

Submission Form

Introduction (100-word limit)

Indicate who the submission is from, i.e., whether from you in a personal capacity or sent on behalf of an organization, and any relevant background information.

The Canadian Geothermal Energy Association (CanGEA) 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 unlocking Canada's tremendous geothermal energy potential. British Columbia is positioned perfectly, with its bounty of geothermal resources and ambitions to drastically reduce emissions, to lead the country in geothermal energy production.

Geothermal energy can provide competitively priced, non-emitting, renewable, around-the-clock energy to the BC market. CanGEA believes that geothermal district heating systems must be part of BC's solution to address growing concerns about securing sustainable and cost-effective energy sources, while prioritizing decarbonization in the province, and reconciliation with Indigenous peoples.

Recommendation 1 (50-word limit)

The 2023 Budget can further meet CleanBC's objective of reducing GHGs by directing BC Hydro (BCH) to include the use of geothermal district heating and cooling systems to complement BCH's Integrated Resource Plan (IRP) programs seeking to reduce electricity demand. Demand side management utilizing local, renewable district heating will help decarbonize the province.

Recommendation 1 Explanation (300-word limit)

CanGEA believes that a narrow focus on electrification is not necessarily the most effective course of action for the province to meet its energy goals. In certain regions of the province, geothermal energy is a lower-cost, and higher reliability option than electricity for heating. Electricity Demand Side Management utilizing local, renewable district heating will help decarbonize the province and reach CleanBC's objective to reduce GHG emissions.

The basis of our proposal is that the government provide funding or direction to have BC Hydro include the use of renewable (geothermal) district heating and cooling systems to complement BCH's IRP demand-side measures and energy efficiency programs seeking to reduce electricity demand. We believe that by working together, geothermal and other renewable heating options would assist BCH's Demand Side Management efforts by allowing heating customers to use geothermal heat, where available, thus freeing up electricity to be used for non-heating customers.

Presently, BCH is focused on using Demand Side Management programs and rate structures to encourage its customers to reduce peak electricity demand. Instead, economy damaging load curtailments could be avoided by implementing renewable heating solutions, where resources exist, in proximity to the industry that requires heat.

Additionally, BCH may use their monopoly scale to compete and offer electric heating options that renewable district heat can also provide directly. We assert that where a heating customer can be served with electricity or renewable heat, and a geothermal resource is available to provide the

heating, BCH should not compete, but rather facilitate the sharing of the market. Please see attached submission from Kitselas Geothermal to BCH 2021 IRP.

Recommendation 2 (50-word limit)

The 2023 Budget can provide CleanBC funding for no-carbon geothermal district heating customer connections in residential, community, commercial, and industrial buildings and facilities. Funding can only currently be used for existing fossil fuel, woodstove, and electrical switching to BC Hydro.

Recommendation 2 Explanation (300-word limit)

Industrial, commercial, and residential heating comprise one of the largest GHG emitting sectors. This makes the diversification of the province’s heating sources one of the most effective and efficient methods to decarbonize and curb the impending threats of GHG emissions. Around the world, countries are adopting geothermal district heating systems as core solutions in their long-term plans to lower GHG emissions. According to the European Geothermal Energy Council, “Most European countries are looking to significantly expand their use of this renewable resource as they pursue policies to decarbonize heating and cooling.” However, in B.C., the significant capital and installation costs and associated expenses required to convert existing emissions intensive heating systems to no-carbon (geothermal) district heating connections have proved to be a consequential impediment for families, communities, and businesses to make these important changes.

The financial burdens associated with converting traditional heating systems to a no-carbon (geothermal) district energy system necessitate bold government action to support and accelerate these efforts. CanGEA respectfully submits that increased government funding for a no-carbon (geothermal) district heating incentive offered through CleanBC is the correct method to support the transition of fossil fuel, woodstove, and electrical heating systems to no-carbon (geothermal) district heating projects for space heating and hot water. These efforts are consistent with the CleanBC Roadmap to 2030 and align perfectly with, and could expand on, CleanBC’s Better Homes and Better Buildings rebates, financing and innovation funding. See the attached CanGEA paper prepared to support the Village of Valemount’s geothermal conversion efforts.

Recommendation 3 (50-word limit)

The 2023 Budget should support the heating industry fairly and provide the same fiscal and regulatory support to district geothermal energy as other industries, such as, renewable natural gas, hydrogen, and electrification. This will result in leveling the playing field for the province’s emerging geothermal industry.

Recommendation 3 Explanation (300-word limit)

CanGEA applauds the BC Government’s efforts to reduce GHG emissions in the province through fiscal and regulatory incentives for low-carbon energy solutions. However, the geothermal heating industry continues to face significant barriers to access these essential government supports compared to other industries.

For example, the May 25, 2021 amendments to the Greenhouse Gas Reduction (Clean Energy) Regulations (GGRR) created classes of prescribed undertakings for low-carbon energy solutions that are able to benefit from exclusive rate recovery incentives, outlined in section 18 of the Clean Energy Act. These amendments encourage the development of low-carbon energy solutions, but inadvertently tilt support in favour of renewable natural gas, hydrogen, and electric heating industries over renewable (no-carbon) energy suppliers, like geothermal, because they are excluded from the prescribed undertakings.

Respectfully, there is no rational explanation for the exclusion of no-carbon energy solutions, like geothermal heat, from government support aimed to facilitate the reduction of GHG emissions when they are available to its low-carbon counterparts. If the government is providing fiscal and regulatory support for low-carbon energy solutions, then identical supports should be extended to no-carbon energy solutions in order to ensure fair, consistent, and effective methods to advance the Government's objective to decarbonize the province.

CanGEA submits that leveling the playing field for energy solutions that will reduce GHG emissions must be a priority for the government to demonstrate its commitment to decarbonization. This can be achieved easily by making additional amendments to the GGRR that include geothermal as a prescribed undertaking.

In order to process your completed submission, this form should be emailed to: financecommittee@leg.bc.ca with your name, organization (if submitting on behalf of an organization); mailing address and phone number.

As well, we require your acknowledgement that you have read our [privacy policy](#) (required in order to formally receive your submission). We also seek your permission to post your submission on the Committee's website following the release of the Budget 2023 Consultation Report (please note that we only post submissions where consent has been received).

I have read and agreed to the Privacy Policy of the Parliamentary Committees Office.

I consent to having my submission posted on the Legislative Assembly website.



