



# Regional Networked Geothermal Initiatives

## Moderator:

John Ciovacco / *Aztech Geothermal*

## Panel:

Eric Bosworth / *Eversource (MA)*

Greg Koumoullou / *ConEdison (NY)*

Owen Brady-Traczyk / *National Grid (NY&MA)*

Morgan Hood / *VGS (VT)*

*Presented Live at the  
NY-GEO 2023  
Conference  
Albany, New York on  
April 26, 2023*

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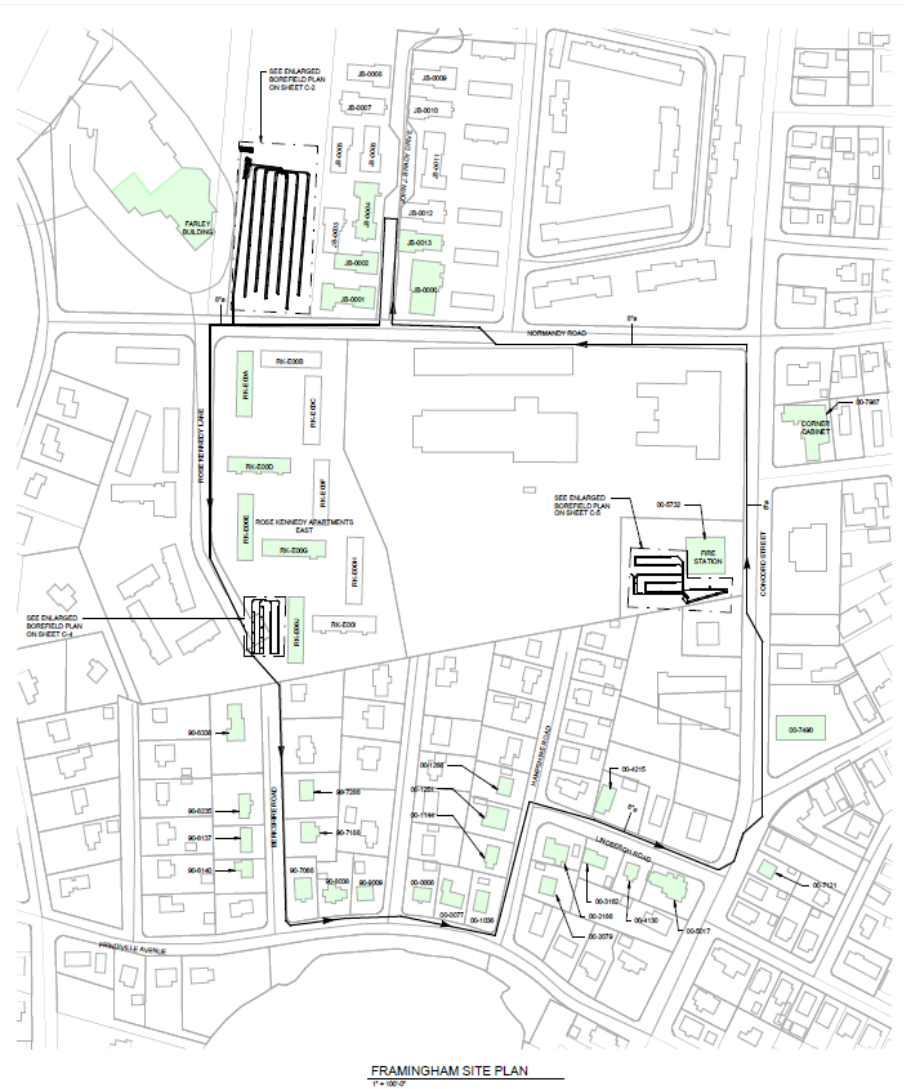
# Eversource Networked Geothermal Update

Eric Bosworth- Senior Program Manager

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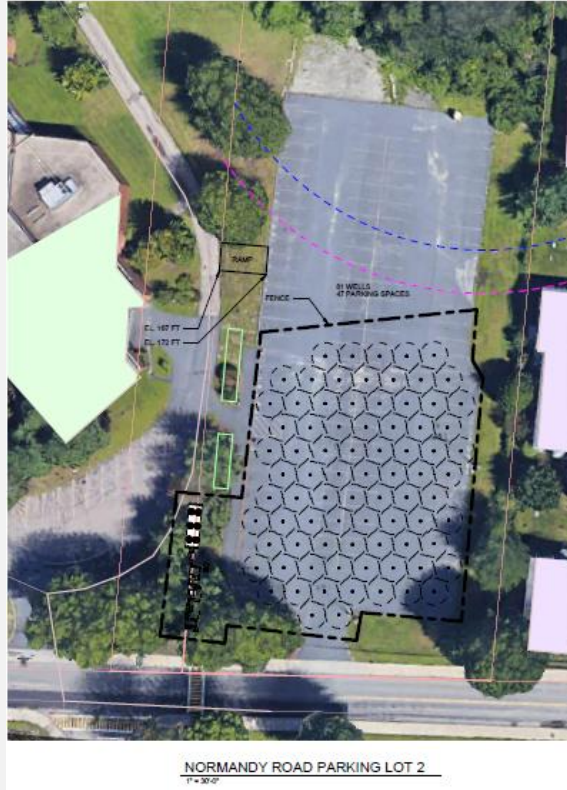
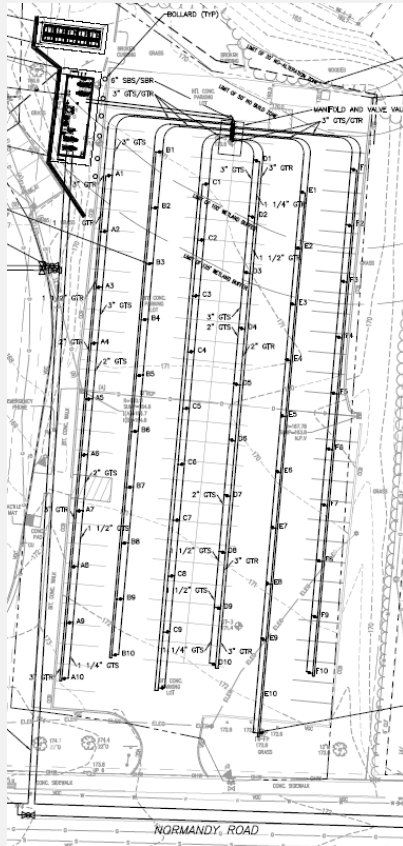
# Pilot Project Overview

- Project began in 2021 with site selection. Commissioning and operation targeted for later this year
  - One pipe system of approximately 1 mile of main
    - 40 buildings with 150 individual customers throughout
    - 113 boreholes to provide capacity of approximately 375 tons of load

