

An hourglass-shaped graphic with a globe in the top bulb and another globe in the bottom bulb. The top bulb is dark blue, and the bottom bulb is light blue. The hourglass is light gray. The globe in the top bulb is dark blue, and the globe in the bottom bulb is light blue. The hourglass is centered on the page.

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February 2, 2009

Congressional Research Service

Report RS20761

LIHEAP and Residential Energy Costs

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March 7, 2006

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CRS Report for Congress

Received through the CRS Web

LIHEAP and Residential Energy Costs

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Summary

Among considerations in setting funding levels for the Low Income Home Energy Assistance Program (LIHEAP)¹ are current prices of residential energy. Those prices fell in real terms for most of the years since the program began and energy efficiency gains probably have reduced the amount of energy required to provide a given level of comfort and convenience. However, the aggregate cost in current dollars of energy used by low-income households has risen over the last 25 years and residential energy prices have increased recently. Federal LIHEAP funding has not kept pace with the increases, but this does not necessarily mean that funding has failed to keep pace with "need."

Context and Scope of Report

Because energy costs account for a larger share of low-income than of high-income family budgets, the relative impact of energy price increases is believed to be greater on the poor than on the better off.² Thus, many in Congress are concerned that the recent steep rise in energy prices is imposing hardship on low-income families. For example, residential heating oil prices jumped in 2000, have increased steeply after 2002 (**Table 1**), and the U.S. Energy Information Administration projects those prices to rise even further in 2006 and 2007.³

Congress established LIHEAP in the early 1980s, following a period of several sharp energy price increases. LIHEAP makes grants to states, which distribute the aid that

¹ For more on LIHEAP and related legislation, see CRS Report RL31865, *The Low-Income Home Energy Assistance Program (LIHEAP): Program and Funding*, by Libby Perl.

² There is some disagreement as to the degree to which energy costs are a greater burden on low-income families. Part of the issue pertains to whether one is looking at a short period or a lifetime. For a related discussion, see, for example, "Yes! Consumption Taxes Are Regressive," by Howard Chernick and Andrew Reschovsky, *Challenge* (magazine), September-October 2000.

³ Energy Information Administration. *Short-Term Energy Outlook*, February 7, 2006. [<http://www.eia.doe.gov/emeu/steo/pub/contents.html>] viewed August 10, 2005.

provides cooling as well as heating assistance. Federal funding, initially \$1.6 billion (FY1980), has ranged from \$1.08 billion (FY1996) to \$2.16 billion (FY2006).

Given LIHEAP's purpose, a congressional consideration in setting a particular year's appropriations is the level of energy costs incurred by low-income families. This report addresses the question of whether energy used by low-income households costs more or less, in constant dollars, than when LIHEAP started, what any change in such costs may imply for LIHEAP funding, and what changes may have occurred in the burden of energy costs on low-income households in relation to their income.

Change in Energy Costs

Energy costs are defined here as the expenditures associated with purchasing a particular amount of energy. Because the level of energy costs is determined by both the price and the amount of energy purchased, an attempt to determine whether energy costs now are higher or lower than in 1980 must examine both factors.

The price aspect is complicated. For the most part, prices of residential energy in current dollars have risen since 1980. The household fuel component of the Consumer Price Index (CPI), which combines changes in the retail prices of several energy forms used in residences (including oil, natural gas, and electricity), increased 145% between 1980 and January 2006 (**Table 1**). This means that, other things being equal, 145% more money is required to purchase the same amount and mix of energy in 2006 than in 1980.⁴ However, the general price level faced by consumers rose 142% during the same period. Therefore, because the energy priced and paid for in 2006 is in dollars that have declined in value since 1980 almost as much (in relative terms) as energy prices have increased, the average price of residential energy in constant dollars actually rose only 1.7% between 1980 and January 2006⁵ despite the oil and natural gas price jumps of 2000-2001 and 2004-2006.⁶

Aside from being affected by price, the *amount* of residential energy purchased per household depends upon the number of persons per household, the size of apartment or house, the number of appliances, and the energy efficiency of the building and appliances. Over time, the amount of living space and number of appliances have increased — i.e. microwave ovens, videotape players, and additional television sets.