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Recommendation 3 – Information to Accompany Presentation:

Kitselas Geothermal’s Submission to CleanBC Roadmap to 2030: Low Carbon Energy & Industry



Submitted April 28, 2022

Due: May 3rd 2022

Patrick Wruck
Commission Secretary
British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Subject: BCUC Proceeding – BC Hydro 2021 Integrated Resource Plan
Kitselas Geothermal Inc. (“KGI”) Intervener Information Request No.1

Dear Mr. Wruck,

Please find enclosed Kitselas Geothermal Inc.’s Intervener Information Request No. 1 for the above proceeding, in compliance with BCUC Order G-15-22.

Kitselas Geothermal is also representing our affiliates Borealis GeoPower and the Canadian Geothermal Energy Association (CanGEA) in this proceeding.

If you have any questions, please do not hesitate to contact me.

Warm Regards,

Alison Thompson
Director
Kitselas Geothermal Inc.

British Columbia Utilities Commission BC Hydro 2021 Integrated Resource Plan

Intervener Information Request No.1 by Kitselas Geothermal Inc.

May 3, 2022



REQUESTOR NAME: **Kitselas Geothermal Inc.**
INFORMATION REQUEST ROUND NO: **1**
TO: BRITISH COLUMBIA HYDRO & POWER AUTHORITY
DATE: **May 3 2022**
PROJECT NO: **No. 1599287**
APPLICATION NAME: **BC Hydro 2021 Integration Resource Plan**

Please find attached, our comments and response to the BC 2021 Integrated Resource Plan.

Introduction

Kitselas Geothermal Inc. believes that electricity Demand Side Management utilizing local, renewable district heating will help decarbonize the Province and reach CleanBC’s Objective of reducing Greenhouse Gas Emissions (GHGs). In certain regions of the Province, we believe geothermal energy is a lower-cost, and higher reliability option than electricity for heating.¹ Geothermal energy would certainly be included in any list of green energy projects, with an exceptionally small environmental footprint.

The basis of our submission is our proposal that BC Hydro include the use of renewable (geothermal) district heating and cooling systems to complement BC Hydro’s programs seeking to reduce electricity demand. We believe that by working together, geothermal and other renewable heating options would assist BC Hydro’s Demand Side Management by allowing heating customers to use geothermal heat, where available, thus freeing up electricity to be used for non-heating customers.

As stated in our Request to Intervene, Kitselas Geothermal is also representing Borealis GeoPower and the Canadian Geothermal Energy Association (CanGEA).

1.0 Reference: British Columbia Hydro and Power Authority (BC Hydro) – 2021 Integrated Resource Plan dated December 21, 2021.

Correction Request

- 1.1 Within the BC Hydro Integrated Resource Plan (IRP), two tables distinguish Geothermal as an “energy option” as opposed to a “capacity option” ([Appendix B, p. 20, Table 5-4](#); [Appendix D, p. 26, Table 3](#)). However, BC Hydro correctly characterizes geothermal resources as having “high availability” in [Appendix O-2, p. 17](#), which rightly places this source as a capacity option, alongside battery storage and pumped storage.

¹ [Kitselas Geothermal Inc, 2021 Integrated Resource Plan, C15-1, Request to Intervene, March 22 2022](#)

- 1.2 According to the Canadian Energy Research Institute, geothermal resources have a distinct advantage over other renewables because it is base load and reliable, with a capacity factor as high as 95%.²
- 1.3 We draw upon the 2017 CanGEA Submission from the BCUC Site C Inquiry to cite the following graph in Figure 1,³ originally published by its authors in 2012, that illustrates geothermal as having the highest capacity factor by a significant percentage when compared to other resources such as biomass, hydro, and natural gas.⁴

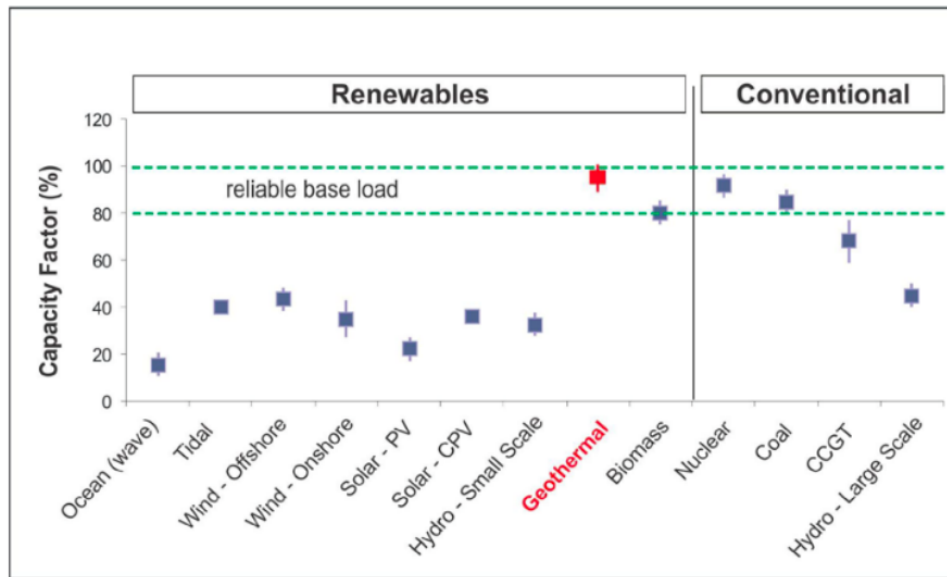


Figure 1 - Comparison of Generation Capacity Factor for Various Electrical Energy Sources

Figure 2, (next page) accurate as of January 2022, further supports this claim.⁵

² [Canadian Energy Research Institute, “A Comprehensive Guide to Electricity Generation Options in Canada,” Study No. 168, February 2018, p. 63.](#)

³ [Originally found in S.E. Grasby et al., “Geothermal Energy Resource Potential of Canada,” *Geological Survey of Canada, Open File 6914, 2012, p. 1.*](#)

⁴ CanGEA. “Geothermal Energy: The Renewable and Cost Effective Alternative to Site C.” November 25 2014.

