

Frequently Asked Questions



Project background

What is the Ulbrich Heights Community Geothermal Project?

This is a federally funded project to explore design options for high-efficiency, environmentally beneficial heating and cooling systems for Ulbrich Heights – a State Sponsored Housing Portfolio complex owned and managed by the Wallingford Housing Authority in Wallingford, Connecticut. The Connecticut Department of Energy and Environmental Protection (DEEP), in partnership with the University of Connecticut (UConn), Wallingford Housing Authority (WHA), Wallingford Electric Division, and Northeast Energy Efficiency Partnerships (NEEP), won an award from the U.S. Department of Energy (DOE) to conduct community engagement, design a networked geothermal heating and cooling system for the Ulbrich Heights campus, and complete a geothermal workforce needs assessment for Connecticut.

Why geothermal?

Geothermal systems provide an innovative approach to heating and cooling residential buildings more efficiently, more cleanly, and more affordably. The technology can also reduce greenhouse gas emissions and improve air quality for residents..

How was Ulbrich Heights selected?

The Project Team worked with the Connecticut Department of Housing and the Connecticut Housing Finance Authority to identify suitable affordable-housing projects. The Project Team looked at which of these projects fall in Justice40 Tracts, Connecticut Tribal Reservations, U.S. Department of Housing and Urban Development Qualified Census Tracts, and Community Development Block Grant Areas. Ulbrich Heights was the most suitable candidate because it is located in an Environmental Justice Block Group, is actively seeking

to undertake capital and energy improvements, and has ample space for drilling geothermal boreholes.

What are the goals of this project?

The primary objective is to design a technically and economically feasible low-temperature, shallow geothermal heating and cooling system that will serve at least 50% of Ulbrich Heights' heating and cooling load. Other goals of the project are to develop a statewide geothermal workforce plan for Connecticut and share lessons learned and geothermal technology benefits to promote geothermal adoption across Connecticut, especially in affordable-housing developments.

How long will the project run?

Phase 1 of the project, encompassing system design, runs until September 2024. Phase 2, which is contingent on competitive grant funding from the U.S. Department of Energy, would encompass installation of the community geothermal system. If funded, Phase 2 would begin shortly after the end of Phase 1 and run until construction of the geothermal system is complete (approximately 30 months). A Phase 2 award is not guaranteed and will be a highly competitive down-selection process.

Who is overseeing this project?

The project is led by the Department of Energy and Environmental Protection in partnership with the University of Connecticut, Wallingford Housing Authority, Wallingford Electric Division, and Northeast Energy Efficiency Partnerships.

The project is supported by a Project Advisory Committee consisting of representatives of the Connecticut Office of Workforce Strategy, the Connecticut Office of Environmental Justice, Eversource Energy, the Connecticut Housing Finance Authority, the Connecticut Department of Housing, Eversource, Connecticut Office of Legal, Planning, and Regulatory Affairs, Connecticut Office of Climate Planning, Oak Ridge National Laboratory, Emergent Urban Concepts, Meriden Housing Authority, Connecticut Department of Public Health, and Wallingford residents.

How can I become involved in the project?

The project team invites comments on documents that will be posted on [the project's web page](#). The team also would like to hear from organizations and individuals interested in joining the Project Advisory Committee.

To learn more, contact the team at ulbrichgeothermal@neep.org.



Geothermal heating and cooling

What is geothermal heating and cooling?

Geothermal heating and cooling use the consistent temperature of the Earth at shallow depths – from 5 feet to 500 feet below the surface – for heating and cooling space or water in buildings. The system extracts heat from the ground in winter and pumps heat back into the ground in summer, using mechanical devices called heat pumps to move heat into and out of residential units. In the northeast United States, the temperature 5 feet underground remains about 55° F year-round.

What is a geothermal heat pump system?

Geothermal heat pumps (also sometimes called ground-source heat pumps) are extremely efficient heating and cooling systems that use the ground itself as a thermal resource. A “geo exchange” system circulates a fluid through pipes to harvest heat from underground in the winter and deposit heat underground in summer. Mechanical systems called heat pumps connect single buildings or groups of buildings to this underground network of pipes. Geothermal systems are much more efficient than heating with oil or gas and cooling with AC. They provide significant energy and cost savings over time.

What is community/networked/district geothermal?

Community geothermal is different from typical geothermal systems that serve only one home or commercial building. Community geothermal, also called networked or district geothermal, heats and cools multiple buildings through a single distribution network, creating even greater energy efficiency. In a networked geothermal system, underground pipes typically are in vertical wells rather than in horizontal loops near the surface.

What fluids or chemicals are pumped through geothermal pipes?

In most geothermal systems, the circulating fluid that is warmed/cooled by the ground is self-contained within pipes and includes a mixture of water and glycol. This freeze-resistant fluid is environmentally friendly and non-toxic.

What are the benefits of geothermal?

Residential heating with gas and oil is the second-largest source of greenhouse gas emissions in Connecticut. Inefficient air conditioning also contributes to high energy costs and emissions by consuming larger than necessary amounts of electricity. Geothermal heating and cooling systems – with their high efficiency and their use of the ground itself as thermal resource – dramatically reduce overall emissions and can lower energy bills. This technology also can help improve air quality for residents. The Ulrich Heights project promises a replicable model to convert fossil fuel-based systems in multi-family affordable housing properties across the state.



