



STEAM FROM GEOTHERMAL IN ICELAND

# Gaining Steam: A Regulatory and Policy Framework for Geothermal Energy Development in Alberta

*ADDENDUM*

*BILL 36: Geothermal Resource Development Act*

Environmental Law Centre  
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Environmental  
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# The Environmental Law Centre (Alberta) Society

The Environmental Law Centre (ELC) has been seeking strong and effective environmental laws since it was founded in 1982. The ELC is dedicated to providing credible, comprehensive, and objective legal information regarding natural resources, energy and environmental law, policy, and regulation in the Province of Alberta. The ELC's mission is to educate and champion for strong laws and rights so all Albertans can enjoy clean water, clean air, and a healthy environment. Our vision is a society where laws secure an environment that sustains current and future generations.

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## BILL 36: *Geothermal Resource Development Act*

In early November, the ELC published *Gaining Steam: A Regulatory and Policy Framework for the Geothermal Energy Development in Alberta* which looks at law and policy issues associated with geothermal resource development in Alberta. This publication was released as an Executive Summary and four modules:

- [Executive Summary](#)
- [Module 1: Geothermal Energy and Alberta's Current Regulatory Landscape](#)
- [Module 2: The Missing Pieces in Alberta's Regulatory Landscape and a Path Forward for Geothermal Energy Development](#)
- [Module 3: Policy Support Mechanisms for Geothermal Energy Development in Alberta](#)
- [Module 4: Regulation of Geothermal Energy in Other Jurisdictions.](#)

Mere days before the release of our publication, on October 20<sup>th</sup>, the provincial government tabled *Bill 36: The Geothermal Resource Development Act (Bill 36)*. Due to the timing, the discussion and recommendations in *Gaining Steam* were made without reference to *Bill 36*. As such, in this blog post we provide an overview of *Bill 36* and a comparison with our recommendations.

Given that *Bill 36* was passed on November 23<sup>rd</sup>, it is no longer a bill but rather a statute awaiting proclamation which means it will come into effect on a future date to be stated in a forthcoming Order-in-Council. However, for the purposes of this discussion, we will still refer to *Bill 36* even though it technically is no longer a bill.

It should be noted that the Government of Alberta has described Bill 36 as “placeholder” legislation. What is meant by placeholder legislation is not exactly clear, but one must assume it means there will be opportunity for amendments.

## Types of Geothermal Resources and Applications

Geothermal energy is the heat energy generated and stored in the earth. Depending upon the nature of the particular resource, geothermal resources can be used in geo-exchange systems, direct heat systems, or power plant developments.

The ELC recommends that the province draw a distinction between **shallow** and **deep** geothermal resources for regulatory purposes. We define shallow geothermal resources as those less than 400m and above the base of groundwater protection. This means that deep geothermal resources are those found more than 400m deep or below the base of groundwater protection. The base of groundwater protection is the elevation above which groundwater is deemed to be non-saline (these elevations can be found [here](#)). In some areas of Alberta, the base of groundwater protection is set at 600m.

Typically, shallow geothermal resources are used in geo-exchange applications utilizing the constant temperature below the surface to heat and cool buildings, and for water heating. A geo-exchange application does not require any special geological conditions. Deep geothermal resources are typically used for direct heat or power production and often access special geological conditions.

## The Current State of Geothermal Regulation in Alberta (until *Bill 36* comes into effect)

There is some specific regulation of shallow geothermal resources. The Directive for Water Wells and Ground Source Heat Exchange Systems sets out minimum requirements for open-loop ground source heat exchange wells and for vertical closed-loop ground source heat exchange wells completed at depths above the base of groundwater protection. It does not apply to horizontal closed-loop or submerged closed-loops ground source heat exchanged systems.

However, there is no comprehensive legislative framework in place for geothermal resources. Although laws of general application – the Environmental Protection and Enhancement Act (EPEA), the Water Act and the Municipal Government Act (MGA) – have some bearing on geothermal resource operations. As well, in terms of geothermal power production, the regulatory requirements overseen by the Alberta Utilities Commission remain relevant.

EPEA is Alberta's primary environmental legislation that:

- establishes a system of approvals, registrations and notice for activities listed in its Schedule of Activities;
- establishes the provincial environmental assessment process and how it will be applied; and
- prohibits the release of substances that may cause a significant adverse effect or that is in contravention of an approval, a code of practice or regulation.