⁵ [NREL, “Utility-Scale Energy Technology Capacity Factors,” Transparent Cost Database, Last Modified: Jan 28, 2022.](#)

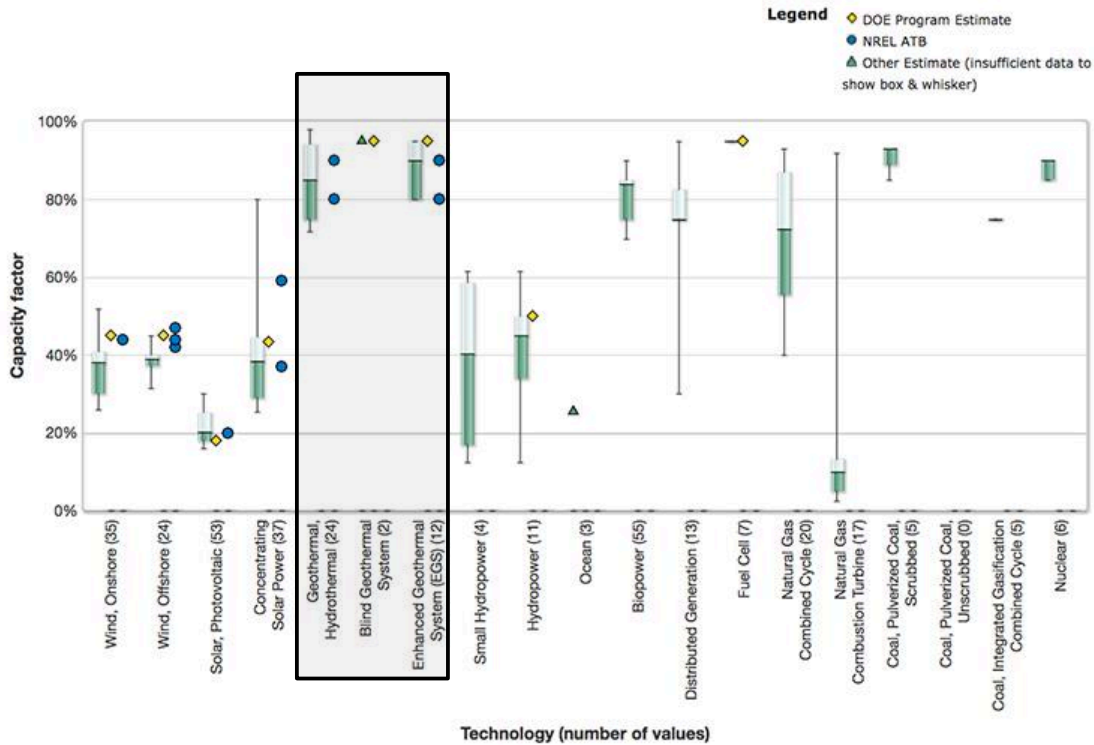


Figure 2 - Utility-Scale Capacity Factors

1.4. Kitselas Geothermal and our affiliates respectfully request that the “capacity option” description for geothermal energy be reflected forevermore within all BC Hydro’s publications and all applicant documents from BC Hydro to the BCUC.

2.0 BC Hydro – 2021 Integrated Resource Plan – Appendix E-1

Appreciation

2.1 Kitselas Geothermal viewed with much interest the IRP’s Contingency Resource Plan dedicated to the North Coast region electricity supply and demand, and the steps to implement this electrification on a timely basis if the need arises, i.e. LNG projects and mining industry electricity needs are higher than the BC Hydro IRP reference case.⁶

Kitselas Geothermal’s project is located near Terrace, and we are delighted to see BC Hydro’s focus on utilizing geothermal energy renewables in their Contingency Resource Plan.⁷ We are happy to see that our project has government acknowledgement, and that BC Hydro seems poised to play a supporting role in the successful distribution of our

⁶ [BC Hydro, 2021 Integrated Resource Plan, B-1, December 21 2021, p. 1-5.](#)

⁷ [BC Hydro, 2021 Integrated Resource Plan, B-1, December 21 2021, Appendix E-1, p. 118 of 213.](#)

geothermal energy. We remind BC Hydro that since the cancellation of the Standing Offer Program,⁸ our project which initially contemplated using geothermal energy for electricity generation, has pivoted to be a direct use of heat project. We welcome the adoption of our suggestions in section 3.0 and a discussion about our future geothermal electricity potential and your future energy and capacity needs.

3.0 BC Hydro – 2021 Integrated Resource Plan

Direct-Use Geothermal for Demand Side Management

- 3.1 Kitselas Geothermal would like to preemptively distinguish between ground-source heat pumps, often referred to as geo-exchange heat pumps, and geothermal energy (a primary energy source), which use different technologies. We would like to avoid this confusion to the reader as BC Hydro provides the information requested in this document.
- 3.2 Kitselas Geothermal is providing comments on the BC Hydro Draft IRP for the purpose of highlighting the premise that a narrow focus on electrification is not necessarily the most effective course of action for BC Hydro or the Province to meet its energy goals.

The fundamental thread running through the entire IRP is that British Columbia must diversify its energy and heating sources in order to curb the impending threats of GHG emissions. Kitselas Geothermal firmly believes BC utilities must collectively take an “all of the above” approach.

Major utilities like FortisBC are making changes with “Renewable”⁹ Natural Gas (RNG) – derived from decomposing organic waste. BC Hydro and the government are replacing natural gas heating in homes by providing heat pump incentives and an increased electricity supply. Meanwhile, smaller utilities are providing locally generated heat and electricity, with even more First Nations pursuing the idea of creating Indigenous utilities.¹⁰

- 3.3 A recent CBC article discussed BC’s foremost utility providers, BC Hydro and FortisBC, bringing to Twitter on October 12, 2021 their debate between “renewable” natural gas and hydroelectricity for home heating.¹¹ While these companies involve the online public in their competition for customers, the elephant in the room remains unaddressed: industrial, commercial, and residential heating is one of the largest GHG emitting

⁸ [BC Hydro, Standing Offer Program, last modified: March 20, 2019.](#)

⁹ [CanGEA, BCUC Inquiry - FEI BERC Rate Methodology and Review of Revise RNG Program, Exhibit E-6, Letter of Comment, February 8, 2022.](#)

¹⁰ [BC Hydro, 2021 Integrated Resource Plan, B-1, pg. 887.](#)

¹¹ [Singh, Inayat. “As Canada tackles building emissions, what’s a natural gas utility to do?” CBC News, January 27, 2022.](#)

sectors, and there are mitigating solutions available through district heating systems. Renewable district heating through geothermal energy is carbon neutral, and could contribute significantly to lowering heating-based GHG emissions, enabling BC to reach its climate goals. Local, direct-use heating systems are sustainable and must be incorporated into long-term plans for BC's clean energy future, where (geothermal) resources exist.

