Progress Report

Implementing HUD's Energy Strategy

Energy Task Force

Submitted Pursuant to Section 154
Energy Policy Act of 2005

U.S. Department of Housing and Urban Development
Office of Policy Development and Research

PD&R

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U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410-0001

THE SECRETARY

December 18, 2008

I am pleased to submit a progress report on implementing HUD's energy strategy, as required every 2 years under Section 154 of the Energy Policy Act of 2005. This report builds upon HUD's initial report – submitted in August 2006 – and describes the initiatives that the Department has undertaken to address rising energy costs in federally assisted housing.

As noted in the Department's 2006 report, HUD remains committed to implementing the actions outlined in this report via 25 key objectives. Under the guidance of Deputy Secretary Roy Bernardi, the Department's Energy Task Force has made significant strides in increasing awareness of energy efficiency among HUD staff, as well as among HUD's customers and partners.

HUD's own "energy bill" – the amount that HUD spends annually on heating, lighting, and cooling its portfolio of public and assisted housing – has now reached the $5 billion mark, representing a 13.5 percent increase since the Department's initial report. The impact on our customers is also greater than it was 2 years ago. We will work with our private and public partners to strengthen HUD's strategies for alleviating the energy burden on both renters and homeowners, especially those who rely on the federal government for housing assistance. HUD will also need to expand or replicate green building programs such as the Mark to Market Green Remodeling initiative.

These efforts and others identified in this progress report outline the future of HUD's energy strategy, and I look forward to working with our federal partners, and the Congress, to meet these objectives.

Steven C. Preston

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Executive Summary

As this report goes to Congress, the nation emerges from a period of record-high energy costs. The U.S. Department of Housing and Urban Development (HUD) has made progress in several areas toward fulfilling its commitment to promote energy efficiency in HUD's inventory of public and assisted housing, as well as in housing financed through its formula and competitive grant programs.

In its August 2006 report, *Promoting Energy Efficiency at HUD at a Time of Change*, HUD identified 25 key actions to accomplish its objectives. The underlying goals of HUD's Energy Action Plan, first announced in the 2006 report, were to provide information, incentives, and technical assistance to HUD consumers, partners, and other housing providers to assist in the development or design of new housing and in the management, maintenance, or operation of existing stock.

This progress report, which is being submitted to Congress pursuant to Section 154 of the Energy Policy Act of 2005, describes the actions undertaken by the Department—both program and field offices—to address energy use and consumption in some 5 million housing units nationwide. A Departmentwide Energy Task Force consisting of representatives from HUD program offices, as well as Regional Energy Coordinators in each of HUD's 10 regional offices have coordinated implementation of the Energy Action Plan.

The linchpin of HUD's energy programs is the Energy Star label—both Energy Star-qualified products and Energy Star-qualified new homes. Energy Star is now a widely recognized benchmark of energy efficiency, and HUD has partnered with the Environmental Protection Agency and the U.S. Department of Energy to encourage its affordable housing partners to build to the Energy Star standard for new homes or to buy Energy Star-qualified products and appliances.

Since submitting the August 2006 report, the Energy Task Force has responded to a number of congressional directives. The Energy Independence and Security Act, enacted in December 2007, requires HUD to update its minimum energy standards for public, assisted, and insured housing to "meet or exceed" the 2006 International Energy Conservation Code. Congress also directed HUD and the Federal Transit Administration to create an interagency Working Group on transportation and housing to encourage the development of transit-oriented, affordable housing. The House Appropriations Committee also strongly encouraged HUD to move beyond incentives and voluntary measures and institute stronger energy and green building standards in HUD's programs.

Section A of this report highlights selected accomplishments and documents energy-saving results for those programs for which HUD collects data. In 2007 the Department reported a combined $33 million in energy savings in four program areas: the HOME Investment Partnerships (HOME) program, the Community Development Block Grant (CDBG) program, energy performance contracting in public housing, and the FHA-insured Energy Efficiency Mortgage program. HUD does not yet have tracking systems to monitor energy savings for its overall inventory of public and assisted housing.

Section B of the report shows that HUD's outlays for utilities continue to increase. The most recent data show that owners and tenants in public and assisted housing units spend an estimated $5.01 billion, including $1.8 billion in public housing; $3.2 billion is spent on utility allowances through the tenant- and project-based rental assistance programs. This represents a 13.5 percent increase since the 2006 report.

Specific actions HUD has taken over the past 2 years to implement the measures reported to Congress are described in Section D of this report. They include the following:

- *Departmentwide*. A successful training program on energy-efficient management and development of both multifamily and single-family housing was implemented in 2007 by HUD's Office of Policy Development and Research.
- *Public and Indian Housing*. HUD developed a benchmarking tool that will assist public housing authorities in addressing utility costs as they shift to asset management and implemented a vigorous training and capacity-building initiative for energy performance contracting in public housing.
- *Community Planning and Development.* The HOME Investment Partnerships program launched a new energy training curriculum and issued HUD's first competitive grant program specifically for energy efficiency and green building.
- *Multifamily Housing.* HUD initiated a pilot program in California for Section 202 senior housing that provided energy audits for projects seeking refinancing. In addition, the Mark to Market program initiated a Green Remodeling Initiative, which was launched with a pilot project in Oklahoma.
- *Local and National Partnerships.* Many of HUD's field offices partnered with local communities through the Energy Star Change a Light, Change the World Campaign, homeownership fairs, and other initiatives.
- *Energy Star Products and Appliances*. HUD worked with the Department of Energy to develop Energy Star Quantity Quotes to enable multifamily building owners, public housing authorities, state and local governments, universities, and others to contact suppliers and negotiate discounted prices. See www.quantityquotes.net.

In addition to these energy-related activities, HUD is beginning to address a broader green building agenda that addresses indoor environmental air quality, siting and location, materials selection, and water conservation. These activities are described in Section F. They are intended to complement the growing number of national green housing initiatives, such as the Enterprise Green Communities program, LEED for Homes, the Energy Star Plus Indoor Air Package, and the National Association of Home Builders' (NAHB) Green Building Guidelines. HUD is also planning to "green" its own Robert C. Weaver headquarters building with a green roof, solar thermal and photovoltaic systems, new high-performance windows, and other energy-efficient measures.

A. Introduction

In August 2006, HUD submitted a Report to Congress, *Promoting Energy Efficiency at HUD at a Time of Change*. Section 154 of the Energy Policy Act of 2005 stated that the Secretary "shall develop and implement an integrated strategy to reduce utility expenses through cost-effective energy conservation and efficiency measures and energy-efficient design and construction of public and assisted housing. The energy strategy shall include the development of energy reduction goals and incentives for public housing agencies."

HUD is required to report every 2 years on its implementation of the actions outlined in that report. According to the 2005 Act:

> "The Secretary shall submit a report to Congress, not later than 1 year after the date of the enactment of this Act, on the energy strategy and the actions taken by the Department of Housing and Urban Development to monitor the energy usage of public housing agencies and shall submit an update every 2 years thereafter on progress in implementing the strategy."

This report outlines progress that HUD is making to address rising energy costs through increased energy efficiency in public and assisted housing (as well as in housing financed through its formula and competitive grant programs).[1] This progress report covers actions undertaken in Fiscal Year (FY) 2007 and, where data are available, the first two quarters of FY 2008.

The report addresses the steps HUD is taking to implement the 25 actions outlined in its 2006 report. This report also addresses actions that HUD is undertaking to address: (1) Congress' and the affordable housing industry's growing interest in and support for green affordable housing, (2) new legislation enacted by Congress since the 2006 report, and (3) directions and concerns included in FY 2008 Appropriations Committee reports.

Estimated Energy Savings

While HUD does not yet have portfolio-wide energy savings data, an estimated $33 million in energy savings was documented in 2007 in the following four program areas: the HOME Investment Partnerships (HOME) and Community Development Block Grant (CDBG) programs, energy performance contracting in public housing, and the FHA-insured Energy Efficient Mortgage. Reported energy savings are as follows:

[1] For the purpose of this report, this includes existing public housing units, HOPE VI new construction, Housing Choice vouchers, and FHA-insured or FHA-assisted multifamily housing, including Section 202 housing for the elderly. In addition, this report addresses the Office of Native American Programs' (ONAP) initiatives to promote energy conservation, as well as housing built or rehabilitated through the HOME and Community Development Block Grant (CDBG) formula grant programs.

- A total of 1,066[2] single-family Energy Efficient Mortgages were reported to have been insured by FHA, for an estimated savings of $390,000.
- A total of 3,856 units of HOME-funded new construction projects were reported as having achieved the Energy Star label for new homes.[3] This represents a 15 percent savings over standard new homes built to the 2004 International Residential Code, resulting in an estimated savings of $1.2 million.
- A total of 125 units of CDBG-funded projects were reported as having achieved the Energy Star label for new homes, for an estimated combined savings of $36,875.
- A total of 32 new energy performance contracts were reported in public housing in FY 2007. They involved a combined capital investment of $141.3 million and an estimated annual savings of $32.2 million. As of March 2008, a total of 183 contracts were completed or in repayment, for a total investment of $570 million and projected annual savings of $102.8 million.

Selected Accomplishments

- The Office of Policy Development and Research sponsored a four-part energy training series for HUD employees, grantees, and partners, which drew more than 2,500 registrants. The training was provided via satellite broadcasts and webcasts. See www.hud.gov/energy/training/coursedesc.pdf.
- The Office of Affordable Housing Preservation launched a new green building initiative for multifamily properties participating in the Mark to Market program. The initiative provides the first HUD incentive for green building (the owner's matching contribution is reduced from 20 percent of the cost of rehabilitation to just 3 percent for green construction). See www.hud.gov/offices/hsg/omhar.
- The Office of Community Planning and Development reported for the first time on Energy Star-qualified new homes funded through the HOME and CDBG programs.
- The Office of Public and Indian Housing strengthened technical support to public housing authorities in developing energy performance contracts, developed a utility benchmarking tool that will assist housing authorities in managing their energy use, and expanded the Public Housing Environmental and Conservation Clearinghouse.
- HUD's field offices continued to play a prominent role in leveraging resources for HUD customers and partners and in conducting training and outreach in their regions. Regions 1, 4, 6, and 9 have been particularly active. In Region 9, for example, a partnership with Pacific Gas and Electric resulted in the installation of 21,000 compact fluorescent lights (CFLs) in some 200 public and assisted housing properties in Northern and Central California. Region 9 was also instrumental

[2] This is the actual number of such mortgages reported, slightly lower than the 1,118 reported in HUD's 2007 Performance and Accountability Report (PAR), which included an estimated number of mortgages for the fourth quarter.
[3] The total of 3,856 units is adjusted from the figure reported in the FY 2007 Performance and Accountability Report, which included estimated figures for the fourth quarter. This total includes actual fourth-quarter production.

in developing a bulk purchasing tool for Energy Star products and appliances. See www.quantityquotes.net.

- The Office of Multifamily Housing developed a package of reforms to boost energy efficiency in privately owned HUD-assisted or HUD-insured multifamily housing. HUD expects to implement these reforms in FY 2009.
- Feasibility assessments of combined heat and power (cogeneration) were completed in 20 multifamily buildings in 6 states (Connecticut, Massachusetts, Pennsylvania, Wisconsin, Illinois, and California), showing paybacks ranging from 3 to 20 years.

Congressional Actions Impacting HUD

Congress has directed HUD to implement energy-efficient and green building practices through the following legislative actions:

- *Energy Policy Act of 2005.* HUD continues to implement key provisions of the Energy Policy Act of 2005, including: (1) requiring public housing authorities to buy Energy Star products and appliances, (2) encouraging energy efficiency in Indian housing, and (3) extending the length of energy performance contracts in public housing.
- *Energy Independence and Security Act of 2007.* During the period covered by this report, Congress enacted the Energy Independence and Security Act of 2007, which requires HUD to establish energy standards that "meet or exceed" the 2006 International Energy Conservation Code for new construction in public, assisted, and insured housing. The Act also requires the Department of Energy to set new standards for HUD-Code manufactured homes, in consultation with HUD.
- *House Appropriations Committee Report.* HUD's FY 2008 House Appropriations Committee Report included language urging HUD to move beyond voluntary approaches toward establishing requirements for energy efficiency and green building. The FY 2008 Consolidated Appropriations Act included language requiring HUD to allow existing energy performance contracts in public housing to be extended to 20 years.
- *Joint Explanatory Statement on Housing and Transportation.* In light of rising gasoline prices, an increasingly important element of all green buildings is the location efficiency—in addition to the energy efficiency—of the property. In its Joint Explanatory Statement accompanying the FY 2008 Consolidated Appropriations Act, the House-Senate Conference tasked HUD and the Federal Transit Administration (FTA) to continue and expand its work in this area.[4] HUD and FTA have created an interagency Working Group and will submit a report on ways that HUD and FTA can better coordinate transportation and housing programs.

[4] FY 2008 Consolidated Appropriations Act, Pub. L. 110-161, Joint Explanatory Statement.

B. Energy Costs and Affordable Housing

This section of the report discusses changes in energy use in the residential sector, their impact on low- to moderate-income households, and HUD's best estimates of current utility expenditures through its various programs.

Residential Energy Trends

The housing sector consumes about one-fifth (21 percent) of all energy consumed annually in the United States. Of the 21.1 quadrillion BTUs (quads) used in the residential sector, less than one-third (6.5 quads) is "primary" energy that is consumed in the home.[5] The remaining energy is used to produce electricity or is lost in transmission. As a result of these losses, while housing consumes only one-fifth of all energy used, it uses 37 percent of all electricity produced in the United States.[6]

Residential energy consumption has increased four-fold over the past half century. Over that time, there have also been dramatic changes in the type of energy used. In 1950, one-third of all homes (34 percent) were heated with coal; today, the share is just 1 percent. Meanwhile, natural gas heating increased from just 11 percent of all housing units to more than one-half (52 percent) today. Heating oil use has declined from 22 percent of all homes in 1950 to 8 percent. In addition, whereas electric heat was almost nonexistent in 1950, today 31 percent of all homes are heated with electricity.[7] This translates into 56 million households that heat with natural gas, 34 million with electricity, and 9 million with heating oil (primarily in the Northeast).

Perhaps the biggest shift in residential energy use has been in the area of electricity, as a result of a significant increase in central air conditioning, population growth in the Southwest and Southeast, and the exponential increase in the use of home energy appliances and computers. Fifty-six percent of all homes now have personal computers, 65 percent have ceiling fans, 53 percent have dishwashers, and 86 percent have microwave ovens. More than one-half (55 percent) have central air conditioning, double the share (27 percent) in 1980.[8]

Electricity remains by far the most expensive energy source, despite the dramatic recent increases in the price of heating oil and natural gas. The Energy Information Administration (EIA) indicates that the 2004 price for electricity was $26 per million BTUs, compared with just $14 for heating oil and less than $11 for natural gas.[9]

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[5] Energy Information Administration (EIA), *Annual Energy Review*, 2006, Figure 2.1a, p. 36.
[6] U.S. Department of Energy, 2005 *Buildings Energy Data Book*.
[7] EIA 2006, Op Cit, Figure 2.7, p. 54 and Table 2.7, p. 55.
[8] Ibid, Figure 2.6, p. 52.
[9] Ibid, Figure 3.4.

Rising Energy Prices

Combined with $4 a gallon gasoline, energy costs—for both housing and transportation—are a rapidly growing household expenditure. As recently as 1998, oil was selling for $13.11 per barrel, compared with more than $110 per barrel in August 2008. Natural gas prices for consumers have more than doubled over the same period.[10] Electricity prices have on average increased by approximately 25 percent, from 8 cents/kWh in 1998 to just over 10 cents/kWh in 2006.

According to the EIA, from 2001 to 2007 the cost of home heating nearly or more than doubled in some parts of the country: in the Midwest, natural gas users spent 77 percent more in winter heating costs in 2006–07 than they did in 2001–02, while Northeast heating oil users spent 112 percent more.[11] These costs have continued to rise, especially for home heating oil users in the Northeast. Similar cost increases have occurred for summer cooling costs.

Impact on Low-Income Families

Low- and moderate-income families who reside in HUD-assisted housing are especially vulnerable to rising energy prices. As noted in the President's National Energy Policy, "the energy burden on low-income households, as a proportion of income, is four times greater than for other American households. Many working households accommodate large increases in energy by cutting back on other needs. However, low-income households often have more difficult choices to make."[12]

A recently completed survey by the National Energy Assistance Directors' Association illustrated the impact that energy costs are having on low-income families.[13] Sixty percent of low-income households, 49 percent of moderate-income households, and 42 percent of middle-income households report more difficulty in paying their energy bills than in the previous year.[14]

High gasoline prices, in combination with high home heating and cooling costs, are compounding the problem. Almost three quarters of low-income families report that increased costs of gasoline are having a "large impact" on their households, with 70 percent saying that they were cutting back on food purchases, 31 percent cutting back on medicine, and 19 percent doing so on education. But despite making these adjustments, 29 percent of low-income families and 20 percent of moderate-income families said that they had missed a payment on, or paid less than, their full energy bill.

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[10] Energy Information Administration, *Natural Gas Prices for Households*, from Energy Prices and Taxes, first quarter 2007. Price increased from $6.6/million BTUs in 1998 to $13.96 in 2006.

[11] Energy Information Administration, *Short Term Energy Outlook*, January 2008. Prices include taxes. Compared with a U.S average rise of 65 percent for natural gas and 114 percent for heating oil in the same time period.

[12] President's National Energy Policy, May 2001.

[13] National Energy Assistance Directors' Association, 2008 *Energy Costs Survey*, June 6, 2008.

[14] Low-income is defined as up to 150 percent of the federal poverty level, moderate income is 150 to 250 percent more than the poverty level, and middle income as 250 to 350 percent more than the poverty level.

Rising gasoline prices are especially impacting rural areas, where driving distances are longer and there are fewer public transportation options. While on average Americans spend about 4 percent of their take-home incomes on gasoline, the share of income spent on gasoline is as high as 15 percent in rural counties with median incomes of less than $20,000,[15] compared with only 2 percent in suburban counties with median incomes of $70,000 or more.

Another indicator of the impact on low-income families is the "Home Energy Affordability Gap"—the gap between what low-income households can afford and what they actually pay. The gap rose to $41 billion in 2007, an increase of 126 percent, or $23 billion, since 2002.[16] On the other hand, fuel assistance for these families has risen only moderately; funding for the Low-Income Home Energy Assistance Program (LIHEAP), the primary federal assistance program, has increased by only $279 million over the same period.