Gains in energy efficiency can reduce the amount of energy purchased and, therefore, tend to lower energy *costs* while maintaining, or even enhancing, "delivered" energy services such as heat, light, cooling, and other energy-derived household comforts and conveniences). Adjusting for differences in weather among years, energy use per household

⁴ Strictly speaking, the household fuel component of the CPI overstates the effect of energy price increases on household budgets to the extent that households substitute less costly fuels for more costly fuels over time. The CPI tracks price changes using a fixed "market basket."

⁵ Derived by dividing the ratio of the January 2006 fuel price index to the 1980 fuel price index by the 2006/1980 general price index ratio ($2.455 \div 2.415 = 1.017$), and subtracting 1.000.

⁶ Some of the costs reflected in the prices to households of "delivered" energy is accounted for by distribution (involving labor and capital). Such costs are less volatile than the prices of the commodities themselves.

Table 1. Residential Energy Prices and Inflation

Fiscal Year	Price Indexes, 1987 = 100		Prices of Major Energy Sources in 1987 Dollars ^a		
	Fuels & Electricity ^b	General Price Level ^c	Natural Gas (\$/MCF)	Heating Oil (\$/gallon)	Electricity (¢/kwh)
1980	76.9	72.6	5.1	1.34	7.4
1983	103.3	87.7	6.9	1.23	8.2
1985	107.4	94.7	6.5	1.11	7.8
1988	100.7	104.1	5.3	0.78	7.2
1990	107.4	115.1	5.0	0.92	6.8
1992	111.1	123.5	4.8	0.76	6.6
1993	114.3	127.2	4.8	0.72	6.5
1994	114.8	130.5	4.9	0.68	6.4
1995	114.6	134.2	4.5	0.65	6.3
1996	118.4	138.1	4.6	0.72	6.1
1997	121.2	141.3	4.9	0.70	6.0
1998	116.9	143.5	4.8	0.59	5.8
1999	116.6	146.7	4.6	0.60	5.6
2000	126.2	151.6	5.1	0.86	5.4
2001	139.2	155.9	6.2	0.80	5.7
2002	130.7	158.4	5.0	0.71	5.4
2003	142.0	162.0	5.9	0.84	5.4
2004	148.4	166.3	6.5	0.93	5.4
2005	166.1	171.9	7.2	1.22	5.5

MCF - Thousand cubic feet.

Kwh - Kilowatt-hours.

^a Prices of the respective energy forms in terms of the overall purchasing power of 1987 dollars, derived using the Consumer Price Index (all items).

^b Household energy component of the Consumer Price Index..

^c Consumer Price Index, all items.

Sources: Department of Energy, Energy Information Administration (EIA). *Monthly Energy Review*, January 2004 and February 2006; Department of Labor, Bureau of Labor Statistics. [<http://www.bls.gov>].

fell 14% between 1980 and 2001 — an average of about 0.7% per year — despite an increase in the average amount of floor space per housing unit and in the number of appliances per household.⁷ It is estimated that per household energy use would have fallen about 1.5% per year if the effects of greater floor space and more appliances are removed.⁸

⁷ Energy Information Administration. Residential Sector Energy Intensities. [http://www.eia.doe.gov/emeu/efficiency/recs_tables_list.htm] viewed March 6, 2006.

⁸ CRS estimate based upon data from the Energy Information Administration website page cited in footnote #7.

There is reason to believe, however, that the rate of improvement in low-income household energy efficiency was, and probably will remain, below the national average, given the limited financial resources of low-income households, their propensity to be renters rather than homeowners,⁹ and their possibly lower level of awareness of energy-saving options.

