INVESTING IN ENERGY SECURITY FROM THE GROUND UP.

A multi-stage capital stack to derisk and scale geothermal exchange networks across low income communities in the United States.

THE PROBLEM

Communities across North America are facing a dual energy crisis: one of **climate**, and one of **energy affordability**.

The United States remains one of the world's largest emitters, producing over 6 billion metric tons of greenhouse gases annually, with decisions that carry global consequences. Yet federal support for clean energy is rolling back, placing mounting pressure on states, cities, and private actors to deploy proven, scalable solutions. The path to decarbonization has never been more uncertain.

This is not just an environmental challenge. It is increasingly a household one. **Nearly one in three Americans struggles to afford their energy bills**, with low-income households facing energy burdens up to three times higher than the national median. As electricity demand rises, driven by trends such as data center expansion and electrification, these costs are expected to increase further. The question is no longer whether energy systems need to change, but how to do so without deepening inequity.

A critical insight lies in where energy costs originate. Heating and cooling account for roughly half of building energy use, representing a significant and addressable share of both emissions and household expenses. Proven technologies exist to tackle this, particularly geothermal heat pump systems, which offer highly efficient, low-emission heating and cooling.

However, despite their technical maturity, geothermal systems remain underdeployed. High upfront capital costs, long payback periods, and subsurface uncertainty make these projects difficult to finance. The technology works, but the financial model does not.

GeoServe is designed to bridge this gap. By rethinking the capital stack and risk allocation, it aims to make geothermal infrastructure investable at scale, delivering lower energy costs for communities, meaningful emissions reductions, alignment with evolving policy landscapes, and sustainable returns for investors.

OUR SOLUTION

GeoServe introduces a multi-stage capital architecture designed to unlock district-scale geothermal heating and cooling in the United States. The model operates in three stages:

First, GeoServe deploys exploration capital (GeoEXP) to de-risk subsurface conditions, develop site plans, and secure offtaker commitments before any major capital is deployed.

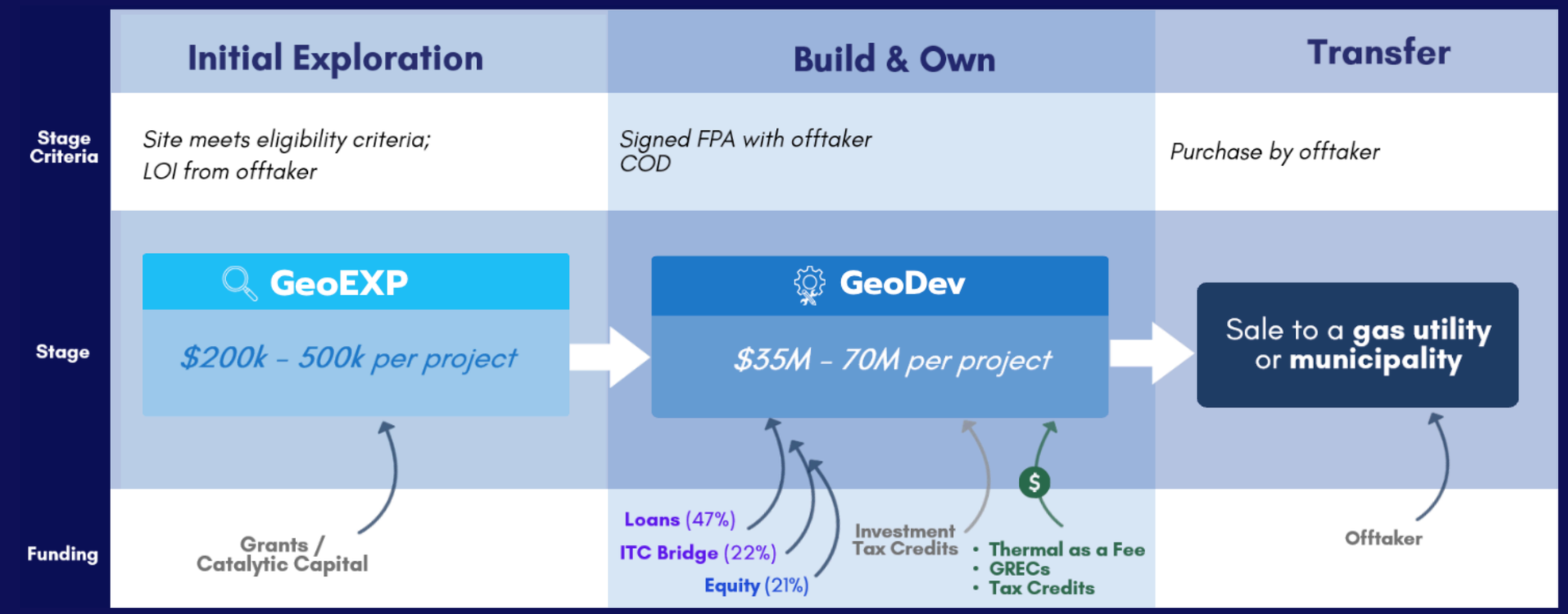
Second, the fund moves into construction and ownership (GeoDev), financing each project through a layered stack of debt, ITC bridge loans, and private equity.