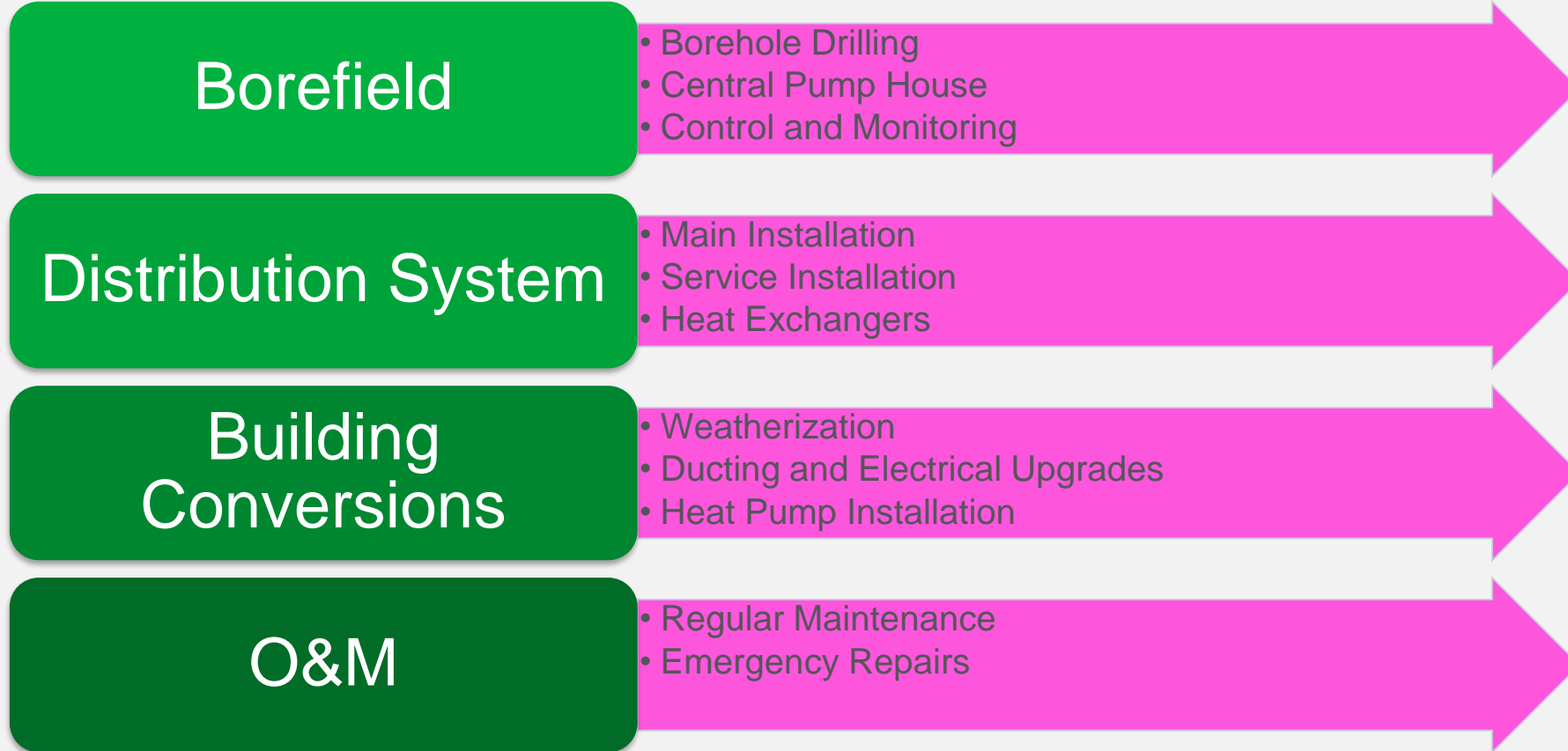


# Design Challenges

- Customer conversion requirements
  - Additional load requests
  - Electric service requirements
- Perfield Layouts



# Construction RFP



# Project Timeline

End of 2021

Eversource selected the pilot site

Spring 2023

Construction is scheduled to begin

Mid-to-late  
2025

Total pilot program duration  
*(two heating and cooling seasons)*

Note: Timing of construction and installation activities will be site-specific. (Approximately one year.)



# What Does Success Look Like?

Success Factors	Data Points to Collect
Validated installation and operating costs	<ul style="list-style-type: none"><li>• System installation costs</li><li>• Ongoing O&amp;M costs</li></ul>
Customer acceptance of technology	<ul style="list-style-type: none"><li>• Customer Satisfaction surveys</li><li>• Customer comfort</li></ul>
Environmental Benefits	<ul style="list-style-type: none"><li>• Emission reductions</li><li>• System efficiency</li></ul>
Technology performance	<ul style="list-style-type: none"><li>• System performance</li><li>• Changes in customer energy consumption</li></ul>
Cost savings	<ul style="list-style-type: none"><li>• Changes in customer heating and cooling costs</li></ul>



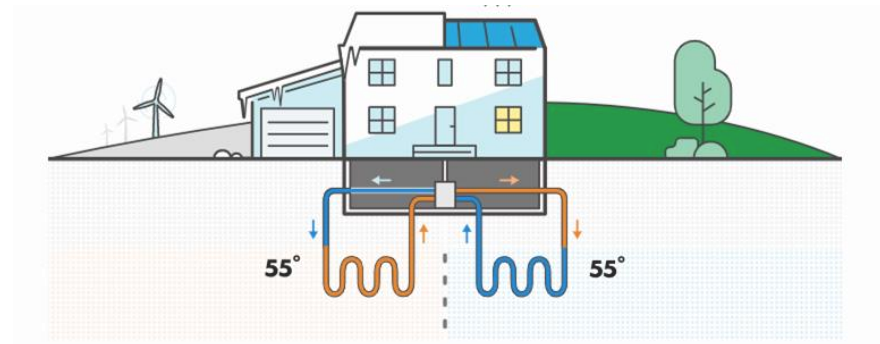


200 years

**Con Edison**

**Utility Thermal Energy Networks**

**NYGEO Conference 4/26/23**





# Agenda

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- Utility Thermal Energy Networks and Jobs Act (UTENJA) Labor Language
- UTEN Defined
- Proposed Pilot Projects

# UTILITY THERMAL ENERGY NETWORKS AND JOBS ACT

## Legislation

Public Service Law was amended, removing legal barriers to allow utilities to own, operate and maintain thermal energy networks in their service territories.

### What are the primary drivers?

- Climate Leadership and Community Protection Act (CLCPA)
  - Decarbonize Buildings Efficiently (reduce impact to electric system)
  - Support Disadvantaged Communities
- Job Creation and Workforce Development

### What's a "thermal energy network"?

- "Piped noncombustible fluids used for transferring heat in and out of buildings for the purpose of eliminating any resultant on-site greenhouse gas emissions of all types of heating and cooling processes, including, not limited to, comfort heating and cooling, domestic hot water, and refrigeration".

