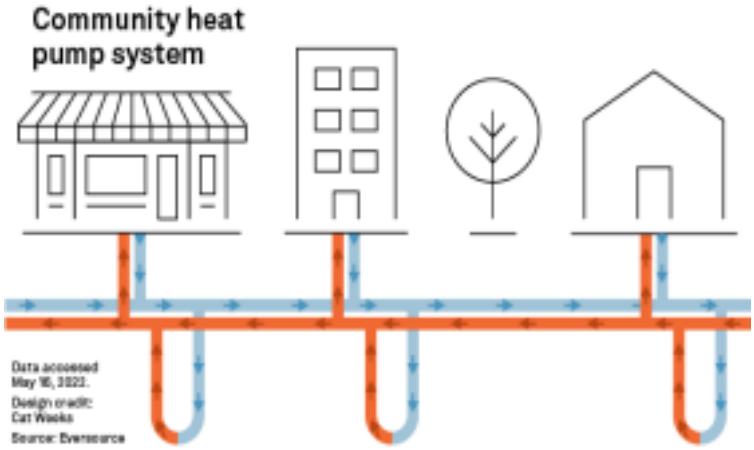
SB 570
Working for Accessible Renewable Maryland Thermal Heat (WARMTH) Act
Neighborhood Geothermal

Maryland has a statutory requirement to reduce greenhouse gas emissions to 60% of 2006 levels by 2031. Once this milestone is achieved, we are further required to transition to a net-zero economy by 2045. Meeting these targets is urgent and imperative. The transition to a carbon-free economy provides benefits to public health and opportunities to invest in Maryland's overburdened and underserved communities.

Networked geothermal systems are a super efficient, inflation resistant, reliable way to heat and cool buildings. These systems can be constructed today. They are an already proven, carbon-free technology. They minimize additional electric demand on the grid.

How Networked Geothermal Works



Geothermal heating and cooling systems, also called ground source heat pumps(GHPs), moderate the temperature of buildings using heat energy from the ground instead of the air. The entire system is made of a network of horizontal and vertical pipes, a water-based solution that transfers heat energy within the pipes, and heat pumps that warm and cool individual houses and buildings. The ground keeps the water based solution at a constant temperature as it circulates through the pipes. The heat pumps pull the heat energy from the solution to warm buildings. Similarly, these systems disperse heat energy via the solution to cool buildings. In a networked geothermal system, geothermal heating and cooling systems are connected and can benefit multiple buildings- using waste heat from one building to heat another building nearby.

The WARMTH Act provides an opportunity to pilot networked geothermal systems in Maryland. This legislation is a strategic investment in the future of Maryland and has several benefits:

Strategic Use of IRA Funds

The Inflation Reduction Act provides an opportunity for historic investment in Maryland's energy infrastructure. However, these IRA funds give us an opportunity to fully electrify many low- and moderate-income homes, but not all. We need to invest these funds as efficiently as possible and we must invest them so that we can gather data and learn for future electrification from fund sources we have not yet identified.

Directing a portion of IRA funds to be used as part of a network geothermal system will allow for full electrification and weatherization of an entire neighborhood, with funds coordinated by MEA and construction coordinated by MES. This can create a model for future electrification.

Electrify Everything as Efficiently as Possible

Decarbonizing to meet Maryland's greenhouse gas reduction goals requires greater electrification of buildings and transportation. As Maryland electrifies, we need to maximize efficiency to limit upgrades needed to the electric grid. Specifically, we need to flatten the projected winter peak energy usage. A Maryland Energy Administration (MEA) study found that 1kW of electricity grid demand reduction can be achieved for each ton of ground source heat pump technology installed compared to electrification with air source heat pumps (citation forthcoming).

Ground Source Heat Pumps Efficiency Avoids Costs to Upgrade the Grid

A US Department of Energy study finds the "mass deployment of GHPs can electrify the building sector without

overburdening the US electric power system. In all GHP deployment scenarios considered, significant reductions are realized in the needed power generation and capacity, energy storage capacity, transmission build-outs, seasonal capacity that can contribute toward resource adequacy, CO2 emissions, and marginal and cumulative system costs of electricity across the United States. Although this study was for the contiguous United States only, the findings are applicable to all 50 states and US territories."[1]

Utility Implementation

This legislation offers a new business model for gas utilities that relies on 100% clean energy and utilizes existing pipeline workforce skills. In Massachusetts, both Eversource and National Grid have pilot projects through which they will own the networked geothermal system and it will be rate-based in the same way their gas and electric assets are currently rate-based.[2] These projects have broken ground and will come on line in the next year. In states such as New York, legislation has been passed in order to remove barriers preventing utility providers from operating networked geothermal systems.[3]

Proven, community-scale change

Networked geothermal systems are the best opportunity for neighborhood scale shifts to fully electric heating and cooling. By operating on the neighborhood level, the state has the opportunity to implement projects that will move the needle toward our 2031 and 2045 goals. These systems are already operating in areas across the country and providing savings for institutions[4] and residents[5].

This bill…

- ✔ requires each gas company in the state to work with community organizations, municipal, and county governments to identify and propose one or two pilot projects to the Public Services Commission (PSC). Based on the cost benefit analysis, the PSC can approve pilots. The utilities will build and manage the boreholes and pipes in their current right of way, which will connect to ground source heat pumps in people's homes which will be owned by the property owner. Utilities will recover the cost of the networked system, and IRA funds will cover the costs of the electric appliances which pilot properties will receive.
- ✔ Requires significant data collection once pilot projects are operational. This data will be key to developing the models for the mix of technology that will be needed for full electrification of buildings in Maryland.
- ✔ The pilots will be in neighborhoods with 80% low- and moderate-income residents and will prioritize overburdened and underserved communities.
- ✔ Labor standards in the bill prioritize maintaining work for those who work on gas infrastructure and ensure prevailing wages for construction on the projects. Because GHP work is similar to gas distribution work, minimal additional training ensures job security. Workers on our gas system have kept us safe and warm for decades. We need to ensure their job security in a new clean thermal energy system.

[1] page xxiv, https://www.osti.gov/biblio/2224191
[2] https://www.eversource.com/content/residential/about/transmission-distribution/projects/massachusetts-projects/geothermal-pilot-project
[3] https://www.nysenate.gov/legislation/bills/2021/S9422
[4] https://www.coloradomesa.edu/facilities/sustainability/geo-systems.html
[5] https://www.cnbc.com/2022/09/01/geothermal-powered-housing-development-saves-homeowners-big-bucks.html