Eversource's Networked Geothermal Pilot Update

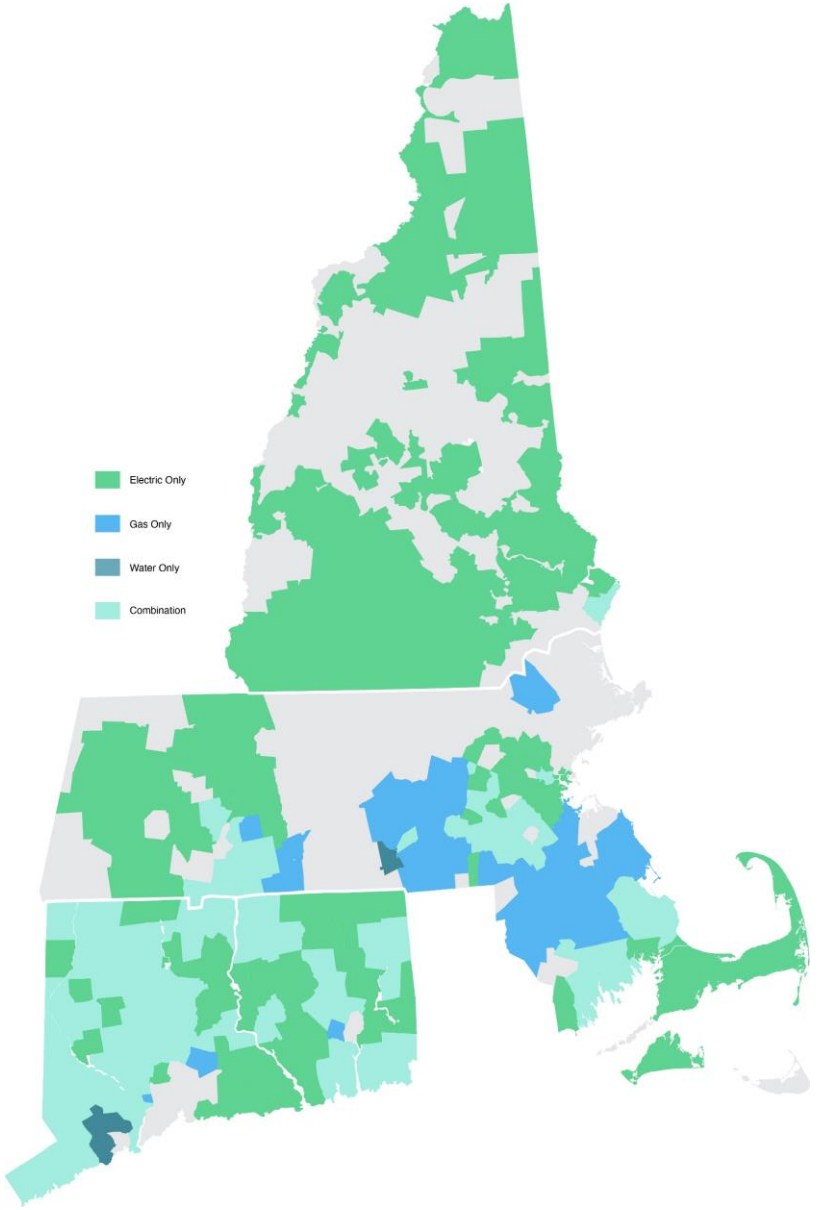
Speakers:

Construction Update:
Eric Bosworth / *Eversource Energy*
Customer Engagement:
Joel Rayberg / *Eversource Energy*

Overview

Eversource operates across three states and has been recognized by Barron's as the most sustainable energy company in the nation.

- Approximately 4.4 million total energy customers across the three states (Gas, Electric, and Water)
- Internally has aggressive decarbonization goals
- Working towards broader climate goals in each of the operating states



Project Background

- Initial pilot proposed in a 2020 gas rate case
- Massachusetts regulators approved a mixed-use project case with an approximate total load of 375 tons of heating / cooling
- Feasibility and site selection work took place to establish Framingham as host community
- Specific neighborhoods were identified with balanced loads that met the proposal requirements
- Detailed design work was performed to determine loads, pipe routing, and borefield requirements

Pilot Loop Overview

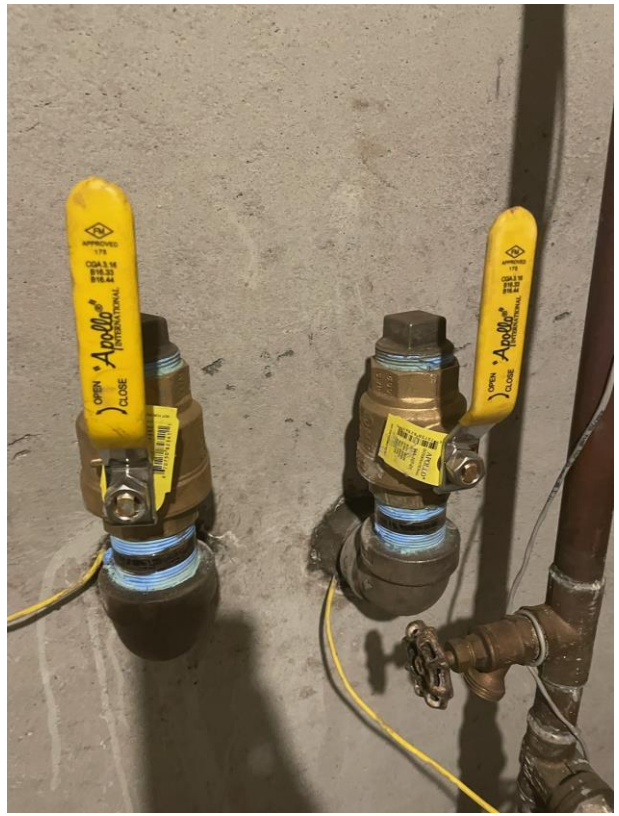
- Project work began in 2021 with site selection.
- Design work completed through 2022 and finalized in early 2023
- One pipe system design of approximately 1 mile of main
- 37 buildings with approximately 140 individual customers throughout
- 5 commercial customers including large school building
- 90 boreholes to provide capacity of approximately 375 tons of load

