



WEATHERIZATION WORKS

Energy efficiency investment in low-income housing will cut energy costs, reduce the need for payment assistance, and create jobs

by **Amanda K. Woodrum**

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EXECUTIVE SUMMARY

In 2013, Ohioans spent nearly \$10 billion to heat and power their homes, with the average Ohio household spending \$2,171.¹ Roughly 1 in 5 Ohio households spends more than 30% of their annual income on housing and utilities.²

Heat and electric power are basic necessities. To keep the heat and power on, low-income families are often forced to cut back on other necessities and/or seek public assistance. Roughly 400,000 Ohio households seek help paying their utility bills each year through the Percentage of Income Payment Plan (PIPP).³

The Home Weatherization Assistance Program (HWAP) — a program designed to permanently lower utility bills through air sealing, insulation, furnace and appliance replacement and repair, and other related measures — helps end this cycle of energy poverty for low-income households. Based on a recent analysis commissioned by the U.S. Department of Energy, conducted by the Oak Ridge National Laboratory, every dollar invested to weatherize homes of low-income households in cold climates, such as Ohio, produces \$2.04 in savings.⁴

By permanently lowering utility bills, Ohio's HWAP reduces financial stress on low-income families and enables them to allocate more of their income towards other necessities, such as food, medication, and transportation. Investment in weatherization also creates 17 jobs per \$1 million spent, lowers costs to Ohioans for utility bill payment assistance programs, reduces dependence on polluting fossil fuels,

results in fewer harmful emissions, and improves public health.

Due to limited federal funding, however, relatively few households receive weatherization services. In 2014, the number of homes weatherized via the federally-funded HWAP amounted to roughly 1% of the number of PIPP households. Federal support for home weatherization increased dramatically under the American Recovery and Reinvestment Act of 2009, when more than 40,000 homes were weatherized over a few years, but those funds were temporary.⁵ Typically, weatherization agencies weatherize approximately 7,000 Ohio homes in any given year.⁶

Ohio's clean energy standards requiring electric utilities to reduce energy use in their territories, enacted in 2008, drove a nearly seven-fold increase in investment in low-income home weatherization by private investor-owned electric utilities. In 2014, Governor John Kasich signed into law a bill weakening Ohio's clean energy standards, making Ohio the first state in the nation to retreat from developing its clean energy economy. The bill froze Ohio's efficiency requirements for electric utilities while a legislative committee assessed whether to eliminate the standards altogether. Once frozen, electric utility investments in low-income home weatherization declined by 26%.

Reinstating Ohio's energy efficiency standards for electric utilities will revive utility investments in low-income weatherization. Doing so will also help the state meet its carbon reduction requirements under the U.S. Environmental Protection Agency's Clean Power Plan. To encourage greater investment in low-income home weatherization, the Clean Power Plan offers states

double credit for any carbon reductions achieved in years 2020 and 2021 as a result of investments made in low-income communities in years prior.⁷ To take advantage of the federal Clean Energy Incentive Program, Ohio would need to submit a plan ahead, submit a state plan as early as possible, which would compel electric utilities to invest in energy efficiency and weatherization in low-income communities between now and 2021.

By adopting a program to weatherize 30,000 homes of customers enrolled in PIPP, each year for 13 years, it would create nearly 2,400 jobs, produce roughly \$1.77 billion in energy savings, and cut annual PIPP program costs to customers in half. It would also help electric utility companies meet their efficiency and carbon reduction requirements.

KEY FINDINGS

- Nearly 400,000 Ohio households struggle to pay their utility bills and seek public assistance.
- Ohio's HWAP lowers utility bills for low-income households, generates jobs, and reduces pollution.
- In 2014, the number of homes weatherized via federally-funded HWAP amounted to roughly 1% the number of PIPP households.
- Ohio's clean energy standards drove a nearly seven-fold increase in low-income weatherization investment by electric utilities. That is, until the standards were frozen, when investments declined by 26%.
- Ohio should reinstate renewable and energy efficiency standards and incentivize utilities to invest in low-income weatherization to meet those standards.
- Ohio should take advantage of the bonus credits for investments in low-income communities, available for a brief window of time through the Clean Power Plan, which will result in carbon reductions.



