



greenlink equity map

Philadelphia, PA

6 Years of Energy Burden Impacts

February 2021

Prepared by Greenlink Analytics



6 Years of Energy Burden Impacts:

Philadelphia in Focus

February 2021

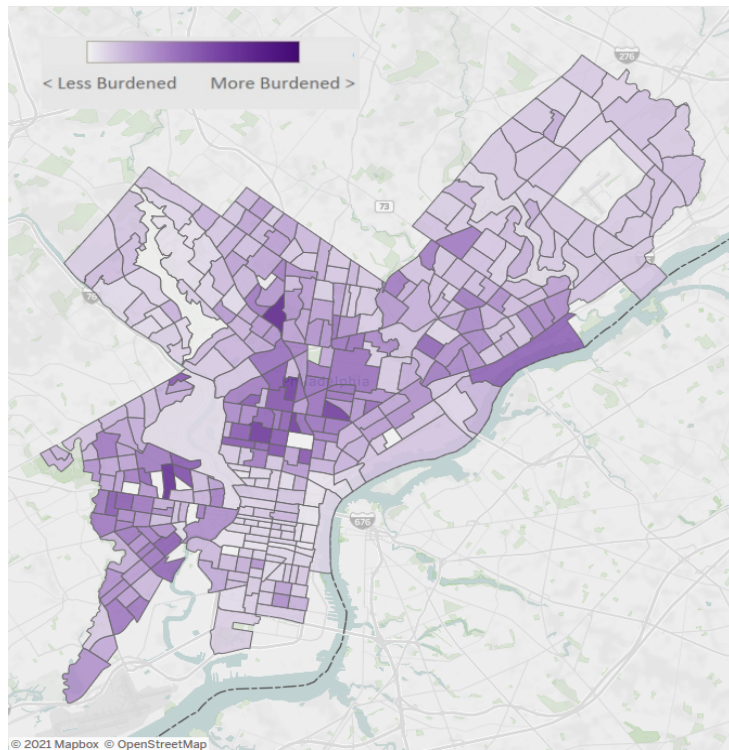


Figure 1. 2019 Philadelphia Energy Burden Ranges From 1% to 26%¹

Thanks to generous support from the Energy Foundation in partnership with Bloomberg Philanthropies, the 25 cities of the Bloomberg Philanthropies American Cities Climate Challenge (“ACCC”) are receiving a 6 Years of Energy Burden Impact report with information on the current energy burdens that residents of their city face, how that burden has changed over time, and how other equity indicators are related to energy burden.

¹ Clear tracts have insufficient data. Energy burden is the percent of income that a household spends on electricity and gas bills; an energy burden over 6% is considered “high” or “unaffordable” while a burden over 10% is considered “severe”.



Energy Burden in Philadelphia at a Glance

On average, households nationally pay about 3.6% of their income on energy (gas and electricity) bills. Philadelphia is currently the **most** energy burdened city out of the Climate Challenge cities. Across the city, Philadelphia’s average energy burden is 6.7% as of 2019, 1.9 times the national average. When energy burden is mapped across the city by neighborhood (Figure 1), the data shows that energy burden disproportionately impacts residents in the inner portions of the city. For 2019, the 20% least burdened tracts in the city have an average energy burden of 3.0%, below the national average, whereas the 20% most burdened tracts have an average energy burden of 13.1%, demonstrating severe energy burdens in these neighborhoods. The table below shows how Philadelphia compares on energy burden and how it’s changed over time.

Table 1. Median Energy Burdens Over Time²

	2013 Overall	2019 Overall	Change
Philadelphia	7.6%	6.7%	-0.9%
Pennsylvania	4.9%	4.8%	-0.1%
25 ACCC Leadership Cities	4.4%	4.0%	-0.4%
National³	3.8%	3.6%	-0.2%

Philadelphia Energy Burden: Change Over Time and City Disparities

In 2013, Philadelphia’s median energy burden of 7.6% was double the national average and well above the unaffordable energy burden threshold of 6% (Table 1). It was also above Pennsylvania’s median energy burden of 4.9%. Energy burden decreased by 0.9% by 2019 but remained well above the national average. This improvement was driven primarily by an increase in incomes - energy costs increased, but at a slower rate than incomes grew. Figure 2 shows how energy burden has

² City by city energy burden for Climate Challenge cities found at the end of this document. Data from the Greenlink Equity Map (GEM) except where otherwise noted.