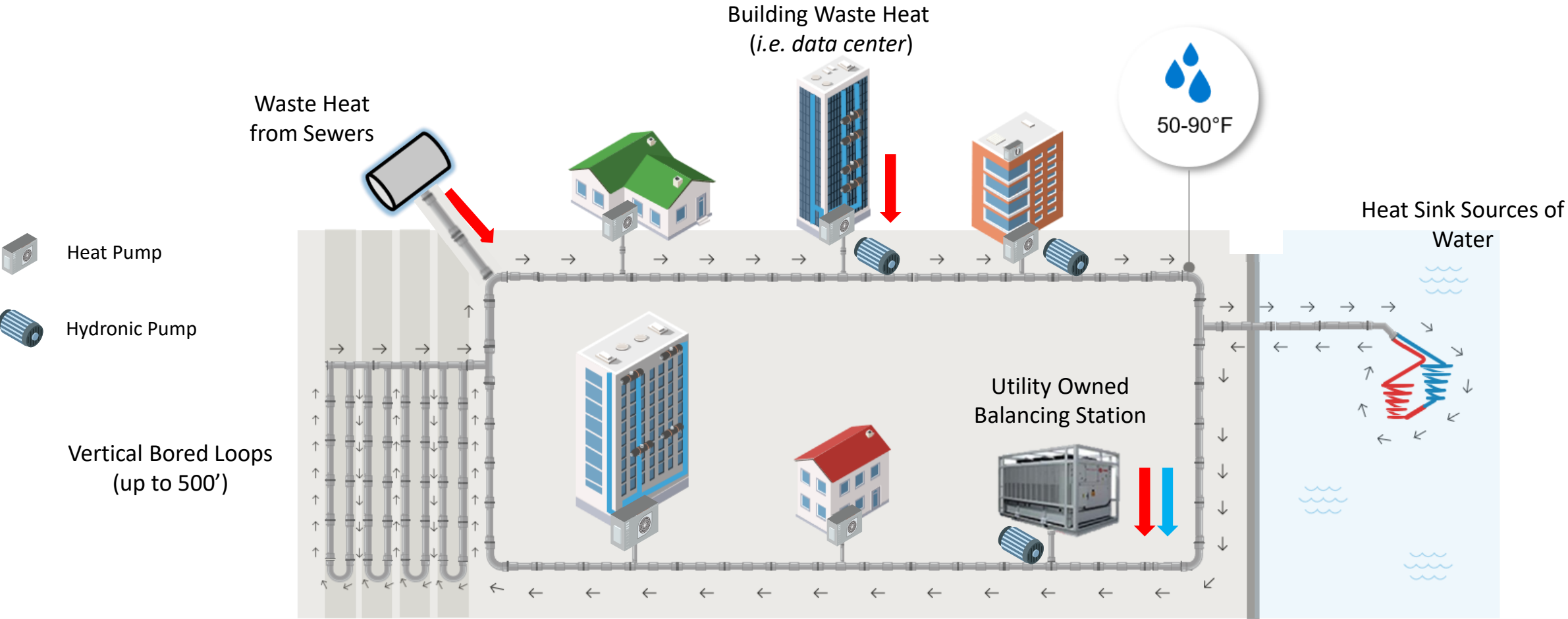
### To whom does the new legislation apply?

- Gas only utilities
- Combination electric and gas utilities

### What are the requirements?

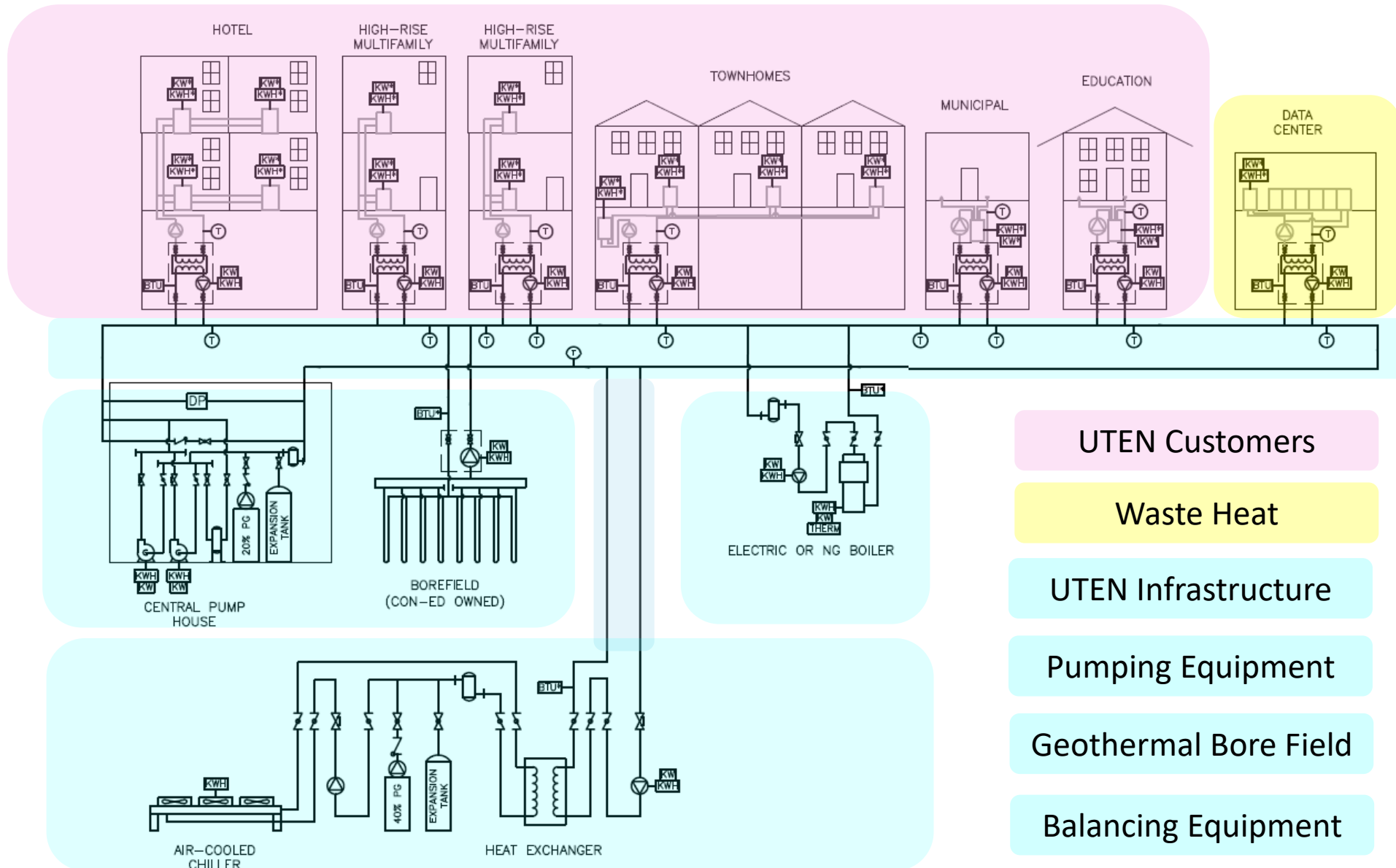
- Each utility propose 1 to 5 Pilot Projects
- At least one in a disadvantaged community (DAC)

# Thermal Energy Network Defined



# CECONY THERMAL ENERGY NETWORKS PILOT PROJECTS

## Typical UTEN Network Design





## Proposed Projects

### Project A: High Rise in Urban Area

- High-rise mixed-use buildings in Manhattan
- Leverage in-building technologies to share waste heat

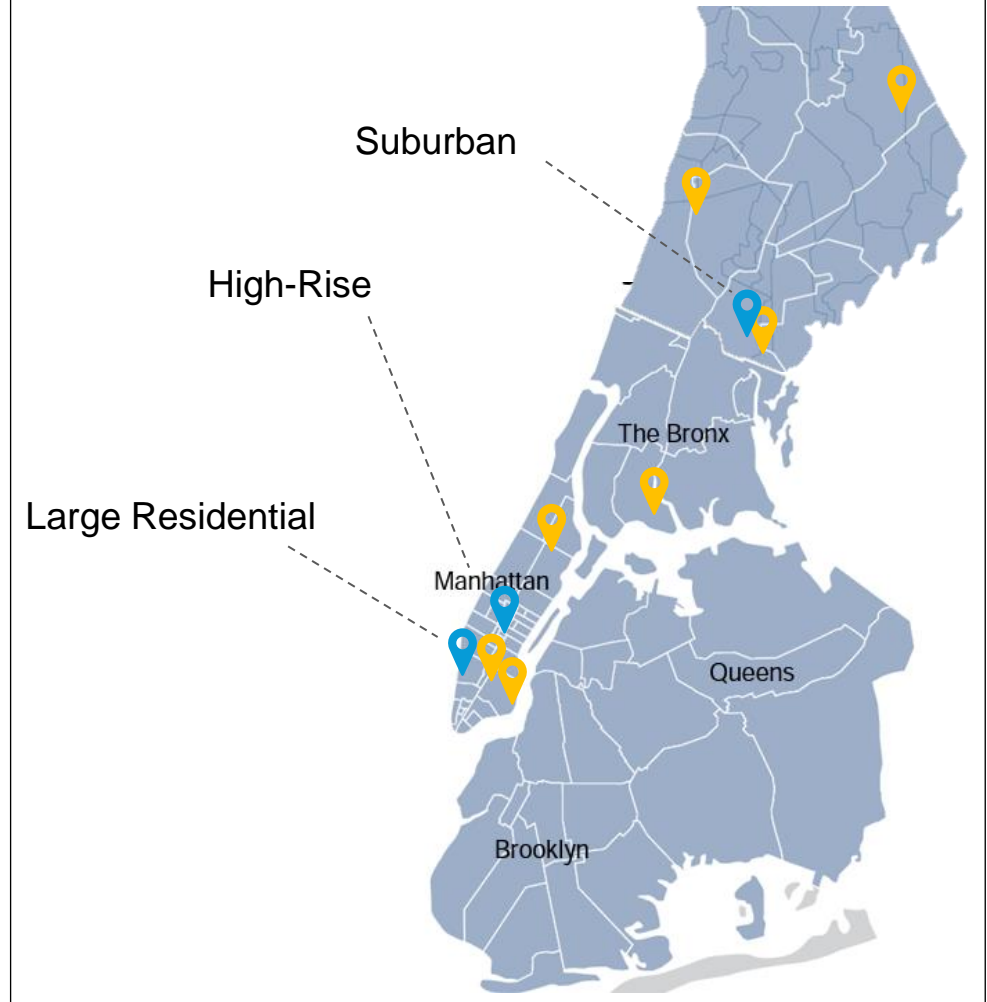
### Project B: Large Residential in Urban Area