- 3.4 The 2021 IRP is an opportunity to set foundations for reaching climate targets in a net-zero future. Kitselas Geothermal highlights that a single-minded drive towards full electrification of heating systems (industrial, commercial, and residential) will take an abundance of clean energy generation in Canada.¹² The electrification approach would be best supported by also developing renewable district heating and thus diverting electricity away from industrial heating, which could be more efficiently supplied, in certain locations, by geothermal and other renewable heat alternatives to electrification of heat, natural gas, and renewable natural gas options.
- 3.5 Moreover, around the world, countries are adopting district heating systems as core solutions in their long-term plans to lower GHG emissions. According to the European Geothermal Energy Council (EGEC), *“In 2020 there were 350 geothermal district heating systems in operation in Europe. A further 232 were in various stages of development [and]12 projects are commissioned per year, on average....Most European countries are looking to significantly expand their use of this renewable resource as they pursue policies to decarbonize heating and cooling.”*¹³ Even the impacts of COVID-19 have not stopped the upward trend of geothermal in Europe. Kitselas Geothermal points to the following graphs in Figure 3,¹⁴ Figure 4,¹⁵ and Figure 5¹⁶ as evidence of the exponential growth of GHG reducing opportunities via geothermal district heating systems, and as context for our questions.

¹² [Singh, Inayat. “As Canada tackles building emissions, what’s a natural gas utility to do?” CBC News, January 27, 2022.](#)

¹³ [European Geothermal Energy Council, 2020 EGEC Geothermal Market Report, Ed. Thomas Garabetian et al., Tenth Edition, June 2021, p. 8 – as of 2020.](#)

¹⁴ [European Geothermal Energy Council, 2020 EGEC Geothermal Market Report, Ed. Thomas Garabetian et al., Tenth Edition, June 2021, p. 14 – as of 2020.](#)

¹⁵ [European Geothermal Energy Council, 2020 EGEC Geothermal Market Report, Ed. Thomas Garabetian et al., Tenth Edition, June 2021, p. 14 – as of 2020.](#)

¹⁶ [European Geothermal Energy Council, 2020 EGEC Geothermal Market Report, Ed. Thomas Garabetian et al., Tenth Edition, June 2021, p. 15 – as of 2020.](#)



Figure 3 - Number of European Geothermal District Heating and Cooling Systems, Operating and in Development

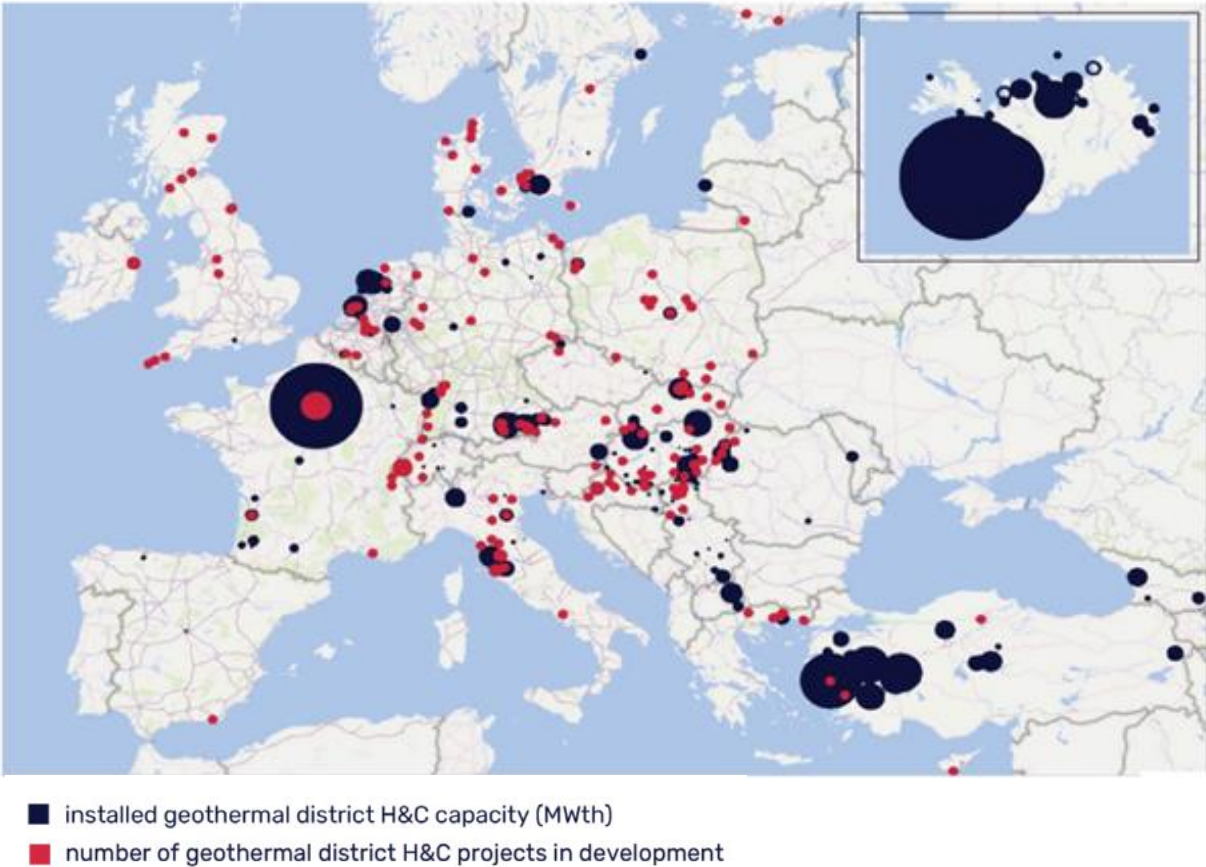
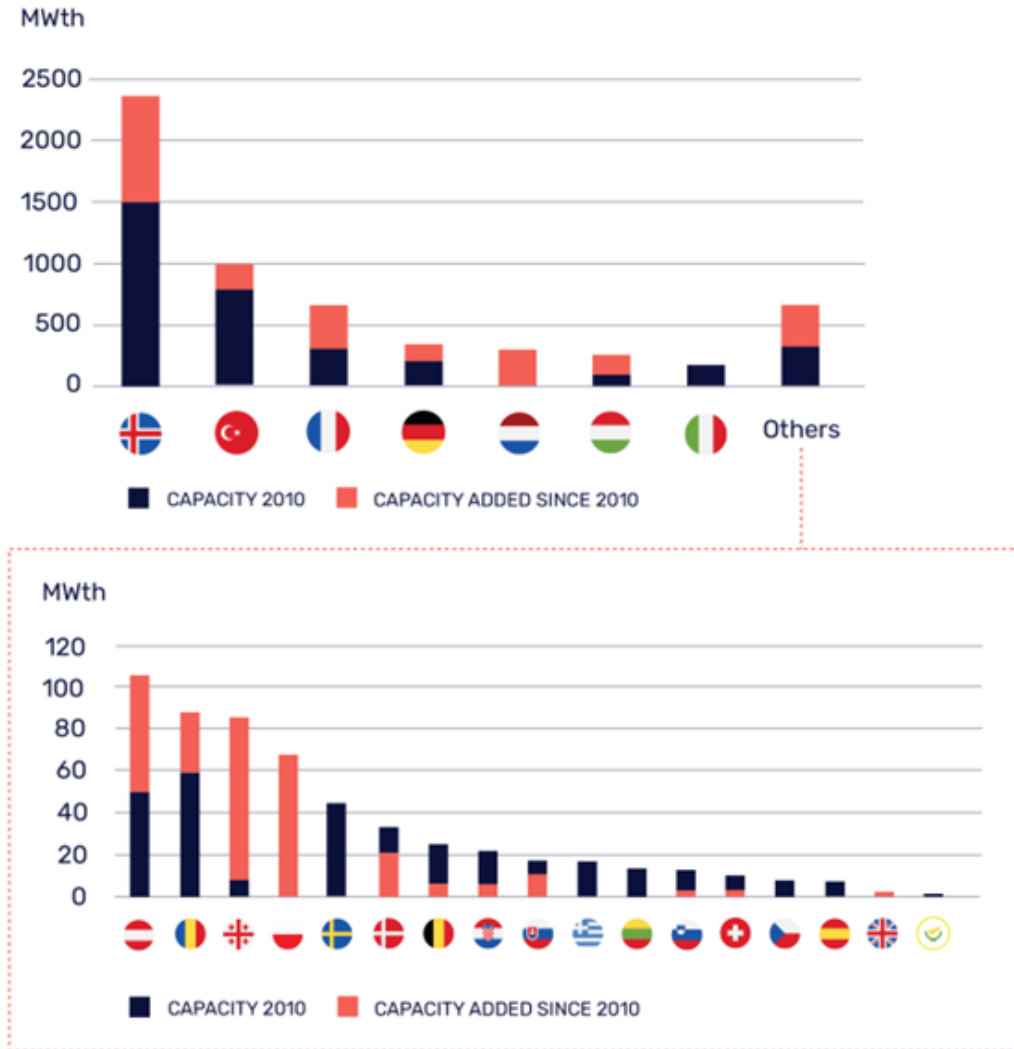


