Building Energy Codes Impacts Beyond Energy

Building energy codes establish minimum energy efficiency requirements for designing and constructing new and renovated buildings. Specifically, the energy code focuses on components within a building that affect energy consumption. When implemented, the energy codes requirements ensure that homes and buildings reduce energy use and emissions. Buildings built to the latest codes are affordable, comfortable, and resilient for homeowners, students, and other occupants.[1]

Beyond base economic (energy savings) and environmental benefits (emissions reduction), energy codes provide other impacts or "non-energy" benefits. These benefits relate to health, resilience, grid reliability, fire safety, and security, all of which have economic, social, and environmental impacts.[2]

Impacts Beyond Energy[3]

Health and Safety

Improved Indoor Air Quality

The energy code, the International Energy Conservation Code (IECC) or American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 90.1, requires increased insulation, sealing of air leaks, and ventilation (exchange of indoor air). This attention to detail and integration of these construction methodologies reduces allergens, pollutants, moisture issues, leading to healthier indoor environments.

Fire Safety

Energy codes help prevent fire and smoke spread by prioritizing airtight construction, which involves sealing gaps, holes, and penetrations and separating heated and cooled spaces from non-heated and cooled spaces (conditioned/non-conditioned). Meeting the air sealing requirements of the energy codes also helps meet the fire blocking requirements of the International Residential Code (IRC).

Increased Building Resilience[4]

Energy-efficient buildings are more resilient to extreme weather events such as storms and heat waves because they reduce reliance on external energy sources and enhance the ability to maintain livable conditions during such events. Built more flexible and adaptive, with passive systems (increased envelope insulation values, lower U-value windows and shading), active energy generation (solar), backup systems (battery storage), and efficient energy use practices (setback thermostats, energy monitoring systems), they provide greater protection during extreme weather conditions.

Enhanced Comfort

Energy-efficient buildings provide more consistent and comfortable temperatures, better air quality, acoustic comfort, and higher quality lighting. More comfortable buildings yield more productivity in office environments and increase student health, performance, and test scores.[5]

Environmental Benefits

Reduced Emissions[6]

Energy-efficient buildings use less energy, reducing greenhouse gas emissions (CO_2, CH_4, N2O, NO_x, and SOx).

Durability/Resource Efficiency

Energy codes endure durability by incorporating design and construction techniques that reduce wear and moisture issues. These techniques extend the life of buildings, reduce the potential for premature equipment failure, and reduce the materials and energy needed for maintenance and replacement.

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Affordability, Economic & Social Benefits

Reduced Energy Burden

Energy codes ensure rental properties meet minimum efficiency standards, lowering utility bills. This can be especially important for renters and low-income households.

Lower Life-Cycle Costs[7]

While higher initial costs may be associated with building or retrofitting for energy efficiency, the long-term savings on utility bills can be significant, reducing the overall cost of ownership.

Economic Development and Market Transformation

Energy efficiency, new construction, and improvements can stimulate economic activity and job creation (e.g., design professionals, energy raters, energy verifiers, skilled trades) in construction and related industries (e.g., education and training, sheet metal, commissioning).

Grid Resilience[8]

Energy-efficient buildings can also help reduce peak energy demand, making the electrical grid more reliable and resilient.

ENDNOTES

[1]Building Energy Codes Resilience and Codes, United States Department of Energy, https://www.energycodes.gov/sites/default/files/2024-05/Resilience%20and%20Building%20Energy%20Codes_Final_4.10.24.pdf

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[3]Energy Codes are Life Safety Codes by Christine Brinker, Southwest Energy Efficiency Project, July 23, 2018, https://www.swenergy.org/energy-codes-are-life-safety-codes/

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[6]ENERGY CODES AND BUILDING PERFORMANCE STANDARDS: SUPPORTING ENERGY USE AND EMISSIONS REDUCTIONS IN BUILDINGS, International Code Council, January 2023. https://www.iccsafe.org/wp-content/uploads/23-22169_CORP_1322_BPS_FINAL.pdf

[7]Energy Codes and Affordability, Northeast Energy Efficiency Partnerships, December 2024.

[8]Building Energy Codes and Grid-Interactive Efficient Buildings: How building energy codes can enable a more dynamic and energy-efficient built environment, by E Franconi, M Rosenberg, R Hart. Prepared for the U.S. Department of Energy, October 2021. https://www.energycodes.gov/sites/default/files/2021-10/GEB_in_Codes_PNNL_28605.pdf

Michigan Tribal Code Initiative

Who We Are and How We Work

The Inter-Tribal Council of Michigan (ITCM) is a non-profit organization that serves as a forum and advocacy group for 12 federally recognized Native American Tribes in Michigan.

The Bay Mills Indian Community (BMIC) is a federally recognized Ojibwe Tribe located in Brimley, Michigan.

The Midwest Energy Efficiency Alliance (MEEA) is a collaborative network, promoting energy efficiency to optimize energy generation, reduce consumption, create jobs, and decrease carbon emissions in all Midwest communities.

Slipstream is a nonprofit that develops and scales energy efficiency programs with a focus on climate solutions for buildings.

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