GREENLINK EQUITY MAP REPORT
FOR OKLAHOMA CITY

Oklahoma City: The Big Friendly's Decreasing Energy Burden from 2013–2018

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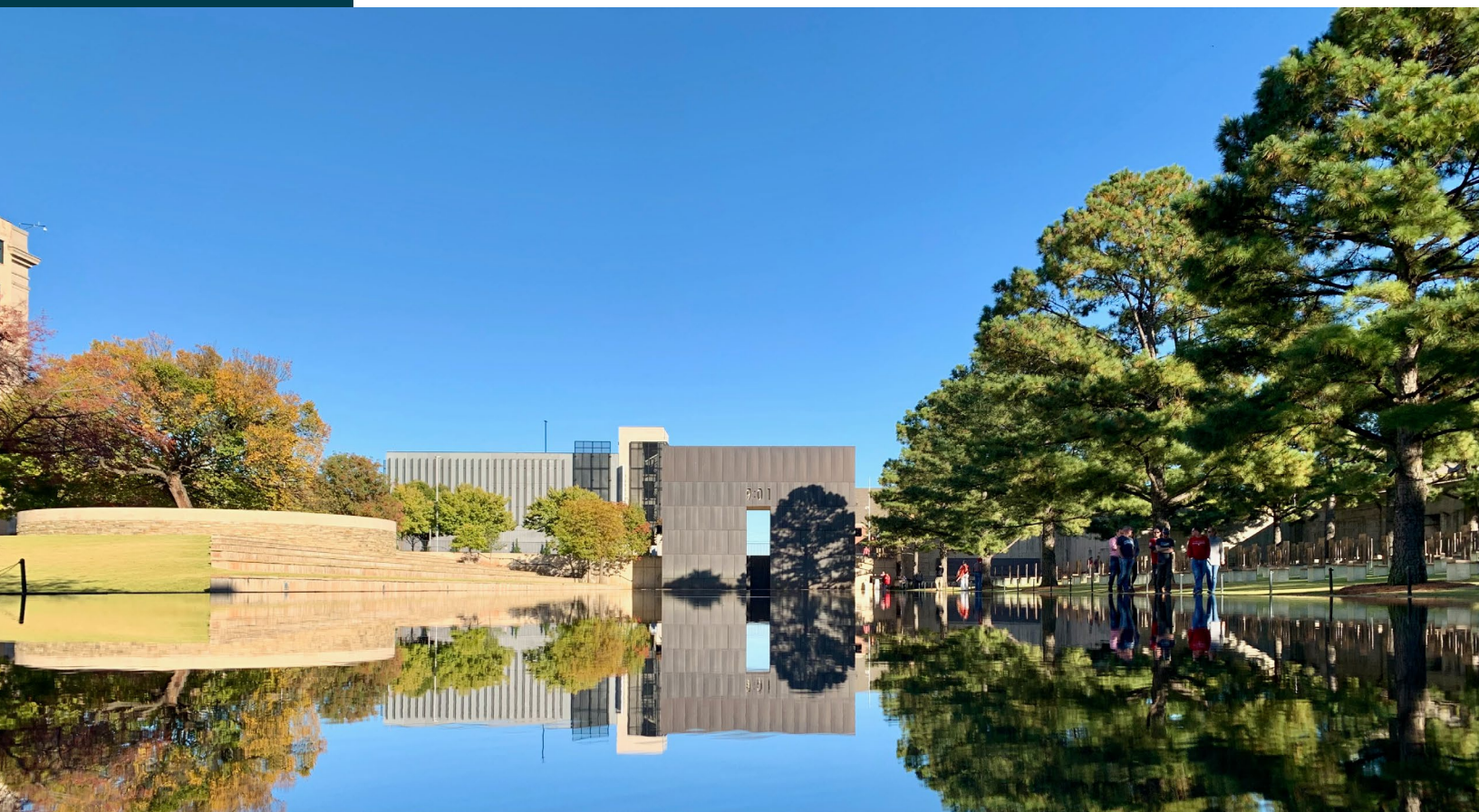


