

NO: **R048**

COUNCIL DATE: **March 12, 2012**

REGULAR COUNCIL

TO: Mayor & Council

DATE: March 8, 2012

**FROM: General Manager, Engineering
General Manager, Finance and Technology**

FILE: 5510-103

**SUBJECT: Additional Expenditure Authority for the Construction of the Geoexchange
Field in support of the District Energy System in Surrey City Centre**

RECOMMENDATION

The Engineering Department and the Finance and Technology Department recommend that Council approve an increase in the expenditure authorization for the underground works contract related to the Civic Centre project in City Centre in the amount of \$1,491,000 plus HST to allow for the expansion of the geoexchange field being installed by way of this contract for the City Centre District Energy system.

PURPOSE

The purpose of this report is to obtain Council approval of funding for the expansion of the geoexchange field that is being installed under the new parking structure in City Centre in support of the City Centre District Energy system.

BACKGROUND

At its Regular meeting on March 14, 2011 Council awarded a contract to PCL Constructors Ltd for the construction of underground works for the New City Hall, Civic Parking Structure and Community Plaza (the "Civic Centre Project") that included, among other things, the installation of a geoexchange field for heating and cooling the Civic Centre Project. At its Regular meeting on May 9, 2011 Council approved the recommendations of Corporate Report No. R070; 2011, a copy of which is attached as Appendix I, that provided an allocation of \$2,300,000.00 for the implementation of a district energy system to serve new development projects in the Surrey Central node of City Centre, including the Civic Centre Project. Part of these funds are being used to support an expansion of geoexchange field under the new City Centre parkade since it has been determined that such an expansion is an economical source of energy for the proposed City Centre District Energy system. The amount approved for the contract related to the construction of the geoexchange field needs to be increased by \$1,491,000 plus HST to cover the cost of the expansion of the field. The subcontractor undertaking the construction of the field was the low bidder chosen through a competitive process.

The costs associated with implementing the City Centre District Energy system will be recovered over time by way of energy rates paid by customers serviced by the District Energy utility.

Funding

Funding to support the recommended expenditure authority increase is available from the \$2,300,000 previously approved by Council for the implementation of a district energy system in City Centre as referenced above.

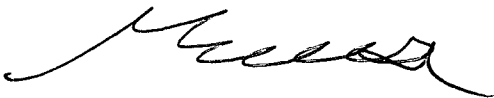
SUSTAINABILITY CONSIDERATIONS

The implementation of a district energy system in City Centre supports the Economic and Environmental Pillars of the City's Sustainability Charter; more particularly, the following specific action items:

- EC8: Energy Security - by promoting the use of low-impact, renewable energy sources and promoting community energy solutions;
- EN1: Energy Efficiency - by incorporating alternative energy systems such as geexchange systems for City facilities that are less impactful on the environment; and
- EN10: Integrated Community Energy Master Plans - by developing an Integrated Community Energy Master Plan for the City Centre and by working with private property owners to promote upgrades and retrofits that increase building energy efficiency such as through the connection to a district energy system.

CONCLUSION

Based on the above discussion, it is recommended that Council approve an increase in the expenditure authorization for the underground works contract related to the Civic Centre project in City Centre in the amount of \$1,491,000 plus HST to allow for the expansion of the geexchange field being installed by way of this contract for the City Centre District Energy system.



Vivienne Wilke, C.G.A.
General Manager,
Finance & Technology



Vincent Lalonde, P.Eng.
General Manager,
Engineering

VL/JA/JO/brb

Appendix I – Corporate Report No. R070;2011

CORPORATE REPORT

NO: R070

COUNCIL DATE: May 9, 2011

REGULAR COUNCIL

TO: Mayor & Council

DATE: May 3, 2011

FROM: General Manager, Engineering
General Manager, Finance and Technology

FILE: 5510-103

SUBJECT: Financing for a District Energy System in Surrey City Centre – Surrey City Energy

RECOMMENDATION

The Engineering Department and Finance & Technology Department recommend that Council:

1. Receive this report as information; and
2. Approve an allocation of \$2,300,000.00 from internal reserves as a loan to augment capital funding that is already allocated in the City's Capital Budget for the implementation of a district energy system to serve development in vicinity of the Surrey Central Station including the New City Hall, the new City Centre Library and other future development in this area.

INTENT

The purpose of this report is to provide information about a proposed inaugural district energy system in Surrey City Centre, the establishment of a Corporation known as "Surrey City Energy" that will oversee the design, construction, operation, maintenance and management of the district energy system and to seek Council approval for a loan of \$2.3 million to assist in financing the subject district energy system.

BACKGROUND

At its Regular meeting on May 17, 2010 Council considered Corporate Report R109; 2010, that noted that DE systems would help the City to meet the commitments set forth in the Surrey Economic Investment Action Plan and the Surrey Sustainability Charter with respect to energy security, energy efficiency, waste reduction and economic development.

At its Regular meeting on January 24, 2011 Council considered Corporate Report R013; that authorized staff to establish a District Energy Utility for the purpose of designing, constructing and operating a district energy system in City Centre. As part of that report, staff committed to forward further reports to Council regarding the design, financial strategy, operating strategy,

tendering, construction and other matters related to the implementation of a DE system in the City Centre area.

