

April 3, 2014

To: Members,
Public Works and Infrastructure Committee

Re: Landfill Gas to Energy – Sale of electrical power generated from landfill gas

RECOMMENDATION

1. That City Council authorize the Deputy City Manager & Chief Operating Officer (DCM & COO) or his or her delegate to negotiate, prepare, review, amend and approve the following:
 - (a) A Power Purchase Agreement with SaskPower at the rates as described in this report, as required by the Green Options Partners Program for a supply period of 20 years;
 - (b) A Generator Interconnection Agreement with respect to the construction and operation of electrical facilities installed by the Transmission Service Provider (SaskPower) in order to connect the City's facilities with the Transmission Service Provider's Facilities as required by the Green Options Partners Program;
 - (c) That this report be forwarded to the April 14, 2014 meeting of City Council; and
 - (d) Any additional documents, instruments, assurances and auxiliary closing documents as may be necessary to give full effect to the City's participation in the Green Options Partners Program as described in this report.
2. That City Council authorize funding of up to \$5 Million, from the Solid Waste Reserve, to build; purchase; install; commission and operate a Landfill Gas to Energy facility at the Fleet St. Landfill.
3. That City Council authorize the Deputy City Manager & Chief Operating Officer (DCM & COO) or his or her delegate to initiate a Request for Proposals and enter into an agreement with the successful proponent with respect to the following:
 - (a) Consulting Engineering Services with respect to the Landfill Gas to Energy Project outlined in this report;
 - (b) Acquisition of all equipment required to undertake the Landfill Gas to Energy Project outlined in this report; and
 - (c) Design and construction services with respect to the design, construction and installation of all equipment required to undertake the Landfill Gas to Energy Project outlined in this report.
4. That City Council authorize the City Clerk to execute all agreements authorized by this report.

CONCLUSION

The City of Regina has been presented with an opportunity to sell electrical power generated from landfill gas to SaskPower through the Green Options Partners Program. This opportunity provides the City with preferential power pricing for a 20-year period. Through this program the City could earn over \$21 million in revenue (\$7.1 million surplus, net of capital investment and operating costs) over the 20 year term. The City would build and operate a Landfill Gas to Energy (LFGTE) facility which would direct landfill gas (LFG) from the existing collection system to a generator, which would produce electrical power. This power would then be sold to SaskPower at preferential rates over the 20-year term of a power purchase agreement.

As well as the financial benefits, the City would be recognized as a leader in waste diversion by converting “garbage to power”. The City would also be acknowledged as an environmentally-conscious organization by its continuous commitment to voluntarily reduce greenhouse gas emissions.

BACKGROUND

In 2007, the City constructed a landfill gas collection system comprising of 27 extraction wells and a candlestick flare. This system collects and combusts the methane produced from the decomposition of organic waste within the landfill. Typically, landfill gas contains 50% methane and 50% carbon dioxide. The combustion of LFG resulting in the conversion of the methane to carbon dioxide reduces the impact on the environment as methane is considered 22 times more harmful than carbon dioxide. The City earns credits for the capture and destruction of the methane. These credits represent a marketable commodity that can potentially generate additional revenue for the City.

The primary objectives of a landfill gas collection system are to reduce potentially harmful greenhouse gas emissions and provide a means for potential utilization of landfill gas as an energy source. The intent in 2007 was to sell the captured LFG to Solar Hydrogen Energy Corporation (SHEC). SHEC's intention was to convert the LFG to hydrogen and market the hydrogen. SHEC was unable to meet its contractual obligations and the agreement between the City and SHEC was terminated.

The Green Options Partners Program (GOPP) with SaskPower renews the City's opportunity to utilize the landfill gas as a source of revenue by generating and selling electrical power to the utility. The City applied and was awarded the opportunity as part of a SaskPower lottery in 2011. The GOPP has been suspended by SaskPower since 2012, pending review. SaskPower has agreed to honour our application with the understanding that a power purchase agreement be finalized no later than June 30, 2014.

