



Value of code compliance and its cost-effectiveness

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Current Shortfalls in Energy Code Compliance

Funding:

- Building departments vastly understaffed and underfunded
- Needs depend on volatile construction volumes; difficult to rebuild capacity after construction rebounds.
- Revenue collected for plan reviews and building permits siphoned off and used for other activities.

Education / Outreach

- Uneven enforcement by code officials
- Code officials, building professionals and building operations and maintenance staff inadequately trained through the state building energy code administrator

Political willingness:

- Energy codes are often downplayed
- Lack of political priority as compared to fire or safety codes

Building Energy Code Compliance: Value and Cost Effectiveness

Energy Code Compliance Task Force

- Task force of over 40 experts, with participation broad range of other local, regional, and national stakeholder groups.
- Convened from May to August 2010 with the goal of providing perspective on the level of funding needed to improve compliance levels across the U.S. and build support for increased federal and utility support for state/local enforcement and compliance efforts.
- The group set out to quantify:
 - (1) the cost to achieve 90% energy code compliance and
 - (2) the cost-effectiveness of such spending.



Building Energy Code Compliance: Value and Cost Effectiveness

An additional \$610 million in annual funding is needed to achieve 90% compliance with building energy codes.

**(1) PLAN REVIEW &
INSPECTION
\$660 Million**

Model Jurisdiction:
Austin, Texas

Determined Austin's level of funding for energy code compliance as a percent of construction volumes in the city and applied these to the U.S. new construction, renovation volumes.



**(2) IMPLEMENTATION
& TRAINING
\$125 Million**

Based on BCAP's budgeting recommendations to states for allocating their ARRA budget. Activities include:

- Baseline compliance evaluation study
- Training and outreach
- Compliance materials development/distribution
- Pilot Compliance methodologies
- SEO or SBO staff requirements

**(3) NATIONAL-LEVEL
SUPPORT
\$25 Million**

Maintain current annual funding level:

- \$10 million: DOE's building energy code program
- \$10 million: national-level building energy code funding from ARRA
- \$5 million: public outreach campaign



Total Need (\$810M) - Current Spending (\$200M) = Funding Gap (\$610M)

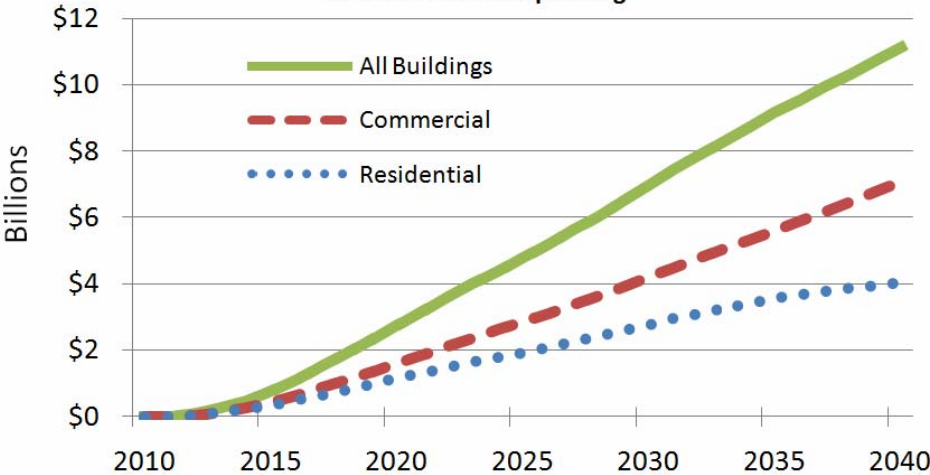
Cost Effectiveness of Code Compliance

- Funding code compliance to achieve 90% compliance would yield average annual **energy savings** ramping up to **\$10 billion** in 2040 and create **26,000 jobs per year**, \$800 million in wages and salaries.
- Energy savings produce a benefit-cost ratio of 6:1.
 - Including incremental costs to the private sector of constructing to code and all public sector costs, **every \$1 spent on code compliance efforts yields \$6 in energy savings**

