Vandalia Geothermal June Public Event

Community Infrastructure & Future Planning

Vandalia - Community Geothermal

City-Led Initiative

This study was officially awarded to the City of Vandalia by the State of Illinois and the Illinois Finance Authority (IFA).

Reduced Energy Costs

The explicit goal is build a resilient energy infrastructure and lower monthly heating and cooling bills for the local residents and businesses connected to the network loop.

Practical Feasibility Study

Exploring localized utility infrastructure options to keep our community's energy dollars right here in town.

Your Choice

No mandates or requirements. This study is built entirely on community interest, local voices, and transparent data.

The Feasibility Phase: Moving Forward

Securing practical, reliable utility savings for the City of Vandalia.

Community Interest

Non-Binding Letters of Interest (LOIs) from local property owners provide the necessary foundation. Your written interest establishes the baseline demand required to make the project bankable for construction funding.

Site Testing & Engineering

Field teams will execute a local test borehole to map subsurface thermal behavior. The engineering team will design the system and layout, calculate optimal loop depths, and conduct utility and thermal load reviews to ensure complete network reliability.

Financial Modeling

We are running rigorous 20-year financial pro formas to ensure long-term utility asset stability, cost transparency, and maximum return on investment for connected participants.

Thermal Energy Networks

Types of Geothermal

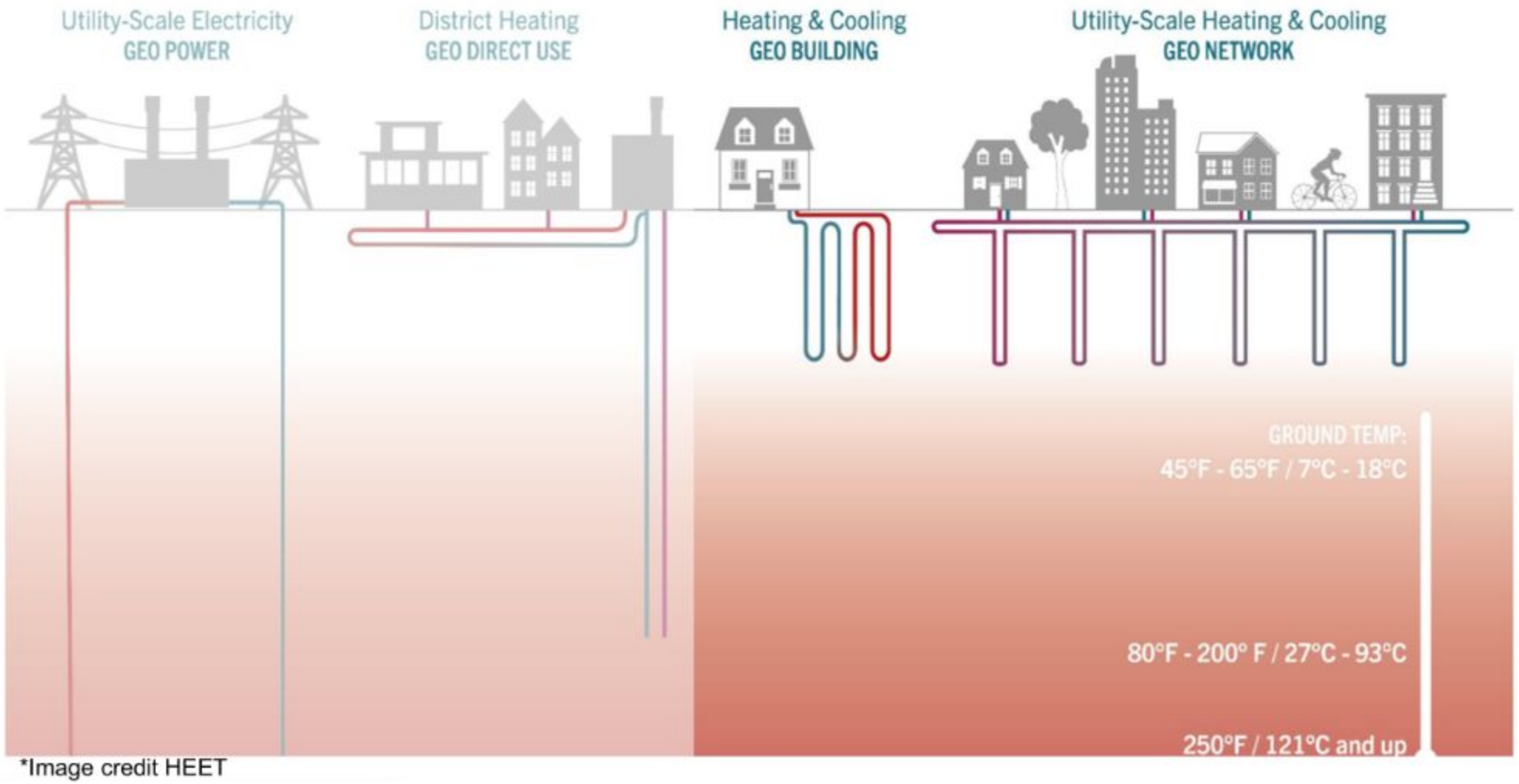


*Image credit HEET

Networked Geothermal (TENS) Overview

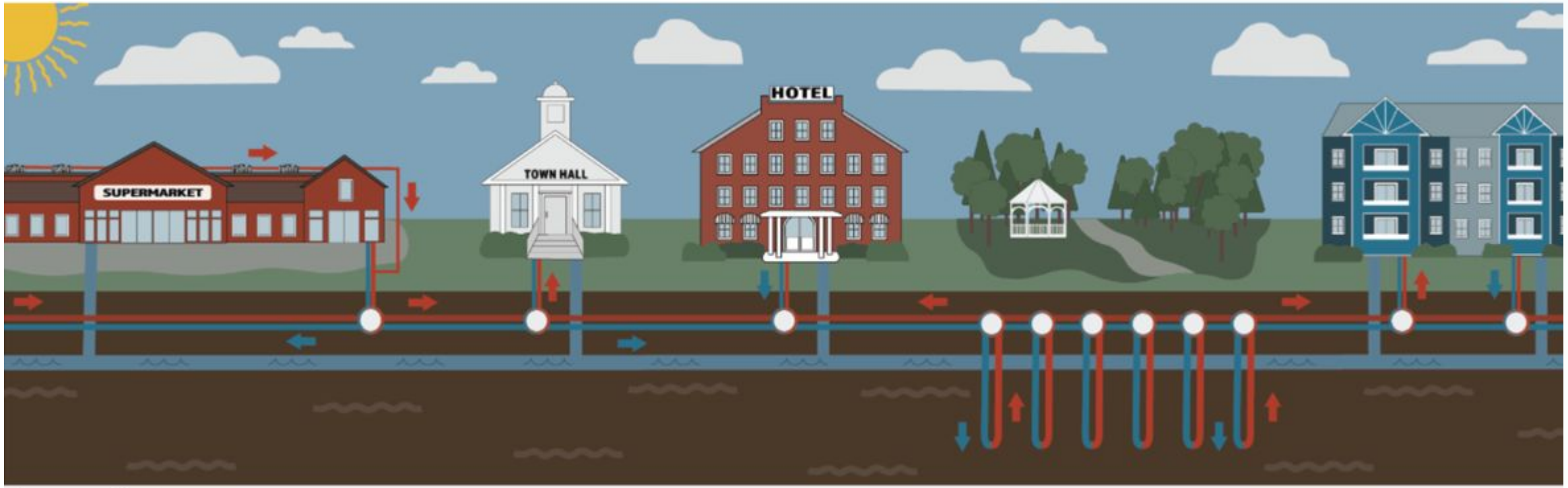
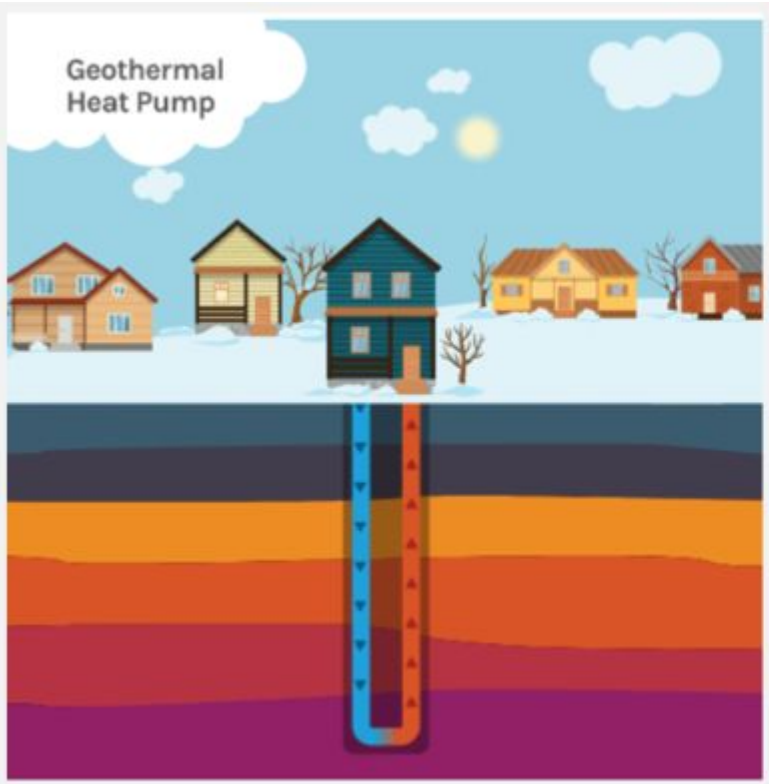


