

Energy Efficiency in Supportive Housing: The Long View

Supportive Housing Network of
New York Annual Conference

June 7, 2012

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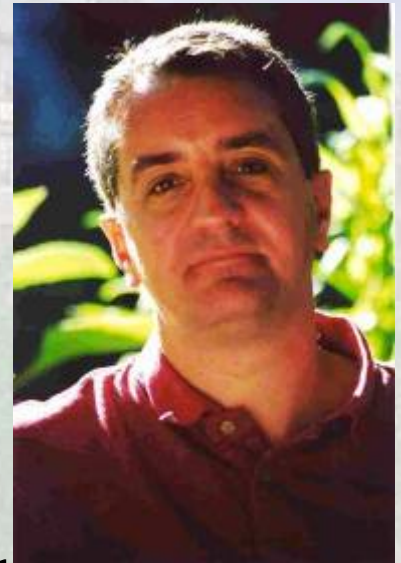
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The Community
Preservation
Corporation

About today's speaker.....

- 30 years of Building Analysis
- LEED, Energy Star Affordable Housing
- Hands-on experience
- Stressing performance
- Stressing Incentives
- Multiple publications
- Presentations all across the nation
- NESEA, Affordable Comfort, GreenBuild, National MF Conf., National WAP Conf.






The Community Preservation Corporation (CPC)

- **Non-profit 501 c(3) mortgage finance company**
- **Founded in 1974 by NY clearinghouse banks**
- **Sponsored by more than 70 banks and insurance companies in NY, NJ and CT**
- **CPC Mission:**
 - **Provide an economic platform of investment to spur recovery in distressed communities**
 - **Develop and enhance public/private partnerships**

Create a Program: “The CPC Green Initiative”



- Construction and permanent financing
 - Target Market - occupied multifamily properties
 - Audits - benchmark the buildings, create a usage database
 - Monitor the retrofits and measure the savings
 - Create a “One Stop Shop” for retrofit financing
 - Fold in the public incentives
 - Make retrofit part of the standard mortgage process
- 



Case Studies





The Auburn Housing Authority worked with CPC to replace every 1950's furnace and hot water maker in every unit, and replaced 19 roofs using HA funds. Lighting and refrigerators were also done in every apartment. Since the retrofit, vacancy has gone from 20% to single digits. Master metered for gas and electric, we saw 54.8% reduction in non-heating gas usage 26.2% in heating usage.



James Geddes Houses, a two block complex of the Syracuse Housing Authority was retrofitted with sealed combustion furnaces, hot water makers, and wall insulation in the low rise, and lighting, refrigerators, showerheads and aerators in all apartments. Another master metered building for gas heat and tenant electric, and another building where local private crews were kept employed. 25-41% reduction in gas, 3-21% reduction in water.





This former 1873 engineering school converted to senior housing is getting attic air sealing and insulation with heating and DHW replacement without raising historic preservation flags south of Albany NY. 37% reduction in electricity, 20% gas to date.





But, I don't want to talk about those...



SIMPLE,
SENSIBLE,
SUSTAINABLE





SIMPLE,
SENSIBLE,
SUSTAINABLE





SIMPLE,
SENSIBLE,
SUSTAINABLE





SIMPLE,
SENSIBLE,
SUSTAINABLE



IMPROVEMENT PACKAGES

80 Parrish St

For: 80 Parrish St Apartments

By: Andrew Padian

Date: 5/26/2010

Evaluated Packages:

| Package Name | Cost \$ | Annual Savings, MMBtu | Annual Savings, \$ | Payback years | Cashflow \$/year | SIR |
|-----------------------|------------|-----------------------------|-----------------------|------------------|---------------------|------|
| Improvement Package 1 | 217,790 | 861.8 | 29,654 | 7.34 | 10,477 | 1.77 |

Package Description:

1. Improvement Package 1

| Improvement Name | Cost (\$) | Annual Savings MMBtu | Annual Savings (\$) | Payback (years) | Cashflow (\$/year) | Improve- ment Life (Years) | SIR in Package |
|--------------------------------------|--------------|----------------------------|---------------------------|--------------------|-----------------------|----------------------------------|----------------------|
| Heat Recovery Ventilation | 35,000 | 54.41 | 2,392 | 14.6 | -690 | 20 | 1.02 |
| Air Sealing | 60,000 | 95.53 | 4,200 | 14.3 | -1,083 | 20 | 1.05 |
| Common Area Lighting Upgrade | 77,000 | 267.36 | 11,754 | 6.6 | 4,974 | 15 | 1.83 |
| Water Heater Replacement | 14,000 | 150.58 | 2,523 | 5.5 | 1,290 | 15 | 2.16 |
| Refrigerator Replacement | 20,000 | 93.13 | 4,094 | 4.9 | 2,333 | 15 | 2.46 |
| Apt Lighting Upgrade | 5,240 | 47.40 | 2,084 | 2.5 | 1,622 | 10 | 3.41 |
| Low Flow Aerators and Showerheads | 6,550 | 153.39 | 2,608 | 2.5 | 2,031 | 20 | 5.97 |
| Total for Package | 217,790 | 861.8 | 29,654 | 7.34 | 10,477 | N/A | 1.77 |

