its civic facilities. Thus, the corporate plan targets a net reduction from civic facilities of 4,650 tonnes from 1990 levels through a variety of measures.

The City and Park Board occupy approximately 260 City buildings (approximately 4.8 million SF), of variable sizes and age. Some newer buildings, such as those at in the new Engineering Yards and those in the design stage, incorporate high standards of energy efficiency, however, most of the City's existing buildings are significantly inefficient and offer substantial opportunities for improving energy consumption. It is estimated the City consumed approximately \$12 million dollars of energy in 2003 (natural gas, electricity and steam).

Measures for reducing energy use range from improving controls; reducing heating, ventilation, air conditioning and electricity use; introducing efficient lighting, appliances and equipment; increasing insulation levels; making use of daylight and passive solar heating; and improved monitoring and training. Because every facility is unique in its construction, operation, and potential for improvement, each building requires a tailored approach to energy conservation.

Every method of reducing energy use has both costs and paybacks that must be individually weighed for each facility and in aggregate so that efforts may be focused on obtaining the necessary overall benefits. In financial terms, most energy efficiency measures require initial capital outlays that can be repaid over time with lower electricity and fuel costs.

DISCUSSION

Considerable expertise is required to audit and prioritize the measures suitable for each facility if the City is to receive an acceptable payback in both energy efficiency and financial terms. Assessing the individual emission reduction potential of so many different buildings, and then making the necessary improvements within the available time, is a major initiative requiring specialized expertise and significant capital outlay.

The City lacks sufficient staff and expertise to conduct such technical audits and retrofit programs within the available time. In addition external consultants and contractors will be required to perform this work. Two approaches to implementing such projects are:

- 1) Energy Performance Contracts
- 2) Self-managed implementation

Staff have evaluated the two approaches and recommend pursuing Energy Performance Contracts. The Energy Performance Contractor (Contractor) who partners with a facility owner can undertake an audit and implement retrofit programs much quicker and more economically than would be possible under a self-managed approach. Handling such large scale and highly-specialized projects by City staff would require either a reallocation of existing senior staff (resulting in a disruption or cancellation of other equally critical programs and projects), or the recruitment and organization of a substantial team of project managers and consulting engineering personnel with specialized skills in assessing and identifying building upgrades. A self-managed approach would take significantly more time to implement and it may not be possible to meet the established target within the timeframe that has been established.

An additional motive to expedite the projects is BC Hydro commitment to assisting and providing funding for organizations to pursue energy efficiency until March 2005. Although it would not be possible under any approach to have the retrofits completed by then, the City would be eligible for this significant Power Smart funding if it were to enter into Energy Performance Contract(s) by this deadline.

1. Energy Performance Contracts

Energy Performance Contracts (EPCs) offer the City a potential means of implementing energy efficiency projects and reducing operating costs without up-front financial outlay and at minimum risk. Energy Performance Contractors typically provide the initial capital outlay, guarantee the cost savings, and are repaid from a share of the resulting cost savings.

EPCs are often consortiums of consulting engineers and other resources, normally providing a comprehensive, turnkey package of project services, which can include analysis, design, tendering, construction, commissioning, staff training, maintenance and monitoring. Consortiums usually include a bank or financial institution for the capital resources needed to implement the projects. The Contractor's compensation is based solely on results and the energy and other cost savings realized through the efficiency improvements. Additionally, the Contractor will be required to assume all of the technical and financial risks and will typically guarantee its promised share of the savings even if those savings do not actually materialize.

Energy performance projects represent a comprehensive bundle of energy saving measures, addressing all energy related components such as lighting, heating, ventilation, air-conditioning, and control systems as well as water efficiency measures. At the same time, these contracts offer the opportunity to incorporate and finance large-scale facility infrastructure renewal and "green" building measures. Additionally, economies of scale and scope are enabled by combining the energy auditing and retrofitting of multiple facilities into a single contract.

Regardless of the comprehensive nature of the services provided, the City will be required to commit resources to manage the contract and evaluate and approve the measures to be implemented to ensure that City operations and interests are not adversely affected. Council has already approved an Energy Projects Coordinator position to assist with this work.

2. Energy Performance Contract Features

There are five (5) major components of EPC. These are:

Proposal Call

A Request for Proposal (RFP) with specific terms, including: a list of buildings, energy reduction target, present energy consumption levels, and desired operational, safety and functional requirements for each building will be issued to prequalified EPCs. On the basis of a walk-through inspection of all, or a representative group of buildings, proponents will be required to submit proposals that will include the cost for undertaking an audit, options for achieving the desired energy reduction, general terms of financing, typical implementation upgrades based on a range of assumptions, guarantees, and payback periods for each group of buildings specified. In the process of developing the RFP, staff will evaluate the possible advantages of entering into more than one EPC based on grouping of facility types and the opportunity to accelerate the schedule for some types of facilities.

The actual terms of the contracts will be finalized with the selected Contractor(s) after the audit is completed and will be reported to Council.

