



Achieving Utility Savings in HUD-Assisted Housing: Progress Report to Congress

**SUBMITTED PURSUANT TO
SECTION 154 OF THE ENERGY POLICY ACT
FOR THE PERIOD 2016-17**

U.S. Department of Housing and Urban Development
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EXECUTIVE SUMMARY

This report reviews utility costs paid by HUD's owners and tenants, and the subsidies and allowances provided by HUD to cover those costs. It outlines initiatives taken by HUD over the period covered by this report (2016-17) to lower utility consumption and costs in its portfolio of public and assisted housing.

HUD estimates that owners and tenants in HUD's portfolio of public and assisted housing spend approximately \$7.6 billion per year on utilities. HUD offers utility subsidies and allowances – an estimated \$6.9 billion per year – to cover most of these utility costs. This report updates the methods and assumptions used in developing these statistics compared to years past.

Key utility expenditure findings show a significant decline in energy-related expenditures but an increase in water costs. Energy-related owner-paid expenditures (electricity, natural gas, heating oil) in public and assisted housing have declined by an estimated 16.3 percent, or \$348 million, over the 2010 baseline year, to \$1.79 billion annually. As past projections indicated a much more significant increase if HUD failed to address energy efficiency in its housing, this trend speaks to the effectiveness of HUD's efforts in recent years.

A deeper look at the utility data reveals that the significant decline in energy costs was, however, counteracted by a significant escalation in water costs: water expenditures have increased by 34 percent since 2010, to \$1.33 billion. While water consumption may have increased in some cases, the rise in water costs appears to be primarily due to increases in water rates, as local water utilities have begun investing in improved water treatment and distribution systems and pass these costs onto their customers. As a result, overall estimated annual utility costs (both water and energy) have held steady, increasing by just 1.2%, since last reported to Congress.

Activities aimed at lowering these expenditures undertaken during the 2016-17 period are summarized below:

1. **Energy upgrades of 128,000 units reported through retrofits or new construction of HUD-assisted housing (Agency Priority Goal).** HUD made significant progress in increasing the energy efficiency of HUD-assisted housing over the two-year period covered by this report. As part of HUD's Agency Priority Goal to increase the efficiency and health of HUD-assisted housing, HUD supported the completion of an estimated 128,442 retrofitted or new energy-efficient housing units.¹ Through 2017, 539,800 energy-

¹ This Agency Priority Goal (APG) also included lead hazard control and Lead Safe Housing Rule enforcement: in addition to energy efficient units reported here, another 38,000 units were lead hazard control or healthy housing retrofits funded through

efficient retrofits or new units were reported since the agency first established this Agency Priority Goal in 2010. Reporting of these results was discontinued in 2018.

2. **Cost savings of an estimated \$400 million projected through new Energy Performance Contracts (EPCs) in public housing.** Twenty-eight Energy Performance Contracts in public housing were approved in 2016-17, impacting some 64,000 units with projected savings of approximately \$400 million over the life of these contracts. Contracts were approved for 28 Public Housing Authorities (PHAs or housing authorities).
3. **Participation in the Multifamily Better Buildings Challenge increased to more than 650,000 housing units, with annual savings estimated at \$118 million.** HUD partners with the Department of Energy to implement the multifamily sector of the Better Buildings Challenge. A total of 105 affordable and market-rate housing organizations, representing more than 650,000 housing units, have joined the Challenge through 2017 and pledged to reduce portfolio-wide energy use by at least 20 percent over 10 years. This group of early adopters represents about one third of HUD's public and assisted housing portfolio. Participating partners report 10 trillion BTUs in energy savings since 2011, translating into an estimated \$118 million in cost savings for the entire inventory in 2017. Two early goal achievers show savings of 24% and 26% over their 2011 baseline, respectively.
4. **Systems for incentivizing and tracking multifamily utility savings were implemented.** FHA introduced the Capital Needs Assessment (CNA) e-Tool for multifamily housing, and plans to launch a "Pay for Success" multifamily utility cost savings pilot program, previously authorized by Congress. Efficiencies are also being achieved through the Rental Assistance Demonstration (RAD) program.
5. **Commitments exceeded resilient and renewable energy targets.** HUD's Renew300 initiative, completed in 2017, exceeded its goal of commitments to 300 megawatts of renewable and resilient energy in Federally assisted housing. More than 80 PHAs and other affordable housing developers made commitments of 340 megawatts of renewable energy against the 300-megawatt target. These installations will yield cost savings – and, in some cases, increased resilience to power outages in the event of extreme weather events – for PHAs, multifamily building owners, residents, and potentially, HUD.

HUD welcomes public comment on this report from any interested party. Please direct comments to energyaction@hud.gov.

HUD's Office of Lead Hazard Control and Healthy Homes or enforcement of the Lead Safe Housing Rule in projects financed with Community Development Block Grant or Home Investment Partnership (HOME) funds.

I. INTRODUCTION

Section 154 of the Energy Policy Act of 2005 requires HUD to “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...[and] include the development of energy reduction goals and incentives for public housing agencies.” The Act also requires HUD to update Congress on progress in implementing this strategy. In addition to the Section 154 reporting requirement, the Act requires HUD to take other actions related to energy efficiency, which are referenced in this report and summarized in Appendix A.

HUD’s programs support a diverse portfolio of multifamily and single-family housing. HUD’s public housing and multifamily assisted programs support nearly 5 million units of housing: 1.1 million public housing units, 1.4 million units of privately-owned assisted housing (Project Based Rental Assistance or PBRA), and 2.4 million rental units supported with Housing Choice Vouchers (Tenant Based Rental Assistance or TBRA).²

Utility costs account for approximately one fifth of public and assisted housing operating budgets. Reducing these rising costs—and in the process preserving affordability for residents and owners and generating savings for taxpayers—can generate significant savings for owners, residents as well as to the federal government.

Note on Utility Data Used in This Report

Water and Energy Expenditures. Throughout this report, the term “utilities” is used to indicate combined energy, water, and sewer expenses, as these expenses are often reported together in HUD programs. Water and sewer charges represent a significant area of utility expenditure in HUD-assisted properties. Where separate water and sewer data are available (public and Indian housing, and owner-paid utilities in assisted multifamily housing), we show energy expenditures separately, often by fuel source (electricity, natural gas, heating oil). HUD does not have a separate breakout for water expenditures through utility allowances for tenant-paid utilities.

Reporting Periods. The most current complete data presented in this report represent utility expenditure data reported to HUD in 2017, the most complete data available at the time of writing this report. While data may be reported in 2017, the actual consumption periods covered in these reports will vary. For Public and Indian Housing, the data reported is for the Cycle 18 reporting period, which covers PHA Fiscal Years ending in one of the following quarters: September 30, 2016; December 31, 2016; March 31, 2017, June 30, 2017.

Updated Assumptions Relative to Prior Reports. The baseline data for the 2010 reporting year included in this report may differ from the data for that period included in the 2012 report to Congress. This is due to updated data collection and reporting methods, as well as changing assumptions. These changes are footnoted in the relevant sections of this report.

Data Quality. This report relies on expenditure data for owner- or PHA-paid utilities as reported by PHAs or multifamily owners in Annual Financial Statements submitted annually to HUD. Utility Allowance data for tenant-paid utilities are as reported in the TRACS database.

² HUD, Office of Policy Research and Development, *A Picture of Subsidized Households 2017*, based on 2010 Census data. https://www.huduser.gov/portal/datasets/assthsg.html#2009-2017_data

II. CURRENT UTILITY EXPENDITURES

This section of the report updates HUD's annual utility expenditures, and trends for individual utility types in HUD's affordable housing portfolio compared to U.S. market trends. The updated figures were generated by analyzing a collection of 2017 data from relevant HUD data sets and were compared to data reported in 2010.³

This discussion of utility expenditures is divided into three sections: (1) owner-paid utilities in public housing; (2) owner-paid utilities in multifamily assisted housing; and (3) individually-metered tenant-paid utilities that are paid for with utility allowances as part of HUD's rental assistance programs.

- Public housing data are organized using data provided in Annual Financial Statements as reported by PHAs through HUD's Financial Assessment Subsystem-Public Housing (FASS-PH) in the Financial Data System (FDS). The baseline year used for comparative purposes is Cycle 11 (PHA Fiscal Years ending September 30, 2009 through June 30, 2010); the most recent complete year of reported data available at the time of writing this report is Cycle 18 (PHA Fiscal Years ending September 30, 2016 through June 30, 2017). The following FDS line items are included: 93100 – Water; 93200 – Electricity; 93300 – Natural Gas; 93400 – Heating Oil; 93600 – Sewer charges; and 93800 – Other Utility Expenditures. Two data points, 93500 – Labor and 93700 – Employee Benefit Contributions, reported by some PHAs under utility expenses, are not included here.⁴
- Multifamily data are derived from Annual Financial Statements submitted by multifamily owners in HUD's Financial Assessment Subsystem – Multifamily (FASS-MF) and compiled in a dashboard developed by HUD's Office of Multifamily Housing. The most recent utility data included in this report are those reported in Annual Financial Statements submitted in Calendar Year 2017 by a subset of 1.17 million assisted or insured units out of a total 1.42 million units in the entire assisted housing stock. Total utility expenditures were then extrapolated from reported data for the entire portfolio, using average utility costs per reported unit.
- Utility allowance data are compiled from data reported on HUD Forms 50058 and 50059 in the Tenant Rental Assistance Certification System (TRACS), Real Estate Management System (REMS), and Public Housing Information Center (PIC) – Resident Characteristics Report. Utility allowances represent HUD's expenditures on individually metered, resident-paid utilities though one of the agency's rent

³ HUD, *Affordable Green: Renewing the Federal Commitment to Energy Efficient, Affordable Housing*, December 2012.

