



Report to: General Committee

Meeting Date: October 5, 2020

SUBJECT: Contract # 043-S-20 To Operate and Maintain the Combined Heat and Power System at Angus Glen Community Centre

PREPARED BY: Jason Vasilaki, Project Manager, Ext. 2845
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RECOMMENDATION:

1. THAT the report entitled “Contract # 043-S-20 To Operate and Maintain the Combined Heat and Power System at Angus Glen Community Centre” be received and,
2. THAT the Operation and Maintenance of the Angus Glen Combined Heat and Power System be awarded to Markham District Energy Inc. (“MDE”) to an annual upset limit of \$167,904.00 inclusive of HST impact for a period of five (5) years (2020 – 2024), totaling \$839,520.00 inclusive of HST impact (excluding adjustment to CPI) over that five (5) year period and,
3. THAT years 2 – 5 (2021-2024) be adjusted based on the Consumer Price Index (CPI) Ontario All-Items (January to January) and,
4. THAT the 2020 award be funded from operating budget account 504-921-5314 “Service Agreements Facility Maintenance” and,
5. THAT the tendering process be waived in accordance with Purchasing By-Law 2017-8, Part II, Section 11.1 (h), which states “where it is in the best interests of the City to acquire non-standard items or Professional Services from a supplier who has a proven track record with the City in terms of pricing, quality and service;” and,
6. THAT the Mayor and Clerk be authorized to execute the agreement with Markham District Energy Inc, in a form approved by CAO and the City Solicitor and,
7. THAT the CAO be authorized to extend the contract for an additional five (5) years (2025-2029) subject to Council’s approval of the annual operating budget
8. AND THAT Staff be authorized and directed to do all things necessary to give effect to this resolution.

PURPOSE:

The purpose of this report is to seek Council’s authorization for a non-competitive award to Markham District Energy Inc. (“MDE”) to operate the Combined Heat and Power (CHP) system at Angus Glen Community Centre & Library and for associated maintenance advisory and maintenance co-ordination services on behalf of the City.

BACKGROUND:

The City recently installed a Combined Heat and Power (CHP) system at Angus Glen Community Centre & Library (AGCC&L). Commissioning is currently ongoing.

The CHP system utilizes a heat engine (a natural gas powered generator) to generate electricity. The facility uses this electricity in lieu of power from the electrical utility (grid), at a lower overall cost. A typical generator creates heat as a by-product, which is usually released to the environment as waste heat. The CHP process reclaims such waste heat and reuses it in the facility, thereby further creating even more savings in utility costs. At Angus Glen, this waste heat is used to supplementally heat the building's interior space, the domestic water and the water in the pools. As a result AGCC&L will see a reduction in overall operating costs as the utility savings are greater than the costs to operate the CHP (including this contract).

Markham District Energy Inc. (MDE) is an internationally recognized district energy company providing heating and cooling services to nearly 12 million square feet of private and public buildings in Markham with 15.5 MW (megawatts) of combined heat and power equipment in their system.

MDE is wholly owned by the City of Markham and provides heating and cooling services to City facilities including; Civic Centre, FLATO Markham Theatre, 8100 Warden, Pan Am Centre, Cornell CC&L and Fire Station 99.

OPTIONS/ DISCUSSION:

Retaining an experienced CHP operator would ensure maximum operational efficiency and energy savings are achieved. Staff recommends a non-competitive contract award to MDE based on following rationale:

Technical expertise

MDE has owned and operated CHP equipment since 2001. As part of the service agreement, MDE will provide the following services:

- CHP design and integration reviews
- Assisting with start-up and commissioning activities
- Establishing vendor maintenance contracts and reviews in conjunction with the City representative
- Managing warranty and vendor guarantees
- Management and ongoing review of CHP Vendor Service
- Management of any third-party service or repair firms
- Review and advise on natural gas contracts with Enbridge
- Updates to the City with respect to industry awareness, changing rules, regulation and advocacy
- Updates and assistance to the City with respect to Ontario Energy Board matters, LDC rules, electricity regulations specific to CHP
- Regular reporting to the City (daily, monthly and annual performance reports)

Efficiency and cost savings

This agreement is structured to ensure overall up-time (target of 8,400 hours per year) on the CHP equipment to ensure the City achieves the maximum annual utility cost savings from this capital investment.