A Series Highlighting Most Improved Cities

Massive change is taking place in the energy landscape as countries and cities grapple with climate change and the accompanying heat, storms, flooding, and pollution. Unfortunately, the communities who endure the brunt of these harsh impacts are frequently non-white and lower-income. These more vulnerable communities also disproportionately experience health, environmental, and economic impacts of a warming climate and other systemic inequities. Many sustainability organizations, policymakers, and utilities have an increased interest in understanding and alleviatiating the load these communities face to improve quality of life.[1]

In 2021, Greenlink Analytics published a new report, A Nationwide Review of Energy Burden, which examined the energy burden of the country's 50 most populated metropolitan areas between 2013 and 2018, using the Greenlink Equity Mapping tool. Energy burden is a measure of affordability using the percentage of a household's income spent on electricity and gas bills. The findings show that all 50 metropolitan areas experienced a reduction in average energy burden and an increase in median income from 2013 to 2018. However, low-income household energy bills saw a more significant increase in over half of the metro areas studied.

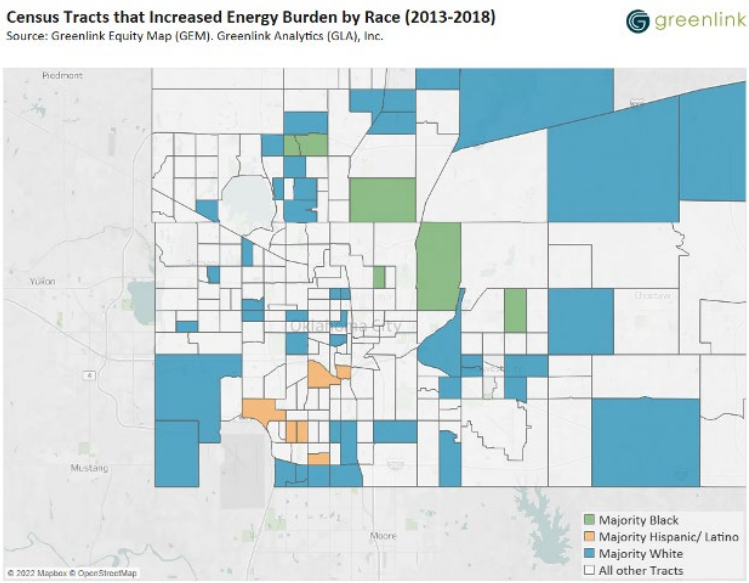
Among these metro areas, Oklahoma City was one of the most improved in terms of energy burden. By 2018, the city saw a 22.4% reduction in energy burden relative to their 2013 level,[2] while the national average was a 10.4% reduction. This report investigates Oklahoma City's specific trends and how they achieved the significant decrease in median energy burden. The main findings are listed below. Note that a city's median energy burden does not reflect the discrepancy between the highest and lowest income households; *A Nationwide Review of Energy Burden* provides more information on this topic.

Main Findings

- Of the 50 metro areas surveyed in Greenlink Analytics's Nationwide Review of Energy Burden, Oklahoma City experienced one of the largest absolute reductions in average energy burden between 2013 and 2018.
- The Greenlink Equity Map (GEM) was used to gain insight on energy burden changes from 2013 to 2018 at the census tract level.
- Median income for Oklahoma City increased 16% between 2013 and 2018, which was higher than the national median of 13.9% over the same time period.
- Average energy bills for Oklahoma City decreased by 6.1% from 2013 to 2018, compared to the national average that saw a 0.2% increase.
- Energy burden for Oklahoma City decreased from 5.8% to 4.5%, a 22.4% reduction between 2013 and 2018, while the national average energy burden decreased from 4.8% to 4.3%, a 10.4% reduction.
- Oklahoma City's utility, Oklahoma Gas and Electric, created and implemented significant energy efficiency and demand response programs that saved residential customers an average of $192 per year.[3]
- Oklahoma City is currently implementing a wide-reaching sustainability plan, *adaptokc*[4], which includes several energy efficiency and renewable energy initiatives.

