ADDENDUM REPORT:
U.S. MULTIFAMILY HOUSING STOCK ENERGY EFFICIENCY POTENTIAL

HUD-Assisted, Low Income Housing Tax Credit, and Large Real Estate Investment Trust Properties

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BenningfieldGroupinc
400 Plaza Drive, Suite 120
Folsom, CA 95630
916.221.3110

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Executive Summary

While a great deal of research and analysis has been done on the energy efficiency potential of single family homes, analysis of the potential in multifamily homes is sparse. This report lays out the potential in a few segments of the multifamily housing stock: those owned by large real estate investment trusts (REITs), those that are HUD-assisted, and those that were financed partly by Low Income Housing Tax Credits (LIHTCs). Together, these three segments comprise more than a quarter of all multifamily dwellings in the United States – roughly 7.2 million apartments. The achievable energy efficiency potential is about 29% of their energy use, or approximately 650 million therms of natural gas, and approximately 12,000 GWH of electricity. That is the equivalent of the natural gas used by all Colorado commercial end users,[1] and nine average coal fired generation units.[2] The investment needed to create this efficiency gain is under $5 billion, but would result in utility cost savings of greater than $2 billion per year for the tenants and property owners. A targeted program focused on just 15 REITs and 59 LIHTC property owners could reach over 10% of the properties in this sector; 765,000 apartment units in over 5,500 projects.

Introduction

In October 2009, Benningfield Group, Inc. completed a study of the energy efficiency market potential by 2020 among the United States multifamily housing stock. The report was funded by the Energy Foundation with the intent of assisting policy makers. It provided a picture of what kinds of savings could realistically be had by investing in the multifamily sector, with what greenhouse gas (GHG) emissions impacts, and at what cost. That report relied on approximately 30 energy efficiency potential studies that had been completed in the prior eight years.

The primary finding of the study was that savings worth about $9 billion per year to the tenants and owners of multifamily buildings could be achieved with an investment of less than $8 billion over the next 10 years. The energy savings would be equivalent to all the non-power-plant natural gas usage of California, Oregon and Washington combined, plus the electricity output of 20 average sized coal-fired power plants. The emissions reduction would be about 50 million tons per year – roughly equivalent to the output of 4,000,000 U.S. households.

Subsequent to the publication of the report, affordable housing and energy efficiency policy advocates asked what portion of that savings potential was related to specific target sectors. In particular, what the energy efficiency potential is in the sector of the market assisted by Housing and Urban Development (HUD) programs or by Low Income Housing Tax Credits (LIHTCs). They also wanted to know what the potential is among those properties owned or managed by multifamily real estate investment trusts, or REITs. Benningfield Group developed this addendum to address those questions.

[1] 2008 EIA data.

[2] According to SourceWatch.org, 1522 coal-fired units provided 1,994,305 GWH of power to the U.S. in 2008.

Background

Nearly 15 million of the over 35 million households who rent are households in buildings with five or more apartments, and another six million rent in buildings with two to four dwelling units. Renter households' median income is approximately half the median income of households who own their homes.[3] By far, the majority of renter households are in market rate apartments, but roughly five million households either receive subsidies, like Section 8 Housing Choice Vouchers, or have affordable rent because of project-based subsidies. Collectively, these are called "HUD-assisted housing units." Additionally, nearly two million households live in buildings that are affordable because the developers received LIHTCs. This report addendum focuses mostly on housing for low-income rental households, and to a much lesser extent, the range of housing owned by the largest REITs.

Real Estate Investment Trusts own about one million of the roughly 17 million apartments in the United States.[4] Apartment complexes owned by REITs tend to be larger, newer, and at higher rents than the average of all apartments. But this general tendency masks a wide range of REIT-owned apartment types, including student housing, older buildings at the low end of market rates, and subsidized housing. Because of this, there is some overlap between households benefiting from HUD subsidies and those residing in REIT-owned properties. As is shown later, the overlap potential is fairly small and can generally be disregarded.

To estimate the energy efficiency potential in this report, we primarily rely on the energy efficiency potential per unit of multifamily housing that was stated in the primary report: "U.S. Multifamily Energy Efficiency Potential by 2020." There may not be a one-to-one relationship between the potential in the overall multifamily housing stock and the potential in the sub-sectors we focus on in this report addendum, and where possible, we highlight the differences. For example, there is a greater opportunity for appliance upgrades in older housing, like much of the existing public housing and the qualified affordable housing stock owned privately, than there is in the average rental market.

HUD Assisted Housing

Low income households are commonly defined as those at or below 150% of the federal poverty standard. Depending upon the program, households eligible for rent restricted housing or rental subsidies are those at 30%, 40%, 60%, 100% or up to 150% of the poverty level. According to the American Housing Survey,[5] the incomes for 8.6 million renter households are below the poverty line.

[3] Note that the 2008 State of the Nation's Housing (Harvard) which was quoted in the 2009 Energy Efficiency Potential study listed the median household income for home owners at $61,284 and for renter households at $31,338. Current HUD data, the source of the many of the tables in this addendum, reports income levels that are $4,000-$5,000 less.