In Staff's due diligence during business case development in 2018, we consulted with other municipalities that had already installed CHP units in recreation facilities and found that operational issues due to lack of expertise and availability of parts and service negatively impacted their ability to achieve base case targets or stretch targets. To maximize operational efficiencies, Staff sought out and have received advice and support from MDE during the scoping and construction of the CHP at AGCC&L. A performance based payment is recommended as part of the agreement, to act as an additional incentive for MDE to operate the CHP favourably and minimize downtime, thereby maximizing the energy savings to the City, as detailed in the Financial Considerations section. Such performance incentive payment clauses are common in the energy savings industry (e.g., building automation systems with a 50/50 split savings between the building owner and Energy Savings Company/provider), where revenue generated is highly impacted based on performance. Performance based contracting has been a successful model for procuring energy efficiency retrofits in the public sector for over twenty years.

MDE has experienced staff and resources and is located only 5.8 km from the CHP site to efficiently and effectively carry out operational services. As part of the service agreement, MDE's operating engineers will provide remote monitoring and control services 24 hours a day, 365 days a year. Alternative operators would take hours to respond to site issues and would be unavailable outside normal business hours.

MDE will be the first responder to site when abnormal or shut-down conditions occur for initial diagnosis and restart. MDE will then liaise with third-party technicians as required in order to minimize unnecessary dispatch services.

The overall intent is for MDE to be the one-stop shop, where MDE will take on full responsibility to operate and maintain the CHP system as if it was a MDE-owned asset.

The alternative would be for the City to hire another third party or its own technical expert to join our staff complement. By partnering with MDE the City is able to achieve enterprise synergies with a business we own, that is an expert CHP operator, and a company with which we have significant experience as a satisfied customer.

Staff Analysis

Staff tested the market and confirmed that pricing in the agreement is reasonable and competitive. The performance based incentive will serve to maximize operational efficiencies and savings to the City.

We believe this agreement provides the expected value to the City and staff will undertake a detailed review of performance results with MDE at the end of the second year of the contract.

Year one will be under warranty, therefore a second full year outside of warranty is necessary for a true measure of performance. The outcome of that review may result in continuation of the contract, cancellation or agreed to modifications.

FINANCIAL CONSIDERATIONS:

Award Breakdown

The total payment to MDE is comprised of 3 components: (1) an operating base fee, (2) a maintenance services fee and (3) a performance-based incentive; and will be paid from the reduction in the utility costs at AGCC&L.

Table 1: Award Breakdown:

All costs will be adjusted yearly based on Consumer Price Index (CPI) Ontario All-Items (January to January)

(1) Operating Base Fee

The annual base fee is \$45,792 inclusive of HST impact, and it includes the following:

- advisory and management services
- remote monitoring and operating services
- monthly (12) site visits and inspections per year by MDE's CHP Lead, and
- six (6) site visits per year by MDE's Operations staff for such things as manual re-starts or to enable the emergency power mode.

(2) Maintenance Services

MDE will invoice the City for costs from the CHP vendor with no markup on a transparent and open book basis. On-site operation and maintenance (O&M) services performed by MDE staff, as well as any required on-site attendance to supervise or assist the CHP vendor, will be billed on actual hours at \$71.40 per hour per person, and 1.5 times for after-hours work, plus HST impact. While the actual cost of maintenance services will fluctuate from year to year, and will be billed as incurred, MDE estimates that the average annual cost for the first 5 years of operation is expected to be approximately \$76,320, inclusive of HST impact.

(3) Performance Incentive

In the event MDE achieves utility savings on behalf of the City exceeding the base business case, such savings is shared 50/50 between the City and MDE, as a financial incentive for performance. The maximum incentive is capped at 100% of the base fee (\$45,792). On the other hand, a financial penalty is imposed in the event of negative performance below the base business case. The maximum financial penalty is a reduction of 50% in the operating fee (\$22,896). The penalty is limited because negative performance in utility savings may result from factors that are unrelated to MDE's performance (e.g. utility rate fluctuations, facility maintenance and/or deficiencies in the supply of the equipment by others) and MDE will have incurred sunk costs in fulfilling their contractual obligations.

The actual costs will be benchmarked against a Base Case financial scenario and both the positive and negative variance from the Base Case will be shared 50/50 with MDE.

