

# THE HOME ENERGY AFFORDABILITY GAP 2018

(2<sup>ND</sup> SERIES) PUBLISHED APRIL 2019

## Finding #1

| Poverty Level | Home Energy Burden |                                                                                                                                                                                                                                                                                                         |
|---------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Below 50%     | 51%                | Home energy is a crippling financial burden for low-income Vermont households. Vermont households with incomes of below 50% of the Federal Poverty Level pay 51% of their annual income simply for their home energy bills.                                                                             |
| 50 – 100%     | 28%                |                                                                                                                                                                                                                                                                                                         |
| 100 – 125%    | 18%                |                                                                                                                                                                                                                                                                                                         |
| 125 – 150%    | 15%                | Home energy unaffordability, however, is not only the province of the very poor. Bills for households with incomes between 150% and 185% of Poverty take up 12% of income. Vermont households with incomes between 185% and 200% of the Federal Poverty Level have energy bills equal to 11% of income. |
| 150 – 185%    | 12%                |                                                                                                                                                                                                                                                                                                         |
| 185% - 200%   | 11%                |                                                                                                                                                                                                                                                                                                         |

## Finding #2

| Poverty Level | Number of Households |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------|----------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | Last Year            | This Year |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Below 50%     | 13,189               | 12,950    | The number of households facing unaffordable home energy burdens is staggering. According to the most recent five-year American Community Survey, nearly 13,000 Vermont households live with income at or below 50% of the Federal Poverty Level and face a home energy burden of 51%. And nearly 17,000 <i>additional</i> Vermont households live with incomes between 50% and 100% of the Federal Poverty Level and face a home energy burden of 28%. |
| 50 – 100%     | 16,728               | 16,557    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 100 – 125%    | 10,923               | 10,959    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 125 – 150%    | 10,451               | 10,340    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 150 – 185%    | 16,469               | 16,198    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 185% - 200%   | 6,516                | 6,484     | In 2018 the total number of Vermont households below 200% of the Federal Poverty Level stayed relatively constant from the prior year.                                                                                                                                                                                                                                                                                                                  |
| Total < 200%  | 74,276               | 73,488    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

### Finding #3

|                                                    |               |                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Home Energy Affordability Gap: 2011 (base year)    | \$216,126,924 | The Home Energy Affordability Gap Index (2 <sup>nd</sup> Series) indicates the extent to which the Home Energy Affordability Gap has increased between the base year and the current year. In Vermont, this Index was 83.6 for 2018.                                                                                                                                                     |
| Home Energy Affordability Gap: 2018 (current year) | \$180,622,641 |                                                                                                                                                                                                                                                                                                                                                                                          |
| Home Energy Affordability Gap Index (2011 = 100)   | 83.6          | The Home Energy Affordability Gap Index (2 <sup>nd</sup> Series) uses the year 2011 as its base year. The Index for 2011 is set equal to 100. A current year Index of more than 100 thus indicates that the Home Energy Affordability Gap for has increased since 2011. A current year Index of less than 100 indicates that the Home Energy Affordability Gap has decreased since 2011. |

### Finding #4

|                                           | Last Year | This Year |                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------|-----------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gross LIHEAP Allocation (\$000's)         | \$16,997  | \$16,952  | Existing sources of energy assistance do not adequately address the Home Energy Affordability Gap in Vermont. LIHEAP is the federal fuel assistance program designed to help pay low-income heating and cooling bills. The gross LIHEAP allocation to Vermont was \$17.0 million in 2018 and the number of average annual low-income heating and cooling bills "covered" by LIHEAP was 7,615. |
| Number of Households <150% FPL            | 51,291    | 50,806    |                                                                                                                                                                                                                                                                                                                                                                                               |
| Heating/Cooling Bills "Covered" by LIHEAP | 9,674     | 7,615     | In comparison, the gross LIHEAP allocation to Vermont in 2017 reached \$17.0 million and covered 9,674 average annual bills.                                                                                                                                                                                                                                                                  |

