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What We Heard: Community Feedback for the NunatuKavut Geothermal Greenhouse Project

January 25 – February 5, 2026

Executive Summary

Between January 25 and February 5, 2026, community conversations were held across five communities to explore opportunities, concerns, and practical considerations for expanding local food production and investigating geothermal resources in NunatuKavut communities and the application of geothermal for a commercial scale greenhouse in the region. Participants consistently expressed interest in reliable, year-round or extended-season growing, while emphasizing the realities of labour constraints, funding for both capital and operations, and the importance of pairing greenhouse infrastructure with outdoor plots and appropriate storage (e.g., root cellars). Discussions also revealed significant local knowledge—from artesian wells to site-specific drilling experience—that should inform any exploratory work, as well as a desire to share skills between communities and actively involve youth and Elders in knowledge transfer.

Wrapping up a session in Port Hope Simpson.

Engagement Approach and Participation

Engagement included in-person sessions in St. Lewis (Fox Harbour), Mary's Harbour, Port Hope Simpson, Charlottetown and Cartwright, and due to weather for travel, a virtual session for Black Tickle. Community members from Lodge Bay and Pinsent's Arm travelled to attend in person sessions. Attendance ranged from six to thirteen people per session, including local leaders and experienced growers.

Across sessions, communities were supportive of geothermal because of its environmental benefits and its ability to provide steady, always-on heat compared to intermittent renewables. In St. Lewis, Mary's Harbour and Port Hope Simpson, participants

associated geothermal with proven concepts such as ground-source heat pumps and climate batteries. Cartwright noted interest in ocean-water heat pumps alongside geothermal. Residents also proposed recovering waste heat from existing diesel infrastructure where practical.

Residents asked questions about whether geothermal would work in each specific location, what studies have been undertaken to date, what drilling depths would be required, how systems should be costed and sized, and how they compare with alternatives like air-source heat pumps, wind and solar.

Greenhouses, Community Gardens, and Root Cellars

Residents expressed enthusiasm for extending the growing season inside greenhouses while reaffirming the importance of outdoor production in community gardens for staple crops, particularly root vegetables like potatoes, turnips and carrots, which are better suited to outdoor beds. Greenhouse success stories (e.g., Mary's Harbour) point to the value of site-appropriate designs with climate batteries, basic irrigation and integration with storage infrastructure such as root cellars. A recurring theme was to "start small and scale," piloting concepts in one or two locations before building larger facilities and ensuring designs remain flexible given the high cost of larger geothermal systems. Communities also emphasized the need to plan for snow clearing, site access, and maintenance from the outset.

Local Knowledge

Local hydrogeology knowledge is substantial. Many buildings in NunatuKavut communities rely on artesian wells, with typical drilling depths around 100 feet and occasional wells reaching 300 feet (at the school in Black Tickle). Residents in Black Tickle noted that some previously dry wells have begun flowing, and several locations now have overflowing wells. At the same time, communities warned about hitting seawater at shallow depths in certain sites—raising concerns about corrosion, clogging, and potential contaminants. These insights indicate that information gained from INRS's upcoming geothermal study should be combined with community-guided site vetting to ensure any future projects are well situated. Community knowledge of artesian wells in the study region will be communicated to consultants as the geothermal study begins.

Practical Constraints: Labour, Operations, and Ownership

Participants repeatedly highlighted labour as a limiting factor. Communities value the momentum from existing greenhouses, but sustaining operations is difficult without dedicated staff or consistent volunteers; many current volunteers are aging, and there is

concern about burnout if systems operate year-round without planned downtime. Conversations also raised the need to clarify ownership and operating models (e.g., community vs. commercial), food inspection requirements, and the potential market effects on small local retailers. Funding programs like New Horizons for Seniors have helped with salaries and equipment, yet reliance on short-term grants creates uncertainty for staffing and maintenance and would need to be greatly expanded for a larger scale greenhouse. A successful model would require a clear governance approach, multi-year operational funding, and a staffing plan that includes training, seasonal scheduling, and opportunities for youth involvement.

Knowledge Sharing and Education

Participants endorsed a model in which communities share expertise and even specialize in different crops, exchanging lessons on varieties, weed and disease management, and low-effort irrigation methods. Participants suggested that seniors and experienced growers could lead workshops and mentor new gardeners, alongside school-based programming to introduce children to greenhouse and garden work. There was strong interest in harnessing existing knowledge throughout NunatuKavut communities. Knowledge sharing, in the form of events/workshops, or scheduled training days—should be undertaken to sustain momentum and distribute workload.