EPEA does not specifically refer to geothermal resource activities but does reference thermal electric power plants. EPEA, read in conjunction with its regulations, requires that all power plants with a rated output greater than 1 MW obtain an approval and those with a capacity greater than 100 MW (using non-gaseous fuel) also require a provincial environmental assessment. There is

nothing in EPEA to suggest that a geothermal power plant is exempt from these approval and environmental assessment requirements.

In addition, under EPEA's Conservation and Reclamation Regulation, land on which there was construction, operation or reclamation of a renewable energy operation (including "heat from the earth when used for electrical power generation") is subject to conservation and reclamation requirements which means that a geothermal power plant operator is required to return land to an equivalent land capacity and to obtain a reclamation certificate (although the latter does not apply to power plants reclaimed before July 1, 2018 or to micro-generators). As well, if geothermal operations of any kind result in the release of a substance that has caused, is causing, or has the potential to cause an adverse effect, the person responsible for the geothermal resource operations must remediate the site in accordance with EPEA and the Remediation Regulation.

The *Water Act* sets out the licensing and priority system which enables the allocation of water, its diversion, and its use throughout the province. Although it contains no direct references to geothermal resources or operations, the *Water Act* is most likely to apply. Under the *Water Act*, an approval is required for those activities defined in the Act which include drilling or reclaiming a water well or borehole; undertakings that alter or may alter the flow or level of water; undertakings that change or may change the location of or the direction of the flow of water; and undertakings that cause or may cause an effect on aquatic environment. As well, the *Water Act* requires a license for a diversion of water which is defined as "the impoundment, storage, consumption, taking or removal of water for any purpose" (although saline groundwater diversions do not require a licence as per the Water (Ministerial) Regulation). Given that geothermal resource operations often involve wells and use of water, it is likely that the *Water Act* requirements will be triggered.

The MGA sets out the powers, duties, and functions of municipalities in Alberta. Municipalities have authority over the direction, control, and management of bodies of water within their boundaries. As well, municipalities have authority to make bylaws addressing land use planning and zoning and a variety of environmental and matters. This means, depending upon the municipality and its bylaws, geothermal resource operations will likely require municipal permits to proceed.

## Missing Pieces in Alberta's Current Regulatory and Policy Landscape

While these laws of general application provide some regulation for geothermal resources and related operations, there is no comprehensive regulatory framework for the geothermal industry. Some key missing pieces of the legal landscape include:

- No legal definition of geothermal resources.
- A lack of clarity as to ownership of geothermal resources. As well, there is no process for obtaining tenure (in the case of Crown ownership) and access to geothermal resources.
- No licensing system specifically enabling exploration for and development of geothermal resources.
- Aside from those mentioned above, no provisions addressing environmental regulatory matters such as environmental assessment, and abandonment, reclamation, and remediation requirements.
- The interface between geothermal resource development and oil and gas development promises synergy in terms of co-production and reworking of wells, and shared data and technical knowledge. However, it also brings significant legal challenges around subsurface conflicts and liability which are not addressed by Alberta's current regulatory system.

So the question is: does *Bill 36* provide these missing pieces?

## Overview of *Bill 36: Geothermal Resource Development Act*

The first thing to note about *Bill 36* is that it deals only with **deep** geothermal resources. This is because *Bill 36* defines **geothermal resource** as “the natural heat from the earth that is below the base of groundwater protection” (section 1(1)(d)). This means that any provisions relating to ownership, tenure, licensing or other regulatory oversight set out in *Bill 36* does not apply to **shallow** geothermal resources.

The regulatory scheme established in *Bill 36* is modelled on the *Oil and Gas Conservation Act* (OGCA) and is to be overseen by the Alberta Energy Regulator (AER) (sections 1(1)(g) and a consequential amendment to the *Responsible Energy Development Act*).

*Bill 36* defines a well as “an orifice in the ground completed or being drilled to a depth below the base of groundwater protection for the purpose of the exploration for or development of geothermal resources” (section 1(1)(h)). As well, an oil and gas well may be designated by the AER for purposes of *Bill 36* (sections 1(1)(h) and 1(3)(b)). The AER may also designate oil and gas facilities as being geothermal facilities (section 1(3)(b)).

