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Massachusetts Climate Careers: Powering the Future

Networked Geothermal Projects

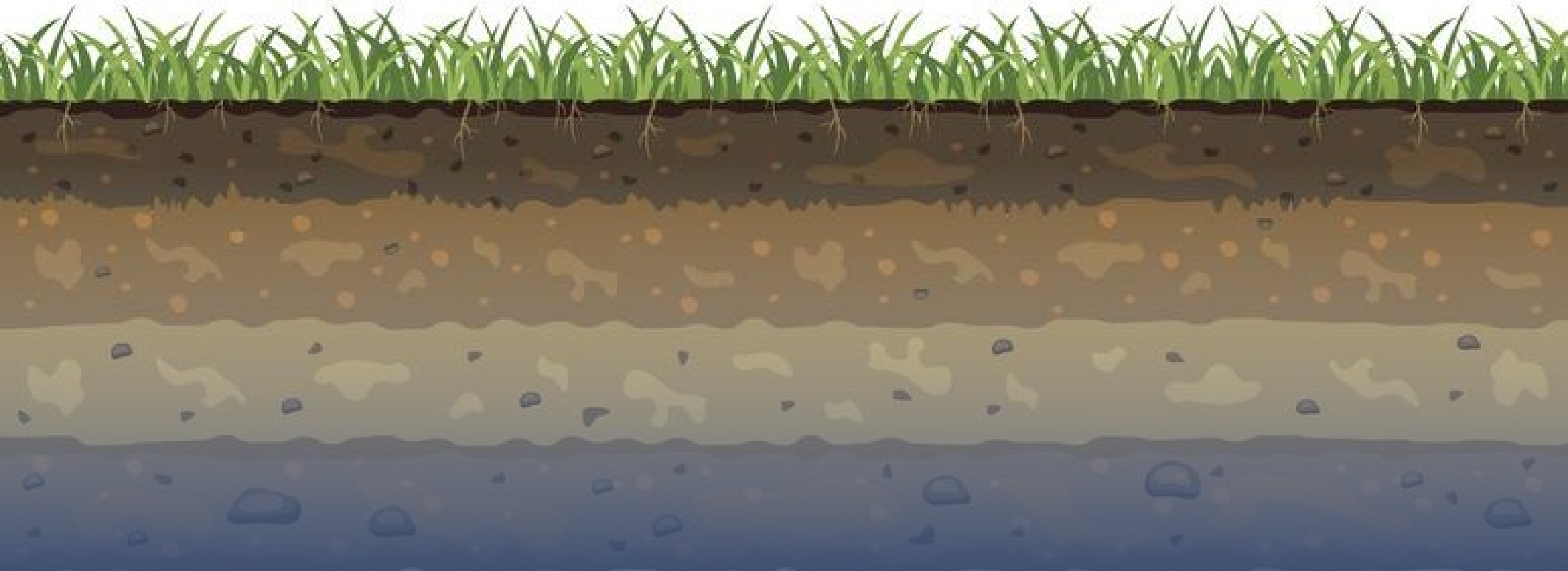


Opening Activity



Why are caves still cool in the summer and warm in the winter?

Climate Solutions Hidden Underground



Earth's temperature remains a constant 50–60°F (10–16°C) all year round, just a few feet below the surface.



Geothermal Systems

- Transfer heat from the ground to buildings in **winter**
- Send heat back into the ground in **summer**





The Big Question

In what ways will the use of geothermal energy make our communities cleaner and healthier?





My Climate Goals

When you complete this lesson, you'll be able to:

1. Explore the science behind networked geothermal systems and how they can contribute to clean heating.
2. Identify examples of climate-critical professionals who work together to design and implement networked geothermal systems.
3. Discuss the steps that communities take to explore a solution, such as networked geothermal systems.



Today's Agenda

- **The Big Question and My Climate Goals**
- **Climate Watch and Discussion**
- **Networked Geothermal Systems**
- **Lowell, MA Case Study**
- **Takeaways and Closing**



Geothermal Heroes

Essential geothermal project roles:

1. **Planners:** Work with the community to get everyone on board
2. **Engineers:** Design systems that use the Earth's natural heat
3. **Electricians:** Connect geothermal energy systems to the energy grid



Networked Geothermal Systems



Image source: [Eversource](#)

Networked geothermal systems connect multiple buildings to a single, shared network of pipes called a **geothermal loop**.

