Kentucky Energy Affordability Dashboard

Technical Notes

Energy affordability and energy burden are complex topics with many components and factors. When access to energy becomes difficult, the burden is felt in every facet of life—housing, mobility, health, work, education, etc. .The Office of Energy Policy (OEP) will utilize the Kentucky Energy Affordability Dashboard to better understand the complexities of these variables. The Affordability dashboard is an interactive visualization tool to display Kentucky-specific data relating to housing stock, utility costs, and demographic factors that impact energy usage and energy burden. The dashboard is designed to be utilized by community leaders, policy makers, and the OEP. Additionally, the dashboard helps these groups to collectively identify gaps, aid in program development, identify areas for cost allocations, and other solutions for communities experiencing disproportionately high energy burdens.

OEP produces The Kentucky Energy Affordability Dashboard (KEAD) by utilizing data provided by the United States Census Bureau's Public Use Microdata Sample (PUMS), American Community Survey (ACS), and the Energy Information Administration (EIA). Occasionally, data from one source will not conform to data from another source because of differences in cohorts, how variables are defined, how variables are calculated, the treatment of missing data, and other factors. This means that data published in this report may not be comparable to data published in other reports. For specific details about metric formulas, please refer to Appendices A and B.

Any questions or concerns related to the dashboard or the content within should be directed to Evan Moser at the Office of Energy Policy: Evan.Moser@ky.gov

Appendix A

Data Sources:

United States Census Bureau American Community Survey (ACS), 1-Year and 5-Year Estimates (ACS): ACS is an ongoing survey that collects information about the lives of the American people in every state and region of the United States. It contains data on the social, economic, housing, and demographic aspects of every American community. The data are available in both the Census API and in a tabular format from the Census website.

Energy Information Administration (EIA) Form 861 – Annual Electric Power Industry Report: Form EIA-861 contains data from distribution utilities and power marketers of electricity. This survey is a census of all United States electric utilities. It contains comprehensive information on utility sales, revenue, and customers for every distributor of electricity and power marketer in the United States. Only the results that have been finalized are used in this dashboard. A link to tabular versions of this data can be found here.

United States Census Bureau Public Use Microdata (PUMS), 1-Year and 5-Year Estimates: PUMS are data contained within the ACS program. While ACS data contains estimates aggregated from survey responses, the PUMS contains a sample of responses for ACS, allowing analysts to calculate their own estimates for each PUMS area, a geographical region defined by the census for each U.S. state. You can find PUMS data via the Census API or in a tabular format.

Appendix B

Metrics:

Demographics:

Average Energy Burden, Low Income Population (% of Income): Energy burden is defined as the percentage of income a person or household spends on electricity and other fuels. This metric utilizes 80% area median income (AMI).
Data Source: ACS, PUMS, EIA
Data Element: Average Energy Burden, Low Income Population (% of Income)

Average Energy Burden, Total Population (% of Income): Energy burden is defined as the percentage of income a person or household spends on electricity and other fuels. This metric utilizes all households (0-100+% Area Median Income).
Data Source: ACS, PUMS, EIA
Data Element: Average Energy Burden, Total Population (% of Income)

Median Household Income: The Census defines a household as any group of related or unrelated individuals living together other than in group quarters such as dormitories, prisons, or military barracks. Half of all households have an income higher than the median, and half have an income lower than the median. The Census calculates median household incomes for counties, states, and the nation, but there is no way to mathematically combine medians, so we are unable to report median household incomes for Workforce Planning Regions or Local Workforce Areas.
Data Source: U.S. Census Bureau, American Community Survey, "Income in the Past 12 Months," Table S1901
Data Element: Median Household Income

Below Poverty Level (% of Total Population): Percent of individuals whose family income in the last 12 months was below the poverty line for a family of that size.
Data Source: U.S. Census Bureau, American Community Survey, "Poverty Status in the Past 12 Months," Table S1701
Data Element: Below Poverty Level (% of Total Population)

Working Age Population (18-64): Number of individuals between the ages of 18 and 64.
Data Source: U.S. Census Bureau, American Community Survey, "Educational Attainment," Table S1501
Data Elements: Population 18-24 Years, Population, 25 Years and Older

Less than HS Diploma (Ages 18-64): Population of individuals ages 18-64 without a high school diploma or equivalent.
Data Source: U.S. Census Bureau, American Community Survey, "Educational Attainment," Table S1501
Data Elements: Less than 9th grade, 9th to 12th grade No Diploma

