BUILDING DECARBONIZATION Alliance

Geothermal-as-a-Service in Canada

Unearthing affordable, grid-friendly clean heat with a business model that unlocks scale

May 2026

White Paper

Authors

Mathieu Lévesque

Lead, Technology & Alternatives
Building Decarbonization Alliance

Leslie Malone

Director, Strategic Projects
The Transition Accelerator

Connor Wicklum

Principal
Greenlight Geothermal

About the Building Decarbonization Alliance

Canada's competitive future depends on abundant, affordable, and secure clean electricity. As Canada's voice for building electrification, the Building Decarbonization Alliance (BDA) positions buildings at the foundation of our electrified economy, where heat pumps, smart controls, solar, storage, and EV chargers become flexible grid resources for a stronger energy system.

An initiative of the Transition Accelerator, the BDA is a non-partisan, cross-sector coalition working to advance smart electrification as a driver of productivity, energy security, and competitive advantage. Together with more than 350 partners across the building ecosystem, we inspire and inform industry and government leadership, and accelerate market transformation — modernizing Canada's buildings into engines of prosperity.

If you are interested in supporting our work, visit our website or reach out to us at info@buildingdecarbonization.ca to find out how you can help accelerate building electrification.

About the Transition Accelerator

The energy transition is disrupting global power. The Transition Accelerator is here to help Canada win — economically and geopolitically.

Working with 300+ partners in industry, government, civil society, and beyond, we help build out pathways to a prosperous low-carbon economy and avoid costly dead-ends along the way. By connecting systems-level thinking with real-world analysis, we're enabling a more affordable, competitive, and resilient future for all Canadians.

For more information or interview opportunities please contact communications@transitionaccelerator.ca

Contents

The Takeaway

Geothermal-as-a-Service unlocks affordable, grid-friendly clean heat

Electrified end-use technologies are reshaping how the global economy consumes energy. In Canada, that shift must be informed by our unique conditions: our climate means winter heating already drives peak demand in most provinces, with the rest soon to follow. How we electrify heating will influence grid investment for decades.

***Smart* heating electrification provides an opportunity** to deliver affordable, resilient, and clean buildings that double as productive demand-side infrastructure. When buildings shift from static loads to interactive grid resources, they become engines of economic competitiveness.

Geothermal heating is a key grid-compatible solution that leverages stable subsurface temperatures to remain efficient through both winter cold snaps and summer heat waves, when grid costs peak. Three structural barriers explain why geothermal is **still not being deployed at scale**:

- **High upfront capital cost:** drilling adds a large capital layer not borne by alternatives;
- **Delivery complexity:** requires expertise outside of most developers' core competencies;
- **Risk aversion:** uncertain performance, operating costs, and long-term policy signals.

The technology isn't the obstacle; the delivery model is.

The **Geothermal-as-a-Service (GaaS)** model restructures delivery. A specialized utility takes on capital cost, complexity, and performance risk associated with the geothermal unit; developers focus on the building as a whole; and building owners benefit from paying a predictable service fee. The result is cost certainty for owners, infrastructure-grade returns for investors, and a demand-side resource that optimizes or defers grid investment.

GaaS is not a future concept — it is a proven Canadian delivery vehicle that needs an enabling environment to reach scale across Canada. Action is needed on three fronts:

1. **Level the playing field for clean heat.** Extend to GaaS the regulatory, financial, and program treatment that legacy gas and electricity infrastructure already enjoy. *This promotes a more competitive Canadian building sector.*
2. **Integrate geothermal into planning.** Assess early in energy plans, utility studies, and major development and investment decisions. *This results in more resilient buildings and grids.*
3. **Unlock delivery at scale.** Build workforce, standardize structures, and support replicable demonstrations, anchoring a Canadian geothermal value chain. *This scales an affordable clean-heat market with the industrial capacity to match.*

The Issue

Peak-friendly and affordable geothermal heating electrification technologies are not being deployed at scale

Buildings are a critical asset to the Canadian economy. The $6-trillion building stock is not just floor space — it is productive infrastructure whose performance shapes affordability, resilience, and economic competitiveness over decades. Modernizing how buildings are powered is a precondition for a competitive built environment that attracts investment ***and*** supports skilled jobs ***and ultimately*** Canadian communities.[1]

In cold climates, heating drives the largest share of building energy demand, and heating, ventilation and air conditioning (HVAC) systems last 15 to 30 years. Equipment decisions being made today will be locked in through 2050, with lasting impacts on the fuel used*,* the shape of the electricity system, and ultimately their costs to Canadians. Electrifying heating is therefore both a critical leverage point to decarbonize buildings, and a move that can place upward pressure on the grid, concentrating demand during winter peaks.[2]

This is why smart heating electrification matters: not just ***whether*** a building is electrif***ied***, but ***how.*** On-the-ground experience shows that smart heating electrification delivers better comfort, lower energy costs, and is a hedge against future rate volatility — which can result in higher embedded building value. This means deploying the right heat pump types alongside demand flexibility that manage*s* peak loads.

Heating electrification options have varying trade-offs

There are several mature technologies to electrify heating. **Air-source heat pumps (ASHPs)** have become the standard electrification pathway for buildings, and for good reason. They are low cost relative to other heating electrification options and easy to integrate into established construction schedules. Their shortcoming is that their efficiency and capacity drop in cold weather, concentrating grid impacts during winter peaks at the precise moment when this impact matters most. For one unit or building, this is not a significant issue — but at scale, can be the cause for concern for grid operators. Grid-friendly performance from ASHP systems requires demand response, thermal storage, and hybrid configurations that add complexity and cost beyond the heat pump itself.