- Mid-rise multifamily residential
- Data Center waste heat energy source

### Project C: Low Rise Suburban Neighborhood

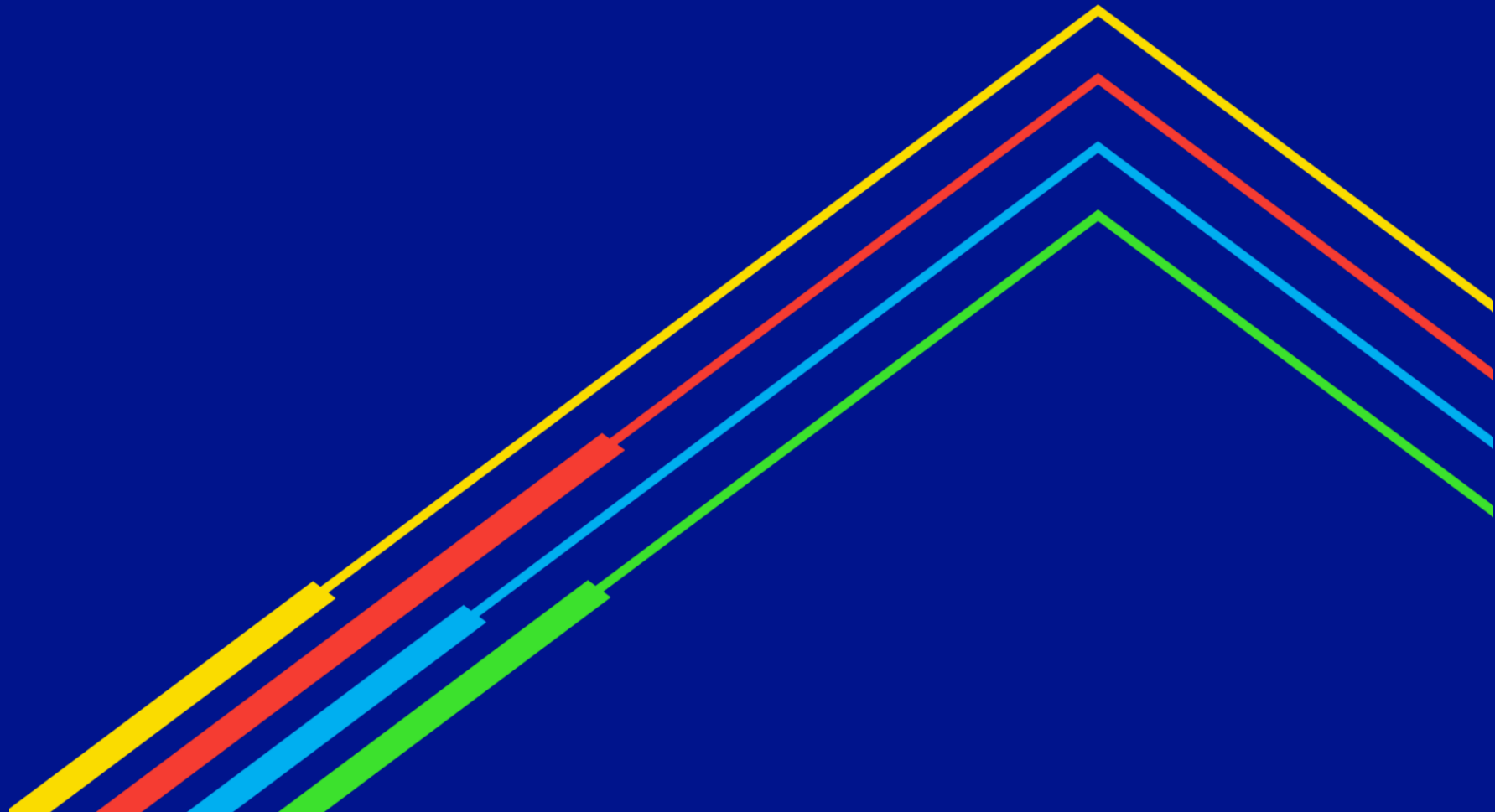
- 70+ buildings including 1-3 family, religious, recreation center, fire station & medical offices
- Several bore fields throughout network area

### Locations of Proposed Projects



# Regional Networked Geothermal / Thermal Energy Network Initiatives

April 2023



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# Summary

	MA	NY
Cost	\$15.6M	\$180.2M
Capacity	>200 tons	3,720 ton
Area	TBD	2,134,000 ft <sup>2</sup>
Status	In Development	Pending Regulatory Review



# MA Geothermal Demonstration Program Summary

## Program Overview

- Operating Company: Boston Gas Company
- Approved Dec 2021 (Docket # 21-24)
- Program Years: 2022 – 2026
- Approved Budget: \$15.6 million
- Estimated Number of Customers: 100-200 (20-40 heat pumps or 100-200 tons per installation)

