

Building Green

Energy and Water Efficiency Are More Important Than Ever in Affordable Housing Developments

*Silver Gardens,
Albuquerque, New Mexico.
Developed by Romero-Rose
(a Jonathan Rose Company)*

Photo by Patrick Coulie

TCA

Staying current on green building and energy efficiency requirements and techniques, funding sources and incentives to pay for improvements, and steps for effective operation and maintenance are more essential than ever for the successful construction and rehabilitation of affordable multifamily rental housing projects.

In the low-income housing tax credit (LIHTC) program, it can mean the difference between winning and not winning an award of 9% tax credits. And, in the current environment of tight federal budgets and rising energy costs, greater efficiency is also vital for other government-assisted multifamily properties, such as public housing and rental projects assisted or financed under programs of the U.S. Department of Housing and Urban Development and USDA's Rural Development.

Green and sustainable development of multifamily housing is beneficial for developers, owners, property managers, and residents.

"Multifamily buildings house our nation's poorest residents, who bear energy burdens at least double those of families with average incomes," says Trisha Miller, Senior Director, Green Communities, at Columbia, Md.-based Enterprise Community Partners. For developers, owners, and managers, "greening" their multifamily buildings produces economic and marketing benefits.

LIHTC Programs Raising the Bar

Miller, who oversees Enterprise's Green Communities Criteria, a green building certification program tailored to affordable single-family homes and multifamily housing developments, said state allocating agencies are increasingly raising the bar in their LIHTC programs in requiring or encouraging projects to achieve energy and water efficiency and sustainability.

"More states and allocating agencies are incorporating holistic green building criteria, either as threshold or incentive measures," says Miller.

Enterprise recently completed an analysis of the 2010 LIHTC qualified allocation plans (QAPs) of allocating agencies for all 50 states, the District of Columbia, New York City, and the City of Chicago. Some 81% reported a requirement or incentive tied to green criteria, and over half of the agencies referenced one or more of the five major green building programs: Enterprise Green Communities; the U.S. Green Building Council's



Trisha Miller

Photo by Enterprise Community Partners

LEED rating system; the federal EPA's Energy Star for Homes program; the National Association of Home Builders' National Green Building Standard; and the regional EarthCraft program. According to Miller, 60% of the agencies recognized Energy Star for Homes, 57% Enterprise Green Communities, and 35% LEED for Homes.

In addition, Miller said, "we found that 66% of the [9% LIHTC] projects funded in 2010 committed to meeting some definition of green building. And that translates to over 37,000 units."

In terms of additional trends, Miller said that a few agencies will now approve a boost in the eligible basis of projects committing to green building. She also noted Colorado's agency now requires all new 9% credit projects to meet the Green Communities Criteria.

"We're seeing a combination of HFAs recognizing multiple green building programs as a pathway to incentives or bonus points," says Miller. "And then states like Colorado are creating a threshold requirement for all tax credit-funded properties."

The past year has seen changes in some national green building programs.

For example, Enterprise released an updated version of the Green Communities Criteria in February 2011. A few of the major changes included:

- Establishing three location categories for projects (Urban/Small Cities designation, Suburban/Mid-Size Town, Rural/Tribal/Small Town), each with some different mandatory and optional measures. A calculator helps users identify the location category for their project; and,
- Adding incentives for developers to incorporate universal design features and principles in their projects.

Significant Benefits, Starting Point

The financial benefits from energy and water efficiency features or improvements can be substantial, and provide for a reasonable payback period.

In 2009, Enterprise studied properties completed under the Green Communities Criteria (homes and multifamily projects). The average projected utility cost savings over the lifetime of the energy and water measures (average cost \$19,000 per unit) was \$4,851 per unit, and the average payback period less than seven years. Enterprise plans to release an updated study in early 2012.

"We're seeing, as a result of implementing the

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Green Communities' mandatory criteria, a 20 to 30 percent increase in energy performance," says Miller.

The question for many developers and owners, though, is where to start? Which projects or buildings to tackle first? Which specific improvements to make? And how do you pay for them?

For new development, either new construction or acquisition/rehabilitation projects, Enterprise recommends an integrated design approach. Here the different participants in the proposed green housing project – developer, architect, engineer, energy consultant, contractor, utility company, etc. – huddle at the front end to discuss options and costs and hash out collective design decisions.

For energy "retrofits," or developers/owners rehabbing existing multifamily rental housing developments, or even a portfolio of properties, industry officials say that you first need to determine what you have. This means identifying the specific current and historical levels of energy and water usage for a building, determining how these compare to an energy/water efficient "benchmark" building of similar size and construction, determining the type, age, and condition of the building and mechanical systems, and then figuring out which are the most cost-effective features or improvements that could be made based on various cost-benefit metrics. A building "energy audit" might be part of this process (see sidebar on p. 14).

