



Energy Star for Multifamily High-Rises

by Linda Reeder
May 5, 2010

The EPA's pilot program for the [Energy Star](#) for Multifamily High-Rises (MFHR) applies primarily to new construction. It was launched in 2006 with projects in New York and Oregon, and was later expanded to Colorado, Georgia, New Jersey, Texas, and Nevada in order to gather data from different climates.

In undertaking the pilot program, the EPA identified four challenges in the MFHR building type that could not be addressed by the existing Energy Star programs for homes or other commercial buildings:

- There is a split incentive in multifamily high-rise buildings, in that the costs of improving energy efficiency are paid by the developer or owner, but the resulting savings typically go to the tenants.
- Tenant turnover in MFHR is high, making tenant education difficult. Occupant behavior and building management can have a significant impact on energy use.
- Current residential modeling tools do not accurately model energy consumption in multifamily high-rise buildings.
- Benchmarking the energy consumption of new projects to similar buildings types, as done in the Energy Star program for commercial buildings, is difficult because there is very little data publicly available on comparable buildings.

At this time, the pilot phase of the MFHR program is still underway, so the EPA has not yet finally determined if it will establish a national Energy Star program for multifamily high-rises, nor has it identified what, if any, changes would be made as a result of the pilot if the program is to be launched nationally.



The six-story [Intervale Green](#) apartment building by [Edelman Sultan Knox Wood/Architects](#) provides 128 units of energy-efficient affordable housing in the Bronx, New York City.
Photo: Courtesy WHEDCo



Part of an Energy Star pilot certification program for high-rise multifamily residential buildings, [Intervale Green](#) includes a green roof and other sustainable features.
Photo: Courtesy WHEDCo



The EPA's agreement with pilot partners cited the following criteria as those it would use to determine whether the Energy Star MFHR pilot program would be extended nationally:

- The performance specifications must be cost-effective.
- The program must represent true energy savings over standard construction.
- The program must provide value in the marketplace to MFHR stakeholders.
- The program must be easy to implement and understand, including energy modeling and verification protocols.

Eligibility and Criteria for Earning the Energy Star for MFHR

The pilot program applies to new construction of multifamily buildings four stories or higher. To be eligible for the Energy Star label, the performance target of the pilot projects must exceed by at least 20 percent the minimum requirements for energy efficiency in ASHRAE 90.1 2004, Appendix G. Projects must also be modeled to obtain a score of 75 or better on the EPA's MFHR benchmark tool, indicating performance in the top 25 percent of similar buildings nationally. Benchmarking is based on information on comparable buildings collected by the Residential Energy Consumption Survey (RECS) of home energy use and costs, conducted by the Energy Information Administration of the U.S. Department of Energy.

Also in progress are quality assurance measures, such as reviews of energy modeling and inspections of construction. Buildings, not individual units, may earn the Energy Star under this pilot program.



[Pearl Place](#), a multifamily housing project in Portland, Maine, was designed by [Winton Scott Architects](#). Photo: Courtesy Avesta Housing



The exterior walls of [Pearl Place](#) are insulated with dense cellulose. Photo: Courtesy Avesta Housing



Case Study: [Intervale Green](#), The Bronx, New York City

This multifamily residential project was developed on a triangle of city-owned property that had been vacant for more than 25 years. All apartments are rented to people earning below 60 percent of the area median income.

- **Climate:** Mixed-Humid (Zone 4)
- **Space type:** Multifamily residential with ground-floor commercial
- **Size:** 128 units (one to three bedrooms each); 140,800 square feet (13,080 square meters) residential, 6,800 square feet (630 square meters) commercial
- **Completion date:** 2008
- **Construction cost:** \$155 per square foot (\$1,668 per square meter)
- **Total development costs:** \$29,237,815
- **Owner/developer:** [Women's Housing and Economic Development Corporation](#) (WHEDCo), Bronx, New York
- **Architect:** [Edelman Sultan Knox Wood/ Architects LLP](#), New York, New York

Energy-Efficiency Costs and Savings

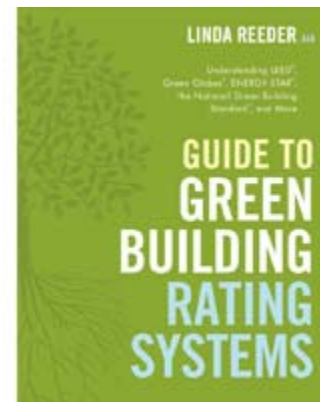
"We pursued the Energy Star designation to set an example that high-rise green building can be both affordable and beautiful," said WHEDCo President Nancy Biberman. The project includes two green roofs totaling 20,000 square feet (1,900 square meters); a private backyard; an entry courtyard; and a public garden.

