Partner Proposal: Collocated Geothermal, Thermal Network & High-Performance Windows

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Date: February 8, 2026

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1. Executive Summary

This proposal presents a partnership opportunity to deliver integrated, high-margin campus decarbonization projects by combining three complementary scopes under a single, collocated delivery model. Rather than bidding geothermal, thermal networks, and building envelope upgrades as separate line items from separate vendors, our approach unifies all three into a single optimized system — reducing total project cost, compressing timelines, and generating superior margins for every partner involved.

Our core thesis is straightforward: **the money traditionally spent over-building underground infrastructure to compensate for inefficient buildings should instead be reallocated into the building envelope itself.** By combining advanced inclined-bore geothermal drilling, a 5th Generation Ambient Loop (thermal network), and European-style triple-pane windows delivered at US double-pane pricing, we create a virtuous cycle where each scope amplifies the value of the others. The result is a project that wins on technical merit, wins on price, and delivers margins that standalone bids cannot match.

On a representative 256,000 sq ft commercial campus, this collocated approach delivers **$10.7M in total project savings** compared to a conventional vertical geothermal bid — while providing 100% energy coverage, full thermal redundancy, and a path to Net-Zero certification.

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2. The Opportunity: Why a Collocated Approach Wins

The commercial geothermal market is growing rapidly, driven by decarbonization mandates, rising fossil fuel costs, and federal incentives such as the 30% IRA tax credit. However, most bids in this space are fragmented: one firm drills the bores, another designs the piping, a third handles the building HVAC, and the windows are an afterthought. This fragmentation creates three problems that our partnership model solves.

First, fragmented bids are over-engineered. When the drilling contractor does not control the building envelope, they must assume worst-case thermal loads. This leads to oversized borefields, inflated costs, and reduced competitiveness. Our integrated design process ensures the borefield is sized to the actual optimized load, not a conservative estimate.

Second, fragmented bids leave margin on the table. Each subcontractor prices their scope independently, with no incentive to optimize across boundaries. In our model, savings generated in one scope (e.g., fewer bores) directly fund value in another (e.g., better windows), creating a larger total margin pool that is shared among fewer partners.

Third, fragmented bids are harder to sell. Clients increasingly want a single point of accountability for their decarbonization investment. A collocated proposal that covers the full system — from the granite 800 feet below to the glass on the facade — is a fundamentally stronger value proposition than a patchwork of separate contracts.

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3. Scope 1: Geothermal Borefield — Design, Drilling & Delivery

3.1 Our Capability

We provide a complete, end-to-end geothermal solution. This is not limited to design consulting — we control the entire delivery chain:

Capability	Description
Borefield Design	Full thermal modeling, bore spacing optimization, and load analysis for any campus configuration
Driller Preparation	We can prepare and equip any drilling contractor with the required tools, specifications, and D&I control protocols for the project
Tooling & Equipment	We provide the specialized tooling required for inclined and deep-bore drilling operations
Surface Piping Design	Custom design of surface headers, manifolds, and building connections — including specialized mini-manifold configurations that reduce piping complexity by up to 70%
D&I Control	Full drilling and installation quality control, ensuring every bore meets depth, angle, and grouting specifications

3.2 The Technical Advantage: Inclined Drilling

Traditional vertical borefields in constrained urban sites face a fundamental conflict: fitting enough bores into a limited footprint forces the spacing below the 20-foot minimum required for deep granite bores, leading to thermal interference, reduced capacity, and long-term degradation. Our solution leverages Celsius Energy's inclined drilling technology, which starts bores at a tight 3–5 foot surface spacing but achieves 30+ feet of separation at the bottom of the 853-foot run. This eliminates the heat-soak risk entirely while preserving 90% of the surface area.

The financial impact is dramatic. On the reference 256,000 sq ft campus project, the inclined approach reduces the bore count from 220 to 110 and cuts the base drilling cost from $11.8Mto$4.7M — a savings of over $7M before any further optimization from the thermal network or windows.

Metric	CE Inclined (Our Bid)	Vertical (Traditional)	Advantage
Bore Count	110	220	50% fewer bores
Spacing at Depth	30+ ft	~15 ft	Zero heat-soak risk
Energy Coverage	100%	90%	Full coverage guaranteed
Parking Lot Disruption	10% (6,120 sq ft)	100% (61,200 sq ft)	90% less site impact
Installation Timeline	4–6 weeks	5 months	75% faster
Base Project Cost	$4.7M	$11.8M	$7.1M savings

3.3 Margin Opportunity for Partners

Because we control the design, tooling, and D&I process, we eliminate the typical cost overruns and change orders that erode margins on geothermal projects. Partners who bring the client relationship and general contracting capability can expect healthy margins on a scope that is pre-engineered for efficient delivery. The reduced bore count also means lower bonding requirements and less subcontractor risk.