Building Energy Code Compliance: Value and Cost Effectiveness

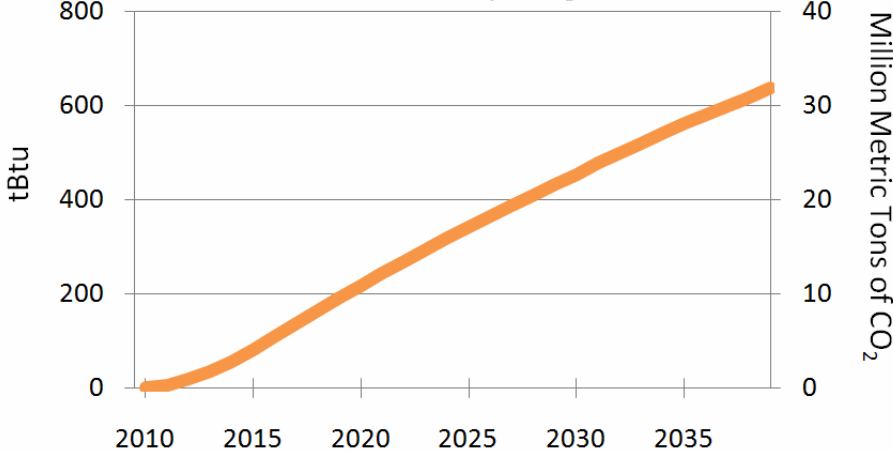
Annual Energy Cost Savings

resulting from \$610M in additional code compliance and enforcement spending



Annual Energy Savings and Avoided CO₂

resulting from \$610M in additional code compliance and enforcement spending



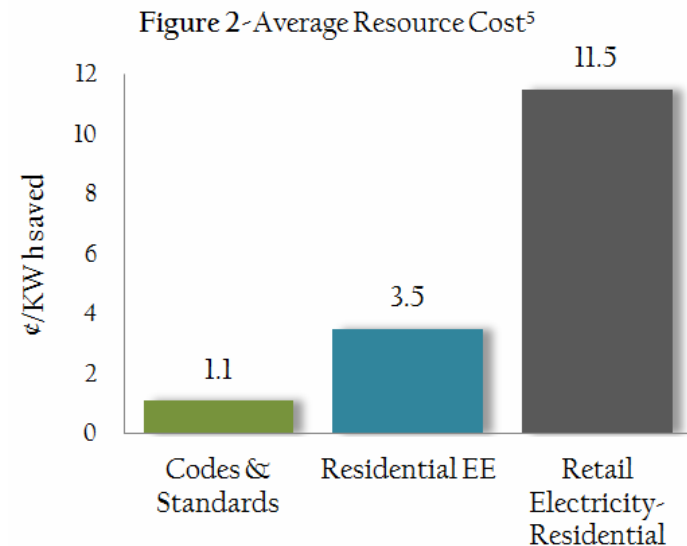
Potential Sources for New Funding:

Local building permit fees currently provide most of the funding for enforcement. Potential sources of additional funding:

1. Increased permit fees and/or improved collection
2. Federal Government (comprehensive climate change bill, appropriations, DOE)
3. Utilities: system benefit charges, integrated resource planning and other ratepayer funds

Utility Involvement in Energy Code Compliance

- Cost-effective relative to other conservation and generation options.
- Potential Activities:
 - ✓ Training for builders, architects, code officials
 - ✓ Support for third party inspection
 - ✓ Baseline compliance studies
 - ✓ Communication with stakeholders on code provisions, incentives
- Opportunity to claim savings from building energy codes



Building Energy Code Compliance: Value and Cost Effectiveness

Building Energy Code Compliance Factsheets:

\$810 Million Funding Needed to Achieve 90% Compliance with Building Energy Codes

Every dollar spent yields \$6 in energy savings

Strong building energy codes are one of the most fundamental, affordable and effective mechanisms for increasing the long-term energy efficiency of the nation's buildings. Economic analysis indicates that every dollar spent on energy code compliance and enforcement initiatives yields \$6 dollars in energy savings. This ratio includes the incremental costs to the private sector of constructing to code. Nevertheless, throughout most of the United States, building code development, implementation, training and enforcement have long been severely underfunded, with energy codes the most severely underfunded. As a result, many new and renovated homes and buildings do not comply with codes and consume far more energy to operate than they should.

