# Topic Briefs: Upgrading Manufactured Homes

ACEEE Smart Energy. Clean Planet. Better Lives.

AUGUST 2023
TOPIC BRIEFS

## Using Energy Efficiency to Improve Affordability and Health

## Model Programs for Retrofits and Replacements

## Federal Funding Opportunities for Retrofits and Replacements

This series contains three topic briefs on upgrading manufactured homes. These briefs are primarily designed for use by states and utilities—especially rural utilities due to the higher concentration of manufactured homes in these areas—but much of the content will also be applicable to local governments and housing nonprofits.

The first brief provides important context on manufactured housing residents and on opportunities for retrofits to alleviate high energy bills and improve home comfort and safety. The second outlines  model retrofit and replacement programs. The third highlights federal funding opportunities for upgrading manufactured homes.


## Acknowledgments

Aimee Bell-Pasht wrote this series of briefs. This work was supported by Enterprise Community Partners. The author thanks Lowell Ungar, Lyla Fadali, Kristin Campbell, Mark Kresowik, and Amber Wood for internal review; Bob Coates (USDA), Grant Beck (Next Step), Mark Wyman (Energy Trust of Oregon), Dillon Teal (Entergy Solutions), Alec Shebiel (Umatilla), Bill van Vliet (Network for Oregon Affordable Housing), John-Michael Cross (EESI), Rachel Krogram (Slipstream), Annie Reierson, Kathrine Teiken, and Tonya Taylor (Minnesota Housing), Justin Lindall and Emily Blett (Minnesota Dept of Commerce), Flora Arabo (Enterprise) for external review; Kate Doughty for design; and Mariel Wolfson, Ethan Taylor, and Roxanna Usher for editing and production. Review does not imply affiliation or endorsement.

# Upgrading Manufactured Homes: Using Energy Efficiency to Improve Affordability and Health

ACEEE Smart Energy. Clean Planet. Better Lives.

**AUGUST 2023**
**TOPIC BRIEF**

**Manufactured homes are an essential source of affordable housing in the United States, but residents face high energy bills and health hazards due to historically weak building standards and underinvestment.[1] Pending a yet-to-be implemented revision issued in 2022, energy codes for manufactured homes have not been meaningfully updated since 1994 despite frequent updates to model building codes developed by independent standards organizations in the intervening decades. Residents of manufactured homes face higher energy costs per square foot, higher rates of energy insecurity, and higher housing costs relative to their income than any other type of household. New federal funding may help invigorate existing energy efficiency programs and deliver much needed energy savings to the nearly 18 million residents living in the country's 6.7 million occupied manufactured homes.**

[1] Homes built in this fashion before 1976 are referred to as "mobile homes." Here, we use the term "manufactured homes" to refer to all mobile and manufactured homes.

# Manufactured Housing Background

Manufactured homes are assembled on a chassis in a factory and typically delivered to the consumer's site in one or two sections (distinct from modular homes, another type of prefabricated home, which are assembled at the home site from multiple factory-built pieces). Manufactured homes represent about 5% of the occupied housing stock in the United States, and represented 8% of new homes built in 2021.[2, 3]

In 2022, new two-section homes cost an average of $158,000 and single-section homes an average of $86,500.[4, 5] This translates to roughly half the cost per square foot compared to site-built homes (not including the lot), making these homes an essential source of affordable housing.[6] They are sometimes referred to as "naturally occurring" affordable housing—homes that are affordable without public subsidy as a result of their low cost compared to traditional "site-built" homes.

Though the homes are shipped to the site, they typically are not moved after their first placement due to high moving costs and potential damage to the home, making "mobile homes" somewhat of a misnomer and underscoring the need to improve existing homes when possible.

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[2] United States Census Bureau. 2021. *American Housing Survey (AHS)*. Accessed January 2023. Washington, DC: United States Census Bureau. www.census.gov/programs-surveys/ahs.html.

[3] St. Louis Federal Reserve. 2022. *FRED Economic Data*. Accessed January 2023. fred.stlouisfed.org/graph/?g=10Slw.

[4] United States Census Bureau. 2023. Manufactured Housing Survey (MHS).

[5] Single-section homes are typically 1–2 bedrooms and between 500 and 1,200 square feet. Two-section homes are typically 2–3 bedrooms and between 1,000 and 2,200 square feet. Triple-section homes tend to be over 2,000 square feet with 3+ bedrooms.

[6] Manufactured Housing Institute (MHI). 2022. *Manufactured Housing Facts*. www.manufacturedhousing.org/wp-content/uploads/2022/04/2022-MHI-Quick-Facts-updated-05-2022-2.pdf.

# Residents

**Income.** Manufactured homes are an important source of affordable housing for lower-income households. In 2021, manufactured home residents had a median household income of $35,280—about half of the median income of residents of detached single-family homes ($76,000)—and just below the median household income of residents of multifamily buildings ($40,800).[7] While manufactured homes make up 5% of all occupied housing, this share rises to 9% of households with annual incomes below $35,000 (the bottom quartile of earners).

**Race and ethnicity.** Nationally, there is a similar racial and ethnic makeup for residents of manufactured homes compared to their site-built single-family counterparts. However, there are more Hispanic or Latino residents in manufactured homes (16%) compared to single-family homes (12%).[8]

**Age.** Roughly 3.2 million adults aged 60 and over live in manufactured homes. Though the share of older adults is not meaningfully different than in detached single-family homes, older residents in manufactured homes are much more likely to own their homes outright with no mortgage debt. However, older residents of manufactured homes report higher rates of housing insecurity than their counterparts in other forms of housing: 7.9% of owners reported being behind on their mortgage (compared to 4.9% for other housing) and 6.5% of renters reported facing eviction (compared to 3.6% for all other housing).[9]

**Renters.** Despite the comparatively lower cost of purchasing a manufactured home, residents of manufactured homes are disproportionately renters compared to those in other single-family homes: 26% of manufactured home residents rent, compared to only 15% of residents of site-built, single-family detached homes.

Of the 74% of manufactured home residents who own their homes, nearly 40% do not own the underlying lot.[10, 11] For homeowners who rent a lot in a land-lease community (mobile home park), the monthly fee is an important part of overall housing costs. Like renting a home, lot rents are subject to increases, but manufactured home owners rarely have the flexibility to move their home if faced with rent increases. As a result, residents who live in these communities may be subject to excessive rent increases and poor community conditions. Strong state- and local-level policy to improve homes should complement housing policy that promotes nonprofit park ownership models, such as Oregon did in 2018.[12]

[7] United States Census Bureau. 2021. American Housing Survey (AHS). Accessed January 2023. Washington, DC: United States Census Bureau. www.census.gov/programs-surveys/ahs.html. Multifamily median income taken for buildings with 10–19 units.

[8] United States Census Bureau. 2021. *American Housing Survey (AHS).* Accessed January 2023. Washington, DC: United States Census Bureau. www.census.gov/programs-surveys/ahs.html.

[9] Consumer Financial Protection Bureau (CFPB). 2022. Profiles of older adults living in mobile homes.

[10] United States Census Bureau. 2019. *American Housing Survey (AHS).* Accessed January 2023. Washington, DC: United States Census Bureau. www.census.gov/programs-surveys/ahs.html.

[11] In these instances, typically the lot is owned by the park in which the home is situated. Less frequently, the home may be placed on private property of a family member, friend, or otherwise.

[12] Housing Assistance Council. 2020. *Rural Research Brief.* www.ruralhome.org/wp-content/uploads/2021/05/Manufactured_Housing_RRB.pdf.

**Geography.** The highest concentrations of manufactured housing (relative to other housing types) are generally found in the southern, northwestern, and southwestern United States. The census division comprising Kentucky, Tennessee, Mississippi, and Alabama has the highest share of manufactured housing, at nearly 10% of the housing stock, roughly double the national average.[13]

About half of all manufactured homes are located in rural areas. Manufactured homes make up approximately 13% of the housing stock in rural areas and small towns, compared to the 5% national average. (In some counties, this rate climbs to over half the homes, as shown in figure 1.) Generally, rural areas have disproportionately older housing stock, and residents face persistent poverty and increased risks of flooding and other damage as a result of climate change.[14] Rural areas have historically had less access to philanthropic or federal investment, making these challenges more difficult to overcome.[15]

**Financing.** Though the comparatively low cost of these homes offers an opportunity for home ownership, financing options for manufactured homes are a significant barrier to accessibility and affordability for residents. Nearly half of all manufactured home loans are personal property loans, similar to car loans.[16] Personal property loan interest rates have in recent years been roughly double those of traditional mortgage rates and have significantly lower approval rates than traditional mortgages for

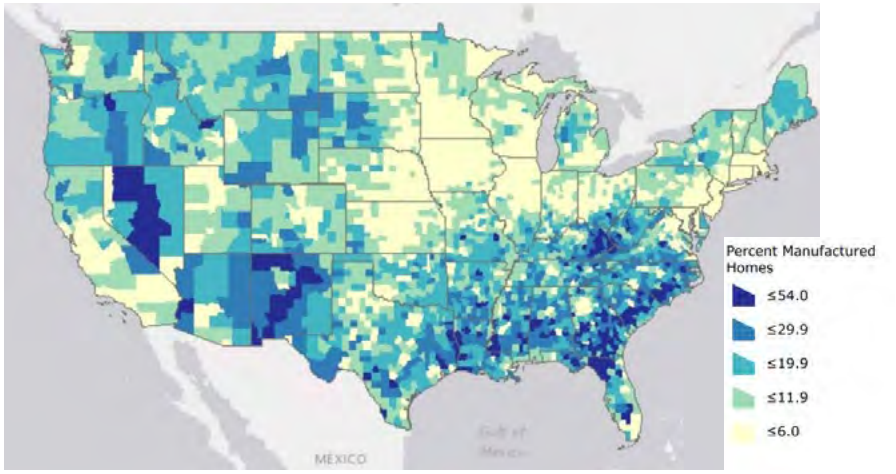


**Figure 1. Manufactured housing share by county, 2018. (*Source*: Housing Assistance Council, 2020).**

site-built homes.[17] These trends hold for traditional mortgages for manufactured homes also, but to a much lesser extent.

Borrowers who are purchasing their home but not the underlying land almost exclusively use personal property loans, while those who own the land as well as their home typically have traditional mortgages at lower rates. However, Black and Indigenous borrowers are significantly more likely to have personal property loans, even if they own the underlying land.[18] Personal property loans will contribute to higher overall housing burdens as financing costs greatly exceed their traditional mortgage counterparts.

[13] United States Census Bureau. 2021. *American Housing Survey (AHS).* Accessed January 2023. Washington, DC: United States Census Bureau. www.census.gov/programs-surveys/ahs.html.

[14] Housing Assistance Council. 2020. *Rural Research Brief.* www.ruralhome.org/wp-content/uploads/2021/05/Manufactured_Housing_RRB.pdf.

[15] Walsh et al. 2020. "Rural Studio Front Porch Initiative: Intersections and Details of Resilience, Efficiency and Equity." Paper presented at the 2020 ACEEE Summer Study on Energy Efficiency in Buildings.

[16] Personal property loans are also referred to as "chattel loans."

[17] Personal property loan rates have lowered somewhat as a result of amendments to the Home Ownership and Equity Protection Act (HOEPA) in 2014 intended to reduce abusive practices in high-cost mortgages. However, there is still widespread concern among advocates that these loans can be predatory and risky. In many instances, borrowers of personal property loans might qualify for less expensive mortgages (see Challenges to Obtaining Manufactured Home Financing).

[18] Consumer Financial Protection Bureau (CFPB). 2021. Manufactured Housing Finance: *New Insights from the Home Mortgage Disclosure Act Data.* www.consumerfinance.gov/f/documents/cfpb_manufactured-housing-finance-new-insights-hmda_report_2021-05.pdf.


# Energy Costs

In addition to improving comfort and health outcomes, energy efficiency improvements can address the disproportionately high energy costs faced by residents of manufactured homes. The minimum efficiency standards for manufactured homes are often significantly less stringent than state-set standards for site-built homes, which are updated more frequently (and to more stringent levels) than the federal code has been for manufactured homes.

Energy costs per square foot are roughly 50% higher than those in site-built single-family homes and 20% higher than in apartments in large buildings, despite the fact that a higher share of manufactured home residents leave homes at unhealthy temperatures due to high bills, broken equipment, or utility disconnections (see table 1). This gap widens further for renters of manufactured homes.[19]

**Federal Energy Standards for Manufactured Homes**

**Because manufactured homes are assembled in factories and can be transported between states, they are subject to federal standards, including energy requirements, that preempt state building codes.**

**Prior to 1976: Mobile homes (or trailer homes) are lightly regulated by states.**

**1976: Federal U.S. Department of Housing and Urban Development Code (HUD Code) aims to improve quality.**

**1994: HUD Code safety requirements, as well as some thermal efficiency requirements, are revised as a result of Hurricane Andrew.**

**2024-25: New Department of Energy (DOE) energy standard scheduled to take effect. These codes require moderate energy savings for new double-wide homes, and small energy savings for new single-wide homes compared to the 1994 HUD Code.**

[19] Energy Information Administration (EIA). 2020. *Residential Energy Consumption Survey (RECS)*. www.eia.gov/consumption/residential/data/2020/. Energy costs per square foot are calculated by EIA and based on the total national energy expenditures and total square footage for each housing type.

