Charting a Pathway to Maryland's Equitable Clean Energy Future

Electrification and Building Upgrades for Low-Income Residences

Report
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Report prepared by

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MARYLAND CHAPTER

Contents

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A family cooks together on a modern induction range. *Getty Images*

Introduction

Maryland has cast itself among the nation's climate leaders through its passage of the Climate Solutions Now Act (CSNA) and a greenhouse gas (GHG) reduction goal of 60 percent by 2031. Equitably electrifying the state's building sector is a pillar to achieving the state's climate goals and of CSNA.

As Maryland begins investing in a cleaner, more efficient building sector, it should prioritize low-income households, which make up 20% of all households in the state or approximately 450,000 homes (using criteria of 200% Federal Poverty Level which in 2022 was $55,000 annual income).[i] Yet, Maryland's existing housing assistance and energy policies are disparate and uncoordinated, leaving the state's low-income residents underserved and putting the state at risk of not reaching its climate goals in an equitable manner. Without streamlining health and safety repairs, weatherization, and electrification in the homes of low-income residents, Maryland risks deepening housing safety, health, and financial disparities for households that are unable to afford necessary upgrades.

Recent unique and unparalleled streams of federal funding, including the Inflation Reduction Act, offer an opportunity for Maryland to kickstart an innovative program to upgrade, repair, and electrify Maryland's low-income homes simultaneously. This funding, combined with other federal and state sources, presents $2 billion in funding opportunities for whole-home repairs in Maryland (Appendix A). Utilizing these funds to upgrade low-income homes is just one important step to invest in environmental and social justice (ESJ) communities that have been historically underserved and overburdened.

> ***Equitably electrifying the state's building sector is a pillar to achieving the state's climate goals and of CSNA.***

This report begins by assessing four main sets of housing- and energy-related policies, programs, and opportunities that currently exist in Maryland, and identifies barriers to implementation and openings

for improved collaboration. It then moves to explain an alternative scenario, where the current disparate programs are streamlined through a one-stop-shop whole-home retrofit program that addresses health and safety repairs, as well as energy and electrification upgrades. This report then lists significant state and federal opportunities for funding such a program–$2 billion in the next decade–and lists specific agencies and departments tentatively responsible for each funding stream. Finally, specific recommendations are presented for each branch of Maryland's state government in order to create and fund a whole home retrofit program and reduce energy burdens on low-income Maryland households in the long-term.

Maryland should take four steps to equitably decarbonize its building sector and fund safer, healthier, more resilient homes for Maryland's low-income residents and families:

1. Set a 2030 goal with targets for decarbonizing Maryland's low-income homes;
2. Implement a "whole-home" initiative that overcomes barriers to upgrading low-income homes and prioritizes electrification;
3. Align applicable federal, state, and additional funding sources to a whole-home upgrade and electrification program; and,
4. Establish long-term utility planning to manage the transition of Maryland's housing sector away from fossil fuels and reduce energy burdens.

Current Maryland policies impacting energy insecurity and climate goals

Sustained inequities in Maryland's housing policies directly impact the housing conditions for residents historically disadvantaged by environmental, economic, and social programs and practices. These groups include low-income environmental and social justice communities and minority groups such as people of color, Black, Hispanic, Latinx, Asian-American, and Indigenous communities. An example of these disadvantages are Maryland's *energy burdens*, the percent of income a household pays for energy bills. Energy burdens for low-income Marylanders are *six times* those of the average Marylander; low-income Maryland residents spend on average 12% of their income on energy bills compared to 2% for Marylanders as a whole.[ii]

Low-income residents typically rent or own older housing that is less efficient, healthy, and safe. Heating and air conditioning systems are often outdated and inefficient, contributing to poor air quality due to incomplete combustion or improper venting. Poorly sealed building envelopes introduce pests, moisture, and air pollution. Leaky windows and poor insulation expose residents to drafts and extreme temperatures. Unhealthy housing contributes to a variety of chronic diseases, including asthma, and can increase vulnerability to other diseases, such as COVID-19.[iii] Indoor and outdoor gas leaks and other sources of local air pollution exacerbate these adverse health impacts.[iv]

While several state working groups are formulating options to move the state to clean energy sources, the low-income residential sector is still on a muddled "default path" made up of four mis-aligned components to address housing health and safety issues and energy burden:

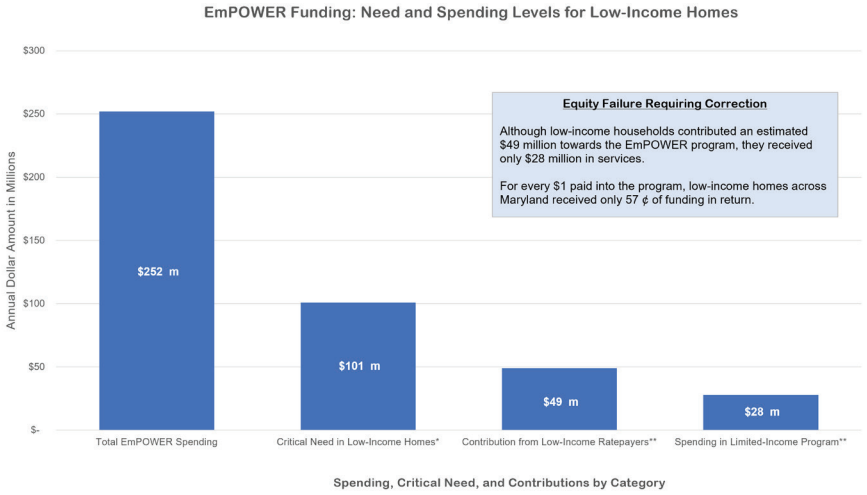
- **Weatherization and appliance upgrades.** The Department of Housing and Community Development (DHCD) administers two state-run EmPOWER programs that provide weatherization and appliance upgrades. The programs are funded by gas and electric customers through energy efficiency and conservation surcharges on utility bills. EmPOWER's FY2021 spending for low-income programs was $23 million, about nine percent of a total program spend of $250 million.[v]

- **Bill payment assistance.** Maryland relies on "bill assistance" as the principal means to reduce energy cost burdens. This assistance is provided through two programs administered by the Office of Home Energy Programs (OHEP) of the Department of Human Services (DHS) that provided $103.8 million in bill payment assistance benefits in FY2021.[vi]

- **Accelerating spending for gas pipeline infrastructure.** Maryland's Commission on Climate Change found that gas use in buildings must decline 50-100% by 2045, as the sector decarbonizes.[vii] When faced with the reality that the state will shift away from gas usage in buildings, it would be prudent for Maryland's utility regulators to re-examine and reduce ratepayer spending on new gas infrastructure projects. However, regulators have given Maryland's gas utilities the green light to deepen investments in gas infrastructure replacement and expansion. For example, Maryland's Strategic Infrastructure Development and Enhancement (STRIDE) program provides a financial incentive to utilities to make large, capital-intensive replacements of the gas distribution system. Over the next two decades, the estimated capital spending in STRIDE is $4.764 billion,[viii] borne by a shrinking number of gas ratepayers. The 42% of low-income households in Maryland living in residences heated by gas are on a course to bear the brunt of the state's stranded gas distribution assets and rising gas prices.[ix]

- **Legacy workforce and limited contractor pipeline.** Home upgrades and electrification present enormous local job growth opportunities. However, Maryland has not yet scaled or diversified its workforce to seize this opportunity.[x] The state does not have a centralized energy efficiency jobs training and recruitment program. This is even more pronounced given the need to upskill in more comprehensive energy efficiency and decarbonization measures, such as building electrification.