Main Installation

- Installation method similar to water or gas line work in the public right of way
- HDPE pipe was used for the distribution loop, fittings, and valves
- Entire loop was installed in roughly 5 months time
- Installation completed by traditional gas construction firm RH White

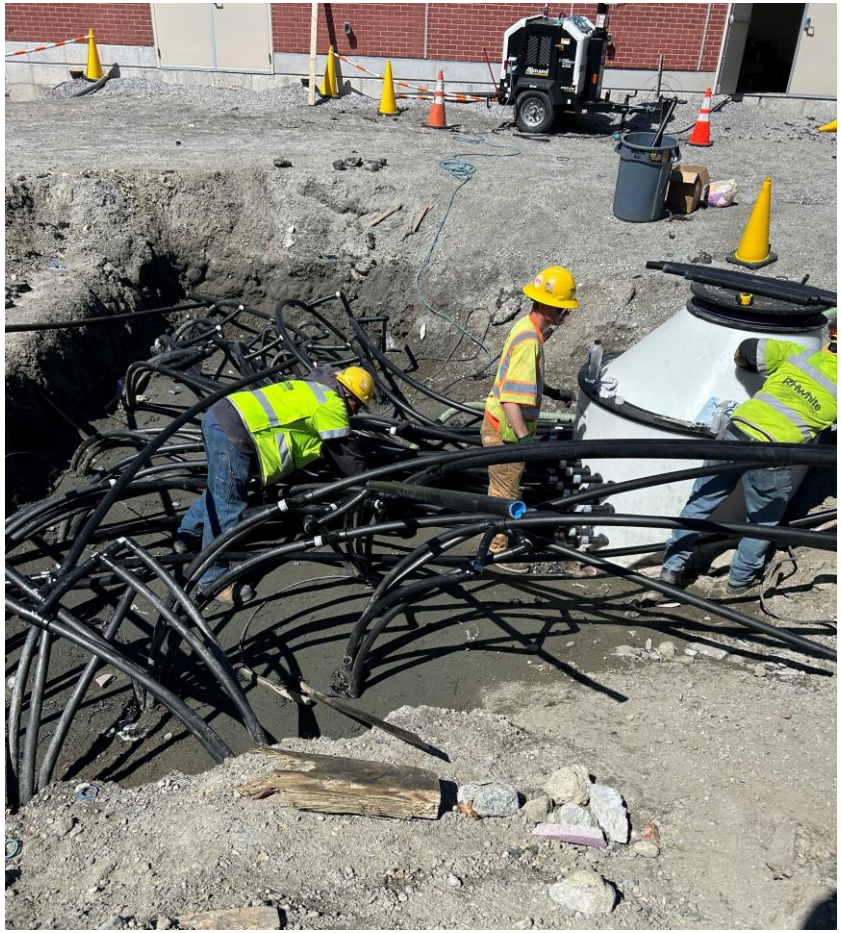
Service Installation

- Single trench with 2x lines (inlet and outlet)
- Two curb valves with bypass
- Interior isolation valves within the building



