Insulation, Energy Codes & Housing Affordability

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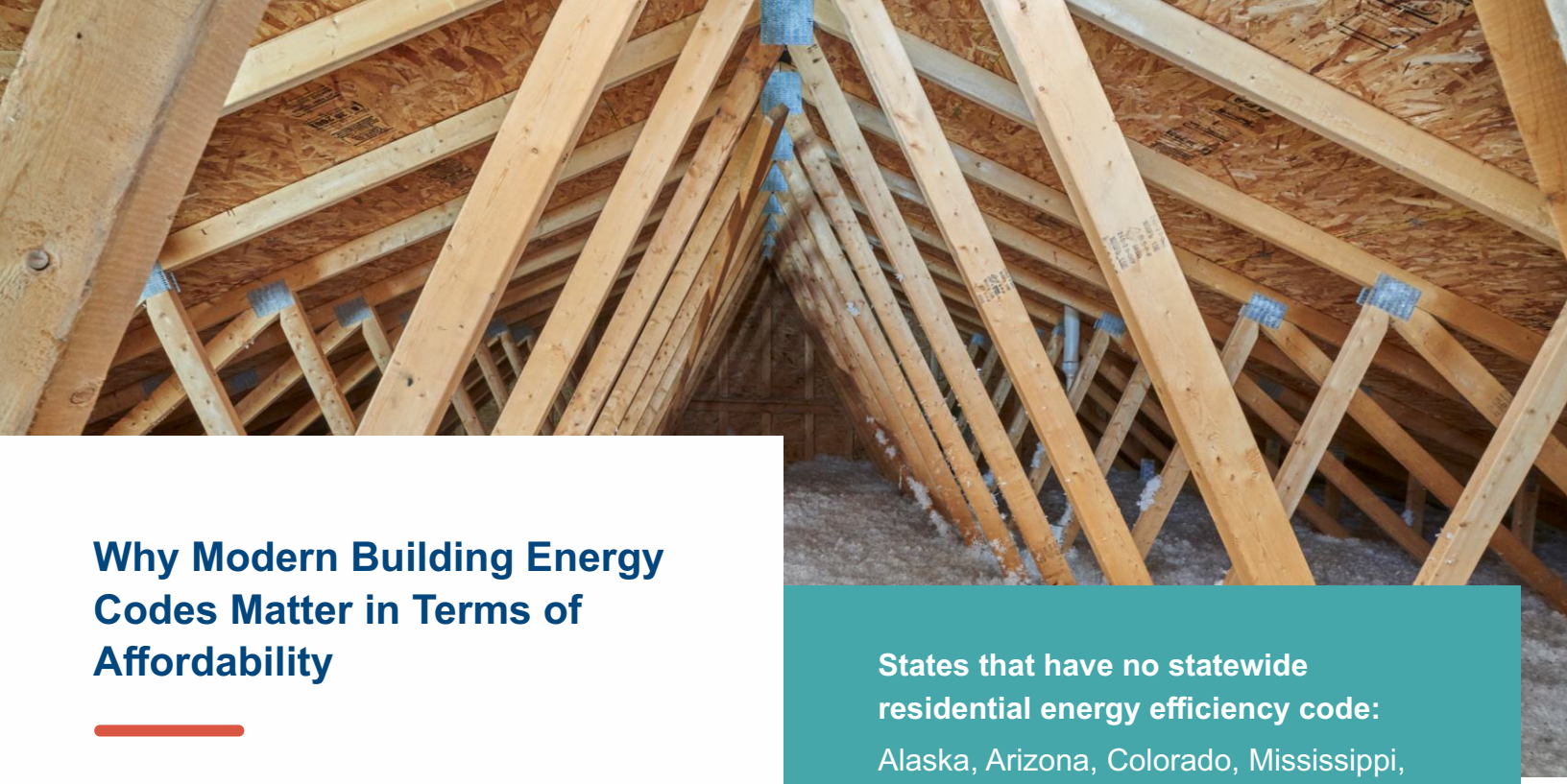
Introduction

Homeownership affordability is one of the toughest challenges facing many Americans today. It's not just the cost of building a home but also the cost of maintaining one that impacts the buying decision. Fortunately, many new home buyers have a hidden ally in housing affordability – modern building energy codes that optimize building envelope energy efficiency and deliver lower heating and cooling costs for the life of the building.