Oklahoma City's Economic Growth and Trends for Income, Energy Bills, and Energy Burden

Oklahoma City is the capital of Oklahoma, and the largest city in the state with a population of about 650,000 today. Between 2013 to 2018, the population rose almost 6% from 612,000 residents to 648,000.[5] The 2018 Oklahoma City metropolitan area grew to 1.4 million residents; this growth is nearly double that of the national average. The trend occurred in parallel with a strong investment in regional economic development.



Since 1995, the region has added over 100,000 service industry jobs.[6] More recently, Oklahoma City saw a 16% increase in median household income from $51,000 to $59,000 between 2013 and 2018.[7] City residents also experienced a 6.1% decrease in annual energy bills (from $2,500 to $2,300).[8] These changes combined show that Oklahoma City's average energy burden decreased from 5.8% in 2013 to 4.5% in 2018.

Figure 1. Tract-specific energy burden map of the City of Oklahoma by race. 17% of Black census tracts, 19% of Hispanic census tracts, and 29% of White census tracts experienced increasing energy burdens between 2013 and 2018.

Census-Tract Visualizations of Energy Burden Improvements

Oklahoma City is divided into eight wards. The city's northeast residents (primarily Black) and southwest residents (primarily Hispanic) have lower median incomes compared to the surrounding majority-White census tracts.[9] The city's 240 census tracts saw a significant 6.1% overall reduction in energy burden from 2013 to 2018.

Of these, 64 tracts, or 27% of the tracts, saw an increase in energy burden with a higher percentage of those being predominantly White communities (See Figure 1). That being said, the average energy burden in 2018 in Black neighborhoods was 7% while only 4% in predominantly White communities. So, while the greatest overall increase in energy burden occurred within White neighborhoods, the trend continues to show Black's neighborhoods bearing the greatest energy burden (See Figure 2).

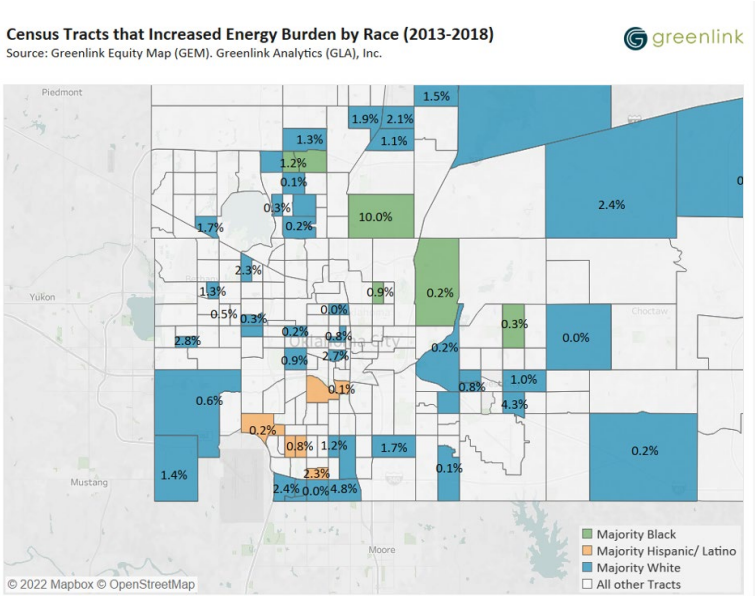


Figure 2. Percentage point increases in energy burden per tract. Between 2013-2018, majority-White census tracts increased by 1.3%, majority-Hispanic/Latino census tracts increased by 1.1%, and majority-Black census tracts increased by 2.4%. On the extreme end, one majority-Black census tract increased as many as 10 percentage points between 2013 and 2018.

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To better understand why energy burden increased in certain neighborhoods, we looked at the influence of education on median income by comparing the percentage of census tract population in Oklahoma County with a Bachelor's degree between 2013 and 2018. The educational data from the American Community Survey (ACS) showed the tracts that experienced an increase in median income corresponded with an increase in percentage of population with a Bachelor's degree. (See Figure 3)

The statistics from Oklahoma City did not follow this trend. Here, 75% of all tracts in Oklahoma County increased in median income between 2013 and 2018 but educational attainment did not noticeably increase for the general population mostly made up of Black, Hispanic, and White neighborhoods in Oklahoma County between 2013 and 2018.[10] An increase in income and education were not coupled in this case.