HUD's $5 Billion Energy Bill

Rising energy prices are also adding to operating costs in public and assisted housing. As summarized in Table B-1, utility costs in public and assisted housing have risen to an estimated $5.01 billion, or an increase of 13.5 percent over the 2-year period since HUD submitted its 2006 report. The amount expended on Section 8 vouchers increased by almost 18 percent.

PHA-paid utilities totaled $1.43 billion in 2006, up from $1.27 billion in 2004. Utility allowances for tenants in public housing increased to $421 million. (See Table B-1.) Another $3.16 billion was expended in the form of utility allowances through project- and tenant-based Section 8 rental assistance, for a total of just over $5 billion.

Table B-1. Combined Energy Expenditures in Public and Assisted Housing (Including Water and Sewer)[16]

Activity	2004–05 ($ in millions)	2006–07 ($ in millions)	% Change
Public housing			
PHA-paid utilities	1,277	1,429	11.9
Utility allowances	411	421	2.3
Assisted housing			
Owner-paid utilities[17]	N/A	N/A	N/A
Utility allowances	605	662	9.4
Section 8 vouchers			
Utility allowances	2,122	2,500	17.8
Total	**4,415**	**5,012**	**13.5**

N/A = not available.
Source: See source notes for Tables B-2 and B-5

[15] *Rural U.S Takes Worst Hit as Gas Tops $4 Average*, New York Times, June 9, 2008. Utilizes U.S. Census Bureau income and travel data.

[16] Fisher, Sheehan and Colton, *On the Brink: 2007; The Home Energy Affordability Gap*, April 2008. The affordability level for home energy costs is set at 6 percent of gross household income for families with incomes at or below 185 percent of the federal poverty level. Energy bills are estimated using the "energy intensities" published in the most recent DOE Residential Energy Consumption Survey (RECS).

Public Housing

Public housing consists of approximately 1.2 million units in 13,000 properties, managed by some 3,100 public housing authorities. Utility expenditures are tracked and reported in the Financial Assessment Subsystem for Public Housing (FASS-PH). The most recent period for which HUD has complete data is Cycle 8 or 2006, covering housing authorities whose fiscal years ended between September 30, 2006, and June 30, 2007.[17]

The overall cost of PHA-paid utilities in public housing (including water and sewer) for 2006 totaled $1.4 billion (Table B-2). This represents approximately 23 percent of total operating expenses. When combined with the most recent available estimate of tenant-paid utilities ($421 million; see Table B-4) total estimated energy-related utility expenditures in public housing are $1.85 billion.

Utility expenditures in public housing show a significant increase over previous years. Most of the increase is due to higher energy prices. On a per-unit basis, the monthly expense (PUM) was $111.66, a 31.2 percent increase over 2000.

Table B-2. PHA-Paid Utility Expenditures, 2001–06 (Including Water and Sewer Charges)

Line Item	2001	2002	2003	2004	2005	2006
Total utilities ($ in millions)	$1,219	$1,158	$1,252	$1,277	$1,411	$1,429
Total operating expenses ($ in millions)	$5,657	$5,754	$5,891	$5,885	$6,043	$6,161
Utilities as % of operating expenses	22	20	21	22	23	23
Total PUM utilities	$87.82	$84.09	$93.02	$97.78	$109.31	$111.66
% change in PUM over previous year	*3.2*	*– 4.3*	*10.6*	*5.1*	*11.8*	*2.2*
% change in PUM since 2000	*3.2*	*– 1.2*	*9.3*	*14.9*	*28.5*	*31.2*

Sources: 2000–2006 Financial Assessment Subsystem (FASS-PH) financial data; the following line items were used in totaling the data for utilities: water, electricity, gas, fuel, and other utility expenses ("other" includes sewer and miscellaneous utility costs)

Table B-3 shows total PHA-paid utility costs for electricity, gas, and fuel oil (excluding water and sewer charges) in 2006. These costs increased by 15.2 percent since 2004, to $1.01 billion—of which $462 million was for electricity, $353 million for natural gas, and $196 million for fuel oil. Per-unit month (PUM) energy expenditures increased by 17.4 percent, with fuel oil increasing by almost 22 percent.

Table B-3. PHA-Paid Energy Expenditures, 2004–06 (Electricity, Gas, and Fuel)

Line Item	2004		2006			
	Total Expenditure ($ in millions)	PUM ($ in millions)	Total Expenditure ($ in millions)	% Expenditure Increase	PUM ($ in millions)	% PUM Increase
Total PHA-paid utilities	878.8	67.28	1,012	15.2	79.04	17.4
Electricity	402.5	30.82	462	14.8	36.11	17.2
Natural gas	311.5	23.85	353	13.3	27.59	15.7
Fuel oil	164.8	12.61	196	19.1	15.34	21.7

Source: FASS-PH financial data for Cycle 6 (2004) and Cycle 8 (2006)

[17] Housing authorities submit unaudited financial statements, including utility expenditures, within 60 days of the end of their fiscal year; audited financial statements are submitted 9 months after the end of their fiscal year. The 2006 (Cycle 8) period covers PHAs with fiscal years ending 9/30/06, 12/31/06, 3/31/07, or 6/30/07. Utility expenses reflect expenses incurred 12 months prior to the year end report. Similarly, 2005 (Cycle 7) data covers PHAs whose fiscal years ended 9/30/05 through 6/30/06.

Assisted Housing

HUD's assisted and insured housing stock consists of approximately 2.3 million units in 31,316 properties, of which 22,674 properties receive project-based Section 8 and other types of rental assistance. HUD's rental assistance pays for a share of owner-paid, master-metered utilities (in addition to utility allowances for individually metered utilities).

Table B-4. Estimated Owner-Paid Utilities in Assisted Multifamily Housing, 2004–06

Line Item	2004 Total Utilities ($ in millions)	2004 Per Unit/Year	2006 Total Utilities ($ in millions)	2006 Per Unit/Year	% Change
Total owner-paid utilities	$937.2	$668	$1,062.8	$757	13.3
Electricity	$527.6	N/A	$570.8	$407	8.2
Natural gas	$343.2	N/A	$416.0	$379	21.2
Fuel oil	$66.4	N/A	$76.0	$521	14.5
Total operating expenses	$3,398.7	—	$3,558.0	—	4.6
Energy share	27.6%	—	29.9%	—	—

Source: Financial Assistance Subsystem (FASS-MF) as of December, 2007.[18]

According to data compiled from HUD's Online Property Integrated Information Suite (OPIIS), average owner-paid utilities (central heating and cooling, common-area lighting) in HUD's 22,674 assisted multifamily properties were reported at $1.06 billion in 2006, for an average of $757 per unit. (See Table B-4.) This represents a 13.3 percent increase since 2004, when owner-paid energy costs averaged $668 per unit. Utility costs accounted for almost 30 percent of total operating expenses.

When added to the $662 million paid for individually metered utilities with utility allowances (see Table B-5), the total estimated cost of utilities in HUD-assisted housing was estimated to be more than $1.7 billion. Note again that these costs are not normalized for weather or energy prices, and they predate the more recent 2007–08 increases in energy prices.

Utility Allowances

HUD's expenditures on allowances for tenant-paid utilities have increased by 14 percent in the 2-year period covered by this report, to almost $3.6 billion[19]—while the total number of voucher holders remained relatively constant (Table B-5). Utility allowance expenditures include $421 million in public housing, $2.5 billion for tenant-based Section 8 vouchers, and $662 million in project-based Section 8 assistance in assisted multifamily housing. The average annualized tenant-based utility allowance was $1,467 in 2007.

[18] The following methodology was used to estimate the amount expended by HUD through Section 8 contracts in HUD-assisted multifamily units. 15,210 assisted properties (out of the total of 22,674 assisted properties) reported paying $799,748,980 in owner-paid utilities. The "total electric count" of 1,056,033 units in these properties was used to arrive at an average $757 per unit in owner-paid utilities. This average was applied to the total of 1,403,484 occupied assisted units as of July 2008, for total owner-paid utilities in all HUD-assisted units of $1,062,878.

[19] For comparative 2005 figures, see Table 2, Utility Allowance Expenditures, p.11, HUD's August 2006 Report to Congress.

Table B-5. Utility Allowance Expenditures, 2007

	Subsidized Housing Units	Occupied Units	% Units With Utility Allowances	# Units With Utility Allowances	Avg Utility Allowance ($)	Annual Spent ($ in millions)
Public housing	1,194,747	1,092,059	42	458,854	$917	$421
Section 8 vouchers	2,204,426	2,034,298	84	1,704,725	$1,467	$2,500
Project-based Section 8	1,625,210	1,563,637	57	890,786	$802	$663
Total	5,024,383	4,689,994	65	3,054,365	$1,173	$3,584
% change since 2005	*4.63*	*9.38*	*6.56*	*0.49*	*14*	*14*

*Sources: Office of Policy Development and Research, December 2007 data from Tenant Rental Assistance System; Real Estate Management System; Public Housing Information Center—*Resident Characteristics Report, *HUD-50058 and HUD-50059; Occupied/Leased Section 8 Moderate, New, and Substantial Rehabilitation, Section 236, and Other assume a 96-percent occupancy rate.*

C. HUD's Energy Strategy

A Departmentwide Energy Task Force was tasked in 2002 to respond to the challenge of rising energy costs to residents and owners of HUD-assisted properties. The Task Force identified a series of actions that HUD could undertake to address the need for energy conservation and energy efficiency in HUD's own programs. Some of these proposed actions were specific to individual programs, while others were Departmentwide or interagency in scope (in partnership with the Environmental Protection Agency and the Department of Energy).

In August 2006, as directed by Congress pursuant to Section 154 of the Energy Policy Act of 2005, HUD submitted an expanded, 25-point energy strategy for HUD's inventory of public and assisted housing, *Promoting Energy Efficiency at HUD at a Time of Change.* The Act requires HUD to provide Congress with a 2-year update on progress made in implementing these measures. (See the table on the following page for a list of the 25 items.)

The energy strategy addresses the following topics:

- *Implement interagency partnerships with DOE and EPA*. HUD's Energy Action Plan includes partnerships with EPA and DOE in two key areas: increased voluntary use of Energy Star products and weatherization assistance for low-income families.
- *Provide information, training, and technical assistance to HUD customers and clients.* In the absence of new programs or funding commitments for energy efficiency, a key objective of the Action Plan has been to provide better information and training to HUD's customers and clients, and to do so in a cost-effective and coordinated way.
- *Strengthen rewards and incentives for energy efficiency.* Although requirements vary from program to program, in general HUD's incentives for encouraging energy efficiency are relatively modest. The Action Plan provides for stronger rewards and incentives for HUD's customers and clients to reduce energy costs in their buildings.
- *Strengthen energy standards and program requirements.* Where it can be accomplished cost-effectively, the Action Plan included several measures to strengthen HUD's current energy efficiency standards and improve compliance with program regulations.
- *Strengthen the management and monitoring of HUD's energy programs.* Better coordination, organization, and staffing of HUD's energy programs, both at headquarters and in the field, are key elements of the Action Plan. A number of activities have been implemented or are under way to enable HUD to track energy efficiency trends over time.
- *Support policy analysis and technology research.* While significant gains can be accomplished working within existing programs and using existing technologies, there may be a need for additional policy analysis and limited research and development of new energy efficiency technologies.

HUD's Energy Strategy—Planned Actions

Departmentwide	
1	Provide incentives for energy efficiency in housing financed through HUD's competitive grant programs.
2	Include energy efficiency performance measures in HUD's Annual Performance Plan (APP) and Management Plan.
3	Promote the use of Energy Star products and standards through HUD's new Partnership for Home Energy and Efficiency with DOE and EPA.
4	Provide residents or organizations with training or information on energy efficiency for building or rehabilitating affordable housing.
5	Establish residential energy partnerships with cities, counties, states, and other local partners.
Community Planning and Development	
6	Encourage energy efficiency in HOME- and CDBG-funded new construction and housing rehabilitation projects.
7	Identify opportunities and assist with feasibility analysis for Combined Heat and Power in public or assisted housing.
Public and Indian Housing	
8	Base appliance and product purchases in public housing on Energy Star standards, unless the purchases are not cost effective.
9	Build HOPE VI developments to a high level of energy efficiency.
10	Improve tracking and monitoring of energy efficiency in public housing.
11	Streamline energy performance contracting in public housing.
12	Promote energy conservation in federally assisted housing on Indian tribal lands.
Housing—Single Family	
13	Feature the Energy Efficient Mortgage as a priority loan product.
14	Provide training on how FHA single-family programs can be effectively used to promote energy efficiency.
15	Continue improved tracking, and evaluate performance, of Energy Efficient Mortgages.
Housing—Multifamily	
16	Promote energy efficiency in multifamily-assisted housing and multifamily programs.
17	Continue HUD-DOE multifamily weatherization partnerships.
18	Encourage use of Energy Star new home standards in the design, construction, and refinancing of Section 202 and 811 projects.
19	Develop incentives for energy efficiency through FHA multifamily insurance programs.
20	Explore asset management strategies and guidance for energy efficiency in HUD-subsidized multifamily properties.
21	Support energy efficiency training for multifamily managers and maintenance staff.
Housing—Manufactured Homes	
22	Implement energy efficiency recommendations of the Consensus Committee for HUD-Code (Manufactured) Homes.
Field Policy and Management	
23	Partner with local energy efficiency groups, HUD program offices, and other agencies to educate HUD customers about ways to reduce energy costs.
Policy Development and Research	
24	Conduct energy-related policy analysis and research to support Departmental energy efficiency actions.
Healthy Homes and Lead Hazard Control	
25	Develop a computerized assessment tool for integrated energy and environmental retrofits.

D. Progress to Date

I. Departmentwide

Five Departmentwide actions are included in HUD's energy strategy.

Action	Departmentwide
1	Provide incentives for energy efficiency in housing financed through HUD's competitive grant programs.
2	Include energy efficiency performance measures in HUD's Annual Performance Plan (APP) and Management Plan.
3	Promote the use of Energy Star products and standards through HUD's new Partnership for Home Energy and Efficiency with DOE and EPA.
4	Provide residents or organizations with training or information on energy efficiency for building or rehabilitating affordable housing.
5	Establish residential energy partnerships with cities, counties, states, and other local partners.

[ACTION 1]

PROVIDE INCENTIVES FOR ENERGY EFFICIENCY IN HOUSING FINANCED THROUGH HUD'S COMPETITIVE GRANT PROGRAMS.

Planned Actions

1.1 Continue energy efficiency as a policy priority in HUD's 2007 and 2008 competitive grant awards. Individual competitive grant programs will continue to award rating points for proposals that adopt energy-efficient products and practices in planned housing projects.

1.2 HUD's Energy Task Force will explore with program offices the feasibility of identifying suggested energy measures in awarding competitive points for energy efficiency activities, to assist applicants in addressing energy efficiency.

1.3 The Energy Task Force will review its experience with the previous year's incentives.

1.4 The Office of Community Planning and Development's Notice of Funding Availability (NOFA) for its technical assistance programs may address energy efficiency technical assistance activities supportive of HUD's HOME program.

Progress To Date

Each year, HUD awards approximately $2.7 billion in competitive grant awards for a wide range of housing and community development initiatives. These funds are awarded through the Department's annual Super Notice of Funding Availability (SuperNOFA), as well as a separate Notice for the HOPE VI program.

For the past 4 years, HUD has established energy efficiency as a policy priority in its annual competitive grant awards. As a policy priority, program offices may award additional points for energy efficiency in rating grant applications. Programs providing at least one point for energy efficiency in 2007 or 2008 included Section 202 Supportive Housing for the Elderly, Section 811 Supportive Housing for Persons with Disabilities, HOPE VI, Rural Housing and Economic Development, Housing Opportunities for People with AIDS (HOPWA), Indian Community Development Block Grants, Housing Counseling, and University Partnerships. Several healthy homes initiatives also provided a point incentive: the Healthy Homes Demonstration, Lead-Based Paint Hazard Control, and the Lead Hazard Reduction Demonstration programs.

One program, the Self Help Ownership Opportunity Program (SHOP), established Energy Star as a minimum requirement, as follows: "All newly constructed units assisted with SHOP funds provided must qualify and receive Energy Star certification by an independent Home Energy Rater upon completion, and only Energy Star-labeled products and appliances may be used in these units."

The McKinney Act/Continuum of Care grant awards, which address homelessness, do not provide additional points for energy efficiency. Rather, applicants are required to fill out a checklist as part of their application (Action 1.1).

The Notices of Funding Availability in 2007 and 2008 for HOME Technical Assistance did not specifically include energy efficiency. However, as described under Action 6 below, several steps are under way to incorporate energy efficiency in the HOME training program—specifically, the development of a HOME Energy Star training curriculum, as well as a Guidebook on Energy Star and green building (Action 1.4).

As noted in the 2007 SuperNOFA, the Department is considering a regulation that would establish the standard for Energy Star-qualified new homes as the minimum standard for HUD's competitive grant programs (Action 1.3).

[ACTION 2]

INCLUDE ENERGY EFFICIENCY PERFORMANCE MEASURES IN HUD'S ANNUAL PERFORMANCE PLAN (APP) AND MANAGEMENT PLAN.

Planned Action

2.1 Performance measures that set energy reduction outcomes or goals and gauge improvements in energy efficiency will be considered for inclusion in HUD's future Annual Performance Plans (APPs) and, where feasible, in future Management Plans.

Progress To Date

Under the Government Performance and Results Act (GPRA), HUD is required to establish annual performance goals through its Annual Performance Plan and to prepare a Management Plan that sets specific targets for each goal. The Management Plan is the operational plan for the Department. HUD's Annual Performance and Management Plans provide the template for institutionalizing key departmental objectives. The documents can be found at www.hud.gov.

HUD's FY 2008 Annual Performance Plan includes Objective B.1.9: Implement Phase II of HUD's plan for increasing the energy performance and reducing utility costs in HUD-supported housing.

In support of this objective, the Department's Management Plan for 2008 includes several energy-related performance goals.

