

St. Paul's Hospital Combined Heat and Power Plant Update

ISSUE

Saskatoon Light & Power (SL&P) and the Saskatchewan Health Authority were successful recipients of the federal government Low Carbon Economy Fund – Champions stream funding, equalling approximately 40% of the capital expenditure required to co-install a 1.07 MW Combined Heat and Power (CHP) Plant at St. Paul's Hospital. SL&P and the Saskatchewan Health Authority would like to create a project to co-build the power plant.

RECOMMENDATION

That the Standing Policy Committee on Environment, Utilities and Corporate Services recommend to City Council:

1. That a capital project be created to co-build a Combined Heat and Power Plant at St. Paul's Hospital, for a total estimated cost of \$3,079,200 (including taxes), with federal funding for the project up to \$1,190,038 of total eligible project costs;
2. That the City of Saskatoon enter into a Memorandum of Agreement with the Saskatchewan Health Authority to co-develop, own, and operate a Combined Heat and Power Plant at St. Paul's Hospital; and
3. That the City Solicitor be requested to prepare the appropriate agreement as outlined in this report, and that His Worship the Mayor and the City Clerk be authorized to execute the agreements under the Corporate Seal.

BACKGROUND

At its meeting held on June 12, 2017, City Council adopted a recommendation that Administration, in conjunction with the Saskatoon Health Region, enter into a contract with Clark Engineering to complete a full feasibility study for the implementation of a CHP Plant at St. Paul's Hospital. The full feasibility study was completed in July 2018, and the Administration and the Saskatchewan Health Authority were provided information on the feasibility study report outcomes.

The feasibility study evaluated several CHP Plant configurations and recommended that two CHP units, rated at 555 kW each, would offer the most economic benefit to both partners. Total construction costs are estimated at \$3,079,200 (including taxes), with an estimated operational annual savings of approximately \$227,000 without carbon offsets, results in a simple payback period of 13.7 years.

In the spring of 2018, the Administration in conjunction with the Saskatchewan Health Authority, submitted an application for federal government funding of this project through the Low Carbon Economy Fund – Champions stream fund to assist with the capital expenditure required to implement this project and reduce the simple payback period. On June 19, 2019, the Administration was notified of successful receipt of federal funding equalling approximately 40% of the total project cost. This reduces the

simple payback period of the project to under 8.5 years. An agreement with the federal government must be signed within 45 days to receive the funding. Canada's contribution is subject to an execution of the funding agreement.

DISCUSSION/ANALYSIS

The implementation of CHP at St Paul's Hospital is identified as one of the top 10 actions with greatest savings per tonne of emissions through the Marginal Abatement Cost analysis in the Low Emissions Community Plan. CHP plants operate on natural gas to produce both electricity and heat at the same time, with less greenhouse gas (GHG) emissions than producing each separately. The CHP plant will produce electrical energy for SL&P and thermal energy for the hospital for use throughout their heating systems. The life expectancy of the CHP plant is 15 years with average annual GHG reductions estimated at 2,361 tonnes of CO_{2e}, which is the equivalent of removing 723 cars from the roadways. The detailed breakdown of annual utility production and costs from the CHP plant is identified in the table below.

Utility	Annual Quantity	Value
Electricity Produced	8,623,344 kWh	\$417,758.00
Minimum Demand Reduction	6,420 kVA	\$124,346.76
Usable Heat Produced	41,226 GJ	\$133,983.75
Natural Gas Consumed	83,238 GJ	\$270,523.50
Annual O&M Cost		\$181,090.00
GHG Reduction	2,361 tonnes	-
Net Annual Savings Projected		\$224,475.15

NEXT STEPS

The Administration and the Saskatchewan Health Authority are currently in discussions on the details of the co-ownership, operation, and maintenance of the CHP units over the life of the project. It is anticipated that both partners will contribute equal capital investment (i.e. \$944,600 each) towards the project, and also share ownership and maintenance costs equally. Execution of the project is contingent on both partners receiving the necessary approvals to pursue the project.

A follow up report will be submitted by Administration outlining the capital funding source for the project. Following receipt of the federal funding and capital funding, Administration in conjunction with the Saskatchewan Health Authority will proceed with the procurement of the CHP units through the issue of a Request for Proposals in Q4 2019, with delivery, installation, and commissioning of the CHP units anticipated between Q2 and Q4 of 2020. The CHP plant is anticipated to be operational in Q1 2021.

APPENDIX

1. Approval Letter from Environment and Climate Change Canada

Report Approval

Written by: Jose Cheruvallath, Metering & Sustainable Electricity Manager
Reviewed by: Trevor Bell, Director of Saskatoon Light & Power
Approved by: Angela Gardiner, General Manager, Utilities & Environment

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