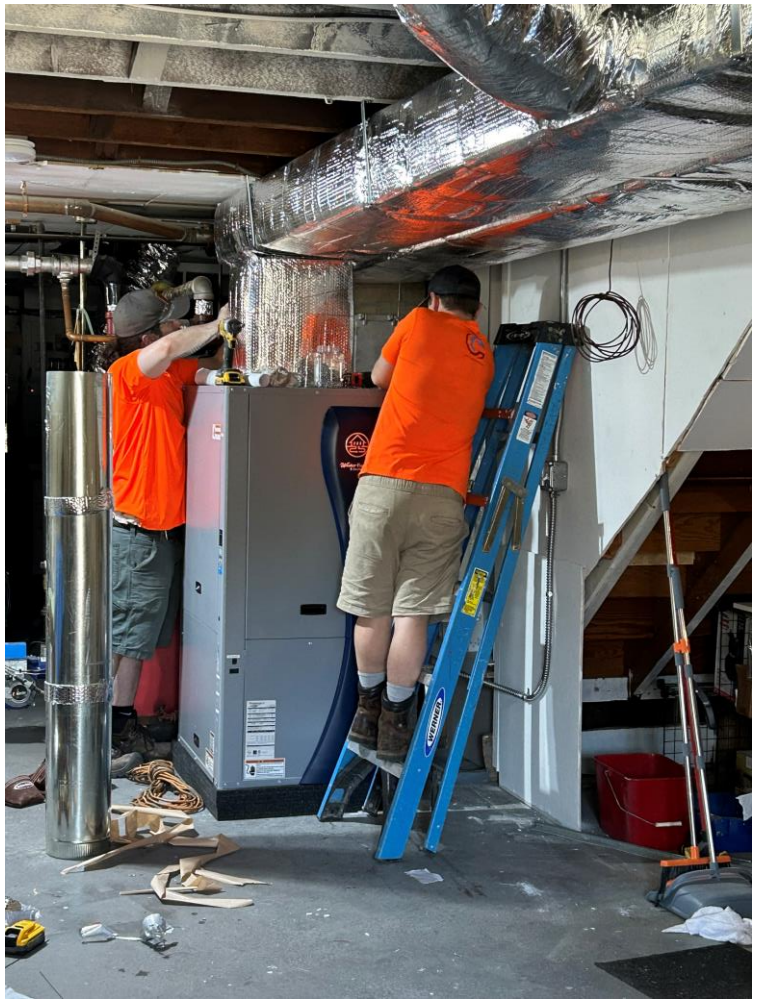
Borefield Drilling

- Total of 90 boreholes drilled across 3x sites
- Drilling took place from August 2023 to January 2024
- Water management and spoils removal were critical to drilling operations
- All borefields located under parking / paved areas



Building Conversions

- Building conversions were a challenging part of the project
- Each building was unique and required input from HVAC professionals
- Equipment varied from force air to VRF and large commercial units
- In some cases, internal air distribution system was re-used with GSHP to condition the space



Pump House

- Pump house installation took place in early 2024
- Pre-fabricated building with wiring, lights, HVAC included
- Mechanical work and equipment installation followed
- Instrumentation and monitoring equipment was the final step

Construction Lessons Learned

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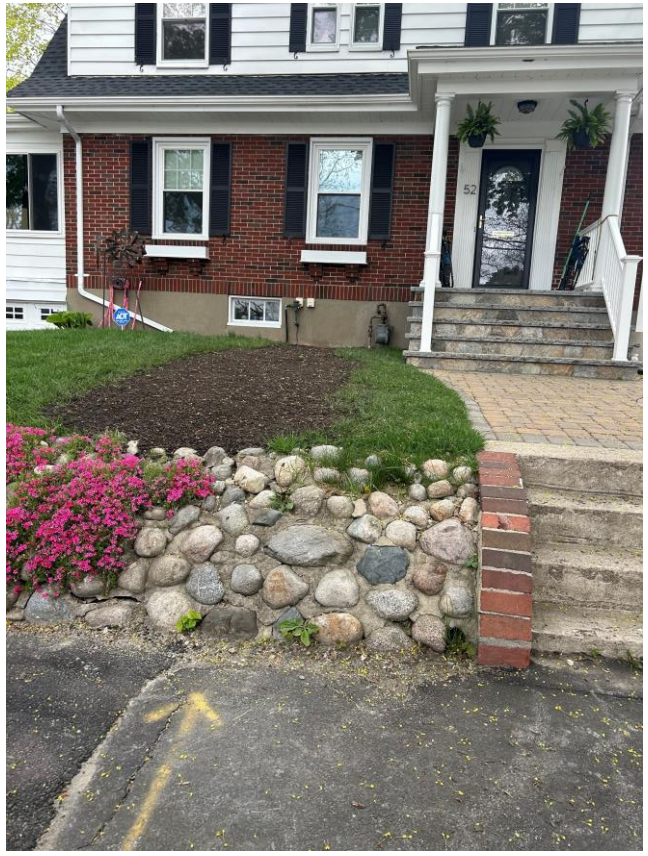
- Timeline Extension
- HVAC unit locations
- Unmarked utilities
- Equipment replacement
- Scheduling challenges
- Asbestos delays

Restoration Work

- Restoration similar to new gas installation
- Roads, sidewalks, and affected customer lawns were addressed by the construction team



Current Project Status

- Loop construction and drilling were completed in early 2024
- Pump house installation, instrumentation, and building conversions took place through the summer / early fall
- Pumps were turned on in June with loads on the system in early September
- Loop was flushed, cleaned, and pressure tested with the D.P.U observing the test
- Final conversions and data monitoring in October