*Image credit vctn.org

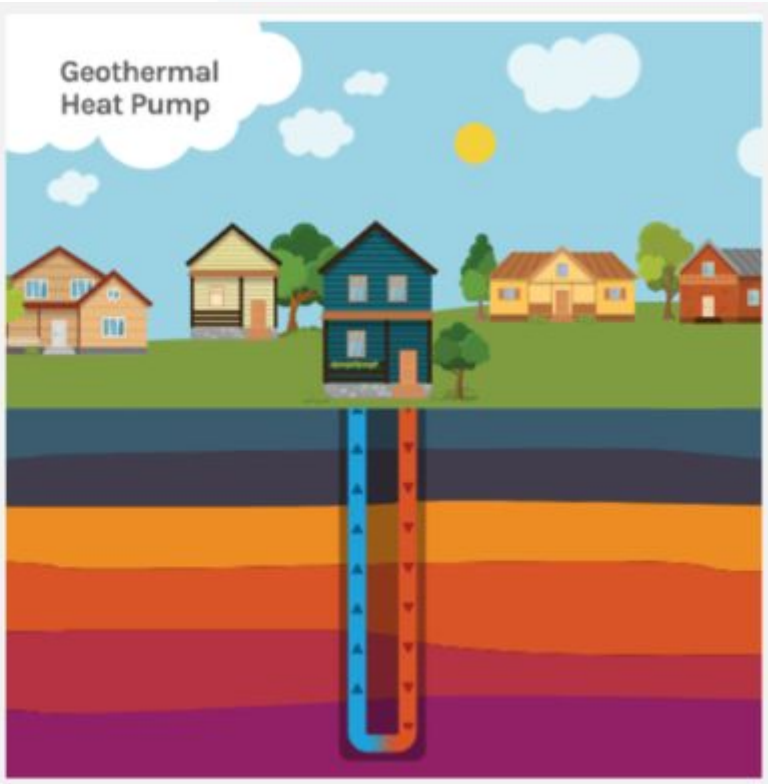
- **What Is It?** Shared system of buried piping to move thermal energy around a community
- **Why Is It Useful?** Allows for simultaneous heating and cooling loads on the system
- **How Does It Work?** High efficiency heat pumps leverage the near constant underground temperature