Building on the results of the City Centre District Energy Strategy, staff has completed a district energy feasibility study for the area in the vicinity of the Surrey Central Station (known as "Surrey Central Node"). The report addresses the technical, financial, environmental and social aspects of implementing a district energy system to serve the heating, cooling and domestic hot water needs of existing and future development in this Node. A second component of the feasibility study was to develop a conceptual design for the district energy (DE) system that would initially serve the new City Hall, the new City Centre Library and future phases of development in the Surrey Central Node collectively called the "Civic Centre Developments".

DISCUSSION

The proposed district energy system will capture energy by utilizing a vertical, closed-loop geexchange system that uses heat pumps to extract heat from the ground under the parkade that is being constructed as part of the new City Hall/Community Plaza project. In addition to simply providing thermal energy for the Civic Centre Developments, the proposed DE system will provide the following benefits:

- Increased energy security by limiting reliance on external energy sources;
- Reduced GHG emissions;
- Flexibility and adaptability to future clean energy sources; and
- Potential for connectivity to future DE systems.

Utility Ownership and Governance

The district energy system will be established as a utility, which will be named "Surrey City Energy (SCE)". The SCE will be operated as a business unit within the Engineering Department at the outset but will be structured to enable future transfer to another management entity should such a transfer prove advantageous in the future.

It is important for the SCE to be established on a sound financial framework. It is proposed that SCE be operated in a similar fashion to a private energy utility where all utility costs are accounted for in the rate structure including operation, maintenance, debt repayment, debt servicing and management costs.

A financial analysis has been completed, which compares the life cycle costs of the proposed district energy system with the conventional non-DE system approach where all buildings would be heated and cooled independently.

It has been determined that the proposed DE system to service the Civic Centre Developments will require a larger capital investment than would be required with the conventional non-DES scenario but has lower annual operating, maintenance and energy costs due to system efficiencies. The following table (Table 1) summarizes the capital costs and operating costs of the DE system in comparison to the conventional system for the aggregate development involving the new City Hall, the new City Centre Library and 400,000 sq. ft. of other "high rise" development in the same area.

Table 1 - Capital, Operating and Maintenance Costs

Cost	Non-DES Scenario (\$,000's)	DES Scenario (\$,000's)
Total Capital Costs	3,607	4,810
Annual Operating (Including Energy), Maintenance and Management Costs	296	198

Based on a 30-year amortization period at an interest rate of 5% the DES scenario has a payback period of 21 years for the difference in capital costs between the two approaches, based on current forecasted pricing for energy used in the conventional systems. The payback period decreases (improves) if the price of conventional energy (electricity, natural gas, etc.) increases at a rate higher than forecast, which is considered to be very probable over the next 30 years.

The DES scenario requires a larger capital investment than the non-DES scenario, but has more favourable life cycle costs due to lower operating and maintenance costs.

System Expansion

The proposed DE system will be expandable to other heat and cooling sources in the future and to serve other development in the vicinity of the Surrey Central Station as it occurs. Future expansion of the DE system will further improve its overall efficiency and increases flexibility in relation to energy sources.

Borrowing Requirements

The Capital budget established for the new City Hall included an allocation for the development of a geoexchange system to heat and cool the new City Hall. Both the new City Hall and the new City Centre Library are designed to be connectable to a DE system. To expand the new City Hall geoexchange system so that it has sufficient initial capacity to service 400,000 sq. ft. of other high density development in the same area as the new City Hall and the new City Centre Library, and to provide funding to design for future system expansion, an additional investment of \$2.3 million is necessary. This amount will be recoverable over time from rates paid to the DE utility. Staff is recommending that the capital allocation to the district energy utility be increased by \$2.3 million by way of a loan from internal reserves, which would be repaid with interest over an amortization period.

Staff will pursue funding for the design and construction of DE infrastructure from the Provincial and Federal Governments, through the BC Hydro PowerSmart Program and from the Federation of Canadian Municipalities' Green Municipal Fund. If funding from such sources is secured the loan amount from internal reserves will be reduced accordingly.


SUSTAINABILITY CONSIDERATIONS

The implementation of an inaugural district energy system to serve the Civic Centre Developments will support the Economic and Environmental Pillars of the City's Sustainability Charter; more particularly, the following specific elements:

- EC8: Energy Security - by promoting the use of low-impact, renewable energy sources and promoting community energy solutions;
- EN1: Energy Efficiency - by incorporating alternative energy systems such as geo-exchange and solar heating systems for City facilities; and
- EN10: Integrated Community Energy Master Plans - by developing an Integrated Community Energy Master Plan for the City Centre and by working with private property owners to promote upgrades and retrofits that increase building energy efficiency such as through the connection to a district energy system.

CONCLUSION

Based on the above discussion, it is recommended that Council approve an allocation of \$2,300,000.00 from internal reserves as a loan to Surrey City Energy to augment capital funding that is already allocated in the City's Capital Budget for the implementation of a district energy system to serve development in vicinity of the Surrey Central Station including the New City Hall, the new City Centre Library and other future development in this area.



Vivienne Wilke, C.G.A.
General Manager,
Finance & Technology



Vincent Lalonde, P.Eng.
General Manager,
Engineering

JA/JO/brb

g:\wp-docs\2011\admin\cr\04271114jo (mdja).docx
BRB 5/5/11 12:28 PM