Figure 4 - Map of Geothermal District Heating and Cooling (H&C) in Europe



4.0 BC Hydro – 2021 Integrated Resource Plan – Chapter 1 - Introduction

Objectives and Defining Features

- 4.1 The BC Hydro IRP lists the following as their planning objectives: keeping costs down for customers, reducing greenhouse gas emissions through clean energy, limiting land and water impacts, and supporting the growth of British Columbia’s economy.¹⁷ Kitselas Geothermal highlights that all these objectives could be partially met by district heating systems.
- 4.2 BC Hydro also lists the defining features of their 2021 IRP, one of which is to support “*BC Hydro’s mandate to incorporate the United Nations Declaration on the Rights of Indigenous Peoples and the Truth and Reconciliation Calls to Action*” into their business.¹⁸ Kitselas Geothermal believes BC Hydro could demonstrate their commitment to this feature by partnering with our intervener group to identify and assess other fault-controlled systems¹⁹ that can be implemented for Demand Side Management of heating needs.
- 4.3 The IRP announces that BC Hydro has Near-Term Actions associated with both the Base Resource Plan and the Contingency Resource Plans,²⁰ and Kitselas Geothermal requests to be consulted on adding the evaluation of geothermal district heating into BC Hydro’s near-term action plans.

5.0 BC Hydro – 2021 Integrated Resource Plan – Chapter 6 – Resource Options and Other Inputs to the 2021 IRP

Load Curtailment

- 5.1 BC Hydro proposes a load curtailment strategy, primarily for large commercial and industrial customers who provide a firm load reduction during peak events in exchange for an incentive.²¹ The proposed industrial load curtailment program, on a voluntary time-varying rate program, intends to achieve 100 MW of incremental capacity savings at the system level by no later than fiscal 2030.²²

Presently, BC Hydro is focused on using Demand Side Management programs and rate structures to encourage its customers to reduce peak

¹⁷ [BC Hydro, 2021 Integrated Resource Plan, B-1, December 21, 2021, Section 1.2, p.1-1.](#)

¹⁸ [BC Hydro, 2021 Integrated Resource Plan, B-1, December 21, 2021, Section 1.2, p.1-2.](#)

¹⁹ <http://www.borealisgeopower.com/about.html>.

²⁰ [BC Hydro, 2021 Integrated Resource Plan, B-1, December 21, 2021, Section 1.3, p. 1-6.](#)

²¹ [BC Hydro, 2021 Integrated Resource Plan, B-1, December 21, 2021, p. 6-12.](#)

²² [BC Hydro, 2021 Integrated Resource Plan, B-1, December 21, 2021, Section 1.2, p. 1-3.](#)

electricity demand. Load curtailment as a demand-side measure may be difficult to implement on a voluntary basis. It is worth noting that industry and employees (including indirect and induced employees) that make up a local economy may not equally benefit from voluntary load curtailment incentives. Instead, load curtailments could be complemented by implementing renewable heating solutions, where resources exist, in proximity to the industry that requires heat.

Kitselas Geothermal proposes that BC Hydro support the use of geothermal district heating and cooling systems to complement the programs seeking to reduce electricity demand. Kitselas Geothermal requests that BC Hydro partner with our intervener group as consultants to identify and assess other fault-controlled geothermal heating opportunities for industrial fuel switching.