NEARLY 400,000 LOW-INCOME HOUSEHOLDS SEEK UTILITY BILL ASSISTANCE EACH YEAR

In 2014, as **Table 1** shows, nearly 400,000 Ohio households participated in the PIPP, a utility payment plan designed to make monthly utility payments more affordable for low-income households.⁸ To qualify for these reduced payments, households must earn less than 150% of the federal poverty line. For a single mother with two children, that was equal to \$29,685 in 2014.⁹ The vast majority of clients of the program, however, have incomes below 90% of the federal poverty line.

Utility companies are reimbursed for the actual cost of energy used by PIPP customers through a universal service rider applied to all utility customers. In 2014, \$379 million in customer funds provided PIPP customers an average of \$972 in utility bill assistance for the year.¹⁰

TABLE 1

Nearly 400,000 low-income households in Ohio participate in utility payment plans.

COMPANY	#PIPP CUSTOMERS
American Electric Power	140,126
FirstEnergy	160,546
Cleveland Electric	57,642
Ohio Edison	79,467
Toledo Edison	26,437
Columbia Gas	67,513
Dayton Power and Light	39,146
Duke Energy	33,645
Vectren	17,535
TOTAL	461,511
DISTINCT CLIENTS	390,526

TABLE 1 SOURCE:

ODSA, HEAP, Public Hearing Presentation (2014)



HOME WEATHERIZATION PERMANENTLY REDUCES UTILITY BILLS

PIPP customers use more natural gas and electricity on average than other residential customers because they tend to live in homes with little insulation and significant air infiltration.¹¹ PIPP customers also qualify for the federally-funded HWAP, a program designed to more permanently lower utility bills through air sealing, attic and wall insulation, furnace repairs and replacement, and other energy-related home repairs.

Table 2 shows the economic benefits of investment in weatherization. Based on a recent analysis commissioned by the U.S. Department of Energy, and conducted by the Oak Ridge National Laboratory, every dollar invested to weatherize homes of low-income households in cold climates, such as Ohio, produces \$2.04 in savings.¹² When adding in benefits to society, health and safety, the benefits outweigh the costs, four to one.

TABLE 2

Weatherization is highly cost effective.

SAVINGS-TO-INVESTMENT RATIO FOR ENERGY BENEFITS = 2.04

Average Cost of Energy Measures	\$2,211 Weighted average cost of energy measures for single family, multi-family and mobile homes in cold climate zone.
Average Energy Cost Savings (Present Value)	\$4,534 The present value of the energy savings over the lifetime of energy measures.

BENEFIT-COST RATIO INCLUDING HEALTH AND SAFETY BENEFITS = 4.1

Total Cost	\$4,695 Includes energy measures (70%), health and safety measures (10%), Audits and inspection (7%), program management (12%), Training, technical assistance (1%)
Total Benefit	\$21,985 Includes \$4,534 in energy savings (above), \$2,500 in environmental emissions benefits, and \$14,148 in health-related benefits

TABLE 2 SOURCE:

DOE funded report from Oak Ridge National Laboratory, Weatherization Works (2014).



ENERGY COST SAVINGS

Weatherization on average reduced natural gas consumption by 17.8% and electric consumption by 7.1%. Annual energy cost savings from weatherized single-family homes average \$274 per household — including \$190 less in home heating and fuel costs, and \$82 in lower costs for power.¹³ The present value of savings achieved over the lifetime of measures amounts to \$4,534. Numerous evaluations of Ohio’s program show even larger energy savings, some showing up to a 29% reduction in natural gas use in weatherized homes.¹⁴

UTILITY BILL REDUCTION BENEFITS

In states like Ohio, where PIPP programs are in place, energy cost savings accrue both to individual households and utility customers more broadly. For example, a 2014 study found that 78% of savings accrued to the low-income households, while 22% of the savings accrued to customers more generally.¹⁵ The *Ohio HWAP Evaluation*, conducted in 2006, found the net payment shortfall of Ohio PIPP customers declined by more than half following home weatherization (53%).¹⁶

JOB AND ECONOMIC BENEFITS

Every \$1 million invested in weatherization creates roughly 17 jobs in the Midwest, including direct and indirect jobs.¹⁷ Plus, each dollar in energy savings is likely to be spent on other goods and services creating a multiplier effect in the economy.