In high-load, high-density, and cold-climate applications, **Thermal Energy Networks (TENs)** offer a fundamentally different approach. This shared, district-scale infrastructure can serve a collection of buildings — for example, large new developments, institutional campuses, dense urban districts — from a common thermal loop. TENs can leverage multiple sources of heat, many through heat recovery heat pumps, making them a resilient and peak-friendly clean-heat pathway. Their limitation is scale and complexity. TENs require meaningful coordinated planning, upfront infrastructure investment, and multiple willing stakeholders — all of which makes them powerful where conditions align, but difficult to deploy and scale.

Ground-source heat pumps (GSHPs) sit between these two poles. Drawing on stable ground temperatures rather than outdoor air, their efficiency holds through winter cold snaps (and summer heat waves), and they avoid the peak demand spikes that strain the grid when it is most constrained. In addition, unlike TENs, GSHPs can be deployed building by building, without district-scale coordination and investment. In principle, this makes them far more scalable. In practice however, **GSHPs have not come close to matching ASHP deployment levels**.

GSHPs must overcome several barriers to scale adoption

Why are GSHPs not being deployed at scale? There are several key issues at play, including:

- **High upfront costs.** Geothermal systems cost more to install than conventional alternatives. Drilling and ground loop installation account for 40–70% of total geothermal project costs, a large capital layer not borne by gas, resistance electric, and air-source alternatives. In a market with compressed margins, few developers will absorb this capital expense without a compelling reason — especially when the developer pays that capital cost while the owner and occupants capture the long-term operational savings.
- **Delivery friction.** Geothermal remains unfamiliar to much of the building industry. Unlike conventional HVAC, it must be engineered from the outset — the borefield is a complex thermal battery that must be sized to the building's long-term load profile. Drilling capacity and specialized expertise are also unevenly distributed across Canada.
- **Risk aversion.** Even where the economics work on paper, adoption stalls due to uncertainty. Will the system perform as promised, over several decades? Will it actually save money in the long run compared to currently inexpensive gas? Will drilling delay the construction schedule? If policy signals on gas futures, building codes, and performance standards are weak, developers will default to what they know.

The innovative Geothermal-as-a-Service (GaaS) delivery model addresses all three of these barriers — shifting upfront capital off the developer's balance sheet, packaging design and delivery expertise into a single counterparty, and converting uncertain long-term savings into a predictable cost structure.

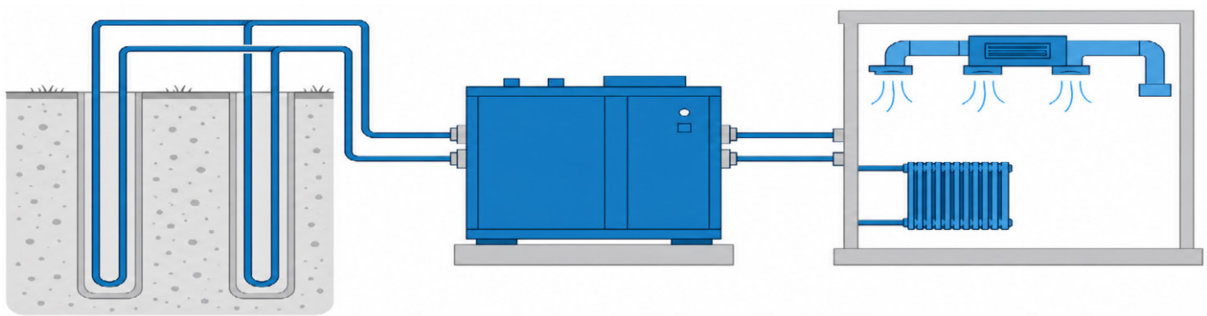
Below is a standalone primer on geothermal heating. **The Opportunity section that follows dives into the GaaS delivery model.**

How Geothermal Works – and Why It Matters

What is geothermal heating and cooling?

Geothermal heating and cooling — also called geoexchange or ground-source heat pump (GSHP) system — moves heat between the ground and a building using an electrically powered heat pump. The ground acts as a thermal source in winter, a heat sink in summer, and seasonal storage year-round. At depths of eight to ten metres and below, ground temperatures are nearly constant regardless of surface conditions. This stability is what gives geothermal systems their efficiency advantage.

A geothermal system has three core components:



Ground loop

The underground piping system that is in direct contact with the ground, acting as a heat exchanger that pulls heat from, or rejects heat to, the ground.

Heat pump (or Energy Transfer Station)

Raises or lowers the temperature coming back from the ground loop for building use, depending on the needs of the HVAC system in place.

Building HVAC distribution system

The internal network that moves air (via fans, airducts and vents) or water (via hydronic pipes, pumps, radiators and fan-coils) throughout the building.

Figure 1. Three core components of a geothermal system

Where can geothermal be used?

Geothermal is a proven technology that is feasible almost anywhere in Canada and has successfully been deployed across the country for decades. Several types of **ground loops** and **drilling techniques** have been developed — depending on local ground conditions — as well as several types of **ground-source heat pumps** which accommodate the needs of various **building HVAC systems**. In most cases, conventional HVAC systems can accommodate geothermal systems without major modification.