<https://www.hud.gov/sites/documents/OSHCENERGYREPORT2012.PDF>

⁴ HUD has updated certain data points used in previous Reports, and the baseline figures reported for 2010 have been updated accordingly, as follows: (1) for public housing, the 2012 Report to Congress did not include "Other Utilities," which are now included; and (2) for multifamily assisted housing, sewer charges were not previously included under water expenditures; these are included in this report.

subsidy programs; they therefore represent an approximation of what residents actually pay, using consumption or engineering methods, or data sampling methodologies prescribed by HUD.⁵

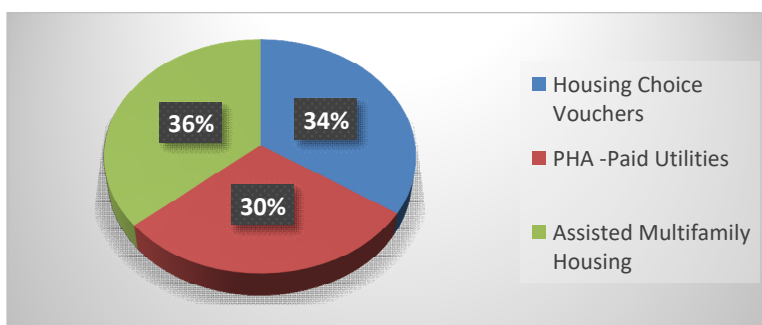
Key Findings

1. HUD spends a total of \$6.9 billion annually on water and energy costs in public and assisted housing, an increase of just one percent since reported in 2010.

As shown in Table 1, total utility expenditures by owners and residents in HUD's inventory of public and assisted housing equals \$7.6 billion. Of this total, it is estimated that HUD-paid expenditures are approximately \$6.9 billion.⁶ Overall utility costs have remained essentially flat since 2010, with HUD-paid costs increasing by just 1.2% since 2010. Public housing saw an overall decline of utility expenditures of \$15 million or just under one percent (0.7%), while multifamily housing saw an overall increase of \$94 million, or almost four percent (3.9%) since 2010. Utility allowance expenditures remained essentially flat, declining by \$14 million, or 0.6%.

As illustrated in Figure 1, below, these utility expenditures are shared between HUD's three major rental assistance programs: 36% or \$2.49 billion in multifamily assisted housing, 30% or \$2.02 billion in public housing, and 34% or \$2.35 billion for utility allowances only through the Housing Choice Voucher program.⁷

Figure 1: Share of Utility Expenditures, By Program



⁵ The methodology for establishing utility allowances varies by program. For utility allowance regulations or requirements for Housing Choice Vouchers, see 24 CFR 982.517; for public housing see 24 CFR 965.505; and for multifamily housing see HUD Notice H-2015-04, <https://www.hud.gov/sites/documents/15-04HSGN.PDF>

⁶ Of the total \$7.6 billion spent on utility expenditures in 2017, it is estimated that HUD's share equals \$6.9 billion. This estimate is based on a 2012 analysis by HUD's Office of Policy Development and Research of 1.7 million housing vouchers administered by non-Moving to Work (MTW) agencies showing that HUD pays for an estimated 76% of utility allowance expenditures through the Housing Choice Voucher program. Therefore, of the \$3.1 billion in Housing Choice Voucher utility allowance expenditures shown in Table 1, we estimate that HUD pays only \$2.36 billion, or 76% of the total, while residents pay the remaining balance. For utility allowances in public housing and project-based assisted multifamily housing, we assume the full cost of the utility allowance is subsidized by HUD.

⁷ Expenditures for Housing Choice Vouchers included in this Report cover Utility Allowances for individually metered, tenant-paid utilities only; while owner-paid utility expenditures are reported for public housing and assisted multifamily housing (PBRA), they not reported to HUD for Housing Choice Vouchers (TBRA).

Table 1: Combined HUD Utility Expenditures 2010-17

Table 1. Combined Utility Expenditures in Public and Assisted Housing 2010-17				
Year Reported	Reported in 2010 (millions)	Reported in 2017 (millions)	Savings (\$ millions)	Percent Change
Public Housing				
Utility Allowances	\$ 487	\$ 539	\$52	10.7%
PHA-Paid Utilities	\$ 1,550	\$ 1,483	(\$67)	-4.3%
Energy Only*	\$ 1,086	\$ 873	(\$213)	-19.6%
Water and Sewer	\$ 464	\$ 610	\$146	31.5%
Total Public Housing	\$ 2,037	\$ 2,022	(\$15)	-0.7%
Assisted Multifamily Housing				
Utility Allowances	\$ 806	\$ 853	\$47	5.8%
Owner-paid Utilities	\$ 1,593	\$ 1,640	\$47	3.0%
Energy Only	\$ 1,052	\$ 917	(\$135)	-12.8%
Water and Sewer	\$ 539	\$ 722	\$183	34.0%
Total Assisted Housing	\$ 2,399	\$ 2,493	\$94	3.9%
Housing Choice Vouchers				
Utility Allowances	\$ 3,105	\$ 3,087	(\$18)	-0.6%
HUD-paid Utility Allowances Only	\$ 2,360	\$ 2,346	(\$14)	-0.6%
Total Utilities				
Total Expenditures	\$ 7,541	\$ 7,602	\$61	0.8%
HUD-Paid Only	\$ 6,796	\$ 6,861	\$65	1.0%
Public and Assisted Housing Only*				
Total Energy*	\$ 2,138	\$ 1,790	(\$348)	-16.3%
Total Water*	\$ 1,003	\$ 1,332	\$329	32.8%
Total Utilities	\$ 3,141	\$ 3,122	(\$19)	-0.6%
* Public and assisted housing only (excluding utility allowances)				

Sources: For public and assisted multifamily housing, Financial Assessment Subsystem (FASS) - Public Housing and FASS-Multifamily data maintained by HUD's Real Estate Assessment Center (REAC). For Utility Allowances, Tenant Rental Assistance Certification System (TRACS), Real Estate Management System (REMS), and Public Housing Information Center (PIC) — Resident Characteristics Report.

*An additional cost of "other utility expenses" reported by PHAs is included in total energy costs for PHA-paid utilities. Energy and water costs are for public housing and multifamily assisted housing only; a breakout of water expenditures for Housing Choice Vouchers is not available

2. Annual expenditures on energy-related owner-paid utilities have declined by \$348 million (16%) since 2010, while water costs have increased by \$329 million (33%).

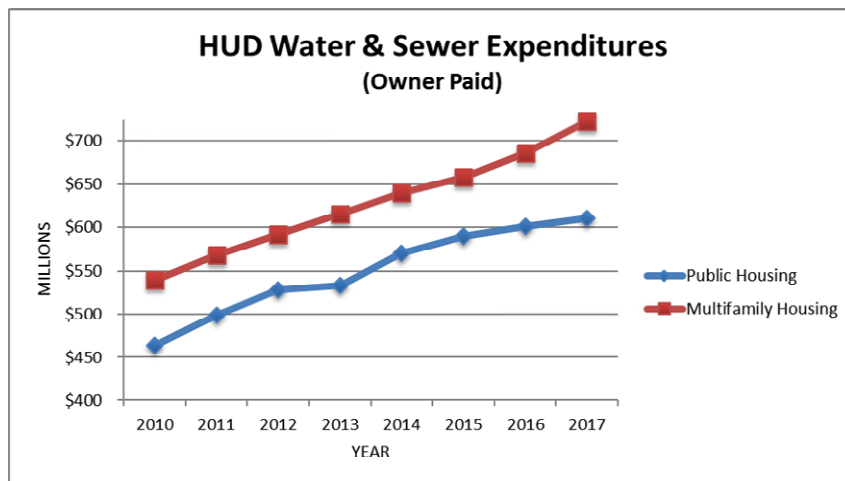
As shown in Table 1, above, while overall utility costs in public and assisted multifamily housing have held steady, total reported energy costs (electricity, natural gas, fuel oil/coal, and "other utility expenses" in public housing) have decreased by 16.3%, from \$2.1 billion in 2010 to \$1.8 billion in 2017. However, water and sewer costs have increased significantly, by 32.8%, up from \$1 billion in 2010 to \$1.3 billion currently.

