Retrofit Roulette: Case Studies in Residential Rehabilitation

Wednesday
3:45-5pm
Panelists

- **Speakers**
  - Elizabeth Merzigian, Peabody Properties
  - Beth Keel, San Antonio Housing Authority
  - Rosemary Olsen, Village of Hempstead Housing Authority

- **Moderators**
  - Julia Hustwit, U.S. Department of Housing and Urban Development
  - Toni Gallo, ICF
Elizabeth Merzigian

Peabody Properties
CASES IN RESIDENTIAL REHABILITATION

Our Story

Braintree Village Apartments
Introduction

Since 1976, Peabody Properties has demonstrated a commitment to quality residential housing that is second to none. We are a trusted partner specializing in residential and condominium management, marketing, leasing, construction management, capital improvement, energy conservation, relocation, assisted and supportive living services and real estate brokerage.

Joined The Department of Energy’s Better Buildings Challenge in June 2014

Commitment to 20% reduction in energy use by 2022

- Over 10,000,000 sq. ft. in housing participating
- 281 utility property accounts
- Baseline year of 2012
Participation in Utility and State-funded energy conservation programs:

- Funding exceeds $12.5 million dollars
- Estimated energy savings throughout portfolio of over $3 million annually
- 7,000+ units of Affordable Residential Housing improved through energy retrofits
Low Income Multi Family Energy Retrofit Program (LEAN)

Massachusetts Program

Eligibility Requirements:
- Project is for one or more multi-family (5+ units) residential buildings; **AND**
- At least 50% of the development households have income at or below 60% of the Area Median Income; **AND**
- Site is served by one or more of the Energy Efficiency Program Administrators: Columbia GAS, National Grid, Eversource, Cape Light, Berkshire Gas, etc.

Melville Towers, New Bedford Ma
$357,000 in Heating Upgrades through ABCD in Boston, Ma.
The Property
Braintree Village Apartments
Braintree, MA
Affordable & Market Rate Housing

Built in 1972
Rehabbed in 2000 & 2017
Heating Retrofit
January 2015

- $990,000 in funding through RISE Engineering & National Grid
- 47 year old equipment brought inside the buildings and off of rooftops
- 27 New High Efficiency Lochinvar® Boilers installed
- Site energy reduction: 42%
A Closer LOOK 😱

At the time this was our worst performing heating system out of a portfolio of over 100 sites.
New Design, New Day!

**Heating Retrofit**
January 2015

- 27 new high efficiency condensing, wall mounted 285,000 BTU/hour heating boilers
- New indirect water heater at each location
- High efficiency pumps replaced outdated ones
- Addition of separate domestic hot water tank at each location

Our very happy Service Manager. He no longer has to climb on rooftops to service the equipment!
Immediate and Dramatic savings

Boiler - Heat and Hot Water - Upgrade - March 15, 2015

Total Energy: Btu per square foot

Savings of 42%. Usage reduced from 111k to 64.7k.

Before: Original rooftop equipment, second generation, 20 years old

After: New 98% efficient boilers with indirect hot water heaters

Cost: $0.00

Affected utilities: Electric, Gas, Heating

Categories:
- HVAC — Heating — Mechanical Equipment
- HVAC — Heating — Commissioning/Controls
- Water — Domestic Hot Water — Mechanical Equipment
- Water — Domestic Hot Water — Commissioning/Controls
Use of Wegowise to monitor data

Braintree Village

Total energy use in Btu per square foot showing all available data

<table>
<thead>
<tr>
<th>Name</th>
<th>Full-Year Sum</th>
<th>Detailed data per month</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 McCusker Drive</td>
<td>65.3k</td>
<td></td>
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Incomplete total due to missing data

Installation completed January 2015
Capitalizing at Refinance

$300,000 in updated lighting retrofit

Toilet upgrades.
324 new Niagara 0.8 gpf Stealth Toilets installed.

New highly efficient chillers installed
Lessons Learned!

Explore local funding programs! Develop relationships, ask questions.

Always say **YES**—do not hesitate based on time of year, program timelines, etc.

Ride out the resident “shock & awe” with new system.

