

# Energy Efficiency Case Studies

## A Variety of Approaches

Owners and property managers are taking different approaches to incorporating energy and water efficiency features in affordable multi-family rental housing, particularly in retrofits of existing projects. A look at four organizations around the country illustrates this.

### WinnDevelopment

#### Boston, Mass.

WinnDevelopment, the development arm of WinnCompanies, is a national leader in incorporating green designs and efficient technologies in the new affordable rental housing projects it develops and in making energy and water efficiency upgrades at existing properties managed by WinnResidential. The properties are nationwide but heavily concentrated in the Northeast.

Under the direction of Vice President of Energy Sustainability Darien Crimmin, WinnDevelopment religiously monitors utility usage at its properties; compares the data to portfolio and external benchmarks; identifies which properties should be upgraded and what improvements to make; and decides how to fund the work.

"In general," Crimmin says, "we're doing retrofits as often as we can analyze them, prove the savings out, and then find the resources to pay for them."

The retrofits have been wide in scope. The biggest, completed in April 2012, was the \$50.5 million "deep retrofit" of Castle Square Apartments, a 1960s complex in Boston of 500 affordable apartments in four mid-rise buildings and 19 townhouses. The retrofit project involved adding a super-insulated shell to the exterior of one seven-story building and a super-insulated reflective roof; sealing air leaks; putting in high-efficiency windows, appliances, HVAC systems, and solar panels for heating water; and other measures. The property has achieved 52% natural gas savings for heat and hot water, based on a year's worth of data.

Crimmin mentioned two noteworthy retrofits in 2013; heating plant retrofits at a pair of properties in Massachusetts. At one, 38-year-old boilers were replaced



Darien Crimmin

with new high-efficiency, condensing natural gas boilers, along with new pumps and digital controls. At the second, new domestic hot water boilers were installed to separate domestic hot water production from heating production, enabling better control of the hot water temperature delivered to residents while saving energy. Both projects were supported in part by utility rebates.

According to Crimmin, WinnDevelopment also focuses heavily on water conservation, currently specifying toilets using only 0.8 gallons per flush in new developments. As for irrigation, he said smart irrigation controls and timers have been installed as needed at most properties.

### Peabody Properties, Inc.

#### Braintree, Mass.

Peabody Properties, which manages about 100 multifamily rental properties containing nearly 10,000 units, of which the majority are in New England within Section 8 or low-income housing tax credit developments, primarily relies on utility financing programs to implement and pay for energy and lighting upgrades at properties.

In 2011, the company began enrolling its affordable properties in the Massachusetts Low Income Multifamily Energy Retrofit Program, which is administered by the Low-Income Energy Affordability Network (LEAN) in partnership with Action for Boston Community Development, Inc. (ABCD). "We've had tremendous success with it," says Elizabeth Tracey, strategic projects coordinator at Peabody Properties.

Under this program, funds contributed by eight Massachusetts electric and natural gas utility companies fully pay for cost-effective energy and lighting upgrades installed by vendors at affordable multifamily rental properties. To qualify, a property must undergo an upfront assessment by an auditor and then be approved by ABCD. The funds go directly from LEAN to the contractor or vendor installing the improvements.

According to Tracey and Michael Ferguson, Peabody Properties' vice president of facilities & man-



Elizabeth Tracey

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agement planning, some common upgrades have been replacing boilers and refrigerators, weatherizing, air sealing, and installing more efficient lighting. According to Ferguson, major savings have been achieved from installing “bi-level” lights in areas of buildings where there is little or intermittent traffic by residents due to the location or time of day, such as stairwells, laundry rooms, and hallways. The bi-level lights save energy by operating at 10% capacity until they sense motion, sound, or air movement. When someone passes, “it then very quickly clicks up to 90%,” says Ferguson, “and stays there for about 15 minutes and then drops down again.”



Michael Ferguson

Tracey said Peabody Properties strives to enroll all eligible properties in available programs, including those that install upgraded lighting and Energy Star appliances.

She indicated that Peabody Properties has completed energy conservation measures at more than 60 properties with over 6,000 units in the past two years, funding improvements through utility-sponsored programs or planned capital projects.

More recently, Peabody Properties has initiated a pilot program to make water efficiency improvements at an initial 10 properties, replacing old toilets using 3.5 gallons per flush with new, 0.8 GPM rear discharge toilets. “If the property can use replacement reserves to pay for the toilets and installation that is one option,” says Ferguson. “The other option is a pay-out-of-savings program that we’ve created through a first-of-a-kind partnership with a manufacturer and distributor.”