"It makes sense to take a calculated look at the worst performers and target efforts and resources where the biggest bang for the buck might lie," says Darien Crimmin, Vice President of Energy and Sustainability at WinnDevelopment, a Boston-based developer/owner/manager of affordable and market-rate multifamily housing and historic rehabilitation projects. The company focuses heavily on energy and water efficiency and sustainability, both on the development side as well as on the operations and property/asset management side.

On the development side, Crimmin noted, Winn has developed its own "best practices" and internal green building checklist that identifies, for the particular type of planned project, the cost-effective specific green and sustainable features and improvements that should be



Darien Crimmin

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Current Trends in the Green World

According to Washington, D.C. attorney Jeffrey Lesk, a partner at Nixon Peabody LLP, current trends in green building and sustainable development for affordable multifamily rental housing include:



Photo by Nixon Peabody LLP

Jeffrey Lesk

- Continued fostering of sustainability in state agencies' qualified allocation plans for their low-income housing tax credit program qualified allocation plans. The top four priorities of the states promoting sustainability are (1) energy efficiency; (2) smart growth; (3) resource protection (e.g., water); and (4) the health of residents.
- Growing use of benchmarking programs (i.e., software, data), already highly popular with institutional investments in high-end real estate, which utilize different metrics to rate a building for energy performance. Users can therefore compare the performance levels of different buildings, as well as determine which specific energy-efficiency improvements would make the most sense for a particular building.
- Increasing focus on behavioral aspects of green building, including how to successfully get residents to act in ways to save energy and help the overall property to perform as designed. A related aspect is "smart" buildings, including making more use of sensors, automatic adjustments, etc.
- A huge focus on transit-oriented development. Developing multifamily housing by public transit saves residents money as well as cuts energy usage by eliminating the need for a car, for example. It also promotes smart growth.

Lesk, though, said some challenges remain. A major one, he noted, is that mainstream lenders, in their underwriting standards, still generally don't take projected future energy savings into account in sizing mortgages for energy-efficient and sustainable multifamily housing developments. He said this is particularly a problem for energy retrofits of existing properties, though adding there has been some progress with the introduction of the joint FHA-Fannie Mae Green Refinance Plus program. Under this, the Federal Housing Administration and Fannie Mae share the risk on new loans to refinance existing rent-restricted affordable housing projects that include additional funds sustainable improvements, mainly energy- and water-saving upgrades. The program also permits lower debt service coverage and higher loan-to-value ratios. **TCA**



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incorporated, budget permitting.

He noted that the particular features and improvements will vary from project to project. Factors influencing this will be the project budget, whether the improvements are being made as part of a broader new construction or acquisition/rehab project, utility rates, whether the building is master-metered or individually metered for utilities, the property's location, available funding sources and financial incentives, etc.

Breakdown of Energy Usage

A snapshot that breaks down a building's energy usage can be an eye-opener.

Sean Armstrong, an Arcata, Calif.-based development, energy, and utility allowance consultant with Redwood Energy, reported that the typical breakdown of energy usage (e.g., electric, natural gas) for a typical multifamily rental property in coastal Los Angeles, a very moderate climate with low heating and no air conditioning demand, is: 4% for space heating and cooling; 27% for hot water; 37% for refrigeration, lighting, and cooking; and 32% for "plug load," from television cable boxes, televisions, computers, stereos, etc. that draw electricity both when in use and when not being used by residents (i.e., sleep mode). This latter category, dubbed "phantom energy" usage by Miller, can be tough to address.

Armstrong, limiting his comments to apartment properties in California, says the biggest steps

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Energy Audits

The Steps and Content

An energy audit, an assessment of the energy needs and efficiency of a building or group of buildings, can be informative for an affordable multifamily rental housing development as well as provide a roadmap for the most cost-effective improvements to make.

But what are the steps in an energy audit? What is done? How much do they cost? And how long does the process take?

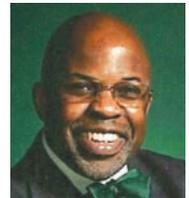
David Jackson, a senior associate with On-Site Insight (<http://www.on-site-insight.com>), provided the answers to these questions in a recent interview. The Boston-based company performs energy audits, capital needs assessments, and other services.

According to Jackson, there are three different levels of energy audits, each with a different price tag. The simplest, or Level 1, is typically for homes or small apartment buildings and generally involves a quick walk-through of the property and perhaps a survey form that the owner fills out. These can range from the free energy audits that utilities provide up to \$1,000 or \$1,500.