Third, completed and stabilized assets are transferred to a gas utility or municipality through a contracted Build-Own-Transfer pathway, recycling capital back into the fund for future deployments.

By separating subsurface exploration risk from construction and operating risk, aggregating drilling demand, and structuring projects as diversified Special Purpose Vehicles (SPVs) under a parent infrastructure fund, GeoServe transforms fragmented geothermal developments into a scalable, portfolio-based infrastructure yield strategy.

The model layers thermal energy-as-a-service revenue, IRA tax credits, and public incentives to lower capital intensity, while the BOT structure enables long-term municipal ownership, aligning investor returns with durable community benefit.

FUND STRUCTURE



GeoExp:

Site validation and planning.

- *Develop site plans*
- *Test wells/Thermal Modeling*
- *Borefield sizing*
- *Developing an open-source data platform*

GeoDev:

Constructing and operating the project for 5 years, with a phased approach..

- Constructing:
  - Boreholes and thermal resource
  - Distribution system
  - End-user systems
- Scaling to the surrounding area
- Operating each phase for 5 years before sale

Transfer:

Phased sale to the designated offtaker.

ADDRESSING THE GAP

The technology works, but it hasn't scaled yet because:

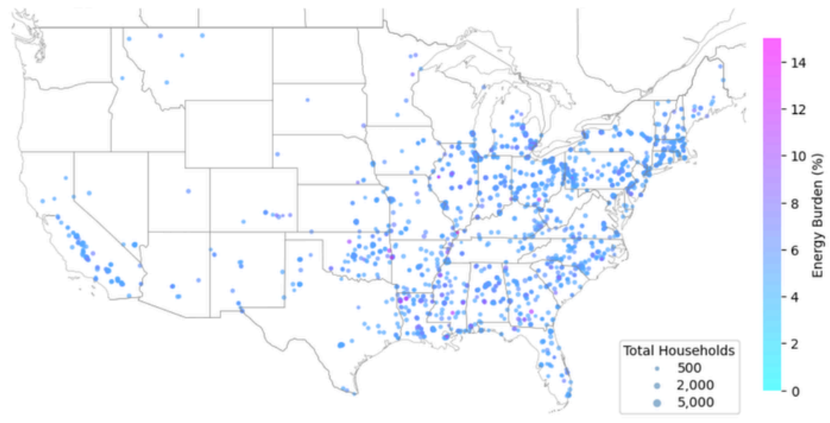
- High Upfront Capital
- Subsurface Uncertainty
- Limited Knowledge Sharing
- Low Community Awareness

The GeoServe Model directly addresses these risks.

THE RISK	THE SOLUTION	THE RESULT
High Upfront Capital & Investor Risk	Catalyzing Public Incentives Aggregation of Drilling Contracts Separate SPV's with Offtake Partnerships	Investable Returns
Subsurface Uncertainty	Strategic Location Selection	Validated Sites
Limited Knowledge Sharing	Open Access to Geothermal Data	Smarter with every Deployment
Low Community Awareness	Community Engagement Framework	Communities as Partners

OUR SOLUTION

We have identified 3,509 initial target regions that will drive the greatest impact. These regions were selected based on the following characteristics:



High Energy Burden | **Low-Income Populations** | **Population-Dense Regions**

$4.2 B is spent on **heating and cooling** by residential & commercial customers in these regions each year.

As the fund grows, geothermal TENs mature, and CapEx decreases, the fund can expand to lower-density regions with grid stability and energy affordability challenges.

Regional Prioritization
Begin deployment in regions with favorable geology, statewide incentives, motivated offtakers.

Density-First Scaling
Begin scaling in regions with higher building density to maximize profits in early phases.

Thermal Load Diversity
When possible, colocate projects with waste heat sources like water treatment

Need-First Deployment
Prioritizing low-income communities maximizes impact and unlocks additional funding.

Stacking Infrastructure Upgrades
When possible, colocate projects with waste heat sources like water treatment

PILOT LOCATIONS

Regional Scaling allows for the establishment of master service agreements to reduce drilling costs and construction delays. Maryland is the pilot region due to need, incentives, strong offtaker, and drilling partnerships. The initial pilot will include 4 pilots.