Analysis of Funding “Adequacy”

Because factors in addition to perceived need often come into play when funding levels for programs are determined, neither initial nor subsequent year funding necessarily meets or tracks the level of “need.” It sometimes is appropriate to analyze the level of funding together with developments that bear on a particular program to try to determine whether funding levels have been maintained in relative terms. Funding for LIHEAP (including contingency funds appropriated and disbursed) rose the first five years after FY1980, mainly fell between 1985 and 1996, and has risen since FY1998 (**Table 2**). Funding increased from the initial \$1.6 billion to \$2.1 billion in FY1985, hit a low of \$1.1 billion in FY1996, and has risen since FY1998 for the most part. Apparent FY2006 funding of \$2.16 billion is the highest ever (by a small margin over the \$2.13 billion for FY2005). However, inasmuch as FY2006 is still in progress, ultimate total actual disbursements are yet to be known.

Comparisons With Hypothetical Scenarios. From FY1981 through FY1986, actual funding came close to matching a hypothetical scenario, called “Constant Energy Level” in **Table 2**, in which funding almost moves with the change in residential energy prices. This scenario shows the estimated level of funding in each year's dollars that would maintain the same amount of residential energy estimated to be purchased by \$1.6 billion in FY1980.¹⁰ Account is taken of changes in residential energy prices through the use of the household fuel component of the CPI. After FY1986, the funding levels in this scenario irregularly but increasingly exceed actual funding. Because it takes no account of the energy-related developments over time that may have improved energy efficiency, this scenario might be considered a set of high estimates of funding “required” to avoid a reduction in assistance to low-income families.

In the first several years of the LIHEAP program and its brief predecessor, actual funding came close to, and even slightly exceeded in the mid-1980s, estimated funding in a hypothetical scenario that embodies improvement in residential energy efficiency. This “Constant Heating and Convenience” scenario is the estimated level of funding in each year's dollars that would maintain the same level of heating and convenience estimated to be purchased by \$1.6 billion in FY1980, taking into account estimated gains in energy efficiency of buildings, appliances, etc. as well as changes in residential energy prices. After the mid-1980s, actual funding has fallen below estimated hypothetical funding in this scenario. Because low-income families probably are less likely to improve energy efficiency than the average household, the estimates of hypothetical “required” funding in this scenario could be considered “low.” Nevertheless, actual funding still falls below the levels of this scenario from FY1988 through FY2005.

⁹ If a household rents rather than owns its living quarters, it has less incentive to invest in physical modifications that reduce energy use.

¹⁰ This scenario does not take into account any weather differences.

With few exceptions, actual annual LIHEAP funding falls considerably below a “Standardized” comfort and convenience scenario that, in addition to increases in energy prices and in energy efficiency, allows for the effect on energy use by societal improvement in the residential living standard of low income families. Nevertheless, the funding associated with this hypothetical scenario is lower than in the “Constant Energy Level” scenario.

None of the hypothetical scenarios take into account the increase in the number of households eligible for LIHEAP benefits (66% between FY1981 and FY2002), and each ignores funds spent for administration. In addition, neither the actual nor hypothetical funding totals include amounts of low-income energy assistance provided intermittently through other disbursements.

The Seeming Contradiction. Hypothesized funding that *increases substantially* over time in order to maintain a constant energy purchase level seems to contradict an earlier statement that real energy prices have risen only slightly since 1980. However, actual funding levels necessarily are in each year's, or nominal, dollars, which have fallen in value over the years; and, for comparability, hypothetical funding levels must be in current-year dollars. Thus, it would take the hypothetical \$3.4 billion for FY2005 in the “Constant Energy Level” scenario to buy the same amount of energy as the \$1.6 billion of funding in FY1980 did (**Table 1**). Similarly, hypothetical FY2005 funding in the other two scenarios also exceed actual FY2005 LIHEAP funding despite the fact that actual LIHEAP funding has doubled since FY1996.

Change in the Energy Cost Burden. The perception of need for low income household energy assistance also is related to the degree of the burden of energy costs on low-income households. Helped by both falling real prices of residential energy and rising incomes, the ratio of average residential energy expenditures to average income among LIHEAP-eligible households fell from 17.1% in FY1981 to 9.6% in FY2002, according to the Administration for Children and Families of the Department of Health and Human Services.¹¹ However, this 44% decrease in the ratio did not necessarily mean a 44% decrease in the "need" for LIHEAP benefits.