Non-Energy Benefits:

1. Heat Recovery Ventilation: Improve indoor air quality, increase value of building.
2. Air Sealing: Reduce drafts.

A Brief Look At Airsealing Numbers

80 Parrish Street - Air Sealing Measures

| Room | Date | Pre BD | Date | Post BD | Measures Installed/Comments | W/AC | W/O AC |
|------|--------|--------|------------|---------|-----------------------------|------|--------|
| 105 | 18-Nov | 659 | 12/13/2010 | 592 | W/O AC | | 0.90 |
| 106 | 18-Nov | 865 | 12/13/2010 | 602 | W/AC | 0.70 | |
| 107 | 18-Nov | 728 | 12/13/2010 | 528 | W/O AC | | 0.73 |
| 108 | 18-Nov | 792 | 12/13/2010 | 591 | W/AC | 0.75 | |
| 109 | 18-Nov | 1032 | 12/13/2010 | 638 | W/AC | 0.62 | |
| 110 | 18-Nov | 834 | 12/13/2010 | 721 | W/O AC | | 0.86 |
| 112 | 18-Nov | 1085 | 12/13/2010 | 809 | W/AC | 0.75 | |
| 119 | 18-Nov | 404 | 12/13/2010 | 392 | W/O AC | | 0.97 |
| 121 | 18-Nov | 844 | 12/13/2010 | 698 | W/O AC | | 0.83 |
| 123 | 18-Nov | 998 | 12/13/2010 | 724 | W/O AC | | 0.73 |
| 124 | 18-Nov | 985 | 12/13/2010 | 732 | W/AC | 0.74 | |
| 201 | 15-Nov | 774 | 12/10/2010 | 597 | W/AC | 0.77 | |
| 202 | 15-Nov | 791 | 12/10/2010 | 652 | W/AC | 0.82 | |
| 203 | 15-Nov | 715 | 12/10/2010 | 583 | W/AC | 0.82 | |
| 204 | 15-Nov | 710 | 12/10/2010 | 592 | W/AC | 0.83 | |
| 205 | 15-Nov | 852 | 12/10/2010 | 612 | W/AC | 0.72 | |
| 206 | 15-Nov | 772 | 12/10/2010 | 680 | W/AC | 0.88 | |
| 207 | 15-Nov | 798 | 12/10/2010 | 610 | W/AC | 0.76 | |
| 208 | 15-Nov | 817 | 12/10/2010 | 722 | W/O AC | | 0.88 |
| 209 | 15-Nov | 660 | 12/10/2010 | 543 | W/O/AC | | 0.82 |
| 210 | 15-Nov | 701 | 12/10/2010 | 622 | W/AC | 0.89 | |
| 211 | 15-Nov | 975 | 12/10/2010 | 629 | W/AC | 0.65 | |
| 212 | 15-Nov | 1195 | 12/10/2010 | 822 | W/AC | 0.69 | |



Some Production Notes:

- 131 apartments
- Pre-testing, retrofitting and post-testing
- Pre: 11/8,9,10, 11, 15, 16, 18
- Post: 12/9, 10, 13
- Start to finish: 36 days (including Thanksgiving holiday period)



...And some results.....

GOAL = 20% Reduction

Air Sealing Includes: Entry Door Sweep, Door Gasket, Shower Sheetrock Penetration, Kitchen Sink, ceiling, Bathroom Sink, Gasket Plug Exterior Wall
Incomplete Seals on AC Units Corrected with Sealed Covers

CFM50pa Reductions without AC Covers = 17%

CFM50pa Reductions with new AC Covers = 24%

CFM50pa Reductions for all units = 24% or 26,261 CFM50pa

*(This does not include stairwell and corridor Air Sealing Measures)



131 residential units

- 46% reduction in gas usage
- 21% reduction in water usage
- CFM 50pa Reduction = 24%
- Apartment electric cost reduction =25.8%





Some Lessons/Takeaways:

- Tightening buildings comes up big
- Do model, then model air leakage
- Do model, then model mechanical airflows
- Build tight, ventilate right
- Fix/Upgrade ventilation
- Don't reinvent the wheel
- Consult the sages



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Thank you.

QUESTIONS?