**Homes for America, Inc.  
Annapolis, Md.**

Homes for America, a nonprofit developer/owner of about 65 affordable multifamily rental communities in Maryland, Pennsylvania, Virginia, and Delaware, plans and develops new projects – both new construction and acquisition/rehab – to meet either the Enterprise Green Communities or EarthCraft standards, says President Nancy Rase. Common in these developments, she said, are high-efficiency furnaces and higher-quality windows and low-flow toilets, showerheads, and faucets.

According to Rase, Homes for America is obtaining energy audits for all of its existing properties not devel-

oped or renovated to meet the green building standards to identify cost-effective energy and water efficiency improvements to make. It is also searching for the funds to pay for such measures. Rase said the nonprofit is focusing first on its properties in Maryland because there are greater state and utility resources for retrofits and because many of its earliest developments are in the state.

Most of the organization’s properties are LIHTC developments. Accordingly, Homes for America works with the syndicator for each property to determine how to structure capital being provided for a project to pay for retrofit improvements. Rase said grants are received by Homes for America and then provided to the project either as a capital contribution or a no-interest loan, depending on the property’s tax needs and where it is in its life cycle.

Homes for America, which uses third-party property managers for all its communities, has recently started to use EnergyScoreCards™, a commercial online energy tracking and database system, to monitor utility usage and costs at its properties. “Now we’re collecting information in-house and comparing the costs and the usage,” says Rase. “So we’re going with this more formalized system, which I think will be really beneficial.”

**LINC Housing Corporation  
Long Beach, Calif.**

LINC Housing Corporation, a nonprofit developer/owner/manager with about 57 affordable multifamily rental properties in California, is trying out EnergyScoreCards™ and WegoWise to monitor utility usage and costs at its developments, and taking a more systematic approaching to planning and executing retrofits, according to President & CEO Hunter Johnson.

The nonprofit recently brought aboard a director of sustainability – a new senior position – to lead this effort. Before, a project manager-level employee and consultants had responsibility but the decision-making and strategic work was primarily handled by Johnson and LINC Housing CFO Karen Maeshima. “We frequently described ourselves as Lewis and Clark,” says Johnson, “meaning we didn’t know what was around the next bend in the river. We had to rapidly traverse to get across things we didn’t anticipate.”

LINC Housing has made retrofit improvements so far to about 2,000 units of its roughly 5,500 units but

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hasn't yet completed all the desired improvements at any. Still, Johnson says, "In some we've done 90% of what we're going to do." Johnson said savings so far have averaged close to 20%. Nearly all of LINC Housing's properties contain one- and two-story garden apartment buildings with large lawn areas.



Photo by Gary Krueger

Hunter Johnson

LINC Housing mostly uses energy audits to determine the specific efficiency improvements to make at properties and usually implements

those with the shortest payback period first. However, the specific work also depends on what funding is available, such as grants, rebates, and project reserves.

LINC Housing has a standard list of 12-15 energy and water efficiency measures it can do in retrofits at its existing properties, ranging from simple things like weatherization to new domestic hot water systems all the way up to installing solar photovoltaic systems.

One simple, low-cost improvement that the nonprofit has installed at some properties is a valve using ShowerStart™ technology inserted between the shower head and the pipe. The device cuts off the water after the temperature reaches 95 degrees but no one is in the shower. The tug of a cord attached to the mechanism turns the water back on. Johnson indicated this prevents wasted water and energy if someone turns on the shower, walks away to do something else while the water warms up, and forgets the shower is on. He said the device, which has a payback period of less than one year, has cut water usage by about 30%.

LINC Housing experiments with different technology and financing sources for retrofits. At City Gardens in Santa Ana, the nonprofit's testing lab for retrofit improvements, LINC Housing covered most of the upgrade costs with proceeds from a Fannie Mae Green Refinance Plus loan. (See p. 4 for article on City Gardens retrofit.)

LINC Housing is participating in an industry initiative to try to develop a model for financing small retrofit projects at affordable multifamily properties.

In addition, it is using a \$1.3 million grant from the California Energy Commission to try to make a portion of a 100-unit property in Lancaster – in the high desert with extremes of heat and cold – "as close to zero net energy as we can," says Johnson. "We want to share the utility savings with the residents, who are very low-income." **TCA**



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