

SEDAC Energy Smart Tips



Energy Code: Low-income housing

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Energy efficiency in low-income housing

Nowhere is there a greater need for energy efficiency than in low-income housing. Low-income households spend a much larger percentage of their income on energy costs than the average household, in part because their homes are not as efficient as they could be.

Energy code requirements can help residents save energy and money by ensuring that new buildings are designed efficiently from the start, and that alterations meet energy efficiency standards.

WHAT IS ENERGY BURDEN?

Energy burden is the percentage of household income spent on energy bills. Compared to the average household, low-income households (income \leq 80% of the area median) have a significantly higher energy burden. A study by the American Council for an Energy Efficient Economy (ACEEE) found that in 50 of America's largest cities, the percentage of household income spent on energy bills is over **three times greater** for low-income households than non-low-income households.

There is also significant racial disparity in energy burden. According to the study, African American households had the highest energy burden, followed by Latino households and White households.

Table 1. Median income, utility bill, and energy burden for households based on income and race (abridged)

Income type/head of household race	Median annual income	Median annual utility spending	Median energy burden
Low-income	\$24,998	\$1,692	7.2%
Non-low-income	\$90,000	\$2,112	2.3%
White	\$58,000	\$1,956	3.3%
African American	\$34,494	\$1,920	5.4%
Latino	\$39,994	\$1,704	4.1%

Source: Ross & Drehobl, 2016, "Lifting the High Energy Burden in America's Largest Cities," ACEEE.

To what extent does the inefficiency of houses contribute to energy burden? The study found that low-income and non-white households paid more for utilities per square foot, suggesting that a good portion of their energy burden can be attributed to poor efficiency in homes (see Table 2).

Table 2. Median unit size and utility costs/sq ft based on income and race (abridged)

Income type/head of household race	Median unit size (square feet)	Median annual utility costs per square foot
Low-income	1,200	\$1.41
Non-low-income	1,800	\$1.17
White	1,600	\$1.22
African American	1,290	\$1.49
Latino	1,200	\$1.42

The study estimated that raising energy efficiency to that of the median household would eliminate excess energy burden by:

- **35% for low-income households**
- **42% for African-American households**
- **68% for Latino households**

This presents a tremendous opportunity for those seeking to create a more equitable energy landscape. By bringing new and existing low-income and minority housing into compliance with the Illinois Energy Efficiency code, you can **greatly reduce the energy burden of these households.**



COST-EFFECTIVE & CODE-COMPLIANT ALTERATIONS

Bringing existing housing up to the energy efficiency standards of the current energy code is ideal, but the cost of such alterations is often prohibitive for low-income households. Alterations like replacing drafty windows, adding attic insulation, and installing a new HVAC system are quite expensive! Below we list the top cost-effective energy efficiency alterations for low-income housing--the alterations with the lowest payback period and highest return on investment.

Air Sealing

Air sealing along breaks and joints is a cost-effective way to save energy. Although the code requires that alterations to the building envelope include a continuous air barrier (Table R402.4.1.1), air sealing can also be completed without installing a continuous air barrier.



Programmable Thermostats

Significant savings can be achieved by installing a programmable wi-fi thermostat that is capable of controlling heating and cooling systems on a daily schedule. (R403.1.1)

Lighting Equipment

Choose LED bulbs and other efficient lighting equipment. According to R404.1, "not less than 90 percent of the permanently installed lighting fixtures shall contain only high-efficacy lamps."



Water heating

Although not required by the code, low-flow showerheads and faucet aerators, and lower water heater temperatures are very cost effective improvements that save significant energy dollars.

Replacing Equipment

When replacing equipment that has reached the end of its life, select energy efficient furnaces or other heating and cooling equipment. The efficiency rating must be equal to or greater than the minimum required by federal law. (R403.7)



Weatherization Program

Take advantage of utility incentives and government programs, especially weatherization programs, to make energy efficiency alterations more affordable!

We recommend that code officials, contractors, and other building professionals become familiar with the Illinois Home Weatherization Program (IHWAP), which funds energy efficiency alterations for low-income households. These alterations include:



- Air sealing
- Attic and wall insulation
- Furnace repair and replacement
- Electric baseload reduction (lighting and refrigerator, and window and door weatherization)

Note: The current Illinois Energy Code is based on the 2015 IECC, although the code will be updated to the 2018 IECC in May of 2019. The requirements discussed in this Energy Smart Tip are based on the 2018 IECC and are subject to change, based on Illinois Amendments.

ENERGY CODE TRAINING & SUPPORT

sedac.org/energy-code

SEDAC provides energy code training and support for professionals throughout Illinois. We offer:

- Workshops
- Webinars
- Online courses and resources
- Technical support

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WHO WE ARE

The Smart Energy Design Assistance Center assists buildings and communities in achieving energy efficiency, saving money, and becoming more sustainable. SEDAC is an applied research program at the University of Illinois at Urbana-Champaign working in collaboration with 360 Energy Group. SEDAC services include

- Quick Advice
- Energy Assessments
- New Construction Design Assistance
- Long-term energy planning
- Retro-commissioning