HOUSEHOLD HEALTH AND WELL-BEING

Energy costs savings for low-income households means more disposable income. Greater income, in combination with health and safety measures undertaken, improves the overall health and well-being of household members. Post weatherization, fewer households reported having to choose between paying for utility bills or buying food, and were better able to afford prescriptions. Household members also report better sleep, more energy, fewer allergy symptoms, fewer visits to the emergency room, and fewer missed days of work or school. This is because weatherization reduces temperature extremes and helps seal the home from drafts, outdoor pollutants, and pests. Weatherization crews also address any carbon monoxide problems found in homes and address mold and mildew issues when funding allows.

ENVIRONMENTAL BENEFITS TO SOCIETY

Reduced energy use also reduces harmful pollutants associated with the production of that energy such as carbon dioxide, sulfur dioxide, nitrogen oxide, and other particulates.¹⁸



DUE TO LIMITED FEDERAL FUNDING, HOWEVER, RELATIVELY FEW PIPP HOUSEHOLDS RECEIVE WEATHERIZATION SERVICES

In 2014, the number of homes weatherized by the federal HWAP amounted to approximately 1% of PIPP households. That year Ohio weatherized 5,624 homes of low-income households, using funds from the U.S. Department of Energy and HWAP funds from the U.S. Department of Health and Human Services.¹⁹ This is similar to levels seen in previous years and far fewer than the hundreds of thousands of Ohio households seeking payment assistance. Federal support for home weatherization increased dramatically under the American Recovery and Reinvestment Act of 2009, but those funds were temporary.²⁰

In 2014, the number of homes weatherized by the federal Home Weatherization Assistance Program amounted to roughly 1% of Percentage of Income Payment Plan households.

OHIO'S CLEAN ENERGY LAW INCENTIVIZED ELECTRIC UTILITY INVESTMENTS IN LOW-INCOME HOME WEATHERIZATION, UNTIL THE LAW WAS FROZEN.

Between 2008 and 2014, the energy efficiency requirements of Ohio's clean energy laws led to a nearly seven-fold increase in low-income home weatherization investments by Ohio's investor-owned electric utilities.²¹ In 2009, electric utilities were required to achieve 0.3% energy savings in their territory for that year, 1.0% annually starting in 2014, and then 2% per year starting in 2019.²² In 2014, Governor John Kasich signed into law a bill freezing the standard for two years while a legislative committee assessed whether to eliminate it altogether.²³ In September 2015, that committee

recommended extending the freeze indefinitely.²⁴ This recommendation would eliminate incentives for cost-effective electric utility investments in low-income home weatherization.

Table 3 shows that as electric utility annual efficiency requirements increased, so did their investments in low-income home weatherization, until Ohio's clean energy laws were frozen. Once frozen, electric utility investments declined by 26%, with American Electric Power cutting its program in half.

TABLE 3

From 2008 to 2014, electric utility spending on low-income home weatherization increased 662%. After the state-law freeze, spending declined 26%.

YEAR	SAVINGS REQUIREMENTS	AMERICAN ELECTRIC POWER	DAYTON POWER & LIGHT	DUKE ENERGY	FIRSTENERGY	TOTAL
2008	Base level	-	\$265,000	\$100,000	\$2,100,000	\$2,465,000
2009	0.30%	-	\$1,000,000	\$222,201	\$5,000,000	\$6,222,201
2010	0.50%	\$590,000	\$1,000,000	\$423,263	\$5,000,000	\$7,013,263
2011	0.70%	\$12,270,000	\$1,000,000	\$0	\$5,000,000	\$18,270,000
2012	0.80%	\$8,790,000	\$1,000,000	\$27,422	\$5,000,000	\$14,817,422
2013	0.90%	\$11,604,000	\$1,000,000	\$410,526	\$5,000,000	\$18,014,526
2014	1.00%	\$12,017,520	\$1,000,000	\$1,086,664	\$5,000,000	\$19,104,184
SUMMARY	From 2008 to 2014, electric utility spending grew nearly seven fold (675%)					
2015	Frozen	\$6,700,000	\$1,000,000	\$1,429,202	\$5,000,000	\$14,129,202
2016 Planned	Frozen	\$6,700,000	\$1,000,000	\$1,419,498	\$5,000,000	\$14,119,498