³ National data from the US Energy Information Administration (Forms 861 and 176) and the US Census.



changed over time tract-by-tract in Philadelphia. Even though burden is decreasing city wide, neighborhood by neighborhood the story is varied. Many of the highest burdened neighborhoods are seeing worsening conditions at the same time as the city and country’s energy burdens are improving. There are many reasons why energy burdens may fluctuate year-to-year in an area including displacement, resident turnover, changing incomes, or rapid changes in energy usage behavior.

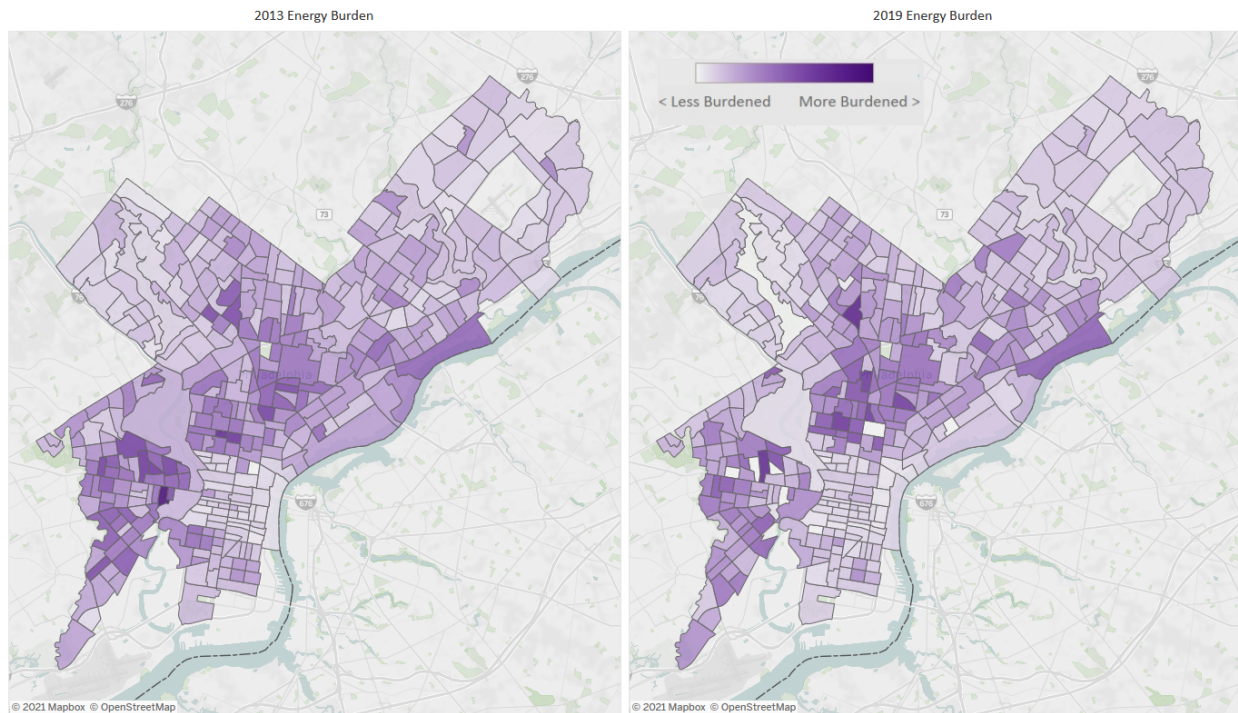


Figure 2. Philadelphia’s Change in Energy Burden Between 2013 and 2019

To look further at how burden is impacting Philadelphia’s most heavily burdened communities, Figure 3 illustrates Philadelphia’s top 20% most burdened tracts in 2013 and in 2019. The data shows wide disparities between the top 20% most burdened and 20% least burdened census tracts in the city.⁴ The 20% least energy burdened tracts had a median burden of 3.5% in 2013 and 3.0% in 2019, below the national average in both years. By comparison, the 20% most burdened tracts in the city had an energy burden of 14.3% in 2013 and 13.1% in 2019, indicating continuing levels of severe energy burdens in these neighborhoods across time.

