

Data Collection Activities

This appendix describes the data collection activities that were conducted for the *Low Income Home Energy Assistance Program (LIHEAP) Report to Congress for Fiscal Year (FY) 2022*. Data collection activities include state LIHEAP grant recipient reporting and national household surveys.

Under the block grants created by the Omnibus Budget Reconciliation Act of 1981 (OBRA), federal information collection and reporting requirements for grant recipients have been limited mostly to only that information which is mentioned specifically in statute.

LIHEAP Household Report

Section 2605(c)(1)(G) of the LIHEAP Act [42 U.S.C. 8624(c)(1)(G)] requires grant recipients, as part of their annual LIHEAP grant application, to report the following LIHEAP household data:

- The number and income levels of assisted households.
- The number of assisted households with one or more individuals who are older adults, members with a disability, or a young child.
- The number and income levels of households applying for LIHEAP assistance, not just those households that receive LIHEAP assistance.

The *LIHEAP Household Report* (OMB Clearance No 0970-0060) gathers state-level data on LIHEAP assisted and applicant households. The submission of the *LIHEAP Household Report* is required as part of each grant recipient's LIHEAP grant application for funding in the subsequent fiscal year. The Administration for Children and Families (ACF), within the U.S. Department of Health and Human Services (HHS), conducted this survey for FY 2022 in December 2022. Reporting instructions provided to grant recipients for FY 2022 are available in [LIHEAP Action Transmittal 2023-01](#).

State-reported data on LIHEAP applicant households are not always comparable across states because states can define applicant households differently. Consequently, such data are excluded from the *LIHEAP Report to Congress for Fiscal Year 2022*. However, the reporting of such data is required as part of each grant recipient's LIHEAP grant application.

Starting in FY 2011, states were required to provide an unduplicated count of households that received any type of LIHEAP assistance, regardless of the type of LIHEAP assistance provided to households (including LIHEAP weatherization assistance). However, states are not requested to break down the unduplicated count of households that received any type of LIHEAP assistance by poverty level, as defined by the Health and Human Services Poverty Guidelines (HHSPG).

Starting in FY 2015, states were asked to report separately on the number of households assisted with Supplemental Nutrition Assistance Program (SNAP) nominal benefits; these households are

excluded from the unduplicated count of households that received any type of LIHEAP assistance. States were also requested to report separately on households receiving winter crisis assistance versus households receiving year-round crisis assistance. (Prior to FY 2015, states reported on the combined count of the number of households receiving winter/year-round crisis assistance during the federal fiscal year.)

Separate unduplicated counts of the number of assisted households with any vulnerable members were also requested. These categories consisted of households that had: (1) at least one older adult member; (2) at least one member with a disability; or (3) at least one young child.

In FY 2022, all states were able to report an unduplicated count of households, and the national total unduplicated count of households assisted by LIHEAP was able to be computed.

Table A-1 provides information for FY 2022 on the percentage of assisted households for which complete data exists for poverty levels, older adults, members with a disability, young children, and unduplicated vulnerable households, as reported by the states. If a state reported missing or unreliable data, its data were suppressed.

Table A-1. Percent of Assisted Households by Poverty Level, Older Adult, Member with a Disability, Young Children, and Any Vulnerable Member, as Reported Uniformly by States, by Type of LIHEAP Assistance, FY 2022ⁱ

Household Characteristic	Heating Assistance	Cooling Assistance	Winter Crisis Assistance	Year-Round Crisis Assistance	Summer Crisis Assistance	Weatherization Assistance	Any Type of Assistance
Poverty level	97.9%	94.6%	73.4%	100.00%	100.0%	97.8%	NA
Older adult ⁱⁱ	100.0	100.0	100.0	100.00	100.0	100.0	100.0
Member with a disability ⁱⁱⁱ	100.0	100.0	100.0	100.00	100.0	100.0	100.0
Young child ^{iv}	100.0	100.0	100.0	100.00	100.0	100.0	100.0
Older adult, member with a disability or young child	100.0	100.0	99.2	100.00	100.0	96.5	93.5

ⁱ These data are derived from the *LIHEAP Household Report for FY 2022*. They are current as of June 30, 2023. Percentages equal to 100 percent indicate that states were able to provide complete information for the reported household characteristic. Percentages under 100 percent indicate that some states were unable to provide complete information for the reported household characteristic.