Table D-1. Energy Performance Measures in HUD's 2008 Management Plan

Program Lead	Mgt Plan Reference	Performance Goals	FY 2008 Target
Policy Development and Research	B.1.09.am1	Implement Phase II of HUD's plan for increasing the energy performance and reducing utility costs in HUD-supported housing.	
Public Housing	B.1.09.am2	Reduce utility consumption by PHAs and residents by increasing the overall investment in energy conservation measures (ECMs) by 5 percent over the FY 2007 baseline, and by ensuring that all ECM investments are cost effective during the expected life of the equipment.	5%
Single-Family Housing	B.1.09.m3	Feature the Energy Efficient Mortgage and other FHA products that promote energy efficiency improvements in single-family housing.	
Single-Family Housing	B.1.09.m4	Provide training on how Federal Housing Administration (FHA) single-family programs can be effectively used to promote energy efficiency.	36
Single-Family Housing	B.1.09.m5	Continue improved tracking and evaluate performance of EEMs.	
Single-Family Housing	B.1.09.m5.1	Promote energy efficiency by encouraging housing providers to use energy-saving devices.	
Community Planning and Development	B.1.09.m6	To implement the Secretary's Energy Task Force Initiative and the Energy Star Memorandum of Understanding (MOU) among HUD, Department of Energy (DOE), and Environmental Protection Agency (EPA), HUD will increase the number of Energy Star certifications in new construction and gut rehab in the Community Development Block Grant (CDBG) and HOME programs.	10%
Manufactured Housing	B.1.09.m7	Continue to process Manufactured Housing Consensus Committee proposals that are not in rulemaking (including appliance efficiency and improved duct insulation).	
Field Policy and Management	B.1.10.m	Increase and preserve decent affordable housing through promotion of HUD's departmental initiatives (that is, Energy Action Plan, America's Affordable Communities Initiative, and Preserve America).	TBD

[ACTION 3]

PROMOTE THE USE OF ENERGY STAR PRODUCTS AND STANDARDS THROUGH HUD'S NEW PARTNERSHIP FOR HOME ENERGY EFFICIENCY WITH DOE AND EPA.

This action focuses on ensuring that HUD staff and partners have access to information about Energy Star-qualified products and new homes. In July 2005, HUD, the Department of Energy, and the Environmental Protection Agency announced a new partnership to reduce energy costs in existing homes by 10 percent by the year 2015.

Planned Action

3.1 Work with DOE and EPA to ensure that information on Energy Star products and appliances, Energy Star-qualified new homes, and "Home Performance with Energy Star" (for existing homes) is available for distribution to field staff, public housing agencies, formula and competitive grant recipients, property managers, and, where feasible, new FHA homebuyers.

Progress To Date

When information is needed on Energy Star products and appliances, as well as on Energy Star-qualified new homes, such information is available from the EPA-operated Energy Star information clearinghouse. HUD-specific information on Energy Star is currently not available for distribution to field staff and others, due to funding and staffing limitations.

During 2006 and 2007, HUD's Region 9 office played an important role in working with the Department of Energy to develop Energy Star Quantity Quotes at www.quantityquotes.net, a bulk purchasing tool for Energy Star products. As of May 2008, Quantity Quotes had been used by 1,200 purchasers, representing schools, apartment building owners and managers, public housing authorities, other government agencies, manufacturers, and others. Purchasers have submitted over 500 requests for 4.3 million compact fluorescent lights (CFLs), 31,000 room air conditioners, 10,000 light fixtures, 10,000 refrigerators, 2,300 clothes washers, 2,500 dishwashers, and 80 dehumidifiers.

Another important area of cooperation with Energy Star has been the annual Energy Star Change a Light, Change the World Campaign, which focuses on enlisting pledges from consumers and property owners to replace incandescent light bulbs with more energy-efficient CFLs. One example: HUD's participation resulted in the replacement of 21,000 light bulbs, in partnership with Pacific Gas and Electric, in 168 properties in Northern California with 9,800 units. EPA estimates that this will save 11.7 million kilowatt-hours of electricity.

[ACTION 4]

PROVIDE RESIDENTS OR ORGANIZATIONS WITH TRAINING OR INFORMATION ON ENERGY EFFICIENCY FOR BUILDING OR REHABILITATING AFFORDABLE HOUSING.

This action focuses on increasing the technical knowledge and capacity of property managers and others in adopting energy efficiency, emphasizing no-cost/low-cost energy management strategies.

Planned Action

4.1 Develop standard training program modules to promote energy efficiency in future developments and existing HUD-assisted and HUD-financed housing. The training program and plan will be developed in conjunction with national intermediaries, including the Local Initiatives Support Corporation (LISC), Habitat for Humanity, the Enterprise Foundation, and the Neighborhood Reinvestment Corporation.

Progress To Date

A successful four-part, online training program, *Save Energy, Lower Costs, Increase Comfort and Quality of Affordable Housing*, sponsored by HUD's Office of Policy Development and Research was implemented in 2007. More than 2,500 people registered for one or more of the training workshops. The training provided an introduction to energy efficiency, as well as new and emerging practices, for operators, managers, and developers of affordable housing projects, both single-family and multifamily.

Information and technical guidance was presented by a faculty of nationally recognized experts in building science with practical experience and demonstrated success in reducing energy costs through better design and building practices. "HUD Energy Champion" certificates were issued to individuals completing all four sessions. Four topics were covered:

- Multifamily Building Operations and Management: The First Step To Energy Efficiency.
- Retrofit and Remodeling Strategies for Multifamily Buildings.
- Single-family Rehab and Retrofits: Focus on Low-Rise Buildings.
- Energy Star-Qualified New Homes, Green Building and Renewable Energy.

Each of these training sessions is currently available on HUD's webcast archives.[20] The information has not yet been compiled into standardized training modules as proposed in HUD's 2006 report, however, due to funding limitations. Discussions with national intermediaries will take place in 2008 and 2009 to explore the feasibility of standard training programs.

[20] See www.hud.gov/webcasts/archives/envirhealth.cfm.

In addition to this Departmentwide training, more specialized training has been offered at a variety of venues. Beginning in October 2007, training workshops for public housing authorities on energy performance contracting have been offered in Atlanta, San Francisco, Little Rock, Honolulu, New York City, Jacksonville, Denver, and Boston. The Office of Native American Programs (ONAP) has also sponsored a series of 2-day training workshops on *Creating Energy Efficient, Comfortable and Healthy Tribal Homes* in the following locations: Santa Fe, Denver, Seattle, Portsmouth (New Hampshire), and Anchorage. A national conference was held in June 2008 in Reno, Nevada.

Finally, the HOME program prepared an energy training guide for Participating Jurisdictions (PJs) and Community Housing Development Organizations (CHDOs), *Building Energy Star Qualified Homes and Incorporating Energy Efficiency and Green Building in HOME-Funded Affordable Housing*. The training was first delivered in Omaha, Nebraska on April 1.

[ACTION 5]

ESTABLISH RESIDENTIAL ENERGY PARTNERSHIPS WITH CITIES, COUNTIES, STATES, AND OTHER LOCAL PARTNERS.

Planned Actions

5.1 Identify opportunities to implement energy partnerships with local communities (cities, counties, states, and/or private sector or nonprofit partners) as part of the HUD-DOE-EPA Partnership for Home Energy Efficiency.

5.2 Work with federal and state agencies to develop regional strategies for providing technical and program resources and services to external partners, and to promote more use of Energy Star-labeled products and construction practices.

5.3 Develop partnerships with program office customers and partners, with the Office of Field Policy and Management playing a facilitating role.

Progress To Date: See Action 23.

II. Community Planning and Development

The two primary programs administered by HUD's Office of Community Planning and Development are the HOME Investment Partnerships (HOME) and Community Development Block Grant (CDBG) formula grant programs, and these are addressed here. Some $1.7 billion in HOME funds are used for new construction and rehabilitation of existing housing, while $4 billion in CDBG funds are used for a variety of purposes, including home repair and rehabilitation. CPD's competitive grant programs, such as the McKinney Act homeless assistance program and the Rural Housing and Economic Development program, address energy through the SuperNOFA grant process and are addressed under Action 1.

Action	Community Planning and Development
6	Encourage energy efficiency in HOME- and CDBG-funded new construction and housing rehabilitation projects.
7	Identify opportunities and assist with feasibility analysis for Combined Heat and Power in public or assisted housing.

[ACTION 6]

ENCOURAGE ENERGY EFFICIENCY IN HOME- AND CDBG-FUNDED NEW CONSTRUCTION AND HOUSING REHABILITATION PROJECTS.

Planned Actions

6.1 Beginning in FY 2007, track the number of units built with HOME and CDBG funds to Energy Star standards through the Integrated Disbursement and Information System (IDIS).

6.2 Hold workshop sessions that present an "Energy Star for Grantees" presentation[21] and tap Energy Star experts and grantees who have adopted Energy Star for New Homes (or its equivalent for multifamily buildings) as the guideline for construction or major rehabilitation.

Progress To Date

HUD encourages voluntary adoption of Energy Star-qualified new homes as the standard for CDBG and HOME new construction and gut rehabilitation. HUD has implemented a new reporting requirement for CDBG and HOME grant recipients that requires them to report units that meet the standard for Energy Star-qualified new homes. The first results were reported through the Integrated Disbursement and Information System (IDIS) in 2007. The new reporting requirement provides extremely valuable information on the extent to which CDBG and HOME funds are supporting energy-efficient construction. At the same time, HUD is working to ensure that the data reported is accurate and reliable (Action 6.1).

[21] See www.hud.gov/offices/cpd/library/energy/energystargrantees.ppt.

CPD field offices reported holding 83 events promoting Energy Star-qualified new homes in 2007. These included workshops with program participants, presentations of the PowerPoint presentation "Energy Star for Grantees" that explains Energy Star for New Homes and what steps grantees should follow to adopt the Energy Star standard for HOME and CDBG programs (Action 6.2).

The HOME program also prepared an energy training guide, *Building Energy Star Qualified Homes and Incorporating Energy Efficiency and Green Building in HOME-Funded Affordable Housing*. The new curriculum was delivered for the first time in Omaha, Nebraska, in April 2008. In addition, in May 2008, the HOME program issued a new Notice of Funds Availability providing a competitive reallocation of $1.5 million for *Energy Efficient and Environmentally Friendly Housing for Low-Income Families.*[22] The grant announcement provided points for energy-efficient, green building, and renewable energy technologies.

Results

By the end of 2007, 3,856 new HOME-funded homes were reported to HUD as meeting the Energy Star standard—approximately 17 percent of all new HOME-funded units that year. The goal for 2008 is to increase that number by 10 percent, focusing on states that reported few or no certifications in 2007. As of the third quarter of 2008, the total reported for HOME was 4,634 units, or 20 percent above the 2007 level. Also as of the third quarter, CDBG reports 250 new homes certified for Energy Star construction, twice the total for 2007.

While CPD is now receiving information on the number of units that are being built to the Energy Star standard, it is not known how many CDBG or HOME grantees have adopted Energy Star as an overall standard for new construction, gut rehabilitation, or product or appliance purchases. However, an increasing number of municipalities are moving in that direction. For example, in February 2008 the City Council of Kansas City, Kansas, adopted a resolution requiring that all new and gut rehabilitation buildings with up to three stories shall be designed to meet the standard for Energy Star-qualified new homes.

[ACTION 7]

IDENTIFY OPPORTUNITIES AND ASSIST WITH FEASIBILITY ANALYSIS FOR COMBINED HEAT AND POWER IN PUBLIC OR ASSISTED HOUSING.

HUD's energy strategy includes an initiative to promote the installation of combined heat and power (CHP) systems in existing multifamily buildings. Combined heat and power, also known as cogeneration, generates some or all of the electricity needed by a building, with the heat that would otherwise be wasted used to provide heating and/or cooling for the property.[23] The primary market for these systems is likely to come from almost 7,300 assisted multifamily and public housing projects with

[22] *Federal Register*, May 16, 2008, p. 28664.

[23] For an overview of this initiative, see webcast at www.hud.gov/webcasts/archives/envirhealth.cfm.

100 or more units.[24] In 2004, for example, a 301-unit senior housing project in Massachusetts installed a 75 kilowatt system that provides 42 percent of the electricity and 33 percent of the space heating and domestic hot water used at the site. The cost of installation was approximately $175,000, for a payback of 5.7 years.

Planned Actions

7.1 Extend HUD's Interagency Agreement on Combined Heat and Power with Oak Ridge National Laboratory.

7.2 Continue to work with DOE and EPA to support the use of Combined Heat and Power in public and assisted multifamily housing.

Progress To Date

To introduce building owners to the value of combined heat and power, HUD and the Department of Energy (Oak Ridge National Laboratories) developed two guidebooks[25] as well as preliminary screening software that could be used by property managers to assess the potential for this technology in their buildings.[26] HUD programs have begun to incorporate material on this technology.[27]

In 2007, the Oak Ridge National Laboratory expanded the scope of the feasibility screening software to include space heating and cooling. Also in 2007, HUD completed feasibility assessments in 20 HUD-assisted multifamily buildings. The software provides a preliminary calculation of the potential return on investment for installing CHP in a multifamily building. The software is posted on the Oak Ridge and HUD websites, along with a revised guide, *Feasibility Screening for Multifamily Housing*. A sample screen is reprinted on the next page.

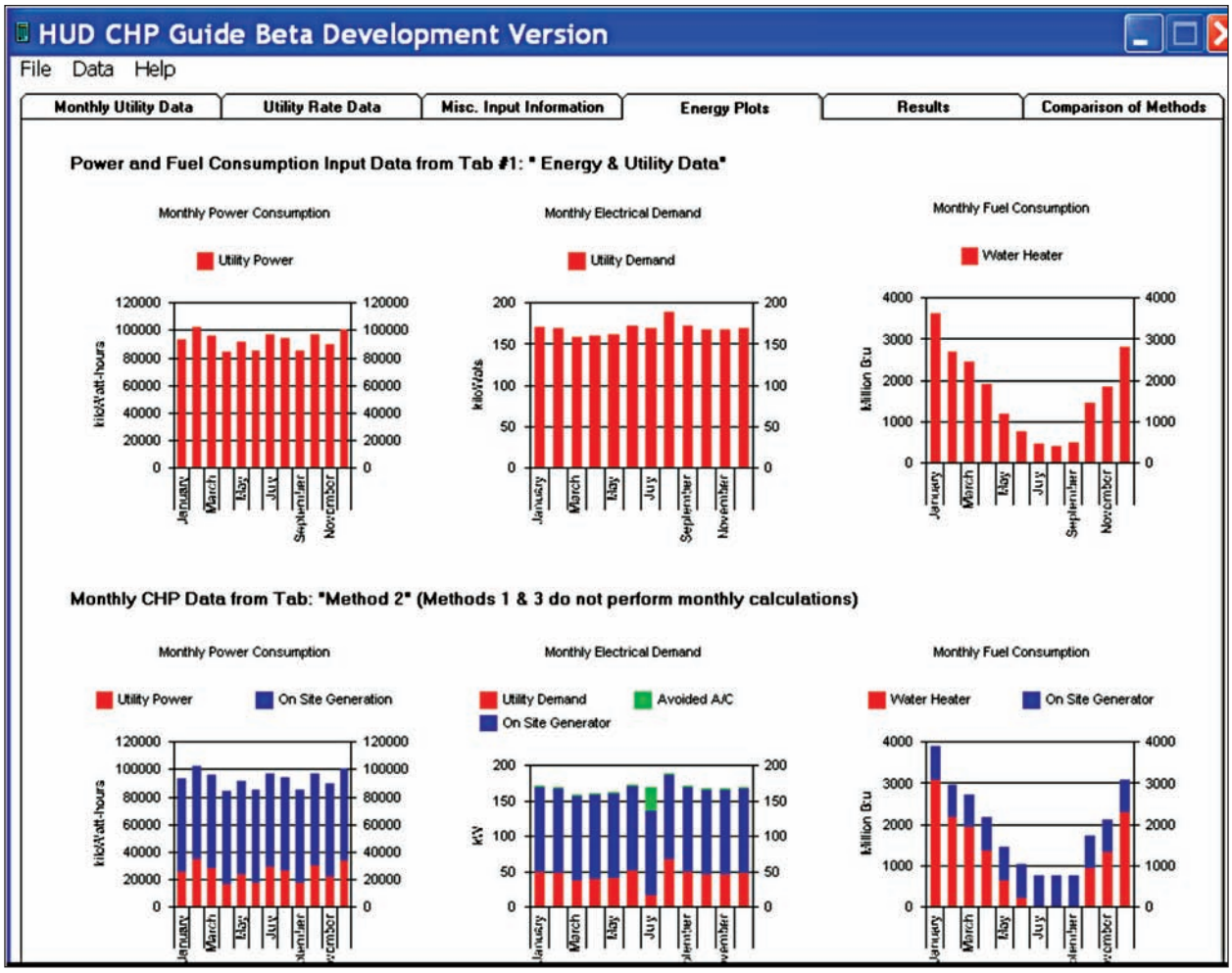
Several of the Department of Energy's Regional Application Centers assisted in identifying properties utilizing the feasibility analysis. One of these, the Midwest Regional Application Center, is following up with a more intensive (Phase II) analysis for an apartment building in Chicago.

[24] These are 1,790 public housing properties and 5,490 active multifamily properties.

[25] See Guide #1: *Q and A on Combined Heat and Power for Multifamily Housing, Guide #2: Feasibility Screening for Combined Heat and Power in Multifamily Housing* at www.hud.gov/offices/cpd/library/energy/index.cfm.

[26] See http://eber.ed.ornl.gov/HUD_CHP_Guide_version_2.1.

[27] Combined heat and power has been included in the update of the HOME Energy Guide, *Building Energy Star Qualified Homes and Incorporating Energy Efficiency*, in the Mark to Market Green Initiative and in Public Housing Notice 2008-25.



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[28] A summary of these efforts can be found in the proceedings of the ACEEE 2008 Summer Study on Energy Efficiency in Buildings. See Groberg, Robert, J., Michael Macdonald, and Patti Garland, 2008. "Promoting Combined Heat and Power (CHP) for Multifamily Properties," in *Proceedings of the ACEEE 2008 Summer Study on Energy Efficiency in Buildings, 2.106-17*. Washington, D.C.: American Council for an Energy-Efficient Economy.

III. Public and Indian Housing

HUD provides operating subsidies and capital grants for approximately 13,000 public housing properties, with 1.2 million units. Of the $6.1 billion in operating subsidies provided in 2006, approximately $1.43 billion was spent on PHA-paid utilities. Five actions are included in HUD's energy strategy for public housing.