⁴ Most and least burdened tracts are defined by the household-weighted average census tract energy burden from 2013-2019 and represent the top and bottom quintiles.

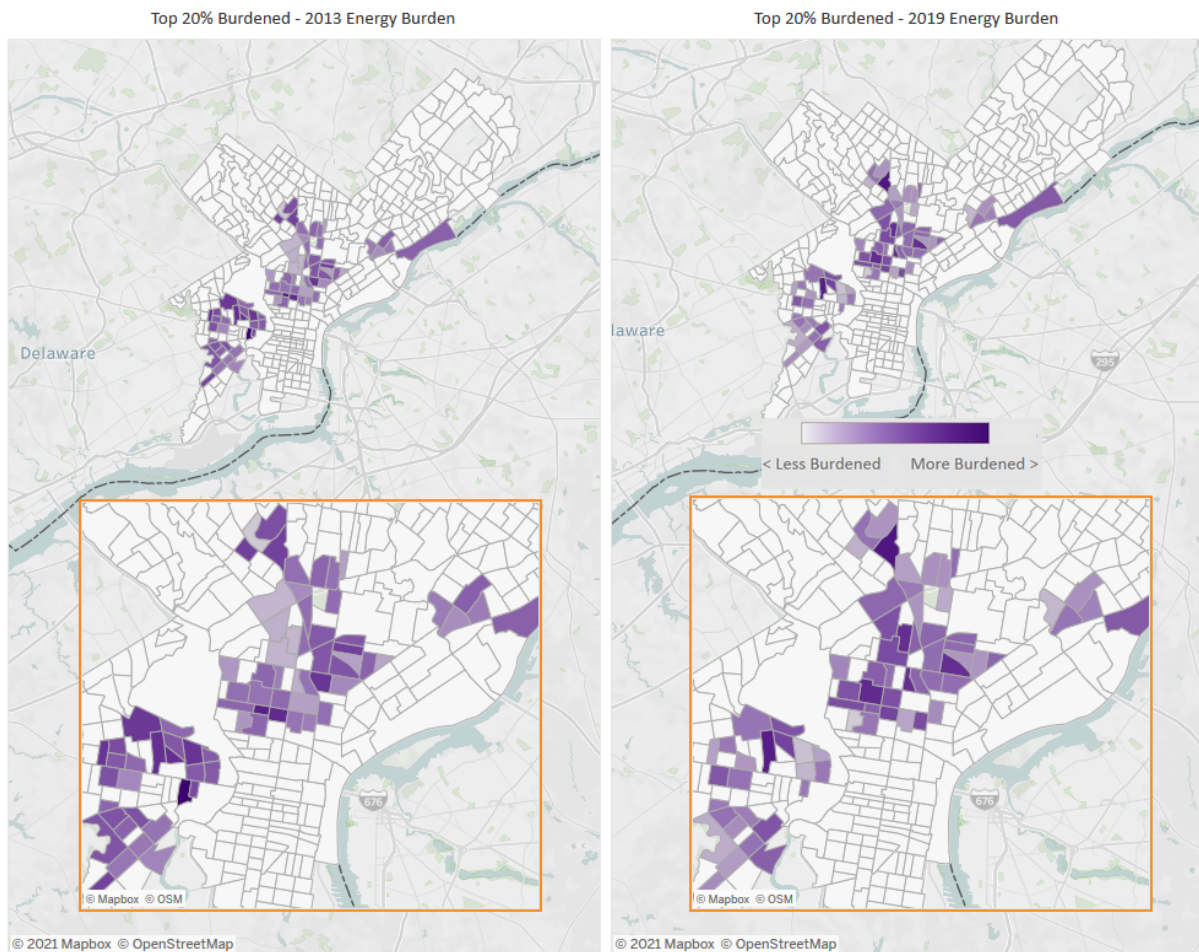


Figure 3. Philadelphia’s Top 20% Most Burdened Tracts in 2013 and 2019

Figure 4 shows the highest burdened areas in the city that have seen their energy burdens markedly increase or decrease between 2013 and 2019.⁵ This demonstrates that while the average burden has been improving across the city, some of the most burdened areas are not sharing in these benefits.