**Table 1. Average residential energy costs and select energy insecurity measures, by housing type (Residential Energy Consumption Survey 2020)**

| | Share of households reporting any energy insecurity | Share of households reducing or forgoing food or medicine to pay energy costs | Share of households who report leaving home at unhealthy temperature | Share of households unable to use heating equipment | Share of households unable to use air-conditioning equipment | Average energy expenditure per square foot |
|---|---|---|---|---|---|---|
| Single-family detached | 22.2% | 15.5% | 7.6% | 3.6% | 4.9% | $0.97 |
| Single-family attached | 28.2% | 21.1% | 10.7% | 3.4% | 4.6% | $1.02 |
| Apartments in buildings with 2–4 units | 44.9% | 35.5% | 17.2% | 5.6% | 6.3% | $1.44 |
| Apartments in buildings with 5 or more units | 30.6% | 23.1% | 12.0% | 2.7% | 3.9% | $1.22 |
| Manufactured homes | 47.0% | 36.7% | 16.8% | 11.4% | 11.6% | $1.46 |

HUD defines housing as affordable if residents spend 30% or less of their income on housing-related costs. Nearly a third of manufactured home residents face high housing burdens (housing costs, including energy, exceed 30% of their income), and 40% face high energy burdens (energy costs exceed 6% of their income). In rural areas, manufactured households face the highest energy burdens of any housing type, and these burdens are significantly higher for lower-income residents.[20, 21] High housing burdens are the result of comparatively high energy costs, lower average incomes of residents, and expensive financing, as discussed previously.

[20] Ross et al. 2018. *The High Cost of Energy in Rural America.* Washington, DC: American Council for an Energy-Efficient Economy. www.aceee.org/research-report/u1806.
[21] Bell-Pasht and Ungar. 2022. *Strong Universal Energy Efficiency Standards Will Make Manufactured Homes More Affordable.* Washington, DC: American Council for an Energy-Efficient Economy. www.aceee.org/white-paper/2022/01/strong-universal-energy-efficiency-standards-manufactured-homes.

# Retrofit Opportunities for Manufactured Homes

Energy efficiency retrofits are an effective way to improve the livability and affordability of manufactured homes in addition to lowering customers' bills. Weatherization measures like adding insulation, replacing windows, and sealing doors can allow residents to maintain comfortable temperatures in the home and reduce exposure to heat- and cold- related illnesses. Improving housing quality and reducing energy bills can also have significant mental health benefits for residents and improve productivity at work and school. These health benefits are especially pronounced for older residents and children.

In the following pages, we highlight common retrofit opportunities for manufactured homes, including those with high energy-saving potential, or that address common failure points.

## LOWER-COST INTERVENTIONS:

**Air and duct sealing.** In both site-built and manufactured homes with forced-air heating and cooling, loosely connected ducts can leak up to 30% of the air that moves through the duct system.[22] Manufactured home ductwork is typically installed underneath the floor in the underbelly of the home. The underbelly is typically not well insulated, which leads to additional air leakage and exposure to the elements. Sealing air leaks in ductwork, especially reattaching crossover ducts in multi-section homes, can improve energy efficiency and climate control and maximize airflow into the manufactured homes. Similarly, sealing windows, doors, and marriage joints (the joints where multiple sections of a double- or triple-wide home are joined together) will minimize energy loss by preventing drafts from entering the home in the winter, or leakage of cool air in the summer. Air and duct sealing are relatively low-cost processes in most homes and will lead to immediate improvements in comfort and energy bills. Air and duct sealing should also be the first step before considering replacing HVAC equipment (see the following section.)

**Insulation.** Generally, improving insulation can have a significant effect on energy affordability, comfort, and on controlling moisture problems.[23] However, there are often obstacles and important considerations to pursuing insulation and

[22] Environmental Protection Agency (EPA). *Duct Sealing*. Accessed January 2023. www.energystar.gov/campaign/heating_cooling/duct_sealing.

[23] Lubliner et al. 2019. *Retrofit of Blown Attic Insulation in Existing HUD-Code Manufactured Homes: Needs Assessment Report*. Golden, CO: National Renewable Energy Lab (NREL). www.osti.gov/biblio/1545588.

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Entergy Solutions

weatherization work in manufactured homes. First, due to the poor conditions of many manufactured homes, the need for structural repairs (such as replacing floor beams or roofs) is likely to create an obstacle to performing this type of weatherization, also known as a "deferral" within weatherization services. Second, wall insulation is not likely to qualify under utility cost-effectiveness tests as the costs are high relative to the savings. In older homes built prior to the HUD Code, very little insulation means there is theoretically a greater opportunity for savings. However, the typical few inches of wall space available to add insulation in these homes would not allow for the upgrades necessary to realize these savings (e.g., adding R-35 to R-38 insulation, which has a thickness of roughly 10 inches). When possible, utility retrofit programs typically provide upgrades to insulation in the underbelly of the home and the attic, where upgrades tend to be more cost effective. In instances where insulation upgrades are costly, state- and federally funded weatherization programs without cost-effectiveness requirements, or some utility-funded low-income programs with more lenient cost-effective requirements, will be best positioned to assist residents.[24]

Improving air and duct sealing, upgrading insulation in the underbelly of the home, and installing a moisture barrier to protect ductwork can lead to annual energy savings of $400–800, and payback in under four years.[25]

[24] Notably, DOE provides state weatherization programs software specifically tailored for performing manufactured housing audits.
[25] Dayem. 2019. Today's Best Opportunities for Improving Manufactured Homes Efficiency. National Rural Electric Cooperative Association (NRECA). www.cooperative.com/programs-services/bts/Documents/TechSurveillance/Surveillance-Manufactured-Housing-Efficiency-July-2019.pdf.

**Mechanical system tune-ups.** Tune-ups can include cleaning and inspection of heat exchangers, fans, and motors and replacing filters in HVAC units. Mechanical tune-ups are a low-cost way to improve efficiency in the system, ensure safety, and prevent some mechanical issues.

**Roof measures.** Cool roof coatings are a minimally invasive method to reduce home temperatures in the heat. The coating applies as a paint on the roof and reflects light to reduce heat in the summer. Energy savings are not high relative to the cost, but this measure could be easily packaged with other measures to address home comfort issues and maximize energy savings from other efficiency measures.

Manufactured home roofs are often leaky and in need of replacement. The roofs generally consist of multiple sheets of metal overlaid with each other, where the seams often separate and let in water, or create noise in the wind. Roof replacements are very invasive for residents and may take several days to complete but offer significant health, safety, and comfort impacts.

**Direct install.** Direct installation of LED light bulbs, water fixtures, or programmable thermostats can significantly improve overall efficiency. These measures are low-cost, noninvasive opportunities to generate energy savings for residents. Moving from incandescent to LED bulbs can result in energy savings of roughly 75% per bulb.

## HIGHER COST, HIGHER SAVINGS INTERVENTIONS:

**Mechanical system replacement.** Replacing HVAC systems can deliver large energy savings to occupants, with potential bill reductions of 30–60%. Replacing electric resistance heating with efficient heat pumps delivers savings of $300–500 per year and can be expected to pay back in just one year compared to replacing that same system with a new electric resistance system. Replacing inefficient heat pumps with newer, more efficient models will deliver slightly less savings.[26, 27] In both instances, savings will be pronounced in the South where residents rely on large electric cooling loads.

Upgrading old or inefficient water heaters and other appliances such as stoves and refrigerators to newer, more efficient, or ENERGY STAR®-certified models can also deliver energy savings to manufactured homes.

**When supporting new HVAC systems, programs should include a long (10-year) warranty in the installation cost to ensure that the unit is covered for its useful life, including an annual maintenance check. Regular maintenance can help avoid costly repairs.**

[26] Dayem. 2019. *Today's Best Opportunities for Improving Manufactured Homes Efficiency*. National Rural Electric Cooperative Association (NRECA). www.cooperative.com/programs-services/bts/Documents/TechSurveillance/Surveillance-Manufactured-Housing-Efficiency-July-2019.pdf.

[27] One 2013 study suggests switching from an electric resistance system to a heat pump will pay back in an average of seven years based on annual savings of $726, and replacing an existing heat pump will pay back in 8.6 years based on annual savings of $522 (see Help My House Program Final Summary Report).

**Electrification.** For the nearly 33% of manufactured homes nationally that rely on fossil fuel-powered heating and cooking appliances, replacing mechanical systems and other appliances may be an opportunity to switch to efficient all-electric systems, especially for homes that use expensive delivered fuels like propane and oil.[28] DOE-modeled energy costs suggest that on average, residents of single-section manufactured homes would pay more for propane and oil heating (averaging $748 and $806 per year, respectively) than homes that heat using air source heat pumps ($648 per year).[29] Upgrading manufactured homes to be all electric may require updates to electric paneling and wiring, which may be costly to undertake. However, if pursued, electrifying existing manufactured homes may provide several benefits: (1) For customers using delivered fuels, switching to efficient electric heating may reduce (and streamline) energy bills; (2) removing fossil-fuel appliances, especially stoves, may improve home health and air quality; and (3) switching homes to all electric will allow residents to benefit from distributed solar (either community-based, or individual pole-mounted panels connected to their homes) in the future.

[28] Nearly 13% of manufactured homes rely on delivered fuels (propane, kerosene, or oil) and 20% rely on piped natural gas. United States Census Bureau. 2021. American Housing Survey (AHS). Accessed April 2023. Washington, DC: United States Census Bureau. www.census.gov/programs-surveys/ahs.html.

[29] Averages are taken from the estimated heating portion of home energy bills in nationally representative climate locations, calculated by DOE using *EnergyPlus* software. Assumes propane heating efficiency of Annual Fuel Utilization Efficiency (AFUE) 80%; oil furnace efficiency of AFUE 75%, and heat pump efficiency of Heating Seasonal Performance Factor 8.2. Department of Energy (DOE). 2021. *Technical Support Document: Supplemental Notice of Proposed Rulemaking Proposing Energy Conservation Standards For Manufactured Housing* (Chapter 7). Docket (EERE-2009-BT-BC-0021). www.regulations.gov/document/EERE-2009-BT-BC-0021-0590.

# Health and Safety Considerations

Structural issues that result from poor-quality construction and toxic construction materials exacerbate negative health and safety issues for residents of many manufactured homes. Health and safety benefits of retrofits or replacements of manufactured homes have not yet been quantified to the same extent as energy savings. However, these benefits should be considered as part of a holistic approach to upgrading manufactured homes. Conversely, safely disposing of toxic materials can be costly, and can make up a large part of demolition budgets.

For the resident, energy and other benefits are intertwined. Energy programs should account for non-energy benefits in cost-effectiveness analyses or work in coordination with housing programs to ensure non-energy housing needs are met. Likewise, health and safety programs should consider energy efficiency as an essential part of a healthy home.

Common health and safety issues in manufactured homes include:

- Extreme indoor temperatures due to minimal insulation and air leakage (discussed in the following sections)
- Frequent leaks, excessive moisture, and mold (discussed in the following sections)
- Poor air quality (discussed in the following sections)
- Asbestos and lead (in older homes) and other toxic construction materials
- Pest infestations due to inadequately sealed (and minimally insulated) belly of the home, inadequate skirting along the bottom of the home, and gaps in ducts and other parts of the home
- Increased risk of fire due to poor or aging electrical wiring or unmaintained mechanical systems

**Heat-related impacts.** Minimal insulation, thin walls and ceilings, poor quality windows, and inadequate air sealing leave manufactured homes highly exposed to outdoor temperatures. In hot climates, high sun exposure means that poor quality manufactured homes are subject to extreme indoor heat. Paired with inefficient air-conditioning units, running air-conditioning is simply not affordable for many residents of manufactured homes.[30] Outdated wiring in many homes precludes residents from installing newer, more efficient air-conditioning, and some

[30] High Country News. 2022. "'You're Living in a Tin Can' Arizona's Mobile-Home Residents Are Far More Likely to Die from Excessive Heat"; Slate (2022) "Mobile Homes Have a Major Climate Change Problem"; *Washington Post*. 2021. "Extreme Heat Is Killing People in Arizona's Mobile Homes."

residents have no electricity at all. Recent research from Arizona State University found that residents of manufactured homes are disproportionately impacted by excessive heat, especially in the West. Residents of manufactured homes are six to eight times more likely to die of heat-related deaths than residents of stick-built homes.[31] In 2019 in Maricopa County, Arizona, one of the hottest counties in the country, many manufactured home residents experienced indoor temperatures averaging 95 degrees over an 85-day summer period, with some homes reaching indoor temperatures as high as 111 degrees.[32]

**Cold-related impacts.** Exposure to outdoor temperatures also creates negative impacts for residents in cold climates. Exposure to excessive cold can lead to increased cardiovascular and respiratory diseases, including stroke, high blood pressure, and asthma, as well as poor mental health.[33] Correctly sealing and resealing (after maintenance) the underbelly of the home will help prevent pipe freezing, cold floors, and subsequent reliance on inefficient space heaters or simply avoiding parts of the home.