Level 2, priced from \$1,500 or \$2,000 up to \$3,500 or so, will usually involve gathering information on such things as utility usage and the specific equipment at the building, but probably not provide an assessment of existing conditions nor utilize complex modeling software.

At the top, from \$4,000 in cost on up, is Level 3, an "investment grade" energy audit that Jackson noted can take about 15 business days to complete from initial client contact to delivery of the final report. Jackson described the steps in the Level 3 audit that On-Site Insight conducts of multifamily rental housing properties. The term energy audit is actually a misnomer because it also assesses water usage and air quality in addition to energy usage. "It's probably more of a utility assessment and a utility audit," Jackson says.

- **Step 1.** The auditor determines which utilities that the owner pays for and seeks to collect utility bills for the last 12 months showing actual usage and costs, for fossil fuel (e.g., natural gas, fuel oil), electricity, and water and sewer. Also collected, from drawings and plans, interviews with the owner or manager, and other sources, is basic information about the property itself, such as its location, the number of buildings, type of construction, brand and type of windows, the current HVAC and boiler system, etc.
- **Step 2.** The auditor, or several people for large properties, then makes a site visit, which typically takes one to two days. The team walks through



David Jackson



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Recent Fund Closings

**CREA
Corporate Tax
Credit Fund
XXIII**

Multi-Investor
National Fund

19 Properties
\$125,000,000

**CREA
Corporate Tax
Credit Fund
XXIV**

Single Investor
Major Life Insurance
Company

7 Properties
\$40,729,096

**CREA
Investment Fund
2010-3**

Multi-Investor
National Fund

11 Properties
\$89,000,000

**City LIII
Tax Credit Fund
IX**

Single Investor
National Bank

5 Properties
\$26,740,889

**CREA
Investment Fund
2010-4**

Single Investor
Major Life Insurance
Company

8 Properties
\$39,293,594

CREA is a full service tax credit syndicator specializing in Low Income Housing Tax Credits that provides equity for affordable housing throughout the United States. CREA raised over \$310 million in investor equity in fiscal 2011 and expects to raise approximately \$400 million in 2012.

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that can be taken to reduce energy usage and costs are, No. 1, eliminating washers and dryers in individual apartments and have common laundry rooms instead (“People do laundry 2.5 times as much if the washer and dryer are in their unit.”), and, No. 2, taking steps to reduce the use of energy for producing hot water. He said that 20% savings can be achieved by installing low-flow showerheads, ideally 1.5 gallons per minute. He also cautioned against switching to tankless water heaters, noting residents then tend to take longer showers.

Armstrong also cited a technique – still experimental in the U.S. but common in many other countries – of “drain water heat recovery.” Noting that 90% of the heat from hot water goes down the shower drain, he said that this technique can cut natural gas or electric costs by 30%. Under this system, heat from the hot water going down the shower drain is captured by a film inside the drainpipe and transmitted through copper tubing wrapped around the cold-water supply pipe leading into the hot water tank, to help preheat the water so that the tank uses less energy.

Armstrong, Crimmin, and others recommended that owners start with the simplest, lowest-cost energy and water improvements that produce the greatest benefits and pay for themselves the fastest. Examples include: improving the efficiency of the building “envelope” through “air

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and examines the building, the exterior of the building and property, and a sample of the occupied and vacant apartment units (or all buildings and a sample of units in each, for multiple-building projects). The team identifies and assesses the condition of the building envelope and its elements (e.g., wall systems, windows, doors, caulking, insulation); of mechanical systems and equipment (e.g., boilers, HVAC, hot water tanks); and of lighting systems. It runs tests on components, equipment, and appliances to determine their exact energy or water usage and efficiency. Within apartments, it measures energy usage and water flow/temperature, such as for showers. The team also measures indoor space conditions (temperature, humidity, and carbon monoxide and carbon dioxide levels). As part of the site visit, the team takes photographs, including infrared photos that can show temperature differences within wall systems, in piping, at a steam trap, or other places. This reveals areas of building heat loss (in winter) or gain (in summer), as well as indicate whether certain equipment is failing.

