

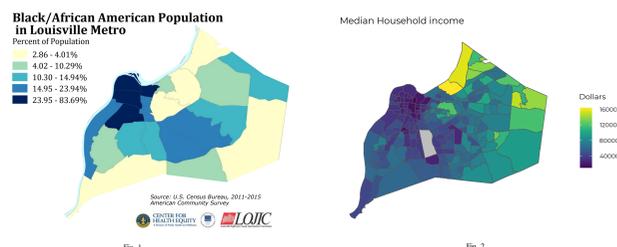
Empowered by the Sun: Exploring the Intersections of Housing Justice and Green Technologies in Louisville, KY

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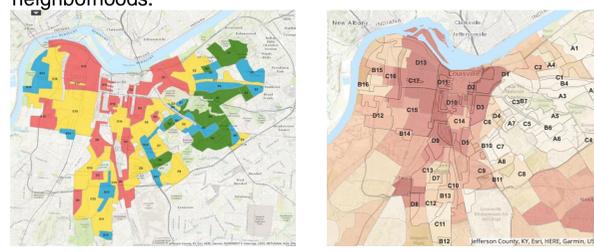
Background and Objectives

There has historically been a clear divide between the West and East ends of Louisville Metro. As the city grows and expands, residents of neighborhoods within the West End are particularly vulnerable to displacement, gentrification, and affordable housing. As shown on the maps below, this means that Black individuals are more likely to be affected by housing injustices. The distribution of populations by race also corresponds with median household income, outlining the vast disparities in income between the dominantly white East End neighborhoods and the majority Black West End neighborhoods. These disparities lead to the inability to create and maintain household security, utilize opportunities for sustainable lifestyles, and further increase the effects and chances of displacement.



In the 1930's, the Homeowner's Loan Corporation (HOLC) was created by the federal government to guide investment and home ownership. HOLC guided the creation and implementation of residential security maps, or redlining maps. These maps graded neighborhoods based on their desirability for investment, however, the bad grades directly correlated with neighborhoods that were predominantly Black, which eliminated access to mortgages and credit (Poe, 2016). As time has progressed, these "grades" have persisted and now correlate with mortgage lending, income, poverty, and health disparities.

Since the 1930's, Louisville's West End has been a prime example of discriminatory practices like redlining and its effects. Because of redlining, Black exclusion has become a characteristic of suburban sprawl and white accumulation of wealth, explicitly neglecting the accessibility and security of affordable housing for minority communities. The West End has since become an under-served and under-resourced area with housing costs more realistic and affordable for local inhabitants, who were unable to move to "better-rated" neighborhoods.



This research follows Louisville Metro Government's Solar Over Louisville (SOL) campaign to study the attitudes and expectations of West End community members, both participants of the program and their neighbors, toward solar energy, as well as climate change. This poster focuses on preliminary data gathered from the early stages of this study, which examine the relationship between solar energy accessibility and usage, vulnerability of housing injustice, and climate change believability and attitudes. The results of this study will inform Louisville Metro Government's continuation of the SOL program and its grants and has the potential to advise other cities to develop and implement subsidy programs like Solar Over Louisville.

Solar Over Louisville

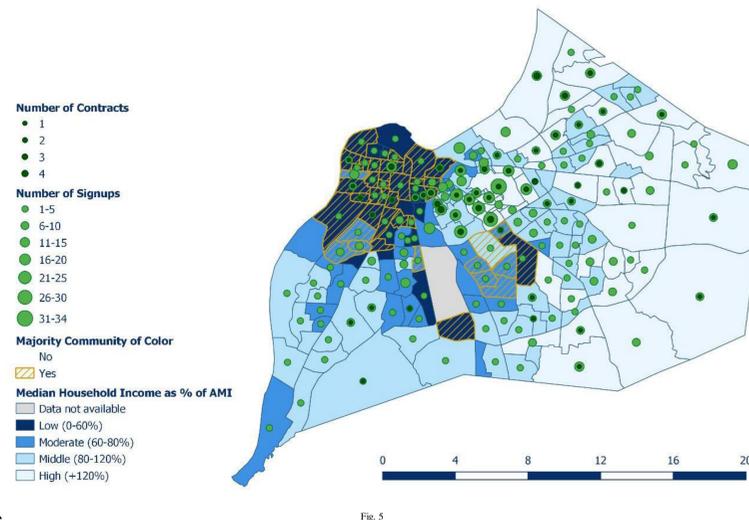
Louisville Metro Government (LMG) has created and implemented a solarize campaign, Solar Over Louisville (SOL), to increase solar usage in residential neighborhoods, especially in low-to-moderate income (LMI) households. The SOL program allowed residents to apply and receive 12-19% off the installation cost associated with solar, with seven homes receiving subsidies to fully cover the cost of the installation.

The SOL campaign began is a way to address disparities in housing stability as well as to work toward Louisville Metro's goals from the 100% Renewable Energy resolution, which states that LMG will have 100% clean energy by 2035 and Louisville, as a city, will have community-wide clean energy by 2040. The program also hopes to educate community members on green technologies, and climate change.