Commissioning Lessons Learned

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Procedures and compliance

Valve position verification

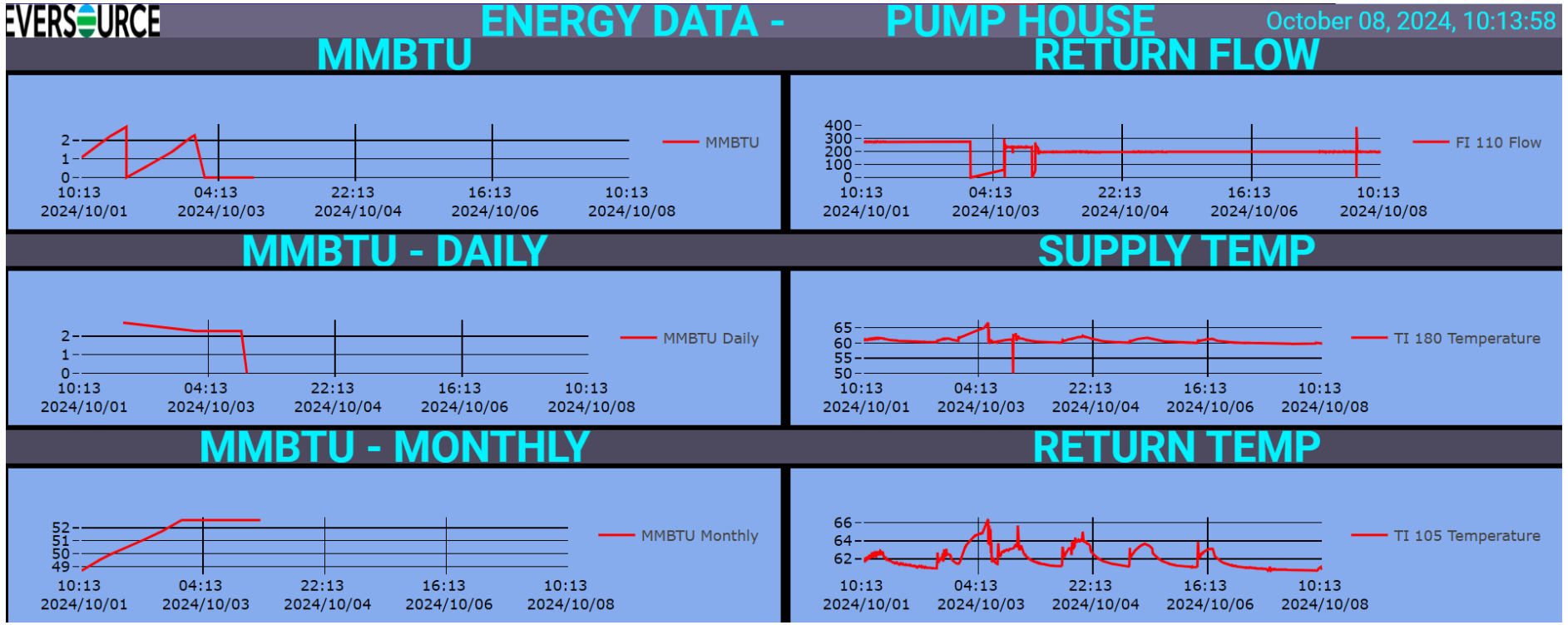
Loop flushing and purging

Troubleshooting loop vs HVAC

Temporary space conditioning

Operations and Data Collection

- Pilot run length is planned for 2x heating and 2x cooling seasons
- Backup heat and cooling will be available for the loop (electric boiler and dry cooler)
- Data will be gathered on costs to operate as well as frequency of maintenance events
- Pilot operation will be an opportunity to train internal workforce on unique aspects of geothermal and identify crossover skills



What Does Success Look Like?

Success Factors	Data Points to Collect
Validated installation and operating costs	• System installation costs • Ongoing O&M costs
Customer acceptance of technology	• Customer Satisfaction surveys • Customer comfort
Environmental Benefits	• Emission reductions • System efficiency
Technology performance	• System performance • Changes in customer energy consumption
Cost savings	• Changes in customer heating and cooling costs

Customer Engagement

Eversource Networked Geothermal.
Sustainable from the ground up.

Overview of Customer Outreach

- Canvassing
- Home Visits
- Presenting Financials/In-Home Calculator
- Dedicated Geothermal Community Partner
- Project Management for Residential Customers
- Other Outreach Activities
- Keeping Customers Informed
- Lessons Learned
- Discussion – Q & A

Canvassing Materials

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- Developed targeted kit of canvassing materials
  - Letter from Eversource
  - Letter of support from the City of Framingham, MA
  - Pilot Project Brochure
  - Project Overview (one-pager)
  - Installation Steps
  - Questions & Answers
  - Letter of Interest
  - Door Hanger

Canvassing – The Process

- Canvassing script developed
- All canvassers received extensive training
- PPE and ID available, along with letter of support from the city.

Note: The actual canvassing process took 1 ½ weeks with an 85% participation rate.

Canvassing Materials – Some Examples

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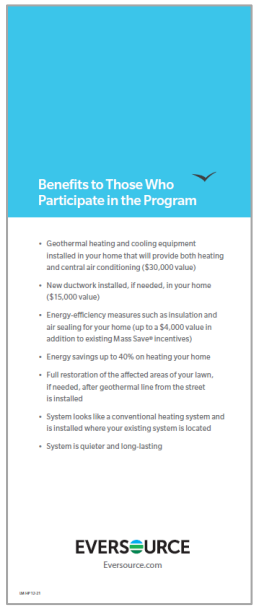
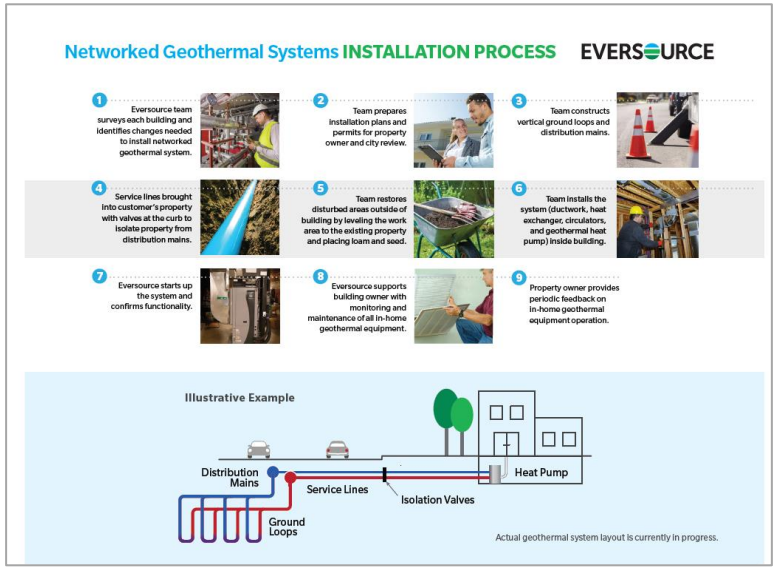
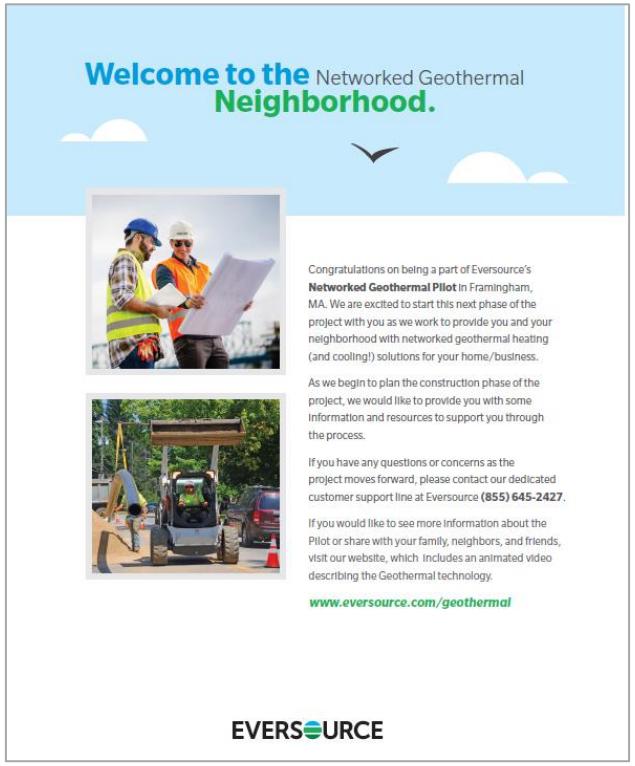




