



Building Change Case Study

[Building Change](#), formerly Blockchain Frontiers Foundation, Inc., is a non-profit organization that strives to create market and policy infrastructure to drive and support investments in sustainable, verified, and valued improvements to commercial and residential built environments. The organization assists local communities, governments, and businesses by assisting in the design, development, and facilitation of programs, providing access to funding opportunities, and supporting community outreach efforts.

Originally founded in Virginia, Building Change moved their headquarters to Prince George's County, Maryland in 2018 and assumed the role of managing the local municipal collaboration, previously managed by a collaboration between local governments known as the Bladensburg Collaborative. From 2012-2018, the Bladensburg Collaborative was awarded over \$4,000,000 in grant funding to assist Maryland's low-to moderate-income (LMI) families in the area through the Maryland Energy Administration's (MEA) [Low-to-Moderate Income Energy Efficiency Grant Program](#). With the MEA funding, as well as leveraged funding from other sources such as the Maryland Department of Housing and Community Development and utility rebate programs, the municipal collaboration has performed energy efficiency and weatherization services in over 777 households in 43 towns to date, resulting in an average cost of slightly over \$5000 per home and an average annual savings of over \$600 per home. Building Change's ability to take advantage of multiple funding sources allows them to maximize their impact on each household. Funds received from each of these programs can go towards specific energy saving measures, allowing them to broaden their scope of work and deliver healthier, more efficient, and more affordable homes to low-and-moderate income Marylanders.



Figure 1: From left: Jim Flynn (Project Manager, Municipal Collaboration, Building Change), Jason Dispenza (Chairman, Building Change), Dean Fisher (Program Manager Maryland Energy Administration) Gary Boyer, (Project Manager - Energy Rater, EDGE Energy)

Energy efficiency is particularly important for LMI households as they face a disproportionately higher energy burden, the percentage of gross household income spent on energy costs. According to the US Department of Energy, "the national average energy burden for low-income households is 8.6%, three times higher than for non-low-income households which is estimated at 3%."¹ There are many factors that contribute to a high energy burden, which for low-income households may include the detrimental combination of energy inefficient housing and the inability to finance energy upgrades.

¹ [Low-Income Community Energy Solutions | Department of Energy](#)

Building Change Case Study 2019 LMI Program

Since 2012, Building Change, or the local collaborative preceding it, has used grant funding from the MEA LMI program to assist LMI residents across Maryland’s Central and Southern Regions. Building Change has been able to make a significant impact on the financial burden facing LMI residents through energy efficiency and weatherization services. For most homes, these services include attic, roof, and wall insulation, air sealing, and the installation of LED lighting and low-flow showerheads. Some projects also included, where cost effective, the installation of air source heat pumps, high-efficiency water heaters, and ENERGY STAR appliances such as refrigerators, clothes washers, and freezers.

Data collected from 2017-2019 highlights the significant impact that these projects are having on the Low-to-Moderate Income community. The data, which includes over 235 projects completed using LMI grant funding, shows the energy savings to be significant for those with lower household incomes. Those households in the lowest income group participating in the project, with household annual incomes under \$20,000, had an average energy savings of \$651, or over 6% of their total annual household income.² As seen in the chart below, the participating households in the lowest tier of household incomes had the greatest percentage improvement in overall energy savings.

