




RECOMMENDATION REPORT

TO:	Chair and Members of Hamilton Renewable Power Inc. Board
COMMITTEE DATE:	August 30, 2022
SUBJECT/REPORT NO:	Hamilton Renewable Power Inc. (HRP Inc.) Renewable Natural Gas Development (HRP202201) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Tom Chessman (905) 546-2424 Ext. 2494
SUBMITTED BY:	Rom D'Angelo President, Hamilton Renewable Power Inc.
SIGNATURE:	

RECOMMENDATION

- (a) That the consultant report identified as “Renewable Energy Options Assessment”, prepared by Jacobs Engineering Group Inc., dated June 2, 2022, attached as Appendix “A” to Report HRP202201 be received;
- (b) That staff proceed to advance the concept design and develop both a financial business case, including funding options and an environmental benefit for renewable natural gas (RNG) production, at a cost not to exceed \$100,000 to be drawn from the HRP Inc, ‘cash reserve’.

EXECUTIVE SUMMARY

The existing twenty (20) year electricity supply agreement between Hamilton Renewable Power Inc (HRP Inc.) and the Independent Electricity System Operator (IESO) for the Woodward cogeneration plant ends in December of 2025. To prepare for the end of this existing contract, a study was completed to assess what would be the best option for the use of the continued production of biogas at the Woodward Water and Wastewater Treatment Plant (WWWTP). The study confirms greatest overall value with the production of renewable natural gas (RNG). It is recommended a new RNG production facility be designed, built and operated at the Woodward site. Estimated capital according to the attached report is \$4.3M. Adding for design, project management fee and contingencies suggest a capital budget of \$5M be assumed. Staff will pursue funding source options to mitigate the expected capital costs. The report

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also suggests annual revenues expected to be secured would be approximately \$2.7M annually when RNG is sold to a third party. Operating and maintenance costs are expected to be approximately \$1.1M annually.

The intent will be to switch away from the existing HRP Inc. contractual electricity production when the contract ends. Ideally the new production facility will be ready to switch over to RNG production immediately after the electricity contract ends.

Based on recommendation (b) of this report, staff will proceed with developing a business case and assess financing options for this project. This preliminary work is estimated to an upset limit of \$100,000, which will further refine expected costs and include financial viability, including funding options. Once this work is completed staff will report back to the board in Q2 2023. Further updates on timing and completion will only become available after the project process begins. Milestones and timing details will be made available to the Board as the project proceeds.

In the short term there will be value in the sale of RNG to a third party as this generates revenue for HRP Inc. and in turn produces dividends for the City. As the City progresses towards its goal of Net Zero by 2050 there may be a time when the City would prefer to acquire the RNG and use it to lower the Corporate emissions. Flexibility will be built into the initial RNG agreement to allow for transition to the other supply options that may see the City purchasing the RNG from HRP Inc. for the emission reduction benefit.

Alternatives for Consideration – See Page 4

The attached report outlines the options that were assessed, which included continued electricity production, possible alternative energy production and the production of RNG. The RNG option is viable for multiple reasons, including revenue and the potential to be used to lower the corporate emissions, which is directly linked to the City of Hamilton's Climate Change Emergency, the Corporate Energy and Sustainability Policy and the Community Energy and Emission Plan.

Other alternatives were to operate a combined heat and power unit (CHP) and various scenarios of running both CHP and the RNG production. In the end, the RNG only option provides the best overall solution.

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: In order to proceed to the next step, staff are requesting to further assess this project by retaining a consulting firm which will be funded by HRP Inc's 'cash reserve', to refine the site, system design and develop a business case that will explore the financial viability and the environmental benefits, at a cost not to exceed \$100,000.

Future Ask: HRP Inc. will need to secure capital to design, build and operate this RNG production facility. The report outlines a capital cost of \$4.3M but additional funds should be expected to allow for design, project management and contingencies. For these reasons HRP Inc. should anticipate a budget of approximately \$5M to complete the entire project, with the possibility of having some cost offset from federal or provincial funding programs.

Staffing: As the project is located at WWWTP, it is expected that staff from Water will be required to manage this project. While this may not require extra staff, the existing staff resources should be noted as being critical to the RNG system installed and integrated into the WWWTP operations.

Legal: There will be a requirement for HRP Inc. to enter into supply and construction related tenders and agreements that will be presented to the HRP Inc. Board as this project develops.

HISTORICAL BACKGROUND

HRP Inc. was created in 2005 when the previous Electricity Act prevented a municipality from becoming an electricity generator. HRP Inc. was formed and the City became the sole shareholder of HRP Inc. Since inception, HRP Inc. pays annual dividends to the City through its dividend policy and provides partial City staffing cost relief for both rate and levy budgets. There are two generation sites that both produce electricity from methane sources. The WWWTP was first built in 2005 but in 2007 two further engines were installed at the Glanbrook Landfill site. The landfill also produces power under a twenty (20) year contracts, similar to the WWWTP.

