



nbi new buildings
institute

Multifamily Efficiency Solutions

Advanced Measures for Multifamily Projects

from NBI's Building Innovation Program



Multifamily: A Market Divided

The rapidly growing multifamily building sector represents a major opportunity to advance goals of improved energy performance, better indoor air quality, and more comfortable homes.

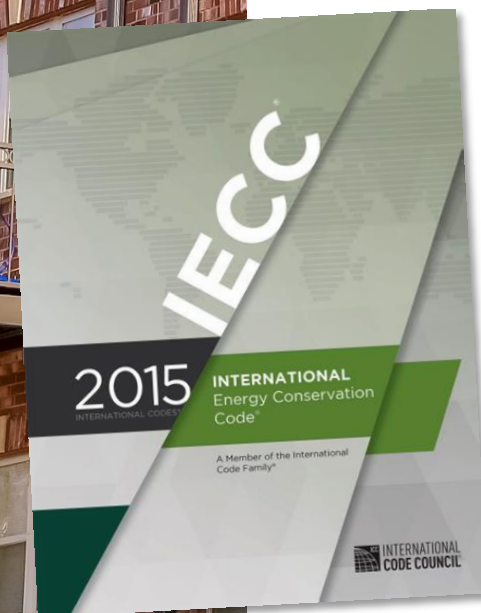
However, typical national model and local energy codes divide the multifamily market between the residential and commercial sections making it difficult to regulate efficiency standards. Low-Rise (3 or fewer stories) is regulated by the residential code and High-Rise (4 or more stories) is regulated by the commercial code.

Divided Market = Implementation Challenges

For energy efficiency program administrators, dueling codes create barriers to implementing effective and successful above-code energy efficiency programs across the range of building types in the multifamily market.

Implementing a single multifamily program can deliver inconsistent savings or neglect segments of the multifamily market.

Implementing separate programs for each segment of the multifamily market creates confusion, duplication of program expenses and branding challenges.





*Advanced measures described under
Multifamily Efficiency Solutions save
15-25% over IECC-2015 or 20-30%
over ASHRAE 90.1-2013.*

The **Multifamily Efficiency Solution's** prescriptive standard addresses all aspects of energy performance in multifamily buildings, including envelope, space conditioning, ventilation, site lighting, water heating and appliances. It also offers a single approach for the unique nature of the multifamily market and supports energy efficiency program administrators by:

- Simplifying program implementation
- Increasing multifamily energy savings
- Eliminating the need for costly energy modeling
- Encouraging program participation by multifamily owners and design teams

Multifamily Efficiency Solutions includes a comprehensive list of measures plus detailed guidance on four of the most pressing topics for multifamily buildings: domestic hot water, thermal bridging, ventilation and lighting.

- NBI analyzed over 50 measures and conducted a parametric energy modeling analysis on 30 measures to develop an integrated whole-building approach.
- Measures can be applied individually or as a whole-building bundle.
- Energy savings estimates from measures and bundles of measures can be customized for any climate zone or applicable code baseline.
- Measures deliver savings across all US climate zones and regardless of building height and whether the building is subject to residential or commercial code.
- Targets aspects under-represented in code, where market practices are significantly lagging best practices, or where technology advances have created design challenges.





The **Multifamily Efficiency Solutions** technical package includes:

- An Advanced Multifamily Standard with 13 core measures and six Additional Efficiency Packages
- An *Energy Savings Study* with predicted results from a parametric energy modeling analysis
- An *Incremental Cost Study* that estimates measure costs in various locations

In addition, market-facing guidance and educational resources help practitioners and owners more successfully apply the measures in multifamily new construction projects, and promotes efficiency program offerings in the market. These include:

- A market-facing *Multifamily Guide* with prescriptive details about each measure
- A complementary webinar series with customizable learning modules. Webinars come with AIA Continuing Education credit that can be leveraged to increase participation.





Learn more.

Contact Sean Denniston, sean@newbuildings.org

More information at newbuildings.org/multifamily-new-construction-guide/

Multifamily Efficiency Solutions was developed with support from and in collaboration with the Energy Foundation, the Northwest Energy Efficiency Alliance, and the U.S. Environmental Protection Agency's Energy Star program.





About Us

New Buildings Institute (NBI) is a nonprofit organization working to improve the energy performance of commercial buildings. We work collaboratively with industry market players—governments, utilities, energy efficiency advocates and building professionals—to promote advanced design practices, innovative technologies, public policies and programs that improve energy efficiency. We also develop and offer guidance and tools to support the design and construction of energy efficient buildings.