In response to the Recovery Act (ARRA), every state has committed to achieve 90% energy code compliance. There is abundant evidence that compliance rates in most jurisdictions are far below 90%. An analysis by a task force of experts revealed an annual spending need of \$810 million for energy code training, outreach, implementation, and enforcement efforts. The task force estimates this necessary funding level, which includes the current local, state, and federal effort and spending on code compliance and enforcement, will increase local and state capacities and expertise to the level required to achieve 90% compliance rates.

WHAT ARE ENERGY CODES?

Building energy codes are minimum local and state energy efficiency requirements for newly constructed or renovated buildings. Along with other building and safety codes, energy codes are intended to ensure sound design and construction practices to conserve energy use. Typically, permitted construction projects must demonstrate compliance with energy and other codes through a plan review and several site inspections during the construction process.

WHY ENERGY CODES?

To reach our economic, climate and energy independence goals, it is critical that our built environment become more efficient. Building energy codes are the most basic and cost-effective tools to address the energy efficiency of buildings. Funding the implementation and enforcement of energy codes to reach 90% compliance will help maximize the energy efficiency of our building stock, save hundreds of billions of dollars annually in energy costs, and reduce the need for costly infrastructure to meet growing peak demand.

CODE COMPLIANCE

Achieving code compliance is essential to effective building codes. Energy codes can deliver their potential energy savings only when projects actually comply with the code, yet statewide reports indicate significant and widespread lack of compliance. A dramatic increase in resources for compliance initiatives at all levels of government and increased enforcement at the local level are necessary to achieve high compliance rates.

RAMP UP TO \$10 BILLION IN ANNUAL ENERGY SAVINGS


Building operations consumed \$400 billion worth of energy in 2009 - 88% of total U.S. energy spending. Buildings that comply with energy codes are more efficient and use less energy. ARRA's Section 201(b) sets a goal of more. The task force economic model predicts that the additional spending needed to achieve 90% compliance would yield average annual energy savings ranging up to \$2.7 billion in 2020 and over \$12 billion in 2040 and each year thereafter. Including all public and private sector costs associated with code compliance, the energy savings produce a benefit cost ratio of 1:1.

Revisiting State Energy Research Funding under the American Recovery and Reinvestment Act (ARRA), ARRA are required to submit and implement plans to achieve 90% compliance with energy codes.

King, Brian, "Revisiting Energy Code Enforcement," Building Code Institute Project, 2009. More study is needed to assess compliance rates and current spending on enforcement and compliance activities. EPA and the Pacific Northwest National Lab are conducting a study to determine compliance rates.

*Under various state and federal programs, over 200 million dollars in energy efficiency incentives have been made available to date. These incentives are a critical part of the energy efficiency program, but they do not replace the need for energy codes. Energy codes are a fundamental part of the energy efficiency program, and they are essential to achieving the goal of 90% compliance with energy codes. The ARRA funding is essential to achieving the goal of 90% compliance with energy codes. The ARRA funding is essential to achieving the goal of 90% compliance with energy codes. The ARRA funding is essential to achieving the goal of 90% compliance with energy codes.

Revisiting Building Energy Code Enforcement and Compliance Tools, October 2008.



Policy Maker Fact Sheet

October 2010

Building Energy Code Compliance:

A Low-Cost Tool to Boost Jobs, Cut Pollution, and Advance Energy Independence; Every Dollar Spent Yields \$6 in Energy Savings

Strong building energy codes are one of the most fundamental, affordable, and effective mechanisms for increasing the long-term efficiency of the nation's buildings. Energy codes require that buildings employ a minimum level of cost-effective and energy-efficient technologies that prevent costly energy waste, improve comfort, and reduce emissions of greenhouse gases. Strong energy codes can create countless clean energy jobs and reduce utility bills for U.S. homeowners and businesses. Though many states have adopted or will soon adopt the latest model energy codes, many new homes and businesses fail to comply with mandatory efficiency requirements, consuming far more energy and money to operate than they should. By simply enforcing the energy codes already in place, states and local governments can achieve dramatic energy and emissions reductions at a minimal cost.

What are Energy Codes?

Building energy codes are minimum energy efficiency requirements for newly constructed or renovated buildings, typically adopted and enforced at the local and state levels. Such standards often cover building envelope (walls, roofs, windows), lighting, water heating, and space conditioning. Along with other building and safety codes, energy codes are intended to ensure sound design and construction practices. What's more, energy codes offer the unique opportunity to lock in lasting energy savings at a much lower cost than later in a building's life.