- **Estimated hard costs associated with energy reduction measures:** \$437,750
- **Projected total energy costs saved annually (all fuels):** \$82,492 (over baseline ASHRAE 90.1 2004 building)
- **Simple payback period:** 5.3 years
- **Savings-to-investment ratio:** 2.8

Incentives and green building support were provided by Enterprise Green Communities, NYSEDA Multifamily Performance Program, Bronx Overall Economic Development Corporation's Bronx Initiative for Energy and the Environment, Home Depot Foundation, New York City Council, and the Bronx borough president..



*Florescent lights and occupancy sensors in common areas help reduce the energy load at [Intervale Green](#).
Photo: Courtesy WHEDCo*



*[Guide to Green Building Rating Systems](#) by Linda Reeder.
Image: John Wiley & Sons*



Energy-Saving Features

The building is expected to use 33.4 percent less energy than the ASHRAE 90.1 2004 baseline building, resulting in projected savings of 208,401 kWh of electricity and 3,410 MMBtu annually. Energy-saving features include a high-performance building envelope, which features air sealing, continuous insulation, and insulated low-e argon-filled windows; 85-percent-efficient boilers and hot water heaters; carbon monoxide sensors in the garage, so ventilation only runs when needed; and Energy Star lighting fixtures and appliances.

The design team also received a code modification to reduce the excessive ventilation rate to a lower level while maintaining good air quality. Cary Trochesset, project manager for Edelman Sultan Knox Wood/ Architects LLP, said that without the ventilation waiver it would have been difficult to earn the Energy Star. The New York City building code has since been updated to make ventilation waivers unnecessary.

In addition to the two green roofs, part of which are accessible to tenants, green features include recycled-content flooring; low-flow faucets and showerheads; and low-VOC paints, adhesives, and sealants.

Tips from the Architect

Randy Wood, AIA, principal at Edelman Sultan Knox Wood, said his firm had already been incorporating many of the energy-efficient practices required by the Energy Star MFHR pilot program into the firm's projects. "I don't consider myself an expert; I just think it's what we should be doing, and we're doing it," said Wood.

"If there was anything that I found difficult," he said, "it was getting contractors to understand what they had to do and getting them to do it." Woods gave as an example sealing ductwork to comply with specifications, rather than as the subcontractor was accustomed to doing — which did not pass performance testing.

Wood's firm designs many low-income and subsidized multifamily high-rises, and Wood says that now many clients are asking them to evaluate the feasibility of participating in the Energy Star program.



Both buildings at [Pearl Place](#) were certified under the LEED for Homes Mid-Rise pilot program, one earning a Gold rating and the other Silver.

Photo: Courtesy Avesta Housing



Linda Reeder, AIA, is an architect practicing in New Haven, Connecticut. Prior to starting her own firm, which is focused on residential projects, she worked on the design of commercial, multi-family, and institutional buildings. The former editor for Building Performance for the AIA's Architects Knowledge Resource web site, Reeder has taught classes in sustainable design and construction in the Construction Management program at Central Connecticut State University and in the Department of Architecture at the University of Hartford.

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Project Credits

Project: Intervale Green (New York, New York)
Owner/Developer: Women's Housing and Economic Development Corporation (WHEDCo)
Architect: Edelman Sultan Knox Wood/ Architects LLP
Energy Consultant: Steven Winter Associates, Inc.
Structural Engineer: Robert Silman Associates
Mechanical, Electrical, and Plumbing Engineer: Abraham Joselow, P.C.
General Contractor: Mega Contracting, Inc.