

WHY ARE ENERGY CODES IMPORTANT?

New buildings, while they represent just over 1% of the total building stock in a given year, are important because they represent a unique chance to effect energy efficiency. Once a new building is constructed, it is very expensive and often impossible to achieve the energy efficiency that can be built in so economically at the time of construction. This is an opportunity that we cannot afford to lose. Hence, it is vital to make energy efficiency a fundamental part of the building design and construction process. Energy codes are an effective way to achieve this goal and build efficiency into all buildings. Buildings fundamentally make an impact on people's lives and the health of the planet.

In the United States, buildings use one third of our total energy, two-thirds of our electricity, one-eighth of our water, and transform land that provides valuable ecological services. Atmospheric emissions from the use of energy lead to acid rain, ground-level ozone, smog, and global climate change. Because of these fundamental environmental issues, and in addition to the increasing cost of energy, it is vitally important to consider the adoption and implementation of energy efficient building codes as sound public policy in any rebuild effort.

Research shows that modern energy codes could save about 330 Trillion BTU by 2030, almost 2% of total current residential energy consumption. There would also be comparable savings in consumer energy bills, air pollution and greenhouse gas emissions.

There are distinct advantages to adopting up-to-date codes beyond legal compliance. These advantages affect the entire spectrum of individuals engaged in and impacted by the building process.

Advantage to Consumers

Consumers save money well into the future by reducing utility bills, minimizing the negative impacts of fluctuations in energy supply and cost, and conserving available energy resources. Monetary savings derived from codes increase a consumer's purchasing power, ultimately helping to expand the economy. Reduced demand for energy prices also helps to lower prices. Energy efficient homes can in some circumstances qualify for energy efficient mortgages, which allow a homeowner to raise the mortgage cap since they are investing now in lower maintenance in the future. Additionally, a homeowner can also expect to see higher resale value for such a home.

There are numerous studies demonstrating that the payback period for capital investments in an energy efficient home is well within an acceptable period of time (generally held to be about 5-7 years). A 2004 study by the Michigan State Energy Office, *Cost/Benefit Analysis: Updating the Michigan Uniform Energy Code ... for New Residential Construction in Michigan*, found that on average, there was an improvement cost of \$2,145 with savings of \$3,191 over a seven year period, or a savings of \$1,046 over this

time period. Pacific Northwest National Laboratory (PNNL) also released a study in Michigan, corroborating these findings. PNNL reported a payback period of 3 to 5 years and a net positive cashflow for homeowners, taking into account mortgage impacts, since the energy savings would easily exceed the increased mortgage payments.

Energy codes capture what would otherwise be lost opportunities. Current energy standards provide energy efficiency provisions that are relatively easy and inexpensive to address in new construction, and that are far more expensive, or even impossible, after the fact.

Advantages to Builders and Code Officials

An important advantage that energy efficient homes offer to builders is a higher rate of customer satisfaction. Lower air infiltration rates, as well as lower utility bills and higher potential resale values lead to customers with comfortable homes and less time consuming and expensive callbacks for builders. Energy efficient construction is increasingly recognized as a standard for good construction.

Energy codes often offer prescriptive and performance based approaches, for flexibility and ease of compliance. This also allows builders and designers to optimize the cost-effectiveness of energy efficiency features in their products, and to cater to a variety of tastes.

Adoption of the national model codes in a state or local jurisdiction confers additional advantages - access to a network of training opportunities and implementation materials developed to support the code nationwide. The Department of Energy and others make training and compliance tools available at no charge to help the construction industry utilize the codes more effectively. Examples include the DOE-developed website and software REScheck™ system for residential buildings and COMcheck EZ™ system for commercial buildings. These tools are sophisticated but simple to use.

Additionally, when an energy code is adopted statewide, it results in lower barriers to builders marketing themselves across the state, and even regionally or nationally. The consistency in standards opens up the market, providing incentives for manufacturers to offer and develop more building products, which can also lead to lower supply prices for builders. Additionally, the demand created for new services relevant to the new code that can expand or open up new markets for builders. A uniform code also enables localities to pool limited resources and combine personnel to form county wide or regional enforcement programs.

Advantages to Community and Society

Building energy codes are one of the easiest and most cost efficient ways for states and local jurisdictions to implement energy management policies. It is even easier to adopt and amend (if necessary) national model codes since they have been fully developed by national organizations (ICC and ASHRAE/IESNA), and have a broad base of support for implementation and enforcement.

An important reason to adopt energy codes is that it is simply the right thing to do. Energy production and use rank among the largest contributing factors to greenhouse gas emissions and air pollution. Most emissions are produced by the combustion of fossil fuels, which accounts for nearly 70 percent of the total electricity generated in the United States. Aggregate emissions from electric utilities of all greenhouse gases increased by 11.8 percent from 1990-1997, and accounted for just under 30 percent of total U.S. greenhouse emissions during the same period. Overall, the generation of electricity results in a larger portion of total U.S. greenhouse gas emissions than any other activity. Buildings account for approximately 35% of total US CO2 emissions at about 683 million metric tons per year.

While the share of electricity in household energy consumption has been rising, it accounted for just 35% of household energy consumption in 1997, while natural gas accounted for 52%, fuel oil for 10%, and LPG for 4% of total consumption. At the same time, the end use of energy in U.S. households has been changing as well. 56% of energy went towards space heating in 1978, as compared to 51% in 1997. In the meantime, energy usage for appliances has increased from 17% in 1978 to 27% in 1997, and energy use for water heating has increased from 15% in 1978 to 19% in 1997.

Aside from the environmental benefits, energy codes, as part of broader energy efficiency policies, have potential economic benefits. ACEEE released a study in 2005 which found that the implementation of statewide energy efficiency programs (including building energy codes) in the Midwest would result in significant job creation. The region was expected to produce 30,220 jobs resulting in compensation of \$750 million by 2010, and 66,620 jobs resulting in compensation of \$1,770 million by 2020. Since the Midwest imports most of its natural gas, a reduction in demand means less money flowing out of the region, and more savings. These savings in turn work through economic multipliers to increase regional investment and growth.