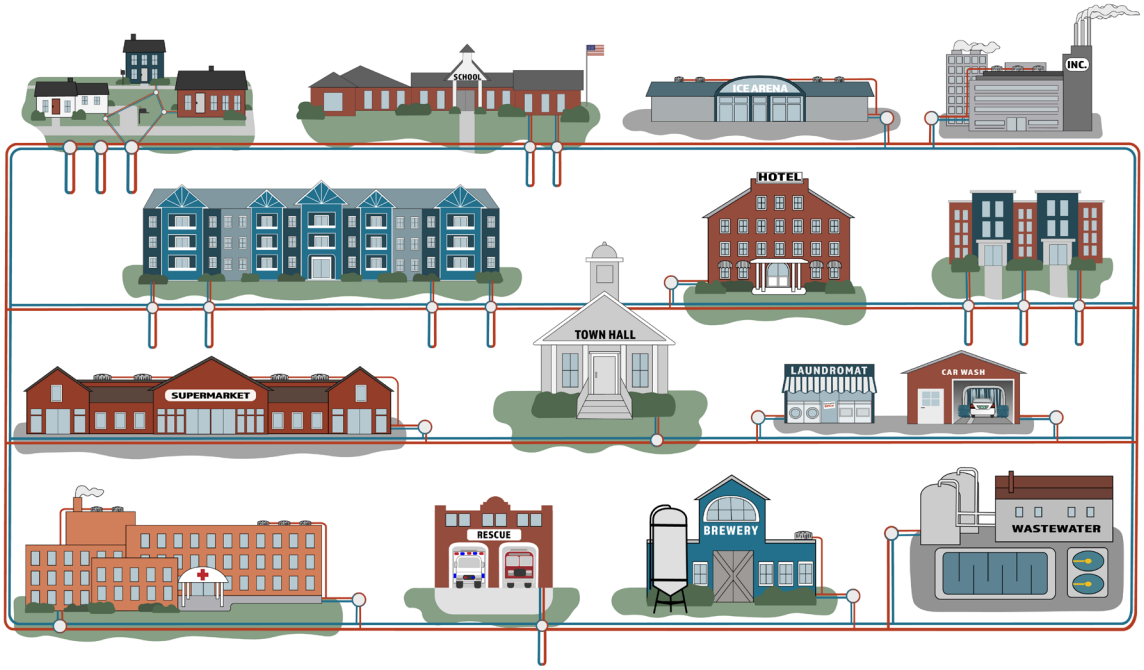
Getting Started with Thermal Energy Networks

A RESOURCE FOR TOWNS & COMMUNITIES



Thanks for your interest in geothermal and other kinds of Thermal Energy Networks for heating and cooling buildings in our communities.

These questions and actions can help you start exploring the possibilities in your city or town.

Some are already bringing people together to inventory resources, identify opportunities, and make a plan. Others are still learning about this clean energy solution and considering how they might use it locally.

We hope the information and suggestions here help you work with your community to consider how to add geothermal and/or Thermal Energy Networks to local clean energy initiatives.

This resource may be for you if:

- **You are a local energy commissioner or committee member.**
- **You are a resident or business owner and want to advance geothermal solutions or other Thermal Energy Networks in your city or town.**

You can use this resource to:

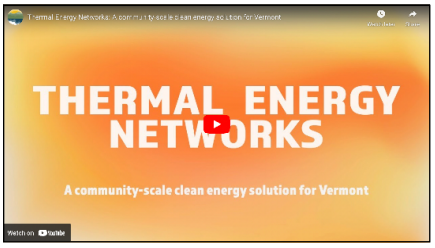
- **Explore local thermal energy needs and resources.**
- **Engage your community to consider what a project might look like.**
- **Get involved with clean energy efforts in your city or town.**

To access this resource online, please visit www.vctn.org/getting-started-resource.
If you're viewing this resource in print, all of the full URLs for the links included are listed on page 7.

Contents

Watch and share our short videos.

CLICK OR SCAN HERE



CLICK OR SCAN HERE

Share information with your community.

FACT SHEETS INCLUDED IN THIS RESOURCE:

- The case for geothermal and other Thermal Energy Networks in Vermont
- A list of the benefits these systems can bring to our communities

FIND MORE FACT SHEETS ONLINE

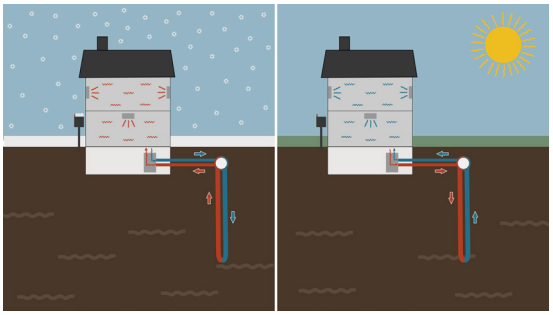
Find answers in our Frequently Asked Questions.