[4] HomeTownRent.com. To arrive at 17 million, HomeTownRent includes a portion of the 2-4 plexes as being part of an apartment complex.

[5] American Housing Survey for the United States: 2007. U.S. Department of Housing and Urban Development and U.S. Census Bureau.

The 2009 U.S. median income for a household of four was $70,354.[6] The median income for renter households was $26,983.[7] And the median household income for HUD-assisted renters was $10,475. These data are important background for an understanding of why it is critical to invest in energy efficiency in this sector.

Low-income households pay an average of 13.5% of their monthly income on energy, compared to 7% for the median household. That is an average of $118/month for HUD-assisted renter households - more than 1/3 of their total cost of housing. For these households improvements in energy efficiency are particularly valuable. For the median household, utility costs make up less than 1/8 of their total cost of housing.[8]

Types

Category of Renter Household	Median Hshld Income	Median Housing Costs	Hsg Cost as % of Income
All HUD-Assisted Renters	$10,475	$318	36%
Tenant in Public Housing	$9,900	$227	28%
Voucher Recipients	$10,703	$437	49%
Tenants in Privately Owned Housing	$10,581	$312	35%
Eligible but Unassisted Renters	$13,969	$586	50%
Total Eligible Renters	$13,130	$540	49%
All Renters	$26,983	$651	29%
Worst Case Needs Households	$9,773	$685	84%

Figure 1: Renter Households - by HUD-assistance and Eligibility Categories

Number and Age

Out of 33.6 million renter households, nearly half (16.6 million) qualify for rental subsidies due to income and family size. However, 12.3 million of the eligible households do not receive subsidies because of funding levels for the various housing assistance programs. HUD-assisted renter households are not distributed across the country at percentages equal to the overall rental population. The figure below shows the regional distribution of all renters across the country. It also shows the regional distribution of a subset of that number, those that receive HUD assistance. Note that although only about 21% of all renter households are in the Northeast, over 27% of HUD-assisted renter households are there. Likewise, although the West has 25% of all renters, it has only 17.3% of HUD-assisted renter households.

[6] Administration for Children and Families, Office of Community Service, Division of Energy Assistance, U.S. Department of Health and Human Services. 2009. Note that this average masks a large state-to-state variation of over $40,000; from about $52,000 in New Mexico and Arkansas to approximately $94,000 in Connecticut, Maryland, and New Jersey.

[7] HUD Policy Development and Research office.

[8] "Trends in Housing Costs 1985-2005: and the 30-Percent-of-Income Standard." U.S. HUD, Office of Policy Development and Research. June 2008.

Region	% of All Renters	% of HUD-Assisted Renters
Northeast	21.3%	27.6%
Midwest	19.6%	21.6%
South	34.1%	33.6%
West	25.0%	17.3%

Figure 2: Percentage of U.S. Renter Households By Region – All Renters vs. HUD-Assisted

Over 57% of HUD-assisted renter households are in buildings with more than four dwelling units.[9] An additional 11% are in buildings with two to four dwelling units, with the remainder in single family homes. The average vintage is the mid-1970s – before any states had building energy efficiency codes. 30% were built before 1950, 61% were built between 1950 and 1989, and 9% were built in the last 20 years. Although some renovations and equipment upgrades have occurred, the vast majority still have significant potential for efficiency improvements. In the winter of 2003, 154,000 HUD-assisted apartments had heating equipment failures; 3.9% of all households with Housing Choice Vouchers, and 4.6% of all dwelling units in public housing.

The savings potential in this subsector is over 7,800 GWH of electricity and 432 million therms of natural gas.[10] That is the equivalent of nearly six average coal fired generation units and roughly 10% of all the natural gas delivered to all customers in Colorado in 2008.[11] Approximately 1/3 of the units are owned by public housing authorities (PHAs), so roughly 1/3 of the savings in this sector can be achieved by working directly with them. With the American Recovery and Reinvestment Act funds, HUD has launched several programs that are beginning to get at these opportunities. Accessing the energy efficiency potential in the HUD-assisted units funded through Housing Choice Vouchers will be more difficult but potentially will produce more savings since total energy costs for Voucher holders is estimated by HUD to be nearly two and one-half times the energy costs of PHA properties.

LIHTC Housing

As of 2007, there were approximately 1.9 million LIHTC apartments in the U.S. Almost 900,000 of them were placed in service at least 15 years ago. The IRS Tax Code requires that the tax credits be taken over a period of 10 years from the placed-in-service date, and that the apartments funded through LIHTCs remain affordable for at least 15 years. During that period, the complex partnerships that own them (often seven or more funders and equity partners) are reluctant to have the project take on any additional debt (e.g., for energy efficiency upgrades). At the 15 year mark, some partners generally sell their interest in the project, allowing the general partner to restructure the ownership and debt. This presents a unique window of opportunity for LIHTC projects that either require additional debt or accept an additional assessment (e.g., Property Assessed Clean Energy Programs) to upgrade energy

[9] HUD Policy Development and Research report. 2008.