**Moisture, leaks, and mold.** Manufactured homes are prone to leaks and moisture problems. Leaks result from poor design, including small gutters, seams, and other gaps in the roof, as well as poorly sealed vents. Older units are especially prone to leaks, in part due to rust that develops on the metal roofs. Roof sealants may address this in the short term but wear (or melt in the heat) over time. Roof replacement (especially with rubber roofs) and adequate sealing can prevent or ameliorate leaks.

Moisture problems result from water and air leakage, inadequate ventilation, and improperly sized or operated heating or cooling equipment, which can all lead to excessive moisture in the home. Summer moisture problems are pronounced in the Northwest and Southeast, while most northern regions are at higher risks for wintertime moisture problems. Outdoor humidity, such as in the Southeast, Northwest, and Northeast, can prevent moisture in the home from drying out naturally and lead to increased risk of rot or decay in the structure, including decreased effectiveness of insulation materials, buckled floors, and soft spots in floors and walls.

Moisture also leads to the growth of mold, which not only leads to home discomfort but also worsens air quality and triggers asthma attacks or infections in the lungs and sinuses.[34] Mold buildup can also be an obstacle to performing upgrades as it can be expensive to work around. Poor air quality should be considered when installing air sealing measures and may need to be paired with adequate ventilation. Further research on air quality in manufactured homes is needed.

Excessive moisture problems can be prevented by sealing air leakage, correctly installing adequate insulation, right-sizing HVAC equipment, limiting ceiling penetrations, and providing proper ventilation, proper flashing, and resident instruction.

**Air quality impacts.** Like site-built homes, manufactured homes can have high levels of certain indoor air pollutants, such as formaldehyde and acrolein, which cause respiratory disease or irritate skin and eyes. Manufactured home indoor air quality may be worse than in site-built homes as a result of inadequate ventilation equipment, poor ventilation practices during use, or high levels of off-gassing from new materials in the small space. Replacing ventilation equipment and providing education to residents may improve air quality. Adequate insulation and air sealing can lead to reduced exposure to outdoor air pollutants, such as ozone, nitrogen dioxide, particulate matter 2.5, and wildfire smoke.[35]

[31] Varfalameyeva et al. 2021. *Heat Mitigation Solutions Guide for Mobile Homes. Knowledge Exchange for Resilience Solutions Series*. Tempe: Arizona State University. keep.lib.asu.edu/items/162992.

[32] Bernard and Proano. 2022. "Too Hot to Handle: Curbing Mobile Home Heat Deaths in a Warming Climate" *Washington Journal of Social & Environmental Justice*. 12 (1). digitalcommons.law.uw.edu/cgi/viewcontent.cgi?article=1001&context=wjsej.

[33] World Health Organization (WHO). *Low Indoor Temperatures and Insulation.* Accessed January 2023. www.ncbi.nlm.nih.gov/books/NBK535294/.

[34] The Manufactured Housing Research Alliance (MHRA). 2000. *Moisture Problems in Manufactured Homes*. www.huduser.gov/portal/publications/moisture.pdf.

[35] Department of Energy (DOE). 2022. *Final Environmental Impact Statement for Proposed Energy Conservation Standards for Manufactured Housing (DOE/EIS-0550).* ecs-mh.evs.anl.gov/.


# Coordinating Energy and Home Repair Measures

Although the benefits to improving manufactured housing are substantial, many traditional utility incentive and other energy efficiency programs work better for manufactured housing if they are specifically targeted to that housing type. Often, these programs are tailored toward site-built homes and as a result may "walk away" from manufactured housing or only partially serve them. However, targeted utility programs for manufactured housing, as for other forms of affordable housing, face cost challenges as low- and moderate-income programs generally require higher touch for homeowners and have difficulty finding workers due to stigma associated with the work.

Energy efficiency programs typically conduct an initial assessment of the condition of the home. In addition to identifying cost-effective energy-saving opportunities, this is an opportunity to identify potential health or home repair needs. Ideally, energy efficiency programs should have the ability to connect residents with complementary health and housing programs that can facilitate necessary improvements like repairing roofs, addressing pests, replacing rotted supporting beams, and generally improving home accessibility (such as reducing trip hazards). Often, these needed critical repairs might enable future energy improvements.

This may be achieved by coordinating energy programs with other housing programs, or by braiding multiple streams of funding so that efficiency programs can address housing repairs directly (a common funding gap encountered in both site-built and manufactured home efficiency programs). Energy retrofit programs administered by the state, local government, or nonprofits might be well positioned to coordinate streams of funding and meet broader mandates to serve the needs of manufactured home residents most holistically.

For older homes or homes that require significant structural repairs, replacing the home may be the best, or only, option. Though manufactured home replacements are outside the scope of traditional energy programs, and the substantial cost cannot be justified solely from the energy savings, this is a critical opportunity to address the overall quality, accessibility, and energy efficiency of local affordable housing. Replacement programs should help residents move into highly energy-efficient, above-code homes as the efficiency measures are cheaper to install in the factory than as retrofits. The second brief in this series examines replacement programs in more detail, including some offered by utilities.

**New State Program: Pennsylvania Whole-Home Repairs Fund**

**Using federal COVID-19 assistance funds, Pennsylvania launched the Whole-Home Repairs Fund to assist low-income homeowners and small landlords with home repairs. The program is one of the first of its kind.**

# Upgrading Manufactured Homes: Model Programs for Retrofits and Replacements

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AUGUST 2023
TOPIC BRIEF

**This brief outlines the role of energy efficiency retrofit and replacement programs for manufactured homes and highlights successful programs. Although we focus primarily on utility and state programs, we note that nonprofits and local governments have also successfully led such programs. Design parameters will differ depending on the type of funding (financing, ratepayer funds, grants) and program goals (maximizing energy savings, improving housing quality, building equity).**

# Energy Efficiency Retrofit Programs

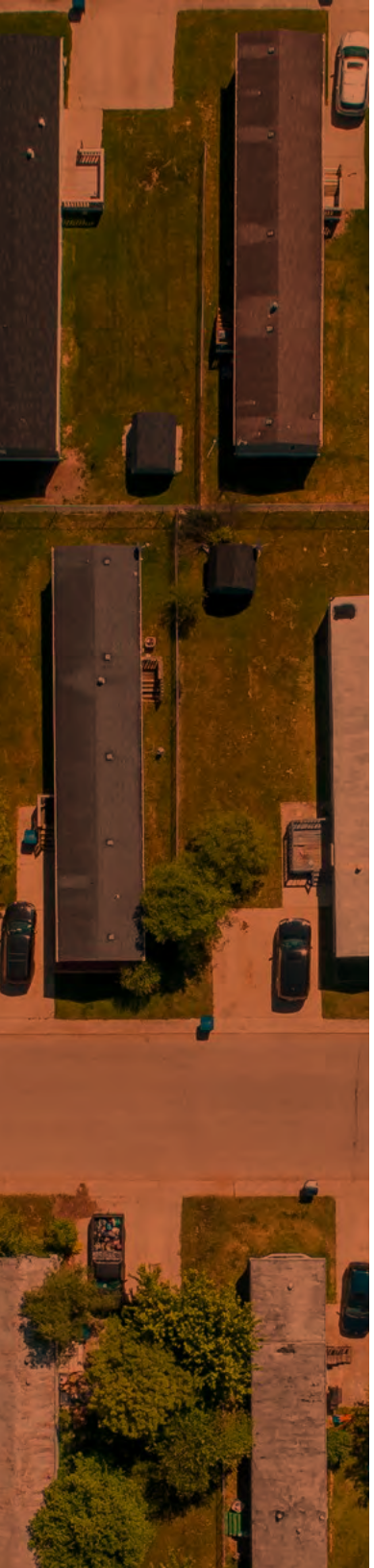
Energy retrofit programs can support residents of manufactured homes in lowering energy use, increasing affordability, and improving home comfort. One Minnesota retrofit program found that residents could save an average of roughly $480 annually through cost-effective retrofit and upgrade measures such as air sealing, duct sealing, insulation, lighting replacement, and HVAC upgrades (including eliminating portable space heaters).[36] Savings from other programs are highlighted in the following case studies. Retrofit programs can also address safety and durability concerns, as well as improve resilience to extreme events, which are exacerbated by climate change.

Like energy retrofit programs for site-built homes, there are many types of programs that can coordinate or provide retrofits, which use different but sometimes overlapping funding streams (e.g., state or local governments may run programs that distribute funds to local or nonprofit programs) and face different regulatory parameters. These different program types are outlined at right and following.

**State programs.** State agencies, such as state energy or housing offices, may coordinate residential programs that provide home and energy improvements. These programs may be supported by federal funds (like the Weatherization Assistance Program), which will allow the state varying flexibility depending on the funding stream or state funds made available through legislation, with which states may have broad authority to establish new programs depending on their priorities.

**Utility-run programs.** Many utilities, including rural cooperatives and other publicly owned utilities, have energy efficiency programs for existing homes. These may include rebates on efficient equipment purchases, financing for efficiency upgrades, or no-cost home assessments, among other assistance. Typically, these programs are limited by cost-effectiveness requirements (i.e., retrofits must deliver enough energy savings to offset the cost), though these requirements may be loosened for programs that serve income-qualified residents. The programs sometimes serve manufactured homes through their existing retrofit programs (i.e., programs that serve both stick-built and manufactured homes). Because the workforce qualifications and retrofit work required have significant overlap, this can be an effective approach. However, there are advantages to designing a retrofit program targeted to the specific needs and opportunities of manufactured homes.

[36] Minnesota Department of Commerce, Division of Energy Resources. 2016. "Minnesota Manufactured Homes Characterization and Performance Baseline Survey. https://slipstreaminc.org/publications/manufactured-homes-study-0. Also Infographc: https://slipstreaminc.org/research/manufactured-homes-study.



**Local government or nonprofit programs.** Though neither are the focus of these briefs, programs run by both local governments and nonprofits play an important role in providing retrofits and especially in addressing housing quality issues. Both types of programs serve as important ways to fill any gaps where state or utility programs fail to meet the specific needs of a community. For example, when state or utility programs are unable to pursue energy retrofits in a home because it needs significant structural repairs, they may refer the home to a nonprofit such as Habitat for Humanity that can support the resident in addressing those needs.

Home energy efficiency measures typically require an upfront investment, and this investment will be paid back through energy savings over years. However, residents often do not have the cash to pay for these kinds of investments. Unique home financing models (such as high-cost personal property loans), restrictive home warranties, and declining home values if the owner does not own the underlying land may prevent homeowners from making large investments in their homes. Retrofit programs can bridge this gap and enable home improvements that manufactured homeowners might otherwise not be able to access on their own.

Though utility and state programs may already serve manufactured homes as part of their residential programs, these services are typically limited in scope. Program administrators should be careful to address manufactured homes specifically. First, contractors should receive training on some of the unique aspects of working in manufactured homes, such as the unique duct layout, common failure points, and working in the underbelly of the home. Because manufactured homes are factory-built in a mostly uniform fashion, once contractors understand the basics, they can easily apply this knowledge to other manufactured homes. Classroom and field training paired with mentoring and regular quality control can help ensure that contractors are adequately equipped to serve manufactured homes.

Second, the financial structure of retrofit programs can be an obstacle for lower-income homeowners. Some programs require residents to provide upfront investments and to wait to receive the rebate. This might not be possible for many residents of manufactured homes. Similarly, financing that requires an evaluation of creditworthiness or income verification may prevent access for some residents or might be too big of an administrative burden. Programs that do not require any out-of-pocket spending or can be seamlessly financed through utility bills are discussed in the following pages.

## Retrofit Program Considerations

Retrofit programs for manufactured homes face obstacles similar to retrofit programs for site-built homes (split incentives between landlords and renters, cost-benefit requirements for regulated utilities, contractors with limited training), but some obstacles require unique consideration.

**Structural repairs.** Sometimes, energy retrofits cannot be undertaken if significant structural repairs are needed, such as roof or structural beam replacement. Though this is an obstacle in site-built homes, the issue is often amplified in manufactured homes. Because of the shorter useful lives of units, less stringent building codes, a history of poor building practices, and lower-income residents who might not have access to finances necessary for repairs, existing manufactured homes often have significant structural needs that must be addressed in order to pursue energy retrofits. Energy efficiency retrofit programs should coordinate with local housing agencies or nonprofits to help coordinate needed funds for repairs or efficiency upgrades.

**Replacement needs.** Energy retrofits can be a highly impactful and cost-effective solution but may not always be a holistic solution to improving housing quality for residents. Program designers should consider helping the resident access a new home, if possible, as opposed to investing in a home that may be near the end of its useful life. Especially in older homes, the structural needs might be beyond repair. For example, the newly created federal funding available through the Preservation and Reinvestment Initiative for Community Enhancement program at the U.S. Department of Housing and Urban Development (HUD) allows programs to use the funds only to replace homes built prior to 1976, and not to retrofit or repair them. Some utility programs will not finance or perform retrofits on pre-1994 homes. In many replacement programs, any pre-1994 home is eligible to apply. Even more recent homes may need replacement, especially if they were not installed properly and as a result face many of the same structural issues as older homes. But new manufactured homes are expensive compared to retrofits and need to be justified as a housing program more than an energy program.