- **Step 3.** Back at the office, the auditor plugs the information and data gathered from Steps 1 and 2 into a sophisticated computer software program (On-Site Insight uses TREAT, Targeted Retrofit Energy Analysis Tool, developed by PSD Consulting) to build an “energy model” of the property. This shows what the property’s actual current usage levels should be for the different kinds of energy utilities (water usage modeling is done by hand). After making sure that the model is accurate, the auditor then reviews the 10 to 15 different possible areas for improvement measures (e.g., lighting, motors, boilers, controls, building envelope, appliances) to determine where the biggest gains can be made. Then, one at a time, the audit plugs different specific improvement into the model, in a “what if” scenario, to pinpoint which are the best from a cost-benefit standpoint. The metrics that On-Site Insight applies to determine whether a specific feature or benefit is cost-effective include the savings-to-investment (SIR) ratio, the pay-back period, life cycle costs, and net present value. Depending on the location, the software can also be used to assess, for example, whether it makes sense to switch to a different available energy source for certain equipment or uses at a property (e.g., electric to natural gas).
- **Step 4.** The auditor prepares and sends to the client a written preliminary report, which contains a narrative describing the building’s current utility usage, current conditions (e.g. equipment), plus recommended measures to reduce energy and water usage. The narrative is augmented by photographs and by spreadsheets showing such things as actual field readings and the results of life cycle cost analysis.
- **Step 5.** The auditor has a discussion with the client about the preliminary report and answers questions. The client, for instance, might say it has just \$200,000 to budget for improvements and asks the auditor to identify the top “big ticket” improvements from all of the recommended measures that

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Stability

(sta•bil•it•E)

*n. 1. **Permanence** 2. **Resilience** 3. Able to continue or last; **firmly established**; enduring or permanent (e.g., *Enterprise's stability as a reliable syndicator of Low-Income Housing Tax Credit equity has met investor and developer needs and helped the country's critical demand for affordable housing.*)*

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sealing” of openings and installation of better insulation; replacing standard toilets and water fixtures (e.g., showerheads) with low-flow versions; putting in Energy Star appliances (e.g., refrigerators, dishwashers); and replacing standard light bulbs with more efficient and longer-lasting compact fluorescent lamps (CFLs).

Once the “low hanging fruit” has been done, more costly features and improvements may be a possibility, such as more efficient boilers, windows, and doors, or even, at the very top end, solar photovoltaic (electric-producing) and solar hot water heating systems.

Funding Sources, Utility Allowances

Available funding sources and improvements will shape the decisions on which specific improvements to make.

In WinnDevelopment’s acquisition/rehab multifamily housing projects, equity generated by federal low-income housing tax credits is a significant source of funding for the energy and water efficiency measures, Crimmin noted.

Additional possible sources are other federal or state tax credits (some states have solar energy tax credits) or tax deductions; utility company rebates; low-cost loans; and grants. A comprehensive state-by-state list of federal, state, local, and utility incentives can be found at <http://www.dsireusa.org>.

There are a few new sources. One is the Green Refinance Plus program, under which Fannie Mae and FHA share the risk on loans made to refinance existing rent-restricted multifamily housing properties that provide additional dollars to help pay for energy and water efficiency improvements.

There is also HUD’s new Multifamily Energy Innovation Fund, which will be awarding \$25 million in grants for a variety of purposes, including supporting the creation of new models and innovative and scalable approaches for multifamily energy retrofits.

An evolving area is the formulation of more effective utility allowances for affordable rental housing developments where tenants pay their own utility bills. A challenge, in the LIHTC and HUD programs, has been the ability of owners to get more favorable utility allowances that reflect the greater energy and water efficiency of their properties.

In 2009, California unveiled a California Utility Allowance Calculator (CUAC) that generates more accurate and favorable project-specific utility allowances for more efficient LIHTC properties. The smaller utility allowances possible reward developers and owners for better energy efficiency, instead of having to settle for larger standard utility allowances that reduce the net rental income from their project.

The current LIHTC rules permit state housing credit agencies to accept alternative utility allowances in certain instances, and establish procedures to permit and approve project-specific utility allowances produced by qualified third-party professionals. It’s unclear the degree to which state agencies have done so.

At the same time, affordable housing organizations have been working with HUD to try to get the Department to improve HUD utility allowances for energy-efficient projects.

Another evolving area is resident education and incentives: educating tenants of green buildings about the energy and water efficiency attributes and equipment in such properties, providing guidance to tenants on how they can control and reduce their energy and water costs, and even holding events such as a contest to award a gift card to the resident with the lowest utility bill in the past month. Enterprise has developed a resident engagement “toolkit” as well as many other different resources for developers, owners, managers, and tenants to promote energy efficiency and green building (<http://www.greencommunitiesonline.org/tools/resources>). **TCA**

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would fit within this budget. Jackson points out that some recommended measures are “interactive”; they are meant to be done together and not alone.

- **Step 6.** The auditor revises the written report to focus just on the measures selected by the client, which the client can then use as a roadmap for making the improvements. The report also lists, ranked in order of cost-effectiveness, additional other measures that could be done later, budget permitting. **TCA**