[10] Throughout the original report and this addendum, "natural gas" is used to represent natural gas and other equivalent energy sources, such as fuel oil, using appropriate energy content conversions from DOE.

[11] EIA 2008 data.

efficiency measures. Approximately 80,000-90,000 units (roughly 1,400 projects) will hit the 15 year mark each year until 2014 when the number is over 117,000. Through 2020, there will be between 103,000 and -128,000 LIHTC dwelling units refinancing each year.

The oldest LIHTC projects are less than 25 years old as the LIHTC program began in 1986. Most are marginally more efficient than the average apartments built in the same era because tax credit allocating agencies at many states provided scoring incentives to projects with increased efficiency. However, the baseline against which efficiency improvements were measured in most states left a lot of room for cost-effective upgrades. Additionally, Federal appliance standards have incrementally improved meaning that most appliances installed in projects more than 10-15 years ago are significantly less efficient than standard models sold today.

LIHTC projects are fairly evenly distributed around the country because allocation of the tax credits is based on population. States get tax credits of approximately $2.50 per person; the rate escalates year-by-year based on inflation. California has approximately 12% of all LIHTC apartments with over 2,500 projects and over 200,000 units. Texas, Florida, and New York have 8.5%, 7% and 6.5% of the total, respectively. New York has over 2,400 projects, but less than 95,000 units. The only other states with more than 3% of the U.S. total of LIHTC apartments are Ohio (4.7%) and Washington (3.7%). On a regional basis, about 23% of the LIHTC apartments are in the West, 36% in the South, 24% in the Midwest, and 17% in the Northeast. Besides California and New York, the only other states with more than 1000 LIHTC projects are North Carolina (1,653), Texas (1,619), Missouri (1,576), Ohio (1,416), Pennsylvania (1,404), and Michigan (1,166).

Size Rank	State	Apartments	Projects	Units/Proj	Size Rank	State	Apartments	Projects	Units/Proj
1	CA	202,198	2595	77.9	28	KS	20,003	425	47.1
2	TX	149,563	1619	92.4	29	MS	19,457	494	39.4
3	FL	126,173	855	147.6	30	IA	16,358	501	32.7
4	NY	94,894	2421	39.2	31	KY	16,348	573	28.5
5	OH	83,016	1416	58.6	32	AR	15,959	350	45.6
6	VA	65,160	777	83.9	33	NV	15,382	157	98.0
7	MI	60,692	1166	52.1	34	DC	12,929	81	159.6
8	IL	51,595	936	55.1	35	NM	12,686	229	55.4
9	MO	50,020	1576	31.7	36	UT	12,562	241	52.1
10	WA	50,009	768	65.1	37	CT	11,219	212	52.9
11	GA	48,348	630	76.7	38	PR	11,000	142	77.5
12	IN	43,877	872	50.3	39	NE	9,538	354	26.9
13	NC	43,783	1653	26.5	40	RI	8,515	157	54.2
14	TN	42,346	732	57.8	41	WV	8,293	217	38.2
15	PA	37,781	1404	26.9	42	ID	7,073	174	40.6
16	MD	37,262	510	73.1	43	ME	6,727	216	31.1
17	MA	33,654	502	67.0	44	SD	6,563	212	31.0
18	AL	29,965	636	47.1	45	DE	6,245	100	62.5
19	WI	29,689	827	35.9	46	NH	5,385	151	35.7
20	OR	28,335	518	54.7	47	VT	5,132	218	23.5
21	MN	26,732	669	40.0	48	MT	4,366	154	28.4
22	LA	26,110	554	47.1	49	ND	4,194	145	28.9
23	AZ	24,105	302	79.8	50	HI	3,888	51	76.2
24	CO	23,843	375	63.6	51	WY	2,966	65	45.6
25	SC	22,512	497	45.3	52	AK	2,585	73	35.4
26	NJ	22,253	318	70.0	53	VI	766	21	36.5
27	OK	21,663	409	53.0	54	GU	108	1	108.0

Figure 3: LIHTC Projects - Number and Size by State (data source: HUD's LIHTC Database. 2010)

On average, LIHTC projects have 1.2 bedrooms per apartment. Apartments tend to be smaller in the Northeast (0.98 bedroom/apt mean) and larger in the South and Midwest (just under 1.3 bedrooms/apt mean). LIHTC funded projects have on average 55 units per building, with a wide range between state averages, and over time. Florida and D.C. have the largest projects at ~148 and 160 apartments per project, respectively. The average size of LIHTC projects in Texas and Nevada is a little less than 100 units. Vermont has the smallest average size at under 24 units, followed by North Carolina, Nebraska, Pennsylvania, Montana, Kentucky, and North Dakota, all between 26 and 29 units per project.