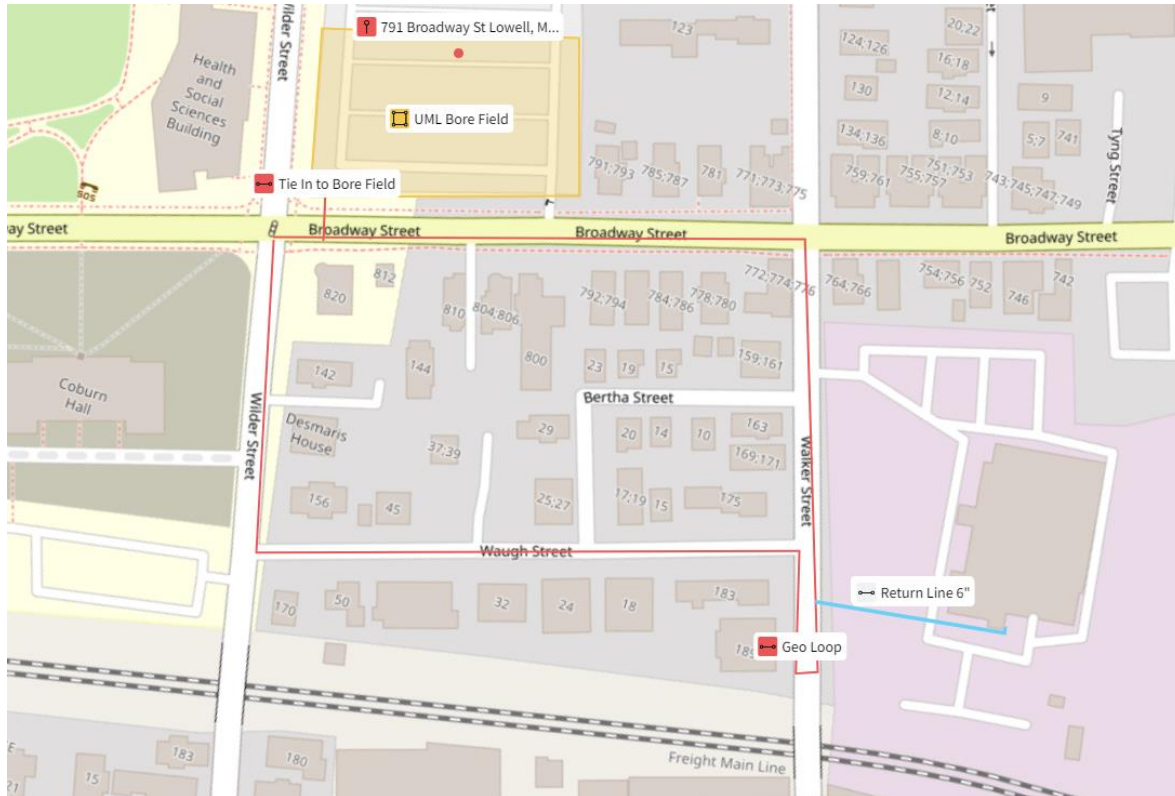
## Project Selection Requirements

- Across the portfolio of installations, the following conditions must be met:
  - Connecting facilities with diverse load profiles
  - Alternative to LPP replacement
  - Managing gas system constraints
  - Supporting low-income (LI) and environmental justice (EJ) communities

# MA Pilot - Lowell

Aiming to convert several types of buildings:

- Duplexes and triplexes
- Multi-family buildings
- Commercial office space



Parameter	Value
Cost	TBD
Capacity	TBD
Area	TBD
GHG Reductions	TBD

# KEDLI Pilot – Campus Setting

Planning to convert six buildings:

- **Heating, Cooling, and DHW**  
(2) High-rise residential buildings
- **Heating and Cooling Only**  
(2) Townhomes  
(1) Wellness center  
(1) Entertainment center

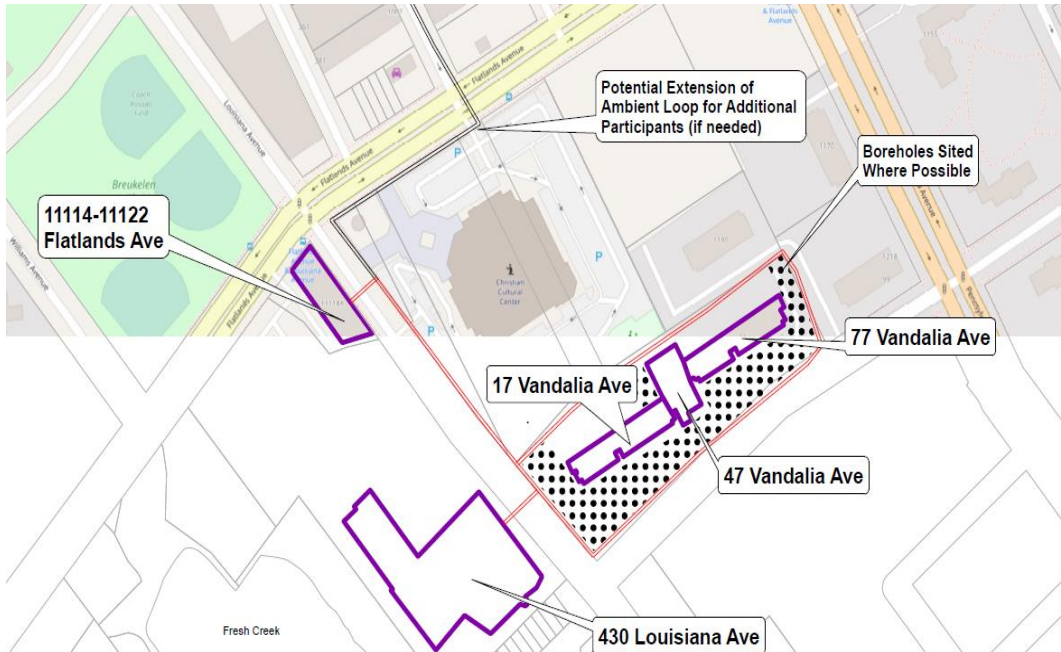


Parameter	Value
Cost	\$33.469M
Capacity	650 tons
Area	200,000 ft <sup>2</sup>
GHG Reductions	-177 MT CO <sub>2</sub> e / year

# KEDNY Pilot – NYCHA Vandalia Ave.

Aiming to convert several types of buildings:

- **DHW, Heating, and possibly cooling**
  - (2) High-rise apartment buildings
  - (1) Senior center
- **Heating & Cooling**
  - (1) Commercial strip mall



Heating and Cooling	
Parameter	Value
Cost	\$67.7M
Capacity	520 Tons
Area	417,000 ft <sup>2</sup>
GHG Reductions	-308 MT CO <sub>2</sub> e / year

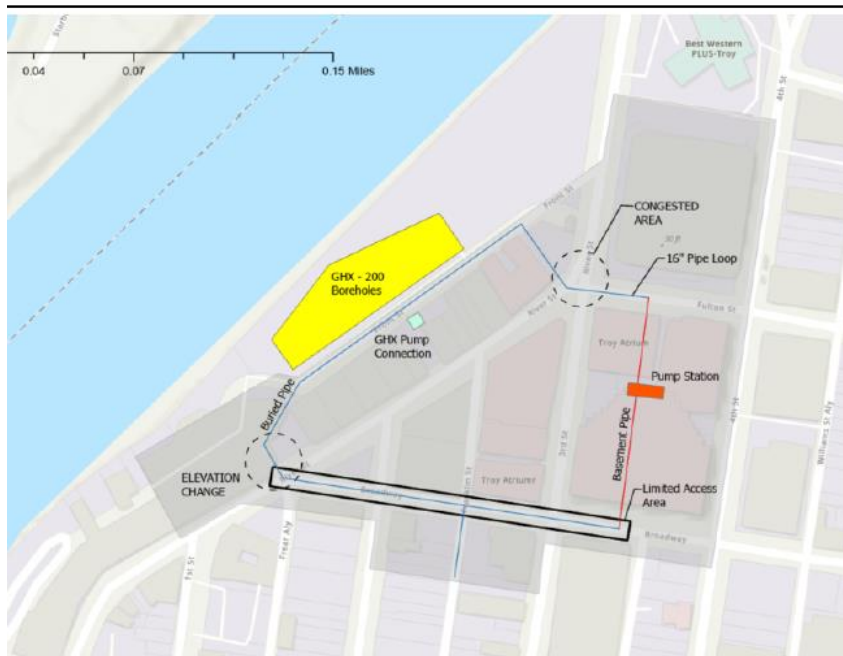
# KEDNY Pilot – Options and costs

Heating Only	Heating & Cooling
\$38.7M	\$67.7M
<ul style="list-style-type: none"><li>• All work done in mechanical room</li><li>• Heat distributed via existing systems<ul style="list-style-type: none"><li>• Nominal Electrical Upgrades</li></ul></li><li>• Would require an alternative approach to providing cooling</li></ul>	<ul style="list-style-type: none"><li>• Each of the 293 apartments would need to be renovated and have equipment installed</li><li>• Electrical service upgrades to each apartment</li><li>• Additional risers to each apartment to distribute chill water</li></ul>