Action	Public and Indian Housing
8	Base appliance and product purchases in public housing on Energy Star standards, unless the purchases are not cost effective.
9	Build HOPE VI developments to a high level of energy efficiency.
10	Improve tracking and monitoring of energy efficiency in public housing.
11	Streamline energy performance contracting in public housing.
12	Promote energy conservation in federally assisted housing on Indian tribal lands.

The policy and regulatory environment for energy efficiency in public housing continues to evolve, as HUD shifts to asset management in public housing and addresses several new statutory requirements established by Congress.

Changes in the Public Housing Regulatory Environment:

- *The transition to asset management.* Begun in 2005, HUD continues to implement the new asset management model for public housing.[29] The shift to asset management includes a requirement that housing authorities report utility consumption (in addition to expenditure) for individual properties, rather than on an agencywide basis. This provides an opportunity to track increases or decreases in energy consumption and to enable housing authorities to assess their energy use against HUD's benchmarking model.

- *Growing interest in green building.* HUD has responded to the growing interest in green building with Notice 2008-25. This Notice encourages public housing authorities to use solar, wind and other renewable energy sources, and other green construction and rehabilitation techniques when they buy appliances or renovate or build new housing. The Notice, *Renewable Energy and Green Construction Practices in Public Housing*, was issued in June 2008.

[29] Asset management is described in Revisions to the Public Housing Operating Program: Final Rule, published September 19, 2005, in the *Federal Register* (79 FR 54983). The rule implemented recommendations of the Harvard University Graduate School of Design that public housing adopt a business model similar to multifamily housing, with project-based budgeting, project-based accounting, and project-based management. This business model became known as "asset management."

Congressional Actions Impacting Public Housing:

- *Implementing key provisions of energy legislation.* HUD is preparing for publication revised regulations at 24 CFR 965 and 24 CFR 990.185 that will implement several provisions of the Energy Policy Act of 2005 related to public housing. These provisions include extending the term of energy performance contracts from 12 to 20 years and requiring public housing authorities to buy Energy Star appliances whenever it is cost effective. The updated regulation will also reflect much-needed energy audit and utility metering guidance. HUD will also publish guidance for field offices and public housing authorities on procedures for implementing energy performance contracts with terms that exceed the current 12-year limit.
- *Higher energy standards for HOPE VI and new construction in public housing.* The Energy Policy Act set the 2003 International Energy Conservation Code (IECC) as the minimum standard for HOPE VI new construction and rehabilitation. The more recent Energy Independence and Security Act of 2007 requires HUD to raise the standard for new construction in public housing (including HOPE VI) to the 2006 IECC.

[ACTION 8]

BASE APPLIANCE AND PRODUCT PURCHASES IN PUBLIC HOUSING ON ENERGY STAR STANDARDS, UNLESS THE PURCHASES ARE NOT COST EFFECTIVE.

Planned Actions

8.1 Publish a regulation to implement the provision of the 2005 Act establishing Energy Star as the standard for PHA procurements, unless not cost-effective.

8.2 Field offices will host events promoting Energy Star and other energy efficiency opportunities.

8.3 Continue to provide information to public housing authorities through the Public Housing Energy Conservation Clearinghouse.

8.4 Contract for an analysis of the impact of Energy Star on public housing authorities.

Progress to Date

The Energy Policy Act of 2005 required public housing authorities to adopt Energy Star (or FEMP-designated products)[30] as the standard for procuring products and appliances, unless not cost-effective. Products purchased by housing authorities likely to be impacted by this provision include lighting, refrigerators, clothes washers, windows, furnaces, and other products receiving the Energy Star label.[31]

[30] FEMP—Federal Energy Management Program.

[31] For a full list of Energy Star-labeled products and appliances, see www.energystar.gov.

Pursuant to the Energy Policy Act, HUD reissued Notice PIH 2007-30. The notice encourages using *Energy Star to promote Energy Efficiency in Public Housing* as the standard for public housing, as follows: "PHAs should purchase Energy Star equipment such as appliances when economically feasible," and "PHAs should purchase Energy Star-labeled products such as windows and ensure that any new buildings are constructed according to Energy Star standards, unless the PHA performs an economic analysis that finds the incremental cost of the Energy Star product or building yields a negative life-cycle cost savings." HUD is also currently revising its regulations to implement the Energy Policy Act's Energy Star requirements (Action 8.1).

In addition, HUD's public housing field offices have regularly hosted outreach events promoting Energy Star and other energy efficiency opportunities, and they have provided guidance in procurement practices that facilitate utility conservation. Approximately 100 energy conservation outreach activities were conducted in 2007 (Action 8.2).

Earlier this year, the Public Housing Energy and Conservation Clearinghouse was revised to reflect a broader range of environmental, energy, safety, green building, and sustainability topics. The website was renamed the Public Housing Environmental and Conservation Clearinghouse (PHECC), and reformatted to improve access to guidance, best practices, and monthly e-newsletters. The Clearinghouse provides information on saving water and energy, protecting the environment, approaches to managing utilities, preventive maintenance practices, and electricity deregulation. The Clearinghouse can be found at www.hud.gov/offices/pih/programs/ph/phecc (Action 8.3).

Results

A survey of public housing authorities to gauge their knowledge of Energy Star and the extent to which they purchase Energy Star-qualified products was completed in June 2008 (Action 8.4). HUD surveyed 3,165 housing authorities; responses were received from 1,549. Fifty-three percent reported that they specify Energy Star-qualified products in their procurement plans. This includes 24 percent specifying Energy Star-qualified products and 29 percent specifying them when the products are shown to be cost-effective.

[ACTION 9]

BUILD HOPE VI DEVELOPMENTS TO A HIGH LEVEL OF ENERGY EFFICIENCY.

Planned Actions

9.1 Pursuant to the Energy Policy Act of 2005, publish a proposed rule establishing the 2003 International Energy Conservation Code as the minimum standard for HOPE VI housing.

9.2 Continue to provide a rating point incentive for new HOPE VI grant awards, for projects meeting the higher standard for Energy Star-qualified new homes.

9.3 Encourage Energy Star as the standard for previously awarded HOPE VI projects that are still in the planning stages.

9.4 Monitor 15 current HOPE VI construction projects to assess implementation of energy conservation measures as part of the construction phase and encourage the use of Energy Star appliances and equipment, where cost-effective.

9.5 Distribute best practices compiled in FY 2005 and FY 2006 to public housing authorities and project sponsors, who will be encouraged to emphasize implementation of energy conservation in all aspects of HOPE VI construction and operation.

Progress To Date

The Energy Policy Act of 2005 required that all HOPE VI projects be built to "meet or exceed" the 2003 International Energy Conservation Code (IECC). This represented a significant increase in energy efficiency over the previous standard (the 1992 Model Energy Code). Subsequently, the Energy Independence and Security Act, enacted by Congress in 2007, raised the standard even further, to the 2006 IECC. HUD is currently drafting a regulation requiring that HOPE VI projects meet this minimum standard (Action 9.1).

For several years, HUD has included language in its Notice of Funding Availability (NOFA) that encourages the adoption of Energy Star in new HOPE VI projects and, for the past 4 years (2005 through 2008), has provided a rating point incentive (1 point out of 125 points) for energy efficiency. Candidates are awarded one point if they: (1) use Energy Star-labeled products,

High Point, Seattle
Seattle Housing Authority

The first phase of this new mixed-income HOPE VI project consists of 320 new homeownership units and 460 rental units. Energy-efficient and green features included: low VOC paints, adhesives, and cabinets; airtight dry wall construction; modified advance framing/panelized walls; compact fluorescent lighting; Energy Star-labeled front-loaded washers and dryers; whole house fans; a closed-loop hydronic HVAC system; instantaneous hot water heaters; higher R value windows. In addition, 35 "Breathe Easy Homes" incorporated a number of features aimed at improving indoor air quality, including a high efficiency closed-loop boiler; filtered fresh air intake ports; low-E coated and argon-filled Energy Star windows.

(2) promote Energy Star design of replacement units, and (3) include Energy Star in homeownership counseling. In addition, HUD staff has provided information on the Energy Star Builder Option Packages (BOPs) and additional information on Energy Star for qualified new homes during initial site visits for new grantees (Action 9.2).

HUD is currently preparing a procurement that will enable it to provide information and technical support to HOPE VI grantees on both Energy Star and green building standards. It is expected that the procurement will be awarded in FY 2009 (Action 9.3 and Action 9.5).

Results

Energy efficiency in HOPE VI projects remains a voluntary activity, to be implemented at the discretion of the sponsoring housing authority and its developer. While there are several standout projects, anecdotal evidence indicates that most HOPE VI projects historically have not incorporated green building practices or built to the Energy Star standard for new homes, unless additional funds have been provided by state and local resources.

That may be changing. All but 3 of the 63 applicants for HOPE VI funding in 2005–07 received a bonus point for energy efficiency. All five of the winning entries in 2007 were awarded the bonus point, as were all four of the 2006 winning entries.

While HUD does not currently maintain a list of HOPE VI projects that are built to Energy Star for New Homes, PIH is awarding a technical assistance contract later this year through which the contractor will develop such a list, as well as undertake other capacity-building and monitoring activities related to green building.

Each year HUD surveys a sample of 15 or more HOPE VI projects. In 2008, 29 housing authorities representing 35 different HOPE VI developments on 49 sites responded to the survey. Every HUD region except for Region 1 was represented. Thirteen of the 49 sites, with 1,695 units, reported achieving the Energy Star label for new homes. Thirty-six of the 49 sites reported that they specify Energy Star products or appliances.

The 2008 data is consistent with results from previous surveys. Eleven of the 70 previously surveyed HOPE VI sites reported homes that received the Energy Star for New Homes label. Overall, energy use in the sampled HOPE VI properties was estimated to be 17 percent below other properties, and those sites certified as Energy Star reported savings of up to 25 percent compared with other properties.

There are several outstanding projects that demonstrate what can be done to incorporate energy efficiency and green building in HOPE VI, either by leveraging state or local resources, or by creatively using HOPE VI funds. One project, Maverick Gardens in Boston, with support from the state of Massachusetts and the U.S. Department of Energy, includes a solar photovoltaic energy component, as well as a combined heat and power (cogeneration) system. Several HOPE VI projects in New Jersey have adopted the standard for Energy Star-qualified new homes (using state rebates), as have additional projects in Milwaukee, Wisconsin (Cherry Court); Louisville, Kentucky (Liberty Green);

Seattle, Washington (High Point); Tacoma, Washington (Salishan); King County, Washington (Greenbridge); Oakland, California (Chestnut Linden Court); and Portland, Oregon (New Columbia).

[ACTION 10]

IMPROVE TRACKING AND MONITORING OF ENERGY EFFICIENCY IN PUBLIC HOUSING.

Planned Actions

10.1 Provide guidance through Notices on energy auditing standards and approaches for leveraging PHA operating and capital resources to implement energy efficiency programs, as well as through information on the Public Housing Energy Conservation Clearinghouse (PHECC).

10.2 Continue the public housing benchmarking initiative as part of the overall shift to asset management.

Progress To Date

Reporting utility consumption

Historically, the only energy data reported by housing authorities to HUD consisted of authority-wide utility consumption and expenditures (dollars), but the consumption data were not captured in an automated system. The absence of energy consumption data for individual properties or projects made it difficult to set benchmarks for energy consumption, to identify top or poor performers, or to measure energy savings over time. That is beginning to change with the current shift to asset management.

Under asset management, housing authorities began to report utility consumption (therms, gallons of heating oil, kilowatt hours) for individual properties in an automated system, the Subsidy and Grants Information System (SAGIS). This data will provide each housing authority with baseline information to monitor the results of its energy conservation programs and also provide HUD with a more accurate picture of energy consumption throughout the public housing stock. The data will be available for analysis for the first time in August 2008.

Utility benchmarking

Using a benchmarking approach developed through a partnership with the Environmental Protection Agency and Oak Ridge National Laboratories, HUD has developed an easy-to-use utility benchmarking model for public housing. The model met three objectives: first, to demonstrate that utilities can be benchmarked in public housing with a high degree of reliability (i.e., that the model is a good predictor of consumption in individual properties); second, to develop a preferred utility benchmarking approach, after consideration of a variety of methodologies; and third, to demonstrate that benchmarking can be useful to a housing authority in targeting low-performing buildings.

The benchmarking model now represents one of the largest databases of utility consumption in residential properties in the country. In 2005, a proof of concept model was developed with data from 595 buildings in HUD Regions 2 and 3, and in 2006 this was expanded to eight HUD regions, for a total of 4,722 properties from 161 housing authorities nationwide. The tool was posted on the web in June 2008 and is now available for use by housing authorities. (See www.hud.gov/offices/pih/programs/ph/phecc/econserve.cfm.)

The benchmarking model will allow housing authorities to quickly determine how well their properties are doing against a reliable benchmark for particular building types in different climate zones. It covers all public housing property types, from high-rise buildings to single-family properties. (See Appendix 2.)

HUD is continuing to develop its Benchmarking and Utility Consumption and Cost System (BUCCS) to track and monitor consumption at the project level as part of the transition of public housing to asset management. HUD anticipates that an expansion of the current pilot approach will provide a useful tool for budgeting, allocating utility resources, and measuring performance. After completing a feasibility study inclusive of industry interests, HUD will convene a meeting with representation of appropriate stakeholders to review utility benchmarking options as required by the asset management regulations at 24 CFR 990.185(c).

Energy auditing standards

HUD regulations require housing authorities to conduct an energy audit every 5 years and to incorporate the most cost-effective energy efficiency measures in their capital plans. HUD suggests that faster payback items be funded first. HUD requires that conservation measures be funded first from operating funds, then from alternative sources such as operating reserves, and finally from capital funds or redevelopment funds, where available. Housing authorities may also use third-party financing.

HUD provides performance criteria for the energy audit, but does not provide a prescriptive format. Housing authorities are provided maximum flexibility in program administration, specifically related to lowering utility consumption and costs in the most efficient and effective ways possible. Comprehensive guidance on conducting energy audits is available at two HUD websites.[32]

HUD's 2006 and 2007 Management Plans included a performance measure that required field offices to verify that all housing authorities had a current energy audit on file.

Streamlining utility reporting

HUD is piloting a system for downloading public housing energy bills directly from utility companies. Four initial pilot sites have been identified: Denver Housing Authority, Colorado; Prince George's County Housing Authority, Maryland; Marion County Housing Authority, Illinois; and

[32] See www.hud.gov/offices/pih/programs/ph/phecc/noteworthy/noteworthyarchive.cfm and www.hud.gov/offices/cpd/affordablehousing/training/web/energy/help/audits.cfm.

Auburn Housing Authority, Maine. HUD has also requested participation from nine additional sites in Maryland.

The objective of the pilot is to provide HUD with a management tool that will enable both HUD and housing authorities to better manage utility costs. The pilot is aimed at streamlining the capture of utility data from housing authorities, by automatically downloading the information from local utilities. The data can then be used to validate reporting of utilities by public housing authorities (HUD form-52722) and to identify buildings that could benefit from implementation of energy conservation measures.

[ACTION 11]

STREAMLINE ENERGY PERFORMANCE CONTRACTING IN PUBLIC HOUSING.

Authorized by Congress in 1992, energy performance contracting is the primary tool available to public housing authorities for carrying out energy efficiency in public housing. An energy performance contract is an agreement with a private energy services company (ESCO) that provides financing for energy efficiency measures; oversees the installation of these measures; and provides long-term services, such as monitoring of energy use, training of maintenance staff, and energy education of residents.

Typically, the ESCO guarantees a certain level of savings and "shares" the savings with the housing authority. Under a performance contract, housing authorities are able to retain 100 percent of the savings for the duration of the contract (12 to 20 years). (For energy efficiency investments not financed through energy performance contracts, housing authorities can retain 75 percent of the savings, for no more than 3 years.) Housing authorities are also allowed to act as their own performance contractor and take advantage of this initiative.

Planned Actions

11.1 Continue to support energy performance contracting as a vehicle for implementing energy efficiency.

11.2 Field offices will continue to streamline the procedures for reviewing energy performance contracts so that they are reviewed in a timely manner.

11.3 Revise regulations at 24 CFR 965 and 24 CFR 990.185 to address the provisions of the 2005 Energy Policy Act.

11.4 Implement the provisions of the 2005 Energy Policy Act extending performance contracts from 12 to 20 years.

11.5 Implement new quality assurance initiatives that will track energy performance contract activity.

11.6 Update regulations to ensure consistency with other regulatory changes.

11.7 Support extending energy performance contracts to smaller public housing authorities through "aggregated" contracts involving multiple public housing authorities.

11.8 Work with public housing authorities wishing to act as their own agent to serve as their own performance contractor.

Progress To Date

Several actions have been taken to strengthen the role of energy performance contracting as an energy financing tool for housing authorities. These include: (1) issuing a new notice (Notice 2008-22) implementing the provision of the Energy Policy Act of 2005 that extends the maximum term of a contract from 12 to 20 years, (2) strengthening technical support to housing authorities, (3) identifying strategies for enabling smaller housing authorities to utilize energy performance contracts, and (4) conducting training workshops for housing authorities (Action 11.1).

- *Streamlining review of performance contracts.* HUD has conducted a series of training workshops to support field offices and housing authorities in implementing energy performance contracts. Over the past 12 months workshops have been held in Atlanta, San Francisco, Little Rock, Honolulu, New York City, Jacksonville, Denver, and Boston. In addition to the workshops, HUD retained an engineering firm (New West Technologies) to help housing authorities review and implement these contracts and to train local HUD staff in coordinating and processing energy performance contracts. A total of 39 energy contracts have been facilitated to date (Action 11.2).

- *Extending length of performance contracts from 12 to 20 years.* HUD is currently revising its regulations to implement provisions in the Energy Policy Act of 2005 as well as the 2008 Consolidated Appropriations Act. These provisions extend the term of both new and existing performance contracts from 12 to 20 years. The longer contract term will enable housing authorities to expand the scope and scale of their investments in energy efficiency. Until the new regulations are issued, HUD will continue to issue waivers to extend the term of energy performance contracts to 20 years. HUD also published PIH Notice 2008-22, which provided guidance for field offices and housing authorities in 2008 on implementing the extended contract term (Action 11.4).

- *New quality assurance initiatives*. HUD is currently revising its Energy Performance Contracting Handbook, otherwise known as the "Green Book." When a draft of the Green Book is completed, HUD will conduct a workshop with energy services companies, third-party consultants, housing authorities, and HUD field staff to resolve any issues related to the proposed procedures. A final document will be produced that represents the best thinking of stakeholders in energy performance contracting (Action 11.5).