During the period from 1987 to 1994, when LIHTCs were first available, the average size of a project was 41 apartment units. Between then and 2003 it grew fairly steadily to about 85 units/project. During the last three years for which data is available (2005-07) the average project size was between 78-80 units.

The energy efficiency potential in this sector alone is over 3,000 GWH and 167 million therms. A program effort targeting just 60 property owners, could (1) reach nearly 140,000 households, (2) in over 1960 apartment complexes, and (3) achieve 8% of the LIHTC sector potential.

REIT Owned Housing

Real estate investment trusts (REITs) are corporations established to invest in real property and provide a return to the trust's investors. REITs are formed generally around the specific real estate market expertise of the officers. There are several REITs that specialize in the multifamily market. Specialization often goes deeper into a market segment such as student housing, affordable housing or luxury and the upper end of market rates. Of the 15 largest multifamily REITs in the U.S., two focus on student housing, three on the upper end of the market, six on mid- to upper market rate, and four on a mix of affordable and market rate apartments.

REIT Name	Projects	Apts	Market	Geography
Equity Residential	525	137,586	Market Rate	Largest MSAs in 21 States
AIMCO	870	136,000	Affordable-Market Rate	44 States
Camden Property Trust	183	63,286	Affordable-Market Rate	13 States; Coasts, TX, and FL
Avalon Bay	178	50,292	High-end	Coasts and Illinois
United Dominion	175	45,701	Market Rate	Coasts, TX, and TN
Mid America Apartment Communities	148	43,000	Market Rate	Southeast and South Central
Home Properties	105	35,797	Affordable-Market Rate (older)	NE, Mid-Atlantic, IL
Essex Property Trust	133	27,143	Market Rate (built > 1964)	CA and WA
BRE Properties	73	21,245	Market Rate	AZ, CA, CO, and WA
Post Properties	55	20,195	Market Rate (avg. vintage 2000)	Southeast and South Central
American Campus Communities	1,024	17,212	Student Housing (built > 1979)	17 States; NW, NE
Education Realty Trust	65	12,500	Student Housing	21 States
Associated Estates Realty	49	12,366	Newer "A" and "B"	8 States; MW
BehringerHarvard.com	32	5,000	High-end (2002 & later)	West, South
Maxus Realty Trust	10	1,700	Market Rate	MW and South
Total	**3,625**	**629,023**		

Figure 4: Fifteen Largest Multifamily REITs (source: the REITs' individual web sites; March 2010)

These 15 REITs represent over 3,600 apartment projects with approximately 629,000 apartments.[12] The numbers in the table below are only approximate because the current pace of acquisition and disposition of apartment properties is rapid enough that data are only accurate for a very short period. Additionally, REITs do not generally make a clear distinction between their affordable properties and what they consider "market rate," and the number of student apartments for one of the two REITs is an estimate based on their stated number of beds.

Category	Projects	Apartments
Student	1,089	29,700
High Market	260	68,000
Mid Market	1,631	400,300
Affordable	645	131,000
Total	**3,625**	**629,000**

Figure 5: REIT Apartments by Category

What is significant from these numbers is that by dealing with just 15 companies, a program focused on multifamily energy efficiency can reach approximately 629,000 dwelling units in over 3,600 apartment complexes across the country. This has the potential to lower the program administration and transaction costs. Some of the REITs have already demonstrated their willingness to embrace energy efficiency and well-designed programs could accelerate their renovations, deepen the efficiency gains, and encourage them to include more of their properties than they would have otherwise.

Low-Income Households

According to the LIHEAP Home Energy Notebook,[13] heating and cooling alone require an average of 6.5% of low-income households' monthly income. Although air-conditioning was fairly rare in low-income housing thirty years ago, it is growing at a rapid pace and represents a significant efficiency opportunity. This also means that electricity is becoming a larger part of the mix of energy fuels in this sector. Adding to this trend, 33% of low-income households now use electricity as their primary heat source, compared to 10% in 1979.

[12] Essex Property Trust lists the number of "beds," not apartments. "14,000" is an estimate of the number of apartments based on their stated holdings of 27, 143 beds.

[13] LIHEAP Home Energy Notebook for Fiscal Year 2007. U.S. Department of Health and Human Services. June 2009.