**Expertise/Workforce.** Like other residential retrofit programs, there is a need for strong contractor workforce development including more workers, increased access to certifications, and on-the-job training. Specific understanding of the unique characteristics of manufactured homes and their residents will help design and administer successful programs. This includes a familiarity with administrative issues, such as financing and ownership models, as well as structural issues. As discussed previously, there are some learning curves associated with retrofitting manufactured homes (e.g., learning different duct layouts and common structural failure points).[37]

**Manufactured Housing Weatherization Workforce Training in New Hampshire**

**In 2011, the New Hampshire Better Buildings Neighborhood program won a federal grant to retrofit low-income homes. However, some manufactured homes in the communities served had household incomes slightly above the threshold, but still required weatherization.**

**A community college partner came up with a creative solution: Homes that did not qualify for the program could receive free services by volunteering as a demonstration home for the program's contractor weatherization training. For more details, read the report here.**

[37] The Building Performance Institute's Manufactured Housing Professional certification is one way to ensure that contractors are familiar with manufactured housing systems. Additionally, the Department of Energy provides job aids for manufactured home weatherization projects.

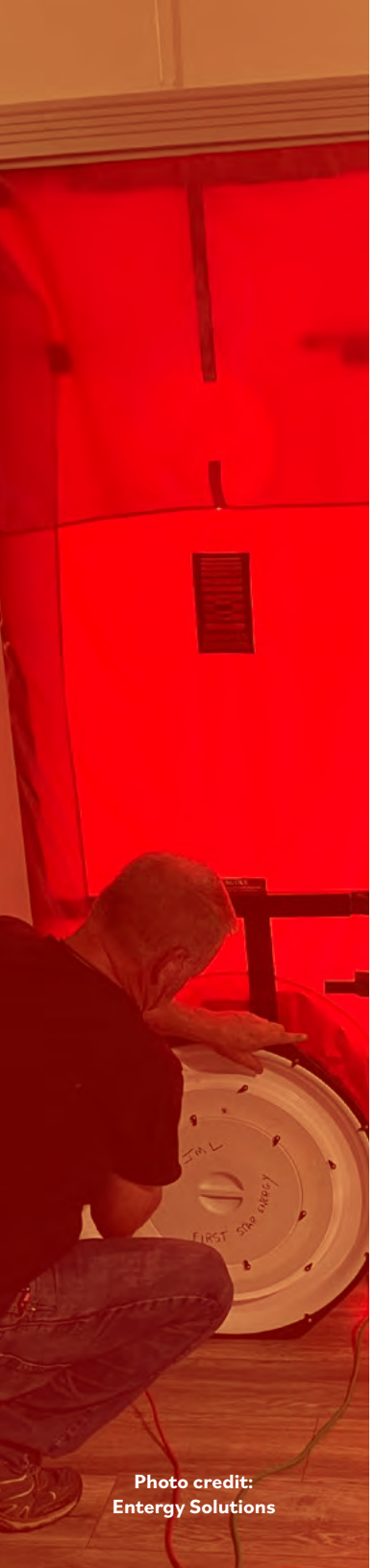


Photo credit:
Entergy Solutions

## CASE STUDY: ENTERGY SOLUTIONS MANUFACTURED HOUSING RETROFIT PROGRAM, LOUISIANA

**About the program.** In 2018, Entergy Louisiana's energy efficiency incentive program, Entergy Solutions, launched a pilot manufactured home retrofit program, which was subsequently adopted as a permanent program beginning in 2020. The program is funded by ratepayers. Drawing on a workforce from trade allies active in their existing single- and multi-family retrofit programs, Entergy Solutions has retrofitted roughly 1,200 manufactured homes since the program's inception.

**How the program works.** Entergy Louisiana's manufactured home residents are eligible for no-cost energy upgrades. Prescreened, cost-effective energy efficiency measures are installed by the contractor. Both renter- and owner-occupied homes are eligible for the program, though contractors do need the permission of the owner to get access to the home. Entergy Solutions' trade allies identify potential manufactured home parks and perform customer outreach. Entergy Solutions provides preliminary training, regular quality control (including site visits to 10% of homes retrofitted) and readily available assistance when needed. On average, customers receive a $1,200 rebate, which they can send directly to the contractor.

**Benefits of focusing on parks.** The retrofit program exclusively services manufactured home parks in order to reduce travel costs for their trade allies and maximize the number of customers served by the program. In instances where all the homes in a park are owned and managed by a single owner, this lessens access barriers for trade allies, who can be granted permission to retrofit all homes in the park.

**Typical measures.** There are four typical measures installed through this program:

1. Direct install of LED lights and/or water-saving fixtures
2. Air and duct sealing
3. AC tune up, including cleaning coils[38]
4. Cool roof coating designed to reflect heat and reduce cooling costs

Measures 2–4 deliver moderate incremental savings on their own, but if trade allies package them together, they receive a $200 bonus.

**Benefits for customers.** Customers do not pay anything out of pocket. They can expect savings of roughly 6,500 kWh, or $780, a year.

[38] HVAC replacement is not available through the program as it does not qualify as cost-effective (under Arkansas' Technical Resource Manual, which Entergy Solutions relies on), but homes may be eligible through a separate single-family retrofit program.

**Program challenges.** The primary limitation of the program is its budget. It has not been able to meet the scale of demand. As a result, the program has refrained from advertising to its customers, has had to turn away others, and has a growing list of interested customers. Its current budget is roughly $500,000/year.

If scaled, program administrators anticipate possible workforce challenges. The program is currently adequately served by existing trade allies, but there is not much capacity for growth. Additional program budget would need to account for workforce training and certification to meet demand.

**Takeaways for other programs.** The program's success points to the strong demand for energy retrofits among residents. By targeting manufactured home parks, the program is able to reach large numbers of customers at lower costs to its trade allies. In instances where homes in a park are individually owned, this strategy has the benefit of demonstrating the real-world success of retrofits to neighbors and allows word of mouth to spread. This also lowers barriers to access for renters if park owners grant permissions to all homes. The program has been remarkably successful in deploying the workforce necessary to support the program. Entergy Solutions credits this success to its existing pool of trade allies and to its role in coordinating and promoting semi-regular access to training and certification.

**Energy retrofit underway in a manufactured home. Photo credit: Entergy Solutions.**

## CASE STUDY: ON-BILL FINANCING WITH HELP MY HOUSE, SOUTH CAROLINA

**About the program.** Manufactured homes make up just over 15% of South Carolina's homes, the second highest rate in the country.[39] The Help My House Program offers accessible on-bill financing for home energy efficiency upgrades. On-bill financing allows customers to receive upgrades with no upfront costs and payments seamlessly included in their utility bills, while reducing customer energy bills by nearly a third. Currently, six electric cooperatives participate in the program, using funding from a low-cost U.S. Department of Agriculture (USDA) Rural Energy Savings Program (RESP)loan. Through the program, customers are eligible to receive home energy audits, weatherization, and high-efficiency equipment installed by qualified contractors. The program has been successfully running since 2011, and roughly 40% of the homes served are manufactured homes.[40] Help my House in South Carolina is structured as a loan to customers, but on-bill financing agreements are not always structured as such; participants may simply agree to a voluntary tariff with a defined payment schedule.

**State Funding Can Get Pilot Programs off the Ground: On-Bill Financing through Vermont's Weatherization Repayment Assistance Pilot (WRAP)**

**Vermont recently passed state legislation to fund WRAP, an on-bill financing pilot program similar to Help My House. The pilot is a partnership of investor-owned utilities, electric cooperatives, and efficiency organizations, all overseen by the state housing agency. Manufactured homes are eligible for the program.**

**If the pilot is successful, the state housing agency may follow up with an application for a low-cost RESP loan to scale up the program with support from federal funding.**

[39] U.S. Census Bureau, 2021. *American Community Survey (ACS)*. Accessed January 2023. Washington, DC: United States Census Bureau. www.census.gov/programs-surveys/acs.html.

[40] For additional Help My House program information, visit the Environmental and Energy Study Institute's (EESI) resources, including Help My House Model.

Photo credit:
Daniel Turner

**How the program works.** Qualified customers receive energy retrofits that are financed over 10 years through their utility bills. To qualify, homes must be deemed safe for contractors to work in, and any required structural repairs must be addressed by the residents. Residents of manufactured homes built prior to 1996 do not qualify for the program due to the high expenses associated with performing energy retrofits in those homes.

**Benefits of on-bill financing.** For the customer, on-bill financing offers an accessible, low-risk way to improve home comfort and reduce energy bills. For lower-income homes, traditional rebate programs may not be practical due to the required up-front costs and effort of coordinating this financing. Additionally, Help My House on-bill financing is tied to the meter, not the resident, making it an accessible program for renters.

One advantage of the Help My House program is that customers qualify for the program if they are in good standing on their utility bill payments. They do not need to provide other documentation of creditworthiness or income verification, which can be a large administrative burden for residents.

For electric cooperatives and utilities, offering on-bill financing programs can leverage existing utility expertise in energy services in order to serve customers who may otherwise not have access to efficiency upgrades. An effective, equitable program will increase the reach of efficiency programs and provide the overall benefit of minimizing utility load and decreasing the risk of defaults on bill payments.

**Typical measures.** Help My House uses a "whole house" approach where energy efficiency measures are evaluated as part of a system. Participating homes typically receive some combination of air sealing, duct repair, HVAC upgrades, and insulation improvements (primarily in the attic and floor).

**Benefits for customers.** The first 125 customers who participated in the program saved 35% on their energy bills, before including the repayment amounts, with some savings as high as 50%. After loan payments, residents saved roughly $288 per year. Repayment is incorporated into existing utility bills as a line item, making the program highly user friendly.

### Weatherization Requirements May Be Adapted To Better Serve Manufactured Housing

**The uniform construction of manufactured homes can be beneficial for program implementers since savings from efficiency measures are relatively predictable.**

**For example, the South Carolina state legislature (S.C. Code Section 58-37-50) requires pre- and post-blower door tests for all on-bill financed weatherization projects. However, Help My House program implementers have found the audit requirement to be burdensome for manufactured homes, given how uniform manufactured homes are.**

# Replacement Programs

Due to the shorter useful life and declining values of some manufactured homes, the cost of retrofits and weatherization (and the structural repairs that might be needed to perform the retrofit) can quickly exceed the value of the home itself. Homes built prior to the 1994 revisions to the federal manufactured housing construction rules are typically in worse condition as a result of being built to weaker building standards. One 2014 study estimated that roughly half a million manufactured homes nationwide were not in liveable condition.[41]

In homes where retrofits are too costly or difficult to perform, replacement programs may better meet resident needs. Unlike retrofit programs, replacement programs do not have existing site-built programs models to replicate and require unique administrative frameworks and funding mechanisms. Though replacement programs have considerable impacts on energy affordability, thermal control, and even peak load management for local utilities, the value derived from replacements is not primarily energy savings. For this reason, utilities or state energy offices may not be typical administrators. We highlight examples of exceptions and complementary incentive programs in the following pages.


[41] Furman. 2014. *Eradicating Substandard Manufactured Homes: Replacement Programs as a Strategy*. Harvard's Joint Center for Housing Studies and NeighborWorks America. www.jchs.harvard.edu/sites/default/files/w15-3_furman.pdf.

## Replacement Program Considerations

**Costs.** Manufactured home replacements are costly and cannot be justified by the energy savings alone. Average sales prices for new homes range from $85,000 for single sections to $160,000 for double sections, not including the cost of delivery, installation work, or other additional features.[42] Replacements also require additional costs, such as temporary lodging for residents, de-titling the old home, destroying the old home in order to keep it out of circulation (a process that includes safe disposal of lead and asbestos if necessary), and other costs involved in delivering and installing the new home, such as laying a new foundation when necessary.

**Consumer debt.** Replacement programs typically require that residents take on some form of debt. Even if loan terms are favorable, taking on additional debt can be burdensome for low-income homeowners. Qualifying for the loan may be difficult for the most economically insecure residents, and if loan amounts are not adequate to cover all the costs involved, residents will need to find supplemental resources.

**Expertise.** Replacement programs require adequate administrative capacity and expertise. Additionally, successful programs require staff who prioritize the needs of manufactured home residents. As discussed above, replacement programs require detailed design considerations for which there are not many parallels in programs for site-built homes.[43]

[42] U.S. Census Bureau. 2022. *Manufactured Housing Survey (MHS).* Accessed March 2023. www.census.gov/data/tables/time-series/econ/mhs/latest-data.html.

[43] Krogman and Stendel. *Great Lakes Energy Manufactured Home Replacement Research.* January 2023. www.slipstreaminc.org/publications/GLE-manufactured-home-replacement-report.

## CASE STUDY: OREGON HOUSE BILL 2896 FUNDING FOR MANUFACTURED HOME REPLACEMENT AND PARK PRESERVATION

**About the program.** Oregon has roughly 150,000 manufactured homes, half of which were built prior to 1980. In 2019, Oregon passed a bill designed to support manufactured home replacement and the preservation of existing manufactured home parks, a primary source of unsubsidized affordable housing in the state.[44, 45] The bill used a multipronged approach to address the challenges facing residents:

The bill established a $2.5 million fund to:

- Provide low-cost loans (up to $35,000) to income-qualified homeowners of older homes to purchase replacement homes that meet Northwest Energy Efficient Manufactured Housing Program (NEEM) efficiency standards.[46, 47] These loans are provided at 0% interest rates and are forgivable after 10 years. Participating parks are required to sign a regulatory agreement, which has resulted in only nonprofit, housing authority, or resident co-op owned parks participating thus far.