The Benefits of Building Energy Codes

Building operations consumed \$400 billion worth of energy in 2009 - 88% of total U.S. energy spending. Building that comply with codes are more efficient and use less energy than those that do not. The benefits of adopting, implementing and enforcing codes extend well beyond utility bill savings. Energy codes can improve comfort, and ease our country's energy independence, and reduce emissions of greenhouse gases and other pollutants. Moreover, and perhaps most importantly, in the current economic climate, building building energy codes enforcement and compliance to reach 90% compliance would create 26,000 jobs each year*, many of them in local, skilled professions in the building inspection, construction, and design industries.

Code Compliance

Achieving code compliance is essential to effective building codes. Energy codes can deliver their potential energy savings only when projects actually comply with the code, yet statewide reports indicate significant and widespread lack of compliance. A dramatic increase in resources for compliance initiatives at all levels of government and increased enforcement at the local level are necessary to achieve high compliance rates.

Low-Cost Energy Savings

Full compliance with energy codes would produce significant annual and cumulative energy savings for American consumers. The average American household spends \$120 each year on home energy bills. Having the energy standards in building codes can cut such costs by 17% or more. Allowing to code compliance and enforcement initiatives just a fraction of one percent of the value of construction projects would provide sufficient resources to achieve 90% compliance with energy codes. Each dollar spent achieves a six-fold payoff in energy savings, saving American households an average \$122 billion and 26 million metric tons of CO₂ annually.¹


What can you do?

Local and state governments can achieve significant energy and emission reductions through simple, cost-effective investments targeted at enforcing building energy code compliance. Such initiatives include training for building officials, on-site inspections and plan review, and education and outreach to design and construction industries. Effective enforcement also depends on funding for an adequate number of qualified code enforcement officials, compliance manuals, and code books. Policy makers must take leadership in signaling to enforcement officials, design professionals, and builders that code compliance is a local priority, limiting the potential for laxness and signaling a commitment to a healthy and affordable built environment.

1. "Revisiting Energy Code Enforcement," Building Code Institute Project, 2009. More study is needed to assess compliance rates and current spending on enforcement and compliance activities. EPA and the Pacific Northwest National Lab are conducting a study to determine compliance rates.

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Energy Savings from Utility Involvement in Building Energy Codes

Commercial and residential building codes held vast energy savings potential. A December 2009 report by the Institute for Electric Efficiency finds that aggressive adoption, implementation, and enforcement of the 2009 International Energy Conservation Code (IECC) could reduce electricity consumption by up to 9% FN in 2020. The Alliance to Save Energy (ASE) estimates that nationwide adoption of and full compliance with the 2012 IECC could save more than 1.5 quadrillion Btu 2020.¹ Simply enforcing existing building energy codes could save consumers over \$60 billion by 2020 (see figure 1).

Figure 1: Cumulative Energy Cost Savings from Energy Code Compliance¹

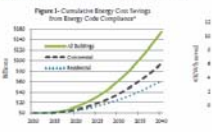
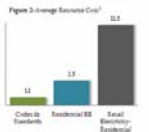


Figure 2: Average Revenue Cost²



Code Effectiveness

Building energy codes are one of the most cost-effective ways to save energy. In fact, at a cost of slightly more than 1 cent per kWh, building codes and standards achieve energy savings at one-third the cost of conventional residential energy efficiency programs and are roughly one-tenth the cost of small residential electricity. A recent study by the Institute for Market Transformation found that every \$3 spent on enforcement of energy codes yields \$6 in energy savings.³ Figure 2 illustrates the cost-effective advantage of pursuing building codes and standards as a resource relative to other conservation and generation options.


How Can Utilities Get Involved?

- Development—design of code language and cost effectiveness testing of proposed code
- Adaptation—support and promotion of the adoption of new efficiency standards
- Training—technical assistance, workshops, training, and testing for builders, contractors, architects, and code officials
- Compliance—building plan review and field inspections or support for third party inspectors; measurement of baseline compliance rates
- Awareness—proactive communication with stakeholders about training programs, key code provisions, incentives, compliance options

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Thank you! Questions?

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