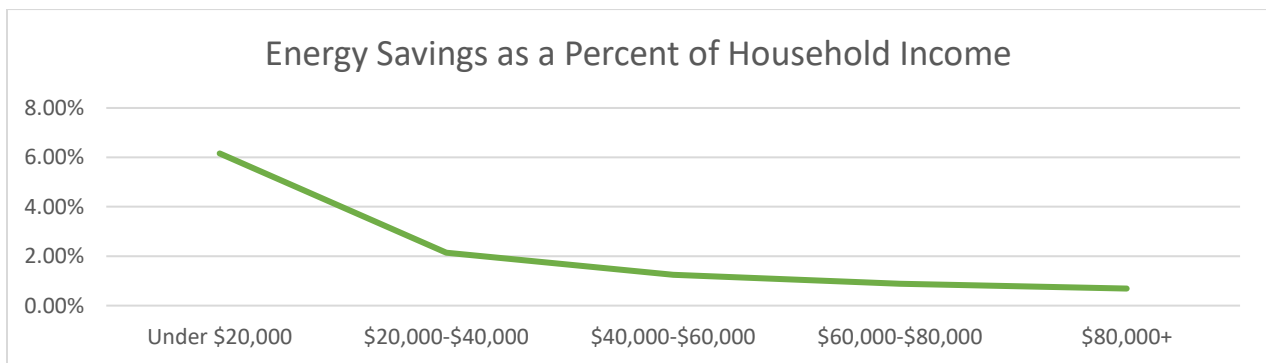


Figure 2: Energy Savings as a Percent of Household Income (2017-2019)

While MEA LMI funding is essential to their projects, Building Change also takes advantage of one of the unique aspects of the LMI program and its encouragement to have grantees apply for and leverage other funding sources. In the data collected from 2017-2019, over \$684,000 in other funding from utility rebates allowed Building Change to further expand their scope of work, introducing utility rebates to households that may not have partaken in the [EmPOWER](#) programs while further driving down the energy burden to these households. On average, nearly \$3,000 of utility funding was applied to each project, contributing to increased energy savings and healthier living conditions.

By leveraging funds, Building Change was also able to help with another aspect of energy burden, the inability for many LMI households to afford or finance energy efficient measures. In nine homes, MEA funding was combined with other leveraged funds to replace old and inefficient electric furnaces with [ENERGY STAR certified heat pumps](#), resulting in average energy savings of \$915, or 50% more on average than the homes participating in the program that did not involve a heating source upgrades. The total costs of the HVAC projects averaged to nearly 30% of household income for these nine homes,

² This number does not represent a traditional “energy burden” due to data availability but does represent a similar metric highlighting the impact energy savings measures can have on the low-and-moderate income demographic.

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and more than 60% in two instances. To encourage best practices and to maximize the benefits in the comfort and cost of these heat pump upgrades, MEA requires that each building receiving the ENERGY STAR heat pumps also receives air sealing and weatherization.

HVAC Upgrade Home Project	Estimated Annual \$ Energy Savings	Leveraged Utility Rebate	Utility Rebate as a % of Income
1	\$716	\$7,064	64%
2	\$1,399	\$7,500	62%
3	\$744	\$6,282	47%
4	\$1,404	\$7,500	38%
5	\$646	\$4,364	15%
6	\$1,044	\$7,500	16%
7	\$771	\$7,500	13%
8	\$831	\$5,602	8%
9	\$687	\$4,756	7%

Table 1: Projects with ENERGY STAR Electric Furnaces Installed (2017-2019)

The table below summarizes the costs and associated savings achieved from Building Change's 2019 grant award from the MEA LMI program, by type of energy measure.

Energy Measures	MEA Grant	Electricity Savings (kWh/yr.)	Gas Savings (Therms/ yr.)	Annual Cost Savings	Payback (Years)
Installed Upgrade Measures					
Lighting	\$5,290	98,638	-1,055 ³	\$11,303	0.5
Appliances	\$21,980	9,146	35	\$1,252	17.6
HVAC	\$97,364	66,372	1,103	\$10,387	9.4
Water Heating	\$13,008	29,409	190	\$4,145	3.1
Home Envelope	\$364,977	109,590	11,527	\$32,050	11.4
Programmatic Costs					
Audits/QA-QC Cost	\$70,327				
Health & Safety Measures Cost	\$93,610				
Totals					
Admin Cost	\$61,944				
Project Cost ⁴	\$572,966			\$59,137	9.7
Total Invoice Cost ⁵	\$728,500			\$59,137	12.3

Table 2: Energy Efficiency Measures with Estimated Savings and Simple Paybacks for Building Change 2019 Awards in Central and Southern Regions

³ Some inefficient devices, like incandescent light bulbs, waste energy as heat. When these are replaced with more efficient LED light bulbs, the home heating system (e.g., a natural gas furnace) may work slightly harder to compensate. Energy savings from efficiency outweigh the slight increase in heating costs.

⁴ Includes all costs associated with energy efficiency upgrades. Does not include Health & Safety Measures and Admin Costs.

⁵ Project Cost + Health & Safety Measures + Admin Costs