However, **there are limitations to its applicability**. Project economics depend on a set of site-specific factors: ground conditions and drilling complexity; existing underground infrastructure; building heating-to-cooling load balance (***the ground in proximity to the geothermal heat exchanger acts as a large thermal battery and needs to be replenished each season***); local regulations on borehole depth and aquifer protection; denser urban conditions; economies of scale; etc. Additionally, compatibility with existing or planned HVAC distribution systems further complicate some retrofits. For example, where existing rooftop units would require long exterior insulated piping runs to connect them to the ground loop. None of these factors are technically disqualifying, but they do mean that early, project-specific screening is essential to identifying the strongest opportunities.

Fortunately, geothermal use cases and performance continue to improve while its costs are falling. For example, a new generation of compact drilling rigs fits into constrained urban sites and existing underground parkades,[3] standing column wells help reduce geothermal borefield footprints,[4] and deep direct-use geothermal draws on Canada's oil-and-gas drilling expertise.[5] Canada's leading geothermal providers are commercializing faster, smaller, and less disruptive installation method — but specialized expertise is unevenly distributed across regions.

Courtesy of the Ontario Geothermal Association

Beyond buildings: Why does geothermal matter to the grid?

Geothermal's most underrecognized advantage may be its value to the electricity system, not just to the buildings it serves.

During winter cold snaps, traditional electric heating and air-source heat pumps can drive up peak load — pushing investment in generation, transmission, and distribution to meet that demand in currently (or soon to be) winter peaking grids. While air-source heat pumps lose capacity and efficiency in extreme cold, they can be paired with smart controls, storage, and hybrid designs to limit their winter peak impacts.

Geothermal's core differentiator in cold climates is that it is inherently peak-friendly. Drawing on stable subsurface temperatures, ground-source systems maintain a consistent — and relatively modest — electricity demand through both winter cold snaps and summer heat waves.

The advantage is not just theoretical. A Canadian modelling study found that greater investment in ground-source technologies could reduce electricity infrastructure needs and lower overall system costs.[6] A U.S. Department of Energy analysis found that geothermal could cut winter peak demand by more than 40 GW in 2035, saving roughly US$4 billion in annual grid costs versus a high-electrification scenario centred on other technologies.[7] The winter peak reduction was roughly six times larger than the summer effect, which highlights the increased potential in colder regions like Canada.

SUPPORTING GEOTHERMAL THROUGH FINANCIAL INCENTIVES

Typical upfront incentives are especially important because they address one of the main barriers to ground-source heat pump adoption: higher initial capital costs. But because geothermal delivers value beyond the building, a portion of the avoided system costs these projects create — including lower peak capacity needs and deferred infrastructure investment — can reasonably be used to reward the systems that deliver those benefits. Examples of financial incentives include:

- **Utility and efficiency programs:** Incentives such as CleanBC Better Buildings,[14] Efficiency Manitoba's ground-source heat pump offer,[15] and Hydro-Québec's LogisVert[16] and Solutions Efficaces[17] reduce first-cost barriers by rewarding peak-friendly solutions.
- **Tax advantages:** Federal measures such as the Clean Technology Investment Tax Credit (ITC)[18] and accelerated capital cost depreciation[19] improve after-tax project economics.
- **Other incentives:** Municipal development charge rebates[20] and preferential construction financing terms for higher-tier performance such as CMHC's[21] improve project economics.

The Opportunity

Geothermal-as-a-Service is an innovative delivery model that can remove the key barriers to geothermal deployment

The barriers to geothermal are real, but they are not inherent to the technology. They stem largely from a delivery model that asks building developers to do something outside their core business: finance, procure, build, and operate a specialized subsurface energy system.

The Geothermal-as-a-Service (GaaS) model is designed to remove that burden.

What is the Geothermal-as-a-Service model?

GaaS is not simply a financing tool or a discounted service agreement, it is a structural shift in who owns, delivers, and manages the geothermal system. Under this model, a specialized geothermal utility takes on the capital cost, technical complexity, and long-term performance risk of the system. Under this structure:

- the **developer** builds the building;
- the **third-party geothermal provider** builds and operates the energy infrastructure; and
- the **building owner** pays a predictable fee for heating and cooling service from the system.

In effect, GaaS converts geothermal from a capital-intensive and technically demanding construction requirement into an infrastructure service with agreed-upon contracted cash flows. In this sense, it resembles the arrangement that natural gas utilities have offered for decades — a third-party builds, owns, and maintains the energy infrastructure while the customer pays for the service it delivers.

Why is this important to developers and building owners?

First, it **removes upfront cost from the developer or owner's balance sheet**. The geothermal service provider finances the borefield and associated equipment independently, often using infrastructure capital. The developer or owner does not need to carry the capital expense, and available grants, tax credits, and preferential financing can flow to the party best positioned to use them effectively.

Second, it **shifts delivery complexity to a specialist**. In increasingly high-cost, high-speed markets where projects face pressure from lenders, municipalities, and buyers simultaneously, every added responsibility adds complexity and is a potential liability. Under GaaS, the third-party geothermal provider is responsible for engineering, procurement, drilling, commissioning, and long-term performance management. Developers and owners do not need in-house expertise or coordination across specialized trades. As a result, geothermal is less likely to disrupt the project schedule or sit on the developer's critical path.

Third, it **reduces the forms of risk that often stall adoption**. Technology risk is mitigated through specialist expertise and performance guarantees. Long-term commitment is managed through contracts with defined terms and exit provisions. Operating cost uncertainty is reduced through predictable fee structures that can be benchmarked against conventional alternatives. At portfolio scale, providers operating across many projects can also absorb the variability in ground conditions and system performance that would otherwise make an individual project difficult to underwrite.