Heat Pumps 101

- **How Do They Work?** Heat pumps are electrically driven and move thermal energy from one place to another
- **How Do They Operate?** They are extremely efficient within the range of approx. 40-70 deg F
- **GSHPs vs. ASHPs:** Ground source heat pumps generally operate within this range. Air source heat pumps are exposed to external conditions, so may operate outside the ideal range



*Source: DOE GTO Website

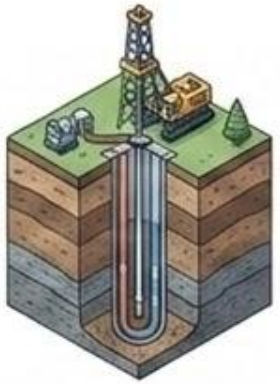


Example System Layout

- Ongoing Pilot Loop
- 1-mile single pipe system
- Support approximately 140 customers
- 36 connected buildings
- Main borefield with 2x satellite borefields
- Main temperature should stay within about 2 deg F (1 deg C) throughout the loop
- Peak load of 375 tons (~1,300 kW)

System Construction

THERMAL SOURCE



1. Heat Exchanger Installation

2. Laterals and Headers

3. Thermal Source Pumps

HORIZONTAL LOOP

1. Main Installation

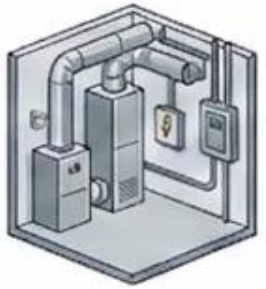
2. Service Installations

3. Pump Center and Controls

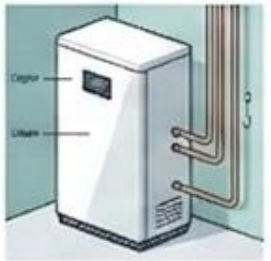
CUSTOMER INSTALLATIONS

1. Weatherization

2. Ducting and Electrical



3. Heat Pump Installation



PHASE ONE: FIELD INVESTIGATIONS

Testing the Subsurface

The success of the system depends on the thermal conductivity of Vandalia local geology.

- **Drilling Operations:** Execution of a ~300’ test borehole to sample soil and rock.
- **Thermal Response Test (TRT):** Measuring how quickly heat moves into and out of the ground.
- **Design Accuracy:** Testing ensures we don't "over-engineer" or "under-engineer" the system, keeping costs low.

LOCAL ENERGY INDEPENDENCE

Economic Retention

Energy dollars currently leave our community to national providers. Geothermal keeps those dollars circulating in Vandalia’s local utility framework.

Price Stability

Natural gas and electricity prices are volatile. The earth's temperature is constant, providing predictable utility rates for decades.

Infrastructure Modernization

Updating Vandalia's utility grid with 50+ year assets that improve property values and institutional resilience.

Long-Term Reliability

Utilizing constant ground temperatures creates a stable, weatherproof utility baseline. This reduces home equipment wear and removes vulnerability to outside supply shortages.

FUNDING & PARTNERSHIPS

Illinois Finance Authority

Awarded planning grants through the Illinois Climate Bank to accelerate deployment of shared energy models.

Inflation Reduction Act

Leveraging massive federal tax credits (up to 30-50%) to make construction significantly more affordable for the city.

Assessing Local Ownership Models

Evaluating local frameworks such as municipally owned or a community cooperative model to ensure the city maintains control over rates, operations, and long-term infrastructure choices.