Networked Geothermal Systems & Thermal Energy Networks

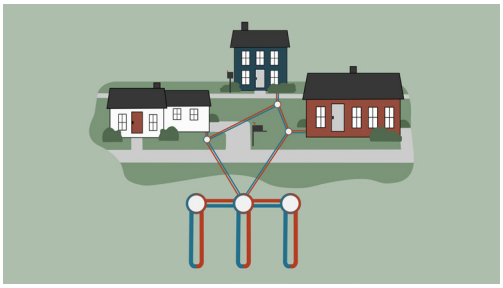
Community-based clean heating and cooling solutions

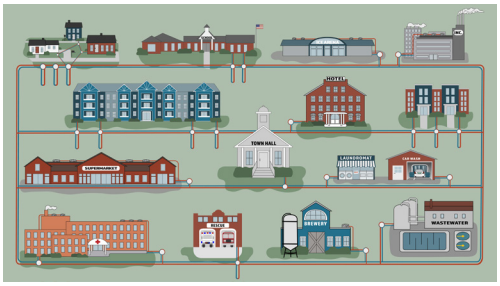
In Vermont, we have an opportunity to find and use our own clean heating and cooling.

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 provide both heating and cooling





Networked geothermal systems use water-filled pipes in closed loops under the ground 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 can also capture existing waste heat and put it to use to heat or cool buildings in the network. The more neighborhoods and multi-use buildings that are linked to the shared system, the more affordable and efficient it gets.

Thermal Energy Networks 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.

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

VERMONT COMMUNITY THERMAL NETWORKS

Geothermal and 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

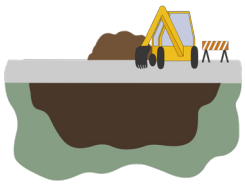
Once installed, most of the infrastructure for a Thermal Energy Network is underground, so streets, parks, and natural areas remain unobstructed. As each network is designed for a unique location, systems can fit into Vermont's landscape, protecting sensitive ecosystems.

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.

VERMONT COMMUNITY THERMAL NETWORKS

Visit vctn.org to learn more

Initial Questions & Actions

The questions below can help you learn about your community's existing thermal energy resources and how they could be linked with buildings in a network.

Each question has an accompanying action you can take to find out more. You can follow the order of these steps or create your own pathway.

Plus: we'll all make more progress when we share information and experiences across towns, so please also take a moment to fill out our interest form below.

1 Who can help gather information?

***ACTION*: GET PEOPLE TOGETHER**

Invite people from your community (a small group is good) to get together to review this resource, discuss possibilities, and identify first steps.

Include a range of perspectives if you can, from people working in clean energy or involved in city or town governance to business leaders or students. You can emphasize that expertise is appreciated but not required, as you can learn together.

2 Is your town already considering geothermal or Thermal Energy Networks?

***ACTION*: CHECK YOUR CITY OR TOWN PLAN**

See if your city or town plan includes geothermal or Thermal Energy Networks.

A city or town plan is a visionary document that is updated every 5 years to reflect your community's current priorities, goals, challenges, and assets. Each plan includes a section on energy and may already reference geothermal solutions or networked thermal systems. Including Thermal Energy Networks in your town plan makes it easier for state agencies to make grants and demonstrate compliance for federal and state clean energy standards and regulations.

We recommend that you read your city or town plan or speak with your local energy commissioner or committee to find out whether or not any of this language is already included in the plan. If not, you can ask for Thermal Energy Networks to be added.

Working with local leaders to bring an ask or proposal to your city council or town selectboard is the most direct path to implementing a Thermal Energy Network. You can start by offering your support to city or town staff, including energy commissioners and committee members, to gather the following information.

3 Who are the local leaders most likely to support a project?

***ACTION*: IDENTIFY SUPPORTERS**

Make a list of local leaders and businesses in your community who might:

Get involved as partners or advocates, such as:

- Local energy commissioners and committee members
- Municipal water & wastewater departments
- Industries that create waste heat or wastewater such as breweries

Provide services to support planning, installation, or maintenance, such as:

- Plumbers, electricians, drillers
- Regional or local planning committee members
- Legal experts

4 What thermal energy is already generated in your community?

***ACTION*: INVENTORY THERMAL ENERGY RESOURCES**

Make a list of existing thermal energy that's currently being wasted, for example:

- Grocery stores and large refrigeration centers
- Hockey/ice arenas
- Wastewater treatment facilities
- Data processing centers, including telecommunications facilities
- Breweries, distilleries, factories
- Land available for a geothermal borefield (open space or parking lot)

What buildings or neighborhoods are nearby (within about ¼ mile) that could use the heat?