- *Aggregated contracts for smaller housing authorities.* Historically, the use of energy performance contracts has been limited to larger housing authorities. HUD has begun to promote energy perfor-

mance contracts for smaller public housing authorities through "aggregated" contracts that involve multiple smaller public housing authorities joining forces on a single contract. This aggregated approach is being tested in two locations—New Jersey and Southern California (Action 11.6).

- *Housing authorities acting as their own performance contractor.* HUD is also working with housing authorities that wish to serve as their own performance contractor, rather than using a third-party ESCO. The primary advantage of working with a housing authority on a self-developed project is higher retained energy savings. However, in exchange for greater savings, the authority assumes a greater share of the risk. A housing authority will therefore need to ensure it has the capacity to manage its own energy project successfully; it will need to demonstrate expertise in energy engineering, knowledge of HUD's rules and regulations, financing, building commissioning, construction management, and performance measurement and verification. As of March 2008, 14 housing authorities have self-financed projects under way. Of 21 prospective energy performance contracts, 5 are currently slated to be self-developed by the housing authority.

Results

Streamlined processing, combined with private sector initiative, has resulted in a significant increase in the number of executed energy performance contracts in public housing. As of October 1, 2007, a total of 154 active executed energy service contracts were in force. From October 2006 to October 2007, the guaranteed savings of all energy performance contracts increased by 81 percent, from $37.6 million to $68 million. Energy conservation investments as of October 2007 totaled $471.6 million, representing an increase of almost $121 million (approximately 35 percent) over the previous year.

As of March 2008, the number of energy performance contracts had increased to 183, representing a total investment of $564 million with annual savings of $102.8 million; 168 contracts are in repayment, 5 are currently under construction or have signed a contract to begin construction, and 10 have completed repayment. Another 21 projects are in progress, 7 projects have completed an investment grade audit, and another 14 are in the preaudit stage. These contracts now total 204 projects.

[ACTION 12]

PROMOTE ENERGY CONSERVATION IN FEDERALLY ASSISTED HOUSING ON INDIAN TRIBAL LANDS.

Title V, "Indian Energy," of the 2005 Energy Policy Act, contains Section 506, "Energy Efficiency in Federally Assisted Housing." Section 506 directs HUD to "promote energy conservation in housing that is located on Indian land and assisted with Federal resources," through the following:

- Use of energy-efficient technologies and innovations (including the procurement of energy-efficient refrigerators and other appliances).

- Promotion of shared savings contracts.

- Use and implementation of such technologies and innovations as the Secretary of HUD deems appropriate.

Section 506 also makes energy efficiency activities eligible costs under the Native American Housing Assistance and Self-Determination Act of 1996 (NAHASDA). Section 202(2) of NAHASDA was recently amended by adding a specific reference to improving energy efficiency as an eligible affordable housing activity.

Planned Actions

12.1 Offer a one-point incentive in Indian Community Development Block Grant (ICDBG) competitive grant programs for applications that address Energy Star goals.

12.2 The Northern Plains Office of Native American Programs (ONAP) will work with EPA's Office of Pollution Prevention and Toxics on green team training, which includes energy efficiency.

12.3 The Northwest ONAP will provide technical assistance to emphasize green/energy-efficient design and construction, with a focus on assessing existing "green housing," developing a training program, providing technical assistance, and conducting workshops to share information on innovative projects that are occurring in the Pacific Northwest. A training manual will be developed for use in all other ONAP regions.

12.4 The Northern Plains ONAP will establish relationships with the Department of Energy's Tribal Energy Program, the Department of Interior's Division of Energy and Mineral Development, the University of Colorado, the National Renewable Energy Laboratory, and others.

12.5 As an adjunct to its study of Indian housing costs, ONAP will expand its onsite work to conduct a more complete review of Indian housing utility costs. On completion of the surveys, the contractor will provide a more comprehensive report to HUD addressing common problem areas and recommended solutions. ONAP will provide the report to all tribes and TDHEs.

12.6 Explore marketing Energy Efficient Mortgages as a priority loan product.

12.7 Continue discussing collaboration and potential partnerships on renewable energy resources and geothermal energy with the Department of Interior's Office of Indian Energy Resource Development and the Bureau of Indian Affairs' Office of Policy and Economic Development.

Progress To Date

The Office of Native American Programs (ONAP) promotes energy-efficient construction, including the use of energy-efficient building materials, Energy Star appliances, windows, insulation, and heating systems in housing units funded by NAHASDA grants. ONAP also encourages tribes and tribally designated development entities (TDHEs) to use the variance provision in the Total Development Cost (TDC) Notice (PIH Notice 2007-11) for green building practices. This provision can accommodate additional costs associated with the use of energy-efficient materials.

ONAP has taken several additional actions:

- Beginning in FY 2007, Indian Community Development Block Grant (ICDBG) applicants may receive a one-point incentive on applications that address Energy Star goals (Action 12.1). ONAP is also exploring coordination with EPA's Office of Pollution Prevention and Toxics on disseminating green building materials to Native American tribes (Action 12.2).

- ONAP has initiated an active training program on energy-efficient and green building in Indian housing (Action 12.3). In 2006 ONAP sponsored an initial energy efficiency training, *Building Green: Sustainable & Innovative Design for the Tribes of the Northwest*. Course objectives included learning about the basic concepts of green or sustainable home design through discussion, presentation, and hands-on activities. Special emphasis was placed on understanding and applying an integrated approach to design, right from the beginning.

  Training concepts from this initial workshop were used in developing training throughout Indian Country. One national training and five regional trainings on *Creating Energy-Efficient, Comfortable, and Healthy Tribal Homes* have been held since December 2007. Topics covered include indoor air quality, mold, mildew, and moisture problems; insulation; water management; partnerships and financing; proper weatherization; and renewable energy efficiency techniques.[33] In addition, in November 2007, ONAP awarded a contract to conduct 12 energy-related, on-site visits per year, as well as 6 "Energy Efficiency" trainings to recipients. The site visits include mold and moisture assessments and energy assessments of tribal homes at each site, for a total of 48 assessments.

- The Northern Plains ONAP has assisted in the promotion of Department of Energy workshops in Denver, Colorado: a "Tribal Business Development and Financing Workshop," and a "Tribal Energy Program Review" (Action 12.4).

- In March 2006 ONAP expanded the scope of its Indian Housing Operating Cost Study work to address provisions of the Energy Policy Act of 2005. ONAP conducted 15 on-site energy assessments for tribes and TDHEs. The assessments considered energy costs, sources of energy, energy delivery methods, and the results of home energy efficiency assessments. Home inspections included

[33] A national workshop was held June 17–19, 2008, in Reno, Nevada. Regional training workshops have been held, as follows: Santa Fe, New Mexico, December 11–12, 2007; Denver, Colorado, February 27–28, 2008; Seattle, Washington, March 18–19, 2008; Portsmouth, New Hampshire, April 15–16, 2008; Anchorage, Alaska, May 5–6, 2008.

an assessment of the energy efficiency performance of the home and identification of specific improvements to increase energy efficiency. When utility bills were available, cost analyses were conducted. At least four preselected homes were assessed at each site (Action 12.5).[34]

- ONAP's Office of Loan Guarantee responded to inquiries on Energy Efficient Mortgages, but found the cost of green construction to be problematic for the Section 184 Indian Housing Loan Guarantee program (Action 12.6).

[34] The Notice extended PIH Notice 2006-17, *Total Development Costs for Affordable Housing under the Native American Housing Assistance and Self-Determination Act of 1996, NAHASDA*. This Notice provides for a variance for "significant additional costs for incorporating green building, energy efficiency or other innovative practices." See www.hud.gov/offices/pih/publications/notices/06/pih2006-17.pdf.

IV. Housing—Single Family

HUD's energy strategy includes the following three actions aimed at increasing the visibility and use of FHA-insured Energy Efficient Mortgages and other FHA mortgage products for energy efficiency.

Action	Housing—Single Family
13	Feature the Energy Efficient Mortgage as a priority loan product.
14	Provide training on how FHA single-family programs can be effectively used to promote energy efficiency.
15	Continue improved tracking, and evaluate performance, of Energy Efficient Mortgages.

In its FY 2007 Management Report, FHA reports a total of 3.7 million insured single-family mortgages and 12,156 insured multifamily projects in its portfolio. Total mortgage insurance in force is currently just under $400 billion. FHA's single-family mortgage insurance business is 85.67 percent of its total insurance in force. The multifamily and healthcare insurance is 14.16 percent of the total. Title I property improvement insurance and manufactured home insurance are 0.17 percent of insurance in force.[35]

FHA's Energy-Related Mortgage Products

FHA has several products that allow borrowers to address energy efficiency in single-family housing. These products include:

- *Energy Efficient Mortgages (EEM)*—The Energy Efficient Mortgage for single-family borrowers permits a borrower to finance up to 5 percent of the cost of eligible energy-efficient improvements, without a second appraisal and without further credit qualification of the borrower. The Energy Efficient Mortgage can be used with both purchase and refinance transactions and in new and existing homes. The recently enacted Housing and Economic Recovery Act of 2008 removes the previous $8,000 cap on the amount that can be financed.

- *Energy Efficient Homes (EEH*)—New single-family homes that are built to the 2000 International Energy Conservation Code (IECC) are eligible for a 2 percent "stretch" on standard debt-to-income ratios. Higher ratios are justified by the anticipated energy cost savings associated with the property.

- *FHA's 203(k) Rehabilitation Program*—This is a purchase-rehab program that can be used to make energy conservation improvements at the time of purchase. Energy-efficient improvements, such as new double-pane windows, insulation, solar domestic hot water systems, caulking, and weatherstripping can be included with other improvements or repairs.

- *FHA's Title I Property Improvement Program*—This is a home improvement loan that can be used to improve the energy efficiency of a home. Title I loans are usually second loans. While their pri-

[35] FHA Annual Management Report, FY 2007.

mary use is to make needed repairs or improvements to residential properties, Title I loans can also be used for weatherization or other energy conservation improvements. The maximum loan amount is $25,000.

- *Weatherization*—Borrowers may include up to $3,500 to pay for basic weatherization items as part of a standard FHA loan. Eligible measures include thermostats, insulation, storm windows and doors, weatherstripping and caulking, and similar building envelope improvements. Up to $2,000 may be added to the mortgage amount without a separate value determination; or up to $3,500 if supported by a determination by an approved or FHA appraiser or underwriter.[36]

[ACTION 13]

FEATURE THE ENERGY EFFICIENT MORTGAGE AS A PRIORITY LOAN PRODUCT.

Planned Actions

13.1 Through HUD's four Homeownership Centers, take steps to increase consumer awareness of Energy Efficient Mortgages.

13.2 Promote the use of the Energy Efficient Mortgage with the 203(k) Rehabilitation program, as well as other single-family loan products.

13.3 Continue Energy Efficient Mortgage marketing efforts.

13.4 Provide information to industry partners, such as lenders, housing counseling agencies, and real estate agents.

Progress To Date

While Energy Efficient Mortgages were first authorized by Congress in 1992 and subsequently expanded to a national program, they remain an underutilized FHA product. While the theory behind the Energy Efficient Mortgage is sound—financing energy improvements through energy savings, at the time of sale—the product has not made significant inroads in the marketplace. This experience is true for FHA as well as for Fannie Mae, Freddie Mac, and the Department of Veterans Affairs (VA), all of which are authorized to offer this product.

HUD's original Energy Action Plan, adopted in April 2002, and the August 2006 Report to Congress both included a proposal to make the Energy Efficient Mortgage a "priority loan product" and to undertake a variety of lender training and consumer education and marketing efforts to expand the use

[36] A contractor's statement of cost of work completed or a buyer's estimate of the cost of materials must be submitted. See HUD Handbook 4150.1 REV-1 and HUD Handbook 4145.1 REV-2 for details.

of this product. These actions have not been implemented, beyond routine FHA outreach and training, primarily due to a lack of marketing funds, insufficient incentive for lenders to underwrite the product, and the difficulty of incorporating the energy elements of the mortgage into the standard underwriting/loan closing process.

In addition, in light of the sharp fall-off in the size of the overall FHA portfolio in 2006 and 2007 and the pressing need to reform the underlying FHA portfolio of products in order to serve underserved customers, FHA has not viewed the Energy Efficient Mortgage as a vehicle for increasing market share.

However, information and training on Energy Efficient Mortgages have been provided to lenders as part of industry trainings, and brochures on Energy Efficient Mortgages have been distributed to consumers at homeownership fairs (Action 14).

Results

FHA insured a total of 532,494 mortgages in 2007, of which 281,883 were initial purchase endorsements and 69,061 were minority first-time homebuyers. The majority of these were Section 203(b) mortgages (403,000). Of these, 1,066 Energy Efficient Mortgages were reported; 861 Energy Efficient Mortgages were reported in 2006.[37]

Year	Number
2005	430[38]
2006	861
2007	1,066

The following is a list of participating lenders: National City Bank; Meridias Capital Inc.; Metro Lending Inc.; Heartwell Mortgage Corporation; Summit First Financial LLC; Columbus Home Mortgage LP; Endeavor Capital Mortgage LP; Colony Mortgage Corporation; Virginia Housing Development Authority; Countrywide Home Loans Inc; M-I Financial Corp; Freedom Mortgage Corporation; and Carolina First Bank.

[37] The 2005 figure may represent a partial count, due to the change in reporting procedures that were implemented that year.

[ACTION 14]

PROVIDE TRAINING ON HOW FHA SINGLE-FAMILY PROGRAMS CAN BE EFFECTIVELY USED TO PROMOTE ENERGY EFFICIENCY.

Planned Action

14.1 Conduct outreach and provide guidance and training for housing professionals (e.g., underwriters, realtors, appraisers, home inspectors, and program support staff) on FHA's programs promoting energy efficiency.

Progress To Date

Training for housing professionals on Energy Efficient Mortgages is typically included in standard lender training programs hosted by HUD's four Homeownership Centers. Each Homeownership Center is expected to conduct eight or more training sessions on Energy Efficient Mortgages per year.

All four Homeownership Centers report providing training on Energy Efficient Mortgages. Training was provided in Buffalo, New York; Detroit, Michigan; Cincinnati, Ohio; Providence, Rhode Island; Long Island, New York; Portland, Oregon; Las Vegas and Reno, Nevada; and Anchorage, Alaska, as well as in other locations.

The Santa Ana Homeownership Center conducted a specialized training on Energy Efficient Mortgages and solar energy opportunities in California. This session focused specifically on opportunities for FHA financing that can take advantage of incentives for solar energy systems in that state. The session attracted an audience of lenders and other housing professionals.

[ACTION 15]

CONTINUE IMPROVED TRACKING, AND EVALUATE PERFORMANCE, OF ENERGY EFFICIENT MORTGAGES.

Planned Actions

15.1 Continue to implement the improved method for tracking Energy Efficient Mortgages through the Computerized Home Underwriting Management System (CHUMS), which was developed in 2004.

15.2 Generate quarterly reports documenting the number of Energy Efficient Mortgages insured each quarter, broken down by region or state.

15.3 Subject to funding availability, the Office of Policy Development and Research (PD&R) and FHA will assess FHA's experience with Energy Efficient Mortgages to determine the relative risk of default and claims for this product, compared with other types of FHA mortgages.

Progress To Date

Beginning in 2005, HUD implemented revised procedures to provide for more accurate reporting and tracking of Energy Efficient Mortgages. In the past, any mortgage for a new home that exceeded the 1992 Model Energy Code could be reported as an Energy Efficient Mortgage, resulting in inflated numbers for this mortgage product. Lenders are now required to report the escrow amount set aside for an Energy Efficient Mortgage. As a result of the revised procedures, the number of Energy Efficient Mortgages currently being reported each year is a more accurate reflection of actual production.

HUD continues to implement the improved method for tracking Energy Efficient Mortgages through the CHUMS reporting system (Action 15.1). FHA generates annual reports on the number of Energy Efficient Mortgages, but not on a quarterly basis or broken down by region or state (Action 15.2). Due to lack of available research funds and the fact that the Energy Efficient Mortgage remains an under-utilized product, there are no plans to conduct an assessment of the performance of Energy Efficient Mortgages compared with other FHA products (Action 15.3).

V. Housing—Multifamily

HUD-assisted and HUD-insured multifamily portfolio consists of 31,808 privately owned properties that house almost 2.4 million households.[38] Of these, 1.58 million units in 22,725 properties receive project-based rental assistance,[39] a portion of which is used to pay for utilities.

The following actions addressing energy costs in this portfolio are included in HUD's energy strategy:

Action	Housing—Multifamily
16	Promote energy efficiency in multifamily-assisted housing and multifamily programs.
17	Continue HUD-DOE multifamily weatherization partnerships.
18	Encourage use of Energy Star new home standards in the design, construction, and refinancing of Section 202 and 811 projects.
19	Develop incentives for energy efficiency through FHA multifamily insurance programs.
20	Explore asset management strategies and guidance for energy efficiency in HUD-subsidized multifamily properties.
21	Support energy efficiency training for multifamily managers and maintenance staff.

[ACTION 16]

PROMOTE ENERGY EFFICIENCY IN MULTIFAMILY-ASSISTED HOUSING AND MULTIFAMILY PROGRAMS.

Energy efficiency and green building are voluntary in HUD-insured multifamily housing. However, HUD encourages property owners to incorporate energy efficiency in their new properties.

Planned Actions

16.1 Incorporate the Energy Action Plan in meetings with industry partners to promote energy efficiency in HUD-assisted properties.

16.2 Encourage FHA mortgage insurance applicants to utilize Energy Star products and new construction standards.

Progress To Date

Through electronic mailings, industry meetings, lender contacts, and industry training broadcasts to owners and agents of FHA- and HUD-affiliated privately owned multifamily properties, HUD continues to make information available and encourages property owners to use energy-efficient measures in their properties. An Energy Tracking Report was put in place in December 2006 to monitor these activities (Action 16.1).

[38] Office of Multifamily Housing, May 1, 2006.

[39] More recent totals from the National Housing Trust (February 2007) show 22,563 properties with 1,372,235 units receiving project-based assistance.