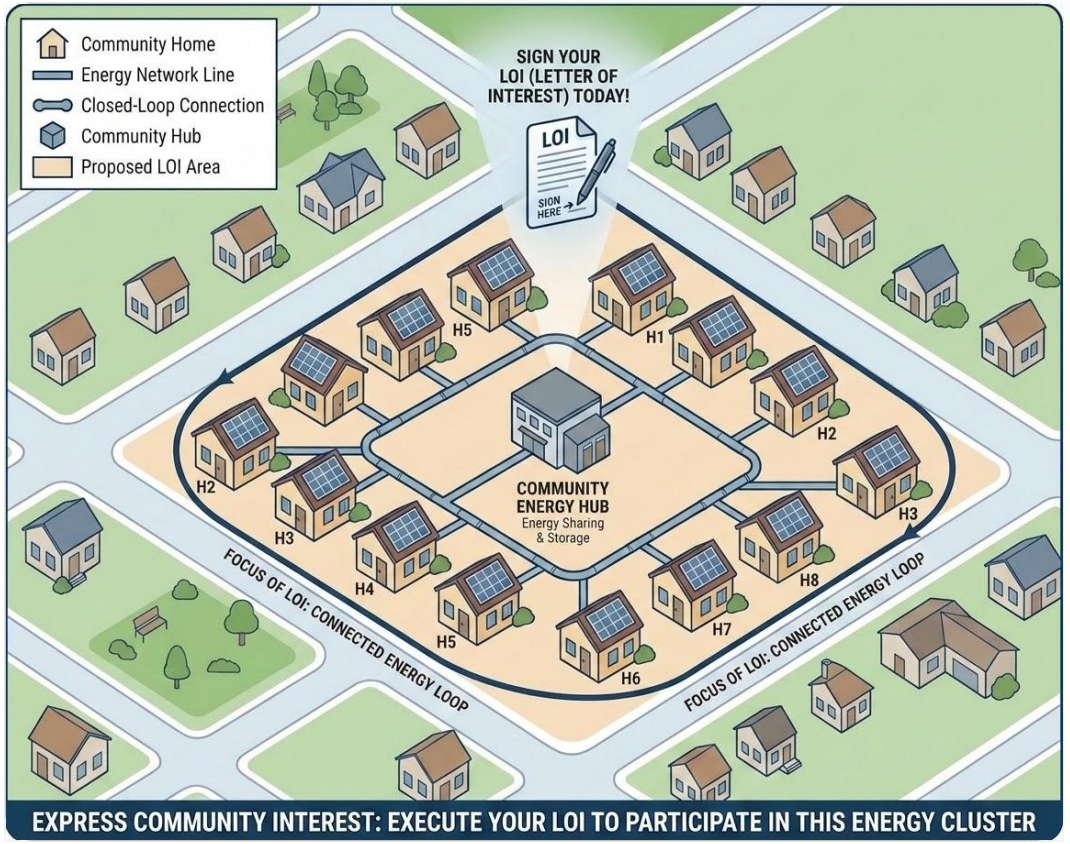
This project is a high-priority model for the State of Illinois.

COMMUNITY BANKABILITY

Why Letters of Interest Matter

A Letter of Interest (LOI) is a non-binding signal that you want to explore connecting to the network.

- **Evidence of Demand:** Funding agencies require proof that the community will use the system.
- **Sizing the Loop:** We design the pipes based on the number of LOIs we receive.
- **No Financial Obligation:** An LOI does not sign you into a contract; it simply keeps your property in the plan.



DISCUSSION & QUESTIONS

Let's hear from you.

Moderated by: Mayor Doug Knebel

Technical Panel: Project Team

Goal: Ensuring every voice in Vandalia is heard.

JOIN THE FUTURE

Visit the Website

VandaliaGeothermal.com

Submit your LOI

Available Here Today, City Hall, or Online

Thank you for your commitment to Vandalia.

Meeting Location: Kaskaskia College-Vandalia Campus