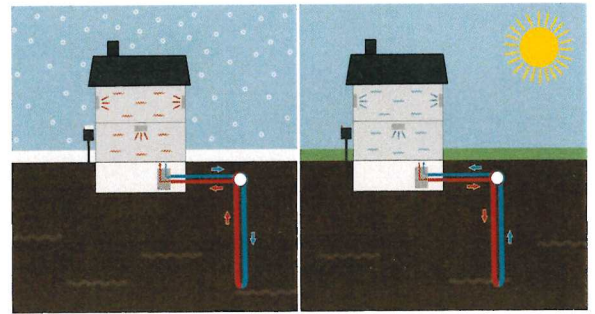


The Basics: Thermal Energy Networks

Community-based clean heating and cooling solutions

In Vermont, we have an opportunity to find and use our own clean heating and cooling.

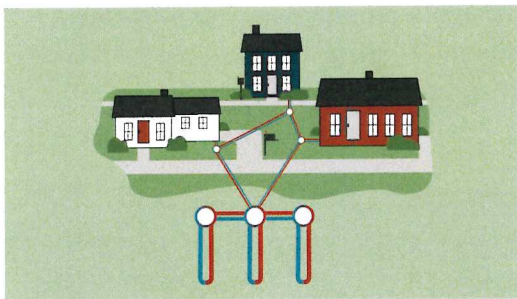
We don't have to rely on importing fuels from out of state or install air source heat pumps in every building. We can add geothermal and other kinds of Thermal Energy Networks to our mix of solutions and benefit many of our communities.



Ground source heat pumps can provide both heating and cooling.

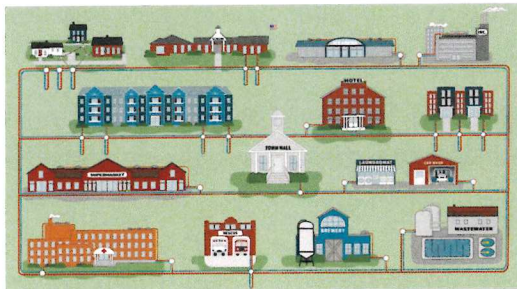
What is a Thermal Energy Network?

"Thermal Energy Network" is an umbrella term that can include networked geothermal and other systems that use water to capture, re-use, and share thermal energy between buildings.



Networked geothermal systems use water-filled pipes in closed loops underground to both heat and cool buildings in a neighborhood or town center. Network pipes are installed at the same depth as gas or water pipes and are connected to individual ground source heat pumps.

Thermal energy can be drawn out of the earth, returned to the ground for storage, and shared between buildings with different heating or cooling needs.



Thermal Energy Networks (TENs) can also capture existing waste heat from building ventilation or wastewater and put it to use to heat or cool buildings in the network.

The more neighborhoods and multi-use buildings that are linked to a shared system, the more affordable and efficient it gets.

TENs are working on college campuses and in communities such as [Berczy Glen](#) near Toronto, where 312 households are enjoying reliable, sustainable, local energy. One [Massachusetts](#) utility is installing networked geothermal to serve a neighborhood of 45 homes, schools, and a fire station. [New York](#) recently passed a law supported by utilities, unions, and environmental advocates that links these systems to quality jobs and kickstarts many new projects. Visit vctn.org/case-studies for more examples of what a TEN can look like.

In Vermont, we can build and benefit from our own clean heating and cooling systems that are:

- **Safe & clean:** With no oil or gas in the pipes, there's no risk of explosions or hazardous leaks, and no climate-damaging emissions.
- **Affordable & reliable:** Customer bills can be low and predictable year-round.
- **Healthy:** Nothing is burned inside, so indoor air is safer to breathe.
- **Flexible:** Systems are designed to fit many locations with minimal footprints.
- **Resilient & secure:** Durable, plastic pipes underground are protected from disruption.
- **Equitable:** As a community-scale solution, they can be available to everyone in a neighborhood, and fossil fuel workers can use skills they already have to install the networks.
- **Local:** We can build our own energy systems right in our communities.

Visit vctn.org to learn more



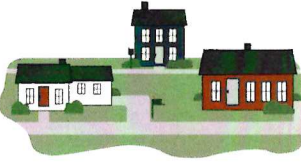
Benefits of Thermal Energy Networks

Thermal Energy Networks are:



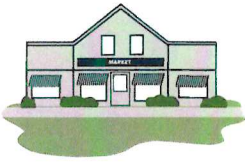
SAFE & CLEAN

With no oil or gas in the pipes, there's no risk of explosions or hazardous leaks. While emissions reductions vary from one project to another, many existing installations have been shown to reduce emissions by up to 90%.



AFFORDABLE & RELIABLE

Customer bills can be low and predictable year-round. Geothermal and other kinds of thermal energy are readily available locally and aren't subject to market changes, so rates for consumers on a network can be stable.



HEALTHY

Burning fuels—whether gas, oil, coal, or wood—creates air pollution that can cause and worsen respiratory and other health conditions. Thermal Energy Networks don't involve any combustion, so indoor and outdoor air is safer to breathe.



FLEXIBLE

Once installed, most of the infrastructure for a Thermal Energy Network is underground, so streets, parks, and natural areas remain unobstructed. As each network is designed for a unique location, systems can fit into Vermont's landscape, protecting sensitive ecosystems.



RESILIENT & SECURE

Durable plastic pipes underground are protected from disruption. Unlike above-ground fuel storage and outside compressors, Thermal Energy Networks are able to withstand extreme weather like storms and flooding.



EQUITABLE

Most people know geothermal energy as a single-home solution available to those who can afford the upfront cost. A Thermal Energy Network can be available to everyone in a neighborhood. Low and moderate income communities can be prioritized, and all can benefit from lower energy bills.



JUST

Side-by-side comparisons of job descriptions for fossil fuel and Thermal Energy Network installations show almost identical skills, so minimal retraining is required and jobs for this skilled labor are maintained. Pipefitters and gas workers are already constructing Thermal Energy Networks in other states.



LOCAL

We can build our own energy systems in our communities. Local businesses, residents, and municipalities can come together to plan and implement Thermal Energy Networks, growing local wealth by harnessing local resources.

Thermal Energy Networks provide an opportunity for us to build, own, and operate community-scale energy projects in Vermont.



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