Innovia GEO × BUFFALO GEOTHERMAL

Shallow Depth,

Deep Impact

How Innovia GEO's accessible delivery model turns the geothermal paradigm on its head — and why one of the industry's most experienced installers is betting their own building on it.

Geothermal energy has long promised clean, reliable heating and cooling — but for decades, the promise outpaced the delivery. Deep drilling requirements, specialized equipment, and a contractor base of fewer than 1,000 capable rigs across North America kept geothermal mostly confined to individual homes not serviced by gas lines, and large institutional buildings. The technology worked. The delivery model didn't scale.

Innovia GEO was built to solve that. By redesigning geothermal systems for shallow depths — 15 to 100 feet instead of 400 to 800 feet — the company unlocks a contractor network of more than 10,000 foundation and horizontal directional drilling (HDD) rigs already deployed across the continent. The result: geothermal that is faster to install, substantially cheaper, and permissible in regulated zones where conventional deep drilling can be banned outright.

The proof of that proposition is already in the ground — literally. In Buffalo, New York, geothermal veteran Johannes Rosemann and his team at Buffalo Geothermal installed one of Innovia GEO's first pilots in their own warehouse. Then they signed up to put the next system in their own office. That progression — from curious installer to adopter — is the story of a paradigm shift taking hold.

10,000+	25–50%	2–5×	Permissible
Capable rigs unlocked	Lower installed cost	Faster deployment	In regions with deep drilling restrictions regions

01 — BEFORE Innovia GEO: WHY GEOTHERMAL COULDN'T SCALE

To understand what Innovia GEO has changed, it helps to understand what it was working against. Conventional geothermal requires drilling 400 to 800 feet through differing layers of soil and bedrock — work that demands highly specialized rigs, experienced crews, and construction timelines measured in months. In most North American markets, that model is expensive but workable. In specific geographies, it can break down entirely.

Parts of New York City and Long Island are clear examples. Beneath midtown Manhattan, bedrock sits at manageable depths — roughly 40 to 90 feet down. But as you move north and east across Long Island, the bedrock drops sharply and is replaced by hundreds of feet of sand and clay overburden — ground conditions that push the cost of conventional drilling to the point of economic unviability.

> *"In areas with large overburden, the ground loop heat exchanger can account for nearly half of the total system cost. If we can reduce that by30 to 35 percent, we're looking at shaving 20 to 25 percent off the overall system cost."*
>
> **— Johannes Rosemann, Buffalo Geothermal**

The overburden problem isn't just economic — it's regulatory. Almost all of Long Island draws its drinking water from underground aquifers, and state regulations can add substantial permit requirements that may prohibit conventional geothermal drilling from penetrating or passing through those aquifers. That prohibition effectively closes one of the most densely built, electrification-mandated markets in North America to conventional geothermal entirely.

David Brodrecht, a mechanical engineer with WalterFedy and board director of the Ontario Geothermal Association, sees the same dynamic playing out across Ontario. Wellhead protection areas in Ontario impose depth restrictions that make conventional geothermal a non-starter — leaving developers with a choice between lesser performing air-source alternatives or no geothermal at all. In his framing, the gap isn't incremental: it's a no-man's land that prior technologies have consistently failed to fill.

02 — THE PARADIGM SHIFT: FROM DEEP DRILLING TO ACCESSIBLE DELIVERY

Innovia GEO's answer is not an incremental improvement to conventional geothermal. It is a fundamental redesign. By engineering systems that operate just 15 to 100 feet deep rather than 400 to 800, the company sidesteps the deep drilling barrier entirely — and in doing so, transforms who can install geothermal systems.

Where conventional geothermal requires a small, specialized pool of deep-drilling contractors, Innovia GEO's shallow systems can be installed with the very same drill rigs that foundation and HDD contractors already own and operate daily. That shift — from roughly 1,000 specialized rigs to more than 10,000 capable ones — is what unlocks scale.

> *"My initial thought was that this could be a very unique approach — either to supplement conventional drilling and reduce the amount needed, or even replace it entirely — because of the different method Andrew had envisioned: using a foundation contractor's rig that can drill thousands of feet a day."*
>
> **— Johannes Rosemann, Buffalo Geothermal**

Critically, this is not a theoretical supply chain. The equipment already exists, the contractors are already deployed, and the materials are already in production. Johannes was direct on this point: everything Innovia GEO uses is existing technology, just used in a different way. The HDPE pipe is widely used by the gas, power and water industries. The drill rigs are plentiful. The

infrastructure needed for scale is already out there — Innovia GEO simply gives it a new application.

David Brodrecht, evaluating the technology from an arm's-length engineering perspective, confirmed what prior attempts had failed to do: clear the price bar. He had seen similar technologies before and passed on each one. None had hit the cost point where they could compete with conventional systems. He believes Innovia GEO can.

03 — THE CULTURAL FIT: WHY BUFFALO GEOTHERMAL WAS THE RIGHT FIRST PARTNER

Accessible delivery only works if installers embrace it. An open contractor pool is a theoretical advantage until a credible, experienced installer actually picks up the technology and deploys it. Buffalo Geothermal is that installer — and their willingness to engage wasn't accidental. It reflects a company culture built around questioning the status quo.