DISCUSSION

The purchase power agreement (PPA) is a commercial and financial contract whereby SaskPower agrees to pay the City a set amount per megawatt hour for electricity we produce. There are no performance penalties; there is no minimum production requirement. We are paid simply for what we produce over the 20 year period. The rate paid through the GOPP provides a substantive positive cash flow to the City, with the rate paid in the first year of production at \$106.10/MWhr (2016 rate), escalating 2% per year, for each subsequent year. In comparison, operating costs are estimated to be \$44/MWhr, resulting in a profit margin of 59%. The PPA requires that the City pass on the benefit received through any environmental incentive program,

including greenhouse gas credits, as it relates to the electrical generation only. The City will retain any incentives and credits related to the current methane combustion process.

Upon successful negotiation of a PPA with SaskPower, the City would have the necessary guarantee on electricity pricing and future revenues to commit the capital funding required to move forward with a generator purchase, detailed design and construction of the LFGTE facility. This project would be funded from the Solid Waste Reserve.

Financial review and analysis identified the following highlights:

- \$21 million in earned revenue over 20 years;
- Capital investment of \$5 million; funding available from the Solid Waste Reserve;
- Capital investment is recovered in 9 years;
- \$12.1 million in operating income, over 20 years; and
- \$7.1 million surplus, considering capital investment.

Administration considered a third-party build/operate option for the LFGTE facility. The following reasons eliminated the option:

- Initial capital investment (\$5 million) is currently available through the Solid Waste Reserve;
- The facility is not complex: a containerized generator with interconnections to SaskPower's electrical grid;
- Operating expertise exists in-house within Landfill Operations Branch and Facilities Management Services; requires less than 1 full-time equivalent (FTE) staff resource;
- Operating income from owning/operating exceeds any reasonable royalty payment from an operator;
- Third party operator would require quantity and quality assurances for the fuel source (City owns the landfill gas) which we could not provide; and
- Time constraint to have a power purchase agreement executed by June 30, 2014.

Administration's recommendation to approve the power purchase agreement and build and operate a LFGTE facility was based on several social, environmental and financial factors. These factors are summarized in Appendix A: Triple Bottom Line Assessment.

Highlights from the assessment:

Social

- The public sees the production of electricity from "garbage" as a good thing to do.
- The City will be recognized as an environmentally-conscious organization by its continuous commitment to voluntarily reduce greenhouse gas emissions.

Environmental

- LFGTE facilities reduce methane emissions, a global climate change agent with 22 times the negative impact of carbon dioxide;
- Methane gas escaping from a landfill is an environmental liability; all possible uses of this gas will reduce this liability.

Financial

- Preferential power pricing from SaskPower through the GOPP;
- Positive annual cash flow; \$7.6 million surplus from the program at the end of the 20 years.

RECOMMENDATION IMPLICATIONS

Financial Implications

Capital expenditures of \$5 million can be fully funded from the Solid Waste Reserve, and will be recovered within 9 years. The project will generate over \$21 million in revenue (\$7.1 million surplus, net of capital investment and operating costs) over a 20-year period. The landfill will continue to earn emission reduction credits which may generate additional revenue for the City.

Environmental Implications

With the LFGTE facility, the City will continue reducing greenhouse gas emissions.

Policy and/or Strategic Implications

The LFGTE facility is consistent with the City's vision for a sustainable community and to implement more environmentally friendly practices.

Evaluation Criteria

The power purchase agreement provides revenue from a non-residential tax source, which is in line with our strategic direction to manage growth.

Accessibility Implications

None with respect to this report.

COMMUNICATIONS

This initiative provides an opportunity to demonstrate the City's commitment to environmental sustainability. The City will use an earned media strategy and a social media strategy to communicate about the gas to energy project.

DELEGATED AUTHORITY

The disposition of this report requires City Council approval.

Respectfully submitted,



Lisa Legault, A/Director
Open Space & Environmental Services

Respectfully submitted,



Neil Vandendort, A/Executive Director
City Operations

Report prepared by:

Lisa Legault, A/Director, Open Space & Environmental Services
Roberta Engel, Manager, Waste Diversion Services