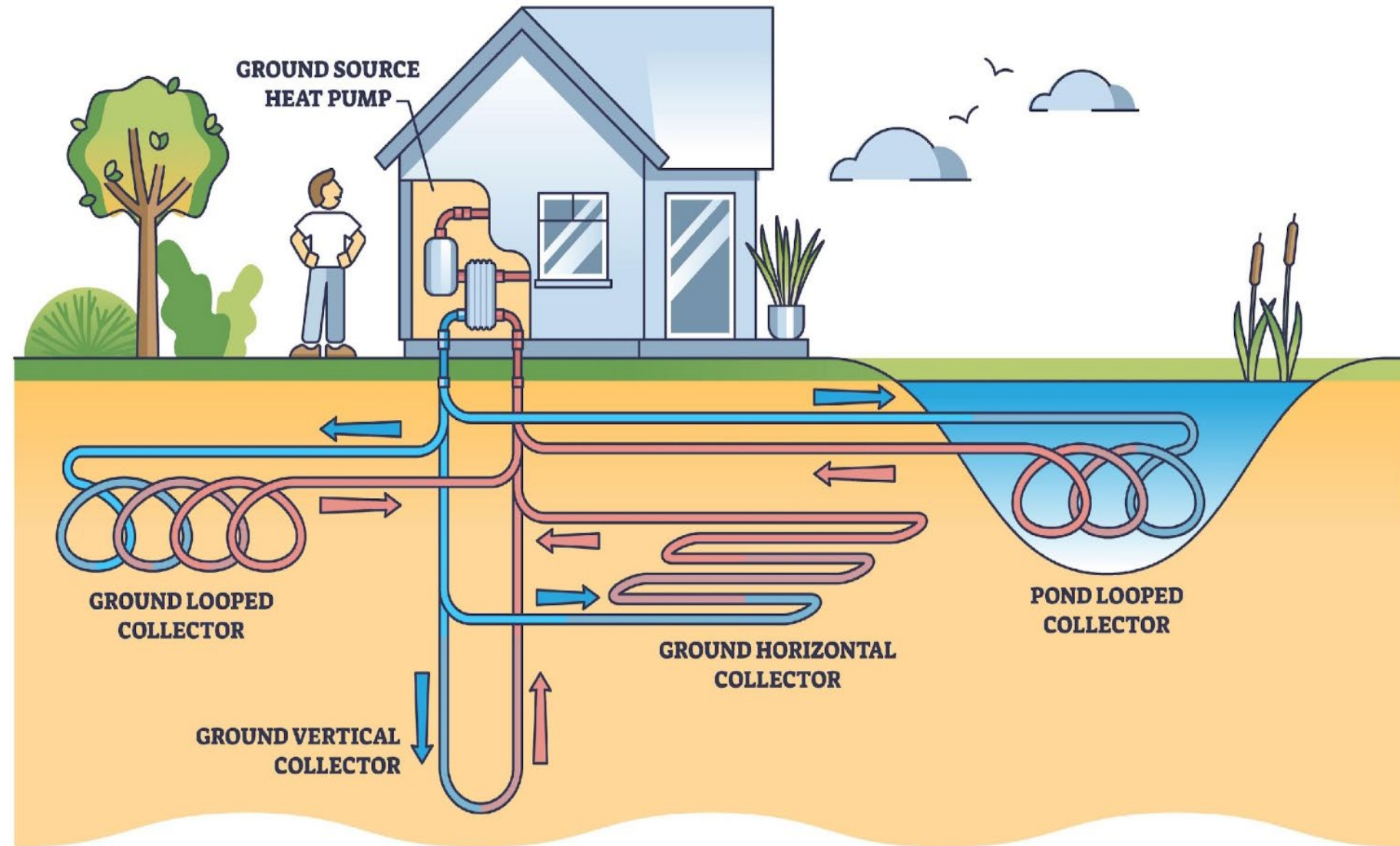
- Cost-effective
- Energy efficient
- Environmentally friendly