The sharp increases in residential energy prices in the years since 2002 probably have reversed significantly the fall in the energy cost burden to LIHEAP-eligible households. This is suggested by the fact that the ratio rose from the previously noted 9.6% to 10.5% in the one year between FY2002 and FY2003, and, obviously, those data (latest available) do not reflect the price increases since FY2003. The burden ratio for *all* U.S. households, which also had decreased between FY1981 and FY2002, did not decline between FY2002 and FY2003.¹²

¹¹ Department of Health and Human Services, Administration for Children and Families (ACF). *LIHEAP Home Energy Notebook for Fiscal Year 2002*, April 2004, p. 26 and 27; ACF. *LIHEAP Home Energy Notebook for Fiscal Year 2003*, March 2005, p. 26 and 27.

¹² ACF, *op. cit.*

Table 2. LIHEAP Funding: Actual and Hypothetical
(billions of dollars)

Fiscal Year	Actual ^a	Hypothetical Scenarios		
		Constant Energy Level	Constant	Heating and Convenience "Standardized"
1980	1.600 ^b	1.600	1.600	1.600
1982	1.875	2.040	1.980	2.020
1984	2.075	2.220	2.090	2.180
1986	2.100	2.120	1.940	2.060
1988	1.532	2.100	1.860	2.010
1990	1.443	2.240	1.930	2.130
1991	1.610	2.280	1.930	2.160
1992	1.500	2.310	1.930	2.180
1993	1.346	2.380	1.960	2.230
1994	1.737	2.390	1.930	2.230
1995	1.419	2.390	1.900	2.210
1996	1.080	2.460	1.930	2.270
1997	1.215	2.520	1.950	2.310
1998	1.160	2.430	1.850	2.220
1999	1.275	2.430	1.820	2.210
2000	1.844	2.630	1.940	2.380
2001	1,856	2.900	2.110	2.610
2002	1.800	2.720	1.950	2.440
2003	1.988	2.960	2.090	2.640
2004	1.889	3.090	2.150	2.740
2005	2.162	3.460	2.370	3.050
2006	2.161 ^b	4.220	2.850	3.700

^a Funds actually distributed. Includes releases of separately appropriated contingency funds.

^b Reflects \$1.98 billion in regular appropriations and \$181 million in contingency funds after a 1% rescission.

Constant Energy Level: Hypothetical funding in each year's dollars that would maintain the same level of residential energy estimated to be purchased by \$1.6 billion in FY1980. For each year, account is taken of change in residential energy prices by multiplying the initial year figure of \$1.6 billion by the ratio of the household fuel price index in that year to the household fuel price index in 1980 (calculated from Table 1.)

Heating and Convenience: Two other hypothetical funding levels in each year's dollars. The "Constant" scenario maintains the same amount of energy services estimated to be purchased by \$1.6 billion in FY1980, but takes into account estimated gains in energy efficiency of buildings, appliances, etc. as well as changes in energy prices. Energy efficiency gains are assumed to be gradual and to equal the average rate of gain in energy efficiency in the residential sector during the period estimated by CRS at 1.5% per year. The "Standardized" scenario allows for the effect on energy use by an increase over time in floor space and number of appliances. CRS estimates this amenity increase at 1% per year, offsetting part of the efficiency gain and tending to increase energy use. None of the scenarios have an allowance for administrative costs.

Sources: CRS Report RL31865, *The Low Income Home Energy Assistance Program (LIHEAP): Program and Funding*, by Libby Perl, p. 1 and 18; CRS estimates using data from (1) Department of Energy, Energy Information Administration, "Residential Sector Energy Intensities, 1978-2001." [http://www.eia.doe.gov/emeu/efficiency/recs_tables_list.htm], and (2) Department of Labor, Bureau of Labor Statistics [<http://data.bls.gov/PDQ/outside.jsp?survey=cu>].