# NMPC Pilot (1) – City of Troy

National Grid will construct, own, and operate the distribution system  
 Troy LDC. will construct, own, and operate the borefield

- Convert 9 commercial buildings

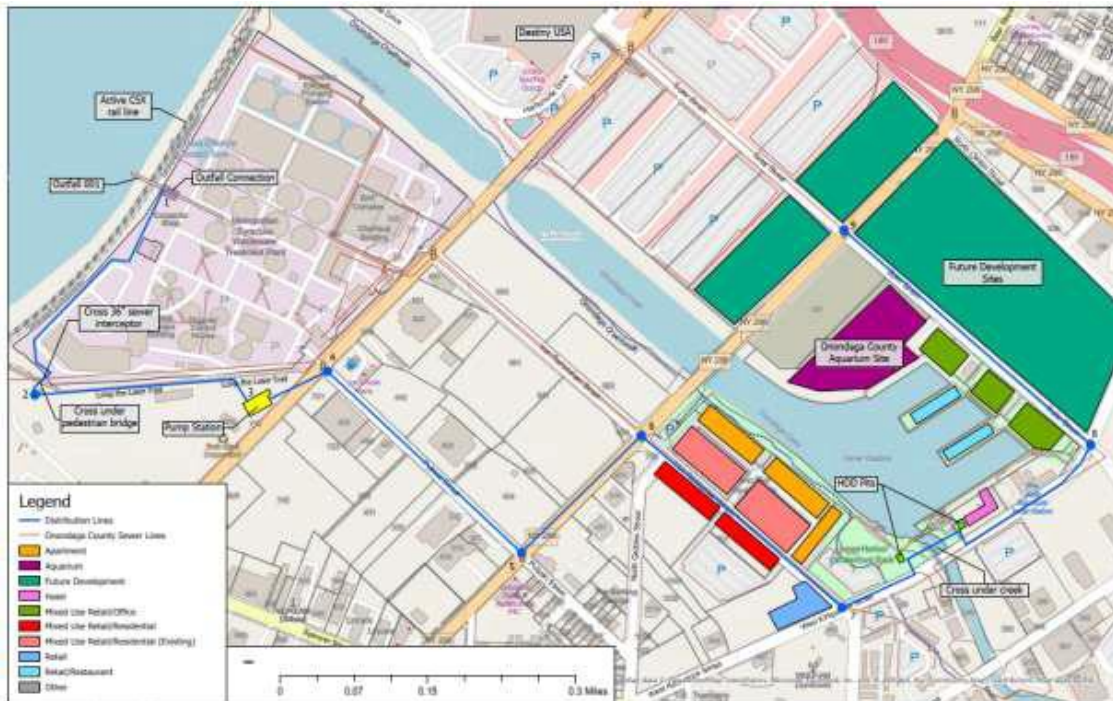


Parameter	Value
Cost	\$12.270M
Capacity	550 tons
Area	317,000 ft <sup>2</sup>
GHG Reductions	-774.7 MT CO <sub>2</sub> e / year

# NMPC Pilot (2) – City of Syracuse

- Connecting to the Metropolitan Wastewater Treatment Plant as a thermal resource
- Connecting 14 new construction buildings in the Inner Harbor Area

**A large aquarium**  
**Office space**  
**Mixed Use Commercial/Residential**



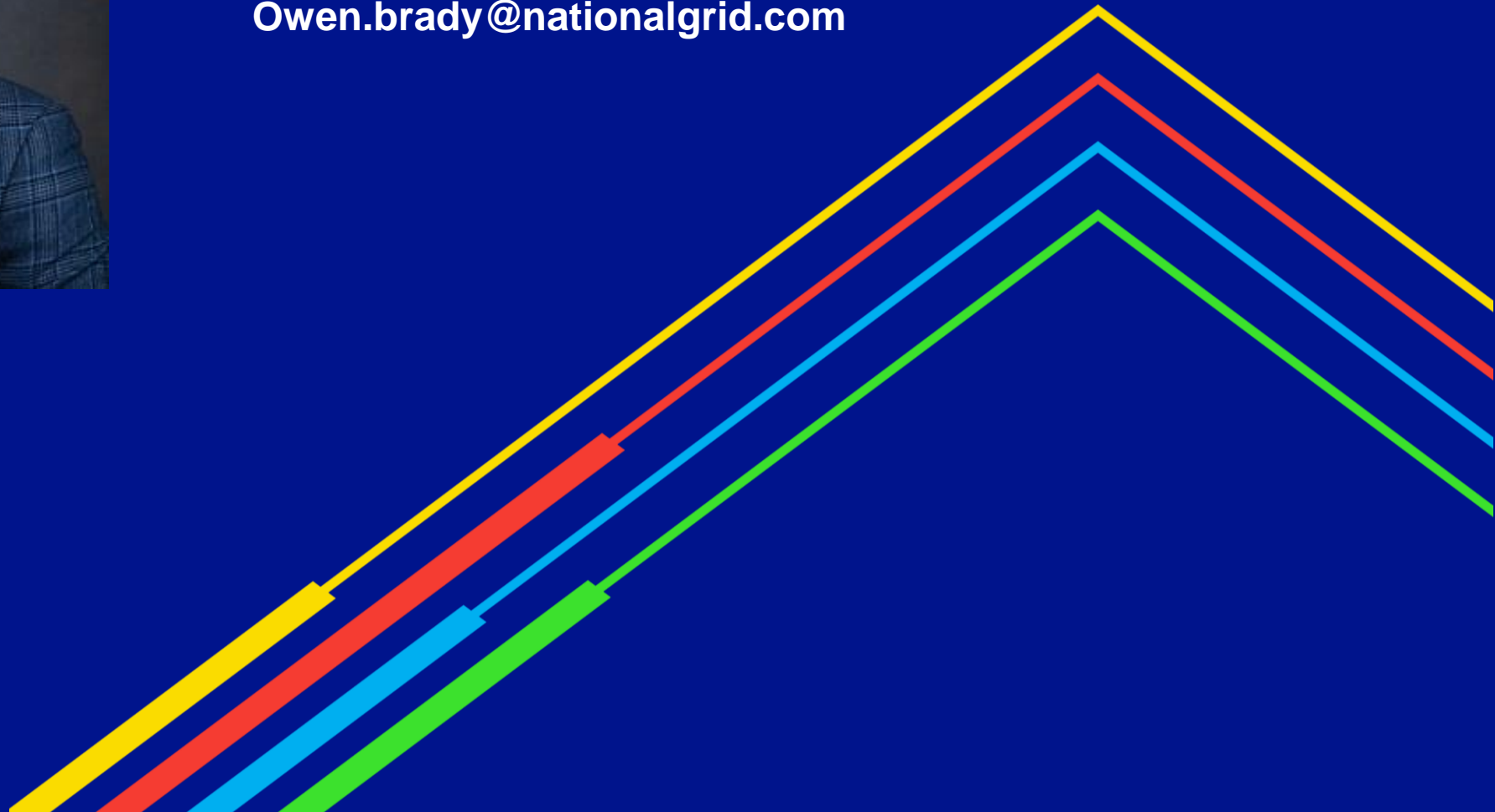
Parameter	Value
Cost	\$66.754M
Capacity	2,000 tons
Area	1,200,000 ft <sup>2</sup>
GHG Reductions	-1,417 MT CO <sub>2</sub> e / year