Costs, Funding, and Timelines

While participants anticipate capital support to be attainable for pilot project infrastructure, concerns were voiced around operating costs (staffing, snow clearing, maintenance, replacement parts, and power). Participants suggested transparent costing, training provisions, and clear maintenance responsibilities to be written into project scopes.

Community Highlights

In **St. Lewis**, discussions centered on environmentally friendly geothermal options, potential use of waste heat from hydro or diesel generation, and practical enhancements like irrigation to reduce manual labour. Residents underscored several challenges, such as securing wood fuel, the importance of composting to build soil, and the need to protect small local retailers if greenhouse production expands. The group was broadly supportive of proceeding, given rising grocery costs and fixed incomes for Elders, and recommended keeping designs flexible because drilling opportunities for test wells will likely be limited.

In **Mary's Harbour**, participants discussed successes with the community's greenhouse and its 10-foot-deep climate battery that extended operations from March through

December. The site's favorable soils made excavation straightforward, though residents cautioned that conditions vary widely across the region. The discussion emphasized sharing knowledge between communities, ensuring adequate agricultural land for outdoor gardening too, and securing reliable staffing. Funding via programs such as New Horizons has been helpful but are likely not a complete solution for long-term operations at a larger scale.

In **Port Hope Simpson**, residents reiterated interest in geothermal paired with waste-heat recovery and raised questions about drilling depth. They pointed to Big Bog as a potential site and suggested learning from nearby experiences. Participants also discussed whether year-round operation is necessary or whether planned seasonal pauses could help manage labour demands and reduce burnout.

In **Charlottetown**, the discussion focussed on whether this project could build off any existing hydrogeological knowledge in the region, and what the anticipated costs of the project would be. Participants were curious about environmental and financial risks associated with geothermal, and recommended these risks be thoroughly investigated.

In **Cartwright**, participants advocated a 'start small and scale up' approach, including the possibility of ocean-water heat pumps. They highlighted the need to budget for training and ongoing maintenance and asked for examples of successful projects. Residents compared the steady output of geothermal heat production against the intermittent energy generation of solar and wind and emphasized that while capital funds for infrastructure may be attainable, operational budgets will require careful planning.

In **Black Tickle**, discussion focused on artesian wells and on the potential for developing outdoor gardens in locations optimized for sun, soil, and snow cover. Participants observed that several previously dry wells are now flowing and identified residents with practical knowledge who should be consulted during site selection. They also noted that many important root vegetables perform better outdoors than in greenhouses.

Summary of Feedback from Communities

• Start small: begin with one or two pilot sites to validate geothermal greenhouse performance, irrigation reliability and labour availability.

• Pair greenhouse pilot with outdoor community gardens and storage: plan root-cellar upgrades and composting alongside greenhouse work.

• Investigate different greenhouse adoption scenarios, such as smaller specialized greenhouses, dedicated to growing specific crops, based on skills and conditions, in multiple communities.

• Design for local hydrogeology: pair community knowledge about artesian wells and seawater risks to guide siting with data from the geothermal resource assessment study.

• Thoroughly investigate environmental and financial project risks.

• Plan for operations from day one: define ownership, inspection, and sales models; create staffing and training plans; budget for snow clearing and maintenance.

• Enable knowledge sharing: develop a regional learning network led by experienced growers and Elders, with youth engagement options.

• Integrate complementary sources of energy: assess solar for electrical load reduction and consider waste-heat opportunities where they are reliable and economic.

Conclusions

Communities across the region are interested in building upon recent greenhouse momentum with practical pilot projects that are mindful of local capacity and conditions. Careful considerations will need to be made with respect to operational costs, labour, site selection, and competition with local stores. Overall, communities were supportive of the project's potential to improve food security, lower exposure to price volatility, and create hands-on learning opportunities for residents of all ages.

Appendix: Geothermal Greenhouses – Key Considerations

Introduction

The following sections provide a brief overview of some key considerations that will need to be taken during the early planning phases of developing a geothermal greenhouse. The material presented below can be used as a primer for further community discussions and stakeholder engagement. A more fulsome report regarding geothermal greenhouse considerations and potential business models will be developed later in the project, as information from the geothermal resource assessment study becomes available.