6.0 BC Hydro – 2021 Integrated Resource Plan

BC Hydro Infrastructure

- 6.1 On January 28, 2021, the Province and BC Hydro released that they are reducing the standard industrial rates for eligible industrial customers who elect to use electricity rather than fossil fuels.²³ While Kitselas Geothermal applauds the Province and BC Hydro for their efforts to lower prices for their customers, thus encouraging the use of electricity rather than fossil fuels and reducing GHGs, the customers who stand to benefit from this rate reduction are the same customers who alternative energy producers, such as renewable district heating systems, propose to serve.
- 6.2 Kitselas Geothermal requests a response to our concerns that BC Hydro may use their monopoly scale to compete and offer electric heating options that renewable district heat can also provide directly.²⁴ We assert that where a heating customer can be served with electricity or renewable heat, and a geothermal resource is available to provide the heating, BC Hydro should not compete, but rather facilitate the sharing of the market.

7.0 BC Hydro – 2021 Integrated Resource Plan – Appendix E-1

General Inquiry

- 7.1 In light of BC Hydro’s cancellation of the Standing Offer Program, Kitselas Geothermal will echo what was highlighted in the IRP’s Appendix E-1 Participant Input section and inquire whether BC Hydro or the BCUC have a mandate to alter the ban on utilities having retail access

²³ [Office of the Premier, “Province helping industry power up with clean electricity,” *BC Government News*, January 28, 2021.](#)

²⁴ [Kitselas Geothermal Inc, 2021 Integrated Resource Plan, C15-1, Request to Intervene, March 22 2022.](#)

to customers, who are also fueled by BC Hydro electricity, using BC Hydro grid infrastructure?²⁵ We ask that a relief from this ban be provided to Indigenous Utilities as an additional IRP Near-Term Action.

Conclusion

Kitselas Geothermal appreciates the time BC Hydro has spent refining the 2021 Integrated Resource Plan, and we look forward to collaborating with BC Hydro to ensure this IRP benefits all parties and supports growth toward a sustainable energy future. Kitselas Geothermal encourages BC Hydro to make use of our intervener group's technical expertise when developing its Integrated Resource Plans. By utilizing information from geothermal experts who are industry focused with BC experience and advanced projects, BC Hydro would be able to better identify how geothermal energy projects can be incorporated into the Integrated Resource Plan for the benefit of all.

All of which is respectfully submitted.



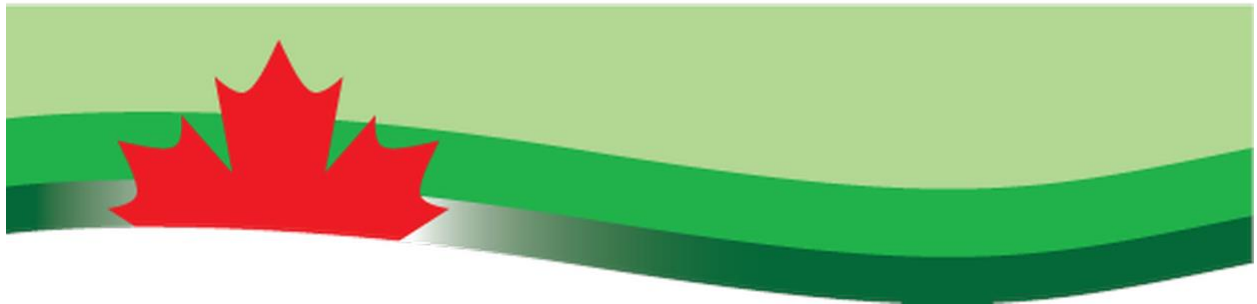
Alison Thompson
Director
Kitselas Geothermal Inc.



²⁵ [BC Hydro, 2021 Integrated Resource Plan, B-1, December 21 2021, Appendix E-1 p. 149 of 213.](#)

CanGEA

CANADIAN GEOTHERMAL ENERGY ASSOCIATION



Proposed No-Carbon (Geothermal) District Heating Clean BC Incentives

June 15, 2022

Proposed No-Carbon (Geothermal) District Heating Clean BC Incentives

Purpose:

To provide fiscal parity for other low-carbon energy alternatives to (BC Hydro) powered heat pumps.

Goal:

To support decarbonization of communities, and availability of low-cost energy.

The proposed incentive should:

- Provide CleanBC funding for low-carbon (geothermal) district heating connections in residential, community and commercial buildings
 - For converting heating systems to connect to a low-carbon district energy system
- Including capital and installation costs
- Including some associated expenses

Eligibility Requirements:

- For fossil fuel, woodstove, and electrical switching to low-carbon (geothermal) district heating projects for space heating and hot water
- Community Support
- Connections to low-carbon (geothermal) district energy system

Upgrade Requirements:

- Eligible expenses
 - Connection to district heating network
 - Conversion or retrofitting of buildings' heating system to hydronic
 - Potential heating systems
 - Hydronic in-floor radiant
 - Forced flow heater / fan coil
 - Hydronic radiators / radiant panels
 - Water-source heat pumps

Incentives Comparison:

Program	Rebate	Note
Indigenous Community Heat Pump Incentive	Up to \$12,000 per residential heat pump	<ul style="list-style-type: none"> Covers expenses associated with heat pump (installation, modifications, etc.) Larger rebate available for community buildings Runs until August 2022
Heat Pump Group Purchase Rebate	Up to \$500 per residential heat pump	<ul style="list-style-type: none"> Number of participants determines rebate amount
Income Qualified Program	Up to \$9,500 per residential heat pump	<ul style="list-style-type: none"> Rebates available for other energy saving upgrades
NRCAN home retrofit grants	Up to \$5,000 total for energy efficiency retrofits	<ul style="list-style-type: none"> Rebates vary depending on what is being retrofitted
(Valemount) Wood Stove Exchange	Up to \$3,000 to replace wood stove with alternative heating	<ul style="list-style-type: none"> \$3,000 to replace with electric heat pump, \$2,750 for other alternative heating

CleanBC Indigenous Community Heat Pump Incentive:

<https://betterhomesbc.ca/rebates/icec-offer/>

- Funding for heat pump installation projects in residential and community buildings
- Available rebates

Residential (e.g., on-reserve housing)	Community Buildings (e.g., administration office)
<ul style="list-style-type: none"> • Up to 80% of the cost of new heat pump installation(s), up to a maximum of \$12,000 per residential heat pump. • For homes switching from woodstove primary to electric heat pumps: <ul style="list-style-type: none"> • \$3,500 for a mini-split heat pump • \$6,500 for a central heat pump system 	<ul style="list-style-type: none"> • Up to 80% of the cost of new heat pump installation(s) and up to \$200,000 total per community building heat pump.
<p>A total maximum funding of \$200,000 is available for each Indigenous Community program application, and intake is limited to one funding application per fiscal year.</p>	