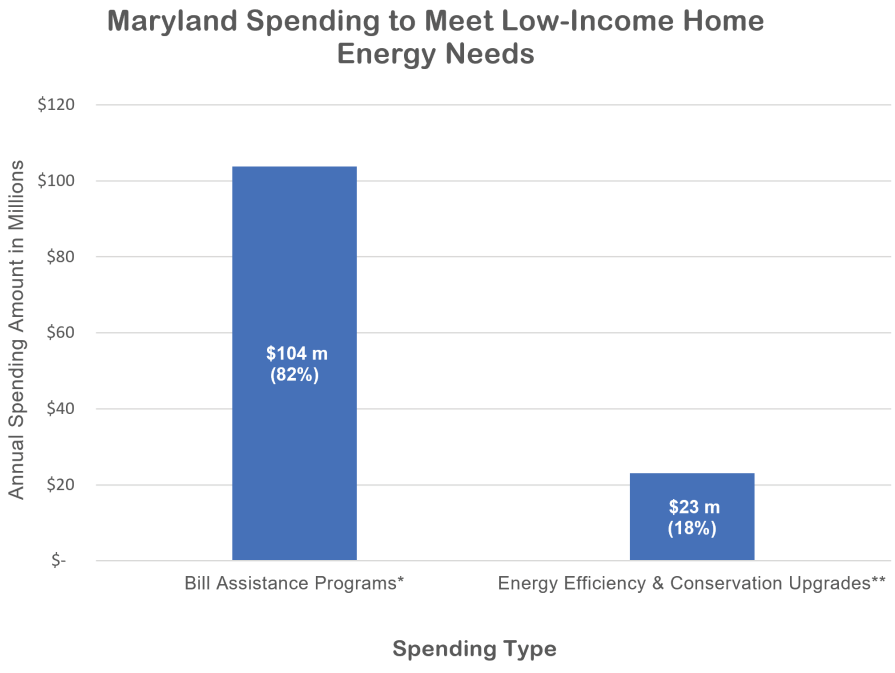
Low-income homes are being left behind by this default approach in several ways:



- **Disproportionate underservice of low-income households.** With an annual budget of $250 million, EmPOWER is the state's largest vehicle for energy efficiency and decarbonization.[xi] However, a recent study commissioned by the Department of Housing and Community Development (DCHD) found that low-income households do not receive benefits proportional to what they pay, with low-income households contributing $50 million per year, with only $28 million in spending on Limited-Income programs.[xii] This is predominantly due to the low participation rate of eligible households. Common challenges to serving low-income households include:

- **Project Deferrals –** Efficiency and weatherization retrofits to a home may be deferred if the property has health and safety issues – like lead paint or mold – or requires other structural repairs.[xiii] Between January 2018 and March 2020, 30% of inbound customers were deferred, largely due to required repairs, from EmPOWER's low-income weatherization program for single family homes.[xiv]
- **Community Access and Trust –** Many low-income energy efficiency programs suffer from challenges of awareness and trust, particularly among households that could most benefit from housing retrofits. DCHD has experienced challenges broadening awareness: 75% of its FY20 single family applicant pipeline were repeat applicants, who were familiar with EmPOWER or have had work done before.[xv] A fundamental change in program design, outreach and community engagement is needed.
- **Split Incentives for Renters and Building Owners –** Approximately 60% of low-income households in Maryland are renters,[xvi] and recruiting participants is particularly challenging given the age old "split incentives" for tenants and building owners. Renters have limited control over when and if home upgrades happen, despite typically paying monthly utility bills. Conversely, building owners have limited incentive to invest in energy efficiency or other retrofits since tenants will realize the energy bill savings.

- **Prioritizing short-term assistance over transformational measures –** Of Maryland's expenditures on low-income energy programs, approximately 18% is directed toward energy efficiency programs and 82% toward bill assistance.[xvii] Both forms of assistance are critical and must be linked, but this imbalance results in a lack of prioritization for bringing energy efficiency, clean space heating, and clean water heating technologies to these neighborhoods – solutions that can bring long-term comfort, economic and health benefits and ultimately reduce some of the need for bill assistance.



* Reported OHEP spending on bill assistance programs for homes at or below 175% FPL in FY 2021
** Reported EmPOWER program spending on homes at or below 200% FPL in FY 2021

The Alternative: Whole-home retrofits delivered via one-stop platforms with flexible funding

Maryland's housing and energy agencies, including the Department of Housing and Community Development (DHCD), have considerable experience rectifying the substandard housing conditions that low-income households can face. The agency runs programs providing weatherization and energy efficiency services.[xviii] Broad consensus supports a **one-stop-shop, whole-home approach** (also referred to as the "Initiative" in this report) whereby four sets of interlinked services are provided as needed:[xix]

- **Health and safety** services include toxic chemical removal (e.g., lead, mold, and asbestos), fixing broken windows, repairing roofs and wiring, and improving indoor ventilation. These common interventions are required for habitable, safe households and are often referred to as pre-weatherization measures.
- **Weatherization and energy efficiency** services include building envelope upgrades such as improved insulation, better windows, and tighter air sealing to reduce energy use.
- **Appliance electrification** replaces fossil fuel appliances such as gas stoves and furnaces with efficient electric alternatives such as induction stoves and air source heat pumps that reduce indoor air pollution, emissions, and overall energy use. Small building electrification requires the adoption of four main technologies: heat pump heating/cooling systems, heat pump water heaters, electric cooktops/ranges, and upgraded breaker boxes.
- **Energy assistance** is necessary to ensure households have access to affordable, renewable electricity. This can include limits on energy burdens (the portion of household income that goes to energy expenses) like "percentage of income payment programs,"[xx] utility bill assistance, rooftop solar programs, and access to community solar.

Unified platforms across different housing and energy programs are an essential part of a successful whole-home approach. A robust one-stop platform, administered and managed by one coordinating organization can weave together the various existing home and energy upgrade programs and streamline the application process, ensuring that each household receives all available incentives. The managing entity can then sequence service delivery effectively, addressing moisture/mold and structural issues first so that insulation and weatherization can follow, preventing residents from having their homes deferred for energy efficiency projects. This kind of approach enables collaborative work across otherwise siloed agencies, supports owners and residents through the process, and ensures successful implementation. This service model is growing with increasing popularity across the United States. A list of similar programs can be found in Appendix D.

As detailed below, DHCD should be the agency to lead and coordinate the robust "one-stop shop" program. As part of its program administration, the

A woman looks over a newly installed electric hot water heater.
Getty Images

agency should contract with community outreach specialists and community navigators. These individuals can facilitate community outreach and refer clients to the program. Critically, community outreach specialists must be able to speak the languages commonly spoken in neighborhoods where they do their engagement work.

Flexible and sufficient funding is also key to a successful whole-home approach. The unified platform needs to be able to leverage and combine funding from various sources to make whole-home retrofit components available at the lowest or no cost to eligible participants.

On a project basis, the suite of measures required to upgrade lower-income homes has an estimated incremental cost total of $30,000 for a single-family home (Appendix C). The measures include: efficiency investments including duct sealing and ceiling insulation, prerequisite structural repairs, required breaker panel and electrical upgrades. Costs also include the incremental costs of opting for efficient air source heat pumps for heating and cooling, heat pump water heaters, and induction stoves, versus gas appliances when equipment reaches end of life. The estimate assumes a portion of the whole-home retrofits include healthy and safety improvements, such as lead abatement, asthma remediation, or aging in place (grab bars, etc.) Per-unit retrofit costs may be lower for multi-family homes.[xxi]

The cost of whole-home retrofits will vary widely based on the work that needs to be done to make the home healthy, safe, efficient, and electric. The cost will also vary based on the size of the home and its age. Maryland will need to conduct a detailed housing stock assessment to understand the full breadth of work needed to upgrade the low-income housing sector in order to determine the state's funding need.

A coordinated program of this scale could link directly to community partnerships and workforce development, including in and especially for ESJ and BIPOC communities. Community engagement and partnerships can provide feedback on program design and bridge the trust gaps in hard-to-reach communities.[xxii] Workforce training programs can utilize federal and state dollars to recruit and train a skilled, diverse workforce, invest in the participants' long-term career paths, and support local small businesses and contractors.

Finding ways to incentivize or require building owners to upgrade and electrify their properties is difficult, but important, given that 60% of low-income households in Maryland are renters.[xxiii] Without proactive policies, housing intervention programs risk raising rents, displacing tenants, raising utility bills, and decreasing pathways to homeownership for low- and moderate-income households.[xxiv] On the other hand, not reaching renters risks leaving many low-income and low-wealth households with inefficient energy systems dependent on expensive fuels and with unaddressed health and safety issues in their homes.

Other housing programs such as the DOE WAP program and Maryland's lead abatement programs include examples of policies to protect tenants that should be taken as a model. The specifics of electrification and the scale of this Initiative will create unique challenges though that will require meaningful engagement with a diverse area of stakeholders.

An in-depth discussion of the challenges and opportunities is beyond the scope of this report. Legislators, advocates, and state officials should explore a variety of potential solutions including incentive programs or forgivable loans for building owners, on-bill financing, weatherization financing direct to tenants, energy efficiency requirements for mid- to large- multifamily buildings, and affordability measures to protect tenants from rental and energy bill hikes.