# Owen Brady-Traczyk

Director, Future of Heat Solutions

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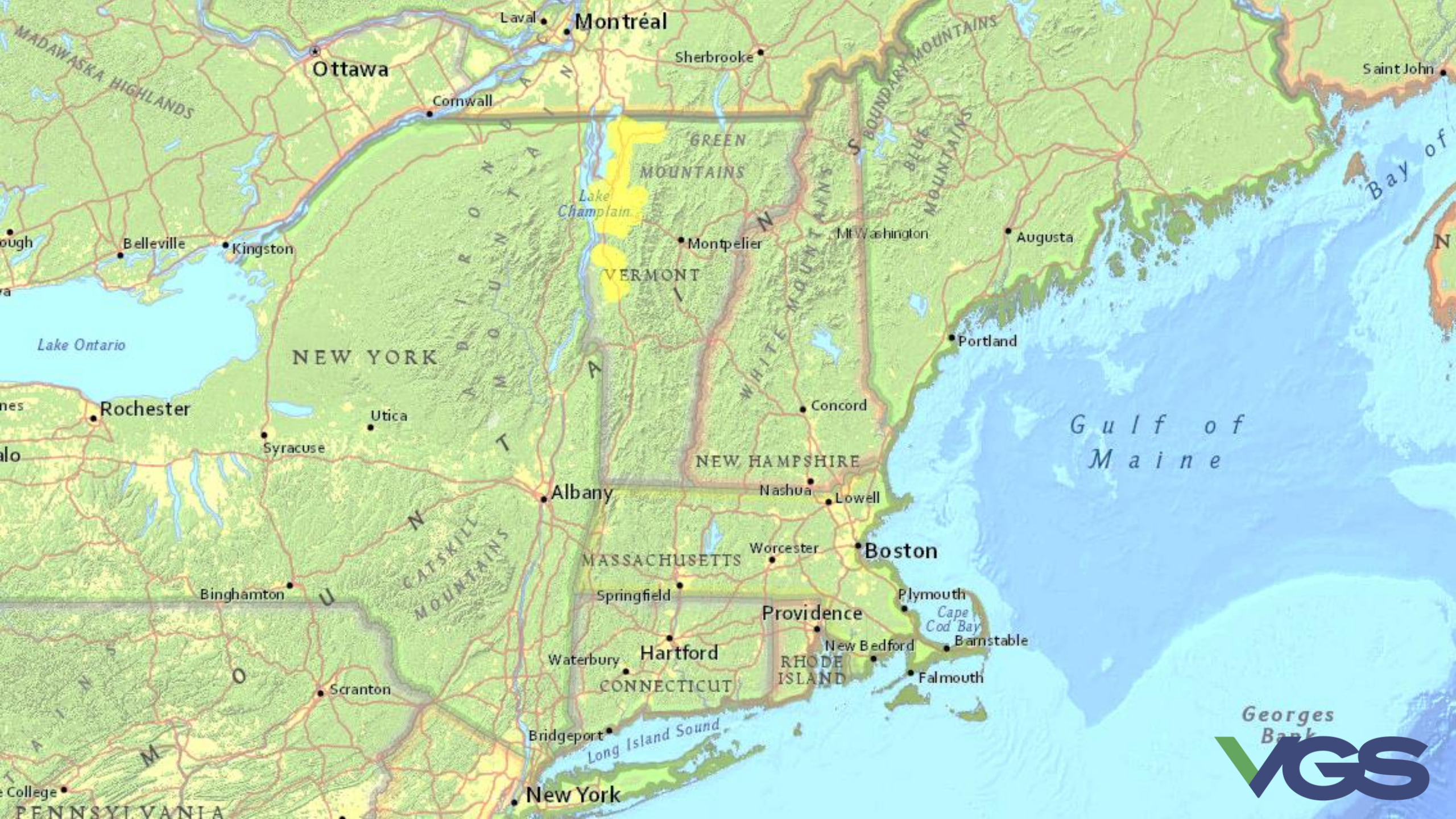
# Utility Geothermal Development in Vermont