[44] HUD User. 2020. *Programs Support Energy-Efficient Modular and Manufactured Housing*. www.huduser.gov/portal/periodicals/em/WinterSpring20/highlight3.html.

[45] These funds were originally proposed as a separate loan program but were ultimately grouped into the $2.5 million fund described above in order to improve flexibility of the funds to meet residents' needs (i.e., reducing the risk of mismatching the level of funding needed for either program from the outset). (*Salem Reporter*. 2019. *Lawmakers try to keep manufactured homes in the neighborhood*.)

[46] Oregon Secretary of State: Oregon Housing and Community Services Department. Division 66 *Manufactured Dwelling Replacement Program.* Accessed January 2023. secure.sos.state.or.us/oard/displayDivisionRules.action;JSESSIONID_OARD=cT-nYNXEycqJRHA65GYmzXShh67IH2A2AkNP4FDDO40nv8DKBQDS!-701024274?selectedDivision=6150.

[47] NEEM is responsible for certifying ENERGY STAR manufactured homes in the Northwest.

- Provide grants of up to $15,000 to cover the costs associated with decommissioning existing homes. Costs can be as high as $20,000 and include destroying the previous building (to ensure the home is removed from the housing stock); safely disposing of asbestos, lead, or other toxic materials; finding temporary accommodations; and preparing a new foundation for the home.

In response to high rates of park closures and redevelopment, as well as park acquisitions by investors that result in rent increases, the bill also targeted affordable housing preservation by establishing a $9.5 million park acquisition fund to provide loans to nonprofits (including resident-owned communities) and local governments to purchase existing parks or to create new ones. In 2021, the legislature added another $4.5 million to the fund. Currently, this is the only state funding available for acquisition of existing parks. Affordable housing advocates are trying to expand these funds to allow new development.

**Takeaways.** State programs can help improve energy affordability and housing quality for residents through weatherization and replacement programs but must consider other economic forces on residents such as limited ability to take on debt or cover upfront costs. By using a multipronged approach, BILL 2896 can target multiple intersecting financing and housing policy considerations. Energy efficiency program designers should work alongside housing professionals and other community agencies to ensure that new policies holistically consider housing quality.

Split incentives between park owners and residents can be partly addressed with complementary legislation that supports resident- and nonprofit-owned manufactured home parks, such as grants or low-cost loans for purchasing existing parks. Facilitating alternative park ownership models (resident, nonprofit, or local government owned) will ensure that more of the benefits of energy affordability accrue to residents without surprise rent increases.

### Addressing energy affordability at the source: the HOPE Factory

**With $15 million in support from the state, St. Vincent de Paul of Lane County and HOPE Community Corporation have teamed up to manufacture affordable housing in Oregon. The first of its kind, the HOPE factory will build manufactured homes that are low cost and energy efficient. Manufacturing homes directly will allow HOPE to supply homes at a lower cost and ensure homes are built above federal energy standards.**

**Through its support, the state has recognized this approach as a means to increase the supply of high-quality affordable housing. The first homes are expected in 2023.**

***As result of the Inflation Reduction Act (IRA), the 45L tax credit is available to tax-eligible manufacturers for each new ENERGY STAR or Zero Energy Ready-certified manufactured home ($2,500 and $5,000 per home, respectively).***

## CASE STUDIES: OREGON UTILITIES

### (1) Energy Trust of Oregon Replacement Program

**Description.** Energy Trust of Oregon, the nonprofit organization that administers energy efficiency programs on behalf of the state's investor-owned utilities, offers a program designed to incentivize the replacement of pre-1994 HUD Code homes with new homes that exceed minimum federal energy codes. The program is designed to work in conjunction with funding made available through the state replacement program (discussed previously) and was designed in partnership with local nonprofit housing organizations and community action agencies.[48]

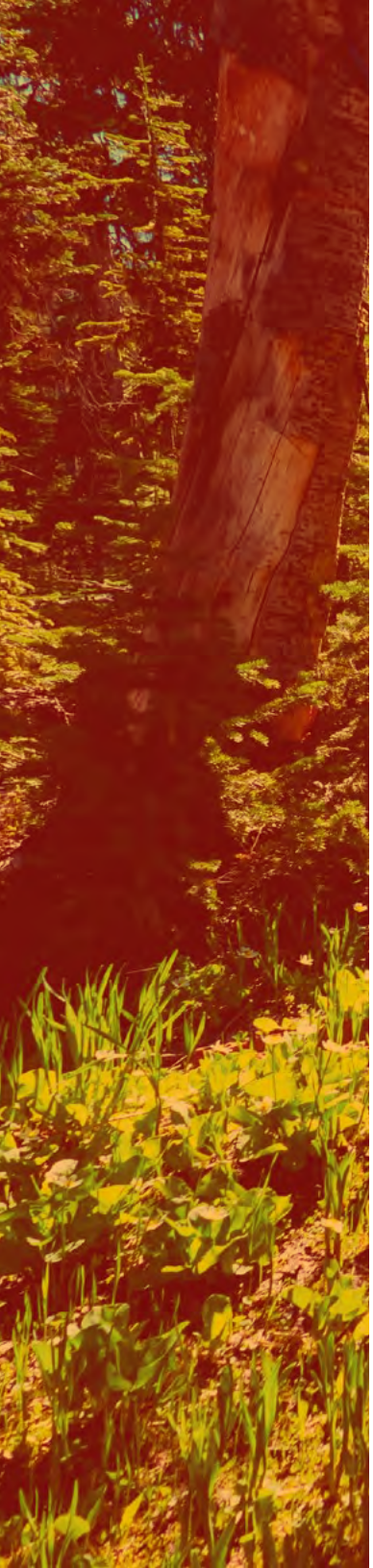
**How the program works.** The program offers incentives up to $16,000 for new NEEM and NEEM+ certified homes to income qualified customers replacing their homes.[49] Energy Trust of Oregon supports residents during the home replacement process and partners with Oregon Housing and Community Services to help customers get additional financial assistance through state programs.[50] In response to recent record-setting wildfires across the state, Energy Trust of Oregon extended its replacement program to include incentives of up to $16,000 to replace manufactured homes that were damaged by fire with efficient new homes.

[48] Energy Trust Blog. 2018. *Energy Trust Launches Pilot to Replace Inefficient Manufactured Homes.* www.blog.energytrust.org/energy-trust-launches-pilot-to-replace-inefficient-manufactured-homes/.
[49] The NEEM+ certification is for homes that have 30% energy savings beyond ENERGY STAR, or NEEM, levels. For more information, visit NEEM.
[50] Energy Trust of Oregon. *Manufactured Home Replacement.* Accessed February 2023. www.energytrust.org/residential/manufactured-home-replacement/.

**Takeaways.** The Energy Trust of Oregon incentive program complements existing state and nonprofit replacement programs. Utility efficiency programs are well positioned to incentivize residents to purchase new, more efficient homes such as those with NEEM or NEEM+ certification in the Northwest, and ENERGY STAR and Zero Energy Ready-certified homes throughout the rest of the country.

**Utilities Can Proactively Identify Customers Most In Need**

**Utilities can support manufactured home retrofit and replacement programs by identifying homes or regions with disproportionately high energy use. For example, Groundswell, a DC-based nonprofit, worked with local utilities in Georgia to identify the highest energy users among low-income households in order to target these homes for energy efficiency retrofits.**



## CASE STUDIES: OREGON UTILITIES

### (2) Umatilla Electric Cooperative Manufactured Home Replacement Program

**Description.** At the end of 2022, Umatilla, a rural electric cooperative in northeastern Oregon, launched a manufactured home replacement program. This program is the first of its kind to take advantage of a 2018 amendment to USDA RESP loans that expanded eligibility to include manufactured home replacement. The program is supported by a $3 million, zero-interest RESP loan to Umatilla, which allows the utility to offer home replacement loans at low interest rates. (See our companion federal funding brief for more RESP details.) The program is designed to complement state funding (described previously). To date, the program has funded one new home and approved two additional families for replacement loans.[51]

**How the program works.** Members of Umatilla's service territory who live in pre-1994 HUD Code homes are eligible to apply for the manufactured home replacement program. There are no specific income requirements, but applicants are required to be screened for creditworthiness. If approved, applicants are eligible for a loan, which is paid back through on-bill financing.[52] Replacement homes are required to be NEEM certified.

Additionally, if the applicant qualifies for the Oregon state replacement program (discussed in Oregon Case Study 1), they will also qualify for 10-year, 0% interest, forgivable gap loans to cover any replacement-related costs such as decommissioning the existing home and accessing temporary housing during the replacement program.

**Program benefits.** The program provides improved, more-energy-efficient homes with affordable financing options for occupants of older manufactured homes. The program may also benefit Umatilla by removing energy-inefficient homes from its service territory and reducing the volume of bills in arrears by increasing energy affordability for its members.

**Challenges.** As a rural electric cooperative (or "co-op"), providing home financing is not a typical business activity for Umatilla. By offering financing, the co-op is ultimately liable for the debt. As such, the program can only be offered if a customer is adequately creditworthy. For lower-income residents, this will limit access to the program.

**Takeaways.** Co-ops are well positioned to offer programs for manufactured homes. They will have access to USDA funding opportunities and have higher shares of customers in manufactured homes compared to non-rural utilities. Smaller, unregulated co-ops and publicly owned utilities have relative flexibility to adapt to and meet the needs of their customers through new and modified programs as they do not need approval from a public utility commission.

[51] Umatilla Electric Cooperative. 2023. *Press Release: Manufactured Home Replacement Program Seeing Success.* www.umatillaelectric.com/news-releases/manufactured-home-replacement-program-seeing-success/.

[52] For more information, visit Umatilla's Manufactured Home Replacement Program.

## CASE STUDY: MINNESOTA REHABILITATION LOAN/EMERGENCY AND ACCESSIBILITY LOAN PROGRAMS (RLP/ELP)

**Description.** Minnesota's state housing finance agency expanded its Rehabilitation Loan Program (RLP) and Emergency and Accessibility Loan Program (ELP) in 2021 to include manufactured home replacements. The program is designed to provide income-qualified customers with low-cost, forgivable loans and has already successfully provided funding for retrofit work on existing manufactured homes.[53]

**How the program works.** Financing of up to $37,500 with 0% interest rates is available to income-qualified residents for retrofits or home replacement. Loan terms are 10 years for manufactured homes owned and taxed as personal property (typically when the owner does not own the land), and 15 years for manufactured homes taxed as real property (typically when the home is permanently affixed to the ground). These loans are forgivable if the resident continues to live in their home.

**Program benefits.** The program makes funding available for home replacement where no state-level financing was previously available. The funds are available to both residents who own the underlying land and those who do not.

**Challenges.** The maximum loan amount for replacement is capped at the same amount as for retrofits, despite the higher costs associated with a replacement. Additionally, to qualify for the program, residents must have a household income no greater than 30% of the area median income. This means that although loans are designed for some of the lowest-income residents, recipients will likely require additional funding sources.

[53] Minnesota Housing. 2022. *Emergency and Accessibility Loan Program Procedural Manual*. www.mnhousing.gov/get/mhfa_008692.

**Takeaways.** In order to provide holistic solutions for residents, states should make funds available for both manufactured home retrofit and replacement programs. For example, customers who qualify for retrofit assistance based on their income but whose homes are beyond repair should have access to funds for replacement. Loan amounts should be adequate to cover most expenses, especially under restrictive income requirements. Allowing flexibility for funds to be used for replacements will offer greater opportunity for residents to improve their quality of life, as well as improve the quality of the state's affordable housing stock.

**Manufactured Home Replacement Program**

**Senate Bill 3141 is currently under consideration by the New York State Assembly. This bill would provide up to $125,000 in financing to income-qualified residents who own their own land for the purpose of replacing their manufactured homes.**

# Policy Takeaways Summary

Though every manufactured home retrofit and replacement program will be unique, the case studies contain some general takeaways for program designers:

- **Develop internal capacity and strong external partnerships.** Despite some overlap with programs for site-built homes, tailoring programs for manufactured homes will benefit from internal expertise, as well as dedicated capacity that can meet the specific needs of the programs. Additionally, all successful programs discussed in the case studies relied on strong partnerships between housing professionals, state policymakers, utilities, manufactured housing communities, and/or manufacturers.
- **Anticipate housing needs beyond energy upgrades.** Manufactured homes will often require structural repairs, repairs to address health issues caused by moisture, or other non-energy-specific upgrades. Programs looking to perform energy upgrades should anticipate these needs and support residents in addressing them.
- **Ensure that funding is made available for upgrades and replacements.** States should ensure that funding is available to support low- and moderate-income residents for addressing needed repairs, upgrades, or homes replacements when necessary.
- **Eliminate up-front cost barriers.** Grants, forgivable loans, or down payment assistance can support residents in covering the costs associated with replacing their homes. On-bill financing or programs with zero out-of-pocket costs can help residents access energy or home upgrades.
- **Make financing accessible.** Credit score requirements can be a barrier for many low-income residents. Programs can use good bill payment history (in the case of on-bill financing) as qualification or partner with a financing agency to provide tailored low-cost loans or mortgage assistance.
- **Focus on parks.** Targeting manufactured home parks for retrofit or replacement programs can reduce travel and administrative costs for, and maximize the reach of, the program.
- **Tailor programs and policies to ownership type.** The motivation (and resources available) for residents to pursue upgrades will vary depending on whether their home is in a park, the ownership structure of the park, the type of home loan, and whether residents own the underlying property.
- **Incentivize high-efficiency replacement homes.** Utility incentives for high-efficiency homes can allow residents to access energy savings and ensure more energy-efficient local affordable housing stock.
- **Leverage federal funding opportunities to increase the reach of retrofit or replacement programs.** Federal funding is available to provide grants or low-cost loans to support retrofit and replacement programs

# Upgrading Manufactured Homes: Federal Funding Opportunities for Retrofits and Replacements

ACEEE Smart Energy. Clean Planet. Better Lives.