This finding applies to owner-paid utility expenditures in public and assisted multifamily housing only, since a breakout by utility type is not available for renters receiving Housing Choice Vouchers. Water expenditures by TBRA owners or residents are not reported separately to HUD; it is likely, however,

that similar increases in water expenditures were found in this program as were reported for public housing and assisted multifamily housing.

As shown in Figure 2, below, water and sewer expenditures in assisted multifamily housing increased from \$539 million in 2010 to \$722 million in 2017 (34%). Public housing water expenditures increased from \$464 million to \$601 million (31.5%).

Figure 2: Water and Sewer Expenditures in Public and Assisted Housing, 2010-2017

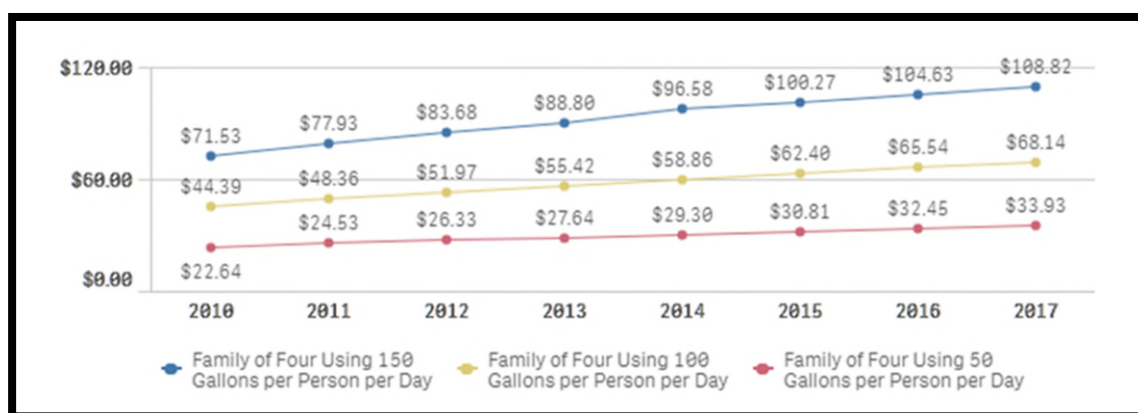


The significant changes in water expenditures seen in public and assisted multifamily housing generally reflect a steep increase in prices in the overall U.S. water market, shown below in Figure 3. According to a recent survey of the top 30 metropolitan areas in the United States, the average household expenditure on water has increased by about 34% since 2010.⁸ For a family of four using 150 gallons per person per day, for example, the average monthly water bill increased from \$71.53/month to \$108.82/month. Annual increases in the monthly cost of water for this family of four in these 30 metropolitan areas ranged from 3.9% in 2016-17 to as much as 8.3% in 8.9% in 2010-11.⁹

⁸ Circle of Blue, *Average Monthly Cost of Water*, Water Rates Dashboard, 2017. <http://www.circleofblue.org/waterpricing/>

⁹ Circle of Blue, *Annual Percent Change for Monthly Cost of Water*, Water Rates Dashboard, 2017

Figure 3: Average Monthly Cost of Water 2010-2017



Source: Circle of Blue, *Water Rates Dashboard*.

3. Public housing spends a total of \$1.48 billion on common area and master-metered utilities, an overall decrease of 4.8% and a 19.6% reduction in energy costs since 2010.

Approximately 1.1 million households live in public housing. HUD assistance is provided through some 3,088 public housing authorities (PHAs), primarily through annual grants for capital expenditures and operating costs. As shown above in Table 1, public housing expenditures on both PHA-paid and tenant-paid utilities through utility allowances declined by less than one percent (0.7%) from \$2.04 billion in 2010 to \$2.02 billion in 2017.

Table 2, below, shows PHA-paid utilities only for common areas and master-metered units only (i.e. excluding tenant-paid utilities). PHA-paid utility expenditures in 2017 were \$1.48 billion, down from \$1.55 billion reported in 2010, a decrease of 4.3%.¹⁰ The per-unit-month (PUM) utility expenditure in 2017 was \$113, a decrease of 4.8% since 2010.

Another measure of progress is the share of utility expenditures relative to overall operating expenditures. Total public housing operating costs have increased significantly over this period – over 10% – from \$7.3 billion in 2010 to more than \$8 billion in 2017 while owner-paid utilities have decreased by 4.3%. As a result, utility costs have declined significantly as a share of PHA operating expenses, from 21.2% in 2010 to just 18.3% currently.

¹⁰ PHA-paid utilities reported in 2010 in HUD's 2012 Annual Report to Congress at \$1.59 billion erroneously included salaries and benefits for maintenance personnel; this total has been corrected to \$1.55 billion in this report.

Table 2: PHA-Paid Utility Expenditures, 2010 & 2017

Table 2. PHA-Paid Utility Expenditures 2010 & 2017			
Year Reported	2010	2017	Percent Change
Operating Expenses (\$ millions)	\$7,315	\$8,090	10.6%
Utility Expenses (\$ millions)	\$1,550	\$1,482.8	-4.3%
Utilities (% of Operating Expenses)	21.19%	18.33%	-13.5%
Per Unit-Month (PUM)	\$118.68	\$113.00	-4.8%

Source: Financial Assessment Subsystem-Public Housing (FASS-PH) financial data for Cycle 18 (2017) and Cycle 11 (2010). Includes water and sewer charges.

PHA-paid energy costs are broken down by energy type (electricity, natural gas, fuel oil and 'other utility expenses') in Table 3, below. Energy costs saw a significant 20% decrease in Per Unit Month (PUM) expenditures, from \$83.17/PUM in 2010 to \$66.51/PUM in 2017, while water expenditures increased by 31%, from \$35.51/PUM in 2010 to \$46.49/PUM in 2017.¹¹ Total energy-related expenditures decreased for all utilities: electricity by 2.5% from \$532 million to \$507 million, natural gas by almost 40% from \$302 million to \$179 million, and fuel oil by almost 25%, from \$221 million to \$184 million. However, water and sewer expenditures increased from \$464 million to \$610 million.

Table 3: PHA-Paid Expenditures, 2010 & 2017

Table 3. PHA-Paid Expenditures 2010 & 2017					
Year Reported	2010		2017		Percent Change (PUM)
	Total Costs (millions)	Cost per unit-month (PUM)	Total Costs (millions)	Cost per unit-month (PUM)	
Total PHA-Paid- Water and Sewer	\$464	\$35.51	\$610	\$46.49	30.9%
Total PHA-Paid- Energy Only	\$1,086	\$83.17	\$873	\$66.51	-20.0%
Electricity	\$532	\$40.73	\$507	\$39.72	-2.5%
Natural Gas	\$302	\$23.15	\$179	\$14.00	-39.5%
Fuel Oil	\$221	\$16.88	\$162	\$12.69	-24.8%
Other Utility Expenses	\$31	\$2.41	\$26	\$2.00	-17.0%

Source: Financial Assessment Subsystem-Public Housing (FASS-PH) financial data for Cycle 18 (2017) and Cycle 11 (2010).

Looking at each individual utility expenditure compared to national trends in utility rates reported by the Energy Information Administration, the decrease of 2.5% in public housing PUM electricity expenditures compares

¹¹ Per Unit Month (PUM) is the average expenditure for occupied units in a given month. Unit Months are derived by multiplying the total number of public housing units by the number of months that they are occupied in a given year.

favorably with the U.S. residential market trend of an 11.6% increase in average annual residential retail electricity rates from 2010-17, and a 3.9% increase in commercial rates over the same period.¹² Natural gas expenditures in both public and assisted housing decreased by 30%, significantly higher than the 3.5% decline in average residential natural gas rates and a 16.8% decline in commercial rates between 2010 and 2017.¹³

4. Multifamily assisted housing spends a total of \$1.64 billion on owner-paid utilities, with annual energy costs decreasing by \$135 million, or 13 percent.

The second major area of HUD's utility expenditures is that of master metered or owner-paid utilities in privately-owned assisted multifamily housing, which accounts for 24 percent of total expenditures. HUD's assisted multifamily housing stock includes 1.4 million units in approximately 23,000 properties. The share of HUD's rental portfolio represented by this segment of the portfolio is increasing due to the addition of Rental Assistance Demonstration (RAD) units that were formerly reported under public housing.

As previously shown in Table 1, above, combined owner-paid utilities and utility allowances for individually metered resident-paid utilities in this sector increased by just over 1%, from \$2.39 billion in 2010 to \$2.49 billion in 2017, an increase of approximately 4 percent over this period.

Table 4, below, describes owner-paid utilities only in multifamily housing. Overall owner-paid utilities have seen a modest increase of 3 percent, from \$1.59 billion to \$1.64 billion. However, as previously noted, this figure masks significant changes in individual utilities. Energy costs decreased by almost 13%, from \$1.05 billion to \$917.3 million. Water and sewer costs, meanwhile, have increased by 34% from 2010 to 2017, from \$540 million to \$722 million. Natural gas saw the biggest decline of all utility types: a 24 % decrease, from \$326 million to \$247 million. More modest decreases were seen in electricity (8.2%) and fuel oil (1.8%).