- For community building projects up to \$6,000 is available to help cover cost of energy feasibility study of system to ensure it delivers the desired improvement and performance
- Eligible Costs
 - Heat pump capital cost
 - Heat pump installation costs
 - Up to one year of heat pump maintenance cost
 - Oil tank removal costs
 - Gas system decommissioning costs
 - Ducting modification and/or cleaning cost required as part of heat pump installation
 - Additional air filtration systems added to heat pump system
 - Electrical upgrade costs *not needed for geothermal district heating

CleanBC Heat Pump Group Purchase Rebate:
<https://betterhomesbc.ca/rebates/gpr/>

- Funding for groups of homeowners switching from oil, natural gas, or propane heating to air source heat pumps
- Larger the group the larger the rebate

Available Rebates

The rebate amount a participant can access depends on the size of the group using the same GPR Code.

Size of Group	Each Participant Receives
2-4 homes	\$200
5-9 homes	\$275
10-14 homes	\$350
15-19 homes	\$425
20-30 homes	\$500

- Additional rebates available for certain municipalities when converting from fossil fuel heating to an electric air source heat pump

CleanBC Income Qualified Program:
<https://betterhomesbc.ca/rebates/income-qualified/>

- Rebates to make energy saving home upgrades based on household income
- Rebates to cover 60-90% of home upgrade costs
 - Heat pumps up to \$9,500
 - Heat pump water heaters up to \$3,500
 - Insulation up to \$5,500 *not needed for geothermal district heating
 - Windows and doors up to \$9,500 *not needed for geothermal district heating
- Rebate coverage based on combine income of all adults in house and how many people (adults and children) live in the house
 - Level 1 up to 95% of upgrade costs
 - Level 2 up to 60% of upgrade costs

Number of people living in your home (including adults and children)	Combined pre-tax annual income of all adults in your home (excluding dependants):	
	Income Level 1	Income Level 2
1	\$42,593	\$55,903
2	\$53,026	\$69,596
3	\$65,189	\$85,560
4	\$79,147	\$103,880
5	\$89,768	\$117,820
6	\$101,242	\$132,880
7 or more	\$112,718	\$147,943

Valemount 2022 Wood Stove Exchange Program:

<https://valemount.ca/services/grants-funding/wood-stove-exchange-program>

- Non-EPA/CSA stove to certified wood replacement - \$1,300
- Non-EPA/CSA certified stove to alternative heating replacement - \$2,750 (electric heat pump - \$3,000)
- EPA/CSA certified stove (more than 5 years old) to alternative heating replacement - \$2,750 (electric heat pump – \$3,000)
- Non-EPA/CSA Stove to certified wood replacement (secondary heat source) - \$1,000

Other Rebates in Canada:

<https://www.nrcan.gc.ca/energy-efficiency/homes/canada-greener-homes-grant/start-your-energy-efficient-retrofits/plan-document-and-complete-your-home-retrofits/eligible-grants-for-my-home-retrofit/23504>

- NRCAN - \$600 for home evaluation to plan retrofits and \$5,000 total for energy efficient retrofits to home
 - Eligible retrofits
 - Space and water heating up to \$5,000
 - Home insulation up to \$5,000 *not needed for geothermal district heating
 - Air-sealing up to \$1,000 *not needed for geothermal district heating
 - Windows and doors up to \$5,000 *not needed for geothermal district heating
 - Thermostats up to \$50 *not needed for geothermal district heating
 - Renewable energy (solar) up to \$5,000 *not needed for geothermal district heating
 - Resiliency measures up to \$2,625 *not needed for geothermal district heating



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CleanBC Roadmap to 2030: Low Carbon Energy & Industry

ACTION: A level playing field for geothermal heat



Kitselas Geothermal Inc.
4562-J Queensway Dr.
Terrace, BC
V8G 3X6

July 8, 2021

¹ CleanBC Roadmap to 2030 Engagement – Session 3 Actions Illustration

² CleanBC Roadmap to 2030 Engagement – Session 3 timelapse

On July 6th and 8th, 2021, Kitselas Geothermal Inc. (KGI) participated in the “Action” breakout room of the CleanBC Roadmap to 2030: Low Carbon and Energy Engagement. In preparation for the engagement, KGI discovered the amendments to the *Greenhouse Gas Reduction (Clean Energy) Regulation*. Also, during the engagement session on July 6th, the Government of BC released its Hydrogen Strategy.

These government actions not only serve to highlight the steps that the government is taking to reduce GHG emissions in the province, but they now serve as examples of what types of support the government should be providing for the geothermal heat industry so that there is a level playing field between industries and support is not tilted in favour of fossil fuel heating over non-combustion heating.

In the following sections, KGI will briefly discuss the recent steps that the government has taken to reduce GHG emissions that have inadvertently tilted support in favour of the natural gas and hydrogen industries, as well as the future actions that should be made by the government to level the playing field for the geothermal industry.

Greenhouse Gas Reduction (Clean Energy) Regulation

On May 25, 2021, the Province of BC, via the Minister of Energy, Mines and Low Carbon Innovation, amended the *Greenhouse Gas Reduction (Clean Energy) Regulation* to allow for the increased production and use of renewable gas as well as green and waste hydrogen by Public Utilities. The government published a news release describing these changes on July 2, 2021.

This change was implemented to help reduce GHG emissions from BC’s natural gas system and is part of BC’s commitment to find new solutions to develop a clean economy by reducing GHG emissions in all sectors.

To increase the amount of renewable gas and green and waste hydrogen that natural gas utilities can acquire and make available to their customers, the amount of renewable gas (including hydrogen and other previously ineligible gases) utilities can acquire and supply was increased from 5% to 15% of their total annual supply of natural gas, based on 2019 volumes.

While KGI commends the BC Government for implementing these changes, there remains an opportunity to further amend the *Greenhouse Gas Reduction (Clean Energy) Regulation* to encourage a public utility’s customers to use energy sources that produce less GHG emissions. This opportunity is to allow for and encourage Public Utilities to invest in the production and supply of geothermal direct-use heat. The direct use of geothermal heat is a non-emitting substitute to the combustion of natural gas and other fossil fuels.