**AUGUST 2023**
**TOPIC BRIEF**

**This brief highlights new and existing federal funding opportunities for manufactured home energy retrofit and replacement programs. Funding opportunities presented here have a special focus on states and rural utilities, though we also highlight when nonprofits and local governments are eligible to apply for funding. Federal programs are just one stream of potential funding and may be combined with state- or utility-level funding to expand existing programs or create new programs.[54]**

[54] Retrofit and replacement programs can be funded in a variety of different ways: Utilities host ratepayer-funded incentive and rebate programs, states set aside funds to support state-level programs or distribute grants to smaller organizations, and nonprofits coordinate programs funded primarily through philanthropy or foundation funds. Some federal funds cannot be combined with other federal funds but may be combined with other non-federal funds.

# Federal Funding Opportunities

The passage of the 2022 Inflation Reduction Act (IRA) provided substantial new federal funding for climate investments, including new opportunities to support energy efficiency in affordable housing. Over the course of 2023, federal agencies will release detailed guidance and open funding applications for these programs and many programs will have funding available in subsequent years. States, local governments, utilities, and manufactured housing community organizations can leverage these funding opportunities to start up new manufactured housing programs or expand existing programs to reach more residents. Additionally, the 2021 Infrastructure Investment and Jobs Act (IIJA) created new energy investment programs and injected funds into existing programs, like the Weatherization Assistance Program.

A variety of federal funds are described below: some from housing programs, some from energy or climate programs, and some from health programs. Programs funded through the IRA or the IIJA have been noted to highlight new opportunities. The eligible applicants and activities vary by program. Retrofit and replacement programs thrive when coordinated across local government, housing agencies, utilities, nonprofits, and other stakeholders. Enabling these programs might also require layering multiple sources of funds, including health funding that is not traditionally used for housing upgrades but which shows promise for health-related work.[55]

Table 1 summarizes the federal funding opportunities covered in this brief with more detailed descriptions of each program following.

[55] Hayes and Gerbode. 2020. *Braiding Energy and Health Funding for In-Home Programs: Federal Funding Opportunities*. Washington, DC: American Council for an Energy-Efficient Economy. www.aceee.org/research-report/h2002.

**Table 1. Overview of federal funding opportunities described in this resource. Opportunities include funding from the U.S. Department of Housing and Urban Development (HUD), U.S. Department of Agriculture (USDA), U.S. Department of Energy (DOE), Environmental Protection Agency (EPA), Centers for Disease Control and Prevention (CDC), and Centers for Medicare & Medicaid Services (CMS).**

| Energy, housing, or health | Program | Agency | Eligible applicants | Eligible uses (retrofits and/or replacement) | Funding |
|---|---|---|---|---|---|
| **Featured Programs** | | | | | |
| Housing | (New) Preservation and Reinvestment Initiative for Community Enhancement (PRICE) | HUD | States, local governments, resident-owned manufactured housing communities, nonprofits, and more | Both energy retrofits and replacement programs | Competitive grants. $225 million available through FY2027. |
| Energy | Rural Energy Savings Program (RESP) | USDA | Rural utilities and other energy efficiency providers | Both energy retrofits and replacement programs | Competitive loans. $350 million in FY2023. |
| Energy | (New – Inflation Reduction Act) Home Efficiency Rebates (previously "HOMES") | DOE | State energy offices (for consumer rebates) | Energy retrofits | Formula. $4.3 billion through FY2031. |
| Energy | (New – Inflation Reduction Act) Home Electrification and Appliance Rebates (previously "HEEHRA") | DOE | State energy offices (for consumer rebates) | New electric equipment, insulation, and air sealing in existing or new home | Formula. $4.5 billion through FY2031. |
| Energy | (New – Infrastructure and Jobs Act) Energy Efficiency Revolving Loan Fund Capitalization Grant Program (RLF) | DOE | State energy offices (for direct loans and grants to homeowners) | Likely just energy retrofits | Formula grants. $250 million in FY2022 until expended. |
| Energy | (New – Inflation Reduction Act) Greenhouse Gas Reduction Fund (GGRF) | EPA | States, local governments, nonprofits with financing abilities for financial and technical assistance | Potentially both (if focused on GHG emissions) | Competitive grants. $27 billion through FY2024. |
| Energy | Weatherization Assistance Program (WAP) | DOE | States for grants to community action agencies | Energy retrofits | Formula grants. $3.2 billion plus annual appropriations. |
| Energy | Energy Efficiency and Conservation Block Grants (EECBG) | DOE | States, local governments | Energy retrofits and potentially replacement programs | Primarily formula funding. $440 million until expended. |

| Energy, housing, or health | Program | Agency | Eligible applicants | Eligible uses (retrofits and/or replacement) | Funding |
|---|---|---|---|---|---|
| Housing | Community Development Block Grants (CDBG) | HUD | States and local governments | Both energy retrofits and replacement programs | Formula grants. $3.3 billion in fiscal year 2023. |
| Health | Medicaid | CMS | States | Likely retrofits and potentially replacement programs | Hundreds of billions annually, with a smaller share available for weatherization. |
| **Other Relevant Programs** | | | | | |
| Energy | Energy Efficiency and Conservation Loan Program (EECLP) | USDA | Utilities with rural customers (areas with populations up to 20,000) | Energy retrofits | Competitive loans. Part of a larger program with $5 billion available annually. |
| Energy | (New – Infrastructure and Jobs Act) Energy Improvements in Rural or Remote Areas (ERA) | DOE | Utilities, states, local governments, and more | Likely retrofits and potentially replacement programs | Competitive grants. $200 million annually FY2022 through FY2026. |
| Housing | HOME Investment Partnerships (HOME) | HUD | States, local governments | Both energy retrofits and replacement programs | Formula grants. $1.5 billion in fiscal year 2023. |
| Health | Preventive Health and Health Services Block Grant (PHHSBG) | CDC | States | Likely retrofits and potentially replacement programs | Formula grants. $145 million in FY2022. |
| Energy | (New – Inflation Reduction Act) Environmental and Climate Justice Block Grant Program (ECJ) | EPA | Community-based organizations along with local governments, tribes | Potentially both (if focused on resiliency, zero-emissions technologies) | Competitive grants. $3 billion through FY2026. |
| Energy | (New – Inflation Reduction Act) Climate Pollution Reduction Grants | EPA | States, local governments, tribes for developing and implementing climate plans | Potentially both (if focused on emissions) | Competitive grants. $5 billion through FY2026. |

# Featured Programs

## Preservation and Reinvestment Initiative for Community Enhancement (PRICE), HUD

**Program Description.** A new U.S. Department of Housing and Urban Development (HUD) competitive grant program to preserve and revitalize manufactured housing. These funds are designed specifically to improve access to and quality of manufactured housing. The funds can be used for infrastructure investments and resiliency activities, including reconstruction, repairs, health and safety measures, weatherization, and energy efficiency measures.[56] These funds can be used in a broad range of ownership models, including resident-owned communities. Privately owned communities will be subject to binding agreements that maintain long-term affordability.

**Who can apply for this program?** There is a broad list of eligible recipients including states, local governments, resident-owned manufactured housing communities, cooperatives, nonprofit entities (or consortia of such entities), community development financial institutions, and tribes.

**How much funding is available?** $225 million.

**Timeline.** Funding available through fiscal year 2027.

**Notes.** PRICE funds require 50% non-federal cost matching, which can be a barrier for new or small programs. These grants can be used for homes that are not in manufactured housing communities, or in manufactured housing communities that are owned by resident-controlled entities or are legally required to remain affordable for the long term. Funds can be used to replace pre-1976 homes, but not to repair them.

**More information.** Guidance has yet to be issued. A brief summary of the appropriations for PRICE funds can be found here and a short write-up from ROC USA (resident-owned communities) can be found here.

**Unique Funding Opportunity for Manufactured Housing**

**PRICE is the only federal funding program dedicated to manufactured housing. The broad eligible uses make these funds well suited to expand new or existing energy programs for manufactured homes to include repair work or infrastructure needs to pursue energy investments.**

[56] The funds can also be used for planning, community services, assistance for land, and site acquisition.

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## Rural Energy Savings Program (RESP), USDA

**Program Description.** RESP is designed to help rural families and small businesses achieve cost savings by providing zero-interest loans to rural utilities and other entities that make low-interest loans to consumers for implementing cost-effective energy efficiency measures including renewable energy and energy storage.

Funds may be used for the purpose of implementing energy efficiency measures to decrease energy use or costs for rural families and small businesses. As of 2018, these funds may also be used for manufactured home replacement programs (if the replacement would be more cost effective in saving energy). RESP funds can be used to issue loans to customers through on-bill financing. To read about the first RESP loan used for replacement, read about Umatilla's replacement program within this series of briefs.

**Who can apply for this program?** Rural electric cooperatives, utilities that provide retail electric service in rural areas (populations of no more than 50,000 people[57]), and any other entities that provide or propose to provide eligible purposes under RESP.

**How much funding is available?** FY2023 budget of $350 million (inclusive of annual lending authority and unused funds).[58]

**Timeline.** RESP funds are available on a rolling, first-come, first-served basis. Note that RESP is authorized through the Farm Bill, which expires in September 2023. Funding may change somewhat once a new Farm Bill is passed.

**Notes.** RESP is a re-lending program where funds must be re-lent from the U.S. Department of Agriculture (USDA) borrower to a rural consumer (residential or business). USDA offers loans at 0% interest rates with 20-year payback periods to the utility or provider (longer than the 15-year period for Energy Efficiency and Conservation Loan Program (EECLP) funds). The recipient re-lends funds to customers at up to a 5% rate for up to 10 years.

**How will funds be distributed?** Applicants must apply directly to USDA's Rural Utilities Service.

**More information.** For more information, including application materials, visit USDA's Rural Energy Savings Program page. Applicants are encouraged to reach out to the USDA to determine whether their program would serve an eligible rural area.

**In 2020, Michigan rural electric cooperative Traverse City Light & Power was the first municipal utility to receive a RESP loan. With the $1.8 million loan, the utility designed an on-bill financed energy efficiency retrofit program to improve rural access to energy efficiency and energy equity at low interest rates.**

[57] "By law, the definition of 'eligible rural area' is different for each USDA Rural Development program. The statutory rural area eligibility criteria for most programs are complex. The statute may include exceptions for specific communities based on regional circumstances." (See www.rd.usda.gov/files/RD_ProgramMatrix.pdf.)
[58] USDA. FY2023 Budget Summary.

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Photo credit: Marcela Gara, Resource Media

## Home Efficiency Rebates (previously "HOMES"), DOE

***This is a new program created through the Inflation Reduction Act of 2022.***

**Program Description.** This is a new rebate program designed to lower home energy bills through energy efficiency. Rebates will be available for comprehensive whole-home retrofits designed to achieve significant energy savings. State energy offices can provide rebates to owners (or contractrors) of both manufactured and site-built homes. Rebates are typically $2,000 to $8,000 per home depending on the level of energy savings and household income.

**Who can apply for this program?** State energy offices (though it may be possible to forward these funds to another state office or program implementer).

**How much funding is available?** $4.3 billion, with state apportionments determined by formula.

**Timeline.** States will likely be able to apply for the first round of funding by summer 2023. Funds may remain available through fiscal year 2031.

**Notes.** These funds cannot be used with other federal grants but may be combined with federal loans or tax incentives and with state and utility funds. There are two approaches: Retrofits are required to save at least 15% of existing energy use for "measured" energy savings, with rebates prorated based on savings percentage, or save 20% for "modeled" energy savings, with higher rebates for retrofits that save at least 35%.

**How will funds be distributed?** States will need to apply directly to the U.S. Department of Energy (DOE).

**More information.** Check for regular funding updates and guidance at DOE's Home Energy Rebate Programs. Guidance for Home Efficiency and Electrification Rebates can be expected to be issued simultaneously.