SUMMARY After the state-law freeze, spending declined 26%.

TABLE 3 SOURCE:

Ohio Partners for Affordable Energy



REINSTATING ENERGY EFFICIENCY STANDARDS

Reinstating Ohio's energy efficiency standards will drive cost-effective investment in home weatherization for low-income households — reducing financial stress on low-income families, lowering PIPP program costs for all utility customers, and creating jobs in the process. It will also help Ohio meet federal carbon rule requirements.

THE FEDERAL CLEAN POWER PLAN GIVES STATES THE FLEXIBILITY TO MEET CARBON POLLUTION REDUCTION REQUIREMENTS THROUGH ENERGY EFFICIENCY AND OTHER LOW-CARBON EMISSIONS MEASURES

The Clean Power Plan's Clean Energy Incentive Program enables states to double count emissions reductions achieved in 2020 and 2021 as a result of low-income efficiency investments.²⁵ Any investments made after the state's submission of an approvable plan, producing measurable outcomes in 2020 and 2021, will qualify for the incentive. Therefore, Ohio can see increased benefits by submitting its state plan early.

WEATHERIZE PIPP: TARGET 30,000 HOMES PER YEAR FOR 13 YEARS

Ohio currently has approximately 390,000 low-income households enrolled in PIPP for their gas or electric utility bills.²⁶ Developing a plan to weatherize approximately 390,000 — 30,000 homes a year over 13 years — would not only help electric utilities meet their carbon pollution limits under the Clean Power Plan, while lowering utility costs for struggling households, it would also create jobs and reduce PIPP program costs to utility customers. Estimates, based on figures from the Oak Ridge National Laboratory report, listed on page 8, suggest weatherizing 30,000 homes a year for 13 years would create roughly 2,400 jobs during that time. It would also produce \$1.77 billion in energy savings, roughly half of which would accrue to customers more generally in the form of reduced costs for PIPP gas and electrical programs (53%).²⁷

A plan to weatherize low-income households enrolled in PIPP would also produce \$1.77 billion in energy savings, roughly half of which would accrue to Ohioans more generally in the form of reduced costs for PIPP gas and electric programs (53%).