Funding a Whole-Home Retrofit Program

Funds identified for the Initiative are divided into two categories: 1) federal funding available from the Inflation Reduction Act (IRA), Bipartisan Infrastructure Law (BIL), and annual grants for housing programs; and 2) state funding sources already in play in Maryland to promote energy efficiency. **In total, this report estimates approximately $2 billion in funding to the state of Maryland that can support the Initiative in the next decade.** The funding sources listed in this section provide insight into some of the most significant flexible, weatherization, and electrification funding opportunities available to Maryland. However, numerous additional federal, state, and innovative funding sources exist. Maryland's state government is encouraged to continue seeking out these funding streams.

This section provides an overview of federal and state funding categories and Table 1 presents specific funding sources, estimated funding amounts, and coordinating departments. Appendix A describes these programs in detail. Though these programs will not meet the entirety of the need for low-income homes, they will help kickstart the program and make significant headway into the needed transition. Appendix B: Additional Funding Sources provides insight into innovative funding sources, including utilizing healthcare system dollars and Medicaid funding, that have been explored in other states and ideas on how they may be tapped in Maryland.

Federal Housing Funding

The past two years have seen two landmark laws pass Congress in the form of the Bipartisan Infrastructure Law (BIL, though also referred to as the Infrastructure Investment and Jobs Act or IIJA), and the Inflation Reduction Act (IRA), which will provide Maryland with over $250 million toward home upgrades, weatherization, and electrification through program funding and incentives. Competitive grants from the EPA for investments in low-income communities are also significant, and a concerted effort by Maryland agencies and communities could yield hundreds of millions in additional funding for low-income households.

A child plays with her food cooked on a modern induction cooktop. *Getty Images*

Additionally, every year, the federal government provides substantial funding to housing rehabilitation and energy programs that are implemented at the state level. The funding sources included in Table 1 are the formula grants Maryland receives annually, including for the Department of Energy (DOE) Weatherization Assistance Program (WAP), as well as competitive grants for flexible funds Maryland has received through the IRA. We've also included an amount of program funding that can

be reasonably applied to the Initiative from the Department of Health and Human Services (DHSS) Low-Income Energy Assistance Program (LIHEAP).

Altogether, federal programs could unlock more than $670 million in funds Maryland can use over the next decade to incentivize electrification, provide resources for safety and health repairs, and create platforms for relevant workforce training (Appendix A). Adopting a whole-home strategy across agencies can ensure coordination of these funds to increase flexibility of programs and meet long-term needs.

In Maryland, both MEA and DHCD will be recipients of the bulk of this funding and would be responsible for ensuring the funds are funneled toward the Initiative appropriately. When tapping into federal funding, the agencies will also be responsible for strategically stacking and braiding funding for optimal usage, including understanding limitations of funding buckets and recognizing when funding sources cannot be used together.

State Housing Funding

Currently, housing programs in Maryland are operated by different agencies which can create barriers to coordination. By bringing these programs and their funds into a singular whole-home program, these funds can be optimized, and services can be efficiently coordinated.

EmPOWER, the ratepayer funded efficiency program operated by state utilities and DHCD, could fund approximately $1 billion toward the Initiative over the next decade if EmPOWER meets the challenge of increasing its support of low-income programs to match the federal Justice40 commitment of 40% of benefits going to disadvantaged communities.

Additionally, substantial funds will need to be raised by DHCD Sustainability Bonds, which have previously been used in the state, to raise flexible spending funds. These can be coordinated with the new Climate Catalytic Fund that will serve as the state "green bank."

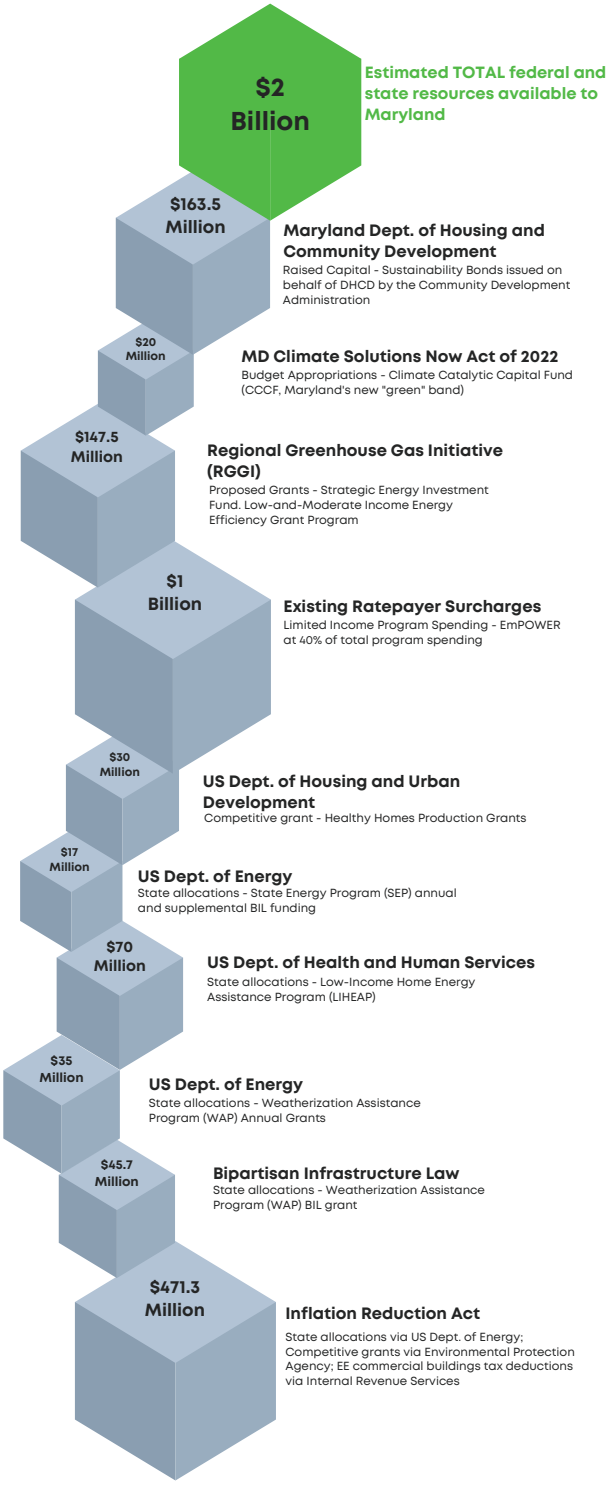


Table 1: Significant funding opportunities for a state-wide weatherization and electrification

For information on the programs and process for estimating cumulative funding figures, please see Appendix A.

Source	Program	Estimated cumulative funding over 10 years	State agency responsible for directing funding
FEDERAL SOURCES			
Inflation Reduction Act/ US Dept. of Energy (DOE)	State Allocations – Home Efficiency and Home Electrification Rebates	$136,800,000	MEA develops state program applications, incl. program guidelines
Bipartisan Infrastructure Law/ US DOE	State Allocations – Weatherization Assistance Program BIL Grant	$45,700,000 (over 5 years)	DHCD operates program and can take steps to maximize effectiveness
US DOE	State Allocations – Weatherization Assistance Program Annual Grants (assume $3.5 million per year)	$35,000,000	DHCD to disburse funds and provide services
US Dept. of Health and Human Services (DHHS)	State Allocations – Low-Income Home Energy Assistance Program (LIHEAP) (directing 10% of assumed $70m per year)	$70,000,000	DHS and OHEP manage LIHEAP funds, would direct to DHCD for weatherization
Inflation Reduction Act/ US Environmental Protection Agency (EPA)	Competitive Grants – Environmental Protection Agency (EPA) including the Greenhouse Gas Reduction Fund, Climate Pollution Reduction Grants, and Environmental and Climate Justice Block Grants	$264,500,000	MD Clean Energy Center applies for funds from GHG Reduction Fund; Other agencies—MDE, DHCD, MEA— enable grant applications to support clean energy technologies in environmental justice communities.
Inflation Reduction Act/ Internal Revenue Service (IRS)	Estimated Cash Value – Energy-Efficient Commercial Buildings Tax Deduction (Section 179D) (estimated cash value for multifamily residence owners)	$70,000,000	Tax deduction processed by the Internal Revenue Service
US DOE	State Allocations – State Energy Program (SEP) annual and supplemental BIL funding	$17,000,000	MEA
US Dept. of Housing and Urban Development (HUD)	Competitive Grant — Healthy Homes Production Grants	$30,000,000	Various agencies and nonprofits
	FEDERAL SUBTOTAL	**$669,000,000**	