First In-Home Visit Materials

A customer leave-behind piece that provided a project overview including the proposed timeline, questions and answers, and what to expect during the construction of the project. A technical visit followed to prepare for the third visit



Welcome to the Networked Geothermal **Neighborhood.**

Congratulations on being a part of Eversource's **Networked Geothermal Pilot** in Framingham, MA. We are excited to start this next phase of the project with you as we work to provide you and your neighborhood with networked geothermal heating (and cooling!) solutions for your home/business.

As we begin to plan the construction phase of the project, we would like to provide you with some information and resources to support you through the process.

If you have any questions or concerns as the project moves forward, please contact our dedicated customer support line at Eversource **(855) 645-2427**.

If you would like to see more information about the Pilot or share with your family, neighbors, and friends, visit our website, which includes an animated video describing the Geothermal technology.

www.eversource.com/geothermal

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Our Commitments to You

Our company-wide procedure ensures a consistent and positive customer experience during the construction.

We call you in advance. You will receive a call from an Eversource representative before the installation of your geothermal service line to confirm the date of your appointment.

We respect your property. Since our work includes some digging or excavation, a member of our crew will review the installation plan prior to starting work.

We want to protect your property. Please inform the crew of any underground facilities such as sprinklers, septic systems, dog fences, private electric lines, etc. Eversource will not be responsible for repairing damages to underground facilities that we were not made aware of.

We work hard to minimize construction impacts. Whenever possible, Eversource uses a cost-effective, trenchless technique called "Low Dig," for installing service lines. This technology enables us to install piping without disrupting the surface of your property. But when ledge, rocky soil or other underground obstructions, prohibit the use of that process, it may be necessary to use conventional trenching equipment, such as a backhoe or small excavator.

We clean up after ourselves. After the service line has been installed, Eversource will remove any excavated material and the impacted work area will be raked and leveled with the existing property.

We restore the impacted area. Once our work is completed, Eversource will provide landscaping material, such as a one-time application of loam and seed. Watering the soil and planted seed, as well as any future maintenance of the area, will be your responsibility. The restoration work is weather-dependent, so if construction/installation work is done during the winter, we will wait until the spring to begin the restoration work.

We patch excavation areas. If your driveway is excavated in order to install the service line, Eversource will patch the affected area.

We follow your community's guidelines. Eversource will restore any openings made on public property based upon municipal guidelines. Please note that there may be a delay between temporary restoration and final restoration activities, such as road or sidewalk repair, to allow proper settling of the construction area.

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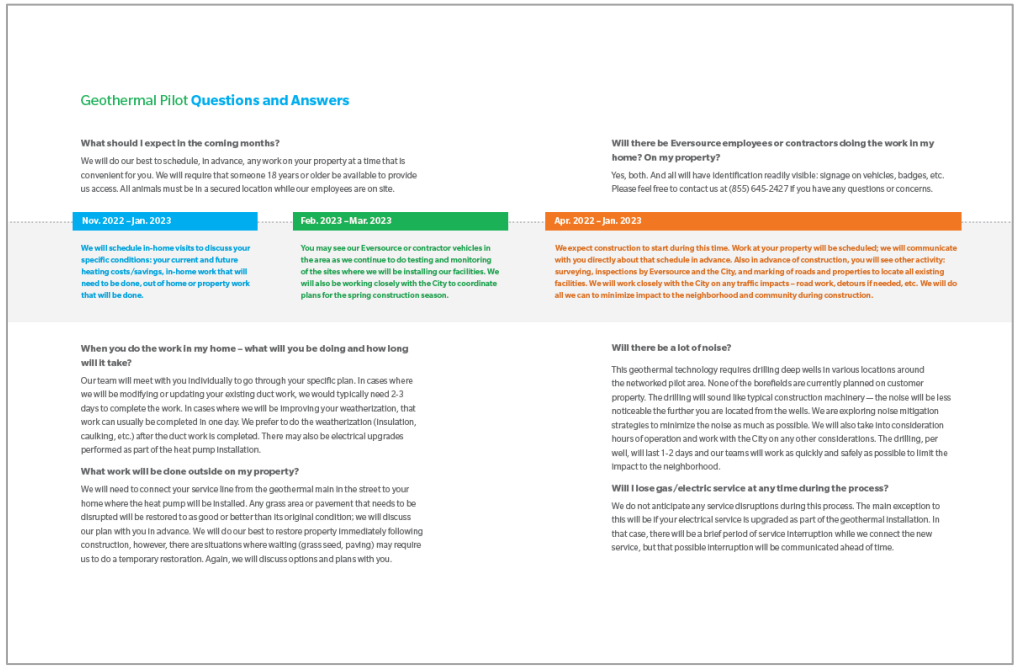

Geothermal Pilot Questions and Answers

What should I expect in the coming months?

