ACEEE
American Council for an Energy-Efficient Economy

Understanding Energy Affordability

How Energy Efficiency Can Alleviate High Energy Burdens

According to the US Energy Information Administration (EIA), nearly one-third of US households in 2015 struggled to pay their energy bills.[1] For many low-income families the issue is more acute as they tend to live in older homes with less-efficient appliances and heating and cooling equipment. High energy bills can put a strain on families and lead to difficult trade-offs between paying for energy and other necessities. According to EIA, one-fifth of Americans in 2015 reported reducing or forgoing necessities such as food and medicine to pay an energy bill. In addition, 11% of households reported keeping their home at an unhealthy or unsafe temperature to lower energy bills and 14% received a disconnection notice.

A household's energy burden—the percentage of household income spent on energy bills—provides an indication of energy affordability. Researchers define households with a 6% energy burden or higher to experience a high burden.[2] Factors that may increase energy burdens include the physical condition of a home, a household's ability to invest in energy-efficient upgrades, and the availability of energy efficiency programs and incentives. See the table below for more examples of the drivers of high energy burdens.

1 www.eia.gov/todayinenergy/detail.php?id=37072

2 The 6% affordability threshold is based on Fisher, Sheehan and Colton's Home Energy Affordability Gap Analysis. This affordability percentage is based on the assumption that an affordable housing burden is less than 30% of income spent on energy, and 20% of housing costs should be allocated to energy bills. This leads to 6% of an affordable housing burden spent on energy costs, or a 6% energy burden. For more information, see www.homeenergyaffordabilitygap.com/.

Photo: Marcela Gara, Resource Media

Drivers of High Burdens	Examples
Physical	▪ Housing age and type (e.g. manufactured homes) ▪ Heating system, fuel type, and fuel cost ▪ Poor insulation, leaky roofs, inefficient and/or poorly maintained HVAC systems or inadequate air sealing ▪ Inefficient large-scale appliances (e.g. refrigerators, dishwashers) and lighting sources ▪ Weather extremes that raise the need for heating and cooling
Economic	▪ Chronic or sudden economic hardship ▪ Inability to afford (or difficulty affording) up-front costs of efficiency investments ▪ Difficulty qualifying for credit or financing options to make efficiency upgrades
Behavioral	▪ Lack of access to information about bill payment assistance or efficiency programs ▪ Lack of knowledge about energy conservation measures and impacts/costs ▪ Increased energy use due to age, number of people in household, or disability
Policy	▪ Insufficient or inaccessible policies and programs for bill assistance and/or efficiency and weatherization ▪ Certain utility rate design practices, such as high fixed customer charges, that limit customers' ability to respond to high bills through energy efficiency or conservation

Energy affordability is a national, state, and local priority across the country. The Department of Energy manages a Clean Energy for Low-Income Communities Accelerator, which developed an energy affordability toolkits and data analysis tool. States and local governments are also setting energy affordability targets, such as New York's goal of achieving a 6% statewide energy burden[3] and Portland's Ten-Year Plan to Reduce Energy Burden in Oregon Affordable Housing.[4]

A Closer Look at Energy Burdens

Over the past few years, ACEEE has researched energy affordability. We have calculated energy burdens nationally, regionally, and locally through several research reports, direct assistance, and other projects. We have consistently found that households with lower incomes, communities of color, elderly households, renters, and multifamily building residents tend to have higher energy burdens, on average, than other households.

3 www.governor.ny.gov/news/governor-cuomo-announces-expansion-financial-benefits-low-income-utility-customers

4 www.oregon.gov/energy/Get-Involved/Documents/2018-BEEWG-Ten-Year-Plan-Energy-Burden.pdf

National Burdens

ACEEE analyzed data from the US Census Bureau's American Housing Survey to provide a national snapshot of energy affordability for 2017. We measured what percentage of Americans experience an "high" energy burden, i.e. spending more than 6% of income on energy bills. Using the same methodological considerations as our 2018 rural energy burden analysis, we estimate the percentage of certain groups that experience high energy burdens (> 6%) nationally:[5] [6]

- 67% of low-income households (200% of Federal Poverty Level)
- 36% of African American households
- 34% of elderly households (65+)
- 29% of renting households
- 27% of Latino households
- Compared to 24% of all households nationally