Capture changes in *Net Operating Income* at time of refinance to further fund conservation projects!
Thank you!

Elizabeth Merzigian, LEED Green Associate, CGPM
Facilities Manager/Sustainability Initiatives
Peabody Properties, Inc.

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Beth Keel
San Antonio Housing Authority
The San Antonio Housing Authority (SAHA) serves over 65,000 families in San Antonio, Texas. SAHA adopted new building policies in 2010 to increase energy efficiency and water conservation. BSAG is San Antonio’s local green certification program. SAHA currently has over 744,064 of Build San Antonio Green (BSAG) certified square footage throughout its portfolio and is forecasting an additional 444,924 SF within the two years. SAHA has been building, rehabbing and modernizing to BSAG Level 2 standards since 2010 and currently has one development certified Level 1.
Green Rating program that is San Antonio climate zone specific
> Energy Efficiency
> Water Efficiency
> Efficient Material Usage
> Indoor Air Quality
> Site Preservation

All Level 2 Comprehensive Modernizations are 50% more efficient per Home Energy Rating (HERS) score.
SAHA Comprehensive Modernizations

- SAHA currently has two BSAG Level 2 Modernizations
- SAHA has two additional modernizations being designed to BSAG Level 1 or 2. Construction is scheduled to start in 2017
- SAHA endeavours to make modernizations as efficient as possible within budget constraints
- All modernizations have a sample pre-HERS and post-HERS test to ensure energy efficiency is achieved
- SAHA has in-staff HERS raters that inspect and coordinate with contractors to ensure compliance
Energy Efficiency: A variety of elements and systems contribute to the energy efficiency of the building including increased insulation, Low E windows, storefronts and the mechanical systems, upgraded lighting with CFLs or LEDs, and a high efficiency, community gas water heater.

Water Efficiency: McGuire is equipped with low-flow plumbing fixtures. All old plumbing fixtures were replaced to ensure longevity of the water systems. The building was equipped with a high efficiency, community hot water heating system. Its specifications indicate it to be 96% more efficient than other comparable systems.

Indoor Air Quality/Health Practices: The main elements for indoor air quality and health were considered when designating and selecting appropriate products for this project. All paints, primers, sealers, glues are low or have no Volatile Organic Compounds (VOCs). The benefits to such a careful selection of material for the residents has the potential of fewer sick days and feeling more energized.

The Lofts at Marie McGuire
Energy Efficiency: A variety of elements and systems contribute to the energy efficiency of the building including increased insulation, Low E windows, storefronts and the mechanical systems, upgraded lighting with CFL’s or LED’s, and a high efficiency community gas water heater.

Water Efficiency: Lewis Chatham is equipped with low-flow plumbing fixtures. The building was equipped with a high efficiency community hot water heating system. It boasts to be 96% more efficient than other comparable systems. Around the building xeric landscaping was installed with a temporary irrigation system, the system was removed before the building was occupied.

Environment: SAHA and UTSA Architectural students partnered on designing a xeric habitat garden for the Elderly and Disabled at Lewis Chatham. The design includes low maintenance materials, xeric and native plant materials, and many of the materials were harvested within a 500 mile radius of the City of San Antonio. The Lewis Chatham Xeric Elder Garden’s design is creating urban habitat.

Lewis Chatham Apts.
SAHA continuously researches incentives and partnerships with local utilities for energy efficiency or renewable energy programs.

SAHA self implemented a Phase 1 Energy Performance Contract (EPC) totalling over 2,000 units.

SAHA is considering a potential Phase 2 EPC program to continue energy efficiency in our public housing portfolio.

- EPC has funded lighting, water upgrades and system upgrades.
- EPC will provide some funding on a modernization project scheduled for late 2017.
Capital repairs, such as structural, foundation, water, sewer, electric, City of San Antonio Ordinance requiring fire sprinkler retrofits in all high rise buildings, etc...must be considered before complete building modernizations.