ⁱⁱ “Older adult” refers to a household with at least 1 member who is 60 years old or older.

ⁱⁱⁱ “Member with a disability” refers to a household with at least 1 member with a disability, as defined by each state.

^{iv} “Young child” refers to a household with at least 1 member who is 5 years old or younger.

LIHEAP Performance Data Form – Grantee Survey Section

All states are required annually to complete the *LIHEAP Performance Data Form – Grantee Survey Section (Grantee Survey)* (OMB Clearance No. 0970-0449). The data from this survey provide state-level estimates on the sources and uses of states' LIHEAP funds, average household benefits, and the maximum income cutoffs for determining income eligibility for a four-member household.

ACF conducted this survey for FY 2022 in January 2023. Reporting instructions provided to grant recipients for FY 2021 are available in [*LIHEAP Action Transmittal FY 2023-02*](#).

A key feature of this survey is the collection of estimates of sources and uses of LIHEAP obligated funds. The estimates of obligated funds do not provide data on LIHEAP expenditures in FY 2022 as LIHEAP obligations in FY 2022 could be spent in FY 2023 or later, depending on state law. The estimates provide a snapshot of how states obligated their FY 2022 funds.

LIHEAP Performance Data Form – Performance Measures Section

All states are required annually to complete the *LIHEAP Performance Data Form – Performance Measures Section (Performance Measures Report)* (OMB Clearance No. 0970-0449). The data from this survey provides estimates for four new developmental performance measures. Two measures are focused on measuring the impact of LIHEAP at ensuring households have access to necessary home energy services, and two measures estimate the impact of LIHEAP on targeting households with the highest energy costs in relation to energy burden (as required in Section 2605(b)(5) of the LIHEAP Act [42 U.S.C. 8624(b)(5)]).

ACF conducted this survey for FY 2022 in January 2023. Reporting instructions provided to grant recipients for FY 2021 are available in [*LIHEAP Action Transmittal FY 2023-02*](#).

Currently, HHS views these new performance measures as developmental while state grant recipients continue to build the capacity to successfully collect and report complete and accurate data.

National Household Surveys

Since FY 1982, the Office of Community Services (OCS), within ACF, has relied upon the two national household surveys described below. The results of these surveys provide a variety of national and regional demographic and energy-related data on characteristics of households income eligible for LIHEAP and households receiving LIHEAP bill payment assistance.

Data from national household surveys are subject to the following errors (for further information, see the *technical documentation for the Current Population Survey's 2022 Annual Social and Economic (ASEC) Supplement*):

- **Sampling error.** The data in the national household surveys are estimates of the actual figures that would have been obtained by interviewing the entire population using the same methodology. The estimates from the chosen sample also differ from other samples of housing units and members within those housing units. Sampling error in data arises due to the use of probability sampling, which is necessary to ensure the integrity and representativeness of sample survey results. The implementation of statistical sampling procedures provides the basis for the statistical analysis of sample data.
- **Non-sampling error.** In addition to sampling error, data users should realize that other types of errors may be introduced during any of the various complex operations used to collect and process survey data. For example, operations such as editing, reviewing, or keying data from questionnaires may introduce error into the estimates. These and other sources of error contribute to the non-sampling error component of the total error of survey estimates. Non-sampling errors may affect the data in the following two ways: (1) errors that are introduced randomly, which increase the variability of the data; and (2) systematic errors, which are consistent in one direction and introduce bias into the results.

The “standard error” estimates sampling errors and some types of non-sampling errors. The standard error is a measure of the deviation of a sample estimate from the average of all possible samples. The sample estimate and the estimated standard error permit the construction of interval estimates with a prescribed confidence that the interval includes the average result of all possible samples. Standard errors are not included in this report.

Current Population Survey

The Current Population Survey (CPS) is a national household sample survey which is conducted monthly by the Census Bureau, U.S. Department of Commerce. CPS data in certain previous *LIHEAP Annual Reports to Congress* have been referred to as “March CPS data.” In the past, the Census Bureau expanded the sample size and added several socio-economic questions to the March survey. The Census Bureau referred to this particular CPS supplement as the “March CPS.” Beginning in 2001, the Census Bureau made several substantive changes to the March CPS, as described in the *LIHEAP Report to Congress for FY 2002*. The Census Bureau refers to the revised supplement as the Annual Social and Economic Supplement (ASEC). This supplement represents a break in the March CPS data series. Detailed information about the changes in design and methodology is available in the Census Bureau’s *Current Population Survey Technical Paper 63RV (March 2002)*.