Why Modern Building Energy Codes Matter in Terms of Affordability

Eighty percent of U.S. states adopt and comply with a version of the International Energy Conservation Code (IECC), which establishes the minimum energy efficiency standards for residential buildings. The code governs the building envelope requirements for walls, ceilings, roofs, floors, basements, and crawl spaces. It also requires specific efficiency metrics for windows, doors, air sealing, HVAC, hot water systems, lighting, and electrical. The code is updated every three years to provide an ongoing standard for best practices in energy efficiency.

While the IECC is updated every three years, not all states adopt the most recent version of the code, which is also the most efficient. Some states and localities opt for a less efficient energy code because builders, citing increased costs to build more energy-efficient homes, push back against advanced building energy codes, which require additional insulation, among other features. Currently, 24 states have adopted the equivalent of the 2009 IECC, and 9 states have no statewide energy code, leaving regulation to cities and towns.[1]

Why does that matter? For most homeowners, utility bills are the second-largest household expense after the mortgage. These expenses are a significant factor in housing affordability. Worse, many new and old homes are poorly insulated and leaky, costing homeowners money.

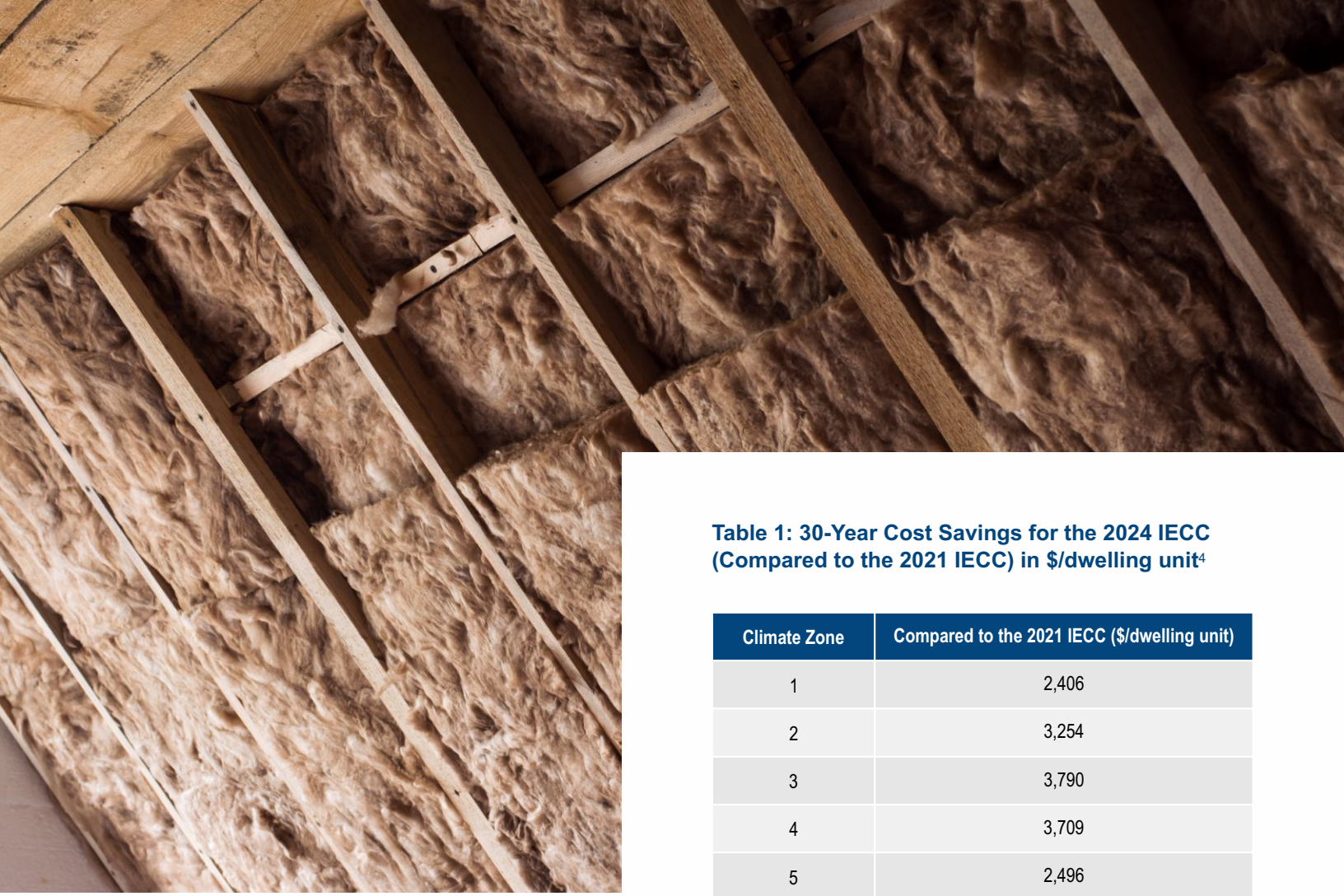
States that have no statewide residential energy efficiency code:

Alaska, Arizona, Colorado, Mississippi, Missouri, Kansas, North Dakota, South Dakota, and Wyoming.

Because regular updates to the residential IECC ensure that buildings are highly energy-efficient and well-insulated, the code ultimately serves the needs of both homebuyers and builders. For the homeowner, a more energy-efficient, well-insulated home means increased comfort, lower heating and cooling costs, more efficient equipment operation using less energy, a lower carbon footprint, and improved health.

Homebuilders also benefit by constructing energy-efficient, well-insulated homes. In a recent National Association of Home Builders study, 72 percent of respondents ranked “above code insulation” as either essential or desirable.[2] For homebuyers, energy efficiency isn’t a luxury in a new home purchase; it's an expectation. Because homeowners recognize the value of an energy-efficient home, builders who leverage the energy efficiency of their homes have a distinct marketing advantage over those who do not. Homes designated as energy-efficient sell more quickly than those that aren’t. Not only do buyers want a more energy-efficient home, but they would also be willing to pay more for one.[3]

[1] https://www.energycodes.gov/state-portal
[2] National Association of Home Builders, “What Home Buyers Really Want,” 2024 Edition.
[3] https://betterbuildingssolutioncenter.energy.gov/beat-blog/research-shows-buyers-would-pay-more-homes-higher-home-energy-scores



Insulation is Foundational to Energy Efficiency

Insulation reduces heat loss and gain, keeping homes warmer in the winter and cooler in the summer. Better insulation leads to lower energy consumption and improved energy efficiency, resulting in lower utility bills. According to the Department of Energy's Pacific Northwest National Laboratory, homeowners can realize significant life-cycle cost savings when purchasing a home built to the 2024 IECC standards. (Life cycle cost is the single savings reduction in costs over a 30-year analysis period.)

Table 1: 30-Year Cost Savings for the 2024 IECC (Compared to the 2021 IECC) in $/dwelling unit[4]

Climate Zone	Compared to the 2021 IECC ($/dwelling unit)
1	2,406
2	3,254
3	3,790
4	3,709
5	2,496
6	2,190
7	7,422
8	9,481
National Average	**2,954**

The average new single-family home built to the 2024 IECC will not only result in annual cash flow savings but also take no longer than two years for the cost savings to be greater than the additional cost of meeting the code requirements.[4] (Cash flow is a small suite of metrics summarizing the net cash flows – costs versus savings – for every year of the 30-year period analysis.) As most homeowners use mortgages when purchasing homes, tracking the mortgage cash flow provides a realistic picture of building energy efficiency from a homeowner or occupant perspective, evaluating how quickly energy bill savings help the homeowner reach a break-even point with the costs for efficiency improvements that are included in that mortgage.