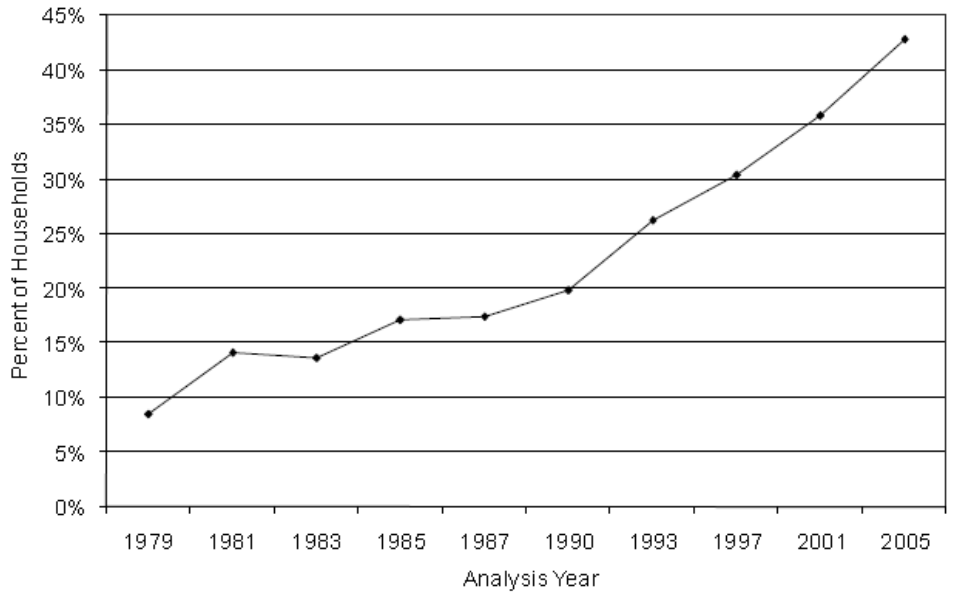

Figure 6: Percent of Low-Income Renter Households Using Air-conditioning (source: American Housing Survey for 2007)

After a decline in average energy usage from 1979 to 1983, low-income household total energy use remained relatively steady through 2007. However, the constituent proportions have changed significantly. Heating energy use has dropped by nearly half, while cooling energy has increased fourfold and appliance/lighting energy use has increased nearly 20%. Because of rising energy prices (rates), heating energy use reductions did not translate into heating cost savings. In fact on average, heating costs rose from about $300/year to about $500/year. Cooling costs rose from about $15 to $200, and the cost for lights and appliances rose from just over $300 to more than $950/year. For low-income households, energy costs in 2007 were 274% of their 1979 levels.

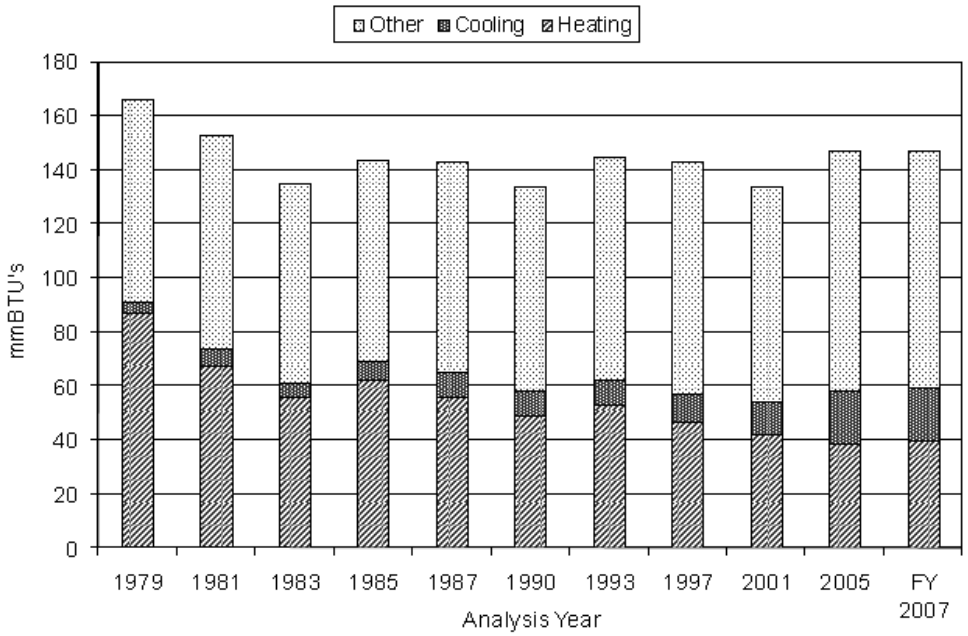

Figure 7: Low-Income Household Energy Burden (source: American Housing Survey for 2007)

By end-use, low income households do not use energy in dramatically different proportions than other households. [see Figure 8] Compared to non-low-income households, a slightly higher percentage of their total energy is used for heating and a slightly lower percentage is used for appliances. Low income households who qualify for and receive Low Income Energy Assistance Program funds have a significantly larger portion of their energy bill dedicated to heating. Although energy use for appliances is a slightly smaller portion of low income households' energy bills, there may actually be a higher potential for savings due to two factors. First, low income households have less discretionary income available for upgrading the appliances they own. Their washers, dryers, and refrigerators are often purchased second hand or are hand-me-downs from relatives who purchase new equipment. Second, many of the appliances in low income households came with the apartment and are owned by the property owner. This represents the extreme situation of split incentives. If a building owner invests in insulation, windows or central HVAC equipment, s/he may not realize bill savings but at least has the potential to reap a return on the investment at the sale of the property. With more perishable items like appliances, even that possibility is remote. As long as the property owner has to buy the appliance and the tenant reaps all the rewards of its efficiency, older, less efficient appliances in low income apartment households will remain a significant energy efficiency program opportunity.