The CPS ASEC includes data that allow one to identify household demographic characteristics. It also is the best source of annual national data for estimating the numbers of LIHEAP income

eligible households and the numbers of LIHEAP income eligible vulnerable households. The data that were used to prepare performance statistics for FY 2022 became available in September 2022.

Residential Energy Consumption Survey

The Residential Energy Consumption Survey (RECS) is a national household sample survey which is conducted periodically by the Energy Information Administration (EIA) of the U.S. Department of Energy (DOE).¹ It is designed to provide reliable data at the national and Census regional level. The RECS includes information on energy consumption and expenditures, household demographics, housing characteristics, weatherization/conservation practices, home appliances, and type of heating and cooling equipment.

The survey consists of the following three parts:

- **Household interviews.** EIA interviews households for information about which fuels are used, how fuels are used, energy-using appliances, structural features, energy-efficiency measures taken, demographic characteristics of the household, heating interruptions, and receipt of energy assistance.
- **Rental agent interviews.** EIA interviews rental agents for households where rent includes some portion of their energy bill. This information augments the information from those households that may not be knowledgeable about the fuels used for space heating or water heating.
- **Energy supplier questionnaires.** After obtaining permission from respondents, EIA contacts their energy suppliers to collect the actual billing data on energy consumption and expenditures. This fuel supplier survey eliminates the inaccuracy of self-reported data. When a household does not consent or when fuel consumption records are unusable or nonexistent, regression analysis and modeling is used to impute missing data.

The 2020 RECS is the fifteenth in a series of surveys. For the 2020 RECS, 18,496 households were interviewed, including 759 verified LIHEAP beneficiary households. Home energy data have been adjusted to FY 2022 with respect to changes in weather and fuel prices.

More information about the 2020 RECS sample design and methodology is available from the [*Methodology tab of the Residential Energy Consumption Survey \(RECS\) page of the EIA website.*](#)

The data on home energy usage and costs from the 2020 RECS are available on the [*other tabs of the 2020 RECS Survey Data page of the EIA website.*](#)

¹ EIA conducts the RECS survey approximately every 4 to 6 years. The most recent survey was the 2020 RECS, which EIA conducted in 2020 and 2021. EIA published final RECS 2020 microdata for analysis in 2023. The *LIHEAP Report to Congress for Fiscal Year 2022* is the first to utilize the 2020 RECS in estimating energy expenditures and burden.

Strengths and Limitations of RECS Data

The RECS provides the most recent, comprehensive data on home energy consumption and expenditures. The strengths of using RECS data to derive home energy estimates are as follows:

- The RECS uses a representative national household sample, providing statistically reliable estimates for all, non-low income, and low income households.
- The RECS includes usage data for all residential fuels.
- Energy suppliers provide information on actual residential energy consumption and expenditures of households sampled by the RECS to eliminate the inaccuracy of self-reported data.
- Regression analyses and modeling of data from the RECS provide estimates of the amounts of fuels going to various end uses, including home heating and cooling.

While the updated 2020 RECS data provide the most current and comprehensive data on residential energy use by low income households, several significant limitations must be addressed:

- The 2020 RECS data for Calendar Year (CY) 2020 were updated to FY 2022 (October 1, 2021, to September 30, 2022), using procedures that adjust the 2020 data to reflect the weather and fuel prices for FY 2022. These procedures are comparable to those used for the FY 1986 - FY 2021 annual LIHEAP Reports to Congress. However, the reader should exercise caution in comparing the data in this report with data in annual LIHEAP Reports to Congress prior to FY 1986, in which consumption and expenditure data were predicated on the RECS year (April 1 to March 31).
- For some variables, disaggregation of data into subgroups at the regional level results in estimates made from a small number of sample cases. This is especially true of the LIHEAP beneficiary household groups and the liquefied petroleum gas and fuel oil/kerosene heating subgroups. This affects the reliability of the estimates for such subgroups.
- The household is a basic reporting unit for the RECS and LIHEAP. The RECS employs the Census Bureau's definition of household (i.e., a household includes all individuals living in a housing unit, whether related or not, who: (1) share a common direct access entry to the unit from outside the building or from a hallway; and (2) do not normally eat their meals with members of other units in the building. A household does not include temporary visitors or household members away at college or in the military.) LIHEAP defines a household as one or more individuals living together as an economic unit who purchase energy in common or make undesignated payments for energy in their rent. Some variation in the count of households, particularly those containing renters or boarders, may result from the difference in these definitions.
- The CPS ASEC, conducted by the Census Bureau, provides, at national and regional levels, data on total household income as a specific dollar amount whereas RECS provides household income data within dollar intervals. CPS's larger sample size and