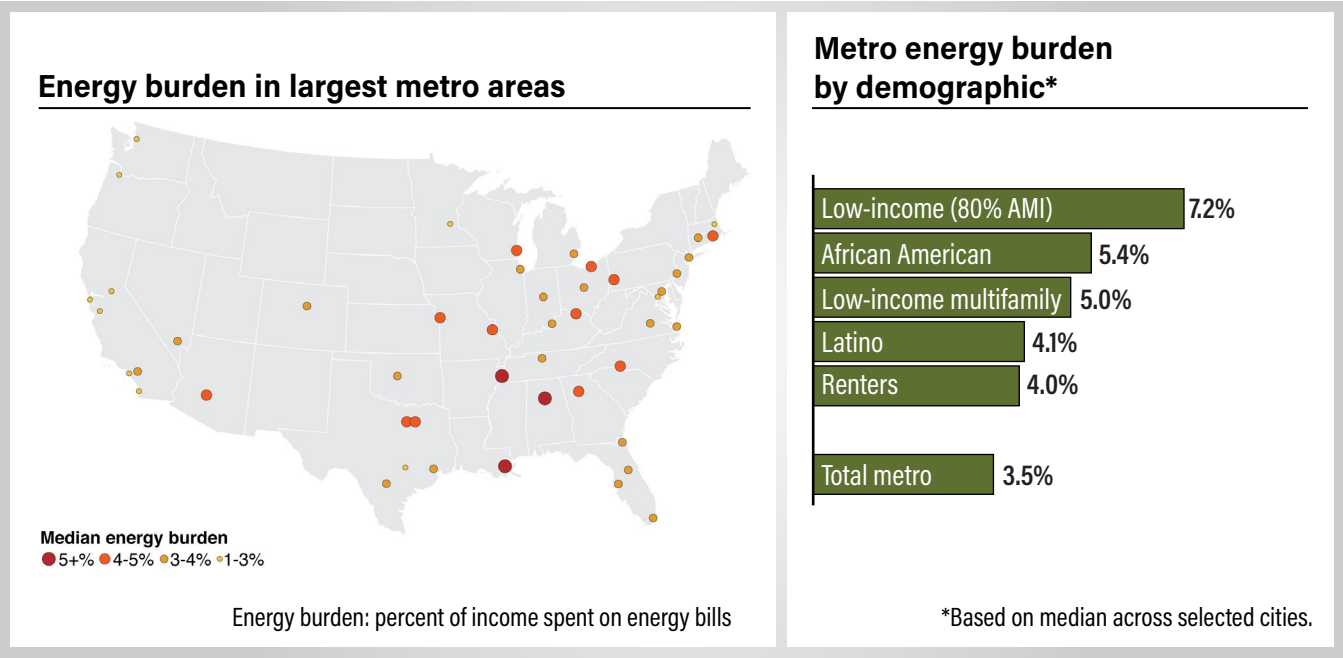
These findings suggest that about one-fourth of all households and more than two-thirds of low-income households live with a high energy burden. In fact, low-income households experience high energy burdens almost three times more than the average household and thirteen times more than non-low-income counterparts. This highlights that energy affordability is a national issue, and one that policymakers can prioritize at national, state, and local levels.

5 ACEEE used the same methodological considerations when calculating energy burdens in our urban and rural energy burden reports, as well as in our national energy burden calculations. Using household-level data from the US Census Bureau's American Housing Survey, we calculated energy burdens by defining energy costs as including electricity and heating fuel costs (not including water and transportation costs). We filtered out cases where individuals either: (1) did not pay for their electric bill, (2) did not pay for their heating bill, and/or (3) did not report positive income. These three factors are needed to calculate a household-level energy burden. We then calculated median energy burdens at the household level and for subgroups. At the national level, we also calculated the percentage of households with a high energy burden (>6%).

6 The following are the median energy burdens for each group based on 2017 American Housing Survey data: low-income households (200% FPL) (8%); African American households (4.1%); elderly households (4%); renting households (3.3%); Latino households (3.5%); all households (3%).