In addition, HUD encourages energy efficiency by including the language noted below with each MAP (Multifamily Accelerated Processing) Team approval—the first step in a new application for mortgage insurance:

> "HUD strongly recommends that new construction and rehabilitation projects utilize energy saving construction methods, mechanical systems, and appliances. In particular, those meeting Energy Star standards should be considered. Therefore, please encourage your mortgagors and developers to incorporate such energy saving approaches into their plans and specifications."

HUD also encourages all Multifamily Housing offices to distribute the following with each request for withdrawal of Reserve for Replacement (R4R) funds:[40]

> "HUD encourages all requests for appliance disbursement and other disbursements from Reserve for Replacements that can exercise energy conservation to utilize energy saving devices, including Energy Star construction standards and appliances. Please explore such energy savings methods and devices in your property replacements."[41]

Results

Multifamily field offices report that in 2007, they encouraged energy efficiency in properties containing 39,872 units whose total mortgage amount was $1.15 billion. Energy conservation was also encouraged in $4.6 billion of Reserve for Replacement (R4R) investments covering 82,775 units. HUD's Office of Multifamily Housing participated in 335 meetings in which HUD staff discussed HUD's Energy Action Plan and/or encouraged energy conservation. HUD is exploring procedures for documenting the outcome of these actions in terms of energy efficiency investments or resulting energy savings.

[ACTION 17]
CONTINUE HUD-DOE MULTIFAMILY WEATHERIZATION PARTNERSHIPS.

Many low- to moderate-income recipients of HUD assistance also qualify for the Department of Energy's Low-Income Weatherization Assistance Program. Accordingly, HUD's energy plan includes a plan to develop partnerships with DOE's Weatherization Assistance Program to improve the energy efficiency of HUD properties, modeled on partnerships that successfully leveraged such funds for assisted properties in New York State.

[40] A sticker is placed on Form 9250 with this language.

[41] This language is provided to Management Agents and Owners with each R4R reimbursement request authorized by HUD where energy efficiency measures could be included in future expenditures.

Planned Actions

17.1 HUD and DOE will continue to identify additional weatherization partnership opportunities. The Office of Multifamily Housing will recommend suitable candidate projects to participate in the Weatherization Pilot Partnership, based on information provided to the Office of Multifamily Housing by the Department of Energy through PD&R.

17.2 Identify energy partnership opportunities to assist multifamily properties to undertake energy efficiency improvements (e.g., Low-Income Housing Energy Assistance weatherization funds, state Clean Energy Funds, utility-sponsored energy efficiency programs, and other state and local energy efficiency programs and services).

17.3 To the extent feasible, consider options to capitalize energy efficiency improvements including flexible use of reserves, rent increases, budget adjustments, or other suitable asset management strategies.

Progress To Date

Weatherization Partnerships

HUD continues to explore leveraging weatherization partnerships with DOE at the national level. In some parts of the country, weatherization partnerships have been established with utility program providers and state agencies, particularly in states that have established utility-financed public benefit funds, such as the Low Income Energy Efficiency Program in California and the Assisted Multifamily Program/Multifamily Performance Program in New York. These partnerships have resulted in energy efficiency improvement in hundreds of HUD-assisted multifamily properties.

Pilot projects have been successfully implemented at the state and local level, as follows:

St. Louis Pilot

A pilot multifamily weatherization project that successfully leveraged DOE weatherization funds was implemented in a HUD-assisted senior housing project in St. Louis, Missouri. The property consisted of a 100-unit, 94,000-square-foot facility in three separate buildings. Through a cooperative agreement between DOE's Midwest Regional Office and the Missouri Energy Center, the St. Louis Urban League (the local weatherization assistance provider) implemented an energy retrofit in the property. The work included the following:

Lighting:
200 T8 fluorescent hallway fixtures
1,000 compact fluorescent lights (CFLs) in individual apartments
Motion sensors for lighting in public rooms
LED exit signs

Appliances:
15 Energy Star refrigerators
100 low-flow showerheads

Heating and Cooling:
Tune up domestic hot water heaters
Insulate hot water piping
90 new heat pumps

The total cost of the retrofit was $95,255, which yielded annual savings of $28,923, for a simple payback of 3.3 years. Almost all of the items installed had very rapid returns on investment, with simple paybacks of 3 years or less.

California Multifamily Weatherization Pilot

HUD's Region 9 office identified six potential candidates for a weatherization pilot in California. Since California receives limited federal weatherization assistance (less than $7 million a year), the proposed improvements were generally funded with a mix of utility and state and local resources. Projects included:

- The Californian, a 217-unit HUD-assisted affordable housing project in Fresno, completed the first phase of an energy efficiency retrofit involving replacement of two inefficient and obsolete boilers. The state's Design for Comfort program provided $151,200 for the boiler replacement and related energy improvements. Additional energy improvements were funded by Pacific Gas and Electric's (PG&E) Low Income Energy Efficiency program, the DOE Weatherization Assistance Program, and the American Synergy Corporation's Heating, Ventilation and Air Conditioning (HVAC) program. Improvements include attic and pipe insulation, residential thermostats controls, HVAC tune-up, and Energy Star-qualified windows.

- The historic Franco Center housing development, a 110-unit HUD-assisted multifamily project in downtown Stockton, was identified as a potential weatherization candidate. Franco Center received assistance from the Bay Area Local Initiatives Support (LISC) Energy Action program, which conducted an energy consultation with the project officials and performed energy audits. The local Weatherization Assistance Program provider declined to participate due to funding limitations; financing was obtained instead from the California Housing Finance Agency to cover the cost of replacing a boiler, chiller, and boiler controls ($1.8 million).

New York State

New York State continues to be a leader in providing weatherization to multifamily properties in both public and assisted housing, either directly or in partnership with the New York State Energy

Research and Development Administration (NYSERDA). NYSERDA reports 22 HUD-assisted projects (60 buildings) with 3,474 units as having completed energy retrofits through the state's Assisted Multifamily Program. Another 11 projects (29 buildings) with 2,141 units are under construction or in the project design phase. Low-interest financing was or is being provided by NYSERDA, but in some cases the state's weatherization funds are used as well.

[ACTION 18]

ENCOURAGE USE OF ENERGY STAR NEW HOME STANDARDS IN THE DESIGN, CONSTRUCTION, AND REFINANCING OF SECTION 202 AND 811 PROJECTS.

HUD Section 202 and 811 projects for elderly and disabled persons provide housing to many low-income households on fixed incomes. The primary incentive for efficiency in these programs is gaining an added rating point for energy efficiency in the annual NOFA.

Planned Actions

18.1 Include competitive points for energy efficiency in the annual NOFAs.

18.2 Work with the Energy Task Force in establishing energy efficiency rating criteria for future NOFAs.

18.3 For projects undergoing refinancing, consider encouraging energy audits in conjunction with physical assessments—properties will be encouraged to undertake energy efficiency improvements in conjunction with refinancing transactions.

18.4 The Energy Task Force will assist the Office of Multifamily Housing in identifying possible technical resources to assist property owners to design effective energy improvement strategies.

Progress To Date

HUD continues to include one point (out of a total of 100) in its annual NOFA for those applicants that indicate that they will use energy-efficient measures in their Section 202 or Section 811 properties (Action 18.1).

The Multifamily Energy Task Force described under Action 19, below, has developed language for specific performance requirements for future Section 202 and 811 grant competitions. The point for energy efficiency is currently awarded by an Architecture and Engineering (A&E) reviewer, based on the design architect's narrative. The new approach would ensure that existing homes or new construction projects would be required to implement specific measures. This is expected to take effect in FY 2009 (Action 18.2).

Action 18.3 and Action 18.4 have been piloted on the west coast. HUD's Region 9 office (California, Nevada, Arizona, and Hawaii) launched a Multifamily Energy Efficiency Initiative, in partnership with Pacific Gas and Electric, which shows great promise for other regions. Property owners applying for renewal of federal rental assistance contracts are requested to complete an energy audit (conducted by the local utility) and then incorporate energy efficiency measures in the project refinancing and reserve for replacement plans. HUD is also assisting sponsors of Section 202 housing in Region 9 by identifying cost-effective energy efficiency improvements that can reasonably be included in their refinancing plans. HUD has asked project sponsors to prioritize energy investments with payback periods of 5 years or less, as part of the project's refinancing transactions, or, alternatively, in conjunction with project operating or reserve for replacement plans.

Results

Of 320 applications for Section 202 and Section 811 funding in FY 2007, 263 indicated that they would include energy efficiency measures in their projects and, as a result, were awarded bonus points when their applications were rated for funding. All 103 Section 202 winners and 99 Section 811 grant award winners received the extra point. However, there is as of yet no documented evidence of greater levels of energy efficiency in Section 202 or Section 811 Supportive Housing, in part because of the time involved before these properties start construction.

[ACTION 19]

DEVELOP INCENTIVES FOR ENERGY EFFICIENCY THROUGH FHA MULTIFAMILY INSURANCE PROGRAMS.

Planned Actions

19.1 Explore incentives for new applications for mortgage insurance or projects seeking refinancing to adopt Energy Star (or its equivalent for mid-rise or low-rise multifamily buildings).

19.2 For affordable housing projects developed by nonprofit and faith-based organizations examine the feasibility of providing incentives to capitalize Energy Star new construction requirements.

Progress To Date

Multifamily Task Force

HUD's Office of Multifamily Housing convened a Task Force of field and headquarters staff to recommend incentives for increasing energy efficiency through its insured housing programs. In September 2007, FHA Commissioner Brian Montgomery approved 12 incentives for implementation, including the 5 listed below for new mortgage insurance or refinancing of existing mortgages:

- Reduce application and/or inspection fees by 50 percent for properties using energy conservation techniques and/or achieving Energy Star certification. The current application fee is $3 per $1,000.
- Extend the maximum term of the mortgage for up to 50 years for a project that receives an Energy Star certification. Extending the term would result in significantly lower mortgage payments.
- Allow installation of Energy Star products to be considered a "major building component" for determination of substantial rehabilitation in order to use 221(d)(4) mortgage insurance, instead of 223(f). This would allow energy-efficient properties to secure a 90 percent mortgage, rather than an 85 percent mortgage.
- Place a notice in the Real Estate Management System (REMS) that a project used Energy Star appliances or products, thereby ensuring that future replacement items will also meet Energy Star standards.
- Create a Section 241(e) loan program to finance energy-efficient systems in properties that are master-metered and are currently insured by HUD. The loan will be eligible for Multifamily Accelerated Processing (MAP), which would result in faster processing. The allowable financing fee will be increased from between 1.5 percent and 3 percent, to gain lender acceptance.

The Office of Multifamily Housing is currently identifying the regulatory and handbook changes that will be required to implement the measures. The target date for implementing these items is December 2009.

The Mark to Market Program Green Initiative

HUD initiated a Green Remodeling Initiative in November 2007 though its Mark to Market program. This voluntary pilot program offers strong financial incentives for private owners to adopt green building practices in both the rehabilitation and operation of their HUD-subsidized, federally insured multifamily properties. These practices include energy and water efficiency, use of recycled and local materials, improved indoor air quality, and the healthy housing approach developed by HUD's Healthy Homes Initiative. The Green Initiative focuses on immediate repairs, but also requires that owners commit to maintain green building principles for the next 30 to 50 years. For further information about the program, see Section E, *Moving to Green Building.*

Multifamily Energy Audit Pilot

A pilot program, the California Multifamily Energy Audit Initiative, was designed to provide energy audits and technical assistance to assisted multifamily properties as part of FHA refinancing transactions. The pilot began in June 2006 and was supported through a partnership with Pacific Gas and Electric (PG&E), the Sacramento Municipal Utility District (SMUD), Nevada Power, the Local Initiatives Support Corporation (LISC), and other energy program providers. The partnership targeted FHA transactions involving requests for Section 8 contract renewal and project refinancing, or refinancing requests from sponsors of Section 202 elderly housing and other HUD-assisted properties.

During 2007, 15 energy audits were completed by PG&E, the San Francisco Municipal Utility District, and Sierra Pacific. HUD worked with property owners to include energy efficiency measures that were identified in the energy audit in project recapitalization plans and/or project replacement and maintenance schedules. Participating organizations included Mercy Housing, Christian Church Homes, Eden Housing, Satellite Housing, John Stewart Company, National Church Residences, the Nevada Rural Housing Authority, and the Maricopa Housing Authority.

The pilot successfully demonstrated that where energy audits are included at an early stage of development, particularly when completed in conjunction with Physical Needs Assessments, substantial energy efficiency improvements can be made in existing housing. The energy audits enabled participants to include a wider range of energy improvements in these projects than initially expected and provided a means for accessing state energy program resources to offset some of the added costs. While the scope of each project varied, each of the participating properties included Energy Star appliances, lighting, and other improvements in its project plans.

[ACTION 20]

EXPLORE ASSET MANAGEMENT STRATEGIES AND GUIDANCE FOR ENERGY EFFICIENCY IN HUD-SUBSIDIZED MULTIFAMILY PROPERTIES.

Planned Action

20.1 The Energy Task Force, with assistance from the Office of Multifamily Housing, will explore the development of informational guidelines for both property managers and HUD staff implementing energy efficiency improvements. The Office of Multifamily Housing will review these guidelines for possible incorporation in a revised Chapter 12 (Energy Conservation), Multifamily Handbook 4350.1.[42] (Action 20.1.)

Progress To Date

Asset Management Incentives

HUD's Multifamily Task Force (see Action 19) proposed the following energy efficiency incentives for existing properties, which were approved for implementation by FHA Commissioner Brian Montgomery, as follows:

- Allow for increased owner distribution by increasing the amount of the initial equity by the cost of implemented energy upgrades. Increased distributions could be accrued if funds are not available to pay the distribution in the current year.

[42] Chapter 12, "Energy Conservation," of Multifamily Handbook 4350.1, Rev.1, *Multifamily Asset Management and Project Servicing*.

- Allow nonprofit owners a distribution based on energy efficiency. HUD would allow the cost of the energy upgrades to increase by the amount of the initial equity of the property, with the appropriate distribution percentage applying to the "new" equity position.
- Allow the management company to share in the energy savings, through the use of a Master Plan created by the agent and approved by HUD. The shared savings would be achieved through a management fee add-on.
- Encourage the use of Energy Star for replacement of lighting and appliances, through normal servicing contact with owners and agents.
- Allow the management company to share in the savings for reduction of total utility usage. Currently, the additional work involved in energy-efficient upgrade results in a reduction in project costs, without the rent being lowered, even if the utility costs decrease.
- Request DOE to delegate to HUD the authority to qualify residents for DOE weatherization funds. Currently, residents must provide income information to qualify for low-income weatherization, even if that information is already on file with the management company.
- Allow owners to pay for an energy audit from surplus cash (at the owner's discretion), residual receipts (with HUD approval), or reserve for replacements (with HUD approval), and encourage owners to utilize recognized energy experts to conduct the audit.

HUD expects to implement these measures by December 2009 (Action 20.2).

[ACTION 21]

SUPPORT ENERGY EFFICIENCY TRAINING FOR MULTIFAMILY MANAGERS AND MAINTENANCE STAFF.

This action focuses on providing training or assistance to property managers and owners for incorporating low- and no-cost energy saving techniques into the operation and maintenance of their properties.

Planned Actions

21.1 Subject to available funds, work with multifamily trade organizations to offer, promote, or advertise hands-on training on energy-efficient property management practices for multifamily building managers and operators.

21.2 Help the Energy Task Force and trade associations organize effective training programs. With limited sources of funding to support training of this kind, the Energy Task Force will explore co-sponsorships or partnerships with trade and other organizations to carry out this activity.

Progress To Date

A four-part series of training webcasts was offered in 2007 (see Action 1) and advertised to multifamily building owners, as well as other HUD partners. A significant share of the 2,500 registrants were managers or operators of HUD-assisted housing. The first two training sessions specifically focused on multifamily housing. Specialized training for multifamily building operators, in partnership with multifamily trade organizations, has not been explored due to lack of available staff or funding resources (Action 21.1). Due to limited funds, no action has been taken on partnerships with trade organizations to carry out this activity (Action 21.2). HUD expects to continue to explore co-sponsorships or partnerships with other trade organizations to carry out training activities in FY 2009.

VI. Other Actions

Action	Housing—Manufactured Homes
22	Implement energy efficiency recommendations of the Consensus Committee for HUD-Code (Manufactured) Homes.
Action	**Field Policy and Management**
23	Partner with local energy efficiency groups, HUD program offices, and other agencies to educate HUD customers about ways to reduce energy costs.
Action	**Policy Development and Research**
24	Conduct energy-related policy analysis and research to support Departmental energy efficiency actions.
Action	**Healthy Homes and Lead Hazard Control**
25	Develop a computerized assessment tool for integrated energy and environmental retrofits.

[ACTION 22]

IMPLEMENT ENERGY EFFICIENCY RECOMMENDATIONS OF THE CONSENSUS COMMITTEE FOR HUD-CODE (MANUFACTURED) HOMES.

Planned Actions

22.1 Issue two proposed rules revising the Manufactured Home Construction and Safety Standards that include provisions recommended by the Consensus Committee to improve certain energy efficiency aspects of manufactured home construction.

22.2 To address existing manufactured housing, the Task Force will distribute and publicize the availability of the booklet, *Manufactured Homes: Saving Money by Saving Energy.*

Progress To Date

Two proposed rules involving a variety of upgrades to the Manufactured Home Construction and Safety Standards (the "HUD Code") have not yet been published (Action 22.1).[43]

During 2007, the Manufactured Housing Consensus Committee solicited recommendations from the public for additional proposed changes to the HUD Code. In response, several proposals for increasing energy efficiency in manufactured housing were submitted. The more significant proposals would: (1) improve the current thermal envelope to insulation levels that match the requirements in the International Energy Conservation Code (IECC), (2) adopt the ASHRAE 62.2 standard for ventilation in lieu of the current provisions in the standards, and (3) require all manufactured homes to be equipped with Energy Star appliances. Other recommendations would address energy losses in duct systems and allow for the use of tankless or instantaneous water heaters in manufactured homes. The Consensus Committee has not established a timetable for considering these recommendations.

Looking ahead, the Energy Independence and Security Act of 2007 (Public Law 110-140) includes a provision (Section 413, *Energy Code Improvements Applicable to Manufactured Housing*) that will change the regulatory environment for energy efficiency in manufactured housing. The 2007 Act requires that the Department of Energy establish standards within 4 years for energy efficiency in manufactured homes based on the most recent version of the International Energy Conservation Code. This would represent a significant increase in the current standards.