1. Passive vs. Active Geothermal Heating

Passive Geothermal

Passive systems draw warm greenhouse air into underground tubes, where heat is stored in the soil or a thermal storage medium and later released when temperatures drop. Passive geothermal systems are low-cost and suitable for small to mid-scale greenhouses. The geothermal climate battery system within the Mary's Harbour greenhouse is an example of a passive geothermal system.

- Works well when paired with passive solar greenhouses.
- Often uses horizontal trenches at shallow depths (2–10 ft).
- Best for smaller structures and climates without extreme winter lows.
- Can be used to extend the growing season in climates with extreme winter lows, rather than growing year-round.

Active Geothermal

Active geothermal systems circulate fluid through buried piping, where heat conducted from the ground is transferred via a heat pump.

- These systems have a higher efficiency than passive systems but significantly higher upfront costs.
- Electricity demands for the ground-source heat pumps used in these systems is larger than the demands of a passive system.
- Active systems are more suitable for commercial-scale greenhouses or multiple greenhouse clusters.

- Active systems can be used for year-round growing in northern climates.

2. Site Selection & Structural Orientation

Site selection for a geothermal greenhouse is critical. The greenhouse should be well-drained and situated to take advantage of passive heating from the sun, in addition to being sited for optimal ground conditions for the geothermal system. Other considerations will include ease of access, for maintenance, supplying water and electricity to the greenhouse, and snow removal.

3. Design Strategies for Maximizing Geothermal Heating

Geothermal greenhouses in northern regions often employ specific design considerations to minimize heat loss. These include:

Buried / Partially Buried Greenhouses

- Greenhouses may be buried into the side of a hill to improve insulation and reduce wind exposure. Generally, it is the northern facing wall of the greenhouse that would be buried.
- This approach can reduce material costs by eliminating need for glazing below grade where the greenhouse is buried.

Double-Wall Systems

- Double-wall systems are more expensive but provide additional insulation and reduce heat loss.

Retractable Roofing/Window Covers

- In some cases, northern greenhouses may have a retractable cover for the windows. The cover can be used to minimize heat losses over night or on particularly cold days. Systems can be manual and hands-on, with covers that are manually attached, or mechanically automated.

Backup Heating Systems

- Back-up heating in the form of electric or diesel space heaters serve as failsafe heating during extreme cold or geothermal outages. It is important that the back-up system is properly set up to minimize extreme temperature fluctuations in the event of a power outage during a winter peak.

Thermal Storage

- Thermal storage refers to materials that passively regulate the temperature of the greenhouse by storing heat during warm periods and releasing stored heat during cold periods. Thermal storage can range in complexity and duration, from simple solutions such as water containers which absorb heat during the day and release heat at night, to complex systems that require active heating and automation.

4. Crop Selection & Greenhouse Sizing

A general sizing guideline is that a 96'x30' greenhouse growing a variety of crops provides approximately 25,293 servings of food, about 8 servings of vegetables for 9 people, for every day of the year.

Crop types will influence greenhouse height, energy needs and structural design. Tomatoes and vines will require the greenhouse to be at least 3m tall. Some crops, such as tomatoes and eggplants, will require greater indoor temperatures than others. If crops requiring warmer temperatures are going to be grown, a geothermal air ducting system can be used to keep one corner of the greenhouse several degrees warmer.

Crops grown during the winter months should be hardy, and capable of withstanding some temperature fluctuations. Generally, commercial greenhouses employ a seasonal optimization of crops, to keep greenhouse temperatures as low as possible and save energy.

5. Water and Energy Requirements

Depending on the size of the greenhouse, and the type of geothermal system used, electricity can be a significant operational cost. Electricity is required for lighting, temperature regulation, irrigation systems and ground-source heat pumps.

Supplying water for a large greenhouse can be a significant operational expense too. Transportation, pumping and storage of water all need to be considered.

Conclusions

Geothermal greenhouses are a proven technology with demonstrated success in northern climates. However, there are many considerations that will need to be careful thought out to ensure the greenhouse is built with the environment and needs of its community in mind. The considerations listed above are intended to provide a quick primer geothermal greenhouse design in northern regions and to serve as discussion prompts for NCC staff, residents and other stakeholders.

Contact Us: koxford@nunatukavut.ca

+1 709 702 7829

200 Kelland Drive Happy Valley-Goose Bay, NL A0P 1C0

www.nunatukavut.ca

Contact Us: JCollier@netzeroatlantic.ca

+1 902 406 7015

1209 Marginal Road,
Halifax, NS B3H 4P8

netzeroatlantic.ca