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Item No. Info Item 3
Environment & Sustainability Standing Committee
July 06, 2023

TO: Chair and Members of the Environment & Sustainability Standing Committee

SUBMITTED BY:



Cathie O'Toole, Chief Administrative Officer

DATE: June 22, 2023

SUBJECT: GreenQuest Power Request for Support

INFORMATION REPORT

ORIGIN

April 06, 2023, Environment & Sustainability Standing Committee motion (Item No.): 13.1

MOVED by Councillor Morse, seconded by Councillor Lovelace

THAT the Environment and Sustainability Standing Committee direct the Chief Administrative Officer to consider and provide a staff report and advice on a letter to the Province of Nova Scotia in support of a request from GreenQuest at the April 6, 2023, Environment and Sustainability Standing Committee.

MOTION PUT AND PASSED.

LEGISLATIVE AUTHORITY

Administrative Order One, The *Procedures of Council Administrative Order*, Schedule 5:

1. (1) Subject to subsection 1A, the purpose of the Environment and Sustainability Standing Committee is to provide advice to the Council relating to the Environment and Sustainability including Solid Waste Resources, energy security and sustainable parks, forests (urban and rural) and open spaces and water resource management.

Halifax Regional Municipality Charter, SNS 2008, c 39:

7A The purposes of the Municipality are to (a) provide good government; (b) provide services, facilities and other things that, in the opinion of the Council, are necessary or desirable for all or part of the Municipality; and (c) develop and maintain safe and viable communities.

BACKGROUND

On April 6th, 2023, Kevin Mullen, CEO of GreenQuest Power Inc. presented to the Environment & Sustainability Standing Committee (the Committee). The focus of the presentation was to share the potential benefit of deploying closed-loop geothermal systems in Nova Scotia and request support from Regional Council in the form of a letter to the Province of Nova Scotia. The Committee requested a staff report to advise on the requested letter.

In October 2021, the Province of Nova Scotia passed the Environmental Goals and Climate Change Reduction Act (EGCCRA), legislating provincial emission reduction targets of 53% below 2005 levels by 2030, and net zero emissions by 2050. To achieve these targets the Province has committed to generating 80% of its electricity through renewable sources by 2030.

In June 2020, Halifax Regional Council passed HalifACT: Acting on Climate Together, which sets emission reduction targets of 75% below 2016 levels by 2030 and net zero emissions by 2050. To achieve these targets, decarbonizing the electricity grid through a diverse renewable energy portfolio is critical.

DISCUSSION

GreenQuest Power is a green energy development company focused on refurbishing, modernizing, and automating aging small hydroelectric plants. The company develops baseline renewable energy solutions such as grid-scale energy storage and closed-loop geothermal assets. The project presented to the Committee was a closed-loop geothermal electricity generation facility.

Geothermal energy is the extraction of subsurface energy that can be used directly for heating and cooling, or to generate electricity. Geothermal energy has some advantages over other low to no-carbon energy sources as it is predictable and non-intermittent. The amount of energy available does not fluctuate due to weather or seasons, so operating and fuel costs are consistent and predictable.

While Nova Scotia does not have the ideal temperature gradient for geothermal systems, GreenQuest Power stated this region is ideal due to its high cost of energy. On a pilot scale, the proposed closed-loop geothermal project could generate electricity for \$100 per megawatt-hour (MWh). If scaled beyond a pilot, it was stated that electricity could be generated for as low as \$50/MWh and supply up to 10% of the total electricity need of Nova Scotia. This price point would be cost competitive with current generating options.

In the *2022 Rate Breakdown by Cost of Service*¹ document published by Nova Scotia Power Inc, the cost to generate electricity with the current fuel mix ranged between \$60 and \$70/MWh. The Rate Based Procurement initiative, issued by the Province in the winter of 2022, saw the approval of five onshore wind development projects resulting in an average energy rate of \$53.17/MWh. While competitive, it must be noted that onshore wind has a capacity factor of 35%-41%, while geothermal averages around 90%.

Geothermal energy systems are permitted in Nova Scotia, and several are currently in operation. In Springhill Nova Scotia, several buildings are heated through a geothermal system that extracts heat from abandoned and flooded mines. When retrofitting the Sexton Engineering Campus, Dalhousie University added a 60 borehole geo-exchange system to provide the campus with heat, but to also act as a heat sink when needed.

The key difference between these geothermal projects and the one proposed by GreenQuest Power, is that these projects provide heating and cooling to a series of interconnected buildings. No electricity is generated. The project proposed would result in grid scale electricity generation. To enable such a project, it was stated that GreenQuest power would need a signed Power Purchase Agreement (PPA) with the province before proceeding with development.

¹ https://www.nspower.ca/docs/default-source/pdf-to-upload/appendix-2---2022-aar-rate-breakdown-pi-charts.pdf?sfvrsn=ec0e1350_1

Discussions with the Province of Nova Scotia's Subsurface Energy Team indicated that they are supportive of this project and geothermal energy in general. However, they were firm that no PPA would be issued to any proponent without a competitive and transparent procurement process. Any request to the contrary would not be entertained. The province intends to issue another call for low carbon electricity projects within the next few years.

Based on this information from the Province, GreenQuest Power could investigate one of the following existing mechanisms to enable their project:

Renewable to Retail Program

Through the Renewable to Retail Program, any renewable energy generator can apply to the Nova Scotia Utility and Review Board for a license to sell renewable energy to retail customers. In fall of 2021, Roswall Development Inc. was the first entity to be granted such a license. Roswall is currently developing a 33 megawatt (MW) wind farm in Queens County.

Compete in the next Rate Based Procurement

The Province intends to issue another call for low carbon electricity projects through a second Rate Base Procurement initiative. This initiative is aimed to attract low-cost and innovative low-emission electricity generation solutions. The first initiative saw the procurement of 372 MW of onshore wind that is estimated to generate 12% of Nova Scotia's total electricity consumption.

Negotiate a Power Purchase Agreement with Nova Scotia Power

Any private entity can negotiate a PPA directly with Nova Scotia Power Inc. In the early 2000s, Highland Energy successfully negotiated a long-term PPA for the sale of renewable energy generated at the closed Sackville Landfill. Through an agreement with the Halifax Regional Municipality, Highland Energy acquired the right to collect and convert the methane gas from the landfill into electricity.

Conclusion

While staff are supportive of decarbonizing the electricity grid through a diverse renewable energy portfolio, providing a letter to the province in support of a PPA for GreenQuest Power is not appropriate. This is largely based on discussions with the province where it was clear PPA issued to a private entity will be done through a competitive procurement process, and not through individual requests. As mentioned above, alternative pathways do exist for GreenQuest Power.

FINANCIAL IMPLICATIONS

No financial implications at this time

COMMUNITY ENGAGEMENT

No community engagement was required.

ENVIRONMENTAL IMPLICATIONS

In June 2020, Halifax Regional Council passed HalifACT: Acting on Climate Together, which sets emission reduction targets of 75% below 2016 levels by 2030 and net zero emissions by 2050. To achieve these targets, decarbonizing the electricity grid through a diverse renewable energy portfolio is critical. Geothermal energy is part of this transition as it is predictable and non-intermittent fuel source.

ATTACHMENTS

None

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

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