The primary function of *Bill 36* is to establish a licensing regime for deep geothermal resource operations. A licence is required to drill a geothermal well or to operate any geothermal well or facility (section 7). The AER may grant licences on any terms and conditions that it considers appropriate and licences may be amended either on the AER’s own motion or on application by the licensee (section 9). A licence may be transferred to another person only with written consent of the AER and the transfer is subject to any conditions, restrictions or stipulations prescribed by the AER (section 9). Further, the AER has the authority to cancel or suspend licence in the event of a non-compliance or

if equipment or operations are improper, hazardous, inadequate or defective (section 10). In addition to cancellation or suspension of a license, the AER may shut down a well or facility and direct remedial actions be taken (section 10).

*Bill 36* also addresses reworking wells or facilities (section 8). Given that the AER may designate an oil and gas well or facility as a well or facility for the purposes of *Bill 36*, this includes reworking an oil and gas well or facility into a geothermal well or facility. If a person other than the licensee or a person directed by the AER to undertake operations wants to rework a well or facility, then they must obtain a licence to undertake operations. At such time, the former licensee is relieved from all obligations under this Act with respect to the well or facility except outstanding debts to the AER or to the orphan fund in respect of suspension or abandonment costs.

Under *Bill 36*, the AER has various enforcement powers including a general right to “inquire into, examine and investigate any matter related to a purpose” of *Bill 36* (section 11). The AER also possesses powers to inspect and investigate (section 12), to direct suspension or abandonment of a well or facility (section 14), to take steps to suspend or abandon a well or facility (section 15), and to direct or take remedial action in the event of a substance release (section 21).

Significant, discretionary rule making powers are granted to the AER – including matters such as licensing; operational matters; management of wastes; monitoring and compliance; shut-down, suspension, abandonment, and other closure activities; security requirements; conservation and management of geothermal resources; and location of geothermal operations including setbacks (section 26). The Cabinet is granted regulation making authority on several matters including access to geothermal resources, applicability of other energy resource enactments to geothermal resources, and prescribing things as not being wells or facilities for the purposes of *Bill 36* (section 27).

There are also numerous consequential amendments made by *Bill 36* including to the EPEA’s Schedule of Activities, the *Mines and Minerals Act*, the OGCA, the

Pipeline Act and the Responsible Energy Development Act. One notable consequential amendment is that the *Mines and Minerals Act* is amended to provide, where the context permits or requires, that Act applies to geothermal resources. Notable consequential amendments to the OCGA include the possibility that, via regulation, some or all provisions of the OCGA will apply to geothermal wells and facilities. As well, the OCGA section 106 authority which essentially allows suspension of principals (including officers and directors) from engaging in ongoing or future operations is extended to geothermal wells and facilities. Other notable consequential amendments are discussed below.

## Does Bill 36 provide the missing pieces?

As explained above, there are several missing pieces in the legal landscape. Once *Bill 36* comes into effect, will the missing pieces be filled? The short answer is that, upon *Bill 36* taking effect, there will be fewer missing pieces, but the legal landscape will not be complete.

### 1. There is no legal definition of geothermal resources.

As mentioned, *Bill 36* defines geothermal resources as “the natural heat from the earth that is below the base of groundwater protection” (section 1(1)(d)). The ELC has recommended that a broad definition of geothermal resources be adopted in Alberta (modelled on the California definition) and that a definition of geothermal energy - energy stored in the form of heat beneath the surface of the earth- also be adopted in order to distinguish between the resource and the energy derived therefrom if necessary. Geothermal resources should be defined as a unique resource (i.e. not as water or mineral).

While the definition in *Bill 36* is fairly broad, it does exclude shallow geothermal resources which has implications for questions of ownership (that is, determining who owns and can use the heat of the earth which is above the base of groundwater protection). It also clarifies that a geothermal resource is only the

heat (not, for example, the geothermal waters that may contain the heat or the minerals dissolved therein).

2. *There is a lack of clarity as to ownership of geothermal resources and no process for obtaining tenure (in the case of Crown ownership) and access to geothermal resources.*

*Bill 36* provides that “the owner of the mineral title in any land in Alberta has the right to explore for, develop, recover and manage the geothermal resources associated with those minerals and with any subsurface reservoirs under the land” (this provision will appear as section 10.2 in the *Mines and Minerals Act*). In other words, it seems that ownership of geothermal resources is being deemed to be owned by the underlying mineral owner. In most cases, this means that the Crown owns the geothermal resources (since the Crown owns most of the mineral rights in the province). However, there is some private ownership of minerals in Alberta.