5 Where does it make sense to start a Thermal Energy Network?

***ACTION*: INVENTORY BUILDING TYPES AND THERMAL NEEDS**

Make a list of the buildings in your city or town center or a local area with a variety of buildings. Look for:

- Different kinds or purposes of buildings
- Current heating/cooling systems and utility bills
- Need for weatherization and other upgrades

Is there a larger municipal building that could be a first project and foundation of a network?

6 Are plans underway or in early stages to improve infrastructure or add new developments?

***ACTION*: IDENTIFY UPCOMING PROJECTS**

Learn about new housing, wastewater system, and other kinds of development or infrastructure that might complement a community thermal network.

Consult local leaders:

- City council and supporting town bodies such as a planning commission or energy committee/coordinators
- Municipal staff such as planners, manager, or clerk
- Regional Planning Commission

Does your town have infrastructure plans in the works such as replacing water or wastewater pipes? Are new housing or mixed-use developments being planned?

What's Next?

After gathering this information, you likely have some good ideas for where a geothermal project or Thermal Energy Network could get started in your community.

Now it's time to dig deeper. Before a project can break ground, there's more to do to figure out how to finance a project, who will own the system, and who can manage the project from design to operations.

Some communities may be prepared to begin those next steps of a project, but many will need a more specific roadmap. In early 2024, we'll publish *How to Build a Thermal Energy Network*. This practical guide is being developed in consultation with and including contributions from the Thermal Energy Network Action Team supported by Energy Action Network.

To be notified when this toolkit is released, please contact us at info@vctn.org.

In the meantime, you can continue to share information with your community, fill out our interest form, and sign up for our Google Group to stay in the loop.

LINKS INCLUDED IN THIS RESOURCE:

Getting Started with Thermal Energy Networks Resource (online): www.vctn.org/getting-started-resource
Geothermal for VT Video: http://tiny.cc/geo-video
Thermal Energy Networks Video: http://tiny.cc/tens-video
VCGA Fact Sheets: https://www.vctn.org/fact-sheets
VCGA FAQ: https://www.vctn.org/faq
Toronto Networked Geothermal (page 3): https://mepgeo.com/projects/berczy-glen/
Massachusetts Networked Geothermal (page 3): https://www.eversource.com/content/residential/about/transmission-distribution/projects/massachusetts-projects/geothermal-pilot-project
New York Thermal Utilities and Jobs Act (page 3): https://www.nysenate.gov/legislation/bills/2021/S9422
Interest Form: https://forms.gle/fHRiYuLGTnZ8z1eBA
Thermal Energy Network Action Team: https://eanvt.org/network-action-teams/networked-geothermal/
Google Group Sign Up: https://www.vctn.org/join

VERMONT COMMUNITY GEOTHERMAL ALLIANCE

Advancing equitable, sustainable heating and cooling

Getting Started with Thermal Energy Networks: Form for Towns & Communities

The Vermont Community Geothermal Alliance is a nonprofit organization advancing geothermal and other kinds of Thermal Energy Networks as a clean, local heating and cooling strategy for communities across the state.

Replying to the questions below is an informal way for you to share your ideas and questions. We'll review your input to identify opportunities and address common challenges or needs. The information you share here is in no way binding or final, and you may edit your response at any time.

You can fill this form out by hand, scan, and send it to info@vctn.org. You can also complete this form online by scanning the QR code to the right or accessing https://forms.gle/fHRiYuLGTnZ8z1eBA

Email *

Your email

Your Name *

Your answer

Your Phone Number *

Your answer

Town or City *

Your answer

Please list any local leaders and others who are already interested in this idea: *

Your answer

Possible locations: Where can you imagine a geothermal or other thermal energy network in your community? *

Your answer

Are there any significant sources of thermal energy in your community, such as grocery stores, wastewater treatment facility, ice rink, etc.? *

Your answer

What benefits of geothermal or other thermal energy networks are most important to your community? Check all that apply. *(You can add more information in the next answer space if necessary.)* *

- [ ] Lower energy costs for consumers
- [ ] Safe and reliable heating and cooling
- [ ] Community or not-for-profit ownership
- [ ] Small infrastructure footprint
- [ ] Job opportunities
- [ ] Reducing demand on electric grid
- [ ] Ending reliance on fossil fuels
- [ ] Other: _____

You can add more detail to your answers here, if you'd like:

Your answer

What potential barriers or challenges do you anticipate? *(You can add more information in the next answer space if necessary.)* *

- [ ] Public opinion
- [ ] Funding for implementation
- [ ] Town Plan/Regulatory roadblocks
- [ ] Organizing ownership and operation
- [ ] Disruption to town streets or public spaces during installation
- [ ] Other: _____

You can add more detail to your answers here, if you'd like:

Your answer

What questions do you have? *

Your answer

What do you need in order to move this project forward? *

Your answer

If you filled in your responses by hand, please scan and send it to info@vctn.org.

You can also fill the form out online by visiting https://forms.gle/fHRiYuLGTnZ8z1eBA **or scanning this QR code:**