### Finding #5

| Primary Heating Fuel | Penetration by Tenure |        |                                                                                                                                                                                                                                                                                                                    |
|----------------------|-----------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | Owner                 | Renter |                                                                                                                                                                                                                                                                                                                    |
| Electricity          | 2%                    | 12%    | The Home Energy Affordability Gap in Vermont is not solely a function of household incomes and fuel prices. It is also affected by the extent to which low-income households use each fuel. All other things equal, the Affordability Gap will be greater in areas where more households use more expensive fuels. |
| Natural gas          | 15%                   | 23%    |                                                                                                                                                                                                                                                                                                                    |
| Fuel Oil             | 44%                   | 40%    |                                                                                                                                                                                                                                                                                                                    |
| Propane              | 15%                   | 17%    | In 2018, the primary heating fuel for Vermont homeowners was Fuel Oil (44% of homeowners). The primary heating fuel for Vermont renters was also Fuel Oil (40% of renters).                                                                                                                                        |
| All other            | 24%                   | 8%     |                                                                                                                                                                                                                                                                                                                    |
| Total                | 100%                  | 100%   | Changes in the prices of home energy fuels over time are presented in Finding #6 below.                                                                                                                                                                                                                            |

### Finding #6

| Fuel                      | 2016 Price | 2017 Price | 2018 Price |                                                                                                                                                              |
|---------------------------|------------|------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural gas heating (ccf) | \$1.316    | \$1.320    | \$1.467    | In Vermont, natural gas prices rose 11.1% during the 2017/2018 winter heating season. Fuel oil prices rose substantially 21.2% and propane prices rose 5.4%. |
| Electric heating (kWh)    | \$0.177    | \$0.122    | \$0.128    |                                                                                                                                                              |
| Propane heating (gallon)  | \$3.238    | \$2.576    | \$2.716    |                                                                                                                                                              |
| Fuel Oil heating (gallon) | \$1.902    | \$2.774    | \$3.361    | Heating season electric prices rose modestly 4.9% in the same period and cooling season electric prices stayed relatively constant.                          |
| Electric cooling (kWh)    | \$0.123    | \$0.134    | \$0.136    |                                                                                                                                                              |

# Home Energy Affordability Gap Dashboard -- Vermont 2018 versus 2017

|                                                                                                                                                                                                                                           |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>AVERAGE DOLLAR AMOUNT<br/>BY WHICH ACTUAL HOME ENERGY BILLS<br/>EXCEEDED AFFORDABLE HOME ENERGY BILLS<br/>FOR HOUSEHOLDS BELOW 200% OF POVERTY LEVEL.</p> <p>2017: \$1,905 per household</p> <p><b>2018: \$2,458 PER HOUSEHOLD</b></p> | <p>AVERAGE TOTAL HOME ENERGY<br/>BURDEN FOR HOUSEHOLDS BELOW<br/>50% OF POVERTY LEVEL.</p> <p>2017: 44% of household income</p> <p><b>2018: 51% OF<br/>HOUSEHOLD INCOME</b></p>       |
| <p>PERCENT OF INDIVIDUALS BELOW<br/>100% OF POVERTY LEVEL.</p> <p>2017: 12% Of all individuals</p> <p><b>2018: 11% OF ALL<br/>INDIVIDUALS</b></p>                                                                                         | <p>NUMBER OF AVERAGE LOW-INCOME<br/>HEATING/COOLING BILLS COVERED BY<br/>FEDERAL HOME ENERGY ASSISTANCE.</p> <p>2017: 9,674 bills covered</p> <p><b>2018: 7,615 BILLS COVERED</b></p> |
| <p>PRIMARY HEATING FUEL (2018):</p> <p>HOMEOWNERS - FUEL OIL *** TENANTS - FUEL OIL</p>                                                                                                                                                   |                                                                                                                                                                                       |

## NOTES AND EXPLANATIONS

The 2012 Home Energy Affordability Gap, published in May 2013, introduced the 2<sup>nd</sup> Series of the annual Affordability Gap analysis. The 2012 Home Energy Affordability Gap going forward cannot be directly compared to the Affordability Gap (1<sup>st</sup> Series) for 2011 and earlier years. While remaining fundamentally the same, several improvements have been introduced in both data and methodology in the Affordability Gap (2<sup>nd</sup> Series).