The beachhead: New-build MURBs

New-build, multi-unit residential buildings (MURBs) are the natural entry point for GaaS in Canada for a number of reasons:

1. **New construction** eliminates the retrofit integration challenge — there is no existing mechanical system to work around.
2. **MURBs offer enough floor area** for borefield economics to work well. Industry consensus places the practical viability threshold at roughly 200,000 square feet of gross floor area.
3. **Emerging building performance standards** in Toronto, Vancouver, and Montréal are pushing developers toward low-carbon HVAC systems, creating requirements that GaaS can serve.

MURBs are where GaaS can build a track record, prove the commercial model, and generate the evidence that brings costs down for everyone. That said, GaaS is not limited to MURBs. Small residential applications are emerging. Retrofits will become increasingly relevant as energy costs rise and technology costs fall.

"It takes a huge effort to get new developers on board, but once they're convinced, our experience has been that they never go back"

– Anthony Drouin, Subterra Renewables

Courtesy of the Ontario Geothermal Association

From leasing to full service: The spectrum of GaaS operating models

GaaS is not a single model. It is an umbrella covering a range of arrangements in which a third party takes on some or all of the capital cost, operational responsibility, and performance risk that would otherwise rest on the building owner. Three of the service models under this umbrella are presented below and detailed in Table 2, each progressively shifting responsibility from a home or building owner to a third-party provider.

- **A simple leasing model** addresses the small residential market through a lighter-touch arrangement. Dandelion Energy launched the first residential geothermal leasing program in the United States in fall 2025. Under this model, a partner financial institution owns the ground loop and heat pump, and the homeowner pays a monthly lease fee for both. The HVAC budget is covered by the geothermal provider instead of the developer, thus reducing the cost passed on to homebuyers — monthly costs can be as low as $10–$40/month on a 20-year term (***note: retrofit applications would not benefit from that developer-covered portion, and monthly payments would then be closer to $120-180/month***). There is no continuous monitoring, no performance management, and no guarantee of heating outcomes — only an equipment warranty. The model solves the cost barrier for single-family homes and townhomes where the upfront capital (~$25,000–$40,000) is the primary obstacle, but where the building scale does not support a full utility relationship, such as those below.
- **The geothermal "utility" model** is the established centre of the GaaS model. Pioneered in Canada's new-build MURB segment by organizations such as Diverso Energy and Subterra Renewables, the model places a specialized provider in full control of the geothermal system — **design, financing, construction, ownership, and long-term maintenance** — under a contractual requirement that the system operates properly over, for example, 25 to 30 years. From its Greater Toronto and Hamilton Area track record, the model is now expanding into adjacent segments and geographies: Diverso's joint venture with Mattamy Homes targets the Canadian low-rise residential market,[8] Subterra's partnership with Enercare[9] blends utility delivery with heat-pump rental for the same segment; and Diverso's partnership with U.S.-based Dandelion Energy[10] brings Canada's utility platform to low-rise U.S. communities.
- **Full energy-as-a-service models** mean that a 3rd-party provider owns **and operates** the borefield and heat pumps but includes operation and performance guarantees by **delivering and billing metered thermal energy to the building**. The contractual logic mirrors what Thermal Energy Networks (District Energy) use for multi-building districts, but can be applied to individual buildings — without the multi-stakeholder complexity of shared underground networks. The model is emerging, with some geothermal utility providers fully integrated turnkey offerings, and a first networked geothermal thermal energy network being deployed in Edmonton's Blatchford new development.[11]

Across this gradient, the **geothermal utility model** already resolves the principal barriers to geothermal adoption: the developer's capital outlay, integration complexity, and long-term performance risk. The **full energy-as-a-service model** is more comprehensive, but its added contractual and operational complexity makes it slower to scale today. At the smaller end of the spectrum, the **simple leasing model** may prove the most pragmatic pathway for single-family retrofits, where building scale and the absence of a developer does not support a full geothermal utility expert 3rd party relationship.

Table 1: From leasing to full service: spectrum of GaaS operating models

Gradient legend: *Business-as-usual* → *Full turnkey service*

	Geothermal-As-A-Service Models		
	Geothermal leasing	**Geothermal "utility"**	**Energy-as-a-Service**
What the customer pays for	Access to the ground loop and the GSHP (energy bills are excluded)	Thermal infrastructure capacity (energy bills are excluded)	Delivered thermal energy (energy bills are part of the arrangement)
Billing basis (ground loop & GSHP)	Fixed monthly lease payment (financing schedule)	Fixed monthly service fee (private contract)	Metered delivery (\$/Btu, \$/kWh$_{th}$) or capacity-based (\$/tonne)
Who owns the ground loop and HP	Financial institution (lessor)	Geothermal infrastructure company	Thermal infrastructure company or utility
Who maintains the infrastructure & equipment	The building owner	The geothermal provider (ongoing asset stewardship)	The thermal utility (contracted service obligation)
Who operates the system	The building owner	The building owner, though provider must maintain level of service	The thermal utility (contracted service obligation)
Who bears the performance risk	The building owner	Both (the geothermal provider must maintain level of service, but no performance guarantee)	The thermal utility (contracted service obligation)

Regulatory considerations

The regulatory treatment of geothermal utilities varies significantly across Canada. In British Columbia, Alberta, and Nova Scotia, thermal energy network (district energy) providers operating ***multi-building*** systems are subject to utility board oversight and regulated rate structures, at least under private ownership models. *Single-building* Energy Service Agreements appear to fall within utility board oversight in B.C. and Nova Scotia as well. In Ontario, where the model was developed, and in most other provinces — though often not yet formally tested — geothermal utilities operate as private service providers, governed by condo legislation, consumer protection law, and standard contract enforcement rather than energy regulation oversight.