⁵ Top quintile (20%) is shown, averaged across all years.

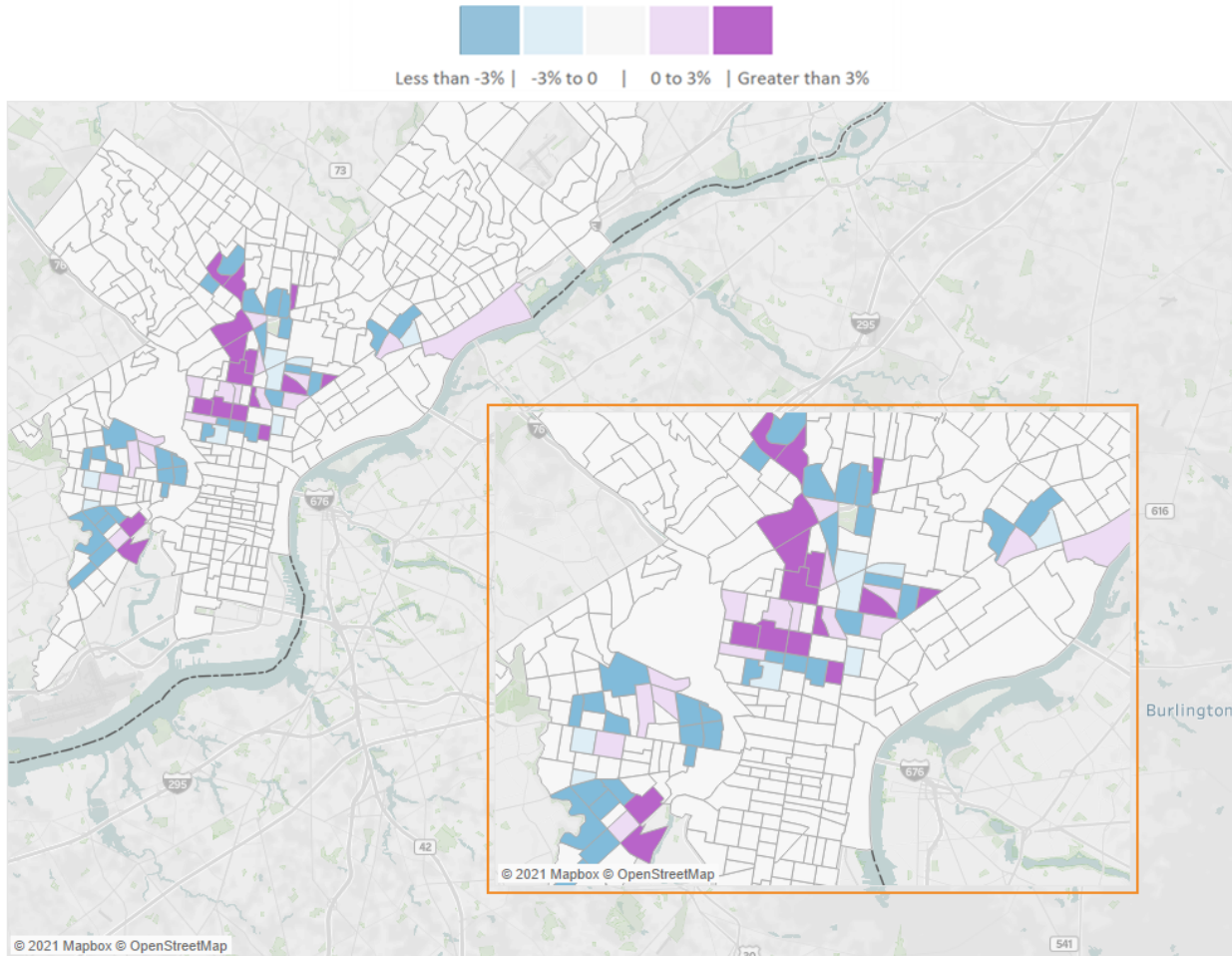


Figure 4. Change in Energy Burden in Highly Burdened Tracts Since 2013

Table 2, below, shows how the number of households living in the most energy burdened parts of the city have changed between 2013 and 2019. Philadelphia saw its total number of households decreased from 573,000 in 2013 to 536,000 in 2019.