Throughout its 20-year history, NBI has become a trusted and independent resource helping to drive buildings that are better for people and the environment.

Delivering Results

NBI is a results-driven organization working to find strategic points of leverage that will deliver the best outcomes for improving building efficiency.

ZNE Research Studies Identify Trends. NBI's groundbreaking research on trends, features, energy performance and tally of zero net energy buildings (ZNE) in North America offers the most comprehensive view of the landscape for ZNE. NBI has also worked nationally with industry leaders to study the costs and technical feasibility of zero net energy buildings, including a financial study for the District of Columbia.

Online Database Profiles Buildings. Building on our ZNE research, NBI continues to track and verify ZNE status with its 2016 list showing 332 verified and emerging projects, a 74% increase over the 2015 buildings count. Case studies on many of these projects and other ultra-low energy buildings can be found in NBI's Getting to Zero Buildings Database.

California ZNE Early Adopter Network and Workshops. NBI staff has been working to increase market acceptance and participation in California's zero net energy goals. We helped formalize an Early Adopter Network and, in partnership with local utilities and the California Public Utilities Commission, we train stakeholders on ZNE design and project planning providing educational resources, toolkits, case studies and a regular *ZNE Action Bulletin*.

Getting to Zero Convenings. NBI's findings on zero net energy progress have been presented by staff and cited by others at dozens of conferences and workshops. As of 2016, NBI's zero net energy webinar series touched over 2,500 designers, owners and advocates; it remains the best intelligence on important aspects of ZNE. In 2016, NBI held the third Getting to Zero National Forum where nearly 400 participants gathered to learn about and collaborate on ZNE.

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A Focus on Outcome-Based Performance. For nearly a decade, NBI has been a leading advocate for measured energy performance in buildings. This overarching focus on energy use data means that high performance buildings will actually save energy and reduce carbon emissions rather than relying primarily on predictive models. NBI has been working with the National Institute of Building Sciences to establish a clear path to transition the industry to more common reliance on measured, outcome-based performance for determining a building's efficiency in operation.

Deep Energy Retrofits Upgrade Existing Building Efficiency. Realizing deep energy savings in existing buildings has long been a focus of NBI. A report on the potential for small commercial retrofits produced in partnership with the National Trust for Historic Preservation's Preservation Green Lab estimates that investments in energy conservation could generate \$30 billion in annual energy cost savings, improving the financial performance of millions of small businesses. These early research findings contributed to a U.S. Department of Energy investment of \$10 million for six deep energy efficiency projects to reduce carbon pollution and energy bills in small commercial buildings.

Community Building Renewal. With funding from NEEA, NBI launched a Community Building Renewal (CBR) project with the cities of Tacoma and Boise. The project looks at comprehensive, portfolio-wide building improvement policies and uses measured energy data to analyze consumption of existing building stock. CBR has been expanded nationally to additional cities through a partnership with the U.S. Department of Energy.

Setting Higher Standards in Energy Codes. Energy codes set the minimum standard for efficiency levels of the country's building stock. In recent code development cycles, major model energy codes have seen substantial increases in efficiency stringency due to efforts by NBI and partners such as The American Institute of Architects, Building Owners and Managers Association and others. Together, we were able to rewrite sections of the 2015 International Energy Conservation Code (IECC) and the International Existing Building Code (IEBC) to clarify and strengthen application of these codes to existing commercial buildings as well as "historic buildings" increasing the impact of the code on retrofit projects. These achievements build on the changes to the 2012 IECC based on the NBI-developed *Core Performance Guide* that resulted in an energy code that is up to 30% more energy efficient than current standards require.

Supporting Adoption of Advanced Energy Codes Locally. NBI supports local jurisdictions in the adoption of higher stringency energy codes. We supported the State of Vermont in development of technical measures, evaluation approaches and implementation plans for its upcoming code cycles. Similarly, NBI has supported the Energy Trust of Oregon on development of code roadmaps for the state. In California, NBI participated on a team of technical and policy experts to conduct a "top-down" code study that sets energy savings targets for code updates based on state energy policy goals and provides focus for strategies and tactics to accelerate market transformation to fast-track code readiness. Most recently, staff worked with NYSERDA to develop New York state's first-ever stretch code.

“With the assistance of NBI’s network of energy and facilitation experts, we have been able to help identify expertise to help train state building professionals. The resources shared through NBI’s extensive energy and ZNE research efforts are a great benefit to not only California building professionals, but across the country.”

Dan Burgoyne, Sustainability Manager,
State of California Department of General
Services, Office of Sustainability

Learn more:

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www.newbuildings.org