



IN CAMERA

ADMINISTRATIVE REPORT

Report Date: November 9, 2016
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Meeting Date: November 15, 2016

TO: Vancouver City Council
FROM: General Manager of Engineering Services
SUBJECT: Landfill Gas Utilization

IN CAMERA RATIONALE

This report is recommended for consideration by Council on the In Camera agenda as it relates to Section 165.2(1) of the *Vancouver Charter*: (k) negotiations and related discussions respecting the proposed provision of an activity, work or facility that are at their preliminary stages and that, in the view of the Council, could reasonably be expected to harm the interests of the city if they were held in public.

RECOMMENDATION

- A. THAT Council direct staff to:
- i. close the Landfill Gas Utilization REFOI # PS20120223 ;
 - ii. report back to Council with the results of a comprehensive evaluation of the business case and project risks, for development of a facility to clean and upgrade Landfill Gas (LFG) to produce Renewable Natural Gas (RNG) for distribution through the Fortis BC natural gas delivery system factoring in the City as both a potential owner of the facility and a customer for the Renewable Natural Gas produced;
 - iii. report back with an appropriate business approach and structure for project development; AND
 - iv. pursue senior government funding opportunities for facility development.

REPORT SUMMARY

This report requests Council to direct staff to undertake actions to advance the development of a facility to produce renewable natural gas (RNG) from landfill gas (LFG).

COUNCIL AUTHORITY/PREVIOUS DECISIONS

Maximising landfill gas recovery is an integral part of the City achieving Greenest City goals around Climate and renewables.

In November 2015, Council approved the Vancouver Renewable City Strategy, which sets the target for the Vancouver to derive 100% of its energy from renewable sources by 2050.

REPORT**Background/Context**

Recovery of LFG was the Major contributor to the City achieving Carbon Neutrality.

The LFG on average contains 51% Methane, 38% CO₂, 8% Nitrogen, 0.5% Oxygen and the remainder is a mix of small quantities of other materials including Hydrogen Sulphide, by volume.

In 2015 the City collected roughly 60,000,000 m³ of Landfill gas at 51.3% methane content. Approximately 32,000,000 m³ (54%) was sold for beneficial use in combined heat and power facilities at a local greenhouse and 28,000,000 m³ (46%) was flared to meet regulations.

This flared 28M m³ of LFG at 51.3% methane and 0.036 GJ/m³ represents 517,000 GJ of energy that could be captured for beneficial use.

Procurement Process

In 2012 the City went to market in order to:

“solicit Applications to design, build, own and operate a new Landfill Gas utilization system to purchase and utilize the New LFG” solicit application to design, build, own and operate a new Landfill Gas utilization system to purchase and utilize the New LFG (Land Fill Gas)”.

Responses focused on generating RNG from LFG and adding it to the natural gas distribution system within the province. The highest ranking submissions were received from Fortis, and from 3rd party organizations proposing to work with Fortis. After reviewing all submissions Fortis was selected as the preferred proponent.

The initial contract approach was for the City to provide a location for the facility and supply LFG only. Fortis would be responsible for production of RNG through infrastructure owned by them, as well as all marketing and sales of RNG to their customers and the initial contract negotiations focussed on that approach.

As a Regulated utility, in order for Fortis to commit to a contract they first needed to receive approval from the BC Utilities Commission to increase the amount of RNG supply they could accept into system as they had reached their regulated limits for taking on RNG supply. The City provided letters of support to BCUC around increasing the RNG supply levels to allow Fortis to accommodate additional supply from our LFG.

In 2014 Fortis received approval to accept additional RNG supply. At the same time Fortis was commissioning a similar system, though at a much smaller scale, in Kelowna. Both Fortis and the City agreed that there would be benefits in monitoring the process and making any adjustments both in technical aspects of the facility and clarifying some aspects of the contract around supply of LEF and demand for RNG. Commissioning of the Kelowna facility was completed in 2015 and led to some improvements in technology that resulted in increased capital costs for facility development in Vancouver and when coupled with the low cost of Natural gas compared to RNG increased the project risks.

Strategic Analysis

The Renewable City Strategy adopted in 2015 places the City on a path to use more renewable energy in the future. RNG generated from LNG provides a carbon neutral source of renewable energy which could be used in City vehicles and buildings. At this point the City expressed interest in becoming a user of the RNG produced and a reworking of the business model to include the City as the primary user of the RNG produced. Current estimates are that up to 517,000 GJ of energy that could be used for heat and power in City facilities and vehicles will be available in future and progressive closure of sections of the landfill site will continue to result in increased gas capture in future. The 517,000 GJ of energy represents 125% of the City's current natural gas demand.

Table 1 - Energy Demand and Landfill RNG supply

REFM Buildings	300,000 GJ
Engineering Facilities (NEU and Kent)	95,000 GJ
Sanitation Fleet	20,000 GJ
Total Potential Demand	~415,000 GJ
Total potentially available from Landfill	517,000 GJ
Percent of City Demand	125%

Implications/Related Issues/Risk (if applicable)

The challenge is to find a business model that balances the cost of facility development and the cost that the City would pay to purchase RNG. Discussions have been ongoing with Fortis on the possible business models that could work. The preferred approach would likely involve the City contributing to capital costs or becoming an owner of the facility. This is significantly different than the original

intent of the RFEOL and a more comprehensive business case and risk analysis is needed to determine the most appropriate approach.

Financial

It is expected that the capital costs for a facility to upgrade LFG to RFG would be in the range of \$25 million. The challenge in the City purchasing RNG on the open market is that cost premium over fossil natural gas is significant.

Financial details, including available funding from other levels of government will be worked out during the business case review. An application has already been submitted for up to \$5 million in funding through the Federal Energy Innovation Program.

In addition we have obtained support from the pilot Canadian Impact Infrastructure Exchange (CIIX), a non-profit organization run through Carleton University in Ottawa that is developing a national platform designed to analyse life cycle environmental, social and governance benefits that accrue through infrastructure projects and include these in a triple bottom line analysis.

Environmental

Environmental benefits accrue through using RNG as a replacement for fossil based natural gas. RNG from biogenic (breakdown of biological material) sources are considered carbon neutral and as result it offsets CO₂ generated from fossil natural gas on a 1 to 1 basis. Every 1 GJ of energy produced from RNG offsets 50.3kg CO₂ (.05T) from fossil gas. This means that for every 50,000 GJ of RNG energy consumed 2500 T of CO₂ is saved. Approximately 25,000 tons of GHG reductions could result from this project.

CONCLUSION

The availability of energy from LFG and the ability to convert LFG to RNG support the Vancouver's Renewable City Strategy. Further detailed analysis is needed to assess long term financial implications, develop an appropriate business model and quantify both benefits and risks of the City becoming both a supplier of LFG and consumer of the RNG generated from it.

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