

November 30, 2015

In response to the proposed BC Geothermal Resources Act Update.

Dear Mr. Walsh, dear Mr. Sedun,

On November 2, 2015 the Canadian Geothermal Energy Association (CanGEA) received information from the BC Ministry of Energy and Mines and the BC Oil and Gas Commission regarding the planned update of the BC Geothermal Resources Act. CanGEA appreciates the possibility to respond to the proposed amendments. The content of this letter was discussed with CanGEA's members and will be made publicly available.

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 the country's tremendous geothermal energy potential. Geothermal energy can provide competitively priced, renewable, round-the-clock energy to the Canadian and U.S. markets.

Overall, CanGEA and its members welcome the idea of streamlining the regulatory framework in order to stimulate the development of British Columbia's geothermal resources. However, we did find points that are worth bringing up for discussion in order to create a framework that does suit the Canadian geothermal industry.

We identified eight points that we would like to bring to the ministry's attention:

1. CanGEA regards the geothermal resource definition to be too restrictive. The exclusion of hydrocarbons in the definition of a geothermal resource creates an artificial and unnecessary division between geothermal resources, which are produced simultaneously with hydrocarbons (co-production) and geothermal resources without hydrocarbon presence.

The proposed definition creates a situation in which co-producible resources are either meant to:

- a. remain unexploited, which would lead to the exclusion of the most economically exploitable resource type (Hot Sedimentary Aquifers – “HSA”) from development and production. Both, the Geological Survey of Canada and CanGEA have stressed the importance of HSA resources for geothermal development.

or

- b. not need a geothermal permit related to their exploitation. In CanGEA’s view, this option is unlikely to be in agreement with the Province’s position on governing and managing geothermal resources.

CanGEA proposes a new definition of geothermal resources that does include the possibility of hydrocarbon components in the geothermal fluid.

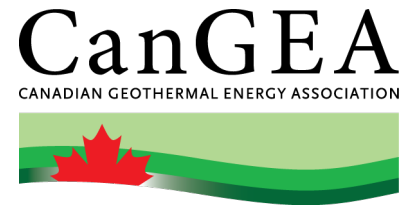
2. On a technical level, the drilling and completion of geothermal wells can differ significantly from oil and gas wells. The technical standards for hydrocarbon production are consequently not directly applicable to geothermal development. It is strongly suggested that documents like the “Code of practice for deep geothermal wells (NZS 2403:2015) are reviewed in order to find practical and advisable regulations that apply for the geothermal industry in Canada. NZS 2403:2015 was authored by New Zealand’s geothermal industry, which has a long history of safe practice.
 3. As mentioned in point 2: geothermal and hydrocarbon operations differ immensely. Therefore, some of the Environmental Protection & Management Regulations (EMPR) might not apply to pure geothermal plays, where hydrocarbons are absent. The EMPR standards for deposits and insurance related to blowouts may not be indicative on the outcomes of geothermal drilling operations. Safety concerns associated with geothermal drilling are unique from oil and gas drilling and development. For example, combustion events (e.g. explosive plumes) are not a threat in pure geothermal circumstances and the according hydrocarbon EMPR standards are consequently not applicable. If the hydrocarbon regulations are adopted without technical modification to reflect the actual circumstances of geothermal drilling, it hinders, not helps, geothermal development. Again, CanGEA suggests the consultation of NZS2403:2015 and similar documents, which are able to provide an inspiration for sensible geothermal regulation.
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4. As the definition of a test hole being shallow is outdated and not longer true, CanGEA welcomes and recommends the alteration of this definition. Test holes can be rather deep, since geophysical, geochemical and temperature measurements are preferred to cover as much of the depth profile as possible in order to provide all information that is needed to successfully manage a geothermal operation. CanGEA therefore recommends the new definition of test holes or “thermal gradient wells” to exclude any statements about the drilling depth.
5. The current regulations do not allow for any flow on exploration wells. This is critically counter to standard exploration practice, where Pressure Stem Tests (PST’s) and flow testing to the surface are the norm. Current regulations would require a conversion of the exploration permit, into a production lease, to allow these tests, which would be premature.

Pressure Stem Tests (PST’s) provide important, early and necessary insight into a reservoir’s effective permeability, porosity and production response. It is a critical feature of exploration activity, which assists in matching surface facilities to subsurface capabilities. Flow testing and subsequent water analyses provide key datasets necessary for long-term reservoir and power project development. CanGEA requests that exploration permits would be modified to allow for this kind of investigation.

6. Royalties – CanGEA recommends a royalty holiday for a fixed period of time in order to support initial industry growth. Once the royalty free period has passed, geothermal resources should not be treated like non-renewable hydrocarbon resources. Royalties for land use, similar to other renewable resource rents, are recommended. The hydropower royalty regulation is suitable as an inspiration. In order to reflect the market value of the land, a use of the zone land values according to the BC Utility Policy seems reasonable. As a power-participation rent regulation, CanGEA suggests fixed payments per produced and transmitted MWh, which are independent from the plant’s capacity factor.
 7. The text passage “... and the production and conservation of geothermal resources” in the “Regulations and order made by the OGC” subsection does not pay tribute to the renewable and sustainable character of production from geothermal resources. CanGEA suggests editing this section.
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8. CanGEO strongly suggests that only one regulatory body manages the development of geothermal resources in BC.

On behalf of its members, CanGEO would like to enter a phase of open dialogue about the amendment of the BC Geothermal Resources Act and is looking forward to your answers and comments.

Updating the BC Geothermal Resources Act is a promising step in the right direction. Nevertheless, these changes need to mark the beginning of kick-starting this industry in BC in order to tap the province's plentiful geothermal resources. CanGEO's view of BC's technical potential features 5,700 MW of "Indicated Resources", which are accessible with a recovery factor of 5% at relatively shallow depths of 2,000 – 3,000 metres. Let's work together to establish geothermal energy as one of the foundational pillars of BC's energy mix.

If you have any questions about the comments made in this letter, please do not hesitate to contact us.

Kind regards,

A handwritten signature in blue ink, appearing to read "Scholtysik".

Sven Scholtysik - M.Sc., B.A.
Geothermal Lead - CanGEO
(On behalf of the Board of Directors of CanGEO)