End Uses	All Households	Non Low-Income Households	Low-Income Households	LIHEAP Recipient Households
Space Heating	28%	27%	31%	38%
Space Cooling	13%	13%	12%	7%
Water Heating	15%	15%	16%	16%
Refrigeration	8%	8%	8%	7%
Appliances	36%	37%	33%	32%
All Uses	100%	100%	100%	100%

Figure 8: Energy Uses by Household Type (source American Housing Survey for 2007)

While households at or above the median income (most households in single family dwellings) buy "all the energy they need," many multifamily households buy only the energy they can afford – without achieving the comfort and utility that single-family households do. This axiom is true for the energy uses they can control. Conversely, while the average household can reduce their energy use by investing in energy efficiency improvements, tenants of multifamily buildings have very little ability to affect their energy use other than by cutting back further. They cannot insulate, replace water heaters, upgrade the HVAC equipment, or invest in tightening ducts, because they don't own the building or equipment. For reasons explained elsewhere in this report, we cannot expect property owners to make the necessary investments.

Energy Savings Potential

For the three multifamily subsectors discussed in this addendum, we estimated the savings potential and greenhouse gas (GHG) emissions reductions as a straight-line proportion of the total multifamily sector estimates in the "U.S. Multifamily Energy Efficiency Potential By 2020." This is a somewhat conservative approach since the efficiency potential in the older apartment buildings that are

representative of HUD-assisted projects is clearly greater than newer market rate apartment buildings.[14] Even the LIHTC projects, though at most 23 years old, are generally operating on slim monthly net margins that do not support broad scale investments in efficiency upgrades without significant intervention from utility or government programs.

Managers of REITs, by their corporate mandates, are profit driven. To the extent that investments in energy efficiency can reliably provide an assured return on the investment, either through increased property values, increased rental income, lower operating costs, or marketing value (e.g., green credentials), they will invest. To the extent it can't, or they are unsure of the return, they will forego the investment. Those REITs that manage older, affordable, or even mid-market rate apartment complexes still have a significant portion of their multifamily housing stock with energy efficiency potential at least as great as the multifamily market on average. Combined, these three multifamily subsectors represent approximately 23% of the multifamily housing stock.

Housing Type	Projects	Apartments (1000s)	Electricity Savings (GWH)	Natural Gas Savings (Million therms)	GHG Reduction (Million Tons)
HUD-Assisted	n.a.	4,761	7,847	432	0.0
LIHTC	31,251	1,843	3,037	167	1.7
REITs	3,625	629	1,037	57	0.6
Total	**34,876**	**7,233**	**11,921**	**656**	**2.2**

Note: much of HUD assistance goes to individual households in market rate apartment buildings, making a number for HUD-assisted projects meaningless.

Figure 9: Savings Potential and GHG Reduction by Housing Type

Since a higher percentage of HUD-assisted multifamily households are in the Northeast and Midwest, where electricity has a higher GHG content than the West, GHG reductions from HUD-assisted housing would certainly be higher than this conservative estimate. Distribution of the LIHTC units and REIT-owned apartments is not significantly different from the multifamily population as a whole.

Why Don't the Property Owners Do It On Their Own?

It is reasonable at this point to ask why the investments are not being made by property owners already. After all, if the cost is between $2 billion and $5 billion and the savings is estimated to be about $2 billion per year, it seems illogical that it is not already being done. After all, many owners of the properties in question (e.g., non-profits, public housing agencies) are known to be mission-driven: they are building and managing these units because they believe in helping people obtain decent affordable housing. There are two basic reasons.

[14] Data on location of subsidized housing is incomplete and inconsistent across sources. We did not attempt to establish an age-weighted map of HUD-assisted housing due to the fact that it was unlikely we could have produced a clear reliable picture.

First, an investment without a return is not an investment – it's a gift. Without a mechanism for property owners to share in the utility bill savings from energy efficiency (e.g., by re-setting rents after upgrades), there is no way for the property owner to realize a return on the investment until they sell the property. Some research has shown a correlation between the efficiency of a property and its market value.[15] However, this research focused on single family homes and there is not yet adequate study to establish the same correlation in multifamily buildings. Even mission-driven property owners still have to maintain a net monthly income to hold onto the property.

The two cases/models below show ways that a developer or multifamily property owner could potentially receive a reasonable return on an energy efficiency investment. The first model applies to a very limited set of properties: that small percentage that happens to be within a jurisdiction with the appropriate policies. The second model is still speculative; such a system has not yet been created.

