

# Building Energy Codes 101

Building energy codes lay out the minimum requirements for the envelope (insulation, windows and air sealing), mechanical equipment and lighting of a building (residential and commercial) in terms of energy efficiency/conservation for new construction or major renovations. National model energy codes are updated every three years to incorporate continual improvements in building efficiency in a collaborative, transparent process by a diverse group of stakeholders.

## Which Energy Codes Are Typically Used?

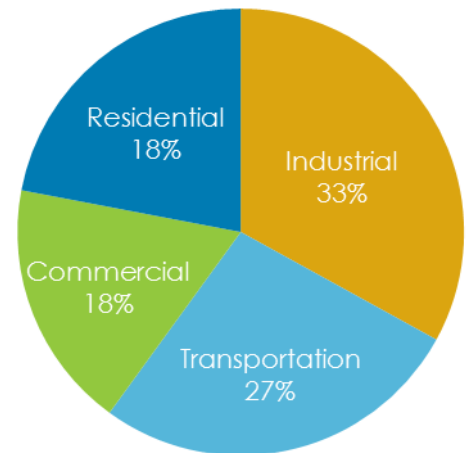
National model codes are used as the basis of the energy code by the authority having jurisdiction, be it, state, county or municipality. Jurisdictions may modify or amend these codes as they see fit but there is considerable benefit in terms of energy savings, cost-effectiveness, and assistance from US DOE, ICC and ASHRAE by maintaining the model code as written.

For residential buildings, most states adopt Chapter 4 of the International Energy Conservation Code (IECC) or Chapter 11 of the International Residential Code (IRC). These codes are published by the International Code Council (ICC).

For commercial buildings, most states adopt either Chapter 5 of the IECC or Standard 90.1 published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

## Total Midwest Energy Consumption by Sector

*Energy Information Administration, 2013*



## Why are Building Energy Codes Necessary?

- Residential and commercial buildings are responsible for over 40 percent of the nation's energy use.
- Building energy codes serve as a critical consumer protection and save money for home and commercial building owners and renters by reducing unnecessary energy use.
- Homes and commercial buildings have a lifespan of more than 50 years. Inefficient new construction can lead to higher energy use over the lifetime of the building and can be cost-prohibitive and difficult to remedy or address after the building is completed.
- Limitations of the marketplace, such as the "split incentive" and lack of builder and consumer education, inhibit the inclusion of energy efficient technologies and techniques into new construction practices. Building energy codes correct these failures.
- Reduced electricity and natural gas use under improved building energy codes help utilities better manage the distribution of energy during peak demand times.

## Are Building Energy Codes Cost-Effective?

Homeowners will find that lower monthly energy bills more than offset any potential rise in mortgage payments, resulting from initial investments in efficient design and construction.

## Who Adopts the Building Energy Code?

Each state has its own adoption mechanism. Typically, the state legislature authorizes a state agency to facilitate the adoption of the building energy code after considering public input.

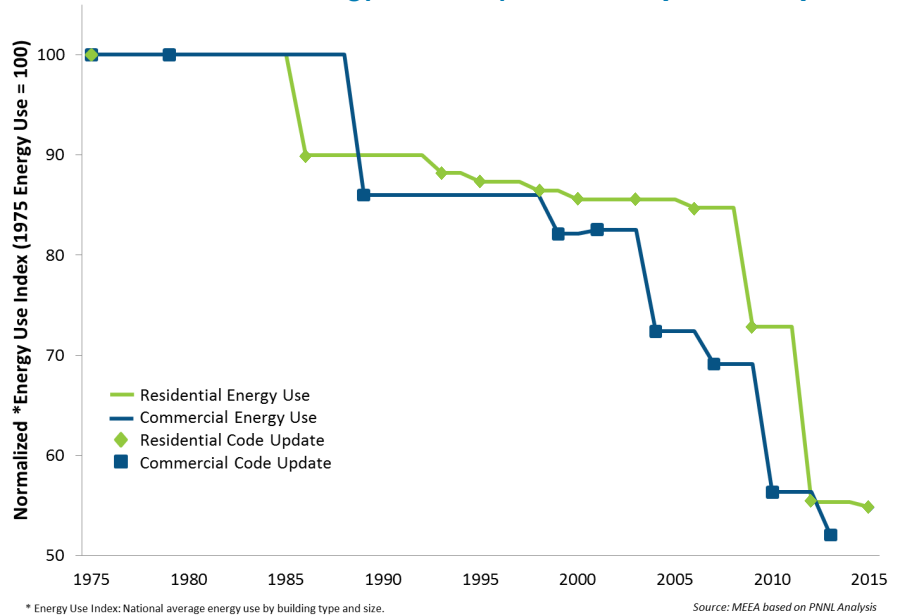
In some states, local counties and/or municipalities can also adopt building energy codes.

## How are Building Energy Codes Enforced?

Building energy codes are typically enforced by state or local code officials that review building plans and physically inspect buildings for compliance with the code.

In some cases, third-party inspectors (registered design professionals or building energy specialists), hired by either the municipality or by the building owners themselves can serve as plan checkers or inspectors.

### Model Energy Code Improvements (1975-2015)



The graph above shows how building energy codes have reduced residential and commercial building energy consumption over time.

## Who Benefits from Building Energy Codes?

### Homeowners and Commercial Building Owners

- Produce more energy efficient buildings, which reduce energy costs and make homeownership more affordable over the life of the building
- Lower energy expenditures mean residents have more money to invest in the local economy
- Result in higher quality, safer and more comfortable homes and buildings

### Energy Industry

- Allows for reduction of wholesale energy prices due to decrease in peak demand
- Help reduce overall energy usage, allowing utilities to manage their load demand requirements

### Building Industry

- Provide uniform standards, which simplifies enforcement and allows jurisdictions to pool resources
- Promotes job creation in the building industry, including installers of high performance HVAC equipment, third-party compliance personnel and building performance raters
- The U.S. Department of Energy provides extensive technical assistance and compliance tools to code officials, contractors and design professionals
- Best practices in high efficiency construction technologies and techniques can be adopted for use in buildings within the state