DEEP Earth Energy Production project site in Saskatchewan (image credit: DEEP).

EXECUTIVE SUMMARY

As the global energy transition gathers speed, Canada has the time-bound opportunity to become a global leader in clean geothermal power, if provinces act quickly to harmonize and extend geothermal regulations across the country. This report supports this opportunity by identifying international best practices from the 10 largest geothermal power producers globally to provide provinces and territories with essential insights and guidelines they can use to establish effective regulations.

Currently, geothermal power production in Canada is minimal. However, three provinces—British Columbia, Alberta, and Nova Scotia—have already implemented geothermal regulations, setting a promising precedent. By harmonizing and extending effective regulations across the country, Canada can leverage its substantial drilling expertise and capacity to develop its geothermal resources efficiently. Establishing a consistent regulatory framework will reduce delays and financial risks for developers, paving the way for a robust geothermal energy sector. This report provides a valuable foundation for Canadian jurisdictions to create and adopt comprehensive geothermal regulations.

> *By harmonizing and extending effective regulations across the country, Canada can leverage its substantial drilling expertise and capacity to develop its geothermal resources efficiently.*

Regulations for subsurface resources typically have three key components: resource definition, resource ownership, and resource tenure. These components are found in mining, oil and gas, and water regulations. Geothermal regulations must also rest on these three pillars, clarifying what the resource is, who owns it, and how it can be developed.

We surveyed the subsurface regulations from the world's 10 largest geothermal producers to identify regulatory best practices that Canadian jurisdictions should adopt. The insights for Canada from each country are summarized below:

International insights for geothermal regulations	
Country	**Key insights**
United States	Template regulations can bring consistency across jurisdictions.
Indonesia	Automation and comprehensive post-operation regulations bring speed and certainty.
Philippines	Clear, technology agnostic regulation speeds development.
Türkiye	Effective public communication reduces project opposition.
New Zealand	A thriving geothermal sector can honour treaties and Indigenous resource claims.
Kenya	Public funding can unlock private investment and create an industry.
Mexico	Mandated decision timelines drive project predictability.
Italy	Regulatory consistency across jurisdictions decreases scale-up risk.
Iceland	A dedicated regulatory body provides clarity and predictability.
Japan	Unclear regulations slow development and sow conflict between landowners.

We also identified six recommendations for effective geothermal regulations that were common across multiple counties and should be applied in Canada. Regulations should:

1. Precisely define the resource.
2. Be technology agnostic.
3. Establish efficient, clear, and consistent processes and permit requirements.
4. Define a maximum acreage of awarded rights to avoid resource monopolies.
5. Set realistic timeframes for tenure to allow flexibility for proponents while avoiding speculative resource grabs.
6. Enshrine early public outreach to build trust and support.

Based on our international case studies and Canada's unique jurisdictional landscape, we also propose some model language for potential inclusion in new geothermal regulations across the country:

Model geothermal **resource** definition:

> *A geothermal resource is energy in the form of heat and/or pressure, below the base of groundwater protection, and includes all dissolved or entrained minerals that may be extracted from the medium used to transfer that energy. This energy can be used to generate heat and/or electricity.*

Model geothermal **ownership** definition:

> *Lease of rights to geothermal resources is granted by the Crown to the developer and includes the subsurface pore space (naturally occurring and human-made) over a given depth. Developers will apply to the Crown for the lease of subsurface pore space, and the lease of space will be awarded based on the merit of the application, following public notice and a period for additional applications.*

Model geothermal **tenure** stages:

