

Canadian Geothermal Energy Association
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Written Submission for the Pre-Budget Consultations in Advance of the 2019 Budget

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Recommendation 1: That the government allocate funding for the continued development of geothermal data collection through support of the Geological Survey of Canada and Natural Resources Canada.

Recommendation 2: That the government create a stream of funding specifically for geothermal projects.

Recommendation 3: That the government provide funding for federal geothermal heat programs.

Recommendation 4: That the government allocate funding for programs to raise public awareness surrounding geothermal energy.

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Introduction:

The Canadian Geothermal Energy Association (CanGEO) is the collective voice of Canada's geothermal energy industry. As a non-profit industry association, we represent the interests of our member companies with the primary goal of harnessing the country's tremendous geothermal energy potential.

In anticipation of the 2019 Federal Budget, CanGEO is putting forward these 4 recommendations for the Pre-Budget Consultation, which will attract investment and spur competition within Canada's geothermal energy industry.

Recommendation 1: That the government allocate funding for the continued development of geothermal data collection through support of the Geological Survey of Canada (GSC) and Natural Resources Canada.

The more that Canadians know about Canadian resources, the more innovative and competitive we can be with our shared resource. The present gap in geothermal energy data between jurisdictions in Canada must be addressed. Additional funding to complete feasibility maps beyond those already completed in British Columbia, Alberta, and Yukon (and the soon to be released map of Nunavut) should be allocated to an organization such as the GSC or CanGEO with a proven track record of creating feasibility maps or experience within the geoscience realm.

Data collection is a crucial part of geothermal exploration and development. Due to the resource being far beneath the Earth's surface, a large amount of exploratory work is required to even consider development in a given area. Activities such as a desktop feasibility study (similar to the ones completed by AB, YK and BC), drilling, and flow testing are all required before committing to a project. **The Federal Government can reduce the front end risk by providing funding for the GSC to further develop Canada's geothermal feasibility maps and host them on a federally hosted geothermal data repository.**

In the United States, the geothermal energy sector's innovation and competitiveness was spurred by the creation of the Geothermal Technologies Office (GTO), a branch of government specifically focused on geothermal development. In Canada, the GSC could play a similar role, however due to a lack of a specific mandate and targeted-funding, the GSC has not been able to support the geothermal industry similarly to the GTO.

The GTO funded the US Geothermal Data Repository and National Geothermal Data System (NGDS), which function as data repositories that provide open access to would-be investors, developers and researchers. The NGDS platform, while providing raw data and various content (flow rate, resource depth, etc.), also contains several tools and

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models to aid in exploration and development opportunities. The creation of the NGDS, as explained on the DOE website, “was created to respond to industry demand for quantifiable data of the subsurface, to target drilling, understand drilling performance in hard rock formations, and effectively characterize the subsurface for reservoir creation and maintenance.”

Research and development in the US geothermal industry has been driven by the prevalence of data, which attracts investment and incites competition and innovation within the US geothermal energy marketplace. Access to data platforms and repositories, such as with the GTO and National Renewable Energy Laboratory, has led to the creation of innovative tools, such as the “Geothermal Prospector” program that works to reduce the risks associated with geothermal exploration by providing a variety of useful data. The Geothermal Prospector program contains numerous data layers and variables that are pulled from several data repositories, such as the United States Geological Survey and the NGDS platform, with the goal of giving developers a better understanding of the US’ geothermal resources.

These programs, which were directly the result of a devoted government branch, have helped shape the US geothermal sector by enabling developers to strategically target high potential areas, allowing for data to improve exploration and resource targeting, drilling faster and less expensive wells, and better managing reservoirs.

Increased access to data must be a priority in order for Canada to compete in the global market. Canada has struggled to entice investors due to regulatory inefficiencies that have resulted in Canadian developers losing out on a number of investment opportunities. A more holistic understanding of the benefits of particular projects would allow geothermal development to shine, but most importantly would allow developers to assess the viability of projects in more realistic terms. The entire set of benefits a project would provide to the local community and the economy can have a significant effect on the overall cost assessment of a project.

CanGEA recommends that the GSC be given funding and a mandate to promote and support geothermal development in Canada. With this funding, the GSC could conduct or provide funding streams for feasibility studies in the remaining provinces and territories as well as host a publicly accessible geothermal database (similar to the limited Canadian National Geothermal Database that CanGEA currently hosts). **Increased available energy data and a government branch with a mandate to support would undoubtedly encourage further investment and development, thereby increasing competition within the Canadian geothermal energy market.**

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Recommendation 2: That the government create a stream of funding specifically for geothermal projects.