Adjusting Restricted Rents

Projects with LIHTC, or rent restrictions based on HUD funding are often referred to as "qualified affordable housing." By IRS and HUD policies, tenants' net rent is partly dependent upon an estimate of what they have to pay for utilities. For some qualified affordable housing in California, the California Utility Allowance Calculator (CUAC) allows property-specific recognition of tenant utility cost savings from energy efficiency and solar upgrades.[16] It currently only applies to new construction using LIHTCs. The CUAC cannot be used for existing multifamily buildings at this time unless they have gone through a LIHTC funded major renovation. Extension of the approved CUAC uses to existing buildings is an important step, but it must be done with careful thought about how to maintain accuracy and credibility. Public housing authorities often do not have the volume of staff nor the expertise to evaluate developers' CUAC submittals. A somewhat similar, though not property-specific, approach used by a number of public housing authorities in California is an Energy Efficiency-Based Utility Allowance (EEBUA). The EEBUA takes a conservative approach to estimating energy efficiency benefits; still, owners do realize some of the economic impact of improvements via increased rents.

Rental Market Recognition of Utility Costs

In the market-rate sector of the multifamily housing stock, a fair, accurate, credible system for rating apartment energy use could help prospective renters evaluate the true costs (e.g., rent + utilities) of renting one apartment versus another.[17] Prospective renters are not accustomed to asking about the cost of utilities when evaluating apartment

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[15] "Evidence of Rational Market Values for Home Energy Efficiency." Rick Nevin and Gregory Watson. The Appraisal Journal. October 1998. Their research showed a $10-$25 increase in property value for each $1 reduction in annual energy bills.

[16] See: http://www.gosolarcalifornia.org/affordable_housing/cuac.html Also, see www.BenningfieldGroup.com for related options. The example in the text is specific to California because for now, California appears to be the only state with an approved engineering model for project specific utility allowance calculations for energy efficient projects. However, IRS rules issued in 2008 provide the opportunity for all states to allow the use of an approved project-specific engineering model to create utility cost estimates for LIHTC projects. Similarly, HUD's Policy Development and Research office could explore use of the same models for HUD-assisted projects.

[17] Note: in order to make the calculation/rating system even more right, we would include the cost of transportation – based on uniform data about distance to jobs, schools, and basic services, and factoring in available transit. Though this would be more correct, it would also mean a much larger engagement with more and better-funded opponents.

complexes, mostly because "buyers" tend to discount what they cannot verify. A landlord's unsubstantiated *claim* of energy costs would be so deeply discounted as to be irrelevant. Credible third party certification of the estimates is needed to make them reliable. A program to rate energy use of apartments, subject to true third party verification, with results published on-line and in certificates, would change the dynamics of demand in the apartment sector and give apartment owners incentives to improve the efficiency of their buildings.

There is a second reason that many developers do not invest in efficiency without a program to defray most of the cost. Even for those property owners who are mission-driven such that they want to "do right" by their tenants more than they want a "fair" return on investment, most simply can't. LIHTC projects, for example, usually have seven or more investors, lenders and/or equity partners. Most partners are locked into the deal for 15 years, and came to the deal with both a specific expected return on investment, and specific restrictions and covenants. It would be an understatement to say that investors are reluctant to have any additional debt or property assessments added until they have realized the return they originally expected when they entered into the deal. The anticipated transaction costs of even trying to get all the agreements in place may be enough to overwhelm the general partner's will to proceed. Consequently as of March 2010, there are no multifamily projects participating in any Property Assessed Clean Energy projects – projects paid for with state or municipal funds and repaid through an increased property tax assessment. The irony is that the investors' positions would generally be made safer by energy efficiency improvements, because (a) the property with efficiency upgrades is worth more than the property without upgrades, (b) the monthly net and therefore ability to service debt could be improved using the CUAC or some other mechanism to re-set rents based on lower tenant utility costs, and (c) with lower energy usage, tenants are less vulnerable to utility bill volatility, and more rent secure, lowering vacancy rates.

Recommendations

One partial solution is to bring more economic rationality to energy efficiency investments in multifamily housing. To the extent that local, state and federal government entities can ensure that energy efficiency is accounted for within utility allowances for affordable housing, and that a credible third-party utility cost rating system operates within the market-rate multifamily sector, owners will have rational, economic reasons to invest in the efficiency of their holdings. This is only a partial solution because it still leaves owners with the usually very difficult task of finding the capital or loans needed for the upgrades.

Utilities and government need to fund multifamily energy efficiency programs to fill that capital gap. Programs will need to cover nearly the full cost of retrofits for most existing multifamily buildings with low income tenants. Other measures, those that directly affect the owner's operation costs, can be incentivized at a less-than-full-cost level. Improvements to central hot water systems, for example, decrease the owner's monthly utility costs, but windows, insulation, and high efficiency air-conditioning systems decrease the tenants' utility costs. Even for measures that provide building owners with a return on investment through direct energy savings, states, the federal government, and local utilities need to establish very low-interest loan programs and pay particular attention to minimizing owners' transaction costs for participation.

LIEE and WAP are potential vehicles for funding some of the upgrades. Both have funded lighting and weatherization type measures, but for the most part these are short-life measures. For an owner to have her/his building participate in LIEE, s/he needs to get the "permission" of all the tenants. In other words, disbursement programs are currently structured so that the utility bill-payer has to agree to participation. Even just a couple tenants who are suspicious or otherwise resistant to signing something they don't really understand, raises the transaction costs for the property owner and building performance contractor. An already expensive proposition may just become impossible. We need new approaches designed specifically to eliminate most of the owners' transaction costs, and to guarantee both the property owner and the tenants a share of the resulting savings.