Currently, Public Utilities are not able to invest in the development of geothermal direct-use systems, as they do not align with the regulated rate recovery framework for Public Utilities.

KGI requests that the BC Government amend the *Greenhouse Gas Reduction (Clean Energy) Regulation* to add the construction/purchase and operation of geothermal direct-use district energy systems as a prescribed undertaking for the purposes of section 18 of the *Clean Energy Act*. For the convenience of the BC Government, these amendments have been drafted by KGI and are found later in this document.

BC Hydrogen Strategy

On July 6, 2021, the Province of BC released its first comprehensive hydrogen strategy.

KGI applauds the BC Government's commitment to utilize renewable and low-carbon hydrogen to support its climate goals and create new economic development. Setting out the 63 actions for government to undertake during the short, medium, and long term are crucial to the establishment of BC as a North American renewable and clean hydrogen hub. Included among the actions was a commitment to introduce alternative electricity rate designs to support hydrogen production.

While the production and use of hydrogen represents a viable method of reducing GHG emissions in BC while growing the clean-tech economy, KGI must note that geothermal direct-use heat is also a viable method of doing the same.

The Province of BC is fortunate to possess world-class geothermal energy resources, yet these resources remain mostly undeveloped, save for the widespread use of accessible hot springs as recreational sites. In many areas of the province, significant energy is able to be harnessed from the subsurface for heating use. Depending on the temperature of the available resource, the energy is able to be used for a variety of commercial and industrial process and space heating applications. Using absorption chilling technology, hot water is even able to be used to drive process and space cooling applications. Overall, the use of geothermal direct heat is able to play a material role in the support of the Province of BC's climate and economic development goals.

As such, KGI requests that the BC Government provide a level playing field for the geothermal industry and not inadvertently tilt support in favour of fossil fuel heating over non-combustion heating. Similar to the recently developed hydrogen strategy, the BC Government's geothermal support should include policy actions. At this juncture, KGI specifically calls out the following simple policy actions.

- 1. Introduce alternative electricity rate designs to support geothermal production (to operate pumps and auxiliary equipment).**
- 2. Enable the investment by Public Utilities in the production and supply of geothermal direct-use heat by including geothermal as a prescribed undertaking under the *Greenhouse Gas Reduction Regulation*.**

Suggested Changes to the Greenhouse Gas Reduction (Clean Energy) Regulation

KGI has taken the liberty of drafting specific suggested changes to the *Greenhouse Gas Reduction (Clean Energy) Regulation*, as shown below.

Section 1 of the Greenhouse Gas Reduction (Clean Energy) Regulation, is amended by adding the following definition:

“geothermal heat” means the natural heat of the earth and all substances that derive an added value from it, including steam, water and water vapour heated by the natural heat of the earth, but does not include hydrocarbons.

The following section is added:

Prescribed undertaking – geothermal

8.1 A public utility’s undertaking that is in a class defined as follows is a prescribed undertaking for the purposes of section 18 of the Act:

- (a) the public utility produces or purchases geothermal heat that is provided to customers of that utility or another public utility and that is to be used by that customer to replace, at least in part, fossil fuels.
- (b) the costs incurred by the public utility in producing or purchasing the geothermal heat referred to in paragraph (a) meet the following criteria, as applicable:
 - (i) if the public utility produces geothermal heat, the levelized cost of production reasonably expected by the public utility does not exceed the maximum amount, determined in accordance with section 9, in effect in the fiscal year in which the public utility decides to construct or purchase the production facility;
 - (ii) if the public utility purchases geothermal heat that is provided to a customer, the price of the geothermal heat and the costs of distribution reasonably expected by the public utility do not, together, exceed the maximum amount, determined in accordance with section 9, in effect in the fiscal year in which the contract for purchase is signed;
- (c) subject to section 10, the public utility produces or purchases geothermal heat that, in a calendar year, does not exceed 15% of the total amount of natural gas, in GJ provided by the public utility to its non-bypass customers in 2019.

Section 9 of the Greenhouse Gas Reduction (Clean Energy) Regulation, is amended as follows:

Maximum amount for costs

- 9 For the purposes of sections 2(3.8)(a), 6(c), 7(2)(b), 8(1)(b) **and 8.1(b)**,
- (a) the maximum amount in effect in the 2021/2022 fiscal year is \$31 per GJ, and
 - (b) for fiscal years subsequent to the 2021/2022 fiscal year, the maximum amount is calculated on April 1 of each year by multiplying
 - (i) the maximum amount in effect in the immediately preceding fiscal year, and
 - (ii) the sum of
 - (A) 1, and
 - (B) the annual percentage change for the previous calendar year.

Section 10 of the Greenhouse Gas Reduction (Clean Energy) Regulation, is amended as follows:

Aggregate amount if multiple undertakings

- 10 If a public utility does 2 or more of the following:
- (c) acquires renewable natural gas in accordance with section 2 (3.8);
 - (d) produces or purchases hydrogen in accordance with section 6;
 - (e) purchases synthesis gas in accordance with section 7;
 - (f) purchases lignin in accordance with section 8;
 - (g) produces or purchases geothermal heat in accordance with section 8.1,**
- the aggregate amount of all products must not exceed 15% of the total amount of natural gas, in GJ, provided by the public utility to its non-bypass customers in 2019.

Other Comments Regarding the Greenhouse Gas Reduction (Clean Energy) Regulation

Section 2(3.2)

KGI believes that a provision similar to section 2(3.2), but modified for the geothermal heat industry, would be particularly useful. A section like section 2(3.2) could allow for public utilities to provide grants or zero-interest loans to customers who require funding to purchase or lease equipment that is driven by geothermal heat, or to convert existing equipment to be compatible with a geothermal heat energy source.

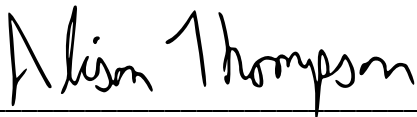
Section 2(3.6)

KGI believes that a provision similar to section 2(3.6), but modified for the geothermal heat industry, would be particularly useful. A section like section 2(3.6) could allow for public utilities to expend amounts on feasibility and development costs in relation to geothermal heat assets.

Concluding Remarks

KGI encourages the BC Government to reach out to KGI and to the Canadian Geothermal Energy Association (CanGEA) to discuss the legislative and policy actions that the government can take to support the geothermal energy industry, for the benefit of all British Columbians.

Sincerely,



Alison Thompson, P.Eng.
Director – Kitselas Geothermal Inc.