

Maryland Clean Energy Center (MCEC): Powering Baltimore's Energy Transition Through Geothermal Networks

Building a Clean Energy Investment Pipeline in Baltimore, Maryland

AT A GLANCE

Investment Priorities

Geothermal Heat Pump Deployment (District & Standalone), Net-Zero Affordable Housing, Municipal Building Retrofits

Pipeline Value

\$121,000,000

Key Partners

Maryland Clean Energy Center (MCEC), City of Baltimore, Buro Happold, Baltimore Gas & Electric, MCB Real Estate, Greater Baltimore Committee, Maryland Energy Administration (MEA), Dandelion Energy

Impact Metrics

- Households Served: 101 affordable housing units
- GHG Emissions Reduction: 13,650+ metric tons CO2/yr
- Jobs Created: 600+
- Energy Cost Reduction: 30–50% for residents

Strategic Role

Market Builder | Project Originator | Co-Investor

The Path Forward

Seeking predevelopment capital and project financing to complete feasibility modeling, financial strategy development, and engineering across five geothermal sites.

THE BIG PICTURE

Buildings account for 64% of Baltimore's emissions, and residents in priority communities face some of the highest energy burdens in the Mid-Atlantic. MCEC, the state's Green Bank, is partnering with the City of Baltimore to transform the city's energy landscape from a reliance on aging fossil fuel infrastructure to a sustainable, geothermal-powered future. With support from the Municipal Investment Fund (MIF), MCEC funded the feasibility studies, financial strategy work, and community engagement needed to begin building a coordinated market for geothermal deployment in Baltimore. By acting as a local engine for sustainable investment, MCEC is bridging the gap between high-level policy and project development, focusing on high-impact sites ranging from affordable housing to major downtown redevelopments.

The Challenge: Aging building stock, volatile natural gas prices, and fragmented contractor capacity have kept geothermal out of reach for most Baltimore residents and building owners. The city lacked the financial products, permitting frameworks, and workforce pipeline to support deployment on a meaningful scale.

The Solution: MCEC brings a rare combination of financial tools to this effort: tax-exempt conduit bond authority, statewide C-PACE administration, and a catalytic lending facility (the C3 Fund). Paired with engineering firm Buro Happold's technical modeling, the coalition is building a replicable framework for geothermal deployment, seeking to leverage federal tax incentives (IRA Sec 48) at scale.



"This grant marks an important step forward for Maryland communities. By helping develop a pipeline of clean energy projects, we're laying the groundwork for new jobs, lower energy costs, and stronger local infrastructure. The Municipal Investment Fund is about more than dollars — it's about giving communities the tools and partnerships they need to take control of their energy future."

— **Kathy Magruder**, Executive Director, Maryland Clean Energy Center

BUILDING BALTIMORE'S GEOTHERMAL MARKET

Laying the Foundation for Geothermal Growth. The MCEC-Baltimore partnership is focused on reducing the "soft costs" of clean energy construction through standardized policy tools and robust cross-agency alignment, with MCEC offering financing products like C-PACE and the C3 Fund to catalyze private investment. They are also focused on building the permanent workforce supply in Baltimore through dedicated workforce education and training.

- **Policy & Regulatory Framework:** This initiative builds upon the Maryland WARMTH Act (2024), which mandates gas utilities to pilot networked geothermal systems, creating a unique regulatory opening for large-scale decarbonization. In tandem, Buro Happold is benchmarking Baltimore's permitting processes against national best practices and producing actionable recommendations for the City's Department of Housing & Community Development and Department of Public Works. The coalition is also working with the International District Energy Association on governance models from jurisdictions that have successfully scaled geothermal.
- **Green Financial Products:** MCEC is developing standardized financing structures that can be replicated market-wide:
 - C-PACE financing for commercial geothermal retrofits repaid via property tax assessments over 10–20 years
 - Tax-exempt conduit bonds (MCAP) for large-scale municipal and institutional projects
 - C3 Fund (Climate Catalytic Capital Fund) provides catalytic predevelopment, bridge, and gap financing.
 - Residential incentive stacking templates combining Baltimore's geothermal tax credit with state MEA pilot grants (\$12,000/home) and federal ITC.
- **Workforce & Community Engagement:** Supported by the MIF grant, MCEC is connecting local HVAC contractors and mechanical tradespeople to geothermal installation opportunities. In priority neighborhoods like Tivoly Triangle, the Coldstream Homestead Montebello Community Development Corporation is providing embedded outreach to ensure residents shape project design and benefit from reduced energy costs.



