

# THERMAL ENERGY NETWORKS: DECARBONIZING BUILDINGS AT UTILITY SCALE

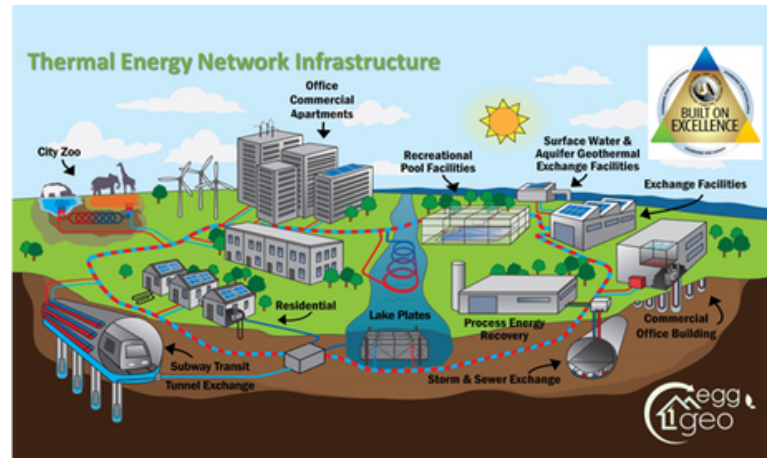
A solution for neighborhood-scale building decarbonization favored by policy experts, climate advocates, and labor unions

## WHAT ARE THERMAL ENERGY NETWORKS?

Thermal Energy Networks are utility-scale infrastructure projects that connect multiple buildings into a shared network with sources of thermal energy like geothermal boreholes, surface water, and wastewater.

Thermal energy refers to energy that changes the temperature of our spaces and the water we use in our homes and workplaces. Most people in New York get thermal energy by burning fossil fuels in a boiler, furnace, or water heater. But there are much more efficient and clean ways to get thermal energy, such as from the earth, which holds a constant temperature year round. Many of the buildings around us also have waste heat that can be recycled and shared. For instance, large commercial, recreational, and manufacturing buildings have excess thermal energy that other buildings, like homes and small commercial, in a shared network can use.

Thermal Energy Networks can be installed under the street. Heat pumps in each building provide the heating or cooling by exchanging thermal energy with pipes containing circulating water as needed. The water in the pipes stays within the needed temperature range by exchanging heat with geothermal boreholes and other thermal resources.



## BENEFITS OF THERMAL ENERGY NETWORKS

- **JOBS:** Transferability for gas utility workers
- **COST:** Lower energy bills
- **SAFE** and **RELIABLE:** Non-combustible and consistent energy flow
- **EQUITY:** Renewable thermal energy delivered to all customers
- **HEALTH:** Improved indoor and outdoor air quality (no combustion in the building)
- **GRID:** Flattens the peak loads on the electricity grid
- **CLIMATE:** A major reduction in carbon emissions from buildings

By linking buildings to pipes with circulating water, thermal energy networks can help us share the thermal energy around us and reduce the impact of building electrification on the electric grid. Thermal energy networks are highly efficient and reduce peak electricity demand.

Building and maintaining thermal networks will utilize the skills that utility workers and the building trades workforce already have. Thermal Energy Networks help reduce the upfront costs of building decarbonization for building owners and provide access to the most efficient forms of renewable thermal energy for people who cannot easily install geothermal energy on their own property.