> *"It has always been a motto of our company — just because we've done something a certain way for 20 years doesn't mean it's the best way. It just means that's the approach we settled on. It doesn't mean there isn't a better one."*
>
> **— Johannes Rosemann, Buffalo Geothermal**

Founded in 2002, Buffalo Geothermal has spent two decades as one of the most active geothermal contractors in the northeastern United States, including a significant footprint in New York City. They know conventional deep drilling intimately — its economics and limitations. That expertise makes their endorsement meaningful.

David Brodrecht's arc is similarly instructive. He describes himself as someone who has seen other geothermal technologies come and go — and passed on each one. What kept him engaged with Innovia GEO was watching Andrew Lee continuously refine and simplify the system rather than forcing it to fit a predetermined solution: genuine, data-driven product development, not a solution in search of a problem. That intellectual honesty, from both sides of the partnership, is the cultural substrate the accessible delivery model requires.

04 — THE VALIDATION JOURNEY: NYSERDA NEXTGEN BUILDINGS CHALLENGE

Innovia GEO didn't ask Buffalo Geothermal to take the technology on faith. The partnership is structured around a disciplined, three-project validation sequence through New York State Energy Research and Development Authority's (NYSERDA) NextGEN Buildings Innovation Challenge — a framework that transforms pilot projects into commercial ready solutions.

Project 1 (2025) was a proof of concept installed in Buffalo Geothermal's warehouse in Buffalo, New York. Design work began in January, ground was broken in May, and the system entered operation by September 1st — a six-month design-to-operational timeline that itself demonstrated the speed advantage of the accessible delivery model. The core question with this system was simple: does it work?

> *"This was a proof of concept. The number one question was: does it work? And I think we've proved that yes, it does."*

> **— Johannes Rosemann, Buffalo Geothermal**

It worked. But the data produced something more valuable than just confirmation — it produced a surprise. The embedded ground temperature sensors installed as part of the project revealed that at 30 feet deep, winter ground temperatures were actually warmer than at 50 feet and deeper. This inverts a core assumption of conventional geothermal, which has always been premised on drilling deeper to reach warmer ground. Andrew Lee explained that the shallow thermal behavior had simply been ignored because no conventional system operates at those depths. The knowledge gap was real, and Innovia GEO was filling it.

> *"If you would have asked me that half a year ago, I would have said I don't think so."*
>
> **— Johannes Rosemann, Buffalo Geothermal — on discovering that ground at 30 feet is warmer than at 50 feet in the heart of the winter**

The ground temperature discovery isn't just scientifically interesting — it has a direct performance implication. Because heat dissipates through soil with a seasonal delay of roughly five to six months, shallow systems experience peak warmth in February, precisely when buildings need it most for heating, and peak coolness in August, precisely when they need it for cooling. The shallow depth becomes an efficiency advantage, not a compromise.

That data is now being fed to research teams at Toronto Metropolitan University (TMU) and the University of Calgary, where it will contribute to peer-reviewed research publications. The pilot isn't just validating a product — it's advancing the field in a fundamentally new way.

05 — THE INSTALLER-AS-CUSTOMER PROOF: PROJECT 2

If Project 1 proved the technology works, Project 2 proves something more powerful: that an experienced installer, who has used conventional deep geothermal for two decades is willling to put their own building on the line.

Project 2 is Buffalo Geothermal's own office — the building where Johannes Rosemann works every day. The system being installed will be tested against two conventional 500-foot boreholes that already exist in the building, providing a direct, apples-to-apples performance comparison that will be monitored in real time. National Grid is supporting the project — a signal that the utility sector sees Innovia GEO's accessible delivery model as a viable pathway to programmatic geothermal deployment.

The stakes are real. Johannes has skin in the game in the most literal sense — the system will heat and cool the very space where he sits. That's not a sales claim. It's an experienced professional betting their own daily comfort on the paradigm shift.

06 — THE UTILITY UNLOCK: MAKING ELECTRIFICATION GOALS ACHIEVABLE

National Grid's support of Project 2 is not incidental. It reflects a growing recognition among the utility sector that geothermal — and Innovia GEO's accessible delivery model in particular — offers something air-source heat pumps cannot: grid-beneficial electrification that flattens demand peaks rather than creating them.

Utilities across the northeastern United States and Canada have supported electrification goals for years, but conventional geothermal has been difficult to deploy at scale. The installer bottleneck is real, costs are high, and deployment timelines are long. Innovia GEO's model changes each of those variables: 25–50% lower installed cost makes incentivization easier, 2–5× faster installation means more systems per season, and the expanded installer base eliminates the supply bottleneck entirely.