STATE SOURCES *existing & proposed*			
MD ratepayer surcharges	Limited Income Program Spending – EmPOWER at 40% of total program spending	$1,000,000,000	DHCD houses and administers EmPOWER's programs
Regional Greenhouse Gas Initiative (RGGI) auction proceeds largely	Proposed Grants – Strategic Energy Investment Fund Low-and-Moderate Income Energy Efficiency Grant Program	$147,500,000	MEA houses and administers SEIF funds
MD Climate Solutions Now Act of 2022	Budget Appropriations – Climate Catalytic Capital Fund (CCCF, Maryland's new "green" bank)	$20,000,000	MD Clean Energy Center administers the CCCF
Maryland DHCD	Raised Capital – Sustainability Bonds issued on behalf of DHCD by the Community Development Administration at approximately $16.4 million per year	$163,500,000	DHCD responsible for issuing and utilizing, potentially in collaboration with CCCF
	STATE SUBTOTAL	**$1,523,000,000**	
	TOTAL	**$2,000,000,000**	

Additional Funding Sources

To supplement the funds described above, Maryland will need to pursue additional resources to create program sustainability, flexibility, and fully address the health and safety needs that are prevalent in low-income housing and present barriers to completing other upgrades. Pathways for pursuing these funding streams in depth can be found in Appendix B: Additional Funding Sources, including identifying additional federal programs, state resources, and highlighting innovative pathways to using health sector funds to remediate hazards in homes. These funding streams are not included in the $2 billion identified in this section, but–if pursued–will make substantial contributions to upgrade low-income housing to electrification in the next decade and to improve housing conditions broadly. Though this report does not list funding potential for specific programs in that section, the report identifies over $750 million in funds that are expected to be available to Maryland over the next 10 years.

The proposed Initiative is envisioned as a major civic challenge to the whole of Maryland society. **To be successful, the Initiative will require participation by Maryland's investment, foundation, and corporate communities on a scale sufficient to harness significant amounts of private investment capital.**

Taking action to create safer, healthier housing and alleviate energy burden in Maryland

Retrofitting Maryland's low-income housing at scale requires advancing policies in four key areas. Maryland should: 1) set a 2030 goal with targets for decarbonizing Maryland's low-income homes; 2) implement a "whole-home" initiative that overcomes barriers to upgrading low-income homes and prioritizes electrification; 3) align applicable federal, state, and additional funding sources to a whole-home upgrade and electrification program; and 4) establish long-term utility planning to manage the transition of Maryland's housing sector away from fossil fuels and reduce energy burdens.

Below, this report has identified actionable next steps for the state executive and agency branches, the legislature, and the state's Public Service Commission (PSC) to develop a holistic whole-home retrofit program and reduce energy burden for low-income families.

1. Set a 2030 goal with targets for decarbonizing Maryland's low-income homes

Executive Action

Maryland should establish a clear building decarbonization goal for 2030 and interim targets, including how many residential and commercial buildings–and low-income homes–need to be decarbonized for the state to achieve its climate and equity goals. Low-income housing decarbonization targets can inform a whole-home retrofit program timeline. The 2030 goal can build on work already undertaken by the Maryland Climate Commission, which previously recommended providing energy efficiency retrofits to all low-income households by 2030.[xxxvi]

Other states have begun to lay out their own targets and goals. For example, in early 2022, New York Governor Hochul laid out a vision for 2 million climate friendly homes by 2030. This vision requires that one million homes be electrified and one million electrification-ready, and that 40% of the households participating in the program be low- and moderate-income (LMI) or from disadvantaged communities, about 800,000 households.[xxxvii]

2. Implement a "whole-home" initiative that overcomes barriers to upgrading low-income homes and prioritizes electrification

Legislative Action

With a goal and timeline in place to retrofit low-income households, a critical next step is to establish a "one-stop shop" for program implementation. **The General Assembly should pass legislation requiring DHCD establish a holistic, streamlined, coordinated "one-stop shop" retrofit program to deliver whole-home retrofits plus electrification.** The program could be housed within the existing Limited Income Energy Efficiency Program under EmPOWER Maryland, administered by DHCD. However, Legislation should make DHCD's role permanent in the EmPOWER Maryland program (currently authorized by delegation from the PSC), and direct DHCD to design the program to achieve targeted energy savings for low-income residents and to leverage multiple funding streams, including EmPOWER. Legislation must also provide resources and funding for community outreach specialists for the program, preferably those that can speak languages commonly spoken in neighborhoods where they do their engagement work.

3. Align applicable federal, state, and additional funding sources to a whole-home upgrade and electrification program

Legislative Action

Legislative reform is required for EmPOWER to adequately serve low-income ratepayers and align with climate goals. Three specific reforms can ensure that EmPOWER funds are deployed equitably and align with Maryland's climate goals include: 1) require that **no less than 40% of EmPOWER funds be directed to whole-home or whole-building retrofits in low-income**

communities; 2) **allow and encourage fuel-switching** from fossil fuels to electric appliance by requiring incentives for electrification beginning in 2024;[xxxviii] and 3) **phase out subsidies for gas appliances** in the EmPOWER program.[xxxix] The EmPOWER reform legislation HB 108/SB 524–passed but vetoed in the 2022 session[xl]–would likely achieve the 40% investment target above, if reintroduced and successful in 2023.[xli]

Executive and Agency Action

Utilize the Bipartisan Infrastructure Law and Inflation Reduction Act funds to advance whole-home retrofits and upgrade homes from fossil fuel to electric appliances. DCHD and MEA have central roles designing and deploying new federal funding for low-income households – in particular, from the Weatherization Assistance Program (WAP), Inflation Reduction Act Home Rebate Programs. These programs should be aligned by DHCD and MEA to support the Initiative through comprehensive retrofits low-income homes, including health and safety upgrades, energy efficiency, and beneficial electrification.

State agencies, supported by the Governor's Office, should look into feasibility and legal pathways of funneling additional state, federal, healthcare and private dollars toward a whole-home retrofit program. In addition to substantial potential funding from EmPOWER and federal funds, this report suggests the state look into additional funding sources, including from a DHCD Sustainability Bond, MEA's Strategic Energy Investment Fund, healthcare sector funding, and competitive federal grants, among other sources. Harnessing these additional funds is vital for the program's longevity and financial resilience, allowing program administrators to scale services and diversify funding sources. Opportunities laid out in this report have been tentatively assigned to relevant state agencies for further research and analysis (Appendix A and Appendix B).

4. Establish long-term utility planning to manage the transition of Maryland's housing sector away from fossil fuels and reduce energy burdens

While a whole-home retrofit program will address low-income energy burden on a household level, substantial policy changes are required to broadly protect Maryland's low- and moderate-income households. The following recommendations are intended to keep energy costs low for Marylanders as the state transitions to a highly electrified building sector.

Public Service Commission Action

Maryland should adopt a "Strategic Gas Transition Plan." This would require the Public Service Commission to plan a managed decommissioning of existing gas distribution networks as electrification efforts take hold across Maryland. Utility resource planning analyzed in the plan should be aligned with state goals for energy efficiency. PSC long-term planning–aligning gas and electric system policies with Climate Solutions Now implementation–will have direct impacts on affordability and consumer protections in the transition.

Legislative Action

Maryland should **sunset STRIDE as it concludes its current, five-year program period in 2023.** The STRIDE program is one of the most expensive and capital-intensive programs ever undertaken in Maryland with substantial cost implications for ratepayers into the next century. Rather than replace gas lines, which utilities favor because they make the most profits on replacements, regulators should: 1) direct gas companies to evaluate repairing any leaking or otherwise problematic gas infrastructure, as repairing infrastructure is significantly less costly than replacing gas lines, and 2) invest in non-pipe alternatives, such as electrification. These measures will avoid placing burdensome costs on the dwindling number of ratepayers, costs which will be recovered from those ratepayers for decades.