GeoServe will expand to other strong-fit regions next IL, NJ, NY, MA, VA, and CO.

	MARYLAND
Weather	Balanced heating & cooling loads
Financial Incentives	Strong GREC market, revenue 15-30 times VCM prices*
Political Support	WARMTH Act incentivizing geothermal and mandating utility pilots.
Potential Offtakers	Gas Utilities (mandated pilots)
Impact	Low-income communities with high energy burden.
Drilling Partners	Chesapeake Geosystems

FLAGSHIP PROJECT

Baltimore, MD · Pleasant View Gardens

IMPACT:

Begin with the **highest need** community in our pipeline.

8% **ENERGY BURDEN** with 4.5% of income spent on heating and cooling.

$25k **MEDIAN INCOME** with 66.5% of residents below the poverty line.

INVESTABILITY:

Demonstrate **strong returns** to fuel growth.

High Revenue · Invested Offtaker · Cost Sharing Strategies

INNOVATION:

Pilot **innovative efficiency strategies.**

1st networked **geothermal system** in the U.S. to use **data center waste heat** to heat residential neighborhoods.

ADDITIONAL PILOT REGIONS

Baltimore, MD *Greater Rosemont*

ENERGY BURDEN	MEDIAN INCOME
7%	**$37k**
3.9% heat/ cool burden	Urban, High subsidy eligibility

OFFTAKER: **BGE Utility**

Waste Heat: WWTP

Sewer upgrade co-build

Federalsburg, MD *Downtown*

ENERGY BURDEN	MEDIAN INCOME
9%	**$35k**
5% heat/ cool burden	Rural, high subsidy eligibility

OFFTAKER: **Chesa-peake Utilities**

Waste Heat: WWTP + Industry

Flood Mitigation Projects

Crisfield, MD *Downtown*

ENERGY BURDEN	MEDIAN INCOME
5%	**$50k**
2.7% heat/ cool burden	Rural, high subsidy eligibility

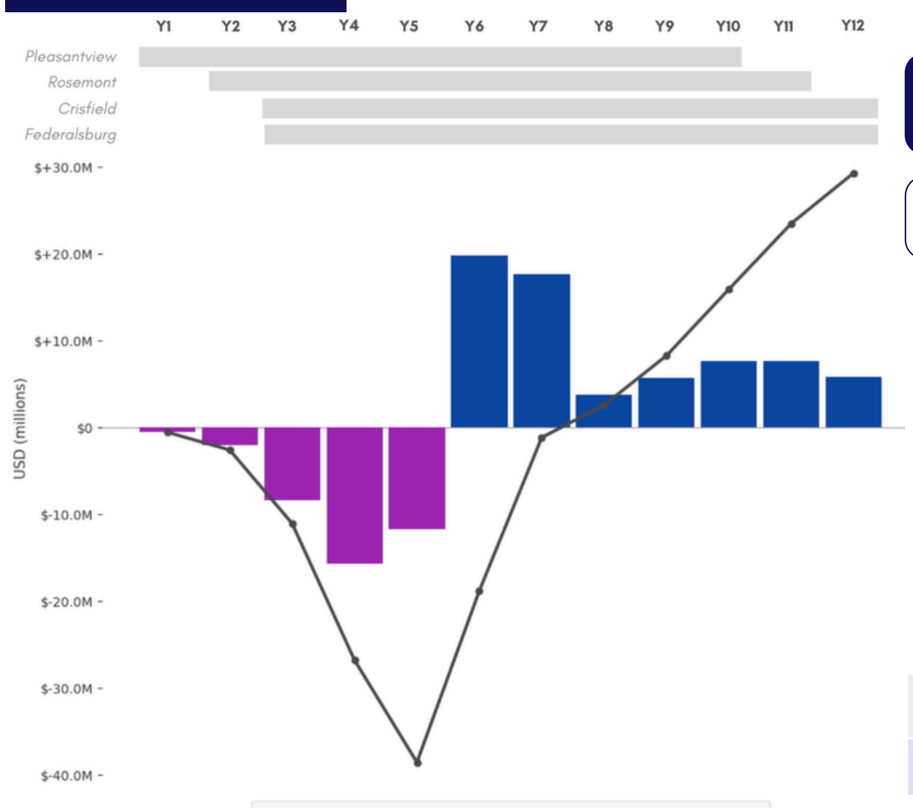
OFFTAKER: **Crisfield PU**

Waste Heat: WWTP + Industry

Funded Sewage Projects

Cost-Cutting Strategies: *Waste heat strategy* · *Piping Cost Sharing Strategy*

CASH FLOW



INVESTABILITY:

The fund demonstrates strong infrastructure-grade returns.