The most fundamental change in the Home Energy Affordability Gap (2<sup>nd</sup> Series) is the move to a use of the American Community Survey (ACS) (5-year data) as the source of foundational demographic data. The Affordability Gap (1<sup>st</sup> Series) relied on the 2000 Census as its source of demographic data. The ACS (5-year data) offers several advantages compared to the Decennial Census. While year-to-year changes are smoothed out through use of 5-year averages, the ACS nonetheless is updated on an annual basis. As a result, numerous demographic inputs into the Affordability Gap (2<sup>nd</sup> Series) will reflect year-to-year changes on a county-by-county basis, including:

- The distribution of heating fuels by tenure;
- The average household size by tenure;
- The number of rooms per housing unit by tenure;
- The distribution of owner/renter status;
- The distribution of household size;
- The distribution of households by ratio of income to Poverty Level;

Data on housing unit size (both heated square feet and cooled square feet) is no longer calculated based on the number of rooms. Instead, Energy Information Administration/Department of Energy (EIA/DOE) data on square feet of heated and cooled living space per household member is used beginning with the Home Energy Affordability Gap (2<sup>nd</sup> Series). A distinction is now made between heated living space and cooled living space, rather than using total living space.

The change resulting in perhaps the greatest dollar difference in the aggregate and average Affordability Gap for each state is a change in the treatment of income for households with income at or below 50% of the Federal Poverty Level. In recent years, it has become more evident that income for households with income below 50% of Poverty Level is not normally distributed. Rather than using the mid-point of the Poverty range (i.e., 25% of Poverty Level) to determine income for these households, income is set somewhat higher (40% of Poverty). By setting income higher, both the average and aggregate Affordability Gap results not only for that Poverty range, but also for the state as a whole, will be lower. The Affordability Gap results for other Poverty ranges remain unaffected by this change.

Another change affecting both the aggregate and average Affordability Gap is a change in the definition of “low-income.” The Home Energy Affordability Gap (2<sup>nd</sup> Series) has increased the definition of “low-income” to 200% of the Federal Poverty Level (up from 185% of Poverty). While this change may increase the aggregate Affordability Gap, it is likely to decrease the average Affordability Gap. Since more households are added to the analysis, the aggregate is likely to increase, but since the contribution of each additional household is less than the contributions of households with lower incomes, the overall average will most likely decrease.

Most of the Home Energy Affordability Gap calculation remains the same. All references to “states” include the District of Columbia as a “state.” Low-income home energy bills are calculated in a two-step process: First, low-income energy consumption is calculated for the following end-uses: (1) space heating; (2) space cooling; (3) domestic hot water; and (4) electric appliances (including lighting and refrigeration). All space cooling and appliance consumption is assumed to involve only electricity. Second, usage is multiplied by a price per unit of energy by fuel type and end use by time of year. The

price of electricity, for example, used for space cooling (cooling months), space heating (heating months), and appliances (total year) differs to account for the time of year in which the consumption is incurred.

Each state's Home Energy Affordability Gap is calculated on a county-by-county basis. Once total energy bills are determined for each county, each county is weighted by the percentage of persons at or below 200% of the Federal Poverty Level to the total statewide population at or below 200% of the Federal Poverty Level to derive a statewide result. Bills are calculated by end-use and summed before county weighting.

LIHEAP comparisons use gross allotments from annual baseline LIHEAP appropriations as reported by the federal LIHEAP office. They do not reflect supplemental appropriations or the release of LIHEAP "emergency" funds. The number of average heating/cooling bills covered by each state's LIHEAP allocation is determined by dividing the total base LIHEAP allocation for each state by the average heating/cooling bill in that state, the calculation of which is explained below. No dollars are set aside for administration; nor are Tribal set-asides considered.