Conclusion

Maryland's low-income housing sector is in urgent need of attention, even without considering the escalating risks of climate change. Recent federal investments in building electrification provide a rare opportunity for the state to catalyze significant funding in the next decade toward a one-stop-shop, whole-home retrofit program that will upgrade Maryland's low-income households, develop a diverse building decarbonization and electrification workforce, and push the state toward its climate goals. The payoffs of the ambitious initiative presented in this report will be many: reduced climate and air pollution, lower energy use, reduced energy burdens and energy bills, workforce training and opportunities, and improved quality of life, health, and well-being for Maryland's most vulnerable residents.

An electrician installs an electric hot water heater. *Getty Images*

APPENDIX A. Descriptions of Major Funding Sources for the Initiative

As described in the funding section of this report, existing federal and state programs have the potential to fund retrofits of LI homes at a level of approximately $2 billion over a 10-year period. The following section provides an overview of the federal and state programs identified for funding the Initiative. This section also identifies the Maryland agencies responsible for managing the funds and implementing their programs.

Federal Funding

Inflation Reduction Act Programs for Low- and Moderate-Income Households

- **The Home Electrification Rebate Program,** created through the High Efficiency Electric Home Rebate Act (HEEHRA), provides point of sale rebates for qualified electrification projects capped at $14,000 per household. Eligible projects include purchases for new construction, replacement of non-electric appliances, or first-time purchase of electric appliances. For low-income households, these rebates can cover 100% of the costs of the home electrification project, including appliance, electrical capacity upgrade, and installation costs. Moderate-income households are eligible for rebates covering up to 50% of project costs.[xlii]
    - MEA will receive funds by formula grant from DOE. MEA should work with DHCD to align these rebates with existing programs and provide the staff necessary to help low-income households, housing providers, and contractors working on their behalf to access these rebates seamlessly.
- **The Home Efficiency Rebate Program,** created through the HOMES provisions in the IRA, provides rebates to low-income residents for qualified energy efficiency projects capped at 80% of total project costs. This rebate also can be used in multifamily buildings where at least 50% of the residents meet the low-income criteria. The full amount of the rebate varies depending on the energy savings either modeled or measured for the project.[xliii] Modeled savings of at least 35% in low-income homes qualifies for the highest cap at $8,000 per home/unit. The IRA legislation notes that State Energy Offices (SEO) can increase the rebate amounts for low- and moderate-income households.[xliv]
    - MEA will receive funds by formula grant from DOE. MEA should work with DHCD to align these rebates with existing programs and provide the staff necessary to help low-income households, housing providers, and contractors working on their behalf to access these rebates seamlessly.

  Particularly important will be providing support for modeling and/or measuring energy savings from programs. Additionally, MEA and DHCD should prioritize increasing the rebates for low-income homes to make this program as accessible as possible.

Other Inflation Reduction Act Programs

- **Energy-Efficient Commercial Buildings Tax Deduction (Section 179D)** reduces tax liability for commercial buildings, including owners of residential buildings of at least four stories, when they reduce energy usage in their buildings by 50% from baseline standards. For the total funding estimate, this report estimates the calculation based on 55,085 units in buildings of 20+ units with 1,000 square feet on average per unit, $5.00 per square foot deduction, and cash value at 25% (mid-point between 20% and 30%). Actual dollars may vary depending on the number of applicants.
    - This tax deduction will be processed by the IRS. Given MDE's role with Building Energy Performance Standards, they should take initiative in communicating

the opportunity for multifamily housing providers (and others) to utilize this tax credit for electrification projects.

- **Environmental Protection Agency (EPA) Competitive Grants** include $27 billion from the EPA's Greenhouse Gas Reduction Fund,[xlv] $5 billion from the EPA's Climate Pollution Reduction Grants,[xlvi] and $3 billion from the EPA's Environmental and Climate Justice Block Grants.[xlvii] A coordinated approach will help Maryland pursue and align competitive federal grants available to states, municipalities, and nonprofits.
  - The Maryland Clean Energy Center should apply for funds from the Greenhouse Gas Reduction Fund to utilize in the Climate Catalytic Fund.
  - Other agencies–including Maryland Department of Environment, DHCD, and MEA–should pursue additional funding opportunities to support clean energy technologies in environmental justice communities.
  - At this time, funding disbursements and grant sizes have not been released for these grants. To calculate an estimate for how much funding Maryland might receive through these grants, it is assumed:
    - Maryland will receive 1.5% of available funds from the competitive grants (calculated from Maryland's approximately $136 million allocation from the $9 billion total HOMES and HEEHRA funds, and assuming Maryland and will apply for and receive all available grants)
    - Of the funds Maryland will receive from the competitive grants, three different percent utilization of these funds were assessed as going toward weatherization and electrification services: 50%, 40%, and 30%.
    - For Table 1, Scenario A (50% utilization of competitive grant funds toward weatherization and electrification services), is used and rounded down to $265 million.

EPA Competitive Grants			
Greenhouse Gas Reduction Fund	$27,000,000,000		
Climate Pollution Reduction Grants	$5,000,000,000		
Environmental and Climate Justice Block Grants	$3,000,000,000		
Total	**$35,000,000,000**		
	Scenario A	**Scenario B**	**Scenario C**
Total Maryland Allocation (assume 1.5% of total EPA competitive grant funds)	~$529,000,000	~$529,000,000	~$529,000,000
% Utilization toward building repairs, retrofits, and decarbonization	50%	40%	30%
Maryland allocation of EPA competitive grants toward building decarbonization	$264,500,000	$211,600,000	$158,700,000

Additional Federal Programs

- **US Department of Energy (DOE) Weatherization Assistance Program (WAP)** funds energy efficiency upgrades in low-income homes. In 2020, MD's annual WAP grant allocation totaled $3,767,334. In Table 1, similar funding levels are assumed for the next decade at $3.5 million per year.[xlviii] This has been supplemented by additional funding of $45.7 million over the next five years from the Bipartisan Infrastructure Law. Though the program provides significant funding for energy efficiency upgrades, it has a limited budget for health and safety measures though, meaning that issues such as lead hazards, mold, mildew, and structural damages in the home will lead to deferrals from the program. Also, in order to use the program funds to fuel-switch each home, state administrators must request approval from the DOE.[xlix]
    - DHCD operates the WAP program in Maryland. DHCD should take the following steps to maximize the effectiveness of the WAP program in the state
        - Develop a plan to prioritize electrification and request approval from DOE to allow DHCD to approve fuel-switching measures
        - Develop a plan and request approval to consider the social cost of carbon into program cost effectiveness tests.
        - Request the maximum separate health and safety budgets for projects to reduce deferrals.
        - Re-open the state Weatherization Training Facility and invest in workforce development opportunities, especially for marginalized and vulnerable communities.
        - Finally, align the program with other outreach and program delivery services in the state.
- **US Department of Health and Human Services (HHS) Low Income Home Energy Assistance Program (LIHEAP)** is operated in Maryland as the Maryland Energy Assistance Program (MEAP) through the Department of Human Services, specifically the Office of Home Energy Programs (OHEP). Through the national LIHEAP program, HHS provides funding by formula to states to provide low-income households assistance paying monthly energy bills and replacing broken equipment in emergencies. The program also allows for states to use up to 15% of their funds for weatherization (or up to 25% after requesting a waiver).[l] Maryland typically receives about $70 million annually for LIHEAP.[li]

  Bill assistance meets urgent needs for low-income residents, and–though weatherization can be a long-term solution to reducing energy costs–weatherization alone will not end the need for bill assistance. With this in mind, dedicating LIHEAP funds to weatherization or electrification must be done as part of a coordinated strategy to ensure bill assistance needs are met as well. In 2018 and 2022, Maryland requested 4% and 5% of its LIHEAP budget to go towards weatherization services respectively.[lii] For this initiative, the report includes directing 10% of Maryland's typical LIHEAP funding allocation to weatherization for our whole-home retrofit program.
    - The Maryland Department of Human Services, specifically the Office of Home Energy Programs, receives funds and implements the LIHEAP program as MEAP. This report specifically recommends the following:
        - Improve coordination between OHEP and housing intervention programs such as EmPOWER and DOE WAP.
        - Continue to prioritize bill assistance to households with critical needs.
        - Utilize 10% of LIHEAP funds for

weatherization services in cases where weatherization can eliminate need for bill assistance to manage energy burden.