We will do our best to schedule, in advance, any work on your property at a time that is convenient for you. We will require that someone 18 years or older be available to provide us access. All animals must be in a secured location while our employees are on site.

Will there be Eversource employees or contractors doing the work in my home? On my property?

Yes, both. And all will have identification readily visible: signage on vehicles, badges, etc. Please feel free to contact us at (855) 645-2427 if you have any questions or concerns.

Nov. 2022 – Jan. 2023

We will schedule in-home visits to discuss your specific conditions: your current and future heating costs /savings, in-home work that will need to be done, out of home or property work that will be done.

Feb. 2023 – Mar. 2023

You may see our Eversource or contractor vehicles in the area as we continue to do testing and monitoring of the sites where we will be installing our facilities. We will also be working closely with the City to coordinate plans for the spring construction season.

Apr. 2022 – Jan. 2023

We expect construction to start during this time. Work at your property will be scheduled; we will communicate with you directly about that schedule in advance. Also in advance of construction, you will see other activity: surveying, inspections by Eversource and the City, and marking of roads and properties to locate all existing facilities. We will work closely with the City on any traffic impacts – road work, detours if needed, etc. We will do all we can to minimize impact to the neighborhood and community during construction.

When you do the work in my home – what will you be doing and how long will it take?

Our team will meet with you individually to go through your specific plan. In cases where we will be modifying or updating your existing duct work, we would typically need 2-3 days to complete the work. In cases where we will be improving your weatherization, that work can usually be completed in one day. We prefer to do the weatherization (insulation, caulking, etc.) after the duct work is completed. There may also be electrical upgrades performed as part of the heat pump installation.

What work will be done outside on my property?

We will need to connect your service line from the geothermal main in the street to your home where the heat pump will be installed. Any grass area or pavement that needs to be disrupted will be restored to as good or better than its original condition; we will discuss our plan with you in advance. We will do our best to restore property immediately following construction, however, there are situations where waiting (grass seed, paving) may require us to do a temporary restoration. Again, we will discuss options and plans with you.

Will there be a lot of noise?

This geothermal technology requires drilling deep wells in various locations around the networked pilot area. None of the borefields are currently planned on customer property. The drilling will sound like typical construction machinery — the noise will be less noticeable the further you are located from the wells. We are exploring noise mitigation strategies to minimize the noise as much as possible. We will also take into consideration hours of operation and work with the City on any other considerations. The drilling, per well, will last 1-2 days and our teams will work as quickly and safely as possible to limit the impact to the neighborhood.

Will I lose gas/electric service at any time during the process?

We do not anticipate any service disruptions during this process. The main exception to this will be if your electrical service is upgraded as part of the geothermal installation. In that case, there will be a brief period of service interruption while we connect the new service, but that possible interruption will be communicated ahead of time.

Third In-Home Visit Materials

A comprehensive brochure that explained how geothermal technology works,
what to expect during construction of the project, and a pilot project map. A geothermal service agreement was signed on this visit.

Presenting the Numbers to Customers

In-Home Meeting

Explaining the cost difference

In-Home Calculator

- Previous energy costs compared to networked geothermal predicted costs reviewed with every customer
- Budget billing
- Every customer signed stating they understand the difference in cost for geothermal.

Third In-Home Visit Materials (cont'd)

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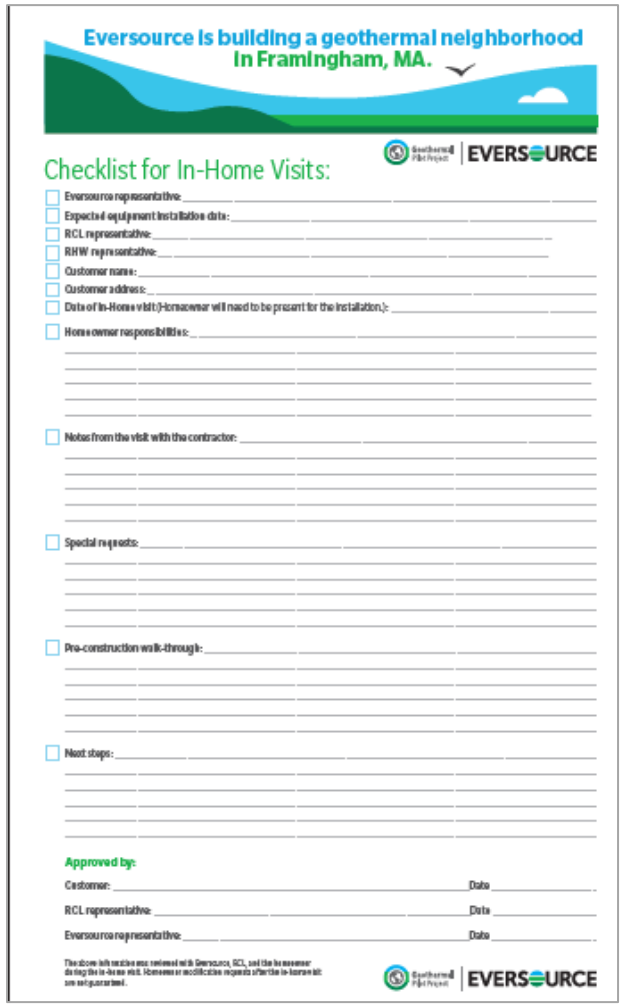

Eversource is building a geothermal neighborhood in Framingham, MA.