Technical Audit

Once selected, the Contractor's first task will be to conduct a comprehensive technical audit of the designated buildings. Audits could be carried out on all buildings as a group, or specific buildings could be bundled and the audit carried out in phases. The latter approach provides the City the opportunity to terminate the audit at its discretion and minimize its financial exposure. The cost of the audit, estimated at 5 to 10 cents per square foot, will be borne by the Contractor and will be incorporated in the overall capital cost. Once the audits are completed, the City will have the option of either proceeding with the recommended improvements or deferring the implementation, in which case the City will be required to reimburse the Contractor for the audit costs on the basis of a pre-agreed payment schedule. If the City elects not to enter into an Energy Performance Contract, these audit results and improvement plans will be useful for undertaking self-managed energy efficiency improvements, should the City choose to undertake this work itself.

Terms of the Contract

Once the audit is completed, the Contractor will prepare an estimate of the energy saving for each building, capital upgrade required, recommended operational changes, guarantees, payback options, and an implementation schedule. The City and Park Board would then decide which of the buildings they wish to include in the retrofit program, and the contract terms will be finalized. The Contractor will be compensated only if it realizes its actual projected savings and, therefore, would be strongly motivated to work out any difficulties or discrepancies. In general, the Contractor will assume all risk for design, capital improvements, performance, efficiency and savings, and the City will likely be required to assume the risk for hidden conditions, if any, rise and fall in energy costs, and ongoing maintenance.

Implementation and Commissioning

In the retrofit stage, past experience is valuable in ensuring that equipment installation and commissioning are accomplished with minimal disruption and inconvenience to facility occupants. Since the Contractor will be required to provide a turnkey service, the City will not be obliged to devote staff time to coordinate work schedules, suppliers and contracts, but only to observe, monitor and review the work.

In a subsequent phase, revisions to operating procedures will be undertaken to ensure that system retrofits operate as planned and at predetermined costs. Systemic measurement of cause and effect relating to operational changes is a unique feature of energy management contracts.

Monitoring and Measuring Performance

The Contractor will be required to subsequently monitor and maintain installed equipment and train the City and Park Board's operations staff to ensure that the energy management improvements perform as planned and that cost savings continue to be realized. The City and Park Board will remain in control of the operation of their respective buildings, but changes in building operations may affect members of the public. It is important that resources be allocated to informing users of any changes on a building by building basis prior to new operating procedures being implemented.

Energy savings are usually calculated by metering a building's energy efficiency improvements. Where a complicated or extensive energy distribution system requires the use of assumptions to determine savings, those assumptions must be validated in advance by the City. Adjustments may be required to compare the effects of weather, occupancy changes, operation and maintenance needs on a year over year basis. Additional changes to the utility rate structure and the resulting real cost of energy may require further engineering and financial analyses.

3. Experience of Other Cities and Organizations

Energy Performance Contracts have been developed and have become established as an effective way to finance and implement building energy retrofits. A significant number of companies offer a comprehensive package of energy performance services. Such services have already been contracted by the Cities of Toronto, Hamilton, Windsor, Prince Albert, Regina, and Calgary. In BC, the University of British Columbia and the City of Burnaby have initiated comprehensive Energy Performance Contract processes. The City of Vancouver is currently conducting pilot projects involving energy audits of potential retrofits of City Hall and Library Square that may be incorporated in the Energy Performance Contracts.

ALTERNATIVE OPTION

Self-Managed Approach

Reduction of building emissions is a critical factor in reaching the 2010 emission reduction goal. City staff have the skills and experience to implement a comprehensive energy management program but cannot be seconded on such large scale without serious impacts on other equally valuable programs and projects. Additional staff would be needed. With only six years to hire, train, develop, organize and apply the necessary and rare expert engineering skills to the required tolerances, performing the required work in-house would result in an unacceptably high risk of failure to achieve the goal. Staff believe that in this context external expertise must be obtained. The expertise and resources of City staff can be used most effectively to manage and direct external turnkey contractors.

Some engineering consulting companies are capable of carrying out energy efficiency projects, on the necessary scale, for a fixed price. However, energy performance consulting is a highly specialized area, and expertise, experience and scope of services is unlikely to be as extensive as that offered through energy performance contracting. In addition the City would have to bear all the risks.

FINANCIAL IMPLICATIONS

An Energy Performance Contract can be formatted so that the Contractor bears the total cost of the full range of improvements and is repaid from subsequent cost savings. The Contractor will guarantee the capital cost and a positive cash flow to the City and will be responsible any shortfall if actual cost savings fall short of the guarantee.