ENDNOTES

- 1** Energy Information Administration, Total Energy Consumption, Price and Expenditure Estimates, 2013
- 2** 2014 American Community Survey, Selected Monthly Costs as a Percentage of Household Income
- 3** Ohio Development Services Agency, HEAP Public Hearing Presentation (2014)
- 4** Oak Ridge National Laboratory, *National Retrospective Evaluation of the Weatherization Assistance Program* at http://weatherization.ornl.gov/evaluation_nr.shtml (Calculation based on Ohio's designation as part of the cold climate zone, and weighted according to Ohio's housing makeup, 87% single family home, 9% small multi-family, and 4% mobile home).
- 5** Policy Matters Ohio, Weatherizing Homes of Ohio's Low-Income Families, <http://www.policymattersohio.org/weatherization-oct-2014>.
- 6** Policy Matters Ohio, Weatherizing Homes of Ohio's Low-Income Families, <http://www.policymattersohio.org/weatherization-oct-2014>
- 7** United States Environmental Protection Agency, Clean Energy Incentive Program, <http://www.epa.gov/cleanpowerplan/clean-energy-incentive-program>
- 8** Ohio Development Services Agency, HEAP Public Hearing Presentation (2014)
- 9** U.S. Department of Health & Human Services, 2014 Poverty Guidelines (calculating 150% of listed poverty line).
- 10** Ohio Legislative Service Commission, Budget in Detail, Main Operating Budget Bill (FY 2016 – FY 2017)
- 11** PUCO Service Monitoring and Enforcement Dept., *PIPP Plus Program Review* (2013).
- 12** Oak Ridge National Laboratory, *National Retrospective Evaluation of the Weatherization Assistance Program* at http://weatherization.ornl.gov/evaluation_nr.shtml (Calculation based on Ohio's designation as part of the cold climate zone, and weighted according to Ohio's housing makeup, 87% single family home, 9% small multi-family, and 4% mobile home).
- In contrast to Oak Ridge Laboratories' findings, the E2e Project produced a 2015 study that asserts that costs of the ARRA Weatherization Assistance Program outweigh economic benefits, available at <http://econresearch.uchicago.edu/content/do-energy-efficiency-investments-deliver-evidence-weatherization-assistance-program>.
- That study contained significant flaws, including its relatively small and unrepresentative sample and the use of non-standard approaches to calculating energy savings and measure costs. These and other shortfalls of the E2e are well-documented by, among others, the American Council for and Energy-Efficient Economy (<http://aceee.org/blog/2015/06/residential-energy-efficiency-works>) and the Natural Resources Defense Council (http://switchboard.nrdc.org/blogs/dsullivan/two_weeks_on_a_wap-up_on_that.html).
- 13** Oak Ridge National Laboratory, *Weatherization Works* (2014)(based on climate zone analysis on cold climates).
- 14** Quantec, LLC.
- 15** Oak Ridge National Laboratory, *Weatherization Works – Summary of Findings from the Retrospective Evaluation of the U.S. Department of Energy's Weatherization Assistance Program* (2014)
- 16** Quantec, LLC.
- 17** Oak Ridge National Laboratory, *Macro-Economic Impacts of the Weatherization Assistance Program for Program Year 2008* (2014).
- 18** Oak Ridge National Laboratory, *Weatherization Works – Summary of Findings from the Retrospective Evaluation of the U.S. Department of Energy's Weatherization Assistance Program* (2014).
- 19** Policy Matters Ohio, *Weatherizing Homes of Ohio's Low-Income Families*, <http://www.policymattersohio.org/weatherization-oct-2014>.
- 20** Policy Matters Ohio, *Weatherizing Homes of Ohio's Low-Income Families*, <http://www.policymattersohio.org/weatherization-oct-2014>.
- 21** PUCO Service Monitoring and Enforcement Dept., *PIPP Plus Program Review* (2013).

ENDNOTES

- 22** Based on data acquired from Ohio Partners for Affordable Energy, Ohio's network of weatherization providers.
- 23** 127th General Assembly, Senate Bill 221. See Ohio Legislative Service Commission Final Analysis at <http://www.lsc.ohio.gov/analyses127/08-sb221-127.pdf>.
- 24** 130th General Assembly, Senate Bill 310 at http://archives.legislature.state.oh.us/bills.cfm?ID=130_SB_310
- 25** The Energy Mandates Study Committee Co-Chairs' Report at <http://emsc.legislature.ohio.gov/>
- 26** Environmental Protection Agency, Factsheet: The Clean Power Plan Clean Energy Incentive Program at <http://www3.epa.gov/airquality/cpp/fs-cpp-ceip.pdf>
- 27** This does not include many of the roughly 450,000 households that seek emergency help during a winter or summer crisis when these households are in fear of having their utilities shut off following large bills they cannot afford to pay.
- 28** M. Sami Khawaja et al., Quantec, LLC, Ohio Home Weatherization Assistance Program Impact Evaluation (2006).



“The effect of weatherization becomes real when you walk up on the porch of an 80 year-old woman, like Meta, one of our clients. She was living with space heaters – which were expensive, dangerous, and inefficient. With the right set of weatherization measures she has lowered her bills and is able to be comfortable in a warm home, all while reducing her carbon footprint. Now we want to bring that impact to families to the whole community – giving people the right system that is better for the environment, all while costing them less money.”

Tom Calhoun

Corporation for Ohio Appalachian Development (COAD)