¹² Energy Information Administration, *Annual Energy Review (2018)*, Table 8.10, Average Retail Prices of Electricity, <https://www.eia.gov/totalenergy/data/annual/>. Average annual residential rates rose from 11.54c/kWh to 12.89c/kWh, commercial rates rose from 10.16c/kWh to 10.56c/kWh from 2010-17.

¹³ Energy Information Administration, *Annual Energy Review (2018)*, Table 9.10, Natural Gas Prices. https://www.eia.gov/totalenergy/data/monthly/pdf/sec9_15.pdf. Average natural gas residential rates declined from 11.39 \$/ccf to 10.91 \$/ccf, commercial rates declined from 9.47 \$/ccf to 7.88\$/ccf from 2010-17

Table 4: Owner-Paid Utilities, Assisted Multifamily Housing, 2010-2017

Table 4. Changes in Owner Paid Utility Estimates for HUD Multifamily-Assisted Programs 2010-2017			
	2010	2017	Percent Change
Total Utility Estimate	\$ 1,592.6	\$ 1,639.8	3.0%
Total Energy Only	\$ 1,052.5	\$ 917.3	-12.8%
Electricity	\$ 665.1	\$ 610.6	-8.2%
Fuel Oil/Coal	\$ 61.3	\$ 60.2	-1.8%
Natural Gas	\$ 326.3	\$ 246.6	-24.4%
Total Water and Sewer	\$ 539.6	\$ 722.4	33.9%
Sewer	\$ 179.5	\$ 254.9	42.0%
Water	\$ 360.2	\$ 467.5	29.8%

Source: Office of Multifamily Housing, Financial Assistance Subsystem for Multifamily Housing (FASS-MF).

5. HUD’s utility allowance expenditures for resident-paid utilities total \$3.7 billion, with Housing Choice Vouchers accounting for an estimated \$2.3 billion

The third area of HUD’s utility expenditures is made up of utility allowances for individually metered, resident-paid utilities. Utility allowances for resident-paid utilities through all programs are shown in Table 5 below. Utility allowance expenditures across all programs total almost \$3.7 billion, or 55 percent of total utility expenditures.

Utility allowances are typically provided as a credit against rent payments, or, in some cases direct payments to residents. For vouchers and public housing, the utility allowance is generally established by the PHA administering the program. This is typically based on utility consumption for a “reasonably conservative” household in similar properties in the local community. In assisted multifamily housing, HUD requires that utility allowances are based on a survey of a sample of households in each property.¹⁴

¹⁴ HUD Notice H-2015-04, *Methodology for Methodology for Completing a Multifamily Housing Utility Analysis*, June 2015.

Table 5: Estimated Utility Allowance Expenditures 2017

Table 5. Estimated Utility Allowance Expenditures 2017							
Category	Occupied Units	% Units with Utility Allowances	# Units with Utility Allowances	Avg. Utility Allowance	Annual Spent - 2010 (\$Millions)	Annual Spent - 2017 (\$Millions)	Percent Change (Annual Spent)
Public Housing	1,004,594	48%	483,667	\$1,085	\$487	525	7.7%
Assisted Housing	1,426,561	66%	937,102	\$910	\$806	\$853	5.8%
Housing Choice Vouchers	2,254,907	88%	1,984,900	\$1,555	\$2,360	\$2,346	-0.6%
Total	4,686,062	73%	3,405,669	\$1,311	\$3,653	\$3,723	1.9%

Source: Office of Policy Development and Research, Data reported on HUD Forms 50058 and 50059 in the Tenant Rental Assistance Certification System (TRACS), Real Estate Management System (REMS), and Public Housing Information Center (PIC) — Resident Characteristics Report.

Overall, almost three quarters (73%) of HUD-assisted households (3.4 million households) receive utility allowances for tenant-paid utilities. However, the share of households who receive utility allowances varies significantly for each program: 48% of all households in public housing, 66% in multifamily assisted housing and 88% of households with Housing Choice Vouchers.

The average annual utility allowance per household also varies significantly: in public housing, the average annual utility allowance is \$1,085 (\$90.25/month), in multifamily housing the average annual allowance is \$910 (\$76.08/month), while the average utility allowance for households with Housing Choice Vouchers averages a much higher amount, \$1,555/year or \$130.83/month. The relatively high average annual utility allowance for Housing Choice Vouchers is a function of the fact that a significant share of voucher holders rent single family homes or smaller low-rise buildings, and as a result are responsible for most or all the utilities. In contrast, public and assisted housing consists primarily of multifamily housing, and utility allowances in these buildings may only cover electricity for appliances and apartment lighting, with heating and cooling costs included separately in rent payments.

Table 6 shows changes in utility allowance expenditures from 2010 to 2017. Utility allowance expenditures in public housing increased by 7.7% (\$487 million to \$539 million) and in assisted multifamily housing by 5.8% (\$806 million to \$909 million). In contrast overall utility expenditures through Housing Choice Vouchers remained relatively constant, increasing by just 1.9%. The number of units with Housing Choice Vouchers increased by almost 6.3% (from 2.12 million to 2.25 million), and the number of units with utility allowances has increased by 800,000 or 4.3% (from 1.9 million to 1.98 million). Despite this increase in the number of voucher holders, the average annual utility allowance has decreased, with the result that total expenditures increased by just 1.9%.

Table 6: Utility Allowance Expenditures 2010-17

Table 6. Utility Allowance Expenditures 2010-17										
	2010					2017				
	Occupied Units	% Units with Utility Allowances	# Units with Utility Allowances	Avg. Annual Utility Allowance	Annual Spent (\$Millions)	Occupied Units	% Units with Utility Allowances	# Units with Utility Allowances	Avg. Annual Utility Allowance	Annual Spent (\$Millions)
Public Housing	1,072,465	45%	482,599	\$1,008	\$487	1,040,084	47.9%	483,667	\$1,083	\$525
Assisted Housing	1,391,700	66.7%	928,477	\$864	\$806	1,426,561	65.8%	937,102	\$909.7	\$853
Vouchers - HUD Share	2,121,908	90%	1,903,949	\$1,632	\$2,360	2,254,907	88.5%	1,984,900	\$1,555	\$2,346
Total	4,586,073	72.28%	3,315,025	\$1,327	\$3,653	4,686,062	72.7%	3,405,669	\$1,311	\$3,723
Percent Change										
Public Housing						-3.0%		0.2%	7.4%	7.7%
Assisted Housing						2.5%		0.9%	5.3%	5.8%
Vouchers - HUD Share						6.3%		4.3%	-4.7%	-0.6%
Total						2.2%		2.7%	-1.2%	1.9%

Source: Office of Policy Development and Research, data reported on HUD Forms 50058 and 50059 in the Tenant Rental Assistance Certification System (TRACS), Real Estate Management System (REMS), and Public Housing Information Center (PIC) — Resident Characteristics Report.

III. PROGRESS REPORT AND UPDATE

This section of the report summarizes HUD’s energy-related activities and their results. Significant progress has been made in increasing energy efficiency and renewable energy in HUD-assisted and public housing.

1. Energy upgrades of 128,000 HUD-assisted units or equivalent units were reported through retrofits of existing housing or new construction (Agency Priority Goal)

Beginning in 2010, HUD established energy efficient, healthy housing as an Agency Priority Goal. The initial two-year goal was to complete a combined total of 159,000 energy efficient units and/or units with lead hazard control measures. HUD subsequently established similar performance goals in 2012–13, 2014–15, and finally in 2016–17. (HUD’s FY 2018-19 Agency Priority Goal focuses exclusively on healthy housing.) As shown in Table 7 below, for the 2016–17 period covered by this report, a total of 128,442 energy efficient units were reported.¹⁵ For the 2010-17 period since the agency initially established this goal, almost 540,000 energy efficient HUD-assisted units (or unit equivalents) were completed.¹⁶

A total of 20 HUD programs contributed to these results. Five programs accounted for three quarters of all energy-efficient units reported in the FYs 2016–2017 period:

- 25,300 public housing (equivalent) units upgraded with Public Housing Capital Fund funds;
- 26,400 FHA-insured multifamily units with energy-efficient or other green features;
- 22,860 units through Energy Performance Contracts in public housing;
- 18,009 multifamily units reported through the Rental Assistance (RAD) program;
- 15,985 FHA-insured single-family homes financed through the Section 203(k) purchase-rehab program.

¹⁵ Totals include Public Housing Capital Fund units reported in PIH’s Energy Performance and Information Center (EPIC) as “unit equivalents,” which are calculated using a methodology developed by HUD, and approved by the Office of Management and Budget, to count only the 10 most cost-effective measures reported by public housing authorities through Capital Fund expenditures.

¹⁶ These energy efficient units were reported as part of HUD’s larger Agency Priority Goal of energy efficient and healthy units. An additional 141,000 units incorporating healthy housing practices were reported FY 2010-17 from two primary sources: lead hazard control or healthy housing interventions funded through HUD’s Office of Lead Hazard Control and Healthy Homes (93,000 units) or through the implementation of the Lead Safe Housing Rule by the Office of Community Planning and Development (CPD) in projects using CDBG or HOME funds (48,370 units).