State financial resources and utility-specific rate discounts are not considered in the calculation of the Affordability Gap. Rather, such funding should be considered available to fill the Affordability Gap. While the effect in any given state may perhaps seem to be the same, experience shows there to be an insufficiently authoritative source of state-by-state data, comprehensively updated on an annual basis, to be used as an input into the annual Affordability Gap calculation.

Energy bills are a function of the following primary factors:

- Tenure of household (owner/renter)
- Housing unit size (by tenure)
- Heating Degree Days (HDDs) and Cooling Degree Days (CDDs)
- Housing size (by tenure)
- Heating fuel mix (by tenure)
- Energy use intensities (by fuel and end use)

Bills are estimated using the U.S. Department of Energy's "energy intensities" published in the DOE's Residential Energy Consumption Survey (RECS). The energy intensities used for each state are those published for the Census Division in which the state is located. Heating Degree Days (HDDs) and Cooling Degree Days (CDDs) are obtained from the National Weather Service's Climate Prediction Center on a county-by-county basis for the entire country.

End-use consumption by fuel is multiplied by fuel-specific price data to derive annual bills. State price data for each end-use is obtained from the Energy Information Administration's (EIA) fuel-specific price reports (e.g., Natural Gas Monthly, Electric Power Monthly). State-specific data on fuel oil and kerosene is not available for all states. For those states in which these bulk fuels have insufficient penetration for state-specific prices to be published, prices from the Petroleum Administration for Defense Districts (PADD) of which the state is a part are used.

The Home Energy Affordability Gap Index (2<sup>nd</sup> Series) uses 2011 as its base year. The base year (2011) Index has been set equal to 100. A current year Index of more than 100 thus indicates that the Home Energy Affordability Gap has increased since 2011. A current year Index of less than 100 indicates that the Affordability Gap has decreased since 2011. The Affordability Gap Index was, in other words, re-set in 2011. The Affordability Gap Index (2<sup>nd</sup> Series) for 2012 and beyond cannot be compared to the Affordability Gap Index (1<sup>st</sup> Series) for 2011 and before.

The Home Energy Affordability Gap is a function of many variables, annual changes in which are now tracked for nearly all of them. For example, all other things equal: increases in income would result in

decreases in the Affordability Gap; increases in relative penetrations of high-cost fuels would result in an increase in the Gap; increases in amount of heated or cooled square feet of living space would result in an increase in the Gap. Not all variables will result in a change in the Affordability Gap in the same direction. The annual Affordability Gap Index allows the reader to determine the net cumulative impact of these variables, but not the impact of individual variables.

Since the Affordability Gap is calculated assuming normal Heating Degree Days (HDDs) and Cooling Degree Days (CDDs), annual changes in weather do not have an impact on the Affordability Gap or on the Affordability Gap Index.

Price data for the various fuels underlying the calculation of the Home Energy Affordability Gap (2<sup>nd</sup> Series) was used from the following time periods:

|                                   |                    |
|-----------------------------------|--------------------|
| <b>Heating prices</b>             |                    |
| Natural gas                       | February 2018      |
| Fuel oil ***                      | Week of 02/05/2018 |
| Liquefied petroleum gas (LPG) *** | Week of 02/05/2018 |
| Electricity                       | February 2018      |
| <b>Cooling prices</b>             |                    |
| August 2018                       |                    |
| <b>Non-heating prices</b>         |                    |
| Natural gas                       | May 2018           |
| Fuel oil ***                      | Week of 10/01/2018 |
| Liquefied petroleum gas (LPG) *** | Week of 10/01/2018 |
| Electricity                       | May 2018           |

\*\*\*Monthly bulk fuel prices are no longer published. Weekly bulk fuel prices are published during the heating months (October through March). The prices used are taken from the weeks most reflective of the end-uses to which they are to be applied. Prices from the middle of February best reflect heating season prices. Bulk fuel prices from October best reflect non-heating season prices.