method of collecting income data result in more accurate income data than RECS income data. Therefore, the 2022 CPS ASEC is used to develop estimates of the number of low income households. In addition, mean income statistics from the CPS ASEC are used in the calculation of group energy burden for this report.

- Households were classified in the 2020 RECS as eligible or ineligible for LIHEAP based on whether their income was above or below the maximum of the LIHEAP income eligibility criteria under Section 2605(b)(2)(B) of the LIHEAP Act [42 U.S.C. 8624(b)(2)(B)]. The estimates of such households do not include those whose incomes may have exceeded the statutory income standards but which received LIHEAP benefits because they were categorically eligible for LIHEAP under Section 2605(b)(2)(A) of the LIHEAP Act [42 U.S.C. 8624(b)(2)(A)]. Conversely, the estimates of LIHEAP beneficiary households include survey respondents who were reported as LIHEAP beneficiaries by state LIHEAP administrative data but who reported incomes higher than the maximum statutory income in the RECS.

Average Home Energy Consumption and Expenditures

Average heating and cooling consumption and expenditure estimates for FY 2022 were calculated at national and regional levels for all, non-low income, low income, and LIHEAP beneficiary households, for various fuels. The heating and cooling estimates were updated for each 2020 RECS sample case using FY 2022 heating degree days, cooling degree days, and price inflators applied to the original expenditure data, as well as the regression formulas developed from the 2020 RECS. Home energy consumption and expenditure data were developed by aggregating and averaging home heating and cooling estimates for the sample cases that represented all, non-low income, low income, and LIHEAP beneficiary households.

Energy Burden

Energy burden measures the percentage of income that households pay for home energy. Thus, it is an important statistic for policymakers who are considering the need for energy assistance. Energy burden can be defined broadly as the burden placed on household incomes by the cost of energy. However, for a group of households, there are different ways to compute energy burden and different interpretations of the resulting energy burden statistics. The purpose of this section is to examine the different energy burden statistics and discuss the interpretation of each.

Computational Procedures

There are two ways to compute mean (average) energy burden for a given group of households. The first is the “mean individual burden” approach and the second is the “mean group burden” approach. While these approaches appear to be similar, they give quite different values.

Using the “mean individual burden” approach, mean energy burden is computed as follows: (1) the ratio of energy expenditures to annual income for each household in the group is computed; and (2) the mean of these ratios is computed for the group. However, for some

households, residential energy expenditures appear to exceed income. Older adult households living on their savings are an example of such households. For such households, the energy burden has been limited to 100 percent.

For example, consider a group that contains four households with energy burdens of four, five, seven, and eight percent. The mean of these energy burdens is calculated by adding the percentages (24 percentage points) and dividing by the number of households (4 households), resulting in a mean individual burden of 6 percent.

Using the “mean group burden” approach, energy burden is computed as follows: (1) total energy expenditures for all households and total income for all households in the group are computed; and (2) the ratio of total energy expenditures to total income is computed for the group. For example, consider the situation where a group consists of 4 households that have a total income of \$100,000 and a total energy bill of \$4,000. Dividing the \$4,000 in total energy bills by \$100,000 in total income results in a mean group burden of 4 percent.

According to the 2020 RECS, the mean residential energy burden for all LIHEAP income eligible households in 2020 using the mean individual burden approach was 19.0 percent and using the mean group burden approach was 8.7 percent. The disparity between the two statistics stems from the fact that the lowest income households spend a greater share of their income on residential energy than do higher income households. For example, 2020 RECS households with incomes of \$15,000 to \$19,999 had average residential energy expenditures of \$1,513, while those with incomes between \$40,000 and \$49,999 had average residential energy expenditures of \$1,670. Thus, households which had more than twice as much income spent only about 10 percent more on energy.