This inconsistency creates friction on both sides: providers face a different legal environment in every province, adding cost and complexity to expansion, while building owners and condo boards face uneven consumer protections. Greater regulatory clarity — on classification, applicable protections, and dispute resolution — would reduce barriers to Energy Service Agreement (ESA) negotiation.

From concept to contract: How the geothermal utility model works

This section focuses on the geothermal utility model, the "middle" option where GaaS has the longest commercial track record and the strongest current evidence base.

Energy Service Agreement

Geothermal utility projects are governed by an Energy Service Agreement (ESA) — sometimes called a Geothermal ESA, Thermal Purchase Agreement, or Thermal Service Agreement. The ESA defines the commercial and operational terms under which the provider delivers thermal energy services to the building. More fundamentally, it is the legal instrument that shifts the financial, technical, and performance responsibility for the geothermal system from the building owner to the provider.

The ESA's typical commercial terms are:

- **Term length:** Typically, 20 to 30 years — long enough to amortize the ground loop investment and reduce the monthly fee to cost-neutrality, short enough to align with building lifecycle planning. Some large-scale projects extend to 50 years.
- **Pricing:** A fixed monthly fee based on floor area, typically $0.06–$0.13 per sq. ft. *($60-$130 for a typical 1,000 sf unit*), with a fixed annual escalation decoupled from gas and electricity markets.
- **Billing:** The fee is paid monthly or annually by the building owner or condo corporation, and is typically passed through to unit owners as part of common-area fees. Energy is not metered at the unit level; this is a building-level infrastructure fee, not a conventional energy utility bill.
- **What the fee replaces:** This is the point that matters most to developers and building owners. The GaaS fee is not an additional cost layered onto existing expenses — it substitutes for the capital cost of the mechanical system the developer would otherwise have installed, plus its ongoing energy and maintenance costs the building owner would otherwise have borne over its service life. In many cases, the net effect on occupant costs is neutral or favourable from day one, and improves over time as gas and electricity rates rise while the ESA escalation remains fixed.
- **Risk allocation:** The ESA defines how the principal risks of geothermal ownership are reallocated between geothermal provider, developer, and building owner. The provider assumes performance, technology, and maintenance risk over the contract term, backed by a contractual service guarantee. Construction delays are borne by the developer, with monthly fees typically beginning on a fixed date tied to the project schedule. The owner retains optionality through transfer, buy-out, and end-of-term provisions, with specific mechanisms varying by province and contract.

It is important to note that not all ESAs are structured the same, and terms are evolving as the market matures. Other commercial structures — including hybrid arrangements, co-ownership models, and phased transfers — may be appropriate depending on project circumstances. The description here reflects the dominant structure used by the leading Canadian providers.

WHAT HAPPENS IF THE GEOTHERMAL UTILITY BECOMES INSOLVENT OR IS ACQUIRED?

Because the borefield is physically embedded and cannot be removed, the asset will almost certainly transfer with the building — but the contractual terms under which it is operated should be explicitly protected. The ESA can include provisions for contract assignment, successor obligations, and building owner protections in the event of ownership change.

The restructuring of Canada's first GaaS provider (Subterra / STS Renewables in 2025) demonstrated both the reality of this risk and the structural resilience of the model. The geothermal utility development business and its contracts were acquired by a new owner through a court-supervised process.

Roles and responsibilities

The table below outlines how responsibilities are typically divided between the developer and the geothermal utility across the project lifecycle. The division is clean by design. The developer builds the building, and the utility builds the energy infrastructure.

Table 2. Typical division of responsibilities in a geothermal utility arrangement

Project phase	Developer	Geothermal utility
Design	Leads building design with mechanical consultant	Performs system modelling, sizing, and integration with the mechanical and electrical team
Financing	Funds building construction (HVAC cost excluded or reduced)	Raises capital independently via infrastructure investors; navigates funding and incentive programs
Construction	Oversees sequencing; coordinates with general contractor	Manages drilling, borefield installation, tie-ins, and all required mechanical equipment
Operations	Building owner handles non-geothermal maintenance	Provides monitoring, maintenance, and system optimization
Energy billing	Coordinates utility setup; may manage multiple accounts	Bills for thermal energy; supports fee inclusion in condo or rental billing

Photo courtesy of Diverso Energy

Value proposition: Who benefits from GaaS, and how

GaaS creates different value streams for the participants in the model. What follows is based on direct engagement with developers, building owners, investors, and industry practitioners across Canada.

Developers

This model removes geothermal from the developer's scope of work. The utility handles design, financing, drilling, and commissioning. The developer therefore delivers only the building, not the thermal energy system.

- **Off-balance-sheet treatment:** The geothermal utility owns the system. The capital expense sits on the thermal utility's balance sheet, freeing the developer's equity for other project needs. Financial incentives — grants, tax credits, preferential lending — flow to the utility, which is better positioned to access and manage them. Less capital risk, less procurement complexity. Here's how Spencer Smyth from CLDevelopments, a Hamilton Developer, put it:
  "We looked at geothermal a few years ago. The numbers didn't work. Then our mechanical engineer brought us an "as-a-Service" provider and suddenly, we weren't footing the bill."
- **Compliance without added risk:** In cities where building performance standards require low-carbon HVAC — Toronto's Green Standard, Vancouver's Zero Emissions Building Plan — GaaS allows developers to meet and exceed the requirement without taking on unfamiliar technical complexity or specialized trade coordination. The geothermal utility carries the engineering, procurement, and performance risk. As one Toronto developer noted:
  "The Toronto Green Standard is the sole reason geothermal adoption has taken off in the last couple years."
- **Practical upsides:** Some developers report simpler HVAC layouts, preferential municipal permitting, and additional usable space — no rooftop cooling towers, smaller or eliminated mechanical penthouses, and freed-up floor area that can be converted to saleable or leasable square footage. These gains are project-specific, but where they land, they improve the project's economics, beyond HVAC.