[4] https://www.energycodes.gov/sites/default/files/2025-01/2024_IECC_CostEffectiveness_Residential_Final.pdf

Table 2: Impacts of Consumers' Cash Flow from Compliance with the 2024 IECC (Compared to the 2021 IECC)[5]

Climate Zone	Net Annual Cash Flow Savings ($ for Year 1)	Years to Cumulative Positive Cash Flow
1	86	2
2	135	1
3	122	1
4	192	0
5	105	0
6	405	2
7	324	0
8	410	0
National Average	**144**	**1**

Table 3: Years to Recoup the Cost of Compliance with the 2024 IECC (Compared to the 2021 IECC)[6]

Climate Zone	Years for Payback
1	9.0
2	5.2
3	2.7
4	0.0
5	0.0
6	7.8
7	0.0
8	0.0
National Average	**2.5**

[5] Ibid.
[6] Ibid.

The average annual energy cost savings by climate zone for the 2024 IECC (compared to the 2021 IECC) are as follows:

Table 4: Average Annual Energy Cost Savings for the 2024 IECC

Climate Zone	$/dwelling unit year
1	180
2	190
3	140
4	177
5	133
6	191
7	309
8	379
National Average	**163**

In addition, the simple payback period for a home built to the 2024 IECC by climate zone makes a compelling case for the code. (Simple payback is a simplified metric that estimates the number of years required for energy cost savings to make up for the increased construction costs, assuming no escalation in prices for discounting of future cash flows.) This metric is geared toward buyers who pay cash and are typically either investors seeking to rent or flip the property, or wealthy individuals for whom affordability is not an issue.

Minimal Cost Increase for Greater Energy Efficiency

Some homebuilders claim that energy efficiency measures based on the 2021 and 2024 IECC – such as insulation and better-performing windows, air conditioners, and heating systems – are driving up the average cost of a new home by tens of thousands of dollars. In reality, those estimates are wildly inflated.

According to the U.S. Department of Housing and Urban Development (HUD), the actual cost of building to the 2021 IECC versus the 2018 IECC is $7,200.[7] Moreover, the total incremental cost for building a single-family home to the 2024 IECC compared to the 2021 IECC is an additional $282 on a national average.[8]

Over a 30-year mortgage, homeowners could save $9,000 to $36,000 or more, not including potential increases in home value.

Table 5: Total Cost Increase for the 2024 IECC (Compared to the 2021 IECC)

Climate Zone	Single Family - 2,376 sq. foot
1	1,541
2	921
3	236
4	-478
5	-261
6	1,507
7	-43
8	-257
National Average	**282**

More Energy-Efficient Homes Have Lower Mortgage Default Rates

Awareness of the many benefits of increasing home energy efficiency – including the financial benefits to homeowners – is hardly new. More than a decade ago, the Institute for Market Transformation studied home loan performance to investigate if more energy-efficient homes have lower default rates due to lower energy costs. This study found that, on average, home loan default rates are 32 percent lower in energy-efficient homes after controlling for all other loan determinants.[9] Because energy-efficient homes cost less to operate than less energy-efficient homes, homeowners can afford their mortgage payments more easily.

Homebuyers recognize that more energy-efficient homes are more cost-effective, and research has shown that these homes also offer another benefit to homeowners: they command a higher resale value compared to less energy-efficient homes.[10]

Moreover, due to better insulation, energy-efficient homes reduce the strain on the power grid. In contrast, inefficient homes waste energy because of poor insulation, outdated appliances, and excessive heating and cooling.[11] Furthermore, homes built to more modern energy codes will be more habitable for longer in the event of a power outage.

State Energy Code Adoption Benefits Homeowners and Homebuilders

State energy code adoption is crucial to enabling homeowners to achieve the greatest energy and cost savings. When states adopt the most recent version of the residential IECC, more new homeowners will realize the utility bill cost savings and improved indoor comfort that come with a more energy-efficient home.

[7] https://www.hud.gov/stat/cpd/mes-notice
[8] https://www.energycodes.gov/sites/default/files/2025-1/2024_IECC_CostEffectiveness_Residential_Final.pdf
[9] https://imt.org/wp-content/uploads/2018/02/IMT_UNC_HomeEEMortgageRisksfinal.pdf
[10] https://www.nar.realtor/research-and-statistics/research-reports/realtors-and-sustainability
[11] https://www.energy.gov/energysaver/why-energy-efficiency-matters

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