Other programs that were significant contributors to this goal were:

- 11,594 units of new housing built to the Energy Star standard through the Home Investment Partnerships (HOME) Program;
- 2,165 units financed with Community Development Block Grant Disaster Recovery (CDBG-DR) funds.¹⁷

See Appendix C for HUD's current minimum energy standards and incentives, including CDBG-DR. For more details on these results, see HUD's 2017 Annual Performance Plan.¹⁸

Table 7: Completed Energy Upgrades, 2016-2017

Program	FY16 Actual (Units)	FY17 Target (Units)	FY17 Actual (Units)	FY16-17 Target (Units)	FY16-17 Actual (Units)	FY 10-15 Actual (Units)	FY 10-17 Cumulative (Units)
CDBG - New Construction	282	415	272	830	554	2,692	3,246
HOME (New Energy Star)	6,261	5,900	5,333	11,900	11,594	42,374	53,968
Tax Credit Assistance Program -ARRA						15,220	15,220
CDBG - Disaster Recovery (CDBG-DR)	2,165	1,236	0	2,472	2,165	2,206	4,371
Total Community Planning and Development	8,708	7,551	5,605	15,202	14,313	62,492	76,805
Green Retrofit Program - ARRA						17,556	17,556
Green Preservation Plus (Green Refi Plus)						936	936
Mark to Market	1,256	2,500	472	5,000	1,728	12,829	14,557
Multifamily Endorsements	10,918	12,193	15,556	24,386	26,474	34,367	60,841
Section 202/811 Supportive Housing	345	850	184	1,700	529	15,958	16,487
Rental Assistance Demonstration (RAD)	6,951	14,000	11,058	25,700	18,009	4,451	22,460
Total Multifamily	19,470	29,543	27,270	56,786	46,740	86,097	132,837
PowerSaver 203(k)						274	274
Title I PowerSaver						928	928
Energy Efficient Mortgages (EEM)	201	275	146	550	347	682	1,029
203(k) - Non-PowerSaver	9,705	3,500	5,933	7,000	15,638	9,222	24,860
Total Single Family	9,906	3,775	6,079	7,550	15,985	11,106	27,091
Total Housing	29,376	33,318	33,349	64,336	62,725	97,203	159,928
ONAP - ARRA						2,306	2,306
Capital Fund - ARRA						77,188	77,188
Public Housing Capital Fund	11,723	6,319	13,599	12,761	25,322	36,000	61,322
Developed/Retrofitted Units	1,835	793	1,387	2,616	3,222	8,218	11,440
Energy Performance Contracts (EPCs)	12,318	13,100	10,542	26,320	22,860	127,977	150,837
Total Public and Indian Housing	25,876	20,212	25,528	41,697	51,404	251,689	303,093
Total Energy Efficient Units	63,960	61,081	64,482	121,235	128,442	411,384	539,826

¹⁷ Minimum standards were established for replacing or building new housing in the aftermath of Hurricane Sandy and subsequent disasters. In addition, HUD developed the CPD Retrofit Checklist for residential buildings incurring less substantial damage.

¹⁸ HUD, *FY 2015 Annual Performance Report and FY 2017 Annual Performance Plan*, April 2016, p. 83ff. See https://portal.hud.gov/hudportal/documents/huddoc?id=2017_APP_2015_APR_Final.pdf.

2. Energy and water cost savings of \$400 million are projected through Energy Performance Contracts (EPCs) in public housing

Energy Performance Contracts (EPCs) continue to be an effective tool for reducing utility costs in public housing, primarily in medium- to large-sized housing authorities. In the FY 2016-17 period, as shown below, a total of 28 EPCs were approved by HUD's OFO Energy Center, covering 64,000 units of public housing, and estimated savings of \$400 million over the life of these contracts. One PHA, the New York City Housing Authority (NYCHA) represents a significant share of this activity, with three EPCs accounting for 48,000 units, or 75% of the total, and accounting for 67% of projected savings.

Table 8: Approved Energy Performance Contracts FY 2016-17

PHA Name	State	ESCO	Units	Projected savings over contract
Albuquerque	NM	Self-Directed	945	\$6,701,901
Charleston (Phase 2)	SC	Self-Directed	1391	\$16,831,379
NYCHA	NY	Ameresco	19853	\$84,159,813
Jamestown	NY	J.W. Danforth	210	\$1,975,395
Topeka	KS	Self-Directed	744	\$4,768,493
Saratoga Springs	NY	J.W. Danforth	339	\$3,391,873
Oklahoma City	OK	Constellation Energy	2208	\$10,491,837
Cleveland	TN	Johnson Controls	420	\$4,585,736
Whitehead County	IL	Johnson Controls	265	\$465,695
NYCHA	NY	Constellation Energy	16781	\$105,817,198
Yolo County	CA	Siemens	442	\$3,300,405
Georgetown	KY	Siemens	328	\$2,764,647
NYCHA (Sandy A)	NY	Constellation Energy	11539	\$78,712,462
Lane County	OR	Johnson Controls	595	\$6,618,236
Presque Isle	ME	CTI	185	\$2,684,056
Marion County	IL	CTI	445	\$4,330,324
Portland (Phase 2)	ME	Self-Directed/Facility Strategies Group	1,008	\$11,920,064
Manhattan	KS	Johnson Controls	202	\$4,145,133
Topeka	KS	Self-Directed	744	\$4,768,493
Decatur	IL	Ameresco	478	\$2,055,277
Pike County Housing (Phase I)	Ill	Johnson Controls	228	\$2,657,264
Lawrence County (Phase 2)	PA	TEN	843	\$8,326,154
Paducah (Phase 2)	KY	Siemens	738	\$2,345,674
Rochester (Phase 2)	NY	Siemens	2,440	\$17,223,849
Westbrook	ME	Self-Directed	83	\$575,036
Brazil	IN	Johnson Controls	228	\$3,593,576

PHA Name	State	ESCO	Units	Projected savings over contract
Alexandria	MN	Johnson Controls	130	\$701,013
Manchester Phase 1	CT	Siemens	275	\$4,838,032

3. The multifamily Better Buildings Challenge expanded to 650,000 households, with estimated annual savings of \$118 million in 2017.

HUD partners with DOE to support the Multifamily Better Buildings Challenge.¹⁹ The Better Buildings Challenge is a voluntary initiative that asks building owners and managers to commit to lowering energy use across their portfolio by 20 percent over the next 10 years and to share their annual progress and lessons learned with the public. As of March 2016, 105 partners representing more than 650,000 units with 625 million square feet have joined the Challenge.²⁰ Portfolios of participating partners range from just 40 units in size to 178,000 units (NYCHA). Multifamily partners include owners or managers of market rate as well as affordable housing.

Each Challenge Partner commits to (1) conducting an energy/water efficiency assessment of their property portfolio and pledge an organization-wide energy/water savings goal of at 20% within 10 years; (2) publishing two short case studies, showcasing an energy/water efficiency project and an organization-wide implementation model; and (3) reporting results annually by sharing performance data that demonstrates success.

An important feature of the Challenge is that partners commit to benchmark their utilities by entering utility data into EPA's Portfolio Manager. These data are posted annually, and as a result accurate information is available on utility consumption and expenditures in their properties.

Significant results have been reported by participating partners. Shown below in Figure 4 are cumulative cost savings achieved by a group of 59 multifamily BBC partners reporting DOE-approved data through EPA's Portfolio Manager.²¹ They report savings of \$61.6 million in 2017 over a baseline 2011 year. The largest share of savings is reported by participating PHAs, followed by assisted multifamily housing, with a small share contributed by portfolios managing a mixed portfolio of market-rate and affordable housing.

¹⁹ See http://portal.hud.gov/hudportal/documents/huddoc?id=BBC_MFFactSheet.pdf.

²⁰ See video at https://www.youtube.com/watch?v=yhZH3e0LLT0&list=PLoLJ9m9zEh3NmV-yB7zIFhBHIdN_RilG&index=3. For partner profiles see http://betterbuildingssolutioncenter.energy.gov/search?f%5B0%5D=type%3Apartner_profile&f%5B1%5D=field_sector%3A34.

²¹ Data based on actual utility data entered in Portfolio Manager by participating partners through 2017.