An investment of less than $5 billion in upgrades to the 7.2 million apartments[18] in the three multifamily sectors described would result in 29% energy efficiency improvement for the tenants and building owners. Once all the efficiency improvements are made, the value of the savings (in 2009 dollars) would be approximately $2 billion per year. Building owners would realize additional savings in lower turnover rates and better rent security (fewer collection actions). The GHG emissions reduction, assuming $20/ton,[19] would be worth another $238 million per year.

[18] Based on the 30 studies reviewed in the original report, the cost could be as low as $2 billion. Using the average cost from a performance based multifamily efficiency program in California, Designed for Comfort, the total cost of the upgrades is estimated to be $5 billion ($700 per apartment).

[19] U.S. EPA uses an estimated price/value of $20/ton. In a paper by the Center for the Study of Energy Markets, C. Knittel suggests that it's closer to $237/ton. That would result in a GHG emissions avoidance value of $2.8B per year; over ½ the cost of the total efficiency investment.

References

EconNorthwest. "Process Evaluation of the Southern California Gas 2006-2008 Residential Customer Programs; Final Report." February 15, 2008. [Accessed through CALMAC web site: http://www.calmac.org/publications/SCG_Res_Report_Final_021508.pdf

Donovan, Shaun. Remarks in "From Despair to HOPE: Two HUD Secretaries on Urban Revitalization and Opportunity." Hosted by the Brookings Institution. Washington, D.C. July 14, 2009.

Fisher, Will. "Obama Budget Includes Major Plan to Preserve Needed Affordable Housing." For the Center on Budget and Policy Priorities. March 16, 2010.

HomeTownRents.com. "Does Your Apartment Home Belong in Someone Else's Portfolio?" July 6, 2009.

Individual REITs' web sites:

American Campus Communities. < http://www.studenthousing.com>

AIMCO. < http://www.aimco.com>

Associated Estates Realty. < http://www.aecrealty.com>

Avalon Bay Communities, Inc. < http://www.avalonbay.com/avalon/site/home.html>

Behringer Harvard. < http://www.behringerharvard.com>

BRE Properties, Inc. < http://www.breproperties.com>

Camden Property Trust. < http://www.camdenliving.com>

Education Realty Trust. < http://www.edrtrust.com>

Equity Residential. < http://www.equityapartments.com/corporate>

Essex Property Trust, Inc. < http://www.essexpropertytrust.com>

Home Properties, Inc. < http://www.homeproperties.com>

Maxus Realty Trust, Inc. < http://maxusproperties.com>

Mid-America Apartment Communities. < http://www.maac.net>

Post Properties. < http://www.postproperties.com>

United Dominion Realty Trust. < http://www.udrt.com>

Joint Center for Housing Studies. "State of the Nation's Housing 2008." Harvard University. 2008.

Knittel, Christopher. "The Implied Cost of Carbon Dioxide Under the Cash For Clunkers Program." The Center for the Study of Energy Markets; University of California, Davis. August 2009.

National Multi Housing Council. "Quick Facts: Apartment Stock." Accessed through www.nmhc.org May 4, 2009.

Nevin, Rick, and Gregory Watson. "Evidence of Rational Market Values for Home Energy Efficiency." The Appraisal Journal. October 1998.

Power, Meg. "Energy Bills of Low-Income Consumers in FY 2005; Resources Available to Help Them Pay, and the Impact on Their Household Budgets." Prepared for The Economic Opportunity Studies. November 23, 2004.

SourceWatch.org. "Existing U.S. Coal Plants." Downloaded March, 2010. <http://www.sourcewatch.org/index.php?title=Existing_U.S._Coal_Plants>

U.S. Department of Energy. 2007 Buildings Energy Data Book. Prepared by D&R International, Ltd. September 2007

U.S. Department of Energy; Energy Information Administration. "Annual Energy Review: 2008." June 26, 2009.

U.S. Department of Health and Human Services; Administration for Children and Families, Office of Community Service, Division of Energy Assistance. "Estimated State Median Income, By Family Size and By State for 2009." October 8, 2008.

U.S. Department of Health and Human Services. "LIHEAP Home Energy Notebook for Fiscal Year 2007." June 2009.

U.S. Department of Housing and Urban Development. "American Housing Survey for the United States 2007." September 2008.

U.S. Department of Housing and Urban Development. "Low Income Housing Tax Credit Database." Accessed February 2010.

U.S. Department of Housing and Urban Development; Office of Policy Development and Research. "Characteristics of HUD-Assisted Renters and Their Units in 2003." May 2008.

U.S. Department of Housing and Urban Development; Office of Policy Development and Research. "Trends in Housing Costs 1985-2005: and the 30-Percent-of-Income Standard." June 2008.