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Photo credit: Marcela Gara, Resource Media

## Home Electrification Rebate Program (previously "HEEHRA"), DOE

***This is a new program created through the Inflation Reduction Act of 2022.***

**Program Description.** This program provides grants to develop and implement a high-efficiency electric home rebate program. The funds may be used to provide rebates to low- and moderate-income residents pursuing electrification projects, including high-efficiency electric home equipment and air sealing and insulation improvements. The equipment cannot replace equipment of the same type (e.g., a heat pump could replace a propane furnace, electric resistance heating, or be in a new home, but could not replace an older heat pump). The program provides rebates up to $14,000, covering 50–100% of associated project costs depending on household income.[59] Contractors supporting these projects are also eligible for a $500 rebate.

**Who can apply for this program?** State energy offices and tribes.

**How much funding is available?** $4.27 billion to States Energy Offices and $225 million to tribes, with state apportionments determined by formula.

[59] Up to 100% of costs up to $14,000 for low-income residents (80% of area median income) and 50% of costs up to $14,000 for moderate-income residents (80–150% of area median income), with sub-caps for each kind of equipment. Congressional Research Service. 2022. The Inflation Reduction Act: Financial Incentives for Residential Energy Efficiency and Electrification Projects.

**Timeline.** States will likely be able to apply for the first round of funding by summer 2023. Funds may remain available through fiscal year 2031.

**Notes.** The same rules for braiding other funds apply as they do for HOMES rebates discussed on the previous page.

**How will funds be distributed?** States will need to apply directly to DOE.

**More information.** Check for regular funding updates and guidance at DOE's Home Energy Rebate Programs. Guidance for Home Efficiency and Electrification Rebates can be expected to be issued simultaneously.

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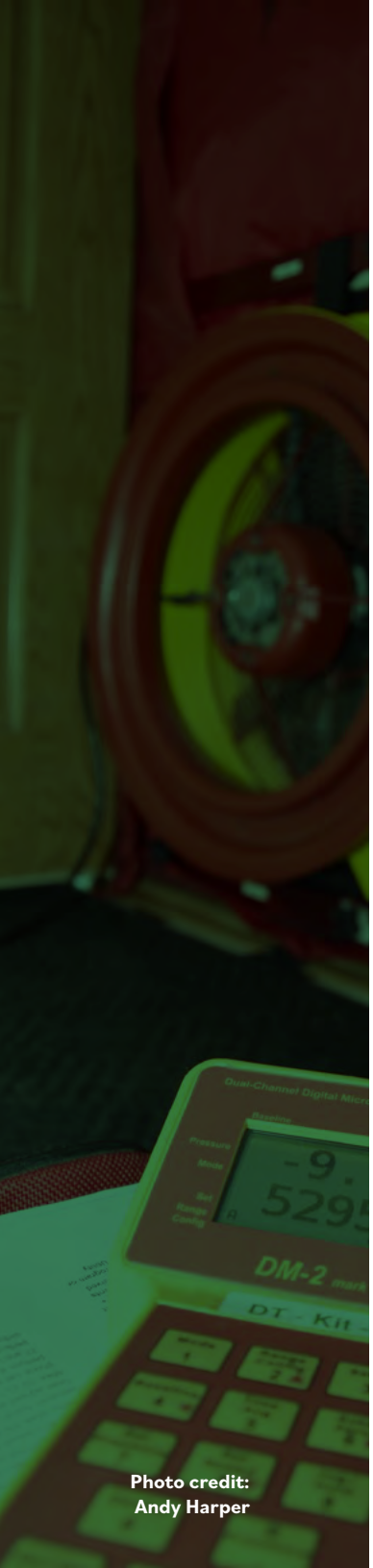

Photo credit:
Andy Harper

## Energy Efficiency Revolving Loan Fund Capitalization Grant Program (RLF), DOE

***This is a new program created through the 2021 Infrastructure Investment and Jobs Act.***

**Program Description.** This program provides capitalization grants to states to establish a revolving loan fund that issues loans and grants for energy efficiency projects. These projects can include energy audits, upgrades, and retrofits to increase energy efficiency and improve the comfort of buildings. Manufactured homes are eligible to receive loans for energy efficiency projects, while low-income homeowners are eligible for grants.[60] For any residential retrofits, funds may only be used to install energy efficiency measures that are cost effective.

**Who can apply for this program?** State energy offices.

**How much funding is available?** $250 million until expended.

**Timeline.** The first round of funding is expected to be awarded by summer 2023. Funding will be available until expended.

**Notes.** State energy offices are encouraged to coordinate with other programs and agencies, and especially with private lenders offering complementary products. States may use up to 25% of funds to provide technical assistance to eligible recipients.

**How will funds be distributed?** Funding is awarded to states by formula. Only 40% of funds will be awarded to all states; the remaining 60% will be awarded to 23 priority states. States must apply to DOE with a detailed plan for the funds.

**More information.** See DOE's Energy Efficiency Revolving Loan Fund Capitalization Grant Program page, as well as Frequently Asked Questions for further details, including required and optional program elements.

[60] Low income here refers to residents on state or federal assistance, with a family income below the poverty line or 70% of the lower living standard income. See paragraph 36 of 29 U.S.C. 3102 for a definition of a low-income individual used for this program.

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## Greenhouse Gas Reduction Fund (GGRF), EPA

***This is a new program created through the Inflation Reduction Act of 2022.***

**Program Description.** The GHG Reduction Fund is a competitive grant program to support deployment of zero-emission technologies and to provide financial and technical assistance to projects that reduce or avoid greenhouse gas emissions, primarily in low-income and disadvantaged communities. Only initial guidance has been issued for these grants, but eligible uses appear to be somewhat broad. The fund includes $7 billion for states, local governments, and nonprofits to invest in solar energy. The remaining $20 billion is for green banks and other nonprofits to finance emissions-reducing investments.

Applicants in areas with a high concentration of manufactured housing might consider applying for funds to support tailored energy efficiency retrofit or replacement programs. Such programs will serve predominantly low-income residents and result in lower energy bills and reduced emissions. These programs could include pole-mounted or community solar options for homes in parks. Financing assistance could be considered for manufactured home replacement programs, especially efficient all-electric homes.

**Who can apply for this program?** States, local governments, nonprofits.

**How much funding is available?** $27 billion for competitive grants, broken into three competitions (according to a draft framework):

- **Solar for All (SFA) competition ($7 billion).** Funding for up to 60 grants to states, tribal governments, municipalities, and nonprofits to expand investment in residential and community solar in low-income and disadvantaged communities.
- **National Clean Investment Fund (NCIF) competition ($14 billion).** Funding for two to three nonprofits that will partner with private capital providers to deliver financing (but not grants) for clean technology projects. The priorities include distributed solar power and decarbonization building retrofits. At least $2 billion will go to low-income and disadvantaged communities.
- **Clean Communities Investment Accelerator (CCIA) competition ($6 billion).** Funding for two to seven hub nonprofits to build the clean financing capacity of hundreds of public, quasi-public, and nonprofit community lenders (including community development financial institutions) to ensure accessible financing for clean energy projects in low-income and disadvantaged communities.[61]

**Timeline.** The competitions are expected to be announced in summer 2023. U.S. Environmental Protection Agency (EPA) funding is required to be awarded by fiscal year 2024 (though the programs funded may extend beyond 2024).

**Notes.** Due to the broad range of eligible uses, the level of funding available, and the relatively short window of availability, we encourage applicants to actively monitor for forthcoming guidance and prioritize pursuing this funding, including as sub-recipients.

**How will funds be distributed?** Applicants will need to apply directly to EPA for large-scale grants, many of which they will use to support smaller funders. Manufactured housing projects likely will only make up a part of grants. Application information will be available in summer 2023.

**More information.** Follow EPA's Greenhouse Gas Reduction Fund page for updates on guidance.

***EPA notes: "All applicants must have an active SAM.gov and Grants.gov registration in order to apply for a grant under the IRA. You should register in these systems now if you think you may apply for a federal grant. The process can take a month or more for new registrants."***

[61] EPA broadly defines "disadvantaged communities" as those that are marginalized, underserved, and overburdened by pollution. A preliminary screening tool has been released but criteria have not been finalized. See Climate and Economic Justice Screening Tool: Frequently Asked Questions.

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Photo credit:
David Dodge,
Green Energy Futures

## Weatherization Assistance Program (WAP), DOE

***This is an existing program that received a one-time infusion of $3.5 billion through the 2021 Infrastructure Investment and Jobs Act.***

**Program Description.** The Weatherization Assistance Program (WAP) has a long history of providing weatherization upgrades to low-income families through funds to states. WAP funds may be used to perform energy assessments, seal air leaks, add insulation, and replace heating and cooling equipment, with funding available for an average of $8,000 per dwelling. In addition to lowering customer energy bills, weatherization delivered through WAP programs improves the indoor environmental quality of the home, often leading to comfort and health benefits for residents. Funds may also be used to provide weatherization workforce training.

**Who can apply for this program?** States, with funding amounts determined by formula.

**How much funding is available?** $3.2 billion beginning in fiscal year 2022, available until expended, in addition to $326 million in regular appropriations for fiscal year 2023.

**How will funds be distributed?** States apply directly to DOE and then distribute the funds through local community action agencies.

**Notes.** DOE has developed regional priority lists of measures to include in retrofits, including for manufactured homes to facilitate greater impacts and reduce administrative burdens. These priority lists are optional and apply to manufactured homes that meet certain criteria (based on size, age of home, space conditioning, etc.).

**More information.** For up-to-date information, subscribe to DOE's Weatherization Program Notices and Memorandums.

**"In Oregon, Community Action Agencies use WAP funds to provide weatherization and energy conservation services at no cost to households earning incomes at or below 200 percent of the federal poverty level. Approximately half of all weatherization efforts [in OR] are performed on manufactured homes—particularly older homes—with critical energy efficiency, health, and environmental concerns."**
***—HUD, Evidence Matters (Winter 2020 Issue)***

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## Energy Efficiency and Conservation Block Grant Program (EECBG), DOE

***This program, which had been dormant, received a one-time infusion of $550 million through 2021 Infrastructure Investment and Jobs Act.***

**Program Description.** EECBG funds may be used to develop and implement energy efficiency programs, including energy audits, rebate programs, and grants to nonprofits and government agencies for performing retrofits on manufactured homes.

**Who can apply for this program?** Larger local governments and states (to distribute to smaller local governments).

**How much funding is available?** $440 million primarily in formula funds, beginning in fiscal year 2022. Funds will be available until expended.

**Timeline.** The most recent application window closed in July 2023.

**Notes.** While the EECBG funds are primarily targeted toward energy efficiency upgrades, it is possible that replacement programs may be eligible for funding. States or local governments that plan to fund residential retrofit programs through EECBG should consult with housing agencies and manufactured housing experts on how to best serve manufactured homes with EECBG funds.

States may consider complementing EECBG funding streams with state-level funding.

**More information.** For program milestones and more information, including state and local allocations, visit DOE's Energy Efficiency and Conservation Block Grant Program. Additionally, DOE's EECBG Program Formula Grant Application Hub provides application guidance, as well as model projects and programs that are eligible for EECBG program use (see "EECBG Program Blueprints," which includes a Blueprint 2A: Energy Audits, Building Upgrades).

## Community Development Block Grants (CDBG), HUD

**Program Description.** Long-standing formula grant program that provides states and localities funds to support economic development, community development, and infrastructure. Typically, states determine funding priorities then award grants to local governments. Recipients are required to use a large portion (70%) of the funds to support affordable housing. CDBG funds can be used to increase housing access and improve housing quality for low- and moderate-income residents. Eligible uses include demolition and relocation, which makes these funds attractive to support state or local replacement programs in addition to retrofit programs.[62]

**Who can apply for this program?** States and local governments.

**How much funding is available?** $3.3 billion in fiscal year 2023, with state and county grant amounts determined by formula.

**How will funds be distributed?** Applicants apply directly with HUD. Applicants are required to participate in the HUD planning process and provide funding plans.[63]

**More information.** Visit HUD's extensive CDBG resources.

[62] HUD, Office of Block Grant Assistance. 2012. *"Basically CDBG: Chapter 4."* files.hudexchange.info/resources/documents/Basically-CDBG-Chapter-4-Housing.pdf.
[63] Congressional Research Service (CRS). 2021. *"Community Development Block Grants: Funding and Allocation Processes."* crsreports.congress.gov/product/pdf/R/R46733.