Figure 4: Better Buildings Challenge Annual Cost Savings – Reported

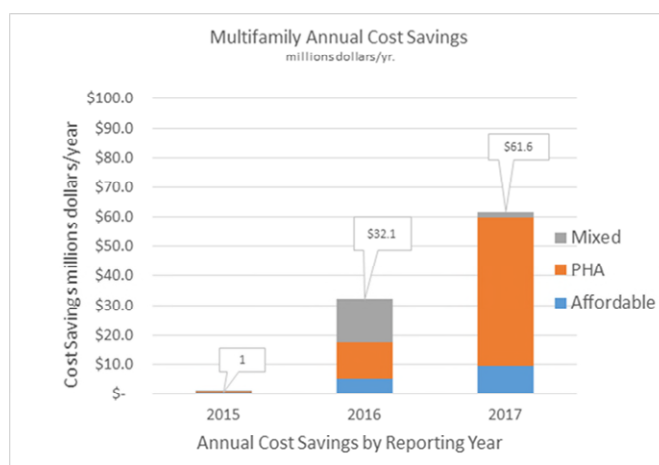
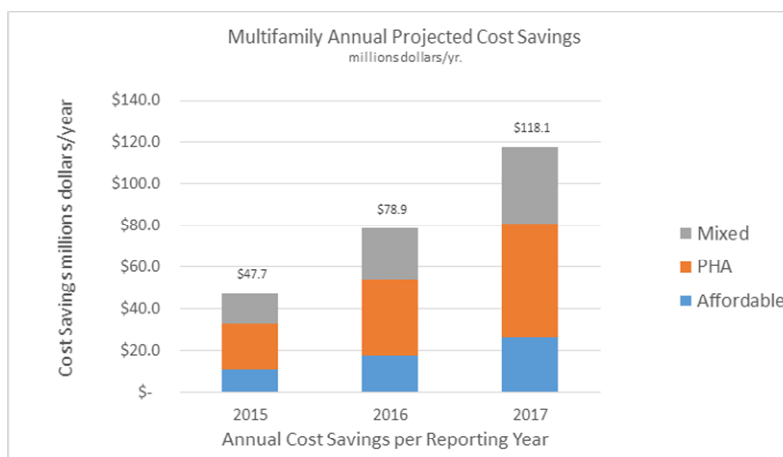


Figure 5 below shows estimated cumulative cost savings for all 105 Better Building Challenge partners of \$118 million in 2017. The relative share of savings for mixed market rate/affordable housing and assisted housing portfolios increases significantly when projecting savings from all partners.

Figure 5: Better Buildings Challenge Annual Cost Savings – Estimated All Partners



Examples of innovative cost savings projects reported by Challenge partners include:

- Keene Housing's West Street Pilot Project (Keene, New Hampshire) achieved energy consumption savings of nearly 40% and energy cost savings of 25% by replacing older electric heating with high efficiency mini-split air-source heat pumps. Keene Housing will be expanding the pilot to additional properties.

- King County Housing Authority (Seattle, Washington) achieved over 20% energy consumption savings and nearly 25% water consumption savings at Cascade Apartments through the installation of ductless heat pumps and upgrades to insulation, windows, light bulbs, and plumbing fixtures.
- Wishrock Investment Group realized 20% energy consumption savings with the rehabilitation of Timbercroft Apartments (Owings Mill, Maryland). The project earned Enterprise Green Communities certification through upgrades to the HVAC systems, water heaters, lighting, appliances, windows, walls, and roofing.
- Boston Land Company upgraded a 200-year old property as a Low-Income Energy Affordability Network project, installing a high efficiency gas-fired boiler and indirect water heater system at the property.

Top performers are shown below, with the savings that they have achieved so far.

Figure 6: Challenge Partners with Greatest Energy Savings Savings Since Baseline Year (2017)

Jersey City, NJ Housing Authority*	26%
Jewish Community Housing for the Elderly	24%
Cambridge, MA Housing Authority	18%
Trinity Housing Corporation of Greeley, CO	18%
The Renaissance Collaborative	17%
Atlanta Housing Authority	17%
Danville Development	15%
Denver Housing Authority	13%
Minneapolis Public Housing Authority	12%
Cascap, Inc.	12%

*Goal Achiever

Two partners achieved their 20 percent savings goal well ahead of the 10-year time frame allowed under the Better Buildings Challenge:

- The Jewish Community Housing for the Elderly (JCHE) became a Better Buildings Challenge goal achiever in 2016. They lowered utility consumption by 24 percent against their 2011 baseline six years ahead of schedule. JCHE's portfolio consists of 8 buildings and 926,000 square feet.
- Jersey City Housing Authority (JCHA), the second largest PHA in New Jersey achieved a 26 percent reduction in energy use in their rental housing portfolio. JCHA is installing better lighting, more effective

heating, new plumbing fixtures, and improving air quality, and where residents pay their own utility bills—reducing out of pocket expenses.

A full list of participating Challenge partners is shown in Appendix D. For further information see the HUD Exchange web site at <https://www.hudexchange.info/programs/better-buildings-challenge/>

4. Incentivizing multifamily utility cost savings

- **Pay for Success Demonstration.** As part of the Fixing America’s Surface Transportation (FAST) Act, enacted in December 2015, Congress authorized an innovative “Pay for Success” demonstration to support energy efficiency investments in up to 20,000 units of HUD-assisted multifamily housing. The demonstration will allow HUD to enter into contracts with outside entities to raise private capital for water and energy upgrades in privately owned HUD-assisted multifamily rental housing. Investors are paid back only when cost savings are realized as verified by a third party.
- **Capital Needs Assessment e-tool (CNA e-tool).** Capping several years of development, the CNA e-tool was launched in 2017. The CNA e-Tool is both an electronic template that incorporates a data standard for CNAs and an automated process for preparation, review, submission, approval and periodic updating of CNAs. Through the CNA e-Tool, FHA multifamily borrowers are able to assess cost-effective energy efficiency alternatives to standard upgrades of existing properties.
- **Rental Assistance Demonstration.** In addition to requirements for energy efficient appliances, a significant share of RAD conversions that use Low Income Housing Tax Credit (LIHTC) financing are incorporating advanced utility cost savings measures, both energy and water, as required or encouraged in individual state Qualified Allocation Plans.

5. Commitments exceeded resilient and renewable power targets (Renew300)

Some 80 PHAs and other HUD partners committed to the federal Renew300 target, with a total commitment of 340 megawatts, against the 300-megawatt target. This initiative, completed in 2017, aimed to help Federally assisted housing lower utility costs and improve resilience to potential power outages through the installation of on-site or community-based renewable energy technologies. Federally-assisted housing participating in this initiative included HUD’s rental housing portfolio and USDA’s Rural Development Multifamily Programs, as well Low Income Housing Tax Credit (LIHTC) properties. Supported renewable energy technologies included solar PV (electricity) and solar thermal (hot water), wind, geothermal, small biomass, Combined Heat and Power, and

small hydro projects. The goal included individual building installations, as well as community and shared solar installations.

One successful model is the 2.5-megawatt solar system installed by the Denver Housing Authority (DHA). The DHA launched a public-private partnership to install a solar photovoltaic (PV) system across its portfolio of scattered site, single family residential buildings: 10,000 solar panels on 666 buildings. The installation was financed through a Power Purchase Agreement (PPA) with a solar provider that enabled the PHA to avoid paying the up-front capital cost of solar installations. To defray the cost of the PPA, the Housing Authority was able to take advantage of State-issued Qualified Energy Conservation Bonds. HUD provided technical assistance (TA) to some Renew300 participants. A list of 80+ partners who committed to installing renewable energy in their facilities is provided in Appendix E.

6. Updating Code Requirements

The Energy Independence and Security Act of 2007 (EISA) requires HUD and USDA to jointly consider adopting the latest versions of the International Energy Conservation Code (IECC) or the American Society of Heating, Refrigeration and Air Conditioning Standard 90.1 (ASHRAE 90.1) for new construction of public housing and FHA-insured or assisted housing. Two criteria must be met prior to adoption: (1) a determination by DOE that the most recent energy codes represent an increase in energy efficiency over the prior code and (2) a determination by HUD and USDA that the new code does not negatively impact the “affordability and availability” of covered housing. HUD’s current standard is the 2009 IECC for single family/low rise buildings; and ASHRAE 90.1-2007 for multifamily with 5+ units except for the Public Housing Capital Fund which establishes ASHRAE 90.1-2010 as the minimum standard for new public housing multifamily units.^{22 23} (See Appendix C).

EISA also required the Department of Energy to establish energy efficiency standards for HUD-Code manufactured housing²⁴ based on the most recent version of the IECC, except in cases in which DOE finds that the IECC is not cost-effective, or a more stringent standard would be more cost-effective. Prior to establishing these regulations, DOE must satisfy two conditions—(1) provide manufacturers and other interested parties with notice and an opportunity for comment and (2) consult with the Secretary of HUD, who may then “seek further counsel from the Manufactured Housing Consensus Committee.”²⁵ In 2015 DOE initiated a negotiated

²² HUD, Public Housing Capital Fund Final Rule, Federal Register October 14, 2013. See

<https://www.federalregister.gov/documents/2013/10/24/2013-23230/public-housing-capital-fund-program>.

²³ HUD and USDA, Final Affordability Determination – Energy Efficiency Standards, Federal Register May 6, 2015, <https://www.federalregister.gov/documents/2015/05/06/2015-10380/final-affordability-determination-energy-efficiency-standards>.

²⁴ EISA Section 413, 42 U.S.C. 17071(a)(1).