The approach taken to ownership by *Bill 36* is problematic. This provision makes no express declaration of ownership nor is it clearly retroactive which may lead to some debate around ownership. The ownership situation was unresolved prior to *Bill 36*, and the lack of an express declaration including retroactivity may not provide sufficient clarity (see [Nigel Bankes](#) for a much more eloquent discussion). As well, the approach *Bill 36* is problematic in the case of private mineral ownership. It is not uncommon for split title to occur (that is, different owners of different minerals in the same land), in this case who owns the geothermal resource? Likely, all the mineral owners (again see [Nigel Bankes](#)).

Our recommendation is that an express declaration be made that the Crown is, and always has been, the owner of geothermal resources in Alberta. This declaration would include both shallow and deep geothermal resources throughout the province on both Crown and private lands. This approach was taken with respect to pore space (*Mines and Minerals Act*, section 15.1), and we

recommend similar language be used for geothermal resources. Also, the fact that the Crown owns all water within the province can be seen to justify a unified view of water and the physical properties of this water.

If the ownership approach in *Bill 36* is retained, then on private lands, a person will be required to obtain rights from all relevant mineral owners. For Crown owned geothermal resources, then there is a need to obtain tenure from the Crown which is addressed by *Bill 36* via including geothermal resources in section 54 of the *Mines and Minerals Act* (i.e. need authority under the Act or by agreements to recover geothermal resources).

Following from our recommendation that all geothermal resources be declared to be Crown property, we recommend that tenure be obtained either by applying for geothermal rights (granted at the Minister's discretion) or by the Minister posting rights and accepting bids. We also recommend that prior to issuance of any tenure to geothermal rights, there should be a screening for concerns associated with species at risk and other environmental matters (in fact, we would like to see this approach with all tenure in the province including mineral, oil and gas, and forest). Furthermore, we recommend that a distinction be made between shallow and deep geothermal resources for tenure purposes, with shallow resources being exempt from a need to obtain tenure (allowing use by the surface owner).

Given that access to geothermal resources will require surface access, this also should be addressed by geothermal legislation. In its current form, *Bill 36* indicates that access rules may be made by regulation. Our recommendation is that the *Surface Rights Act* and its processes be adapted to accommodate geothermal operations.

3. *There is no licensing system specifically enabling exploration for and development of geothermal resources.*

As reviewed above, *Bill 36* provides a regulatory structure which is modelled on the OGCA. The OGCA, in concert with other statutes, regulations and rules made by the Alberta Energy Regulator (AER), governs oil and gas operations in Alberta.

We note that oil and gas development in the province has created a huge liability problem (see blog posts [here](#), [here](#), and [here](#) for instance). Tenure to oil and gas rights has been granted largely in the absence of environmental screening with only occasional notations on tenure of limited surface impact. A good portion of oil and gas operations are conducted without prior environmental assessment (such as seismic exploration and drilling wells). Security to ensure sufficient funds for future clean-up has not commonly been obtained under current regulation and often is insufficient. There is a lack of legislated timelines ensuring timely well abandonment and clean-up occurs.

The regulatory regime for geothermal resource activities should be designed to avoid repeating these same mistakes while at the same time recognizing that the requirements for geothermal, a greener technology and product, should likely not be more stringent than those for oil and gas.

4. *There are no provisions addressing environmental regulatory matters such as environmental assessment, and abandonment, reclamation, and remediation requirements (except as pertains to reclamation of geothermal power plants as above).*

While geothermal operations have fewer impacts than fossil fuel operations, there are still negative environmental impacts associated with geothermal resource development. Potential impacts include land disturbances, water pollution, air pollutions, noise pollution, and threats to biodiversity (including

thermophilic biota). Environmental impacts need to be addressed for each stage of geothermal resource development including reclamation and remediation, and the potential need for ongoing monitoring of the site post-closure and clean-up.

*Bill 36* does make some changes to address environmental matters associated with geothermal resources:

- EPEA's Schedule of Activities is amended to include "construction, operation or reclamation of a plant, structure or thing for ...the recovery, transfer, injection or storage of natural heat from the earth for the purpose of heating".
- EPEA's definition of well is amended to include geothermal wells.