If the relationship between income and residential energy expenditures were linear (i.e., if a 10 percent increase in income were associated with a 10 percent increase in residential energy expenditures), then the 2 statistics would be equal. However, because several low income households spend a large share of their income on energy, the relationship between income and residential energy expenditures is not linear (i.e., a 10 percent increase in income is associated with a considerably smaller increase in energy expenditures). This leads to a substantial difference between the two statistics.

Statistical Measures

Different measures of central tendency can be used to describe energy burden. The most commonly used measures are the mean and the median. As previously noted, the mean is the sum of a given set of values divided by the number of values in the set; whereas the median is the value that is at the center (i.e., at the point at which an equal number are greater as are smaller) of an ordered distribution of such values.

In the discussion of computational procedures, the mean individual burden was examined. It also is possible to look at the median individual burden. As noted above for LIHEAP income eligible households, the mean residential energy burden computed as the “mean individual

burden” was 19.0 percent. By contrast, the median of the distribution of residential energy burdens from the 2020 RECS was 8 percent. The disparity between these two statistics is the result of the skewed distribution of energy burden ratios.

Data Files

The data files used to make estimates of energy burden also have some impact on the statistic. The RECS data file is the only reliable source of national information on energy expenditures. However, the income reported on the RECS is known to be deficient in several ways. First, it is generally true that income is underreported on household surveys. Second, the RECS collects income data less precisely through the use of income intervals. Finally, the CPS ASEC collects income more precisely than the RECS does and has a larger sample size than the RECS.

As a result, the RECS categorizes more households than justified as LIHEAP income eligible. Based on the 2020 RECS, the estimate of LIHEAP income eligible households was 40.5 million. Based on the 2021 CPS ASEC, the estimate of LIHEAP income eligible households for CY 2021 was 36.5 million. Since some households that were not LIHEAP income eligible were categorized by the RECS as LIHEAP income eligible, the RECS overestimated the average energy expenditures for LIHEAP income eligible households.

The estimates of average energy burden may also be overstated because the RECS, like other surveys, understates income. Comparisons between the estimates of the number of LIHEAP income eligible households from the 1990 RECS and the 1991 March CPS suggest that the probable range of the overestimate in mean group energy burden is from 5 to 10 percent.

Data Interpretation

The statistic used to describe energy burden depends on the question being asked. Each statistic offers some information about energy burden while not telling the whole story by itself.

The key difference between mean individual burden and mean group burden is that mean individual burden focuses on the experience of individual households, whereas mean group burden focuses on the experience of a group of households. The mean individual burden furnishes more information on how individual households are affected by energy burden (i.e., it computes a mean by using each household’s burden) and the mean group burden furnishes more information on how a group of households is affected by energy burden (i.e., it computes the share of all income earned by LIHEAP income eligible households that goes to pay for energy). Both statistics are useful, although the individual burden statistic puts more emphasis on the experience of individual households and the group burden puts more emphasis on the share of group income that is used for energy.

The key difference between mean individual burden and median individual burden is that mean individual burden furnishes information on all LIHEAP income eligible households at the expense of overstating what is happening to the “average” LIHEAP income eligible household,

whereas median individual burden furnishes information on the “average” LIHEAP income eligible household at the expense of disregarding what is happening to households at either end of the distribution.

The best way to furnish information on energy burden is to use all available statistics. For example, it would be informative to show the mean individual burden, the median individual burden, and the distribution of individual energy burdens for all LIHEAP income eligible households to indicate how individual households are affected by energy costs. In addition, it would be useful to show the mean group burden to indicate what share of income is going to pay energy bills for the group as a whole.

However, when doing an analysis of energy burden among several groups of households, it is very difficult to present the entire spectrum of available statistics. Thus, one usually limits the analysis to a comparison of one statistic between groups, the choice of which is dictated by which of the following types of analysis are being conducted:

- If *funding levels* are being examined, then the *mean group burden* is probably preferable. This statistic furnishes information on the aggregate energy cost of LIHEAP income eligible households and the portion of income for this group that is spent on energy. Using this statistic permits a direct examination of the relationship between total energy costs and total LIHEAP funding. In general, a mean is a more complete statistic than a median.
- If *targeting* decisions are being examined, then the *mean individual burden* or the *median individual burden* is probably preferable. Each of these statistics furnishes information on the distribution of burdens among households in a group. Using these statistics helps to target those groups where a significant number of households have high energy burdens.