> *"Electrical utilities have the most to gain from geothermal adoption. Getting them on board with believing in the technology, they can then open up either funding streams to help push through some of the capital cost barriers — or even just recognition of the technology so that their customers can have that peace of mind that geothermal is tried, tested, and true"*
>
> **— David Brodrecht, WalterFedy / OGA**

The policy environment is accelerating the urgency. New York City now mandates all-electric construction for most new buildings under seven stories, effective 2025. The Toronto Green Standard will require all new buildings be net zero by 2030. Federal investment tax credits of 30% under the Inflation Reduction Act are available but time-limited, set to expire in 2032. Similarly in Canada the 30% Clean Energy Investment Tax Credit is available until 2035. With multi-year planning cycles on larger projects, developers who want to capture those credits need to be moving now. The market tailwind and the paradigm shift are converging at the same moment.

07 — SOLVING THE ADOPTION BARRIERS: EDUCATION AND CONTROLS

No paradigm shift arrives without friction. Johannes, speaking from the installer's perspective, was candid about where the remaining hurdles lie — and notably, they are not where most people assume.

Consumer and regulatory perception, which might seem like a natural barrier for any new technology, is actually an advantage in Innovia GEO's case. The foundation drilling methods, and horizontal directional drilling methods, which Innovia GEO uses are already used extensively to build foundations for our buildings and roads and install our water pipes, power distribution cables and fibre optic lines. Compared to conventional deep drilling, he regulatory path is simpler, not harder.

> *"The challenge I foresee is the education of engineers on how to integrate this into their systems, and building a truly robust controls platform. That's what Innovia needs to solve for — something bulletproof and easy to implement, where you can throw 20 different building types at it and it just handles them. "*
>
> **— Johannes Rosemann, Buffalo Geothermal**

The real adoption barriers are education and the controls platform — two challenges that are solvable commercialization problems, not fundamental paradigm risks. The technology itself is validated. The task now is building the design tools and controls infrastructure that make it easyfor installers to deploy.

David Brodrecht articulates both the challenge and the path: once he's satisfied that the technology is ready, he can present it to his clients alongside conventional geothermal options as a matter of course — particularly for projects in wellhead protection zones or deep overburden conditions where conventional deep geothermal is challenged or outright not possible. His arms-length position relative to Innovia GEO is precisely what makes his endorsement effective when it comes.

08 — THE REPLICATION FORMULA: FROM PILOT TO PORTFOLIO

The NYSERDA NextGEN Buildings Innovation Challenge was designed as a structured progression, not a single data point. Project 1 proved the concept. Project 2 provides the apples-to-apples comparison against conventional deep geo delivering real-world performance data in an occupied building. Project 3 will demonstrate replication.

Each step of that progression reduces the risk profile for the next adopter who considers the technology. The NYSERDA structure provides regulatory credibility. Buffalo Geothermal's "installer-becomes-customer" provides commercial credibility. David Brodrecht's third-party engineering validation provides design credibility. These are not parallel validation tracks — they are a compounding stack.

> *"As soon as Andrew tells me we're ready for prime time, I can go in and say, 'Okay, here's the option. This is how this technology works for the building.' And put it right alongside any of the other geothermal technologies — or going into regions where you're not allowed to put the holes in the ground, we have these other options."*
>
> **— David Brodrecht, WalterFedy / OGA**

The scalability of the system itself reinforces this path. Andrew Lee confirmed that the control hardware architecture is modular — the same software code deployed in Buffalo scales to larger buildings by adding modules to the base controller. David Brodrecht made the same point from the engineering side: a controls package for a 10,000 square foot building looks nearly identical to one for a 150,000 square foot building. Standardized components, not bespoke re-engineering.

The installer network activation follows a straightforward formula: anchor partner validates accessible delivery, engineering endorsement provides third-party credibility, regulatory precedent de-risks future deployments, utility partnerships unlock programmatic funding. Buffalo Geothermal is that anchor. The formula is now replicable.

CONCLUSION — THE GEO REVOLUTION IS CLOSER THAN YOU THINK

The shallow revolution in geothermal is not a future prospect — it is operational. The first system in New York State is in the ground in Buffalo. The second is being designed for the office of the installer who built the first. A utility is supporting it. A third-party engineer is preparing to recommend it. A university is publishing the results.

What Innovia GEO has demonstrated through the Buffalo Geothermal partnership is not simply that shallow geothermal systems work. It is that the accessible delivery model — shallow depth,

standard equipment, existing contractor network — is the mechanism that finally makes geothermal deployable at the scale that policy, economics, and the climate demand.

Conventional geothermal required deep expertise, specialized equipment, and patience. Innovia GEO's approach requires none of those things from the installer. The expertise lives in Innovia GEO's design and controls platforms. The equipment already exists. The contractors are already working.

> *"I don't see many supply chain hurdles, because everything Innovia GEO uses is existing technology that's been slightly modified. The HDPE pipe in that diameter is widely used by the gas industry — it's not a new product. The drilling method is the same one we've used for building foundations for a long time. Those rigs are already out there, and they're plentiful."*
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> **— Johannes Rosemann, Buffalo Geothermal**

The paradigm shift is no longer theoretical. In Buffalo, New York, it is heating and cooling a warehouse — and soon an office. The GEO revolution is closer than you think.

ABOUT THIS CASE STUDY

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