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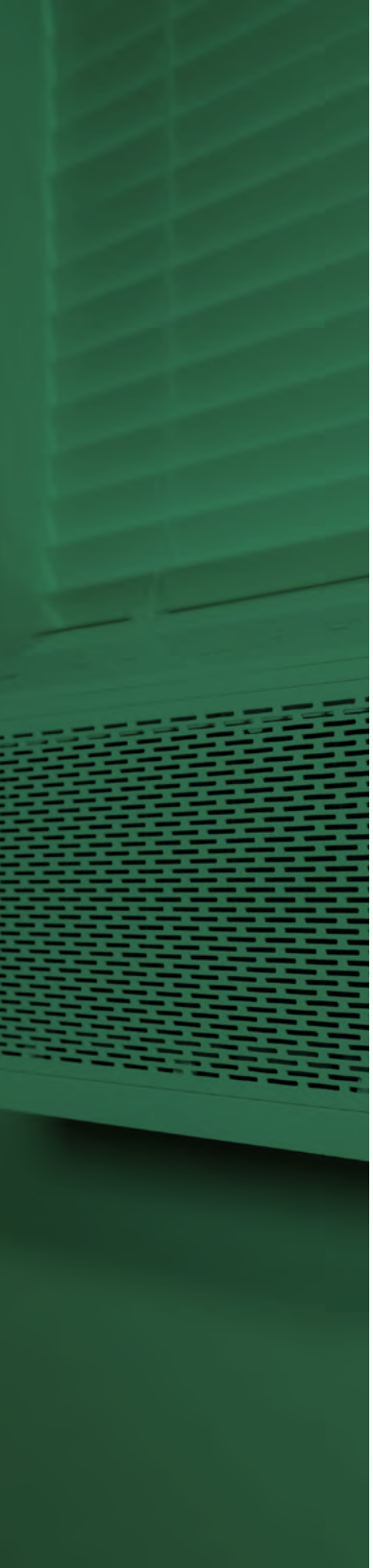

## Medicaid, CMS

**Program Description.** Medicaid funds may be used to provide reimbursement and funding for a limited number of nontraditional health interventions, such as in-home services that mitigate or prevent health harms. These services have typically been limited to remediation activities that are directly tied to household health, such as household allergen remediation for people with asthma, but a recent pilot program has expanded these services to weatherization measures (see text box). Energy efficiency and weatherization upgrades can serve as in-home preventive healthcare services that directly address some of the social determinants of health in order to complement traditional health services.

State Medicaid offices can offer nontraditional medical programs through State Plan Amendments (SPA) or through a 1115 waiver to test new ways to deliver healthcare services not typically covered. States may also include weatherization services in the contract with their managed care organization (the organization contracted by the state to administer Medicaid).

**Who can apply for this program?** States.

**How much funding is available?** Hundreds of billions of dollars annually for Medicaid. However, only a small share of Medicaid funds will likely be eligible for nontraditional interventions.

**How will funds be distributed?** To access broad Medicaid formula funding, states submit their plans (or plan amendments) to the Centers for Medicare and Medicaid Services (CMS) and, if approved, are funded through a matching block grant program. For Section 1115 waivers to fund demonstration or pilot projects, states should apply separately here.

**More information.** States considering using Medicaid funds for weatherization programs should look to pilots in other states, like New York (see call out box). More Medicaid funding information can be found here. Also, see ACEEE's report for more information on leveraging federal health funding for energy efficiency upgrades.

**Medicaid and Energy Efficiency Pilot in New York**

**The New York State Healthy Homes Value-Based Payment Pilot is using Medicaid funds to deliver residential healthy homes interventions, including weatherization and energy efficiency measures, to 500 households. Interventions are designed to improve occupant health and reduce energy bills.**

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# Other Relevant Programs

## Energy Efficiency and Conservation Loan Program (EECLP), USDA

**Program Description.** EECLP provides loans to rural utilities to finance energy efficiency and conservation projects. Funds may be used for customer energy efficiency upgrades, energy audits, and customer outreach programs, as well as a variety of other energy efficiency investments. The loans to utilities are tied to Treasury rates of interest with a maximum term of 15 years for most projects. Loans can be offered to customers through on-bill financing.

**Who can apply for this program?** Utilities with customers in rural areas and towns with populations of up to 20,000.

**How much funding is available?** EECLP funding is part of the Rural Utility Service's Electric Program infrastructure loan program, which typically has at least $5 billion in funding available annually.

**Timeline.** Funds are available on a rolling, first-come, first-served basis.

**Notes.** EECLP loans can be re-lent to the utility's customers at interest rates up to 1.5% above current Treasury rates. Though the definition of rural utilities is broader for this program, EECLP loan terms are more restrictive than for RESP loans. Applicants should consult with the USDA to determine which loan best serves their needs.

**How will funds be distributed?** Utilities may apply directly to the USDA.

**More information.** For more information contact your state-level field representative or visit USDA's Energy Efficiency and Conservation Loan Program page. Applicants are encouraged to reach out to USDA to determine whether their program would serve an eligible rural area.

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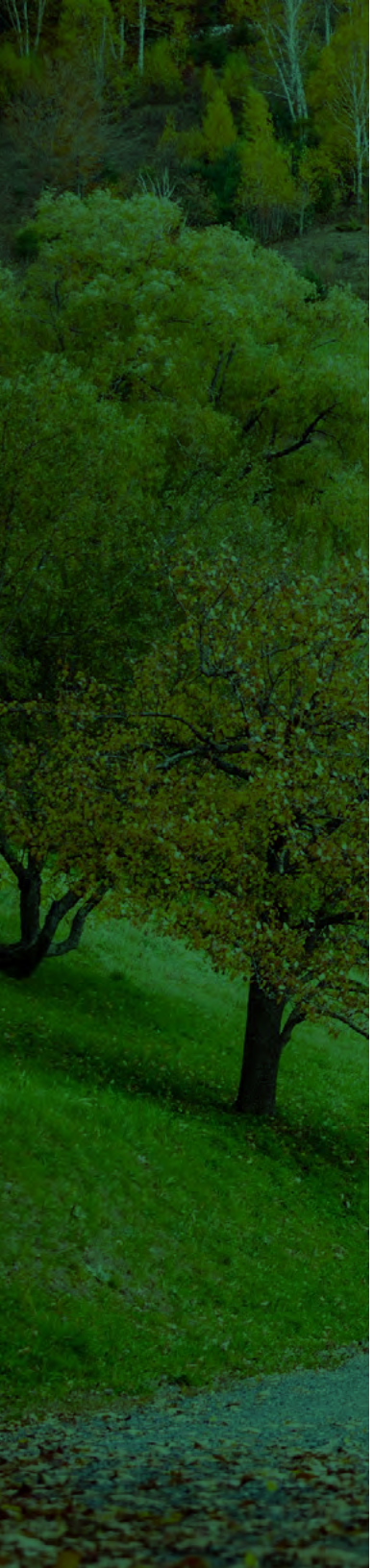

## Energy Improvements in Rural or Remote Areas (ERA), DOE

***This is a new program created through the 2021 Infrastructure Investment and Jobs Act.***

**Program Description.** The ERA provides competitive grants designed to improve the cost, reliability, and resilience of energy systems in rural areas (populations of 10,000 or fewer people). Grants are available for programs that deliver measurable benefits and lower energy costs, including programs that demonstrate new financing mechanisms. Eligible uses appear to be broad, and programs that deliver energy efficiency or renewable energy retrofits for manufactured homes may qualify as eligible projects. Replacements programs that prioritize high-efficiency or renewable-ready units may also qualify.

**Who can apply for this program?** Utilities, nonprofits, state/local governments, and more.

**How much funding is available?** $1 billion ($200 million annually) available FY2022 through FY2026.

**Timeline.** The first round of funding announcements were released in March and May 2023.[64]

**Notes.** These funds may be used to expand energy efficiency and clean energy to families and communities. Applicants may propose community- or large-scale demonstration projects for grants ranging from $5–100 million in size. Nonprofits and government applicants must cover 20% of the project costs, while other applicants cover 50%.

**More information.** Follow DOE's Energy Improvements in Rural or Remote Areas page for further guidance, including announcements on the Energizing Rural Communities Prize, which provides cash prizes from ERA to finance clean energy demonstration projects or plans to connect communities with technical assistance or federal funding. The full funding announcement for 2023 is available here, with the first round of applications due in August 2023.

[64] DOE. 2023. *Coming Soon: Up to $300 Million for Energy Projects in Rural or Remote Communities*. www.energy.gov/oced/articles/coming-soon-300-million-energy-projects-rural-or-remote-communities.

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## HOME Investment Partnerships (HOME), HUD

**Program Description.** HOME provides formula grants to states and localities to fund a wide range of activities to improve access to, and the quality of, affordable housing, including manufactured homes. The funds are often used in partnership with local nonprofit groups. HOME is the largest federal grant program designed exclusively to create affordable housing for low-income households.

HOME funds provide home purchase or rehabilitation financing assistance to income-qualified owners of manufactured homeowners who own the underlying land. HOME funds can also be used for site acquisition or improvement, demolition, and payment of relocation expenses, which make the funds well suited for manufactured home replacement programs. However, the statute specifies that rehabilitation of existing homes (rented or owned) should be prioritized over other types of eligible uses for HOME funds.

**Who can apply for this program?** States (40% of total funds) and local governments (60% of total funds).

**How much funding is available?** $1.5 billion in fiscal year 2023, with funding determined by formula.

**How will funds be distributed?** States or local governments directly apply to HUD with a plan that identifies their affordable housing needs and how they intend to use HOME dollars.

**Notes.** States or localities must match 25% of any HOME funds they spend with their own permanent contribution to affordable housing activities. States may include rehabilitation or replacement of manufactured homes as part of their plans for HOME funds.

**HOME Funds for Manufactured Homes in New York**

**In FY2022, the New York State HOME Program awarded roughly $5.6 million dollars in grants to local organizations running manufactured home replacement programs. The program requires that all new homes meet ENERGY STAR standards.**

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## Preventive Health and Health Services Block Grant (PHHSBG), CDC

**Program Description:** The PHHSBG provides states grants to support areas of health and prevention that currently lack funding. This may include funding measures that promote preventive health care and protect health through social determinants, including in-home and community-based interventions like weatherization programs. In-home programs that are focused on health and energy efficiency can build the case that their work addresses some priority focus areas, like improving indoor air quality, inadequate heating and sanitation, structural problems, electrical and fire hazards, lead-based paint hazards, injury prevention, and chronic disease management (like asthma). Manufactured housing energy efficiency programs may also be eligible as they address economic stability–a key social determinant of health–by improving energy affordability.

**Who can apply for this program?** States.

**How much funding is available?** $145 million was available in fiscal year 2022.

**How will funds be distributed?** States apply directly to the CDC. State funding is determined by formula.

**More information.** See CDC's Preventive Health and Health Services Block Grant page, as well as ACEEE's report on leveraging federal health funding for energy efficiency upgrades.

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## ENVIRONMENTAL AND CLIMATE JUSTICE BLOCK GRANT PROGRAM (ECJ), EPA

***This is a new program created through the Inflation Reduction Act of 2022.***

**Program Description.** The ECJ program is a new, competitive grant and technical assistance program designed to reduce air pollution and greenhouse gas emissions; improve community resilience to the impacts of climate change, including extreme heat and wildfire; and build the capacity of community-based organizations (CBOs) to engage with state and federal decision-making processes. The funds could possibly be used for energy retrofits and necessary structural repair work that can protect manufactured home residents from extreme temperatures (i.e., resiliency). Additionally, funds might be considered for replacement programs, including installation and adequate storm damage prevention measures, such as hurricane tie-downs.

In early 2023, guidance was issued for two grant programs: the Environmental Justice Collaborative Problem-Solving (EJCPS) Cooperative Agreement Program ($30 million) and the Environmental Justice Government-to-Government (EJG2G) Program ($70 million). These programs are designed to fund partnerships that address local environmental and public health issues and develop models to integrate environmental justice into state programs.[65]

**Who can apply for this program?** CBOs, including nonprofit homeowner associations. States, local governments, and tribes in coalition with CBOs may apply for the EJG2G program. States and local governments will likely be able to apply for implementation grants in partnership with CBOs but will not receive funds directly

**How much funding is available?** $3 billion ($2.8 billion in implementation grants, and $200 million in technical assistance) until expended.

**Timeline.** Some funds were released in January 2023, with the lion's share of the implementation grants expected to be released later in 2023. Funding will remain available until expended through fiscal year 2026.

**How will funds be distributed?** Applicants apply directly to EPA.

**More information.** Visit EPA's EJ Grants, Funding, and Technical Assistance page, or contact regional EPA environmental justice staff using EPA's designated Environmental Justice Contact page.

[65] January 10, 2023 Press Release: Biden-Harris Administration Announces Availability of $100 Million through Inflation Reduction Act for Environmental Justice Grants. To provide support to overburdened communities in navigating the federal grant system, EPA also awarded $177 million to establish Environmental Justice Thriving Communities Technical Assistance Centers (EJ TCTACs) around the country.

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## Climate Pollution Reduction Grants, EPA

***This is a new program created through the Inflation Reduction Act of 2022..***

**Program Description.** New competitive grants to support the development and implementation of strong, local, climate pollution reduction strategies. Residential retrofits may be included as part of these strategies. The first phase of funding is to develop or update climate, energy, and sustainability plans. The bulk of the funding will be used to implement those plans. Detailed guidance on eligible activities has not yet been issued, but this is flexible support for a wide range of activities that reduce greenhouse gas emissions and other air pollution.

**Who can apply for this program?** States, local governments, and tribes.

**How much funding is available?** $5 billion ($250 million for noncompetitive planning grants and $4.6 billion for competitive implementation grants).

**Timeline.** Implementation grants will be issued in late 2023. Funding available through fiscal year 2026.

**Notes.** Though the scale of climate pollution from manufactured homes will be a relatively small fraction of a state's pollution, applicants are encouraged to include manufactured homes as part of their overall portfolio of building measures when applying for these funds to ensure that low-income and rural residents receive some of the benefits.

**How will funds be distributed?** Applicants will likely need to apply directly to the EPA. Application information for the implementation grants forthcoming.

**More information.** Visit EPA's Climate Pollution Reduction Grants page.

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