Projections of Energy Consumption and Expenditures

OCS projected energy consumption [in British thermal units (Btus)] and expenditures by adjusting such amounts for each household in the RECS micro data file from the RECS year to the year of this report. The RECS reported consumption for CY 2020; whereas this report covers FY 2022. OCS based such adjustments on changes in weather and prices from CY 2020 to FY 2022; in so doing, OCS assumed that households didn’t change their energy use behavior (that is, their tendency to seek a specific indoor temperature) as a result of weather, price, or other changes.

OCS first projected consumption. It did so by adjusting CY 2020 heating and cooling end use consumption estimates (from the RECS)² for changes in heating degree days (HDDs) and cooling degree days (CDDs) from CY 2020 to FY 2022 using the following formula:

$$\text{FY 2022 projected cons.} = (2020 \text{ estimated heat cons.} * \text{HDD change}) + (2020 \text{ estimated cooling cons.} * \text{CDD change}) + (2020 \text{ estimated water heat cons.} + 2020 \text{ estimated appliance cons.}).$$

OCS next projected expenditures. It did so by adjusting CY 2020 actual expenditures for projected changes in consumption and actual changes in fuel prices from CY 2020 to FY 2022. It did so through the following formula, which it applied to each household and the applicable fuel:

$$\begin{aligned} \text{Preliminary exp.} &= 2020 \text{ exp.} * (\text{FY 2022 projected cons.} / 2020 \text{ actual cons.}) \\ \text{Final exp.} &= \text{preliminary exp.} * \text{price factor.} \end{aligned}$$

Table A-2 shows the price changes in the form of national price factors that OCS used to make its projections. The price factors show the actual change in the average price of a fuel from CY 2020 to FY 2022. For example, electricity prices increased by about 12.4 percent from CY 2020 to FY 2022.

Table A-2. National Residential Energy Price Factors for FY 2022

Fuel	Price Factors for FY 2022 Projections ⁱ
Electricity	1.1242
Natural gas	1.3221
Fuel oil / kerosene	1.7976
Liquefied petroleum gas (LPG)	1.4691

ⁱ Price factors were developed using price data obtained from the Energy Information Administration for electricity, natural gas, and LPG, and the BLS Consumer Price Index for fuel oil. Consumption data were obtained from the Energy Information Administration for all fuels. Electricity price data used for calculating price factors are from the Monthly Energy Review, December 2022, and electricity consumption data is from the Electric Power Monthly, January 2023. Natural gas price and consumption data used for calculating price factors are from the Monthly Energy Review, December 2022. Fuel oil/kerosene price data for calculating prices factors are from the U.S. City Average, Fuel Oil #2, Consumer Price Index of the Bureau of Labor Statistics, Series ID APU000072511. LPG price data were obtained from the [Energy Information Administration website](#). Fuel oil/kerosene and LPG consumption data are from the Monthly Energy Review, December 2022.

OCS used national price factors rather than state price factors to project expenditure data for FY 2022. It did so because the use of national price factors causes little difference in such projections. OCS determined this to be the case for FY 1993/1994. For that period, the state

² EIA developed the CY 2020 end use consumption estimates using data from the 2020 RECS. These estimates were based on models for each fuel, using households that had actual (not imputed) consumption records for the fuel. The models used nonlinear estimation techniques to estimate parameters that described the relationship of consumption to end use, housing characteristics, weather, and demographics.

electricity price factors varied between 0.3 percent and 1.2 percent, whereas the national average price factor was 0.8 percent. Likewise, the state natural gas price factors varied between 1.7 percent and 2.8 percent, whereas the national average price factor was 2 percent.

Copies of the following forms are publicly available at the links below:

- The [*2020 RECS household questionnaire*](#).
- The [*LIHEAP Household Report for Federal Fiscal Year 2022*](#).
- The [*LIHEAP Performance Data Form for Federal Fiscal Year 2022*](#).