²⁵ 42 U.S.C. 17071(a)(2).

rulemaking with a Manufactured Housing Working Group to discuss and, if possible, reach consensus on a proposed rule for the energy efficiency of manufactured homes,²⁶ and subsequently published a proposed rule for public comment in May 2016.²⁷ More recently, in August 2018 DOE published a new Notice of Data Availability and a Request for Information.²⁸ In that Notice DOE sought public comment on 15 topics, including, for example, “an altogether different approach consisting of incremental packages that maximize energy savings of a manufactured home within certain incremental cost parameters.”

²⁶ U.S. Department of Energy, Notice of Intent to Establish the Manufactured Housing Working Group, June 13, 2014. See <https://www.federalregister.gov/regulations/1904-AC11/energy-efficiency-standards-for-manufactured-housing-> and <http://www.regulations.gov/#!docketDetail;D=EERE-2009-BT-BC-0021>.

²⁷ U.S. Department of Energy, Notice of Proposed Rulemaking, Federal Register Notice 81 FR 39756, June 17, 2016. See https://www1.eere.energy.gov/buildings/appliance_standards/rulemaking.aspx?ruleid=97.

²⁸ U.S. Department of Energy, Notice of Data Availability, Federal Register Notice August 3, 2018. See <https://www.federalregister.gov/documents/2018/08/03/2018-16650/energy-conservation-program-energy-conservation-standards-for-manufactured-housing>.

Appendix A: Congressional Requirements to Increase Energy Efficiency in Affordable Housing

Energy Policy Act of 2005. The Energy Policy Act of 2005 included several provisions related to energy efficiency in public housing, including energy efficiency product purchasing requirements; greater integration of energy efficiency in ongoing capital investment planning; and extending the financing period for Energy Performance Contracting in public housing from 12 to 20 years.

Energy Policy Act of 2005
(1) PUBLIC HOUSING CAPITAL FUND CAPITAL PLANNING (section 151). Required integrated utility management and capital planning, processes to maximize energy conservation and efficiency measures; extends contract period for Energy Performance Contracts; and requires installation of fixtures and fittings that meet ASME/ASI standards.
(2) PURCHASE OF ENERGY-EFFICIENT APPLIANCES (section 152). Required public housing to purchase energy-efficient appliances that are ENERGY STAR products or FEMP-designated products.
(3) ENERGY CONSTRUCTION FOR HOPE VI (section 153). Required adoption of the International Energy Conservation Code for HOPE VI new construction and rehabilitation projects.
(4) ENERGY EFFICIENCY IN FEDERALLY ASSISTED INDIAN HOUSING (section 506). Required HUD to promote energy conservation in housing that is located on Indian land (and assisted with Federal resources) through the use of energy-efficient technologies and innovations, shared savings contracts, and other similar technologies and innovations. ²⁹

Energy Independence and Security Act of 2007 (EISA). The Energy Independence and Security Act of 2007 enacted substantial updates to Federal energy building performance standards for new construction projects supported by HUD's housing programs and financing products and for manufactured housing.

Energy Independence and Security Act of 2007
(1) APPLICATION OF INTERNATIONAL ENERGY CONSERVATION CODE TO PUBLIC AND ASSISTED HOUSING (section 481). Required HUD to "meet or exceed" the International Energy Conservation Code (IECC 2006, or for multifamily high rises, ASHRAE 90.1-2004) for new construction for public housing, assisted housing, single family and multifamily residential housing (other than manufactured homes) subject to mortgages insured under the National Housing Act, and new construction and rehabilitation of HOPE VI projects, and to "meet or exceed" revisions to these codes subject to certain determinations.
(2) ENERGY CODE IMPROVEMENTS FOR MANUFACTURED HOUSING (section 413). Required DOE, in consultation with HUD, to establish standards for energy efficiency in manufactured housing within 4 years based on most recent IECC except where code is not cost-effective.

²⁹ http://energy.gov/sites/prod/files/2013/10/f3/epact_2005.pdf

Housing and Economic Recovery Act of 2008 (HERA). The Housing and Economic Recovery Act of 2008 brought new attention to energy efficiency in existing single family residential markets, particularly with respect to FHA-insured, market-rate housing transactions and the growing inventory of foreclosed and abandoned properties in communities.

Housing and Economic Recovery Act of 2008
(1) ENERGY-EFFICIENT MORTGAGE (EEM) (section 2123). Eliminated previous \$8,000 cap and required HUD to change lending limits on EEMs to 5 percent of property value or 2 percent of the limit established under section 203(b)(2)(B) of the Act; and limits EEM production not to exceed 5 percent of the aggregate number of mortgages insured by HUD.
(2) ENERGY EFFICIENCY IN LIHTC PROGRAM QUALIFIED ALLOCATION PLANS (section 3004). Statutory amendments include reforms to the Low-Income Housing Tax Credit program requiring State Housing Finance Agencies to consider energy efficiency in making tax credit allocations and to include energy efficiency considerations in State plans for the allocation of credit among projects.

Fixing America's Surface Transportation Act (Public Law 114-94). Title LXXXI authorizes HUD to establish a Pay for Success demonstration program wherein up to 20,000 assisted multifamily units can receive energy and water conservation retrofits without any additional government outlays.

Economic Growth and Regulatory Relief Act of 2018. Section 209 allows smaller, rural PHAs with up to 550 units (either vouchers or ACC units or both) to retain savings for up to 20 years

Appendix B: FYs 2016–17 Annual Performance Goal

Program	FY 2016 Goal	FY 2017 Goal	Cumulative Goal 2016–17	Results 2016-17
Public Housing Capital Fund (unit equivalents) *	6,442	6,319	12,761	25,322
Energy Performance Contracts	13,220	13,100	26,320	22,860
HOPE VI, Choice Neighborhoods, Mixed Finance	1,823	793	11,900	3,222
Total Public and Indian Housing	22,063	20,914	41,697	51,404
Community Development Block Grant- Disaster Recovery (CDBG-DR)	1,236	1,236	2,472	2,165
HOME Investment Partnerships	6,000	5,900	11,900	11,594
Community Development Block Grants	415	415	830	554
Total Community Planning and Development	7,651	7,551	15,202	14,313
Multifamily Endorsements with Energy Efficient Features	12,193	12,193	24,386	26,474
Sections 202 (Elderly) and 811 (Persons with Disabilities) Supportive Housing	850	850	1,700	529
Mark-to-Market	2,500	2,500	5,000	1,728
Rental Assistance Demonstration (RAD)	11,700	14,000	25,700	18,009
Energy Efficient Mortgages	275	275	550	682
Section 203(k)	3,500	3,500	7,000	9,222
Total Housing	31,018	33,318	64,336	11,106
Other Units	2,883	2,882	5,765	0
Total Energy Retrofits	62,975	64,025	127,000	128,442

*Estimated “equivalent units” comprised of the ten most cost-effective energy conservation measures (ECMs) that achieve an estimated minimum of 15% energy savings.

Appendix C: Minimum Energy Standards or Requirements (New Construction)

Program	Program Type	Minimum Requirements	Additional Points or Incentives
FHA MULTIFAMILY			
Multifamily Mortgage Insurance	Mortgage Insurance Sections 213, 220, 221(d)(4), 231, 232, 241(a).	Low-Rise (3 stories or less): 2009 IECC Mid- or High-Rise: ASHRAE 90.1-2007	Mortgage Insurance Premium for Energy Star Score of at least 75 in EPA's Portfolio Manager AND A recognized Green Building Standard
Rental Assistance Demonstration (RAD)	Conversions to Project-Based Rental Assistance (Section 8) Contract	<i>New Construction:</i> Single Family and Multifamily Low-Rise: 2009 IECC Multifamily Mid- or High-Rise: ASHRAE 90.1-2007 Applicants encouraged to build to Energy Star Certified New Homes or Multifamily High-Rise standards, or industry-recognized Green Building standard. <i>Rehabilitation:</i> Energy Star appliances WaterSense or FEMP-designated products Most cost-effective measures identified in Capital Needs Assessment.	Revision 3 of RAD Notice (1/12/17) provides incentive for property owner to retain savings when improvements will reduce Utility Allowances/tenant-paid utilities (contract rent increased by 75% of approved reduction in UA).
FHA SINGLE FAMILY			
Single Family Mortgage Insurance	Mortgage Insurance	Single Family: 2009 IECC.	
		Condos/coops in mid-rise or high-rise: ASHRAE 90.1-2007.	
PUBLIC AND INDIAN HOUSING (PIH)			
Choice Neighborhoods – Implementation Grants	Competitive Grant (2018 NOFA)	<ul style="list-style-type: none"> - Meet requirements of Energy Star Certified New Homes (single family or low-rise) or Energy Star for Multifamily High-Rise (mid-rise or high-rise) - Certification by recognized green rating such as Energy Star Indoor Air Plus, Enterprise Green Communities, National Green Building Standard, LEED-H, LEED-NC, or local. regional standards such as Earthcraft or Built Green. - Use Energy Star products. 	
Choice Neighborhoods – Planning Grants	Competitive Grant (2018 NOFA)	<ul style="list-style-type: none"> - Eligible for LEED-ND Stage 1 Conditional Approval. - Certification by recognized green rating program (see Implementation Grants above) - Maximize energy efficiency and water saving techniques and practices and improve the health of residents...to the extent feasible and affordable 	