SEQUENCE MATTERS: ENGAGE EARLY, BUILD IN PARALLEL

Two points are worth emphasizing for developers considering the model for the first time. First, the geothermal utility must be engaged early: during design, not after the mechanical system is specified. The borefield is a finite thermal reservoir that must be matched to the building's long-term load profile, and late-stage integration creates rework and cost risk. Second, the utility typically drills and installs the borefield before excavation begins for the foundations, returning for horizontal tie-ins after shoring is complete. This sequencing means geothermal adds time at the front end but runs in parallel with — not in series with — the main construction schedule.

Building owners and occupants

The calculus will differ depending on who owns the building and who operates the equipment.

Institutional owners and Real Estate Investment Trusts (REITs) gain predictable operating costs, reduce capital reserve requirements (*central mechanical equipment is often downsized or eliminated under a GaaS model*), and improve alignment with ESG and sustainability goals. The system hedges against gas price volatility and against future electricity rate increases driven by peak demand growth. **It is a long-lived, low-maintenance asset with no fossil fuel exposure**.

Condo boards and small residential owners gain simplicity as a monthly fee replaces a capital decision and maintenance is outsourced. **In most cases, condo fees actually decrease**; avoided gas bills are the largest driver, alongside reduced capital reserve fund contributions, lower routine mechanical maintenance, and lower water bills, partially offset by moderately higher electricity bills.

One important caveat is that geothermal does not always deliver lower operating costs in every market. The business case depends on local electricity and gas rates, available incentives, and the building's load profile. But as a **hedge against rate volatility across both gas and electricity**, the structural cost advantage strengthens over time.

Investors and capital partners

Geothermal projects are highly capital-intensive with funding coming from a range of sources. The targeted unlevered Internal Rate of Return ("IRR") varies by project; however, the typical range for infrastructure investments is 8-14 percent. Geothermal utilities attract equity or infrastructure investors due to their asset characteristics, including:

- Long-duration inflation-linked cash flows through the ESA;
- De-risked, contracted ESAs with creditworthy counterparties;
- Low volatility given that heating and cooling are essential services and replacement for alternative — by installing a parallel system — is cost-prohibitive for customers;
- The physical systems embedded under the property offer asset security;
- Geothermal is climate-aligned infrastructure with real-estate adjacency, including direct GHG emissions reductions, which is attractive to ESG-focused investors.

At the portfolio level, a provider aggregating many building-scale projects can diversify away the site-specific variability in ground conditions and performance to help de-risk any one project. This is the aggregation logic that makes GaaS investable at institutional scale.

"With the right project profile and contract structure, the geothermal utility model delivers contracted, recurring cash flows underpinned by long-life assets making it one of the few infrastructure-grade decarbonization investments available at the building level."

– Alastair Wong, CVC DIF Capital Partner (Canadian pension-scale infrastructure investor)

Utilities

Electric utilities benefit from geothermal as a demand-side resource. GSHPs maintain performance during both winter cold snaps and summer heat waves, which have a critical impact on utility grid investment decisions, and ultimately on rates. **Widespread geothermal deployment reduces costs associated with peaking generation, transmission upgrades, and distribution reinforcement.** These avoided costs are a value that accrues to all ratepayers, not just to the geothermal building. Therefore, electric utilities and regulators should consider geothermal not only as a customer-side technology, but a non-wires, grid-enhancing infrastructure that defers supply-side investment.

Gas utilities face a structural question as heating electrification accelerates. The “heat-as-a-service” model — where a utility provides thermal comfort rather than supply fuel — offers one transition pathway. Gas utilities bring customer relationships, billing systems, project management capacity, and access to capital. **These assets position them as potential participants in the GaaS market, whether as competitors to or partners with third-party providers**. Several U.S. States have passed laws to support networked geothermal systems, often driven by gas utilities,[12] and Énergir in Québec announced a geothermal offering in December 2025.[13] The aggregation model — managing geothermal across many buildings, averaging performance risk — aligns well with how utilities already operate distributed infrastructure, and could help further scale the geothermal market locally.

Courtesy of the Ontario Geothermal Association

The Path Forward

Clear rules, smart planning, scaled delivery: Unlocking the path to clean heat across Canada

An enabling environment with the policies, planning practices, and complementary market infrastructure that will enable success is needed to get GaaS from a handful of pioneer projects to a standard option across regions and sectors.