Table 2: Incentive Illustration

| | Base Case | Savings Above Base Case due to Low O&M Fees (Example 1) | Savings Below Base Case due to High O&M Fees (Example 2) | Savings Below Base Case due to Decrease in Hrs of Operation (Example 3) | Maximum MDE Incentive (Example 4)* |
|--|------------------|--|---|--|---------------------------------------|
| Hours of Operation | 8,400 | 8,400 | 8,400 | 7,500 | 8,760 |
| Electrical Utility Reduction | \$498,420 | \$498,420 | \$498,420 | \$445,018 | \$589,733 |
| Natural Gas Utility Increases | (\$128,466) | (\$128,466) | (\$128,466) | (\$114,702) | (\$120,575) |
| Overall Utility Savings (A) | \$369,954 | \$369,954 | \$369,954 | \$330,316 | \$469,158 |
| Maintenance Services | \$68,700 | \$50,880 | \$76,320 | \$68,700 | \$76,320 |
| Base Fee | \$45,792 | \$45,792 | \$45,792 | \$45,792 | \$45,792 |
| Total O&M Fees (B) | \$114,492 | \$96,672 | \$122,112 | \$114,492 | \$122,112 |
| Net Savings (C = A - B) | \$255,462 | \$273,282 | \$247,842 | \$215,824 | \$347,046 |
| Less: MDE Incentive (D) | \$0 | \$8,910 | (\$3,810) | (\$19,819) | \$45,792 |
| Net Savings to City (E = C - D) | \$255,462 | \$264,372 | \$251,652 | \$235,643 | \$301,254 |
| <u>Payment to MDE</u> | | | | | |
| Total O&M (B) | \$114,492 | \$96,672 | \$122,112 | \$114,492 | \$122,112 |
| MDE incentive (D) | \$0 | \$8,910 | (\$3,810) | (\$19,819) | \$45,792 |
| Total Payment to MDE | \$114,492 | \$105,582 | \$118,302 | \$94,673 | \$167,904 |

**Example 4 based on favourable fluctuations in utility rates.*

The Base Case scenario anticipates 8400 hours of operation per year at 95% availability at 2020 corporate electrical and natural gas utility budget rates. The Overall Utility Savings (A) is estimated based on utilities volume adjustment due to the CHP system. The Base Case estimates Net Savings (C) of \$255,462.

If MDE generates Net Savings (C) above or below the Base Case, the incentive will increase (Example 1) or decrease (Examples 2 and 3) the Total Payment to MDE will adjust accordingly.

In order to achieve maximum incentive, a minimum of \$347,046 in Net Savings (C) (or 35.9% above the Base Case) is required (Example 4), resulting in a net savings to the City of \$301,254.

Over the course of the first five (5) years (2020 – 2024), the award value is \$839,520.00 inclusive of HST impact (excluding adjustment to CPI) over that five (5) year period.

OPERATING BUDGET AND LIFE RESERVE IMPACT:

The capital investment, after the utilities incentive, is \$1,749,385 and is up-fronted by the Life Cycle Replacement and Capital Reserve through capital project #18083, Angus Glen Community Centre Combined Heat and Power (CHP) System. The estimated service life is 25 years and the estimated annual net cost savings according to base business case is \$255,462, upon start-up, subject to changes in actual usage, weather, facility operation, and utilities rates.

The payback period is approximately 6.8 years (\$1,749,385/\$255,462). Once the initial up-fronted costs have been fully paid back, the estimated net annual savings of \$255,462 will be split 50% (\$127,731) to the MECO account to fund other energy management initiatives and 50% (\$127,731) as a reduction to the Angus Glen Community Centre operating budget.

At the end of the 25 year life of the CHP, the project business case will be re-evaluated for re-investment based on the known benefits and costs at that time. It will not be entered into the City's Life Cycle Reserve.

LEGAL CONSIDERATIONS:

The City is subject to the following new trade agreements, which apply to public sector procurements above a certain dollar threshold: the Canada-European Union Comprehensive Economic and Trade Agreement (CETA), effective September 21, 2017; and the Canadian Free Trade Agreement (CFTA), effective July 1, 2017.

CETA and CFTA do not apply to this proposed procurement, as MDE and the City are affiliated entities.

ALIGNMENT WITH STRATEGIC PRIORITIES:

This project aligns with Building Markham's Future Together goals of:

1. Safe, Sustainable and Complete Community: The CHP unit is configured to provide back up power so Angus Glen CC&L can act as an emergency reception centre in the event of a prolonged power outage.
2. Stewardship of Money and Resources: The unit will provide substantial annual utility cost savings for one of our largest facilities for its service life of 25 years.

BUSINESS UNITS CONSULTED AND AFFECTED:

The Recreation, Legal, and Finance Departments have been consulted and their comments have been incorporated.

RECOMMENDED BY:

Graham Seaman, P. Eng, LEED AP, CEM
Director, Sustainability & Asset Management

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Commissioner, Corporate Services