The new standards are to be established after consultation with HUD, which may "seek further counsel" from the Manufactured Housing Consensus Committee. The new energy standards are to consider

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[43] Proposed Changes to Manufactured Home Construction and Safety Standards (MHCSS)

Second Group:

1. § 3280.505 Air Infiltration has been edited.
2. § 3280.707(a)(2) would require gas and oil burning comfort heating appliances meet or exceed the National Appliance Energy Conservation Act of 1987.
3. § 3280.707(d) updates the energy efficiency requirements for water heaters to the National Appliance Energy Conservation Act of 1987.
4. § 3280.714(a)(i) and (ii) propose changes to the energy efficiency requirements for air-conditioners, and heat pumps must meet the National Appliance Energy Conservation Act of 1987.
5. § 3280.715(a)(7) would require R-4 duct insulation for Thermal Zone 1 and 2 and R-8 for Thermal Zone 3. (Note: the proposed changes to the MHCSS in Third Group would require R-8 for all ducts exposed to the outside air).

Third Group:

1. § 3280.103(a)(3) would require lineal fluorescent fixtures to utilize T-8 lamps or lamps of equal or greater efficiency.
2. § 3280.508(e) would require U values for glazing to be determined using the values in Table 5 in Chapter 29, the 1997 ASHRAE Handbook of Fundamentals.
3. § 3280.715(a)(4)(i) provides air leakage limits for ducts.
4. § 3280.715(a)(7) would require R-8 for all ducts exposed to the outside air. (Note: the proposed changes to the MHCSS in Second Group would require R-4 duct insulation for Thermal Zone 1 and 2 and R-8 for Thermal Zone 3).
5. § 3280.715(c) increases the requirements for sealing joints in ducts and references UL 181A, Closure Systems for Use with Rigid Air Ducts and Connectors.

factory design and construction techniques, be based on climate zones currently in the HUD Code, and be cost-effective.

Under the provisions of the 2007 Act, the Department of Energy will be responsible for establishing the regulations for HUD-Code homes, in consultation with HUD. HUD will support DOE with advice and information needed to complete their analysis.

[ACTION 23]

PARTNER WITH LOCAL ENERGY EFFICIENCY GROUPS, HUD PROGRAM OFFICES, AND OTHER AGENCIES TO EDUCATE HUD CUSTOMERS ABOUT WAYS TO REDUCE ENERGY COSTS.

HUD's regional and field offices play a supportive role to HUD's program offices in leveraging local resources; providing information, training, or technical assistance to HUD's grantees, customers, or partners; and collaborating with local communities to adopt energy efficiency measures in HUD-supported buildings. Regional Energy Coordinators in each of the 10 regions have, as a collateral duty, the responsibility for coordinating regional efforts and providing support for local field offices.

Planned Actions

23.1 The Office of Field Policy and Management (FPM) will develop local energy partnerships that support the energy efficiency objectives and actions of HUD program offices.

23.2 The Office of Field Policy and Management, in cooperation with program areas and other federal and state agencies, will develop regional strategies to educate external partners (industry, local governments, and relevant nonprofit agencies) about Energy Star and HUD's Energy Action Plan.

Progress To Date

Every HUD region has a designated Regional Energy Coordinator who works with field offices to implement local partnerships. Many of HUD's field offices report extensive capacity building, training, and informational activities. These are aimed at educating HUD customers about opportunities for energy efficiency, and, where feasible, leveraging state and local resources for investment in HUD-assisted properties. Table D-2 provides a list of partnerships reported by each of HUD's regional offices.

Table D-2. Partnerships Reported Per Region—FY 2007

Region	FY 2007 Partnerships
Region 1	216
Region 2	26
Region 3	21
Region 4	111
Region 5	19
Region 6	62
Region 7	10
Region 8	10
Region 9	45
Region 10	10

FY = fiscal year.
N/A = not available.

Examples of Local Partnerships

- *Los Angeles, California.* In 2006 a partnership was initiated with a California consultant, Strategic Energy Innovations, to provide technical assistance to public housing authorities to address barriers that prevent smaller authorities from undertaking energy performance contracts, which leverage potential energy savings from existing housing portfolios to obtain financing to capitalize energy efficiency improvements. The result of the partnership was the first "aggregated" energy performance contract approved in Region 9, which involved the San Bernardino and Upland housing authorities. The energy performance contract, approved in 2007, will leverage $18 million, produce $2.4 million in annual savings, and provide energy efficiency improvements in over 1,800 units.

  In 2007, the partnership was expanded to include multifamily housing pilot programs designed in coordination with HUD's multifamily office. The pilot programs include the development of a model aggregated Energy Performance (Lease Purchase) Agreement involving HUD-assisted and Low-Income Housing Tax Credit (LIHTC) properties in Southern California and the creation of an Energy Star bulk purchasing cooperative involving multiple multifamily housing properties and providers.

- *Southern California.* Under the *Aggregated Energy Performance Pilot*, four housing providers (the San Bernardino County, Ventura County, Santa Barbara County, and Orange County housing authorities), identified 40 LIHTC and HUD-assisted properties in need of substantial energy efficiency upgrades. A financial assessment determined that an aggregated energy performance contract could leverage $12 to $15 million in capital investments. HUD is working with a consultant, Strategic Energy Innovations, to address issues affecting implementation of a performance contract, including: (1) property securitization, (2) resetting of utility consumption estimates, and (3) resetting of rents and utility allowances, which reflects adjusted energy savings to generate sufficient cash flow to support project financing.

- *Cambridge, Massachusetts.* HUD's New England Regional Director has formed a working partnership with the Cambridge Energy Alliance, which includes the City of Cambridge,

Massachusetts, Clean Energy Solutions, and Bostonia Partners. HUD will play an important role in the Alliance's $100 million citywide energy plan. The Boston HUD office has established a Coordinated Individual Counseling program that will work with all FHA-insured property owners in the city to design a financing mechanism that will allow them to take advantage of the efficiency programs being offered through the Cambridge Energy Alliance.

- *Louisville, Kentucky.* HUD's Louisville office worked with the Louisville Metro Housing Authority and a number of state, local, and federal agencies to ensure that the Liberty Green HOPE VI project meets the Energy Star standard for new homes. All 718 units will be Energy Star-certified. EPA, HUD, and the housing authority completed an agreement regarding inspections, architect certification, and documentation needed to earn the Energy Star label upon completion of the project.

Selected Field Office Actions

One region (Region 9) adopted a regional energy plan, implementing the various actions described in HUD's Energy Action Plan at the state and local level. Another region (Region 4) established a regional Energy Task Force with representatives from each field office assigned to coordinate energy activities in each local office. The following is a sample of the many partnerships carried out by HUD's 82 field offices in all 10 regions.

In ***Region 1 (Boston),*** the Regional Office has been working with energy companies and lenders to design a program to enhance the use of FHA-insured Energy Efficient Mortgages. HUD's Boston office also approved a $9 million Energy Service Agreement with the Lowell Housing Authority and Ameresco Inc., and another agreement with the Providence Housing Authority in Rhode Island, in the amount of $12 million. The Hartford, Connecticut, field office initiated an energy partnership with a group of five small housing authorities (Stratford, East Hartford, Milford, Middletown, and Vernon). The Manchester Office of Multifamily Housing helped facilitate the Maine Energy Group, a forum for information exchange between HUD, Maine Housing, the USDA, and local housing partners.

In ***Region 2 (New York-New Jersey),*** the Buffalo, New York, Office of Community Planning and Development held its annual conference on the theme of "Go Green." The objective was to discuss strategies for pursuing sustainable development through green affordable housing. HUD's New York Regional Office partnered with the city and state on the financing of 1400 Fifth Avenue, the first green and smart building in Harlem. (HUD provided a Section 108 Loan Guarantee to finance the 30,000 square feet of commercial space.) The New York field office is also working with the New York City Housing Authority on a comprehensive energy efficiency and green initiative.

In ***Region 3 (Philadelphia),*** the Pittsburgh, Pennsylvania, field office worked with the Housing Authority of Pittsburgh and Conservation Consultants, Inc., to host a forum on Energy Star. HUD's Wilmington, Delaware, office worked with the local utility on a Low Income Energy Assistance Summit. The Richmond, Virginia, office worked with the City of Blacksburg, a new CDBG grantee, and a local nonprofit group, Community Housing Partners Corporation, to develop 14 new energy-efficient homes in the Roanoke-Lee district. The Richmond office also hosted two teleconferences to familiarize HUD grantees with the Energy Star bulk purchasing tool at www.quantityquotes.com.

In ***Region 4 (Atlanta),*** the Louisville, Kentucky, office partnered with the Louisville Metro Housing Authority on the Liberty Green HOPE VI project, where all 162 multifamily units are Energy Star rated. Through a partnership with the Nashville, Tennessee, office and the Nashville Area Habitat for Humanity on 79 Energy Star-certified units, energy consumption was reduced by 42 percent, resulting in average monthly bills of under $90 for an 1,100-square-foot home. The Birmingham, Alabama, office partnered with the Governor's office on an Energy Star Change a Light, Change the World Campaign lighting retrofit of Spring Gardens, a 220-unit, HUD-assisted housing project for the elderly.

In ***Region 5 (Chicago),*** HUD's Milwaukee, Wisconsin, office collaborated with the city and the Milwaukee Housing Authority on the 120-unit Cherry Court HOPE VI project for seniors and persons with disabilities that includes a new 20,000-square-foot green roof and a number of sustainable design elements. The Region 5 Energy Coordinator worked with program directors in the Chicago field office to conduct Energy Star workshops and training on energy performance contracting for public housing authorities. The Chicago office also worked with the Winnebago County Housing Authority on a 104-unit HOPE VI project that is Energy Star certified and includes Energy Star-rated appliances.

Region 6 (Fort Worth) played an active role in the Energy Star Change a Light, Change the World Campaign. In 2007, the San Antonio, Texas, field office partnered with the San Antonio Housing Authority to install 6,000 compact fluorescent lights (CFLs) in one public housing complex, reducing electricity consumption by 1.7 million kWh. The New Orleans, Louisiana, field office teamed with the local utility (Entergy) and Green Light to distribute 10,000 compact florescent light bulbs to assisted projects and lower-income households. The region also hosted an important affordable green housing conference in Texas.

Also in Region 6, the Fort Worth Multifamily HUB assisted in a Mark to Market Energy Conservation Outreach Training and Conference to encourage owners to rehabilitate and operate their properties using sustainable green building practices. The Oklahoma City Multifamily office is processing a $2.7 million mortgage for a Mark to Market pilot green project in Lawton, Oklahoma, which includes more than $500,000 in green building features.

In ***Region 7 (Kansas City),*** HUD teamed with the Missouri Department of Natural Resources and the St. Louis Urban League on a pilot program for the weatherization of a 100-unit elderly project in St. Louis. The St. Louis Office of Community Planning and Development contracted with the Meyer Company, an independently owned construction company and architect Garen Miller Incorporated, to build Patrician Place, a new single-family home development in North St. Louis County, which will include green and Energy Star features.

The Nebraska HUD office partnered with the Omaha Public Power District to form the Omaha Energy Efficiency Task Force. The Task Force worked with the Omaha Housing Authority to build Energy Star-certified homes in low- to moderate-income areas in and around Omaha, Nebraska. The Task Force continues to educate public housing owners and tenants on energy-saving strategies and utility payment assistance during severe weather conditions.

In ***Region 8 (Denver),*** the Denver office was active in the Energy Star Change a Light, Change the World Campaign that included hosting an event recognizing 60 Colorado groups and organizations that are Energy Star partners. The Denver Multifamily HUB worked with the Rocky Mountain Chapter of the Affordable Housing Management Association (AHMA), and provided an energy training timeslot at the regional AHMA conference held September 2008. The Helena, Montana, office formed an energy partnership with the Housing Division of Montana's Department of Commerce and the Montana Board of Housing and participated in several subcommittees of the Governor's Housing Coordinating Team.

Region 9 (San Francisco) has been a leader in creating successful state and local energy partnerships. The California Partnership, which includes public housing authorities throughout Northern California, launched a statewide Energy Star Change a Light, Change the World initiative to encourage energy saving practices in HUD-assisted and public housing programs. Pacific Gas and Electric provided compact fluorescent lights (CFLs) to over 9,000 households at 168 participating HUD-assisted and public housing properties, resulting in reduced electricity consumption of an estimated 11.7 million kWh, and estimated cost savings of $1.4 million over the life of the new equipment. In central California, the San Joaquin Valley Clean Energy Organization was established to develop a regional energy plan, help local jurisdictions develop model ordinances, energy efficiency and green building programs, and undertake other efforts to promote clean energy in the valley.

Another partnership was created with the Center for Smart Building and Community Design at the University of Hawaii and Hawaii's Department of Business, Economic Development, and Tourism. The partnership produced a study showing the significant impact lighting has on operating costs for multifamily housing. One project was the HUD-assisted Kalani Garden Apartments, a 119-unit affordable housing project on Oahu that showed that low-cost lighting changes would reduce annual electric energy consumption at the complex by 109,877 kWh and lower annual energy costs by $21,426.

In ***Region 10 (Seattle),*** the Seattle, Washington, office teamed with the Sisters of Providence, the EPA, and the Seattle Office of Housing on an Energy Star Change a Light, Change the World Campaign retrofit of the Providence Vincent House, a multi-story facility with 61 units. The City of Seattle financed several energy efficiency improvements in the building, including replacing refrigerators. The Boise, Idaho, field office partnered with the City's Housing and Community Development Division, Neighborhood Housing Services (NHS), Boise Mayor David Beiter, and other local partners to launch an Energy Star Change a Light, Change the World Campaign event; Idaho Power provided a total of 160 Energy Star light bulbs in a senior citizens apartment complex.

[ACTION 24]

CONDUCT ENERGY-RELATED POLICY ANALYSIS AND RESEARCH TO SUPPORT DEPARTMENTAL ENERGY EFFICIENCY ACTIONS.

Planned Actions

24.1 PD&R will continue to undertake and promote research into energy efficiency technologies through the PATH program. PATH research will support the energy efficiency needs of affordable housing.

24.2 The Partnership for Advancing Technology in Housing (PATH) will sponsor research to implement the PATH Roadmap for Energy Efficiency in Existing Homes, including a 3-year initiative to develop protocols for energy-efficient remodeling of existing homes.

24.3 PD&R will conduct a study, through an interagency agreement with the Environmental Protection Agency, of opportunities for investing in energy efficiency in assisted multifamily housing.

Progress To Date

The Office of Policy Development and Research (PD&R), as co-chair of the Energy Task Force, has provided significant policy and administrative support for the implementation of HUD's Energy Action Plan.

PATH Research

Due to limited funds appropriated by Congress for the Partnership for Advancing Technology (PATH) and, more generally, for PD&R research in 2007 and 2008, HUD's research and development efforts in this area have been severely constrained. Nevertheless, several PATH-supported initiatives have included energy efficiency or green building components:

- The PATH Concept Home in Omaha, finished last summer, represents HUD's version of the house of the future. The home was the first LEED-certified home in Nebraska. The project demonstrated that green is achievable, affordable, and marketable. The home included more than 60 innovative technologies. The PATH website hosts a virtual tour of the Concept Home, downloadable building plans, and specific product information.
- PATH has developed outreach materials to help builders rapidly adopt green residential construction technologies. A *Guide to Building Green* was distributed at the International Builders Show in Orlando in February 2008. PATH's Guide to Green Building presented the essential components of building a green home: low-impact development (LID), resource and waste management, energy-efficient system integration, resource-efficient plumbing, and good indoor air quality. The guide was also made available on the PATH website.

- Virtually all PATH Field Evaluations conducted by HUD's research program have assessed one or more green components, including water efficiency, energy conservation, waste management, indoor air quality, and water recycling.
- PD&R is working with HUD's Office of Healthy Homes and Lead Hazard Control (OHHLHC) to examine the performance of a green renovation of a multifamily property in Lawton, Oklahoma. That evaluation effort is currently in the planning phase (Action 24.1).

Uniform Remodeling Protocols

In response to a key recommendation in the PATH Roadmap for Energy Efficiency in Existing Homes, HUD completed the initial phase of a Uniform Remodeling Protocols initiative in October 2006. The protocols are designed to provide technically sound guidance to remodeling contractors on energy-efficient remodeling techniques, from room additions to bathroom and kitchen remodels and other home remodeling projects. The protocols are intended to enhance the credibility of the remodeling industry for homeowners, by providing a reliable set of remodeling guidelines that result in energy savings. The protocols were designed at three levels: for the beginner remodeler; the intermediate remodeler; and the advanced Home Performance with Energy Star remodeler, who has significant expertise in "whole house" energy remodeling.

Phases II and III of the project, which were to have tested the draft protocols by remodelers, have been suspended due to lack of available funds (Action 24.2).

Energy Efficiency in Multifamily Buildings

A proposed study of energy efficiency in multifamily buildings was not implemented, due to lack of available funds (Action 24.3).

[ACTION 25]

DEVELOP A COMPUTERIZED ASSESSMENT TOOL FOR INTEGRATED ENERGY AND ENVIRONMENTAL RETROFITS.

Planned Actions

25.1 The Office of Healthy Homes and Lead Hazard Control (OHHLHC) will fund the development of a computerized assessment tool that combines energy efficiency, safety, and healthy homes measurements (referred to as the Healthy Homes Energy Efficiency Assessment Tool [HEAT]).

25.2 OHHLHC will finalize the computerized energy-efficient assessment tool and pilot this tool in six residences at two locations (Greensboro, North Carolina, and Boston, Massachusetts).

Progress To Date

A decision to expand the scope and cost of the project resulted in a delay in project implementation. A Statement of Work for a procurement action under the 2009 Office of Healthy Homes procurement plan will include the development, piloting, and field testing of this tool by a number of weatherization programs in different zones.

In addition, in support of Action 1, OHHLHC and Demonstration grant programs provide rating points for reducing energy costs, to encourage using Energy Star building techniques and appliances during health-related housing improvement activities. The NOFAs for those grant programs explicitly promote integrating them with energy conservation activities, including weatherization, housing rehabilitation, and maintenance.

E. Moving to Green Building

In addition to the energy efficiency measures discussed in the preceding sections of this report, HUD is beginning to address a larger green building agenda through a variety of programs. The House Committee on Appropriations, in its 2008 Committee Report, strongly urged HUD to expand its efforts in this area, and HUD is building on the work initiated in the area of energy efficiency to address other green elements: health and indoor air quality, water conservation, siting and location, choice of materials, and renewable energy.