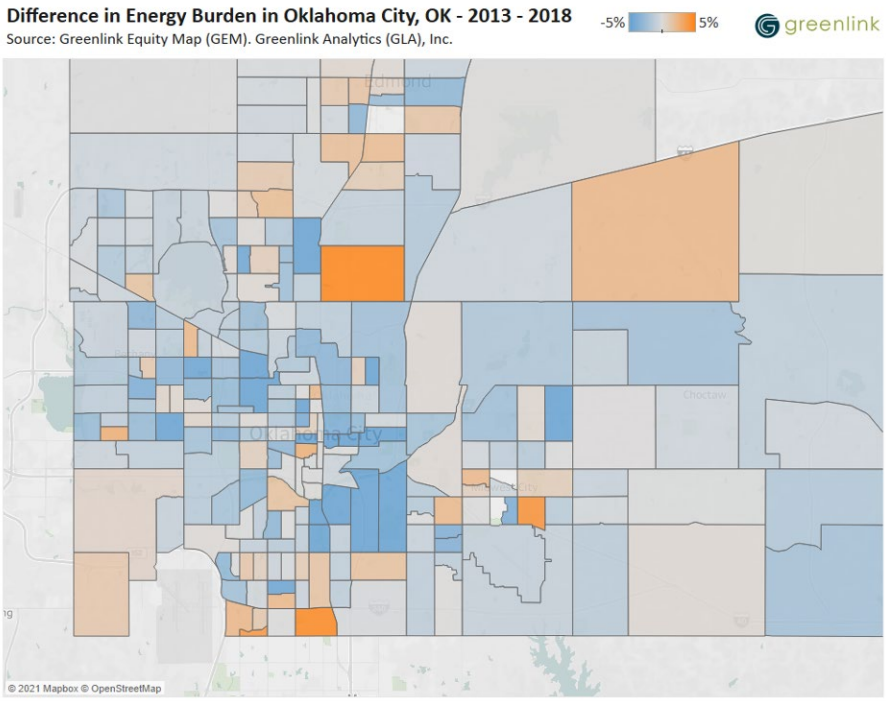

Figure 3. Tract-level GEM map of changing energy burden in Oklahoma City. While the number of higher-burdened census tracts decreased overall between 2013 and 2018, several tracts experienced an increase in energy burden.

Oklahoma City Adopts a Wide-Reaching Sustainability Plan

To address some of these equity and energy challenges, Oklahoma City has invested in a variety of renewable energy and sustainability initiatives over the past several years. In 2016, the city launched the Green Home Loan program, where homeowners can apply for a low-interest loan to make their residence more energy efficient.[11] The approved improvements can include installing energy efficient windows and doors, adding wall insulation, upgrading heat pumps, purchasing energy efficient appliances, and more.[12] Low-income residents face a disproportionately higher energy burden because their homes are likely to use more power because they are less energy efficient due to fewer weatherization upgrades and frequently face strong barriers to accessing loan programs.

According to the data in Table 1 (see below), the Green Home Loan opportunity enabled lower-income residents and families across Oklahoma City to lower their energy burdens. Through April 2021, the Green Loan Home Program has provided 128 loans totaling over $1,000,000 to Oklahoma City residents.[13]

Additionally, some of the success in lowering energy burdens can be attributed to Oklahoma Gas and Electric Company's (OG&E) Smart Grid Investment Grant project with the U.S. Department of Energy and the resulting programs. This project established a new "Smart Hours" time-based rate that varies daily, changing the pattern of the customer's electricity consumption and inducing a reduction in peak demand.[14] Initially introduced as a pilot project, this time-based rate program is now available to all OG&E customers and provides customer equipment installation and evaluation for smart meters, in-home displays, programmable communicating thermostats, and web portals.[15] For many years over this study period, the Smart Hours program was credited with significant contributions to meeting grid demands and reducing rates.