- Capital funds typically go toward rehab and modernization, or health and safety of the community
- Training local developers, engineers, architects and general contractors on green building science
Steps

- Board of Commissioners approved Preservation and Expansion Policy in 2010
- Board Approved Sustainability Addendum added in 2014
- Cultivating strong partnerships with local utility
- Working with developers, architects, engineers, contractors, and Construction Project Managers on housing; from charette to grand opening
- Constant inspection and quality control
- In-house HERS raters for Modernizations
Leveraged Resources:
- Energy Performance Contract funding
- Rebates when available
- Partnering with local utilities for energy and water efficiency upgrades

Results:
- EPC funded water and lighting upgrades on five properties, central plant optimization on two properties
- One modernization in 2017 will have EPC, Capital, and Move to Work Funding for the project
- 25KW installed through the EPC
Capital Fund Program
Move to Work (MTW) Funds
  > Marie McGuire $6 million from CFP funds
  > Lewis Chatham $7 million from American Recovery and Reinvestment Act (ARRA) Funds and received a Green Contractor Rebate from the City of San Antonio for $297,500
Questions or comments please contact
Beth_Keel@saha.org
Rosemary Olsen

Village of Hempstead Housing Authority
Gladys Gardens
Gladys Gardens, Village of Hempstead, NY

- Thirty (30) unit family townhouse development
- Owned and operated by Hempstead Housing Authority
- Built in 1972 – approximately 36,000 sq. ft. as public housing
- Heated via a natural gas fired boiler with hot water baseboard heating – heating and hot water system on its last legs.
- Drafty windows, insufficient insulation, leaking roofs, incandescent lighting.
Hempstead Housing Authority (HHA) 2013

- HHA was designated a “troubled” public housing authority.
- HHA was in severe financial distress due to fraud and mismanagement.
- Significant deferred maintenance problems.
- Gladys Gardens was in the worst condition.
Solutions

• Joined Better Buildings Multifamily Challenge
• Benchmarking with Wegowise.
• HUD Capital Fund Project (CFP) – replaced hot water piping and pipe insulation in crawl space - $106,788
• Applied to Community Development Corporation of Long Island (CDCLI) for federal Weatherization Assistance Program.
Partnership for Healthy Homes Pilot

- CDCLI was granted a health & housing funding from NeighorWorks and Chase Foundation.
- Federal Weatherization Assistance Program (WAP) and Low Income Home Energy Assistance Program (LIHEAP) funded the retrofit costs.
- HUD Public Housing Capital Fund Program (CFP) funded the owner’s contribution, boiler design, and training expenses.
Project Planning

• CDCLI staff conducted an energy audit of the building, developed a scope of work, and put the project out to bid.

• HHA hired Bright Power, an energy management firm to design and develop specifications for the new gas fired boiler and heating/DHW plant.
Measures Installed

• New condensing boilers, piping, boiler venting, and fiberglass pipe insulation. Cost: $173,400

• Low-e argon filled thermal pane windows, with air sealing of frames. Cost: $104,600 ($54,078 WAP funds, $50,522 owner CFP funds).

• 12” loose cellulose attic insulation with air sealing. Cost: $44,500.
Retrofit Project

- Replacement of all lighting throughout with LED fixtures. Cost: $31,900.
- Bathroom fans for ASHRAE ventilation compliance. Cost: $24,000
- New roof, leaders and gutters. Cost: $80,000 (Chase Foundation)
- Maintenance staff training - BPI Multifamily Building Operator (CFP funds and NYSERDA)
Project Cost: $378,400

Annual Energy Use (Source EUI)
- Baseline (2013): 100 kBtu/sf/yr
- Actual (2016): 60 kBtu/sf/yr
- Actual Energy Savings: 40%

Annual Energy Cost
- Baseline (2013): $38,300
- Actual (2016): $19,200
- Expected Savings: $19,100
Other Benefits

Post Retrofit Impact
• Gladys Gardens is now a desirable place to live
• No more heat and hot water complaints
• Reduced resident turnover

Survey Results 4 Months Post Retrofit
• Residents reported increased comfort
• Homes warmer with fewer drafts
• Able to sleep better
• Easier to breathe
• Can identify trip hazards better due to improved lighting
• New windows greatly reduced outside noise as well as reduced drafts
Hempstead Housing Authority

Rosemary Olsen, Executive Director

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516-489-8500 x 120
Thank You

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