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4. Scope 2: Thermal Network — The 5th Generation Ambient Loop

4.1 Our Capability

We have partnered with the **leading thermal network designer in North America**, a firm that has successfully designed and delivered 5th Generation District Heating and Cooling (5GDHC) systems for campuses up to 5 million square feet. This is not a theoretical capability — it is a proven track record of completed projects across multiple climate zones and building types.

A 5GDHC ambient loop connects multiple buildings via a shared, uninsulated water loop that operates at near-ground temperature. Instead of each building

independently heating or cooling against the ground, the buildings trade energy with each other first. A cooling-dominant building rejects heat into the loop; a heating-dominant building extracts it. The borefield only handles the net imbalance — which is dramatically smaller than the sum of individual peak loads.

4.2 The Campus Synergy

The reference campus illustrates this perfectly. Building 1 (100,000 sq ft, glass-heavy) is a natural heat donor — it generates excess cooling waste heat year-round. Building 2 (100,000 sq ft, poorly insulated) is a natural heat taker — it has high heating demand. Building 3 (56,000 sq ft, LEED Gold) with its existing 50-bore field acts as a thermal battery and stabilizer. When connected via a 200-meter ambient loop, these buildings form a self-balancing thermal ecosystem.

Building	Profile	Role in Network
Building 1 (100k sq ft)	Glass-heavy, cooling-dominant	**Heat Donor** — rejects waste heat into the loop
Building 2 (100k sq ft)	Poor insulation, heating-dominant	**Heat Taker** — extracts heat from the loop for "free" heating
Building 3 (56k sq ft)	LEED Gold, existing 50-bore field	**Thermal Battery** — provides buffer capacity and redundancy

The result is a **15–25% reduction in total energy consumption** and a **20% reduction in required bore count**, because the borefield only needs to handle the diversified net load rather than the sum of individual peaks. On the reference project, this translates to approximately 20 fewer bores and $600K$–1M in additional drilling savings — savings that flow directly to the project margin.

4.3 Why This Wins Projects

Thermal networks are the fastest-growing segment of the commercial decarbonization market, driven by utility pilot programs, state mandates, and the proven economics of energy sharing. However, very few firms in North America can actually design and deliver these systems. Our exclusive partnership with the continent's leading 5GDHC designer gives us a decisive competitive advantage: we can offer a capability that most competitors simply cannot match.

For partners, this means access to a differentiated offering that commands premium positioning in the market. Projects that include a thermal network component are significantly harder for competitors to replicate, which protects margins and reduces the risk of being undercut on price alone.

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5. Scope 3: High-Performance Windows — The "Virtual Borefield"

5.1 Our Capability

We have established a unique supply chain that delivers **European-style triple-pane windows (U-value < 0.16, approximately R-6.2) at the price point of standard US double-pane windows**. This is not a marginal improvement — it represents a 30% improvement in thermal resistance at zero additional capital cost to the client.

Standard American double-pane windows typically achieve a U-value of 0.25–0.30. European triple-pane windows, manufactured to Passive House standards, achieve U-values below 0.16 — but have historically been priced 50–100% above their American counterparts, making them difficult to justify in commercial bids. Our supply chain eliminates this price premium entirely, transforming the windows from a cost center into a strategic asset.

5.2 The "Drilling Replacement" Strategy

The power of this capability becomes clear when viewed through the lens of the integrated system. Every improvement in the building envelope directly reduces the thermal load on the geothermal system. For every approximately 12 tons of load reduced by the windows, one 850-foot borehole can be eliminated from the borefield. On the reference campus, upgrading Building 1's glass facade to triple-pane windows reduces the peak cooling load by 25–30%, allowing the bore count to drop from 110 (with the CE inclined approach) to just 80–90 bores.

The financial logic is compelling: instead of spending $1.5M–2.0M on the most difficult 40–50 additional vertical bores, that capital is invested in the building envelope — an asset that improves comfort, reduces energy bills, and increases property value for the

next 50+ years. The bores, by contrast, are a sunk cost with no residual asset value beyond their thermal function.

Strategy	Bore Count	Drilling Cost	Building Value	30-Year Energy Cost
Traditional (Vertical, No Windows)	220	$11.8M	Unchanged	High
Optimized (CE + Network + Windows)	80–90	$3.8M	Significantly Enhanced	Dramatically Lower
Net Savings	**130–140 fewer bores**	**$8.0M**	**Premium Asset**	**25–30% reduction**

5.3 Margin Opportunity for Partners

The windows scope is where the margin story becomes particularly attractive. Because we deliver triple-pane performance at double-pane pricing, there is substantial room for healthy markups while still presenting the client with a cost-neutral or cost-positive proposition. The client sees “free” window upgrades funded by drilling savings; the partner captures margin on a scope that competitors cannot price-match because they lack access to our supply chain.

