

**AIMS Environmental Update
NAA/NMHC Joint Legislative Program**

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1. [New Report Helps Firms Meet Proposed Energy-Efficiency Standards](#)

2. [Miscellanea](#)

NEW REPORT HELPS FIRMS MEET PROPOSED ENERGY-EFFICIENCY STANDARDS

A growing national interest in energy efficiency and green building has translated into a number of proposals at the local and federal level seeking to reduce energy consumption in buildings. In general, these proposals require property owners to improve the energy efficiency of their buildings anywhere from 15 percent to 50 percent above existing building code requirements. Although many of the initiatives enacted so far target commercial space and buildings rented or owned by federal or municipal authorities, there is an increasing interest in subjecting all buildings, including apartments, to higher energy performance standards.

Last year, for example, NAA/NMHC successfully defeated an onerous provision in the 2007 energy bill that would have required expensive changes in apartment development and construction to meet new energy-efficiency mandates. Specifically, the bill would have required all new buildings to be 30 percent more efficient than current standards by 2010 and 50 percent more efficient by 2020. The proposal has been resurrected this year in the leading climate change legislation in the Senate (S. 2191, the Lieberman-Warner America's Climate Security Act of 2007).

At the state and local level, last year the U.S. Conference of Mayors passed a resolution pledging to work toward standards that would require all new buildings to reduce fossil fuel, greenhouse gas (GHG)-emitting energy usage by 60 percent in 2010, 70 percent in 2015, 80 percent in 2020, 90 percent in 2025 and to be carbon neutral by 2030. The city of Dallas is the latest to adopt strict energy-efficiency requirements, requiring new buildings to improve their energy performance by 15 percent over current energy standards.

Of significant concern to the apartment industry is the fact that these initiatives have been promoted without serious consideration of whether they are technically feasible or cost-effective, and whether metrics that are achievable in one property type, for example commercial offices, are applicable to low- and mid-rise apartments. This is in part because there has been a lack of industry-specific data on this topic.

To fill that gap and gain a better understanding of what kinds of energy-efficiency improvements are realistic for the multifamily sector, we commissioned a study examining the costs, benefits and practical limitations of making large increases in energy efficiency in a typical multifamily building. The research was conducted by Newport Partners, LLC, an independent consulting firm with extensive expertise in building science and energy-efficiency technologies, and was supported by the National Association of Realtors (NAR), the Institute for Real Estate Management (IREM) and the CCIM Institute.

The firm performed extensive energy modeling of a typical apartment property in three U.S. climates to determine what products and practices would be required to exceed existing requirements by 15 percent, 30 percent and 50 percent as well as the payback for those investments. The results of this research are contained in a new NAA/NMHC report titled *Strategies and Costs to Exceed ASHRAE 90.1-2004 Requirements in a Multifamily Apartment Building*. The report is designed not only to aid NAA/NMHC's advocacy efforts, but also to help firms identify the most cost-effective way to meet mandatory and voluntary energy-efficiency goals.

The Methodology

The most direct method for measuring how a proposed building design compares to energy code requirements is to use computer simulation. We helped the firm design a "base building," which typifies new apartment construction found in markets across the U.S. The base building is four stories with 32 apartment units of roughly 1,000 square feet each. Building characteristics comport with the conventional materials and systems used in low-rise properties, such as individual heating, cooling and hot water systems.

Newport Partners then used that prototype to conduct extensive energy modeling in three different climate zones--Houston, Atlanta and Chicago--to determine what products and practices would be required to exceed existing code requirements by 15, 30 and 50 percent as well as costs of those investments. These three cities were chosen because they

provide the broadest range of climates found in the US—hot and cooling dominated (Houston), cold and heating dominated (Chicago), and mixed-humid (Atlanta). The report also identifies obstacles to these efficiency targets and provides guidance on how to improve the feasibility of achieving specific energy-efficiency targets.

