

Researchers find geothermal heat pumps most feasible in Halifax

October 23 2015

Geothermal Heat Pumps IN Halifax

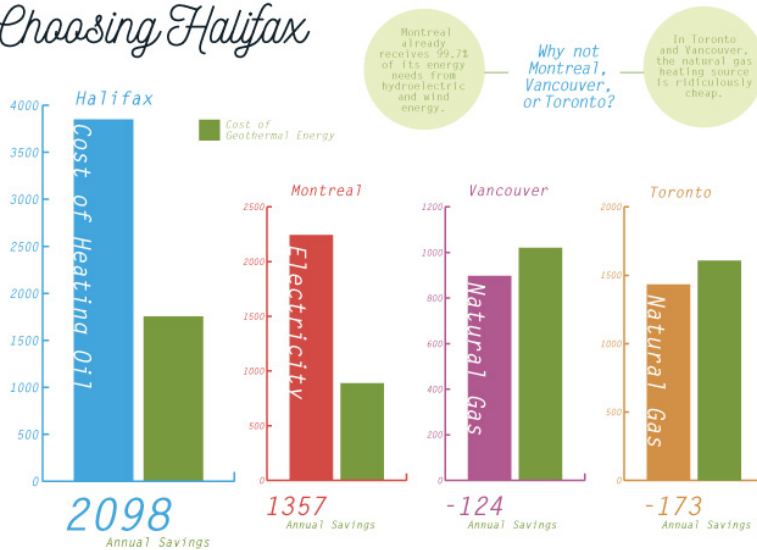
Researchers at the Université du Québec have recently conducted a survey of four Canadian cities to determine the economic feasibility of installing geothermal heating systems in homes in Montreal, Halifax, Vancouver, and Toronto.

For their analysis, the researchers used RET-Screen, a free clean energy software package developed by the Canadian government, to determine the financial savings from the heating systems over the course of 22 years.



The geothermal pump systems, in which vertical pipes run into the ground, were proposed for use in both space heating and cooling and to provide 25% of the total amount of domestic hot water.

Choosing Halifax



Montreal already receives 99.7% of its energy needs from hydroelectric and wind energy.

Why not Montreal, Vancouver, or Toronto?

In Toronto and Vancouver, the natural gas heating source is ridiculously cheap.

Halifax stands to have the most to gain in 22 years, returning a positive cash flow after investing in geothermal systems.



One proposed solution to the high cost of geothermal systems was a \$5,000 subsidy on the installation of the pumps, which would cause the project to break even in 7 years in Halifax--compared to the initial projection of 12--and after 14 years in Montreal.

The pumps cost **CA\$4,000**
And installing them costs **CA\$15,500**

From "Economic and energy analysis of domestic ground source heat pump systems in four Canadian cities" by M. Le Dô, Y. Dutil, D. R. Rousse, P. L. Paradis, and D. Groulx.

J. Renewable Sustainable Energy 7, 053113 (2015)

<http://scitation.aip.org/content/aip/journal/jrse/7/5/10.1063/1.4931902>



Geothermal heat pumps in Halifax are shown. Credit: Malate/AIP

Researchers at the Université du Québec have recently conducted a survey of four Canadian cities to determine the economic feasibility of installing geothermal heating systems in homes in Montreal, Halifax, Vancouver and Toronto.

For their analysis, the researchers used RETScreen, a free clean energy software package developed by the Canadian government, along with the typical energy considerations to determine the financial savings from the heating systems over the course of 22 years. The vertical closed loop heating systems, in which vertical pipes run into the ground, were proposed for use in both space heating and cooling and to provide 25 percent of the total amount of domestic hot water. The researchers found that the systems would be most feasible in Halifax, with fewer potential savings in the other cities.

"It's do-able in Halifax because the people in Nova Scotia tend to heat with heating oil, which is relatively expensive at this time," said Yvan Dutil, a researcher at the Université du Québec's public engineering school, École de technologie supérieure (ÉTS) and now tutor at the Télé-Université. "In Toronto and Vancouver, however, the natural gas heating source is ridiculously cheap."

Conversely, Montreal was ruled out because it already receives 99.7 percent of its energy needs from hydroelectric and wind energy, meaning that the investment in geothermal heat pumps would bring little return on investment in both cost and reduction in [greenhouse gas emissions](#).

Dutil and his colleagues at Dalhousie University describe the results of their analysis this month in the *Journal of Renewable and Sustainable Energy*.

"The problem is that it's hard to save money with the geothermal pump in Canada under the current energy prices," he continued. This is almost entirely due to the cost of installing the geothermal pumps, which is around CA\$15,500, with the pumps themselves at CA\$4,000.

One proposed solution was a CA\$5,000 subsidy on the installation of the pumps, which would cause the project to break even in 7 years in Halifax—compared to the initial projection of 12—and after 14 years in Montreal.

"It doesn't mean that it's not a solution, just that the market conditions aren't there," Dutil said. "Hopefully, technological improvements and price reductions in the [geothermal heat pump](#), and the prices in the [energy](#) market will change this picture in the near future."

More information: M. Le Dû et al. Economic and energy analysis of domestic ground source heat pump systems in four Canadian cities, *Journal of Renewable and Sustainable Energy* (2015). [DOI: 10.1063/1.4931902](#)

Provided by American Institute of Physics

Citation: Researchers find geothermal heat pumps most feasible in Halifax (2015, October 23) retrieved 23 April 2024 from <https://phys.org/news/2015-10-geothermal-feasible-halifax.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is

provided for information purposes only.