- **US DOE State Energy Program** awards annual formula and competitive grants to states to develop innovative energy programs to help all consumers, businesses, and sectors of the economy. The BIL also added to this funding with an additional $7 million for Maryland to use over the next five years. In Maryland, MEA currently uses the funds to support three programs: the Residential Clean Energy Rebate Program, Combined Heat and Power program, and Energy Storage Tax Credit program. The Clean Energy Rebate Program and Energy Storage Tax Credit both support purchase and installation of residential clean energy systems.[liii]
    - MEA receives funds and administers the programs it supports. MEA should align the program incentives with other housing programs, and ensure they support the energy systems that are most needed in low-income households to ensure affordability (namely, highly efficient air source heat pumps and solar panels that reduce energy burden). MEA also should pursue additional competitive grants available through the DOE State Energy Program to supplement annual formula funding.
- **US HUD Health Homes Production Grants** are competitive grants that fund nonprofits, for-profit firms, and state and local governments to remediate housing-related health and safety hazards in homes with children. They provide particularly flexible funding that can address issues that lead to deferrals from other programs. In recent years, HUD has offered $40 million in annual awards (though in 2022 they awarded more than initially offered). The same entity cannot receive an award in consecutive years. In 2022, Maryland awards totaled $5 million between three recipients.[liv]
    - The state of Maryland, cities, and local organizations can all receive and implement these grants. A coordinated state-wide strategy to housing can help create a greater network of partners engaged in and pursuing this work.

State Funding

- **EmPOWER Maryland,** the ratepayer funded energy efficiency program operated by state utilities and DHCD, is a significant source of funding for energy efficiency. If EmPOWER meets the challenge of increasing its support of low-income energy efficiency and conservation programs to match the federal Justice40 commitment of 40 percent of benefits going to disadvantaged communities, then approximately $1 billion over the next ten years could be available to finance the initiative from this source. To do this the program must evolve to better serve low-income households and to align with state climate and clean energy goals. Further reductions will require more use of home repairs, home upgrades, and electrification. The Public Service Commission oversees the state EmPOWER program, and DHCD implements the Limited Income program. Program direction comes from the Maryland General Assembly. Across these parties, the report calls call for the following actions:
    - As described in recommendation 3 in the body of this report, three legislative reforms can ensure EmPOWER funds are deployed equitably and align with Maryland's climate goals.
        1. Require that no less than 40% of EmPOWER funds be directed to whole-home or whole-building retrofits in low-income communities;
        2. Allow and encourage fuel switching by requiring incentives

for electrification beginning in 2024

3. Phase out subsidy for gas appliances in the EmPOWER program.

- Additionally, Maryland General Assembly should, as directed by Climate Solutions Now, shift EmPOWER to a greenhouse gas reduction target in alignment with the state climate goals and long-term cost savings.
- DHCD should increase the implementation of deeper retrofits with weatherization and fuel switching in low-income homes.
- DHCD should align EmPOWER programs with other funding sources to support a whole-home approach.
- PSC should direct utilities to do the same.

- **Strategic Energy Investment Fund (SEIF)** receives and invests proceeds from Maryland's participation in the Regional Greenhouse Gas Initiative (RGGI) and alternative compliance payments connected to the state's Renewable Portfolio Standard. This report recommends utilizing funds from the SEIF allocated to Low- and Moderate-Income Energy Efficiency Grant program, $14.75 million in 2021, toward the Initiative. The Maryland Energy Administration is required to use monies in the SEIF for "targeted programs, projects, activities, and investments to reduce electricity consumption by customers in the [LMI] residential sectors."[lv] In addition to other potential accounts in the SEIF, at least 10% of the monies in the SEIF that come from the sale of allowances under RGGI "shall be targeted to the low and moderate income efficiency and conservation programs account…"[lvi] Conservatively, this report estimates approximately $14.7 million per year available under this account, which can be used for weatherization and efficiency measures, and potentially more.

  Additionally, the SEIF statute discusses using funds for programming to combat climate change and for clean energy, indicating the SEIF could be a potential source of funding for additional measures such as pre-weatherization and electrification.[lvii]

  - MEA operates SEIF programs and should directly allocate SEIF funds to support this initiative by filling in funding gaps for whole-home electrification retrofits.

- **Climate Catalytic Capital Fund** is the state "green bank" created by the Climate Solutions Now Act of 2022. With annual appropriations of $5 million from the state, this bank will seed funding for projects that reduce greenhouse gas emissions with at least 40 percent of the investments to be directed to communities with low- or moderate-income households. The goals of the Fund will be to multiply the impact of those funds by raising private capital, accessing additional sources of federal and state funding, and generating responsible return on investments. This report calculates the funding from this program at the $5 million level that has already been allocated, but it has the potential to contribute more than that by creating a revolving loan fund.

  - The Maryland Clean Energy Center (MCEC) oversees this fund. MCEC should apply for money available through the EPA Greenhouse Gas Reduction Fund created by the Inflation Reduction Act. MCEC should create a revolving loan fund that prioritizes residential whole-home retrofits, thus recognizing the urgent need to move low-income households to electric systems.
  - The General Assembly and Governor's office should increase funding for the Climate Catalytic Fund.
  - Private and philanthropic entities should recognize the value of investing with the Fund and in providing capital to its initiatives.

- **DHCD Sustainability Bonds** are issued by the Department of Housing and Community Development to support energy-efficient projects. The first offering of these bonds was made in 2021 with approximately $13.6 million raised to support energy efficient affordable housing in Frederick County.[lviii] This report proposes offering $16.4 million per year for this initiative. If successful, this amount could grow higher.
    - DHCD should annually offer these Sustainability Bonds, ideally working with the MCEC to align capital raising efforts to support a revolving loan fund for residential retrofits.

APPENDIX B. Additional Funding Sources

This Appendix identifies and describes additional funding sources–beyond the $2 billion in Table 1 and Appendix A–that can support this initiative. Because some of these programs have indirect financial benefits, the report does not estimate the funding available for every program in this section. Still, this section identifies **at least $750 million in funds over the next 10 years** that the state can expect will be accessible if it takes steps to include these resources in the Initiative.

The estimated $2 billion in funds identified in the body of this report and described in **Appendix A** will kickstart the whole-home initiative and make significant progress in moving low-income residents to healthy, safe, energy efficient, and sustainable housing. Fully meeting the need across the state will require access to additional funding sources. These funds are essentially to meet health and safety needs in homes, improve program sustainability by diversifying funding streams, and create flexible programs to meet housing needs as they arise.

The state will also need to develop a coordinated strategy that engages local governments and organizations. Aligning programs funded at municipal levels (such as lead hazard reduction) with statewide strategy will maximize the statewide opportunity to access competitive funds and reach homes.

Federal Funding

Inflation Reduction Act Programs

In addition to providing direct subsidies and grants for low-income households and communities, the Inflation Reduction Act funds programs that aim to transform the home electrification and efficiency markets. These programs are likely to indirectly benefit low-income households by supporting housing providers with tax rebates and by investing in manufacturing and workforce development that should reduce the costs of projects. This section highlights a few specific programs.

- **Other tax credits for electrification and efficiency including sections 25C, 25D, 45L** will support many households with electrification projects, but typically tax credits like these exclude the lowest-income households who lack the tax liability to benefit and/or cannot afford to pay the initial cost for the project. However, when private owners retrofit homes rented to low-income residents, they may have the opportunity to utilize the 45L credit. Section 25C, the Energy Efficient Home Improvement Credit, provides a 30% tax credit up to an annual per-taxpayer limit of $1,200 for energy audits and efficiency upgrades including for HVAC systems.[lix] Section 25D, the Residential Clean Energy Credit, provides a 30% tax credit for installing renewable energy technologies on a residential property.[lx] Section 45L, the New Energy Efficiency Home Credit, provides incentives for residential homebuilders and multifamily developers to reduce energy consumption in newly constructed residences by offering a per dwelling unit tax credit.[lxi]
    - MEA and the PSC should highlight these programs through their existing housing

program communications, including the utility EmPOWER programs.