Table 2. Number of Households in High and Severe Energy Burden

	High Energy Burden (> 6%)	Severe Energy Burden (> 10%)
2013	320,000	139,000
2019	233,000	111,000



Connective Issues: Equity Indicators Correlated with Philadelphia’s Energy Burden

Energy burden is concerning not only because of the strains it produces on its own, but also because it ties into and may deepen other equity issues. Many communities are simultaneously facing multiple equity challenges at once. Across these years of data, Philadelphia’s energy burdens are highly correlated with poor health outcomes and moderately correlated with higher proportions of black populations.⁶ Given these relationships, there may be opportunities to improve outcomes by increasing efforts that emphasize equity, health, and sustainability. Identifying these relationships may open doors for collaboration with other groups inside and outside of City Hall, ultimately advancing strong equity improvements across the city.⁷

Summary

- Philadelphia experiences energy burdens 86% higher than the national average.
- Since 2013, energy burden has decreased by 0.9% across the city and 1.2% across the most burdened communities. The number of households with unaffordable energy costs has declined by 87,000, although 233,000 continue to face high energy burdens.
- Over this time period, a 4.4x disparity exists in Philadelphia’s average energy burdens between the 20% least burdened and 20% most burdened communities, which highlights the need for additional resources to address energy burden in top burdened neighborhoods. This is the **fifth greatest disparity** among ACCC cities.
- Energy burden in Philadelphia is connected to other equity issues like healthcare and race. Cities, counties, and other organizations may be able to work together across departments and agencies to share resources and come up with solutions that multisolve to address several issues simultaneously.

⁶ Energy burden is strongly correlated ($R^2 > 0.6$) with poor mental health, lack of access to healthcare, and asthma. It is also more common in predominantly African American neighborhoods (and negatively correlated with predominantly white neighborhoods) and is moderately correlated ($R^2 > 0.4$) with sleep deprivation, diabetes, pulmonary disease, and stroke.

⁷ In Philadelphia, efforts to improve racial and health equity may also improve energy equity and vice versa. Partnering with community and other stakeholders to “multisolve” on these issues may yield positive synergies when combined with strong processes. See <https://www.equitymap.org/process-guide> for assistance.



Energy Burden Across Climate Challenge Cities

	Median Burden 2019	Highest Quintile 2019	Lowest Quintile 2019	Disparity ⁸
Philadelphia	6.7%	13.1%	3.0%	4.4
St. Louis	6.7%	12.0%	4.0%	3.0
Indianapolis	5.9%	11.5%	3.4%	3.4
Cincinnati	4.9%	9.7%	2.8%	3.5
St. Petersburg	4.7%	7.4%	3.1%	2.4
Pittsburgh	4.6%	9.4%	2.7%	3.5
Atlanta	4.5%	9.7%	2.2%	4.4
San Antonio	4.5%	8.0%	2.6%	3.1
Boston	4.3%	10.6%	2.3%	4.6
Orlando	4.3%	6.7%	3.2%	2.1
Chicago	4.1%	9.5%	1.9%	5.0
Charlotte	3.9%	7.9%	2.1%	3.8
Saint Paul	3.7%	6.8%	2.3%	3.0
Columbus	3.6%	7.1%	2.1%	3.4
Albuquerque	3.5%	6.3%	2.0%	3.2
Los Angeles	3.5%	6.4%	2.0%	3.2
Honolulu	3.3%	6.0%	2.0%	3.0
Austin	3.2%	5.8%	1.9%	3.1
Minneapolis	3.1%	5.6%	1.9%	2.9
Washington DC	3.1%	7.6%	1.5%	5.1
Portland	2.7%	4.6%	1.9%	2.4
San Diego	2.7%	4.0%	1.8%	2.2
Seattle	2.6%	4.4%	1.8%	2.4
Denver	2.4%	3.8%	1.3%	2.9
San Jose	2.1%	3.7%	1.3%	2.8

⁸ The factor difference between the least burdened quintile and the most burdened quintile.