Checklist for In-Home Visits:

- Eversource representative: _____
- Expected equipment installation date: _____
- RCL representative: _____
- RHW representative: _____
- Customer name: _____
- Customer address: _____
- Date of In-Home visit (Homeowner will need to be present for the installation.): _____
- Homeowner responsibilities: _____
- Notes from the visit with the contractor: _____
- Special requests: _____
- Pre-construction walk-through: _____
- Next steps: _____

Approved by:

Customer: _____ Date _____

RCL representative: _____ Date _____

Eversource representative: _____ Date _____

The above information was reviewed with Eversource, RCL, and the homeowner during the in-home visit. Homeowner modification requests after the in-home visit are not guaranteed.

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Checklist and
Project Schedule

Schedule for the Geothermal Project

Completed.

- ☑ An in-home appointment that was scheduled by Eversource to determine eligibility and included a preliminary review to determine qualifications.
- ☑ You signed a Geothermal Service Agreement.
- ☑ An in-home technical visit was completed which included an in-depth feasibility review.

Next steps for the geothermal project.

Be sure that you have scheduled and completed your energy audit.

- Call Mass Save® at 866-527-SAVE, or visit eversource.com/home-energy-assessment.
- Insulation work should not be completed at this time. Wait until after your heating equipment is installed.

On-site walk-through with the contractor and your Geothermal Community Partner, Cindy Galvin.

- We will be contacting you shortly to schedule this visit which will include:
- Expected timing of installation of the underground supply/return service lines in your yard.
- The date(s) contractors will upgrade your home's electrical service (only certain locations).
- Manufacturer information on the new heating and cooling equipment for your home.
- A thorough checklist, will be completed at this meeting, documenting any special requests.

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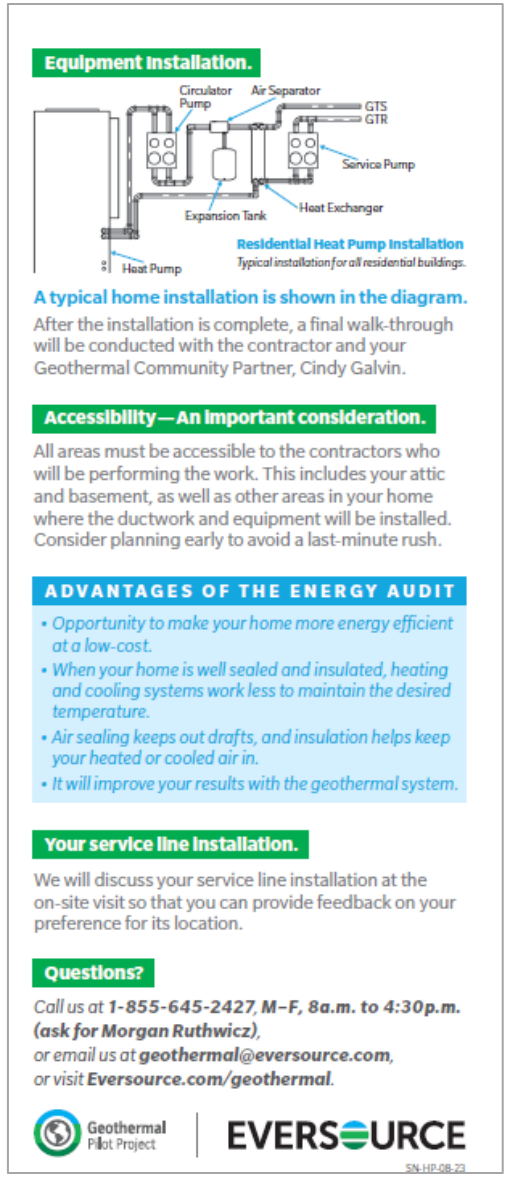

Equipment installation.

Residential Heat Pump Installation
Typical installation for all residential buildings.

A typical home installation is shown in the diagram.

After the installation is complete, a final walk-through will be conducted with the contractor and your Geothermal Community Partner, Cindy Galvin.

Accessibility—An important consideration.

All areas must be accessible to the contractors who will be performing the work. This includes your attic and basement, as well as other areas in your home where the ductwork and equipment will be installed. Consider planning early to avoid a last-minute rush.

ADVANTAGES OF THE ENERGY AUDIT

- *Opportunity to make your home more energy efficient at a low-cost.*
- *When your home is well sealed and insulated, heating and cooling systems work less to maintain the desired temperature.*
- *Air sealing keeps out drafts, and insulation helps keep your heated or cooled air in.*
- *It will improve your results with the geothermal system.*

Your service line installation.

We will discuss your service line installation at the on-site visit so that you can provide feedback on your preference for its location.

Questions?

*Call us at **1-855-645-2427, M–F, 8a.m. to 4:30p.m. (ask for Morgan Ruthwicz)**,*
*or email us at **geothermal@eversource.com**,*
*or visit **Eversource.com/geothermal**.*

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Dedicated Geothermal Community Partner

- Attended all in-home visits
- In the field during construction and available to customers
- Responds immediately to all customer concerns
- One point of contact allows customers to feel like they have a direct line to Eversource.