Project logistics

Is this project definitely going to bring geothermal to Ulrich Heights?

The project is in the design phase, which will be completed in 2024. Installation of a community geothermal heating and cooling is not guaranteed at this time and is contingent on Phase 2 (project implementation) funding from the U.S. Department of Energy. If the project does not receive Phase 2 funding, the project team will search for alternative funding to support installation.

When would geothermal arrive at Ulrich Heights?

If the project receives Phase 2 funding, installation could occur as early as 2025.

Which Ulrich units would get geothermal heating and cooling?

The project team hopes to provide geothermal heating and cooling to all residential units, but initially the project may be able to cover only half of the units – those nearest the area serving as the project’s borehole field.

How will I know if my unit would get geothermal heating and cooling?

Specific units will be determined during Phase 1 (design) in 2024. Final designs will be shared on the [project web page](#) in late summer 2024.

What is a test borehole and why is it needed?

Drilling of a test borehole to support system design is planned for early 2024. The purpose of this borehole is to assess the thermal properties of the ground beneath Ulbrich Heights. Findings from the test borehole will help inform the design of the community geothermal heating and cooling system.

What will the test borehole look like?

The test borehole will be 4.5-6" in diameter and will be capped once testing is complete. One option for capping is a permanent steel cap. Topsoil and grass will be added so the cap is not visible.

Where will the test borehole be drilled?

The location is not yet finalized. Stay tuned for more details as the project progresses.

Where would the borehole field be located?

If the project proceeds to Phase 2 (implementation), numerous boreholes will be needed. The Project Team is looking at using the grassy area between Louis Circle and Wharton Brook Drive for the borehole field. The exact location of this borehole field will be determined as the project design is completed. Stay tuned for more details as the project progresses.

How many wells would be drilled?

A preliminary estimate for the geothermal system suggests approximately 100 borewells would be needed. A final number will be determined as the project design is completed. Stay tuned for more details.

How deep would the wells be?

A preliminary estimate suggests wells would need to be 350-400 feet deep. The precise depth will be determined as the project design is completed. Stay tuned for more details.



Resident impacts

What are the benefits to tenants of using a geothermal system?

Lower long-term costs – While geothermal systems have higher upfront costs than many other heating and cooling systems, their high efficiency and long lifespans can mean significant savings in the long run. They also usually require less frequent maintenance.

Longevity – Geothermal systems last a long time: indoor equipment can last around 25 years, and ground loops can last 50 years or more.

Better for climate and air quality – Fossil fuel heating systems harm the climate and pollute the indoor and outdoor air, effects that geothermal systems eliminate.

Price stability – Because geothermal systems provide heating and cooling using electricity and ground temperature, residents' energy bills are not dependent on the volatile price of oil or gas.

What are the risks of using a geothermal system?

As with a traditional heating and cooling system, if the power goes out, geothermal systems will not operate.

As with other buried utilities, there is always a risk of the system being damaged by digging or construction activities.

As with a traditional system, equipment may need to be maintained and serviced. This could include maintenance and adjustment of the glycol fluid in the underground pipe.

Will the test borehole drilling affect Ulbrich Heights residents?

There should be very little or no impact. A drilling rig will be on site for about a week. Drilling noise should be slight, and the hole will only be 4.5-6" in diameter. The hole will be capped once testing is completed.

Would a geothermal installation cost me anything?

No. Funding for installation of geothermal would come from the federal government, state, or other sources.

Would having geothermal affect my rent or electric bill?

The Wallingford Housing Authority does not intend or expect that a geothermal installation would affect tenants' rent. Tenants' electricity bills would increase while gas bills would decrease. Due to geothermal's extraordinary efficiency, the team does not expect the electricity bill increases to be higher than the previous combined costs of gas plus electricity.

Would geothermal require alteration of equipment within individual residences?

Heating and cooling equipment within individual residences would need to change. A simple, quiet fan-coil likely would replace both radiators and window AC equipment, providing both heating and cooling. The team is looking into the feasibility of replacing gas appliances such as water heaters and stoves with electric appliances to further reduce reliance on gas, improve indoor air quality, and increase energy efficiency. Stay tuned for updates.

What if I am hesitant about geothermal?

Contact the Project Advisory Committee to share your thoughts, opinions, and concerns. The project team is happy to address residents' concerns on the project. To learn more, contact the team at ulbrichgeothermal@neep.org.



More information

Where can I learn more about geothermal?

See the U.S. Department of Energy's [Geothermal Heat Pumps](#) page.

Where can I find more information on installing geothermal at my home, apartment complex, or business?

Take advantage of the free [Heat Pump Consultation service](#) at Energize CT and check out

[Energize CT](#) for incentives and financing options for installing geothermal.

The project team will publish a case study to help other affordable housing complexes consider geothermal.

What if my question is not answered here?

Contact the team by email at ulbrichgeothermal@neep.org or by phone at 781-860-9177, ext. 151. We'd love to hear from you!