Despite the prevalence of competitively diverse Canadian geothermal resources, Canada lags behind 83 other countries that already use geothermal resources for heat and/or electricity generation. This inability to compete on the global stage is due to a lack of investment, funding options, regulatory gaps, and disproportionate distribution of federal and provincial funding for renewable resources. Traditionally, funding streams favour solar and wind due to their lower upfront risk, which is uncharacteristic of a competitive market; this is a detriment to geothermal development and would best be remedied through a focused geothermal project-funding stream.

Geothermal energy is widely undervalued in Canada because of the lack of a precedent. Solar, wind, biomass and finite resources have had exponentially increasing access to programs, funding and development in comparison to geothermal. Without fair access to opportunity, geothermal development has stagnated and investment has migrated to other markets. For example, one of CanGEO's members' has decided to pursue their oil well repurposing pilot project in California rather than Alberta, due to limited funding options and regulatory gaps that exist within Canada.

The US' approach to promoting a competitive geothermal marketplace can serve as an excellent case study for how a specific funding stream can help foster development and innovation. In 2009, the American Recovery and Reinvestment Act (ARRA) program was implemented, which contained a stream designed to better target and fund priority geothermal projects. The program allocated \$368.2 million to nearly 150 geothermal projects, which led to several hundred MW being added to the grid in the following years. The ARRA, as the "jump starter," provided capital for innovative exploration and drilling, coproduced projects, EGS demonstration projects, and (particularly relevant for the Committee's current purposes) funding to collect, support and maintain geothermal data development. Risk reduction programs pertaining to geothermal data are essential to allow for development, competition, and diversification in the Canadian context. Programs that provide funding for the collection and maintenance of energy data by industry organizations or private groups allow for energy data to be developed and distributed in a decentralized way.

Recommendation 3: That the government provide funding for federal geothermal heat programs.

When considering geothermal energy development, the first thought is often geothermal electricity production, however this limited focus undermines the vast potential and many applications possible of geothermal heating projects. Unlike electricity projects, which require hot temperatures, or high quality resources, geothermal heating projects

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can utilize heat as low as 15-20°C. Depending on the temperature of the resource, there are many potential uses for geothermal heat, such as: a district heating system, greenhouse heating, spas or hot pools, lumber drying, snow melting, lumber drying and any other process that requires heat.

Geothermal heat is low-cost, clean and renewable, and provides positive economic and social benefits that add even greater value to geothermal development. Direct use of geothermal heat can either replace fossil-fuel burning heat sources in a community, or replace electric heating, thus reducing the amount of electricity needed on the grid. Government support of geothermal heat programs can help bring these benefits to isolated or underserved communities and promote social and economic prosperity as well as greenhouse gas emission reduction.

Geothermal heating projects could be particularly useful in Northern Canada, where many communities rely on diesel for heating and electricity. As previously mentioned, geothermal heat applications do not require as high quality of resources, which provides opportunity for communities that may not have resources that permit for geothermal power generation. The opportunity to offset any costs and emissions associated with diesel-powered heating is a great opportunity for the North, in which CanGEO is actively pursuing opportunities.

There are currently several geothermal heating projects moving forward in Canada in Sussex, New Brunswick; Springhill, Nova Scotia; Hinton, Alberta; Valemount, British Columbia; Terrace, British Columbia; and Fort Liard, NWT. Though a few of these projects have received federal funding, there is no clear path forward for geothermal heating projects, as they do not fall under the power generation umbrella. **Creating a geothermal heating specific stream or including geothermal heating within the scope of existing streams would promote further investigation and development of geothermal heating projects in Canada.**

Recommendation 4: That the government allocate funding for programs to raise public awareness surrounding geothermal energy.

Raising public awareness and public education is key. Even the most basic information about geothermal development in Canada should be made more readily available. A useful example is that on the website for Natural Resources Canada, geothermal does not have its own discussion page - wind, solar, hydro, tidal, and biomass each have their own discussion pages. Though this can be resolved without further funding, it is illustrative of the level of accessible information available to the public and government officials. Action needs to be taken to improve Canadians knowledge about geothermal energy and its potential applications for Canada.

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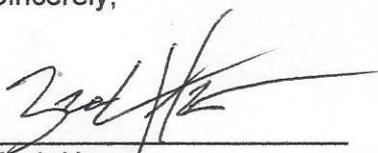


CanGEA recommends that the Federal Government allocate funding for renewable energy public information campaigns and information sessions. More specifically, CanGEA would like to expand on our efforts within Western Canada to further promote the benefits and potential applications for geothermal energy in Canada.

Conclusion:

Geothermal electricity is a clean, renewable, base load energy source that offers heat as a by-product. Due to the larger upfront risk that geothermal energy development requires and historically low political will, geothermal has lagged behind the other renewables in Canada. As such, direct support is needed to get geothermal energy development off the ground.

Sincerely,



Zach Harmer
Director of Operations



Kayla Wilson-Layton
Policy Analyst

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