These amendments bring some geothermal operations within the purview of EPEA, which means there is potential to require approval or registration (with corresponding Codes of Practice), and environmental assessments. However, this would require additional amendments to the relevant regulations (which is not done by *Bill 36*).

Looking at the new language in EPEA's Schedule of Activities, there seems to be no distinction between shallow and deep geothermal activities. The amendment says "natural heat from the earth" rather than "geothermal resources" (which is limited by *Bill 36* to deep geothermal). However, the language is limited to geothermal used "for the purpose of heating". This seems to exclude geothermal power production (which is not really problematic since thermal electric power already appears in EPEA's Schedule of Activities). More concerning is the apparent exclusion of geothermal exploratory operations which can involve seismic activity and drilling.

With the expanded definition of well, this means lands which contain geothermal wells are **specified land** under the *Conservation and Reclamation*

*Regulation* and, as such, EPEA's conservation and reclamation requirements apply.

Despite these amendments to EPEA, there are still some missing pieces in environmental regulation of geothermal resource operations. On the shallow geothermal side, while there is geo-exchange regulation via the *Directive for Water Wells and Ground Source Heat Exchange Systems*, it is limited to open-loop ground source heat exchange wells and for vertical closed-loop ground source heat exchange wells. It does not apply to horizontal closed-loop or submerged closed-loops ground source heat exchanged systems. Regulation for all forms of geo-exchange applications is probably appropriate. As well, in the case of dense geo-exchange or district heating systems, special consideration should be given to environmental impacts. This could include development of provincial level guidelines, standards, or Codes of Practice pursuant to EPEA.

With respect to geothermal power plants, more clarity could be provided. Specifically, the *Environmental Assessment (Mandatory and Exempted Activities) Regulation* should be amended to clarify when geothermal power plants require environmental assessment (and perhaps that small generators are exempt). Again, some environmental concerns should be addressed by not granting tenure in the first instance.

Unfortunately, *Bill 36* does not say much about environmental matters for deep geothermal operations. The AER is granted broad discretion to make rules (or not) including those addressing environmental matters. There is nothing in *Bill 36* mandating environmental assessment, payment of upfront security, appropriate set-backs from water bodies or other sensitive landscapes, or timelines for reclamation and remediation activities. In other words, much of the environmental regulation is left to the discretion of the AER.

5. *The interface between geothermal resource development and oil and gas development promises synergy in terms of co-production and reworking of wells, and shared data and technical knowledge. However, it also brings significant legal challenges around subsurface conflicts and liability which are not addressed by Alberta's regulatory system.*

There is a potential for subsurface conflicts arising from geothermal operations including communication issues (between subsurface zones), incidental extraction of other resources, and negative impacts on the recovery of another resource. *Bill 36* does grant the AER authority to address subsurface conflicts with other energy resources (sections 3(1)(d), 11 and 26(3)(z)). However, similar authority is likely needed to address other potential subsurface conflicts such as water and minerals dissolved in geothermal waters (for example, lithium). As well, we recommend that prior to extensive disposition of rights to geothermal resources, the government should articulate an approach to addressing subsurface conflicts (for example, clarify matters such as whether extraction of geothermal resources be granted priority over other subsurface resources).

The allocation of liability in the co-production or re-working of oil and gas facilities is a significant legal issue. On the issue of liability, *Bill 36* says that abandonment of a geothermal well or facility does not relieve the licensee or working interest participant from responsibility for control or further abandonment or from responsibility for the costs doing such work (section 16).

In the case of reworking a suspended or abandoned well or facility, including an oil or gas well or facility, liability transfers to the new licensee once the license to re-work is issued (section 8). There is no explicit reference in *Bill 36* to liability in the case of re-working reclaimed and remediated oil and gas wells or facilities but presumably under section 8(3) the *Remediation Regulation*, the geothermal operator would be liable for taking remedial actions, including undertaking risk management or exposure controls at the site.

As between working interest participants, *Bill 36* provides that costs of suspension, abandonment, remediation, and reclamation must be paid by each working interest participant in accordance with their proportionate share in the well or facility (although this can be modified by the AER) (section 17).

Assigning liability is an interesting question. If the goal is to encourage reworking of wells to address the backlog of suspended and abandoned wells and to secure a renewable, low impact energy resource, then simply transferring liability to the geothermal operator may not be desirable as this might cause a geothermal operator to be liable for damages associated with the past oil and gas operations. On the other hand, a geothermal operator will be disturbing the suspended or abandoned well in a manner unconnected to the actions of the past oil and gas operator. Further, steps should be taken to ensure that liabilities do not fall on the public purse.

