



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



U.S. DEPARTMENT OF
ENERGY

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



at a glance...



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

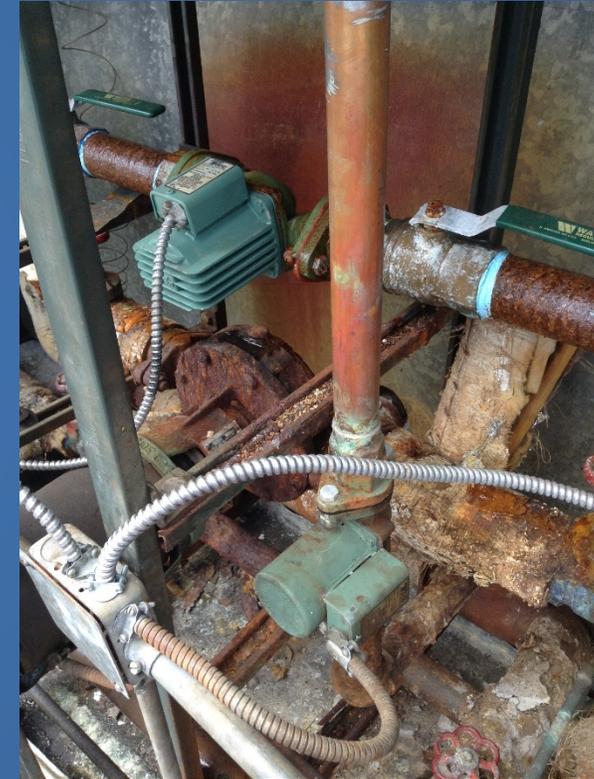
January 2015

- \$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

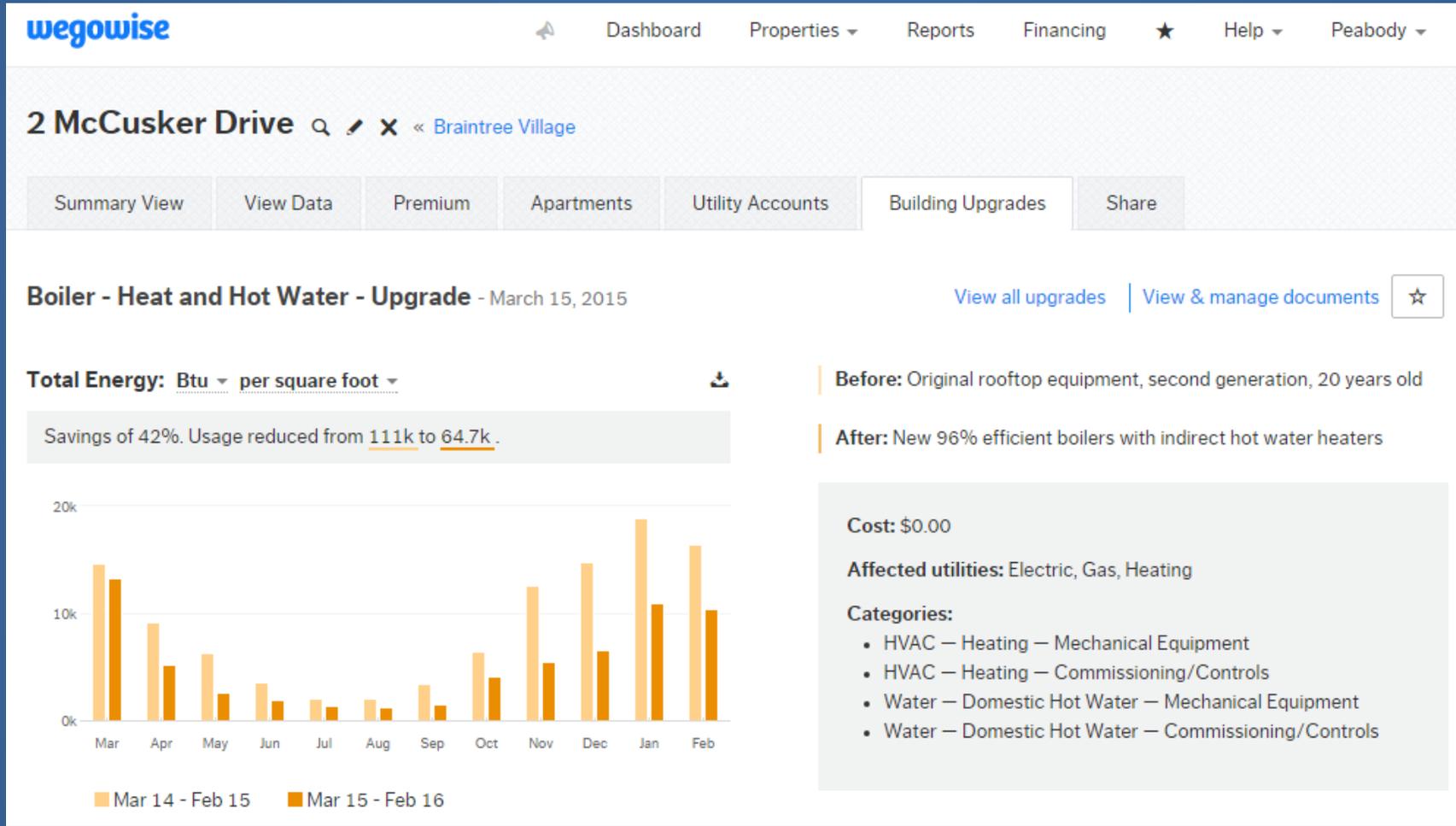
January 2015

- 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



Use of Wegowise to monitor data

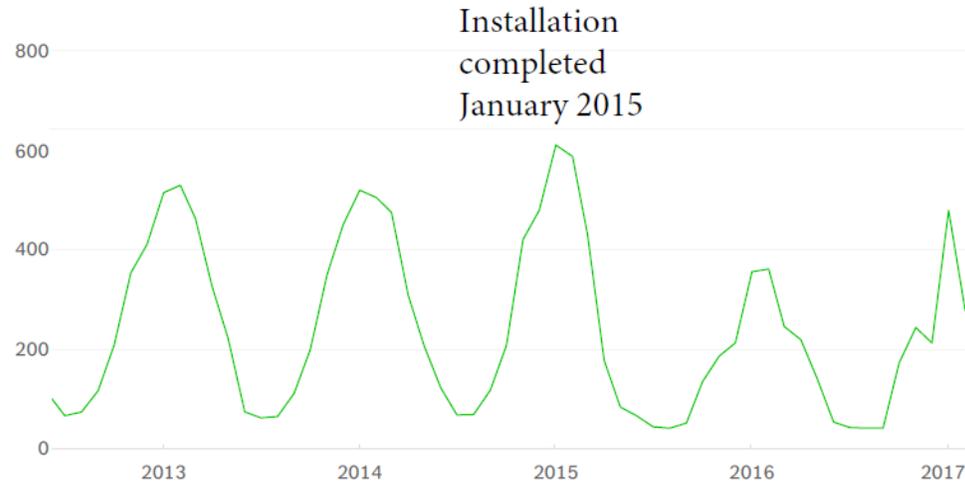
wegowise

Braintree Village

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

Name	Full-Year Sum	<input checked="" type="checkbox"/>	Detailed data per month
2 McCusker Drive	 65.3k	<input checked="" type="checkbox"/>	

Incomplete total due to missing data



Capitalizing at Refinance



\$300,000 in updated
lighting retrofit



New highly efficient chillers
installed



Toilet upgrades.
324 new Niagara 0.8 gpf
Stealth Toilets 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.

emerzigian@peabodyproperties.com



Beth Keel

San Antonio Housing Authority



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ENERGY



SAHA | SAN ANTONIO
HOUSING AUTHORITY
Opportunity Lives Here

Retrofit Roulette
5/17/2017



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



Build San Antonio Green (BSAG)

- 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



Examples

- **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



Examples Cont.

- **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.



Rebates and Partnerships

- 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



Challenges

- 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 and Results

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



Financing

- 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?

Questions or comments please contact
Beth_Keel@saha.org



Rosemary Olsen

Village of Hempstead Housing Authority



U.S. DEPARTMENT OF
ENERGY

Public Housing Healthy
Homes Pilot

Hempstead Housing
Authority NY085

Showcase Project

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 NeighborWorks 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

rosemaryolsen@hempsteadhousing.org

516-489-8500 x 120

Thank You

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