14.9% *After-Tax IRR 12-Year Horizon*

4 *Unique SPVs*

Equity Required: **$40.0 M**

MOIC: **1.75 x**

IMPACT:

The fund drives impact for both people and the planet.

$6.7 M in energy **cost savings** per yr

60k tons **CO_2e** Emissions Reduction

RESILIENCE:

The multi-SPV structure creates resilience to single project failure.

	Pleasantview Fails	*Rosemont Fails*	*Crisfield Fails*	*Federalsburg Fails*
Fund-Level IRR	**10.7%**	**14.1%**	**14.4%**	**14.2%**

Key Assumptions

SITE & SCALE		REVENUE	
Households Served	3,591	GREC Price	$82/MWh
Area	0.7-1.5 km^2	Residential Fee	45% of heat/cool costs
Commercial Use	0.03-0.06 tbtu	Commercial Fee	55% of heat/cool costs
Residential Use	0.03-0.06 tbtu	Fee Escalator	1.5%
TAX & INCENTIVES		**CAPITAL STRUCTURE**	
Effective Tax Rate	21%	Total CapEx	$216M
ITC Monetization	90c per $	Total Investor $	$40.0M
Bonus depreciation	100%	Base Loan Rate	6.5%
Federal ITC	30% base + 10% low income + 10% domestic content	% GeoExp Convertible Capital	50%
ITC Bridge Loan	10% insurance, 10.5% interest rate, 70% ITC	Loan Term	Construction to Term Loan; 3-yr const; 5-year balloon

RISK MITIGATION

Risk	Impact	Mitigation
ITC Credits at Risk	○ ● ○	ITC locked in at financial close via transfer agreement
GREC Market Decline	● ○ ○	Maryland's WARMTH ACT mandates utility purchase of GREC
Construction Timeline Delays	○ ● ○	Phased deployment & master service aggreements
System Efficiency Under-performance	● ○ ○	Geo-EXP validates subsurface & thermal balance before construction capital
Residential area Approval	○ ○ ●	Community engagement partnership with HEET
Utility Offtaker Delays	○ ● ○	Forward Purchase Agreement (FPA) signed before Geo-DEV

IMPACT

SDG	Intended Impact	Metrics
7 AFFORDABLE AND CLEAN ENERGY	7.1 improve **affordability and reliability of energy** in energy-insecure communities; 7.2, increase share of **renewable energy**	Dollars/month in energy cost reductions; SAIDI/SAIFI index improvement; GHG emissions avoided
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	By replacing conventional HVAC systems with high-efficiency geothermal technology, the project directly supports infrastructure upgrading for sustainability and improved resource-use efficiency (9.4).	Peak electricity demand reduction (%); GHG emissions a
13 CLIMATE ACTION	Heating and cooling make up ~40% of domestic energy use. District-scale geothermal for heating and cooling can lead to **5-15% carbon footprint reductions**.	GHG emissions avoided (CO_2 equivalent)
3 GOOD HEALTH AND WELL-BEING	By lowering energy costs and strengthening HVAC reliability, geothermal systems help **protect vulnerable populations** from extreme heat and cold, reducing preventable death and illness (3.d).	# of heat and cold-related deaths/illnesses prevented (estimated)
1 NO POVERTY	Energy costs can burden low-income individuals (~8+% of salary spent on energy). Sustainable investment strategies to deploy geothermal in low-income communities can **create jobs and reduce economic stress** (1.5).	Dollars saved / month on energy; # of jobs created

Impact across the value chain:

Community Members
Lower community energy costs and strengthen energy reliability in areas vulnerable to outages and peak demand stress.

Municipality
*Municipalities are charged partially for peak energy demand. Geothermal can **reduce peak demand by 10-30%** in regions with cooling needs.*

Grid Operators
Geothermal deployment reduces peak demand, lowers capacity procurement needs, and strengthens system reliability during extreme weather events.

Investors
GeoExp and aggregation of equipments under GeoDev derisks the geothermal investment for the investors.

Environment
5-15% carbon footprint reductions in regions where geothermal heating and cooling is deployed.

POTENTIAL INVESTORS

Grants U.S. Department of Energy · Maryland Energy Administration · Geothermal Technologies Office · Maryland Department of Commerce

Catalytic Capital Trellis Climate · Breakthrough Energy

Loans U.S. Department of Housing and Urban Development · Community Preservation Corporation · J.P.Morgan · Maryland Clean Energy Capital · Self-Help Ventures Fund

Private Equity Generate · Greenbacker Capital · Reinova Partners

Offtaker bge · ComEd, An Exelon Company · Metropolitan Water Reclamation District of Greater Chicago · Dominion Energy