We recommend that a pre-transfer inspection and assessment process be implemented prior to reworking oil and gas into geothermal wells (as part of the transfer process regulated by the AER). This process would apply regardless of whether the well was in a pre-abandonment, abandoned, reclaimed, or remediated stage. The object of the process would be to provide a snapshot of the condition of the well, the subsurface, and the surface. This would bring issues to the forefront which must be resolved by the oil and gas operator.

If there are outstanding issues, the oil and gas operator would be required to resolve the issue. For instance, in the case of incomplete or failed remediation efforts, then the oil and gas operator may be required to obtain a (or even another) remediation certificate. In some instances, it may be appropriate to allow provision of security sufficient to address the issue once geothermal activities are completed.

It must be kept in mind that geothermal operations can have significantly long life cycles (upwards of 80 years) which may outlive the oil and gas operator existing at the time of transfer. In this case, provision of security sufficient to

address issues apparent at transfer but not suitable for resolution until certain stages of geothermal activities are completed, should be required.

The results of the pre-transfer inspection and assessment process would also provide some evidence as to which operator – the oil and gas operator or the geothermal operator – caused the issues requiring reclamation, remediation or otherwise to assist with apportioning liability that might arise in the future.

## Legislation is not enough, policy is needed too

It is important to remember that legislation alone cannot support a nascent industry. If Alberta wants to encourage the establishment and growth of a relatively green industry, policy steps are necessary. There are a myriad of policy options involving royalties; government financial support in the form of cost-share program, public insurance, and early-stage fiscal incentives; market incentives such as feed-in-tariffs and renewable portfolio standards; and research and data support.

Alberta already has a history of using policy tools to help establish new industries (for example, development of the oil sands in the 1970s). As a starting point, we recommend:

- Alberta should maintain the authority to impose royalties on the use of deep geothermal resources although actual imposition of a royalty in the early stages of the geothermal industry may not be appropriate. We note that *Bill 36* amends the *Mines and Mineral Act* to grant authority to impose a royalty on geothermal resources.
- Develop government financial support programs such as:

- Cost-share and public insurance programs which reduce the risks associated with geothermal resource exploration and development.
- Early-stage fiscal incentives such as easing import duties on machinery and equipment, reduced licence fees and tax credits/exemptions.
- Consider market incentives, such as feed-in-tariffs and renewable portfolio standards, to encourage the development of geothermal electrical generation in Alberta.
- Alberta should take steps to increase access to exploration data, which could include making sub-surface data public after a prescribed period of time. At the very least, participation in provincial schemes such as cost-share or public insurance programs should be conditional upon a requirement to publicly release data.

While the precise mix of policy tools requires economic analysis beyond the scope of the ELC's *Gaining Steam* report, we recommend adoption of a variety of policy tools designed to alleviate some of the risks associated with a nascent industry. A variety of tools is recommended because different tools have different purposes – for example, cost-share programs provide capital and reduce drilling risks whereas feed-in-tariffs assist with adoption of geothermal electricity into the market. One tool implemented alone is not likely to be effective.

## Final Thoughts on *Bill 36*

As mentioned, *Bill 36* sets up a regulatory regime for deep geothermal resources that is modelled on that found in the OGCA. Given that the OGCA framework has resulted in a legacy of orphan wells and liabilities for Alberta, it is troubling that the same framework is being adopted for a nascent industry. Rather than leaving so much of the environmental regulation to the discretion of the AER, we would prefer to see at least some basic requirements in the legislation (such as security deposits, legislated timelines for clean-up, and a pre-transfer process for re-working wells). Furthermore, *Bill 36* does not address shallow geothermal resources and it remains to be seen if requirements for such resources will be imposed via EPEA.

Geothermal resources do have the potential to provide a relatively clean source of heat and electricity. This potential should be nurtured with clarity around ownership and tenure, a predictable licensing system, and strong policy support. However, this does not mean potential negative environmental impacts associated with geothermal resource development should be overlooked. A regulatory framework should not be thrown together in haste but rather be crafted to clearly address key legal issues such as ownership and subsurface conflicts, and to avoid a further legacy of environmental damage.