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6. The Collocated Advantage: How the Three Scopes Multiply Value

The true power of this proposal is not in any single scope — it is in the interaction between all three. Each scope creates savings and efficiencies that amplify the others, producing a total value that no fragmented bid can match.

6.1 The Optimization Cascade

The optimization works in a clear sequence. First, the **high-performance windows** reduce the building’s thermal demand by 25–30%, shrinking the required geothermal capacity. Second, the **thermal network** enables energy sharing between buildings, further reducing the net load on the borefield by an additional 15–20%. Third, the

inclined drilling technology delivers the remaining (now much smaller) borefield at the lowest possible cost with minimal site disruption. The cumulative effect is transformative.

Optimization Stage	Bore Count	Cumulative Savings
Baseline (Vertical, No Optimization)	220 bores	—
+ Inclined Drilling (CE Technology)	110 bores	$7.1M
+ Thermal Network (3-Building Loop)	88–92 bores	$8.0M+
+ High-Performance Windows	80–90 bores	$10.7M

6.2 The Competitive Moat

This collocated approach creates a competitive moat that is extremely difficult for other bidders to replicate. A competitor would need to independently source inclined drilling expertise, a 5GDHC thermal network designer with campus-scale experience, and a European window supply chain with US-competitive pricing. The probability of any single competitor assembling all three capabilities is very low, which means our partnership can consistently win bids while maintaining premium margins.

6.3 The Client Value Proposition

From the client's perspective, the value proposition is equally compelling. They receive a 100% covered, high-performance campus for approximately 40% of the cost of a traditional vertical geothermal bid. The system is fully redundant, self-balancing, and designed for 50+ years of reliable operation. The building envelope is upgraded to premium European standards at no additional cost. And the entire project is delivered by a single, accountable partnership — not a fragmented collection of subcontractors.

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7. Financial Summary: The Reference Campus

The following table summarizes the financial comparison between a traditional approach and our optimized collocated bid for the 256,000 sq ft reference campus.

Component	Traditional Bid (Option 3)	Our Optimized Bid (CE + Network + Windows)	Savings
New Borefield	220 bores	80–90 bores	130+ fewer bores
Bore Spacing	15 ft (high risk)	30 ft at depth (zero risk)	Eliminated thermal interference
Drilling Cost	$11.8M	$3.8M	$8.0M
Piping Logic	Complex reverse-return (15 circuits)	Simple ambient loop + mini-manifolds	70% less piping complexity
Parking Lot Disruption	100% (full repaving)	10% (corner only)	90% less disruption
Installation Timeline	5 months	4–6 weeks	75% faster
Energy Coverage	90%	100%+ (with thermal redundancy)	Full coverage + backup
Total Project Cost	**$16.6M**	**$5.9M**	**$10.7M savings**

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8. Partnership Structure & Next Steps

We are seeking partners who bring complementary strengths to this model — specifically, firms with strong client relationships in commercial real estate, institutional campuses, and municipal facilities. The ideal partner is a general contractor, mechanical contractor, or energy services company (ESCO) that can serve as the prime contractor or client-facing lead, while we provide the integrated technical solution across all three scopes.

8.1 What We Bring

We deliver the full technical backbone of the project: geothermal borefield design and D&I control, surface piping and manifold engineering, thermal network design through our exclusive North American partnership, and European-style triple-pane windows through our proprietary supply chain. We also provide the specialized tooling and

driller preparation required for inclined drilling operations, ensuring that any qualified drilling contractor can execute the subsurface work to our specifications.

8.2 What We Need from Partners

We are looking for partners who can provide client access and relationship management, general contracting and project management, local permitting and regulatory navigation, and mechanical/electrical subcontracting for the building-side HVAC integration. The partner retains the prime contract and the client relationship; we operate as the integrated technical subcontractor across all three scopes.

8.3 Margin Framework

The collocated approach generates a significantly larger total margin pool than fragmented bids. Because our optimized solution costs $5.9M versus 16.6M for the traditional approach, we can price our bid at a substantial discount to competitors while still maintaining healthy margins for all partners. The exact margin split is subject to negotiation on a project-by-project basis, but the structural advantage is clear: we win more projects, at better margins, with lower delivery risk.

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9. Conclusion

This partnership offers a rare combination of technical differentiation, cost leadership, and margin protection. By unifying geothermal, thermal networks, and high-performance windows into a single collocated delivery model, we create a solution that is technically superior, financially compelling, and competitively unassailable. We look forward to discussing how we can bring this approach to your next project.

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This document is confidential and intended solely for prospective partners. All cost figures are based on the reference 256,000 sq ft campus project detailed in the accompanying Geothermal Borefield Evaluation.