ORIGINATING A FIVE-SITE GEOTHERMAL PIPELINE

With market infrastructure taking shape, MCEC and Baltimore are actively screening, modeling, and advancing five geothermal projects. MIF funding enabled MCEC to retain Buro Happold, a leading EPC firm, for technical feasibility and lifecycle cost analyses, and to coordinate the multi-stakeholder partnerships driving each anchor project. Key decisions on ownership, technology, and revenue are in progress, and targeted capital would accelerate these projects toward bankability.

Tivoly Triangle Eco-Village | 101 Net-Zero Affordable Homes

A local developer is building 101 single-family and duplex homes on previously demolished lots in a priority community marked by historic disinvestment and high vacancy. American Rescue Plan Act (ARPA) funds have already been secured for neighborhood infrastructure upgrades. Dandelion Energy determined that standalone ground-source heat pump (GSHP) systems are more cost-effective than a networked approach at the site's 250 to 300-ton demand scale and is completing system engineering for each unit. Meetings with MEA uncovered a \$12,000/home pilot incentive for geothermal adoption, and the developer and MEA are now in direct contact to proceed.

- **Capital Stack:** \$25M total project cost leveraging MEA's \$12,000/home pilot incentive, Baltimore's geothermal tax credit, ARPA infrastructure funds, and IRA Section 48 ITC (~30–50% of total costs).
- **Revenue Streams:** Homeowner energy cost savings of 30–50% vs. conventional HVAC, with mortgage-integrated financing reducing upfront costs.
- **Investment Readiness:** Advanced Predevelopment. Dandelion Energy is completing system engineering while the Baltimore Planning Commission review is underway. With developer-MEA funding discussions active, additional capital would help finalize engineering and close the affordability gap for priority community residents,

Harborplace Redevelopment | District Thermal Energy Network

MCB Real Estate is leading a \$900M mixed-use redevelopment on Baltimore's Inner Harbor waterfront. Voters approved the necessary rezoning in November 2024, with construction targeted for fall 2026. The coalition is evaluating a low-temperature ambient-loop thermal energy network that would capture waste heat from the National Aquarium and nearby municipal sewer infrastructure, which serves roughly one-third of the city's total capacity. Evergreen Energy, the developer behind San Francisco's Mission Rock waterfront thermal network, has been introduced to the project team to explore what a similar model could look like in Baltimore.

- **Capital Stack:** \$100M estimated geothermal component with potential sources including municipal revenue bonds, MCEC conduit bonds, IRA Section 48 ITC via Section 6418 transferability, and developer equity.
- **Revenue Streams:** Thermal energy tariff priced at or below current BGE heating costs, eliminating fuel price exposure for tenants.
- **Investment Readiness:** Market-Scale Feasibility. Buro Happold is modeling capital and operating expenditures vs. standalone air-source systems, and the team is in early discussions with Evergreen Energy. Predevelopment funding would accelerate the financial modeling and stakeholder alignment needed to finalize the capital stack.

Municipal Facilities | Police Stations & Baltimore Sun Building

There are three additional municipal sites that would use IRA Section 48 ITC via direct pay (Section 6417) for tax-exempt city ownership, stacked with MEA Clean Building Grants and city capital budget. These projects are still undergoing feasibility assessments.

IMPACT & NEXT STEPS

The Strategic Gap

The work in Baltimore is proving that thermal energy networks can be a centerpiece of urban revitalization. By focusing on bankable transaction packages and identifying project champions within city agencies, MCEC is ensuring these projects move from the planning stage to construction.

- The Last Mile: To unlock the \$121M pipeline, MCEC is seeking targeted predevelopment capital to complete lifecycle cost analyses, finalize tariff design, and resole ownership structures before active design windows close.
- The Multiplier Effect: Every dollar of predevelopment support pulls through federal ITC incentives, state grants, and private debt and equity. MCEC's conduit authority and C-PACE administration further reduce the cost of capital for projects that reach financeability.
- Urgency: The MEA pilot incentives and the WARMTH Act are creating a time-limited convergence of policy and funding that this pipeline is positioned to capture.

A Replicable Model

The financial templates, governance frameworks, and permitting recommendations developed through this grantee are designed to apply beyond Baltimore. Together they form a repeatable playbook for geothermal deployment in legacy cities.

This case study was funded through the Municipal Investment Fund, a partnership between ICLEI USA and CGC to support local governments, Tribes, and their partner not-for-profit organizations develop public-private partnership plans that can accelerate the deployment of capital to sustainable energy projects.