More recently, the City worked to create a comprehensive sustainability plan addressing energy productivity, air quality, waste reduction, and other important environmental issues. In the summer of 2020, Oklahoma City's Planning Commission and City Council adopted *adaptokc*.[16] This plan discusses the infrastructural, economic, and technological challenges the city is facing, along with proposed initiatives to address them. The *adaptokc* plan will build on Oklahoma City's previous sustainability efforts and propel the city into a cleaner and more energy efficient future. The primary goals of the plan include:

- Atmosphere and Climate: Reducing the city's emissions related to energy consumption. Although the city's emissions have fallen since 2010, the power plants providing Oklahoma City still emit approximately 41 million tons of CO_2, far outstripping the city's passenger cars and trucks. Increasing renewable energy deployment will help address this.[17]
- Energy Choice: Investing in and incorporating more renewables into the city's energy mix is important for the city's economic future, cutting back on emissions, and bolstering energy resilience. Wind, geothermal, and solar energy are all being investigated as alternatives for the city.[18]
- Reducing the cost of municipal operations and risk, focusing primarily on strengthening the integrity of overhead transmission lines, identifying backup options for electricity facilities located within floodplains, and other efforts to improve the city's self-sufficiency.[19]

Average Energy Burden for 2013 and 2018 by Predominant Race
Source: Greenlink Equity Map (GEM). Greenlink Analytics (GLA), Inc.

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Predominant Race	Energy Burden, 2013	Income, 2013	Annual Energy Bill, 2013	Energy Burden, 2018	Income, 2018	Annual Energy Bill, 2018
Black or African American	9%	$33,800	$2,600	7%	$33,820	$2,232
Hispanic or Latino	10%	$30,800	$2,800	6%	$33,974	$2,071
White	5%	$60,500	$2,600	4%	$66,337	$2,336

Table 1. Average energy burden decreased significantly between 2013 and 2018 for primarily Black, Hispanic, and White tracts. The 2018 energy burden is still significantly higher in predominantly Black and Hispanic tracts (6% to 7%) compared to White tracts (4%). Median incomes and implementation rates of energy efficiency improvements, such as home weatherization, remain significantly lower in Black and Hispanic neighborhoods compared to White ones, explaining why some of these minority communities continue to experience higher energy burdens. Several barriers to implementation, such as financial resources, utility program design, and market availability, commonly contribute to lower implementation rates, although this report does not assess which barriers are contributing significantly in Oklahoma City.

A Way Forward

The City of Oklahoma City needs to continue the good work of investing in improving its energy efficiency, resiliency, and economic future to help benefit its residents, environment, and economy. While it's challenging ensuring equal access to these resources and the benefits they provide, such as decreased energy burden, it's also crucial. Equitable access in combination with strong grassroots programs across communities of different demographics and income levels lead to job creation, reductions in air pollution, better public health, and improved equity outcomes.

Engaging low-income and non-white residents in strategic project planning allows for the development of more equitable policies and better outcomes for all. The best practices for accomplishing effective and positive collaborations between communities and government are available in the Greenlink Equity Map (GEM) Process Guide, which offers a set of guideposts to support city staff in designing and implementing inclusive processes based on the equity data provided through GEM and in collaboration with community partners.

The GEM platform was launched in October 2020 and is used by over 500 city, community, and non-profit leaders. The purpose of GEM is to guide individuals and organizations toward understanding how equity-related metrics are spread across communities in order to help them make informed, data driven decisions. The platform offers detailed data insights into how different communities' exposures to a variety of health, environmental, and demographic metrics in order to get beyond anecdotal evidence, and create equity-advancing interventions.

Addressing some of our nation's largest disparities is no easy feat, but with accurate data and information available to city staff, policymakers, and decision makers across the county, we can work towards a cleaner, healthier, and more equitable future. The creation of this tool and these reports would not have been possible without the support of our generous funders, the Kresge Foundation, Bloomberg Philanthropies, and the Energy Foundation. These reports serve to highlight different equity and energy issues found in cities across the United States, as well as highlight cities where improvements are being made.

For more information on how to access the Greenlink Equity Map, please visit our website here: https://www.equitymap.org/

Recommended Citation

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