The three key recommendations and actions that will move the mark, detailed over the next pages, are:

1. **Level the playing field for clean heat:** Extend to GaaS the regulatory, financial, and program treatment legacy gas and electricity infrastructure already enjoy. *This promotes a more competitive Canadian building sector.*
2. **Integrate geothermal into planning:** Assess early in energy plans, utility studies, and major development and investment decisions. *This will result in more resilient buildings and grids.*
3. **Unlock delivery at scale:** Build workforce, standardize structures, and support replicable demonstrations, anchoring a Canadian geothermal value chain. *This will scale an affordable clean-heat market with the industrial capacity to match.*

Photo courtesy of Diverso Energy

Recommendation 1: Level the playing field for clean heat

Objective: *Create a policy and regulatory environment in which the GaaS model can compete on an equal footing with alternatives by making the model recognized, financeable, and fairly valued.*

Action	First Movers
Action 1.1. Send clear policy signals for pursuing clean heat. Governments should establish directionally clear policy for the energy system and the buildings sector through instruments such as building codes, green standards, existing-building performance standards, and future-of-gas reforms. The goal is not to pick winning technologies or ownership models, but to tilt the whole field toward clean heat — letting cost-effective, resilient, low-emissions solutions compete on outcomes. Toronto's Green Standard has shown that municipal policy can create clear signals that help move the market.	*Provincial and local governments*
Action 1.2. Level the infrastructure playing field. GaaS should receive the same regulatory and financial treatment as legacy gas and electricity infrastructure. Gas distribution benefits from a large rate base, multi-decade amortization, new-connection subsidies socialized across all ratepayers, and easy access to public rights-of-ways — structural advantages no clean-heat model currently enjoys. Levelling the playing field does not mean regulating geothermal utilities as much as gas, but ensuring comparable treatment (benefits and requirements) to new thermal infrastructure models (GaaS, TENs).	*Energy regulators, Provincial governments*
Action 1.3. Clarify the regulatory treatment of thermal providers. Provincial governments and regulators should clarify whether geothermal providers are regulated utilities, private service providers, or a hybrid — and align consumer protection, contracting, and oversight rules accordingly. Clear rules reduce uncertainty, support investment, and support scale.	*Provincial governments, Energy regulators*
Action 1.4. Recognize and value the system-level benefits of geothermal. Geothermal reduces winter peak demand, defers grid upgrades, and improves resilience — benefits rarely reflected in program design or rate structures. Regulators and utilities should incorporate the full suite of avoided costs into their planning and decision frameworks. Evaluated with only on site-level bill savings, geothermal can appear marginal; evaluated as infrastructure with ratepayer and societal benefits, its value proposition is materially stronger, and can be recognized through financial incentives that reward their value.	*Energy regulators, Utilities*
Action 1.5. Make incentives and tax treatment ownership neutral. Incentive programs and tax benefits should assess projects on outcomes, not ownership structure — accommodating thermal service agreements so support flows to high-performing projects regardless of who holds the asset. This means fixing barriers like CMHC's scoring rules and clarifying GSHP eligibility under the Clean Technology Investment Tax Credit (ITC), including under third-party ownership.	*Federal government, CMHC, Program administrators*

Outcome: *GaaS becomes easier to approve, easier to finance, and better positioned to compete in applications where it delivers the greatest value to building owners, occupants, and the energy system.*

Recommendation 2: Integrate geothermal into planning

Objective: *Make geothermal a standard option in clean-heat planning by assessing it routinely, early, and in the projects where it is most likely to deliver value.*

	First Movers
Action 2.1. Develop local thermal energy plans — with geothermal as a standard option. Municipalities and utilities should develop community-scale thermal energy plans, which are geographically granular versions of integrated energy plans focused on heating and cooling loads and sources. These processes should be designed to surface locations where geothermal is most competitive compared to air-source or networked systems.	*Local governments,* *Utilities,* *Energy planners*
Action 2.2. Position municipalities as market enablers. Municipalities influence whether geothermal is considered through the tools they already control: land-use and infrastructure planning, zoning, permitting, and development approvals, including for major new developments where thermal infrastructure decisions are made early and at scale. Additionally, municipal policy can provide market certainty, as shown by the Toronto Green Standard (*refer to* ***Action 1.1*** *above*).	*Local governments*
Action 2.3. Require geothermal screening in project-level decisions. Geothermal is almost always technically feasible, but project economics depend on a set of site-specific factors. Developers, building owners, and their advisors should evaluate geothermal in major new developments, asset renewal planning, and major equipment replacements, particularly where municipal plans or building performance standards signal favourable conditions. The default question should not be why geothermal *is* being considered, but whether it has been screened out for a documented reason.	*Developers,* *Building owners,* *and their advisors*
Action 2.4. Align geothermal screening with housing and growth agendas. Geothermal should be considered in affordable housing, rental housing, and growth-area planning, particularly where governments are seeking to accelerate housing delivery while improving long-term building performance. GaaS can help reduce upfront capital pressure for developers while supporting clean-heat outcomes, making it relevant not only to climate objectives but also to housing affordability and supply.	*Municipal planners,* *Housing providers,* *Developers.*
Action 2.5. Define geothermal-ready requirements in practical terms. A building that is "geo-ready" is designed so that a geothermal system (or a future connection to a Thermal Energy Network) can be added without major retrofit: a central hydronic HVAC design, mechanical room located at ground level, and piping pathways that can reach a borefield. Developers, municipalities, and design professionals need a clear, usable standard for what this means in practice, and where it should be mandated. Even where geothermal is not installed initially, projects should be able to preserve the option at low incremental cost.	*Provincial and local governments,* *Design professionals* *GaaS providers*

Outcome: *Geothermal is assessed where it is most relevant, at the stage when it can still influence project design and investment decisions and is less likely to be overlooked simply because it was never considered.*

