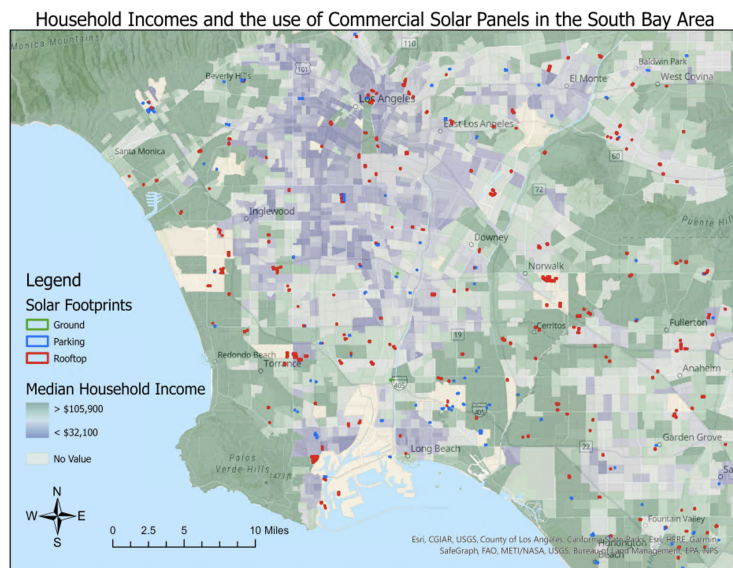


Analyzing the Use of Solar Panels in Southern California's South Bay Area Angela Delgado, Class of 2025

The burning of fossil fuels for energy is the largest contributor to global warming and our climate crisis. This makes a switch to renewable energy necessary for future sustainable development because it will reduce greenhouse gas emissions that trap heat in our atmosphere. As renewable energy technology develops, researchers have found extraordinary benefits to photovoltaic systems as they have the potential to decrease the rate of global warming and reduce urban heat islands (Masson 2014). This makes solar panels an ideal source of energy for densely populated areas like Los Angeles. With this in mind, it's reasonable to question why there hasn't been a faster adoption of renewable energy in communities that would greatly benefit from it.



This project focuses on analyzing the use of solar panels in the South Bay Area of Los Angeles to identify potential reasons for their delayed adoption. I hypothesized that lower-income communities would have less energy coming from solar panels when compared to surrounding higher-income areas. Using data from California's Open Data Portal, I was able to visually represent commercial solar panels in parking lots, on the ground, and on the rooftops of the South Bay with GIS Software. It was apparent that commercial solar systems in use slightly diminished reaching the center of the region with median household incomes of around

\$32,100 or less. It's important to note that this data accounts for commercial solar panels that are at least half an acre. While the map excludes the use of smaller, residential solar panels providing energy to the homes of individual families, it provides insight on how solar panels are implemented into communities as they develop.

Unsatisfied with these results, I turned to other studies that researched barriers preventing a large-scale implementation of residential solar panels. Obstacles encountered in the installment of solar panels include policy and regulatory barriers as well as project management challenges (Mavrigiannaki 2021). Unfamiliarity with building permits and solar panel maintenance can make stakeholders disinclined to make the switch to renewable energy. Residents in low-income communities are likely to have other priorities that are more urgent than their interest to add solar panels onto the rooftops of their homes. Ideally, renewable energy would be implemented into communities as they develop, but the best hope for our communities now is to make sure that these technologies are accessible to everyone.

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References:

- ArcGIS Living Atlas of the World. (2023). *Arcgis living atlas of the world*.
<https://livingatlas.arcgis.com/en/home/>
- Luederitz, C., Lang, D. J., & Von Wehrden, H. (2013). A systematic review of Guiding Principles for Sustainable Urban Neighborhood Development. *Landscape and Urban Planning*, 118, 40–52. <https://doi.org/10.1016/j.landurbplan.2013.06.002>
- Masson, V., Bonhomme, M., Salagnac, J.-L., Briottet, X., & Lemonsu, A. (2014). Solar panels reduce both global warming and Urban Heat Island. *Frontiers in Environmental Science*, 2. <https://doi.org/10.3389/fenvs.2014.00014>
- Mavrigiannaki, A., Pignatta, G., Assimakopoulos, M., Isaac, M., Gupta, R., Kolokotsa, D., Laskari, M., Saliari, M., Meir, I. A., & Isaac, S. (2021). *Examining the benefits and barriers for the implementation of net zero energy settlements*. *Energy and Buildings*, 230, 110564. <https://doi.org/10.1016/j.enbuild.2020.110564>
- Solar footprints in California*. California Open Data. (2023, August 14).
<https://data.ca.gov/dataset/solar-footprints-in-california>