Other Federal Programs

The following existing federal programs will provide important sources of flexible funding and funding for health and safety needs. Of particular note are funds through the US Dept. of Housing and Urban Development for lead hazard control. Lead is one of the most damaging and expensive home health hazards and remains a significant hazard in homes. For additional information on lead and an in depth discussion of the funding needs and opportunities, please see GHHI's 2020 Maryland Lead Poisoning Prevention Asset and Gap Analysis Report.[lxii]

- **US Department of Energy Energy Efficiency Revolving Loan Fund Capitalization Grant Program** will provide capitalization grants to states to establish a revolving loan fund under which the state shall provide loans and grants for residential and commercial energy audits, upgrades, and retrofits. The program is funded nationally in the amount of $250 million.[lxiii]
    - The Maryland Clean Energy Center should apply for funds from DOE to utilize in the Climate Catalytic Fund.
- **US Department of Housing and Urban Development (HUD) Community Development Block Grants (CDBG)** are a significant source of funds to address a range of community needs including local infrastructure, public facilities installation, and housing rehabilitation. Funds will go to the state as well as cities and counties. Across Maryland, annual funding levels are approximately $50 million per year.[lxiv]
    - CDBG Grants are received and projects are implemented by DHCD and various local agencies. Because of the high priority the Initiative should take in Maryland, prioritization is required of projects towards supporting whole-home electrification retrofits by investing in the needed home and infrastructure projects to advance this work.
- **US HUD Lead Hazard Control Grants** support lead hazard reduction in cities and counties. Funding is through a competitive process, so municipalities must apply for funds. Baltimore City and Counties are among the Maryland municipalities that regularly receive and utilize grants for lead work. In other locations, staff capacity may need to increase before they can effectively utilize the funding. In recent years, HUD has offered more than $300 million annually across the country in funding opportunities, though because of limited applications, award amounts were lesser. With enough prioritization, Maryland can access a significant amount of funding to address lead hazards in housing across the state.[lxv, lxvi]
    - Addressing lead hazards involves coordination across Maryland Department of Health and Mental Hygiene, DHCD, local governments, and community-based organizations. The governor's office should embrace their leadership position and develop a statewide lead plan that aligns with other housing policies and fits with this whole-home initiative.

State Funding

- **DHCD Office of Single Family Housing Special Loans Program** provides loans and grants to address a variety of housing services, including lead abatement. The program has recently been funded at approximately $2 million annually.[lxvii]
    - DHCD should continue to operate this program and prioritize alignment with long term housing strategy around housing rehabilitation and electrification.

Health Sector Funding

In recent years, the healthcare system has begun to acknowledge the significance of housing and other non-medical determinants of health outcomes, especially for underserved and vulnerable communities. There are existing models for the health sector to fund home interventions to reduce hazards for those with asthma or in instances of lead poisoning. In the context of whole-home retrofits, healthcare sector funding can address some of the "pre-weatherization" and health and safety barriers that defer projects and add costs. Given the growing body of evidence about health hazards from gas stoves and other indoor combustion sources, there may be future opportunities for health sector funds to cover select home interventions related to electrification.[lxviii] Using Medicaid programs pairs state funding with matched federal funding as well. The following section describes existing pathways for state Medicaid systems to fund home interventions that could support a whole-home initiative with over $240 million in potential funds over 10 years.

- **Medicaid Managed Care Provisions** are contracts between state Medicaid programs and Managed Care Organizations (MCOs). States may incorporate quality improvement provisions in their Managed Care contracts that encourage or require MCOs to address healthy housing or the social determinants of health broadly. MCOs contract with community-based organizations to address social determinants of health and meet goals set by the state. Louisiana[lxix], Michigan[lxx], and Pennsylvania[lxxi] provide models of implementing this model specifically for asthma-focused home interventions such as addressing structural issues that cause mold and moisture–also a common cause of weatherization deferrals.
- **Using Children Health Insurance Program (CHIP) funds for Health Services Initiatives (HSIs),** can unlock significant funds for home interventions. States have the option to amend their State Plan with an HSI to directly improve the health of low-income children who are eligible for CHIP and/or Medicaid.[lxxii] The initiatives are funded under a state's CHIP administrative budget, which is made up of a state share and federal share that is based on an enhanced matching rate, more generous than the typical federal Medicaid match. The state administrative budget is limited to 10% of a state's total CHIP budget, but most states spend well under this limit.

  Maryland is using an HSI to fund the Healthy Homes for Healthy Kids Program for lead remediation and asthma environmental case management[lxxiii], spending about $4 million in recent years.[lxxiv] Annual Maryland CHIP expenditures is approximately $400 million and current Maryland spending on administrative costs is about 5% of funds ($22 million).[lxxv] This means that currently there is an opportunity to increase spending on HSIs by approximately $20 million to $24 million annually before reaching the program cap. Over 10 years, that could be $240 million for health and safety remediation in homes of children in low-income families.
- **Section 1115 Demonstration Waivers,** named after Section 1115 of the Social Security Act, allow for innovative pilot or demonstration projects in states' Medicaid programs.[lxxvi] Waivers can allow for specific interventions "in lieu of" standard care for targeted populations. In California, this has been used to fund housing interventions to prevent asthma and fall hazards. As of January 2022, the state has created a pre-approved list of 14 non-medical "in lieu of" services that managed care organizations are strongly encouraged to offer. This includes home asthma remediation and environmental accessibility adaptations (home modifications) that can be reimbursed up to $7,500 per home.[lxxvii] Expanding this to Maryland–eventually as a part of the state Medicaid plan–would unlock significant resources in many of the highest need homes, particularly on the Eastern Shore and Baltimore City where asthma is prevalent, or to address structural issues in homes of older

adults. Nationally, Centers for Medicare & Medicaid Services (CMS) recently set a cap on "in lieu of" services being no more than 5% of total state managed care capitation. This still presents an opportunity for millions of dollars of funding across the state.

Private Funding

As described in the body of this report, the proposed initiative is envisioned as a major civic challenge to the whole of Maryland society. **To be successful, the Initiative will require participation by Maryland's investment, foundation, and corporate communities on a scale sufficient to harness significant amounts of private investment capital.** Through creative financing, the state can multiply every dollar of public investment with private capital.

- **Outcomes Based Financing and Values Based Payment** can allow for third party investment into addressing social determinants of health through housing services that might not be typically covered under standard Medicaid Fee for Service practices. Example models include GHHI's work in New York City with the Healthy Homes Fund, where third-party philanthropic investors are supporting home asthma interventions for patients in the Affinity by Molina health program. Based on realized savings from reduced healthcare utilization for asthma services, the investors receive a modest return on their investment paid by the health insurance provider.[lxxviii]
- **Private investment in the Climate Catalytic Fund Green Bank** will multiply the impact of state and federal investments to the fund. One of the explicit goals of the new state green bank is to raise and leverage private capital. Philanthropic organizations, investment funds, private individuals, and others should consider the potential for these investments that will be both sound financially and realize significant social good. Green Bank leadership should use these resources creatively, both to meet unfunded needs and to stretch dollars to maximize their impact over time.

APPENDIX C. Whole-home retrofit cost estimates

This report estimates the net cost of whole-home retrofits, including health and safety measures, structural repairs, efficiency measures and electrification to total $28,000 to $31,000 per single family home. The measures include: the incremental cost of heat pumps (replacing a home's energy system with a heat pump rather than a gas furnace), structural investments, efficiency investments including duct sealing and ceiling insulation, breaker panel and electrical upgrades, heat pump water heaters and induction stoves. Whole home retrofit cost estimates associated with health and safety include lead abatement, asthma remediation, aging in place (grab bars, etc.), and general health and safety investments. For these health and safety investments, the report estimates the total cost and then applies a probability that the home will need, for example, lead abatement.

The cost of whole-home retrofits will vary widely based on the work that needs to be done to make the home healthy, safe, efficient, and electric. The cost will also vary based on the size of the home and its age. The cost will likely be significantly lower for multi-family homes.

Table 2. Whole-home retrofit cost estimates for owned, attached, single-family homes in Maryland.

Costing Categories	Estimated Cost	Notes
Structural repairs	$7,400	Varies by home age, up to $9,200/unit for oldest
Health & Safety	$9,202	Varies by home need - includes representative mix of Lead Hazard, Aging in Place, Asthma Management, General Health & Safety
Envelope	$4,900	
Electrical upgrades	$3,000	
Heat Pump (incremental)	$5,164	Incremental vs BAU gas furnace replacement
Heat Pump Water Heater (incremental)	$1,088	Incremental vs BAU gas water heater replacement
Induction Stove (incremental)	$1,371	Incremental vs BAU gas stove replacement
TOTAL Per Unit Cost	**$30,754**	

The report uses data from the Maryland Department of Housing and Community Development, from a number of published studies (E3 for Baltimore Gas and Electric, ACEEE, NREL, Building Electrification Institute from DC) and from GHHI's experience with projects in Baltimore. Heat pump and heat pump water heater cost estimates were averaged from various sources reports and utility filings.[lxxix] To estimate the budget needs to address health and safety issues, separate categories for lead, aging in place, asthma, and general health and safety were considered. For each category, GHHI established a percentage prevalence and average budget estimate. Estimates of prevalence and average cost are based on GHHI program experience and data collected from delivering healthy housing programs in Maryland for decades. Cost estimates for multifamily may be lower.

