Building Energy Codes Make Homes More Affordable

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Building energy codes set a minimum level of energy efficiency for new homes and commercial buildings. They are usually set by states or cities based on the model International Energy Conservation Code (IECC). The federal government sets codes for manufactured homes and federal buildings as well as efficiency requirements for new homes with federally supported mortgages.

Codes Save Residents Thousands on Energy Bills

A recent federal analysis found that a typical household would **save a net of $15,000** from a house built to the 2021 IECC compared to one built to the 2009 code. The net savings range from $8,000 to $52,000 depending on climate.

A lower-income family using an FHA loan would quickly come out ahead financially. After paying $550 upfront in added down payment and fees, the family would save at least $963 each year in energy bills, more than twice the annual $439 cost in higher mortgage payments. The savings pay back the upfront expense in just 1.5 years, and the residents save more each year after that.

Costs and Benefits for 2021 IECC vs. 2009 IECC

	First Year Energy Savings	Annual Mortgage Increase	Added Upfront Costs	Years to Positive Cash Flow	Net Lifetime Savings
Single Family	$ 963	$ 439	$ 550	1.5	$ 15,071
Low-Rise Multifamily Unit	$ 403	$ 182	$ 229	1.4	$ 6,345
High-Rise Multifamily Unit	$ 224	--	$ 18	<0.1	$ 5,886

For average household nationwide with typical FHA loan terms. Lifetime savings are discounted net present value (also including added property tax and mortgage insurance). High-rise analysis is for ASHRAE Standard 90.1-2019 compared to 2007 (incorporated in the IECC). Source: U.S. Department of Housing and Urban Development and Department of Agriculture, based on analysis from the Pacific Northwest National Laboratory.

Codes Have Other Benefits for Residents

- Improve home quality and comfort
- Support the health of residents by reducing mold and moisture-induced upper respiratory problems such as asthma and by keeping residents safer during extreme heat and cold
- Protect renters and home buyers who do not know whether a home they are considering will have high energy bills
- Lessen vulnerability to fuel and electricity price spikes
- Avoid the need for much more costly retrofits after the home is built

Codes Have Economic and Climate Benefits

Building all new homes to current model codes rather than the outdated codes in most states would:

- Save residents **$6 billion,** after added costs, and avoid **34 million metric tons (MMT) of CO_2 emissions**, **for homes built in the first year alone**
- As codes strengthen over time, they could **save residents a net of $26 billion, reduce CO_2 emissions by more than 400 MMT, and add almost 250,000 jobs** (measured in job-years)

Energy Codes' Initial Costs Have Been Overstated

In the above analysis, the average added cost for a house to build to the 2021 IECC compared to the 2009 IECC is $7,229 based on the most straightforward "prescriptive pathway" (builders have other options to reduce costs) and on standard construction cost databases such as RS Means and actual prices in big box stores.

So why has the National Association of Home Builders (NAHB) been saying the 2021 IECC cost is "as much as $31,000"? That claim is based on old speculation by home builders in one city about a proposed local update. More than 80% of the alleged cost is for measures *that are not even required by the code* (and more than $5,000 is for added profit for the home builder)—see here for more detail. Builders in that city and elsewhere have shown they can build to higher efficiency levels at a much lower cost.

State adoption of updated codes has not caused any apparent change in the number of new homes, an ACEEE review has found.

Model Codes Allow Fuel Choice

Builders can meet the IECC with any combination of equipment using electricity, natural gas, propane, or other fuels. Even provisions just to wire homes to ease future installation of electric equipment or solar panels are only in optional appendices some states choose to include, and even the optional zero-energy appendices still allow any fuel if offset by the generation or purchase of renewables.

How Codes Improve Energy Efficiency in Homes

About one quarter of Americans have trouble paying their energy bills, especially lower-income households. Many states have energy codes that are badly out of date, and some have no statewide code at all. Homes built to the 2024 IECC use about one-third less energy than homes built to many of the existing state codes.

The energy cost savings come from added insulation in the walls and above the ceiling as well as better air sealing and energy-efficient windows. The systems in homes built to the code are more energy efficient, including better-sealed ducts that waste less heat, and they have more efficient heating and cooling that costs less to operate.

Up-to-date home energy codes:

- Reduce home energy use by **one third**, saving each household thousands of dollars over time
- Make homes more healthy, comfortable, and resilient
- Could avoid more than **400 MMT CO_2** cumulatively (the emissions from 44 million cars in a year)

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