Associates or Higher (Ages 25-64): Population of individuals ages 25-64 with an associate degree, bachelor degree, or graduate level degree.
Data Source: U.S. Census Bureau, American Community Survey, "Educational Attainment," Table S1501
Data Elements: Associates Degree, Bachelor's Degree, Graduate or Professional Degree

Bachelors or Higher (Ages 25-64): Population of individuals ages 25-64 with a bachelor degree, or graduate level degree.
Data Source: U.S. Census Bureau, American Community Survey, "Educational Attainment," Table S1501
Data Element: Bachelor's Degree, Graduate or Professional Degree

Housing:

Heating:

Primary Heating as Electric: Number of households using electricity as a primary heating fuel. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: Heating Elec

Primary Heating as Gas: Number of households using utility gas as a primary heating fuel. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: Heating UtilityGas

Primary Heating as Bottled/LP Gas: Number of households using bottled or liquid petroleum gas as a primary heating fuel. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: Heating LPGas

Primary Heating as Fuel Oil: Number of households using fuel oil as a primary heating fuel. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: Heating FuelOil

Primary Heating as Coal: Number of households using coal as a primary heating fuel. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: Heating Coal

Primary Heating as None: Number of households with no primary heating fuel. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: Heating None

Primary Heating as Other: Number of households using a non-specified primary heating fuel. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: Heating Other

Age:

Age, 1939 or Older: Number of households built in 1939 or earlier. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: YrBuilt 1939OrLess

Age, 1940 - 1959: Number of households built between the years of 1940 and 1959. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: YrBuilt 1940 1959

Age, 1960 - 1979: Number of households built between the years of 1960 and 1979. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: YrBuilt 1960 1979

Age, 1980 - 1999: Number of households built between the years of 1980 and 1999. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504

Data Elements: YrBuilt 1980 1999

Age, 2000 - 2009: Number of households built between the years of 2000 and 2009. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: YrBuilt 2000 2009

Age, 2010 - 2019: Number of households built between the years of 2010 and 2019. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: YrBuilt 2010 2019

Age, 2020 or Newer: Number of households built after 2020. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: YrBuilt 2020Plus

Units:

Units, Detached Units: Number of housing units classified as Detached. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: OccHU dtched

Units, Attached Units: Number of housing units classified as Attached. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: OccHU atched

Units, Manufactured Units: Number of housing units classified as Manufactured. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: OccHU MH

Units, Apartments (2): Number of housing units classified as two apartments. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: OccHU 2apts

Units, Apartments (3-4): Number of housing units classified as 3 or 4 apartments. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: OccHU 3to4apts

Units, Apartments (5-9): Number of housing units classified as 5 to 9 apartments. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: OccHU 5to9apts

Units, Apartments (10+): Number of housing units classified as 10 or more apartments. To calculate this field as it is seen in the dashboard, divide it by the total number of occupied housing units within the county.
Data Source: U.S. Census Bureau, American Community Survey, "Physical Housing Characteristics of Occupies Housing Units", Table S2504
Data Elements: OccHU 10apts

Utilities:

Average Monthly Electric Bill (USD): Average monthly electricity bills were calculated by dividing utility revenue from residential customers by the number of residential customers. Those numbers were then merged with utility territory data at the county level. Average bills were calculated with a weighted mean, with weights being the number of customers at each utility.
Data Source: EIA-861
Data Elements: Monthly Electric

Average Monthly Utility Gas Costs (USD): Monthly Utility Gas Costs are calculated from PUMS. They are calculated by taking the weighted average of the monthly gas costs reported by survey respondents (GASP) and using the provided household weights (WGTP).
Data Source: PUMS
Data Elements: Monthly Gas

Average Monthly Water Costs (USD): Monthly Utility Water Costs are calculated from PUMS. They are calculated by taking the weighted average of the monthly water costs reported by survey respondents (WATP) and using the provided household weights (WGTP).
Data Source: PUMS
Data Elements: Monthly Water

Average Monthly Utility Other Fuels Costs (USD): Monthly Utility Other Fuels Costs are calculated from PUMS. They are calculated by taking the weighted average of the monthly other fuels costs reported by survey respondents (FULP) and using the provided household weights (WGTP).
Data Source: PUMS
Data Elements: Monthly Other Fuel