As these contracts come to an end, there needs to be an assessment to understand how best to use the available methane from the City's WWWTP and the landfill. This report targets the WWWTP as the contract ends in 2025, while the landfill contract ends in 2027.

Having completed the assessment on the best use of biogas at the WWWTP, HRP Inc. is now poised to move ahead with plans to produce renewable energy. RNG has been growing in terms of acceptance, value and use along with counterparties with whom to establish supply agreements. RNG will also become a key part of the City's transit Pathway to Net Zero, as there are additional compressed natural gas (CNG) buses being purchased in the next three (3) years. These buses are typically used for twelve (12) years before retiring them as an asset. This suggests the City will be using CNG for at least fifteen (15) years and the need for RNG will play an important role as a fuel source option to mitigate emissions. There are other emission reduction portfolios such as the City's Corporate Buildings that will also have a need for RNG in the future. The

Corporate Fleet, Corporate Buildings and other operations in Public Works generates over 90% of the corporate emissions as of 2020. These portfolios all will benefit from some amount of RNG if they cannot switch to electricity. Even if sites and operations do switch to electricity, the electrical grid, while having low emissions, does generate some emissions which also need to be mitigated. RNG can provide one option for these conditions as we go forward.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

The work that HRP Inc. is proposing favourably impacts the City's adoption of the Climate Change Emergency, the targets and Key Performance Indicator's (KPI's) found in the Corporate Energy and Sustainability Policy (Net Zero by 2050, expanded renewable energy), the Community Energy and Emission Plan and the City's Corporate Climate Change goals.

RELEVANT CONSULTATION

An industry leading consultant familiar with the WWTP was used to assess the renewable energy options in the attached report.

HRP Inc. staff worked closely with Water and wastewater staff to develop the study scoping and the review of the final study itself.

HRP Inc. will need to coordinate financial options to pursue this project. Financial development will also include identifying potential incentives from provincial or federal sources.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

A sensitivity analysis was performed for both non-economic and economic parameters. See Table 1: Sensitivity Analysis below. For the non-economic sensitivity analysis, weightings were changed to better understand their impact on total scores. For the economic sensitivity analysis, RNG and electricity contract prices changed to better understand their impact on total scores.

The RNG third party contract price strongly factors into total scores. Similarly, the cost of electricity purchase/electricity contract prices strongly factors into total scores. The combined heat and power (CHP or Cogen) total score increase in proportion to the electricity unit prices. When the non-economic scores receive more weighting than the economic scores, total scores are expressed in a tighter band (64 to 92 as opposed to the baseline of 63 to 100).

ALTERNATIVES FOR CONSIDERATION

SUBJECT: Hamilton Renewable Power Inc. (HRP Inc.) Renewable Natural Gas Development (HRP202201) (City Wide) - Page 5 of 6

The attached report review options that were considered, including continued electricity production, possible alternative energy production and RNG. See Table: Sensitivity Analysis below for details. The RNG option provides the best alternative and was compared to multiple scenarios that included the Cogen running in conjunction with the RNG production equipment, including a sensitivity analysis. Other scoring was used to assess non-economic and economic conditions, and how the system ties into the Woodward digester and sludge heating demand. See Table 1: Sensitivity Analysis below for details.

Table 1: Sensitivity Analysis

Scenario	Total Score								
	100% RNG A	75% RNG A/ 25% CHP	50% RNG A/ 50% CHP	25% RNG A/ 75% CHP	100% RNG B	75% RNG B/ 25% CHP	50% RNG B/ 50% CHP	25% RNG B/ 75% CHP	100% CHP
Baseline	100	91	82	74	63	63	64	64	65
All criteria equal weighting	89	78	75	72	74	67	67	68	74
All category equal weighting	83	75	72	71	71	66	66	68	73
High energy intensity weighting	85	75	73	71	69	63	65	67	75
High technical weighting	92	76	73	69	75	64	64	65	74
High social weighting	86	76	73	71	72	66	66	68	73
RNG third party contract price - \$20/GJ	85	71	64	58	73	62	58	55	57
RNG third party contract price - \$30/GJ	85	68	59	51	54	45	43	43	47
Electricity purchase/contract price - \$0.10/kWh	85	71	64	59	60	52	52	53	58
Electricity purchase/contract price - \$0.14/kWh	85	75	73	72	60	56	60	66	75
Low total score economic weighting – 30%	79	67	65	65	76	65	64	65	72
Low total score economic weighting – 40%	82	70	66	65	74	64	62	63	68
'A' indicates that RNG is sold to a third party and 'B' indicates that RNG is sold to the City, keeping the RNG grid injection GHG emissions credit									

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

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Clean and Green

Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

APPENDICES AND SCHEDULES ATTACHED

APPENDIX “A” to Report HRP202201 - Renewable Energy Options Assessment