The campaign was developed through research from other programs like SOL as well as existing research from the Rocky Mountain Institute (RMI). RMI has provided Louisville Metro with resources and templates to organize and implement a successful solarize campaign through a six-step guide, which has been used to inform other solarize campaigns in cities like Salt Lake City, Houston, Columbus, and Boston, among others (Lombardi & Shea, 2023).

Another aspect of SOL's quest to expand accessibility is the establishment of the program as a professional network that provides a service at a discounted and subsidized rate through access to wholesale pricing. Solar is an industry that is extremely susceptible to predatory organizations. By creating and implementing Solar Over Louisville, Louisville Metro has allowed homeowners to bypass the process of navigating this environment themselves.

Geographic Distribution of Signups and Contracts in Louisville Metro area



Methods and Scope

This mixed-methods research design includes survey data collected from residents of households nearby the homes with fully-subsidized solar. Survey questions involve a variety of different topics, including perceptions of solar and climate change, as well as a table that explores the household's current energy-saving features and habits. Additionally, this research includes data collected through qualitative interviews with SOL-participating households, both fully- and partially-subsidized installation households. Interviews are longer and more comprehensive than surveys and will be utilized to inform pending success of Louisville Metro Government's program goals. Additional interviews will be conducted with stakeholders and LMG employees to gather background data and advise wider work on green technologies. Energy use data from households and city-wide will also be used to evaluate the efficacy and accessibility of the SOL program.

With funding from the University of Louisville and Humana Health Equity Innovation Hub, faculty and student researchers, both undergraduate and graduate, have worked closely to collect and analyze data to meet the goals of the study.

Preliminary Results

Data has been divided into two sections, qualitative and quantitative. Qualitative data consists of the data gathered from interviews ($n = 2$) with two individuals who received a fully-subsidized solar installation. Quantitative data was collected from surveys ($n = 22$) involving the neighbors of the fully-subsidized installations.

Survey data ($n = 22$) has shown that the majority of individuals (15) failed to notice their neighbor's solar installations, compared to the 7 who did. Only 1 of those 7 considered solar after seeing their neighbor's installations, which runs counter to the idea that having solar installations in a neighborhood is a catalyst for adoption of desire for solar. Many of the individuals were concerned with climate change, citing worries about extreme weather or frequent changes within temperatures, however, when it came to reasoning for solar installations, few respondents mentioned environmental benefits over their energy choices.

"The environment affects everybody...I want it to be a healthy environment for my kids, my grandkids, my neighbors, my loved ones, you guys."

The interviews ($n = 2$) provided more extensive insight on participants and demographics, bringing to light 3 themes: motives for participation, environmental framework, and a housing justice framework, either as a motive for participation in SOL or in general. Cost saving seemed to be the primary motive for participation, encouraged by respondent's prior knowledge of solar.

The environmental framework mostly involved participant desire and concern for preservation of a healthy environment for future generations. Additionally, both interviewees were concerned with the threat of gentrification and rising housing costs and the livability of neighborhoods, however, neglected to connect this directly with the installation of solar panels. Responses from both interviewees have been helpful feedback in guiding Louisville Metro's goals with the SOL program.

At this stage of the research process, no interviews have been conducted with non-SOL participants such as Metro employees or other stakeholders, so results are inconclusive on that realm of success of the SOL program.

Discussion and Conclusion

The preliminary data and results presented in this poster highlights the potential correlation between green technologies, like solar, and the increase of housing stability within low-to-moderate income neighborhoods that have been historically underserved. While so far, there are no obvious relationships between perceptions of housing justice and access to green technology, preliminary observations overwhelmingly point towards positive impacts on LMI households.

While the SOL program addresses the difficulties in accessing expensive green technology like solar, it lacks the funding to subsidize solar for entire neighborhoods within the West End. If the program is a success in lowering energy bills, raising home value, and increasing awareness about solar, green technologies, and climate change, then the program could inform others like it across the United States. This program and others that follow it will come at a time when divestment from nonrenewable energy and systemic barriers, like housing affordability and stability, is needed most.

Limitations and Implications

One limitation is inconsistency in survey responses. Because the surveys were conducted door-to-door, responses were limited and were subject to the schedules and timing of both the participants and the student researchers. Weather and other external factors also limited data collection and interfered with the receptivity of participants and the abilities of data collectors. Because of this, a major limitation so far is a general lack of data in both surveys and interview responses.

Additionally, the pool of participants was limited by the nature of the study. Louisville Metro Government's funding narrowed the number of fully- and partially-subsidized installations available, thus limiting the pool of participants for both surveys and interviews. In the wider picture, this begs the question: does subsidizing solar and other green technologies have an impact if it is not accessible for all LMI households?

Opportunities for future research could address the aforementioned question, as well as serve as guidance for broader subsidy programs outside of Louisville. Future research and programs could address disparities in participation in green technologies and housing injustices.

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