Urban Energy Burdens

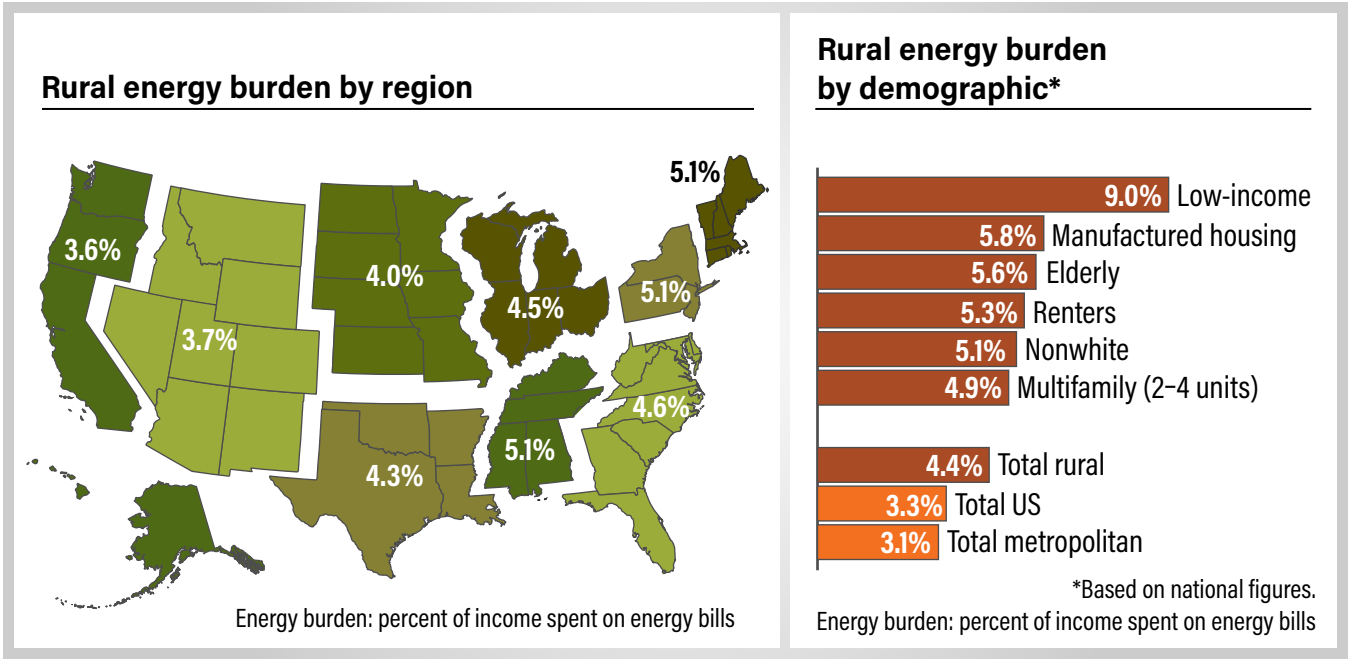
Our first energy burden research report, published in 2016, focused on energy burdens in the 48 largest metro areas in the country. We calculated energy burdens for each major metro area and for certain demographic groups. We found that low-income households were disproportionately impacted by high energy burdens, facing energy burdens three times higher than non-low-income households.



Findings from ACEEE's 2016 urban energy burden study, aceee.org/research-report/u1602

Rural Energy Burdens

In 2018, we published a second energy burden study focused on rural areas. Rural households make up roughly 16% of all US households and are spread across 72% of the nation's land area. The report calculates energy burdens in rural regions across the country and by demographic groups and housing types. Rural low-income households (200% federal poverty level) experienced energy burdens three times higher than non-low-income households.



Findings from ACEEE's 2018 rural energy burden study, aceee.org/research-report/u1806

How Energy Efficiency Can Help

Energy efficiency can offer a long-term solution to high energy burdens. It helps households reduce their energy usage with measures such as heating and cooling system upgrades, insulation, efficient appliances, and behavior change. This lowers energy bills and can also improve home health, comfort, and safety. Efficiency programs targeting low-income households are well suited to addressing high energy burdens. These programs are tailored to the needs of low-income communities and typically provide weatherization and efficiency upgrades at no cost to participants. The following are best practices for increasing energy efficiency and energy affordability for low-income and energy-burdened households.

1. Set state-level spending and savings targets for low-income efficiency programs. Public utility commissions can set requirements for utilities to achieve a certain level of spending or savings on their energy efficiency programs targeted at low-income customers. For up-to-date information on state-level spending and savings targets, see the ACEEE State Policy Database.
2. Utilities can expand and improve their low-income programs. Many utilities have room to ramp up their energy efficiency programs to achieve deeper savings and impact in the low-income sector. Some best practices on program design and delivery include leveraging diverse funding sources, accommodating health and safety measures, partnering with community-based organizations, and prioritizing deep-saving measures. For the most recent reports and data on low-income program best practices, see ACEEE's low-income landing page.
3. Increase Federal support for the Department of Energy's Weatherization Assistance Program (WAP). The FY2019 WAP budget was $257 million, which only allows a small amount of eligible households to participate in the program.
4. Support financing options for multifamily building owners and rural households. On-bill tariff programs that allow customers to pay back energy measures on their bill with their energy savings can help households access efficiency upgrades. For multifamily buildings, one way to address split incentives is to align efficiency incentives with building refinancing and renovation timelines.
5. Conduct equity analysis on program outcomes. Examine the impacts of programs and make changes to ensure that all customers are equitably reached and served by efficiency programs.

ACEEE Research and Future Research

For more information on energy affordability, see ACEEE's Low-Income Programs webpage: aceee.org/topics/low-income-programs. This webpage includes our research related to energy burdens, low-income efficiency programs, and related policy and program design solutions. For more information on state low-income program requirements, visit ACEEE's database or database.aceee.org/state/guidelines-low-income-programs. For information specific to utility low-income and multifamily programs in urban areas, visit database.aceee.org/city/low-income-multifamily.

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