Program	Program Type	Minimum Requirements	Additional Points or Incentives
Rental Assistance Demonstration (RAD)	Conversions to Housing Choice Vouchers	Same as RAD, above	Same as RAD, above
Public Housing Capital Fund	Formula Grant	Single Family and Low-Rise Multifamily: 2009 IECC Multifamily: ASHRAE 90.1-2010 AND Energy Star appliances when cost effective	
Public Housing Capital Financing Program (CFFP)	Private Sector Capital	Single Family and Low-Rise Multifamily 2009 IECC Multifamily: ASHRAE 90.1-2010 AND Energy Star appliances when cost effective	
Indian Housing Block Grants (IHBG) Indian Community Development Block Grants (ICDBG)	Formula and Competitive Grants	ICDBG: Meet Section 8 Housing Quality Standard, standards must include “a livable home environment that is energy efficient and incorporates energy conservation measures” Meet applicable State, local, or tribal codes	ICDBG: Provides rating points for description of “cost savings resulting from building design or energy efficiency measures” (2018 NOFA)
COMMUNITY PLANNING AND DEVELOPMENT (CPD)			
HOME	Formula Grant	Single Family: 2009 IECC Multifamily: ASHRAE 90.1-2007 (Participating Jurisdictions (PJs) required to report new units that meet Energy Star Certified Homes standard in IDIS)	
CDBG	Formula Grant	Meet local codes (Grant recipients required to report new units that meet Energy Star Certified Homes standard in IDIS)	
Self Help Ownership Program (SHOP)	Competitive Grant (2018 NOFA)	Energy Star for New Homes encouraged but not required Energy Star products and appliances not required WaterSense products required	
CDBG-DR	Disaster Recovery Grant (2019 Mitigation Notice)		For new or replacement housing: Encouraged: Green building standard, including Energy Star Certified Homes or Energy Star for Multifamily High-Rise and other specified green building standards For moderate rehab: Encouraged: CPD Retrofit Checklist AND Energy Star appliances, WaterSense or FEMP products, if replaced (2013 Notice)

Key: MF = Multifamily; SF = Single Family; Low-rise = up to 3 stories; Mid- or High-rise = 4+ stories;
IECC = International Energy Conservation Code (for single family and low-rise multifamily)
ASHRAE = American Society of Heating, Refrigeration and Air Conditioning Engineers

Appendix D: Better Building Challenge Multifamily Partners

ACTION-Housing Inc.	Housing Authority of City of Philadelphia, PA
Aeon	Housing Authority of City of San Buenaventura, CA
AHEAD, Inc.	Housing Authority of Knox County, IN
Angola Housing Authority	Housing Trust of Rutland County
Atlanta Housing Authority	Houston Housing Authority
Avon Park Housing Authority	Jamaica Plain Neighborhood Development Corporation
Balfour Beatty Communities	Jersey City, NJ, Housing Authority
Beacon Communities	Jewish Community Housing for the Elderly
The Boston Land Company	Jonathan Rose Companies
Bozzuto Management Company	Keene Housing
BRIDGE Housing Corporation	Kier Property Management
Cambridge, MA, Housing Authority	King County Housing Authority
Capitol Hill Housing	Korman Residential Properties, Inc
Caritas Communities, Inc.	LINC Housing Corporation
Cascap, Inc.	Lucas Metropolitan Housing Authority
Century Housing	Manhattan Housing Authority
Cion Housing Services	McCormack Baron Salazar
City of Hickory Public Housing Authority	Mercy Housing, Inc.
Cleveland Housing Authority	Michigan City Housing Authority
Codman Square Neighborhood Development Corporation	Minneapolis Public Housing Authority
CommonBond Communities	Multi-Family Mission Ministries
The Community Builders, Inc.	National Church Residences
Community Housing Partners	New Bedford Housing Authority
Consecre Housing Network	New York City Housing Authority
Corcoran Management	Newark Housing Authority
Cuyahoga Metropolitan Housing Authority	NewLife Homes
Danville Development	NHP Foundation
The DeBruler Co.	NHT/Enterprise Preservation Corporation
EAH Housing, Inc.	Peabody Properties, Inc.
East Bay Asian Local Development Corporation	Presby's Inspired Life
Economic Development Authority of Mankato, MN	Preservation of Affordable Housing
Eden Housing	Puerto Rico Public Housing Administration
Elderly Housing Development and Operations Corporation	REACH CDC
Essex Management Company, LLC	The Renaissance Collaborative
The Evangelical Lutheran Good Samaritan Society	Retirement Housing Foundation
Fort Wayne Housing Authority	Rockford Housing Authority
Foundation Communities	Rural Ulster Preservation Company
FS Energy	San Antonio Housing Authority
Gary Housing Authority	Satellite Affordable Housing Associates
Gateway Management Services, LLC	Schochet Companies
Green Coast Enterprises	Silver Street Group and Housing Management Resources, Inc
H.J. Russell & Company	Stark Metropolitan Housing Authority
Homes for America	Stewards of Affordable Housing for the Future
Housing Authority of Baltimore City	Tampa Housing Authority
Housing Authority of City of Bristol, CT	Tenderloin Neighborhood Development Corporation
Housing Authority of the City and County of Denver	Trinity Housing Corporation of Greeley, CO
Housing Authority of City of Freeport, IL	Trinity Management
Housing Authority of City of Helena, MT	Truth or Consequences Housing Authority
Housing Authority of City of Palatka, FL	

Utica Municipal Housing Authority
Village of Hempstead Housing Authority
Vistula Management Company
Volunteers of America
Washington, DC, Housing Authority

Wesley Housing Corporation
Windsor Locks Housing Authority
Winn Companies
Wishrock Investment Group
Yolo County, CA Housing Authority

Appendix E: Commitments to Install Renewable Energy in Federally Assisted Housing Properties

Affirmed Housing Group - 0.998 mW	Palm Communities - 2.959 mW
Allegheny County Housing Authority -1.4902 mW	Park, Inc - TBD
Asheville Housing Authority -1 mW	People's Self-Help Housing - 1.735 mW
Bayview Community Development Corporation - 0.4 mW	Preservation of Affordable Housing - 1.12 mW
Black Rock Solar - 11 mW	RREAL - 100 mW
Boulder Housing Authority - 1.518 mW	Rural Ulster Preservation Company - 1.11 mW
BRIDGE Housing - 1.8 mW	Saint Paul Housing Authority - 0.4 mW
Cambridge Housing Authority - 0.8 mW	San Antonio Housing Authority - 0.028 mW
Chelsea Investment Corporation - 6.75 mW	San Diego Youth Services - 0.22 mW
Chicago Housing Authority - 4 mW	Santa Barbara County Housing Authority - 0.167 mW
Coachella Valley Housing Corporation - 3.445 mW	Standard Property Company - 1.402 mW
Codman Square Neighborhood Development Corporation - 0.734 mW	Stewards of Affordable Housing for the Future (SAHF) - 4 mW
Community Advancement Corporation - 0.255 mW	Tampa Housing Authority - 0.595 mW
Community Housing Partners - 0.077 mW	The Core Companies - 0.208 mW
Community Housing Works - 4.621 mW	The Reliant Group - 0.229 mW
Community Power Network - 1 mW	Urban Housing Communities - 0.790 mW
Corporation for Better Housing - 2 mW	Vistula Management Company - .05 mW
Cuyahoga Metropolitan Housing Authority	VITUS - 0.693 mW
Denver Housing Authority - 2.5 mW	Wakeland Housing and Development Corporation - 0.251 mW
District of Columbia Housing Authority - 0.962 mW	WinnCompanies - 4 mW
EAH Housing - 10 mW	Yolo County Housing Authority - 0.9 mW
East Bay Asian Local Development Corporation - 1 mW	York Housing Authority
Enterprise Community Partners - 16 mW	
Essex Plaza Management Company	
Fresno Housing Authority - 0.5 mW	
Global Green USA - 1 mW	
GRID Alternatives - 100 mW	
Harmony Neighborhood Development	
Hispanic Housing Development Corporation - 0.6 mW	
Horizon Development/Preservation Partners - 0.45 mW	
Housing Authority of the County of Los Angeles - 0.5 mW	
Innovative Housing Opportunities - 0.11 mW	
King County Housing Authority - 0.03 mW	
Knox County Housing Authority - 0.176 mW	
Levy Affiliated - 0.561 mW	
LINC Housing - 0.826 mW	
Los Angeles County Housing Authority - 0.5 mW	
Many Mansions - 1.073 mW	
Mercy Housing - 3 mW	
Metro West Housing Authority (Lakewood Housing Authority) - 0.494 mW	
MidPen Housing - 3.781 mW	
Mutual Housing California - 0.486 mW	
National Community Renaissance of California	
National Housing Trust - 0.5 mW	
New Bedford Housing Authority	
New York City Housing Authority - 25 mW	