Green Remodeling Initiative

HUD initiated a Green Initiative in November 2007 though its Mark to Market program. This voluntary pilot program offers strong financial incentives for private owners to adopt green building practices in both the rehabilitation and operation of their HUD-subsidized, federally insured multifamily properties. These include energy and water efficiency, use of recycled and local materials, improved indoor air quality, and the healthy housing approach developed by HUD's Healthy Homes Initiative. The Green Initiative focuses on immediate repairs, but also requires that owners commit to maintain green building principles for the next 30 to 50 years.

The incentive for property owners to "go green" is a reduced owner contribution, from 20 percent for standard construction to just 3 percent for green construction. In the first 6 months since the Green Initiative was introduced last fall, HUD's Office of Affordable Housing Preservation (OAHP) has begun processing more than 500 properties, totaling over 4,000 units. Due diligence begins with the same physical assessment of each property required for all Mark to Market program properties. In the assessment, professional engineers identify repairs and maintenance needed now and in the future.

Unique to the Green Initiative, the engineers also identify a green alternative for each line item, and then complete a cost-benefit analysis to determine the most cost-efficient recommendation. While the scope of repairs is all-inclusive, HUD expects to realize energy and water savings by focusing on: sealing the building envelope; increasing insulation; ensuring that heating and cooling systems are appropriately sized and are of an energy-efficient design; installing Energy Star appliances during replacement; installing Energy Star windows during replacement; using Energy Star compact fluorescent lights (CFLs); installing low-flow faucets, showerheads, and toilets; and installing water and energy monitoring equipment.

The Green Initiative also requires that owners adopt an Integrated Pest Management approach, which mitigates the need for pesticides, and requires owners to participate in future indoor air quality tests. The Initiative also requires ongoing monitoring of utility use, temperature, and humidity levels. This monitoring allows the tracking of savings and improvements, and also provides property management with valuable operating information, thus allowing them to address potential problems when they arise.

Indian Housing

As described above under Action 12, HUD's Office of Native American Programs has initiated an active training program on green building in Indian housing. One national and five regional training sessions have been held since December 2007. Topics included: indoor air quality; mold, mildew, and moisture problems; insulation; exterior water management; and renewable energy. ONAP encourages tribes to utilize the variance provision in PIH Notice 2007-11 to increase Total Development Cost (TDC) limits by up to 10 percent to accommodate additional costs associated with the use of energy-efficient and/or green materials. In addition, an incentive point is provided for competitive awards for the Indian Community Development Block Grant program for projects that meet Energy Star goals.

Transportation and Location Efficiency

An increasingly important element of all green buildings is the location efficiency of the property. Most green building programs provide additional points for housing that is located at or near transit, or provides access to walkable amenities and services. This has become critical in light of the high and rising cost of gasoline. What appeared to be a good strategy for finding affordable housing—moving to farther-out suburban or exurban locations where land and housing is relatively inexpensive—is not proving to be sustainable by many families, especially as gasoline costs exceed $4/gallon. On average, Americans spend more than one-half of their incomes (52 percent) on housing and transportation. The average American household spends approximately 18 percent of its annual income on transportation—and low-income families spend as much as a third.

One approach to lowering the combined cost of housing and transportation is to expand housing opportunities adjacent to transit. Transit-oriented development presents unique opportunities for creating housing in proximity to public transportation, and to address the zoning, land use and financing issues that affordable housing developers typically encounter when developing mixed-use or mixed-income housing projects.

In its Joint Explanatory Statement issued with the FY 2008 Consolidated Appropriations Act, Congress tasked FTA and HUD to continue and expand its work in this area. Specifically, the Conference directed HUD and FTA to convene an interagency Working Group, and to:

> "…develop a best practices manual which will serve to assist communities as they seek to establish mixed-income transit-oriented development. FTA and HUD should also jointly report back to the House and Senate Committees on Appropriations within 6 months of enactment, on new ways FTA and HUD can better coordinate transportation and housing programs to promote affordable housing near transit."[44]

As directed by Congress, HUD and FTA have created an interagency Working Group, and will be submitting a report to Congress on ways that HUD and FTA can better coordinate transportation and

[44] FY 2008 Consolidated Appropriations Act, Pub. L. 110-161, Joint Explanatory Statement.

housing programs. Among the actions that can be undertaken is to explore the feasibility of location-efficient mortgages, and to assess the application of a transportation-housing index, that addresses the combined cost of housing and transportation for working families.

Office of Healthy Homes and Lead Hazard Control

OHHLHC, by its mandate, promotes green building practices through its Healthy Homes Program. The program awards research and demonstration grants to identify and mitigate health hazards and improve indoor environment quality in new and existing low-income housing. Grantees are encouraged to conduct interventions that both improve indoor environmental quality and the energy efficiency of homes.

Healthy Homes projects have demonstrated that housing designs and interventions can improve energy efficiency while also providing health benefits to residents. In Seattle, Neighborhood House, a community-based organization, teamed with the Seattle Housing Authority and local researchers to assess the potential health benefits of public housing (built under HUD's HOPE VI program) that was built using green principles and improved ventilation and moisture control. The research demonstrated significant improvements in the health of asthmatic children following relocation of their families into the new "Breath Easy" homes. An additional grant-funded study of the potential health benefits of low-income units following green rehabilitation is ongoing. OHHLHC is coordinating with the Centers for Disease Control and Prevention on additional research regarding the health effects of green construction techniques.

Healthy Homes program grantees have also demonstrated the feasibility and value of combining assessments and interventions for both weatherization and improvements in indoor environmental quality and hazard reduction.

Public Housing Environmental and Conservation Clearinghouse

HUD provides information for housing authorities on green building through its ECOwise newsletter and its Public Housing Environmental and Conservation Clearinghouse. A new Notice that encourages housing authorities to "go green," PIH Notice 2008-25, was issued in June of 2008. The Notice identifies a variety of green technologies that housing authorities might consider in the operation of existing housing, and in the development of new housing.

HOME Investment Partnerships Program

The HOME program has developed a new training curriculum for HOME grant recipients on energy efficiency and green building, and also issued the first Notice of Funds availability, for green construction using HOME funds. Six applications were selected for funding: the cities of Salinas, California; Anderson, Indiana; Duluth, Minnesota; Columbus, Ohio; Lincoln, Nebraska; and the Lake County Consortium, Illinois. Each award is for $250,000, the maximum amount. The participating jurisdictions (PJs) that are being awarded these funds must use them to produce energy-efficient and

environmentally friendly housing units, using design and technology models that can be replicated. All units must at a minimum qualify for and receive Energy Star certification by an independent Home Energy Rater upon completion.

In addition to meeting the Energy Star label, the "Greening City Homes" project in Duluth will use solar thermal technology to provide at least 50 percent of the project's domestic hot water needs and 10 percent of the project's space heating needs. The Columbus, Ohio, project will include photovoltaic panels to generate electricity. The Lincoln, Nebraska, project will incorporate geothermal energy. All of the projects will use low-VOC paints and mold prevention techniques, adopt sustainable site design practices, and provide instruction and training to residents on sound energy-efficient management practices.

Research and Development

PD&R has undertaken a number of research studies on green building practices. The Partnership for Advancing Technology in Housing (PATH) has demonstrated or supported field evaluations on a number of energy-efficient and/or green technologies. In the existing homes arena, the PATH program supported the initial development of protocols for energy-efficient green remodeling of existing homes. In addition, research into appropriate standards for clean-up of brownfields for affordable housing development has been conducted. A forum on this subject was held in June 2008, with participation from a wide range of housing and environmental stakeholders. However, these R&D activities have been constrained by limited Research and Technology (R&T) funds.

Greening the Robert C. Weaver Headquarters Building

HUD is also planning to make its own headquarters building a model energy-efficient and green building. HUD is negotiating an energy performance contract with an energy services company (ESCO) that will reduce HUD's annual energy bill for the Robert C. Weaver Federal Building by $1.3 million. The $17 million project will include energy upgrades to the HVAC equipment, energy-efficient lighting throughout, water conservation measures, a rooftop photovoltaic and solar thermal system, a green roof, and replacement of all windows with double-glazed windows.

F. Energy Reduction Goals and Incentives

Section 154 of the Energy Policy Act of 2005 requires that HUD's Energy Strategy include the development of "energy reduction goals and incentives for public housing agencies."

Reduction Goals in Public Housing Under Asset Management

Under the new asset management rule at 24 CFR 1990, beginning in FY 2007, public housing authorities began to report utility consumption data for individual projects[45] in an automated system, the Subsidy and Grants Information System (SAGIS). Actual consumption data reported for individual projects will provide baseline information for each housing authority to monitor the results of their energy conservation programs in future years.

HUD is evaluating a benchmarking approach that will help housing authorities focus their resources on those projects and or buildings that are high-energy users. Beginning in FY 2008, HUD will use the property consumption data reported under asset management to consider establishing realistic energy reduction goals.

Energy Reduction Goals

The Energy Task Force has identified possible indicators that would allow for the tracking of actual or estimated energy savings for other programs. (See Table F-1.) These measures continue to be explored for possible implementation beginning in FY 2009. A Working Group is being established to explore the feasibility of these measures, to determine whether there are systems in place (or that can be developed): (1) to gather the information needed, (2) that do not impose extensive additional reporting requirements on grantees, and (3) that do not establish additional data collection or monitoring requirements on field office or headquarters staff.

[45] For the purpose of asset management, housing authorities are able to group individual properties into Asset Management Projects (AMPs). Reporting by housing authorities on utilities will be for AMPs, rather than for individual projects.

Table F-1. Possible Energy Performance Measures

Single-Family Housing	
Performance measure	**Through HUD's four Homeownership Centers, the Federal Housing Administration (FHA) will take steps to increase consumer awareness of Energy Efficient Mortgages (EEMs), including promoting the use of the EEM with "Streamlined (k)" Program and other single-family loan products.**
Action item	Feature the EEM as a priority loan product.
Tracking indicator	FHA will generate quarterly reports documenting the number of both new construction and existing property EEMs insured each quarter, broken down by region or state.
Data source	Computerized Housing Underwriting Management System.
Performance goal	To be determined.
Multifamily Housing	
Performance measure	**Energy savings achieved in assisted multifamily housing participating in energy weatherization pilots.**
Action item	Continue HUD-Department of Energy multifamily weatherization partnerships.
Tracking indicator	Savings will be the estimated annual energy consumption reductions or savings reported for the pilot project, as reported by the energy service provider initiating the energy retrofits and/or energy audits/assessments conducted before the retrofit.
Data source	To be determined.
Performance goal	To be determined.
Performance measure	**Energy savings attained in Section 202 or Section 811 housing for elderly and disabled persons.**
Action item	Encourage the use of Energy Star New Home standards in the design, construction, and refinancing of Section 202 and 811 projects.
Tracking indicator	Number of grantees that report adopting Energy Star for New Homes (or its equivalent for multifamily construction), multiplied by a projected average energy savings associated with Energy Star measures undertaken.
Data source	Section 202-811 grant applications.
Performance goal	To be determined.
Performance measure	**Energy savings attained from projects built to 2003 International Energy Conservation Code (IECC) or Energy Star building standards.**
Action item	Explore incentives for energy efficiency through FHA Multifamily Insurance Programs.
Tracking indicator	Number of properties built to 2003 IECC standards or Energy Star compared with 1992 Model Energy Code (MEC), multiplied by the number of FHA-insured projects built to a standard that meets or exceed the 2003 IECC.
Data source	Possible use of Development Application Processing.
Performance goal	To be determined.
Performance measure	**Energy savings based on HUD-assisted housing commitments to adopt Energy Star purchasing standards.**
Action item	Develop asset management strategies and guidance for energy efficiency in HUD-subsidized multifamily properties.
Tracking indicator	Number of subsidized multifamily properties that adopt Energy Star as a procurement guideline for refrigerators and other appliances, multiplied by estimated savings based on standard equipment replacement rates.
Data source	To be determined.
Performance goal	To be determined.
Energy Partnerships	
Performance measure	**Energy partnerships assisting HUD projects.**
Action item	Establish energy partnerships to support HUD's energy efficiency actions.
Tracking indicator	Number of HUD projects assisted through energy partnerships.
Data source	Partnership progress reports and case studies.
Performance goal	To be determined.

Appendix 1. Energy Task Force Members

Public Housing
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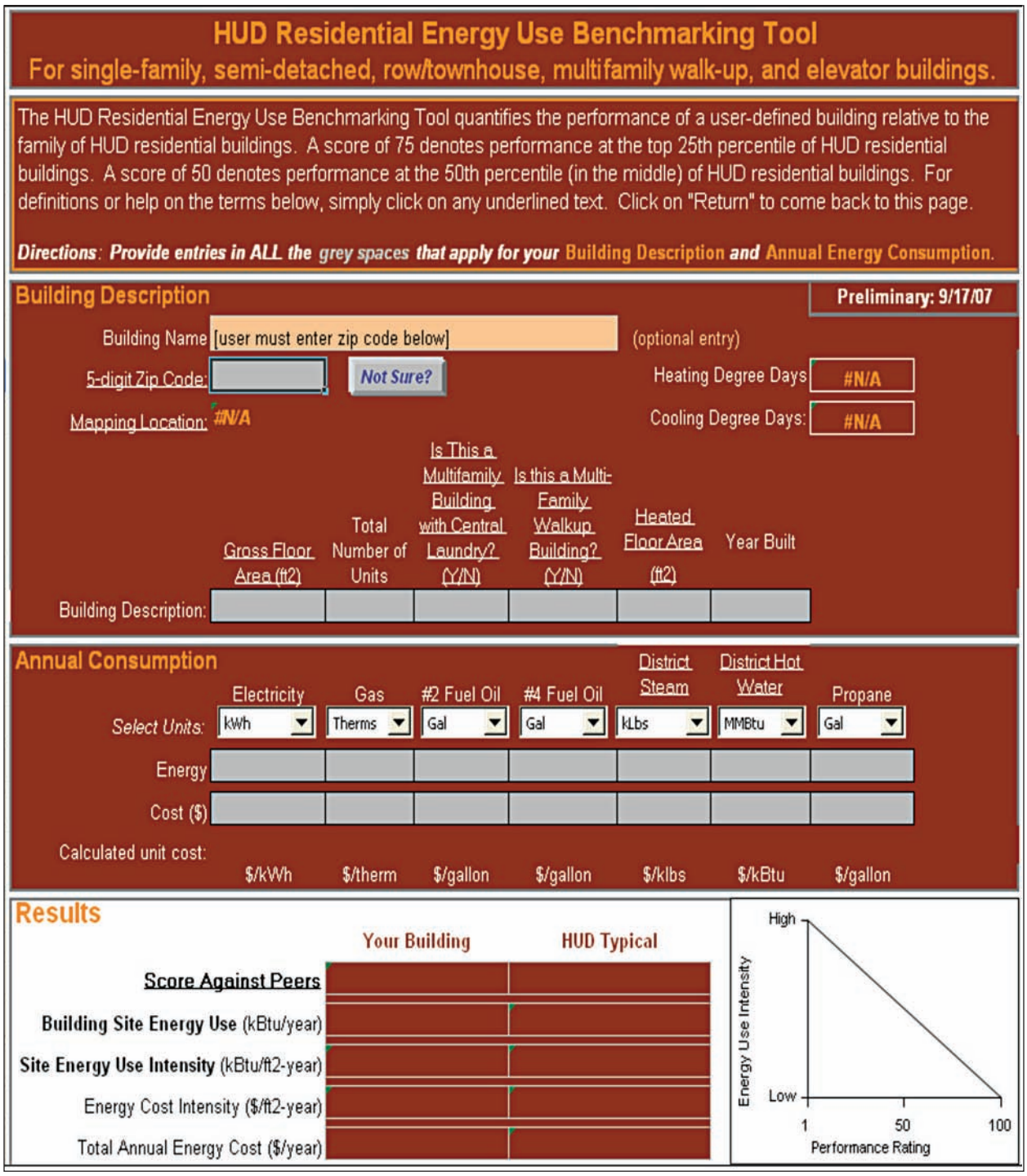
Charles Famuliner—Region 3 (Philadelphia)
Jim Chaplin—Region 4 (Atlanta)
Debbie Wills—Region 5 (Chicago)
Lawrence Doxsey—Region 6 (Fort Worth)
Paul Mohr—Region 7 (Kansas City)
Steve Eggleston, Lawrence Gallagher—Region 8 (Denver)
Wayne Waite—Region 9 (San Francisco)
Deborah Peavler-Stewart, Kristen Johnson—Region 10 (Seattle)

EPA Liaison
Brian Ng

Appendix 2. Public Housing Benchmarking Tool



HUD Residential Energy Use Benchmarking Tool

For single-family, semi-detached, row/townhouse, multifamily walk-up, and elevator buildings.

The HUD Residential Energy Use Benchmarking Tool quantifies the performance of a user-defined building relative to the family of HUD residential buildings. A score of 75 denotes performance at the top 25th percentile of HUD residential buildings. A score of 50 denotes performance at the 50th percentile (in the middle) of HUD residential buildings. For definitions or help on the terms below, simply click on any underlined text. Click on "Return" to come back to this page.

Directions: Provide entries in ALL the grey spaces that apply for your Building Description and Annual Energy Consumption.

Building Description — Preliminary: 9/17/07

Building Name [user must enter zip code below] (optional entry)

5-digit Zip Code: Not Sure?

Heating Degree Days #N/A

Mapping Location: #N/A

Cooling Degree Days: #N/A

	Gross Floor Area (ft2)	Total Number of Units	Is This a Multifamily Building with Central Laundry? (Y/N)	Is this a Multi-Family Walkup Building? (Y/N)	Heated Floor Area (ft2)	Year Built
Building Description:						

Annual Consumption

	Electricity	Gas	#2 Fuel Oil	#4 Fuel Oil	District Steam	District Hot Water	Propane
Select Units:	kWh	Therms	Gal	Gal	kLbs	MMBtu	Gal
Energy							
Cost ($)							
Calculated unit cost:	$/kWh	$/therm	$/gallon	$/gallon	$/klbs	$/kBtu	$/gallon

Results

	Your Building	HUD Typical
Score Against Peers		
Building Site Energy Use (kBtu/year)		
Site Energy Use Intensity (kBtu/ft2-year)		
Energy Cost Intensity ($/ft2-year)		
Total Annual Energy Cost ($/year)		