Geothermal Information Tent

- Staffed by community partner and geothermal project team
- July 2023-October 2023 (Every Wednesday from 3 pm to 6 pm)
- In the Geothermal Neighborhood
- Customers, city officials, and anyone interested in learning about the project were encouraged to stop by with their questions

Other Outreach Activities

- Community Meetings and Events
- Weekly Project Updates
- Monthly Newsletter to Key Shareholders
- Door Hangers
- Route Tours (including virtual)
- Signage (including banners)
- Billboards
- Vehicle Magnets
- Videos
- Webinars
- Website – www.Eversource/geothermal

Project Management for Residential Customers

- Residential in-home work
  - Finding and Selected the vendor through RFP
  - Walkthrough with every customer to determine final design of the system
  - Sign off from every customer acknowledging the placement of ductwork, heating equipment, main electric panel upgrades, placement of supply and return, and all construction related work in their home.
  - Our Geothermal Community Partner worked closely with customers and our HVAC contractor to ensure change orders, updated schedules, and any other customer facing concerns were communicated in a timely manner.

What's Next – After Construction

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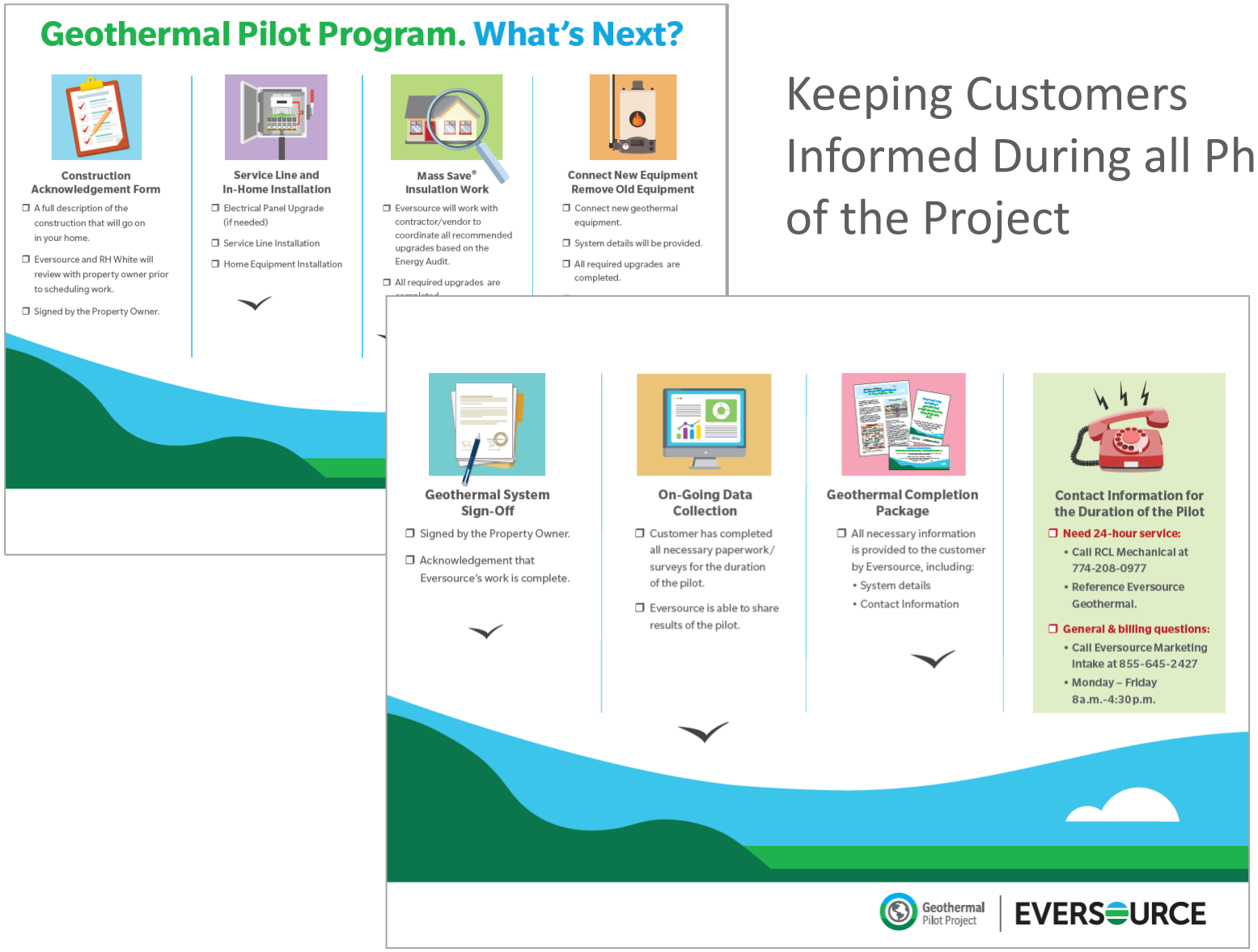

Keeping Customers Informed During all Phases of the Project

Lessons Learned

- Customers are excited for networked geothermal
- Communication is key during a project
- The community is engaged and supportive of networked geothermal.
- A Community Partner ensured a positive customer experience.
- The schedule is likely to change
- Retrofits are difficult and have challenges that are based on several variables including the heating system, age of the home, ductwork, main electric panel, and customer schedule.

Discussion

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