

# The ASHRAE 90.1 Version 2010 Energy Code, and Beyond

By David L. Handwork

Facilities managers should all take notice of deliberate movement regarding the ASHRAE 90.1 energy code. In January of 2011, the 2010 version was published with minor publicity outside of ASHRAE and the Department of Energy (DOE). The most notable accomplishment of the latest publication is achieving approximately 27 percent more code

prescribed energy efficiency relative to the 2004 version, as per DOE software modeling data.

Based on my experience, an average U.S. building energy use index (EUI, in thousands of British Thermal Units per gross square feet per year) constructed under 90.1-2004 would be around 90 kBtu/GSF/yr, according to best available survey results. Applying the

90.1-2010 version modeled energy savings, the average building EUI should result around 66 kBtu/GSF/yr. In raw cost, based upon national average utility rates, this energy savings returns an annual operational cost reduction of \$0.39 per square foot, or \$39,000 per 100,000 square feet.

Presenting all of these figures should not be overwhelming. The bottom line, 90.1 is advancing in energy efficiency stringency. That should be great news for facilities managers, right? But, that depends upon the U.S. location, which results in variability in construction and utility cost. There is no easily obtainable data that provides the average construction cost differential between the 2004 and 2010 energy code versions. Anecdotally, a range of \$2 to \$10 per square foot has been presented in various forums. ASHRAE's own policy is to propose 90.1 enhancements that provide a reasonable return on investment, or ROI (generally three years simple return).

Considering the lower end of the cost differential at \$2 per square foot, the simple ROI is 5.1 years. For institutions with lower than national average utility cost and equal to higher than average construction cost, the simple ROI's can arguably exceed 10 to 15 years. With many education institutions programming buildings for 50+ years of useful life, a 15-year simple ROI may or may not be acceptable. The real issue is that the actual ROIs do not exist, and computer models may

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not be validated for several years when actual building stock is completed under the 2010 version. Most jurisdictions do not adopt the most current version until three to five years post release. Therefore, it could be eight years before a statistical pool is available to validate the current models and

assumptions. Although not likely, it is completely plausible real ROIs could approach or exceed 20 years.

Stating the original premise, facilities managers should take notice. Potentially faulty economics will have unwanted consequences. The perceived success of the 2010 version energy reduction goal 'raised the bar' for the 90.1 committee. When establishing the work plan for the 2013 version, limited discussion resulted in an aggressive goal of 50 percent more code prescribed energy efficiency, again relative to the 2004 version. If achieved, this proposed reduction will place an average building in the current category of high performance building, which is generally considered with EUI less than 45 kBtu/GSF/yr.

The primary concern is affordability for building owners. Even for progressive institutions with strong commitment to sustainable construction standards and best practices, pressing demands on limited available capital funding could create compromises in order to meet energy codes. The most expedient compromise is reduced building square footage that may not meet functional and operational expectations. Can institutions truly afford more complex, higher construction-cost buildings?

Another 90.1 point for facilities managers to take note of is the potential scope change for the code. The APPA Code Advocacy Task Force prior

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reported successfully amending a proposed change to the 90.1 title purpose and scope that would have made the code applicable to operation of a building. Simply put, the change would have provided a local jurisdiction of authority the right to inspect compliance to the 90.1 code post occupancy. Even with this success, it is the view of the CATF movement of

the code into post-occupancy application has not ceded. ASHRAE Standard 100 is titled "Energy Efficiency in Existing Buildings." Standard 100 is currently undergoing a total rewording to code friendly language. The new title purpose and scope of Standard 100 applies explicitly to energy efficient maintenance and operations of any existing building. The standard alone does not raise any concern, as it contains sound best operational practices. However, the fact that approximately one-third of the Standard 100 committee members are current 90.1 committee members should raise a red flag. The significant requirement of Standard 100 is meeting or exceeding a prescribed EUI. The consequence of not achieving an EUI threshold for a particular building type will require investment grade energy audit to identify AND implement energy conservation measures. It is the concern of the CATF Standard 100 could be reference in 90.1, which make the standard de facto code. ☹

*The CATF will actively inform the APPA membership if this concern becomes an ASHRAE proposal.*

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