APPENDIX D. Examples of whole-home retrofit programs in the United States

Below is a chart with examples of whole-home retrofit programs, legislation, and funding allocations from across the country. This list is not exhaustive.

Program	State	Program Type	Includes	Description	Loan program or Grant?
Built to Last	PA	City pilot	One-stop-shop, health and safety repairs, weatherization, appliance upgrades	According to the pilot's overview: "Through Built to Last, PEA enables collaborative work across siloed government agencies. The result is significantly improved government performance, which takes advantage of efficiencies and leverages limited resources for maximum impact on vulnerable households. Built to Last seeks to restore the safety, health, affordability and comfort of existing affordable housing in a way that improves the long-term quality of Philadelphia's housing."[lxxx]	Customer Grant
Whole-Home Repairs	PA	State-wide funding (disbursed/ implemented locally)	One-stop-shop, health and safety repairs, weatherization, appliance upgrades, workforce investment and training	The Whole-Home Repairs Program allocates $120 million to preserve Pennsylvania homes through home repair and weatherization assistance, stabilizing Pennsylvania communities while building out local workforce and adding new family-sustaining jobs in a fast-growing field.[lxxxi]	Customer Grant
Trenton Whole House Program	NJ	City pilot	One-stop-shop, health and safety repairs, weatherization, appliance upgrades	The pilot will address health and safety hazards and implement energy efficiency measures in single- and multi-family residences occupied by "low- to moderate-income residents through an integrated, statewide approach that streamlines and leverages existing resources, programs, and funding streams from multiple sources, including federal, State, and local governments, non-government organizations, and non-profit organizations."[lxxxii, lxxxiii]	Grant
Renew Detroit	MI	City program	Focused upgrades (phase 1: roofs, phase 2: roofs and windows, among other repairs)	The Renew Detroit Essential Home Repair Program is a 2-phase home repair program for senior and disabled homeowners in the city of Detroit, was created. ($2–4 billion need, $45M program). Funding from Detroit's City Council earmark of $30M of ARPA funds for "home repair to seniors, low income and disabled community", as well as philanthropic funding from Gilbert Family Foundation, Promedica, etc.[lxxxiv]	Customer Grant
Detroit 0% Interest Home Repair Loan Program	MI	City program	Home repairs, health & safety issues	For those Detroit residents who need home repairs but do not qualify for Renew Detroit, the City offers the Detroit 0% Interest Home Repair Loan Program, which loans between $5,000 to $25,000 for residents to complete home repairs and resolve health and safety issues. The loans are provided at 0% interest and residents10 years to pay back the loans.[lxxxv]	Loan program

California's Low-Income Weatherization Program (LIWP)	CA	State-wide program	Weatherization, energy efficiency, and solar	Administered by the California Department of Community Services and Development (CSD), LIWP is designed with the primary goal of reducing GHGs by saving energy and generating clean renewable power. But just as importantly, the program reduces residential energy expenses for low-income households, strengthening their economic security. LIWP funds energy efficiency upgrades and solar for both low-income single-family households and multi-family affordable housing.[lxxvi]	Customer Grant
Connecticut Statewide Weatherization Barrier Remediation Program Operator	CT	State-wide program	Health and safety repairs	According to its website, "The purpose of the Weatherization Barrier Remediation Program is to address health and safety issues, such as mold and asbestos, that prevent the completion of residential weatherization and energy efficiency measures. Addressing these barriers improves the health and safety of homes and allows for the installation of measures that reduce energy use."[lxxvii]	Customer Grant

i US Department of Health and Human Services. 2022 Poverty Guidelines: 48 Contiguous States. https://aspe.hhs.gov/sites/default/files/documents/4b-515876c4674466423975826ac57583/Guidelines-2022.pdf.

ii Maryland Office of People's Counsel, *Maryland Low-Income Market Characterization Report - 2022 Report Update,* September 2022, Table 2.1, https://opc.maryland.gov/Portals/0/Publications/Reports/Maryland%20Low-Income%20Market%20Characterization_September%202022%20final.pdf?ver=ISQp2eGhvqVBmh8NcvoylQ%3d%3d.

iii Sara Hayes, Mary MacPherson, Christine Gerbode, and Lauren Ross, *Pathways to Healthy, Affordable, Decarbonized Housing,* Ch. 5, Health Homes and Communities (Washington, DC: American Council for an Energy-Efficient Economy), p. 64, https://www.aceee.org/research-report/h2201.

iv Brady Seals, Andee Krasner, *Health Effects from Gas Stove Pollution,* 2020, RMI, Physicians for Social Responsibility, Sierra Club, https://rmi.org/insight/gas-stoves-pollution-health/.

v 2021 EmPOWER budget, *The Maryland EmPOWER Energy Efficiency Act Report of 2022,* Maryland Public Service Commission, pp. 18. https://www.psc.state.md.us/wp-content/uploads/2022-EmPOWER-Maryland-Energy-Efficiency-Act-Standard-Report.pdf and Maryland Public Service Commission, Future Programming Work Group Report, 2021-2023 EmPOWER Maryland Program, Case No. 9648 (April 15, 2022), pp. 26.

vi Maryland Department of Human Services, *Fiscal Year 2021 Electric Universal Service Program Annual Report to the MD Public Service Commission,* Tables 1 and 2. https://www.psc.state.md.us/wp-content/uploads/2021-EUSP-Report-FINAL.pdf

vii Maryland Commission on Climate Change, *Building Energy Transition Plan,* Nov 2021. Pg. 23. https://mde.maryland.gov/programs/Air/ClimateChange/MCCC/MWG/Building%20Energy%20Transition%20Plan%20-%20MWG%20Draft.pdf

viii Maryland Office of People's Counsel, *Maryland Gas Utility Spending: Projections and Analysis,* Oct 2022, pp. 2. https://opc.maryland.gov/Portals/0/Files/Publications/Reports/Report%20on%20GasUtilitySpending%2010-5-22%20Final.pdf?ver=WHc7fhLjCE5powa-6u4i8w%3d%3d

ix Apprise, Prepared for the Office of the People's Counsel, *Low Income Market Characterization Report,* 2018, Page 45. https://www.energyefficiencyforall.org/resources/maryland-low-income-market-characterization-report/

x Energy Efficiency Jobs in America: Maryland Fact Sheet. E4theFuture and BW Research. August 2021. https://e4thefuture.org/wp-content/uploads/2021/08/Maryland_2021.pdf

xi 2021 EmPOWER budget, Maryland Public Service Commission, *The Maryland EmPOWER Energy Efficiency Act Report of 2022*, pp. 18. https://www.psc.state.md.us/wp-content/uploads/2022-EmPOWER-Maryland-Energy-Efficiency-Act-Standard-Report.pdf

xii Maryland Public Service Commission, *Future Programming Work Group Report,* 2021-2023 EmPOWER Maryland Program, Case No. 9648 (April 15, 2022), pp. 25. Note: this analysis defines low-income households at 250% of FPL. https://webapp.psc.state.md.us/newIntranet/Casenum/NewIndex3_VOpenFile.cfm?filepath=//Coldfusion/Casenum/9600-9699/9648/Item_169\9648-Report-04-15-22.pdf

xiii Maryland Department of Housing and Community Development, Housing and Building Energy Programs, *Energy Efficiency Program Operations Manual v.3-2021,* https://dhcd.maryland.gov/Residents/Documents/wap/EnergyEfficiencyProgramOperationsManualv.3-2021.pdf.

xiv Maryland Department of Housing and Community Development, 2021-2023 DCHD Limited Income Program Plan filing to the Public Service Commission, https://webapp.psc.state.md.us/newIntranet/Casenum/NewIndex3_VOpenFile.cfm?filepath=//Coldfusion/Casenum/9600-9699/9648/Item_3\2020.08.31DHCD_LimitedIncome_ProgramPlan2021-2023FINAL8-31-2020.pdf

xv Ibid

xvi ACS 2014-2016, as quoted in Apprise, *Low Income Maryland Market Characterization Report,* Prepared for the OPC, October 2018, page 34.

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