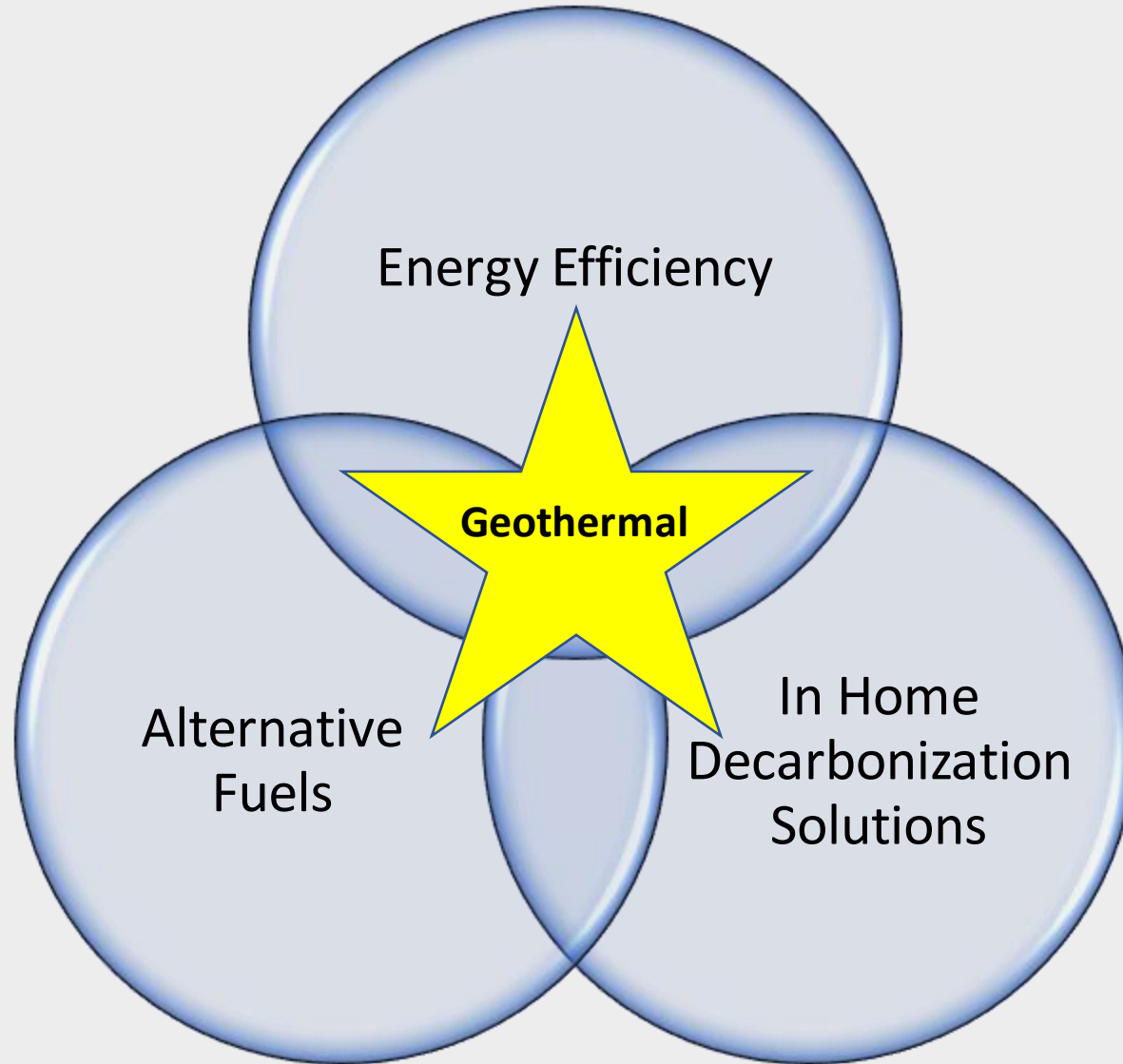
2023 NY Geo Conference

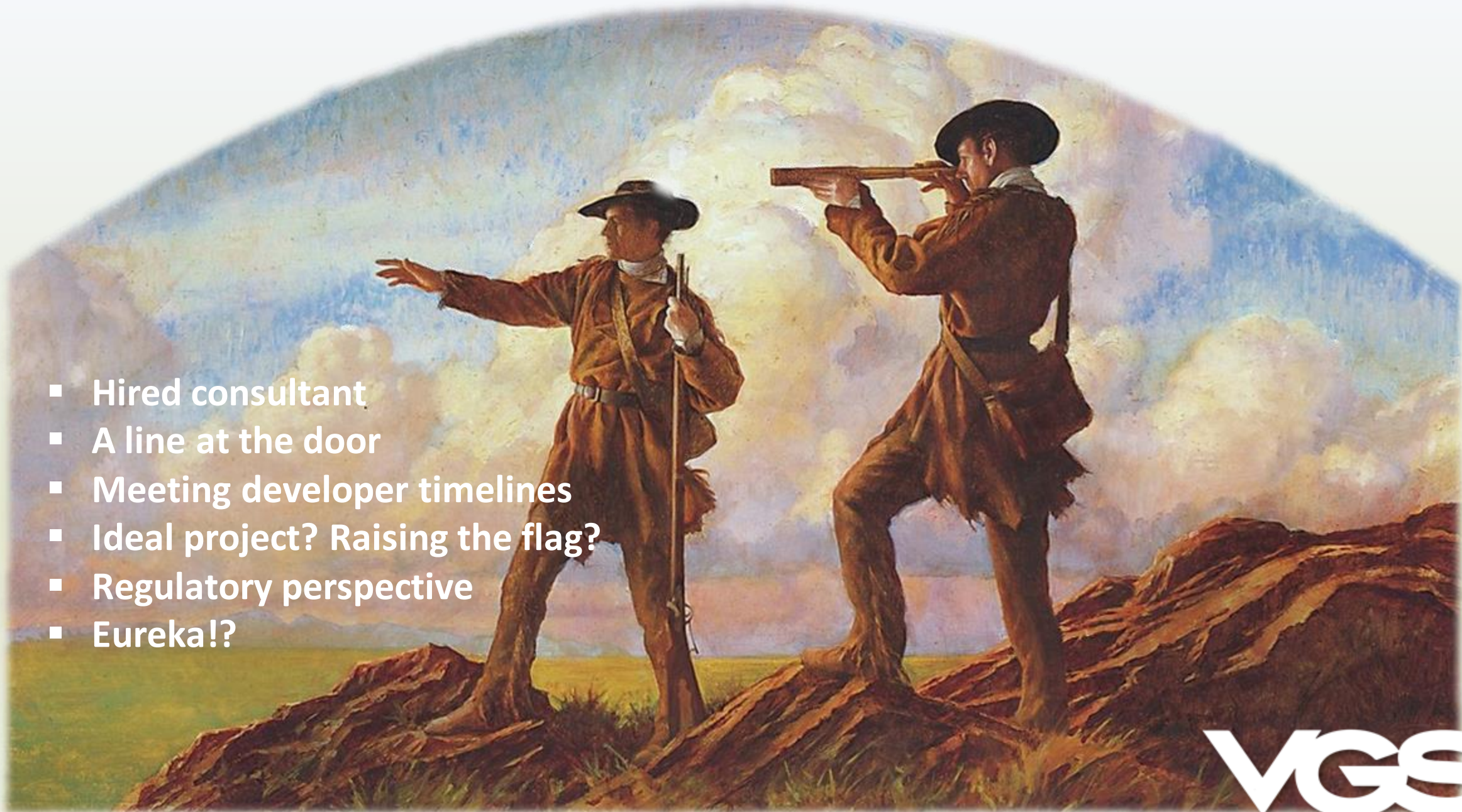
4/26/23

Richard Donnelly, Director  
Energy Innovation

**VGS**







- Hired consultant
- A line at the door
- Meeting developer timelines
- Ideal project? Raising the flag?
- Regulatory perspective
- Eureka!?

VGS



Rutland Regional Medical Center

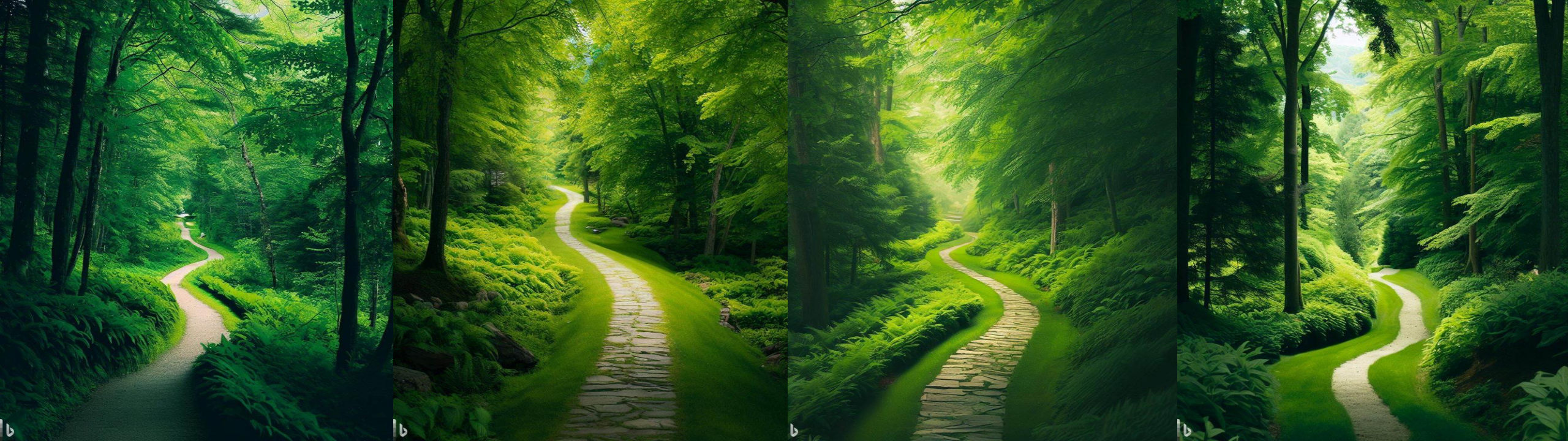
- Existing building on campus
- Already deploying WSHPs
- Failed cooling tower
- Engaged customer
- Great learning opportunity
- Potential for geo network
- Denied by regulators



## Feasibility study performed:

- 150 Units, 50% affordable housing
- Developer to own and maintain HVAC equipment
- VGS to own and maintain external loop
- Developer's priorities: minimize OpEx costs
- Competing against NG (new pipe on the street)
- CapEx and OpEx costs compared between baseline systems and geothermal
- With VGS as a partner, OpEx cost would have more than doubled even with IRA incentives
- If developer did project alone, they would have lower CapEx and OpEx





- Commitment to geothermal
- Collaboration with NG Utilities
- Discussing development outside our service area with regulators

- Engaging experts
- Exploring alternative business models
- Tax-equity partnerships
- Master service agreements

# Thank you!

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