Courtesy XXXXX



System Types

GROUND SOURCE HEAT PUMP TYPES



Climate Watch: Video

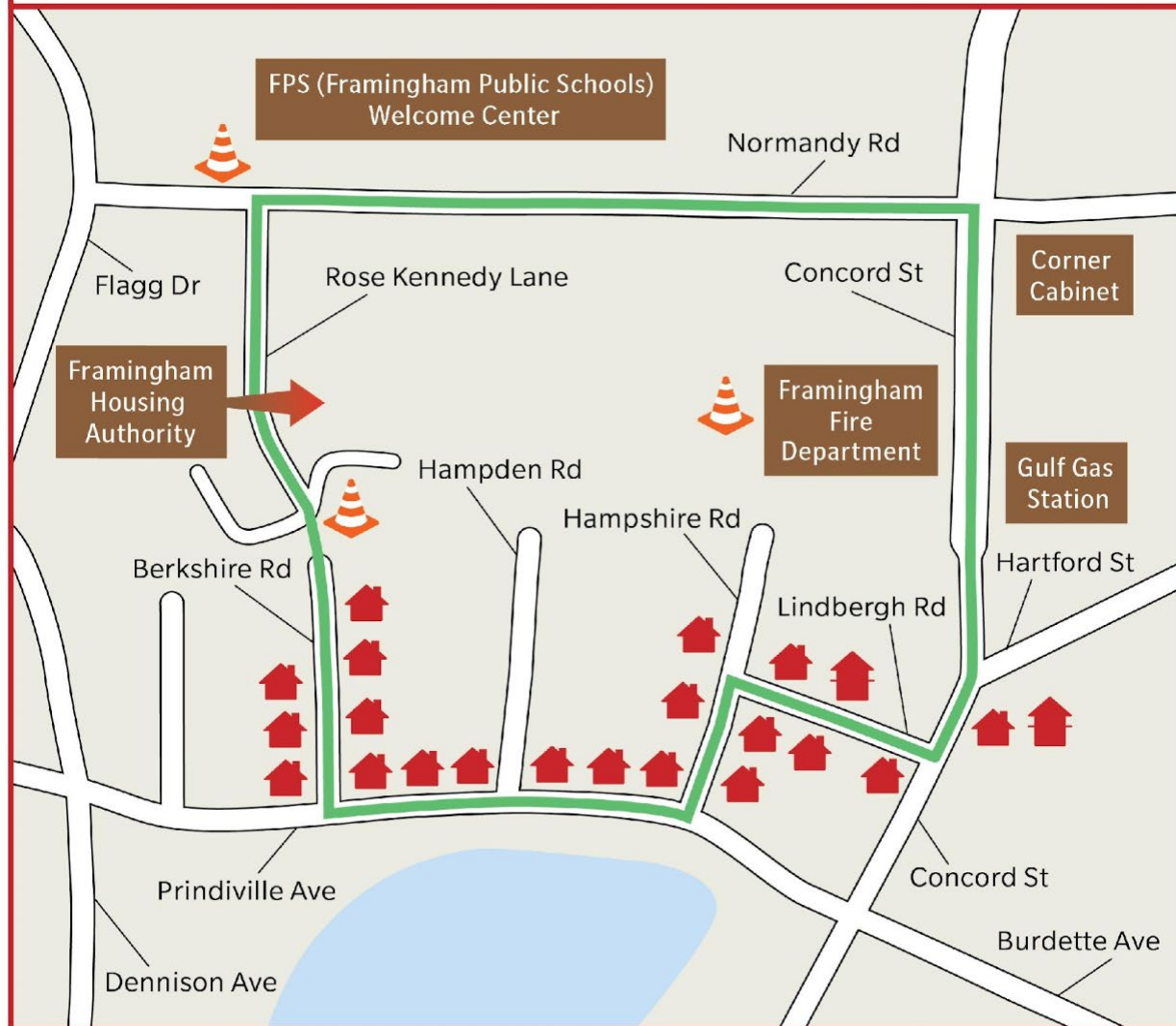




Climate Watch Discussion

1. How is this project using existing infrastructure to speed up the transition to clean energy? Where else might that tactic work?
2. Several professions and trades were mentioned in the video. Which ones stood out to you or interested you?
3. The Framingham project relied heavily on community support. What are some ways to rally community interest and support for new clean energy projects like this geothermal project?

Geothermal Pilot Project



Framingham, MA

Massachusetts is leading the way with geothermal systems!

Three key aspects:

1. Site selection
2. Community engagement
3. Installation and implementation



*Representation of 24 residential systems (20 single-family households, 2 two-family households).

Image source: [Eversource](#)

Case Study: Lowell, MA Geothermal Project

Read and analyze the case study on your worksheet.

- Why is Lowell interested in geothermal energy over other energy sources?
- What steps did Lowell take to prepare its community for a geothermal project?
- What are some of the possible impacts of geothermal energy on this community?

Present your findings to the class!





Key Points

- Geothermal energy is a clean and renewable solution.
- Community engagement and education are crucial to the success of geothermal and similar projects.
- Geothermal projects have environmental, economic, and social benefits.
- Geothermal projects require careful planning, and conducting feasibility studies and pilots may help determine the best locations and practices for long-term success.





Closing Activity

What kinds of community outreach or education would be necessary to gain support for a geothermal system in your community?





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