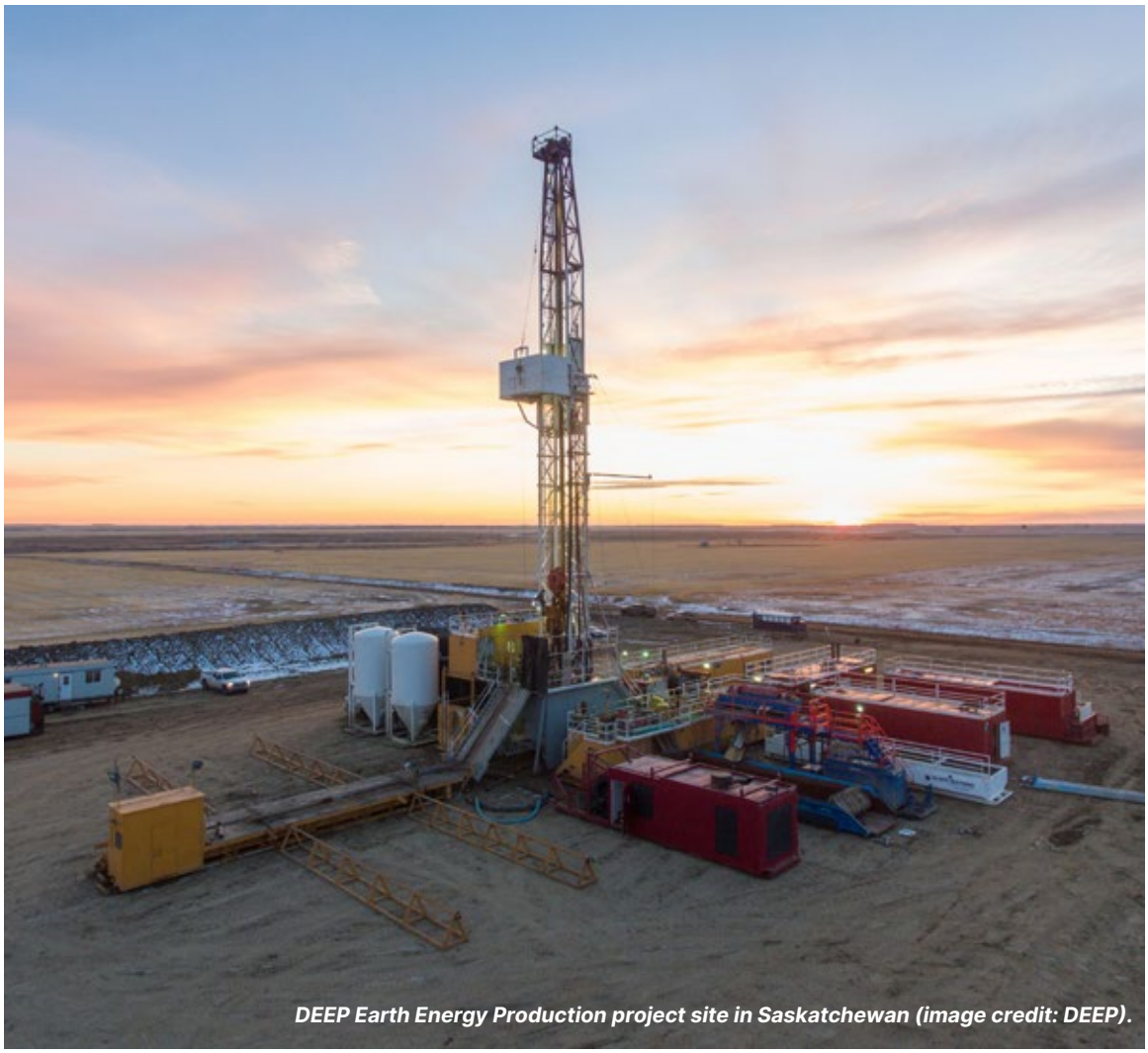
Development:
Five years
Five-years renewals

Operations:
30 years
Ten-year renewals

Decommissioning:
Two years
Single site-specific renewal

Based on its transferable subsurface expertise and abundant geothermal resource, Canada can be a leader in geothermal energy, meeting growing demand for electricity with clean, secure, and affordable baseload power while bolstering Canada's energy security. To achieve this potential, the country will need clear and consistent subsurface regulations. Putting such regulations in place is a necessary condition for project financing and development, as geothermal resources cannot be developed in Canada without a regulatory pathway.

Following this report, we will use the guidelines proposed here to develop model regulations that can be adapted and rapidly implemented by the 10 Canadian jurisdictions currently lacking subsurface geothermal regulations. These model regulations can also inform improvements to, and consistency among, the regulations in the three jurisdictions that currently have them.



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