There are several alternative ways of structuring the resulting cash flows. Under a “first-out” arrangement the Contractor retains all of the cost savings generated until the pre-approved project cost is paid out or until the end of the contract term, whichever occurs first, and all subsequent cost savings are retained by the City. A “shared savings” approach permits the Contractor and the City to split the savings under a prescribed formula over the life of the contract. Another alternative, “guaranteed savings”, requires the Contractor to pay the City’s utility bills for the contract period, and the City in turn pay the Contractor a fixed monthly fee equal to its energy costs before the project, less a specified discount. Under each option the Contractor would bear all risks associated with the capital costs, except for hidden conditions noted earlier. After the audit is completed and financial analyses are completed staff will report back to Council and the Park Board on which financial option best fits the City needs.

Generally, Contractors will allow a facility owner to buy out a contract at any time after construction is complete, at a price based on the combination of the outstanding balance of the Contractor’s investment and stated profit margin.

Although the intention of an Energy Performance Contract is to combine many City-owned and City-occupied buildings into a single package, it is readily feasible to identify and allocate the resulting benefits on a building-by-building basis.

BC Hydro’s Power Smart program offers significant financial incentives for energy efficiency improvements to buildings, and these incentives can conceivably sweeten the City’s payback.

However, Power Smart sets a threshold level of 300,000 kilowatt hours consumption, and in order for the City to qualify, multiple buildings must be packaged into a single project. An Energy Performance Contract offers an ideal package. Such contracts may also enable the City to realize additional compensation through grants under the Federation of Canadian Municipalities' Green Municipalities Enabling Funding and Green Municipal Infrastructure Funding.

The recommendations in this report does not commit the City financially at this stage of the process. The first financial commitment will occur once a Contractor is selected and Council authorizes staff to proceed with an audit of the buildings. As noted in the report, the audits could be undertaken as a single package or grouped into representative packages and be undertaken sequentially so as to limit the City's financial exposure should the City decide to terminate the audit at any time. Should the City decide not to proceed with the capital works by way of EPCs, the City will be required to reimburse the Contractor for the portion of the audit work completed.

The second financial commitment will be made when the audit is completed, and Council authorizes the capital work to proceed. At this stage the City will be required to decide the amount of funding, if any, it wishes to commit for the capital works and the payback period it wishes to adopt. Funding will likely to be only committed by the City if the City deems that it could finance the capital work at a lower price than the Contractor and, in so doing, receive the cost savings earlier.

If the City decides to have the Contractor bear all the audit and capital costs associated with the retrofits, then the City will bear no financial commitment for the project, and the Contractor will assume all risks associated with the project. The City may secure additional security against other risks such as bankruptcy by way of insurance and bonding.

ENVIRONMENTAL IMPLICATIONS

Council has endorsed a 20 percent reduction in Greenhouse Gas emissions by 2010 for the City as a corporation. This goal cannot be met without a substantial reduction of emissions from buildings and facilities. Staff believe that an Energy Performance Contract approach can provide improvements to the required extent, in the time remaining, at acceptable risk levels.

IMPLEMENTATION PLAN

If Council endorses this proposal, staff will immediately begin a request for proposal process to assess and identify the most appropriate energy performance contractor, and report back to Council with results of the process and recommendations.

Once identified and selected, the Energy Performance Contractor will conduct comprehensive energy audits on all designated City facilities. These energy audits result in a facility-by-facility identification of potential savings and the requirements necessary to realize those savings. Concurrent with these audits, the City and Contractor will negotiate the terms of the Energy Performance Contract. Although many precedents exist, intensive and time-sensitive negotiations will be necessary to prepare a contract that adequately describes

relative roles in this complex, large scale building improvement process, and satisfactorily defines terms and conditions of financial guarantees and operational requirements. When the audit and negotiations are complete, the City will have the option of either proceeding with the execution of the Contract(s) or reimbursing the ESCO(s) for the audit costs.

After approval is received from Council, City staff and the Contractor(s) will then proceed to implement the audit recommendations under a plan carefully designed to ensure the 2010 goal is met in time. The Contractor(s) will be compensated for its investments and effort by a share of savings over a period time, after which all subsequent cost savings belong to the City.

A preliminary timeline including major project milestones is included in Appendix A.

CONCLUSION

An energy performance contract can potentially offer the City of Vancouver the opportunity to upgrade energy-consuming building infrastructure and reduce greenhouse gas emissions with minimal demands on City capital and staff resources while at the same time receiving cash benefits from reducing energy consumption and building operating and maintenance costs.

This approach uses City staff expertise effectively, facilitates cost control, creates a single source of project accountability, generates a positive cash flow, and transfers most of the risk of project performance to the Energy Service Contractor while maintaining City control of the project objectives. It is also likely to result in quicker completion of the retrofits than would a self-managed approach.

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Preliminary Schedule for EPC Projects

Issue RFP to select EPCs	April 15, 2004
Site Visits by EPCs	April 30 to May 21, 2004
Receive Proposals	August 01, 2004
Report to Council on selection of Contractor	September 21, 2004
Award Contract	October 05, 2004
Complete Audit and Contract Negotiation	June 14, 2005
Report to Council on Implementation of projects	June 28, 2005
Complete Projects	June 2007