Key Findings

The research uses the ASHRAE 90.1-2004 standard as a baseline (as do most of the legislative proposals) since this is the most widely adopted energy conservation standard in the U.S. Among other things, the study concluded:

- Exceeding ASHRAE 90.1-2004 by 30 percent or 50 percent will present practical and financial barriers for building developers and owners. In fact, it will not be possible for most buildings to achieve a 50 percent increase over ASHRAE 90.1 with today's technology.
- Even where an increase in energy efficiency of 30 percent or more is achievable, the cost to do so would be nearly impossible to recapture, since the expected payback is outside historically accepted ranges. For example, a 30-percent improvement in Atlanta would cost up to \$8,000 per unit with a payback of 16 to 25 years.
- Large efficiency gains in apartment buildings would necessitate the use of advanced technology, such as ground-source heat pumps (GSHP). GSHP technology does not have a well-developed support infrastructure and can cost several hundred thousand dollars more than conventional equipment.
- Efficiency gains of 15 percent were achievable in two of the three climate zones using conventional methods and materials that are commercially available.

The study also found that some of the often-promoted energy improvements, such as advanced window technology, solar shading and stepped-up R-value insulation, only increased building performance by one percent or less in many cases. This is a significant finding since many proposed building code changes are directed at these particular building attributes.

Significant efficiency gains can be achieved, however, by improvements to water heating, advanced in-unit lighting and the use of onsite-renewable power generation. Unfortunately, these items are not within the scope of current energy standards, and therefore the energy savings these improvements produce are not “counted” in the math used to determine whether a property complies with a “better than code” efficiency mandate.

Similarly, the report discusses the limitations of efficiency initiatives that peg energy savings to existing energy codes since the scope of these codes is extremely narrow. It reinforces an important message for policymakers: A 30-percent or 50-percent increase in code requirements will **not** result in an equivalent decrease in whole-building energy consumption. For instance, these codes do not regulate residential appliances, like refrigerators, washing machines, lighting and home entertainment equipment, which account for more than 65 percent of energy use in residential buildings. A codes-based approach to energy conservation puts extreme pressure on developers and owners to upgrade specific building characteristics, while leaving the vast majority of building energy use (appliance use, etc.) unaffected. NAA/NMHC will use this study to educate policymakers and code officials about what energy improvements are technically feasible and cost effective in apartment communities. It also provides a platform for our continued advocacy on financial incentives for energy-efficient building upgrades. The full report is available at www.naahq.org/govern_affairs/Issues/.

MISCELLANEA

- **National Green Building Standard (NGBS).** The first and only consensus-based standard for residential green building will be published later this spring. Thanks to NAA/NMHC's efforts, the ANSI-approved standard was expanded to include multifamily properties. The NGBS, which will be available through the International Code Council, will provide firms with uniform guidance on green building practices appropriate for low-, mid- and high-rise apartment construction. It will also offer local jurisdictions that are considering mandatory green building requirements an alternative to non-standardized green rating systems (like the U.S. Green Building Council's LEED criteria). The April 11 *AIMS Building Codes Update* examines the NGBS, how it differs from existing standards and how apartment firms can use it to their advantage. It is available on NAA's web site at www.naahq.org/govern_affairs/Issues/.
- **Green Communications Technology.** In a move that could help apartment firms lower energy usage in their buildings, the U.S. Environmental Protection Agency announced last week that cable, satellite and telecom boxes carrying U.S. EPA's Energy Star label will be at least 30 percent more efficient than conventional models by January 1,

2009. The agency plans to partner with cable, satellite and telecommunications companies to offer newly qualified boxes to subscribers or upgrade boxes already in homes. According to EPA, if all set-top boxes sold in the United States met Energy Star requirements, the country would save \$2 billion per year and cut greenhouse gas emissions equivalent to taking about 2.5 million vehicles off the road. U.S. consumers have installed about 148 million set-top boxes, and 23 million more are expected to ship in 2008.

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