The Conclusion

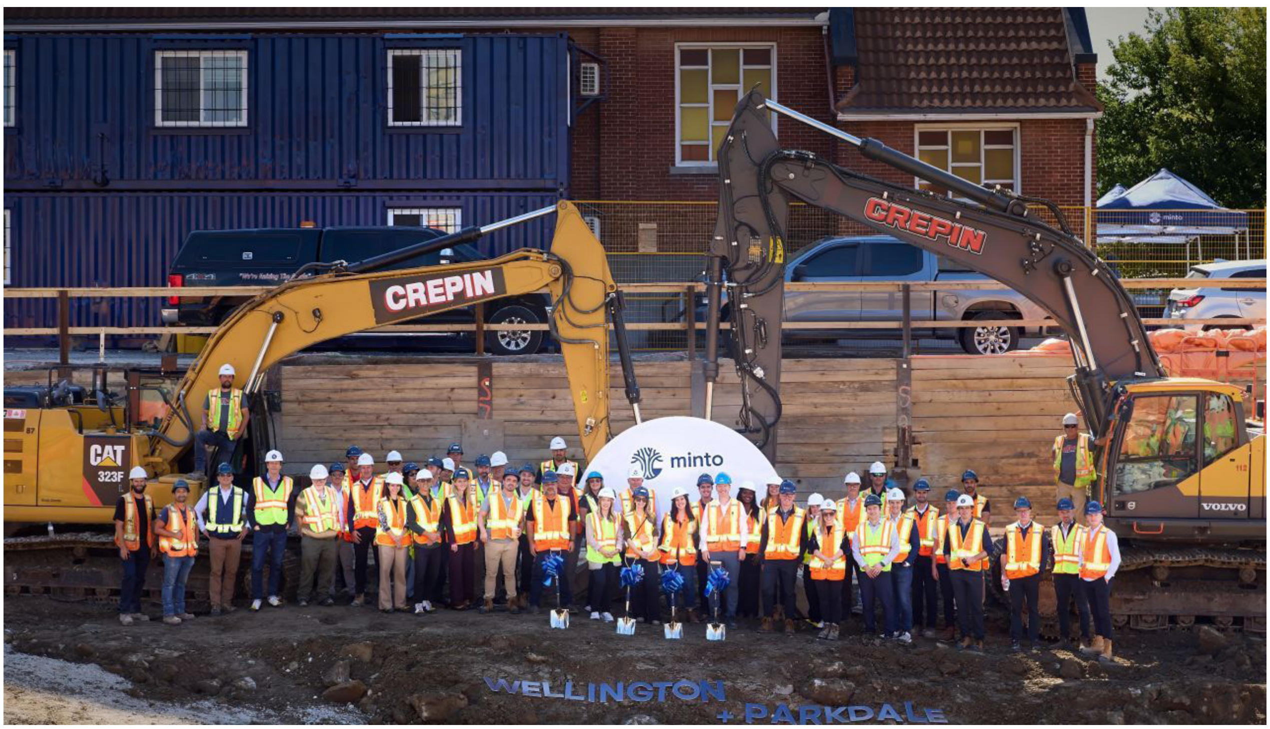
The GaaS model is proven. Now is the time to scale it across Canada

Geothermal is a proven technology that can make an important contribution to an electrified and competitive Canadian economy. **What has been missing is not the technology but underlying delivery model and the enabling conditions.**

GaaS fills the gap. For developers, it removes complexity and capital burden. For building owners, it provides cost certainty and a hedge against rate volatility. For investors, it offers contracted, infrastructure-grade returns. For the electricity system, it reduces the peak demand that drives the most expensive grid investments.

The path forward requires action from policymakers, utilities, and the real-estate industry to level the playing field, integrate geothermal into planning, and build the market infrastructure for repeatable delivery. Decisions today will form the foundation of building performance, fuel needs, and costs for decades.

Geothermal-as-a-Service is ready. The question is: will the enabling environment catch up?



Courtesy of the Ontario Geothermal Association

Endnotes

1 Ember (2025). The Electrotech Revolution.

2 Building Decarbonization Alliance (2023). The Case for Building Electrification in Canada.

3 https://www.thermacityenergy.com/

4 Polytechnique Montréal. Chaire de recherche en géothermie sur l'intégration des puits à colonne permanentes (PCP).

5 Net Zero Atlantic (2022). Direct Use of Geothermal Heat in Nova Scotia.

6 Dunsky Energy + Climate Advisors, for HRAI (2020). The Economic Value of Ground Source Heat Pumps for Building Sector Decarbonization.

7 DOE (2025). Pathways to Commercial Liftoff: Geothermal Heating and Cooling.

8 Toronto Star (2025). Inside the deal that's making geothermal heat go mainstream in Toronto

9 Geothermal Canada (2024). Subterra Renewables and Enercare Launch Fully Integrated Heating and Cooling Solution

10 The Globe and Mail (2026). Diverso Energy and Dandelion Energy Partner to Accelerate Geothermal Deployment Across U.S. Housing Markets

11 Blatchford Renewable Energy. District Energy Sharing System.

12 BDC. Thermal Energy Networks State Legislation

13 Énergir (2026). Climate Resiliency Report 2025

14 Better Buildings BC. Incentive Search Tool.

15 Efficiency Manitoba. Ground Source Heat Pump Program.

16 Hydro-Québec. Programme LogisVert

17 Hydro-Québec. Solutions efficaces : Appuis financiers pour les entreprises

18 Government of Canada. Clean Technology Investment Tax Credit (ITC) - Clean technology property.

19 Natural Resources Canada. Tax Incentives for Clean Energy Technologies - Class 43.1 and 43.2

20 City of Toronto. Development Charge Refund Program

21 CMHC's Apartment Construction Loan Program (ACLP) and MLI Select provide preferential financing for high-performance multi-unit buildings, including below-market interest rates, loan amounts up to 100% of eligible costs, amortizations up to 50 years, loan-to-value ratios up to 95%, and reduced mortgage insurance premiums.