

Race to Solar:

Disparities in Rooftop Photovoltaics Deployment in the United States by Race and Ethnicity



Deborah A. Sunter, Ph.D.
Assistant Professor
Department of Civil & Environmental Engineering
Department of Mechanical Engineering
Tufts University

Solar & Income



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FEATURE

Is rooftop solar just a toy for the wealthy?

Nikkei ▲ 22297.58 1.30% Hang Seng ▲ 28387.55 0.50% U.S. 10 Yr ▼ -4/32 Yield 2.392% Crude Oil ▲ 54.66 0.51% Yen ▲ 113.91 0.24%

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THE EXPERTS

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Is US residential solar just for the rich?

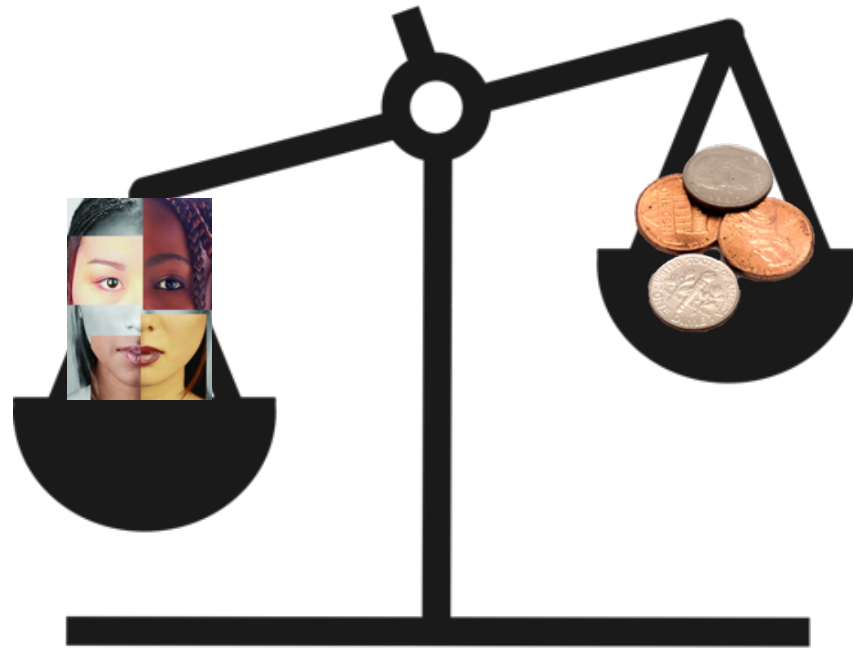
By Danielle Ola | Apr 21, 2017 11:15 AM BST | 0

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Environmental Racism

- Communities of color are more heavily targeted for hazardous waste landfills than poor communities are.

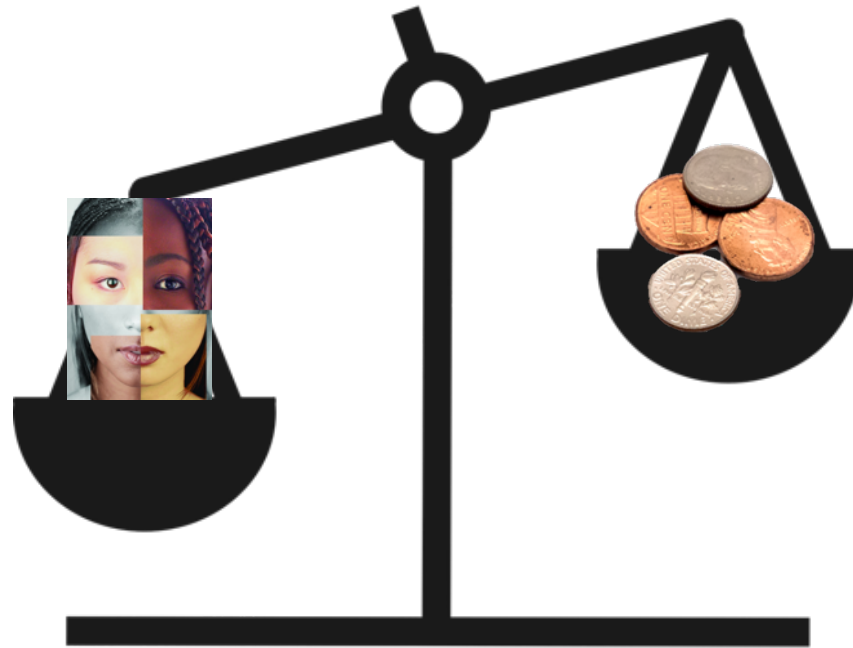


U.S. General Accounting Office. (1992). *Siting of hazardous waste landfills and their correlation with racial and economic status of surrounding communities*. Washington, D.C.

<https://www.ejnet.org/chester/delco-swat.pdf>

Energy Racism?

- Are communities of color are being left out of the solar revolution?

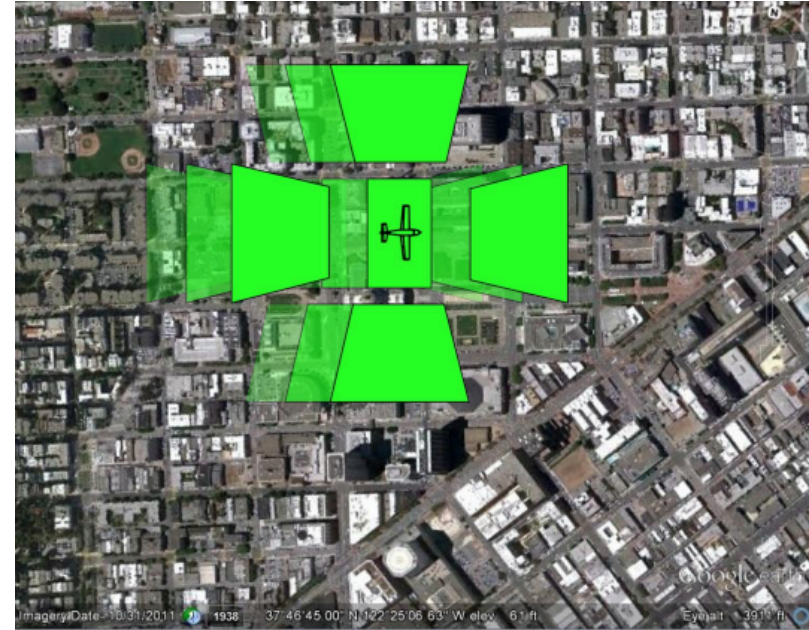
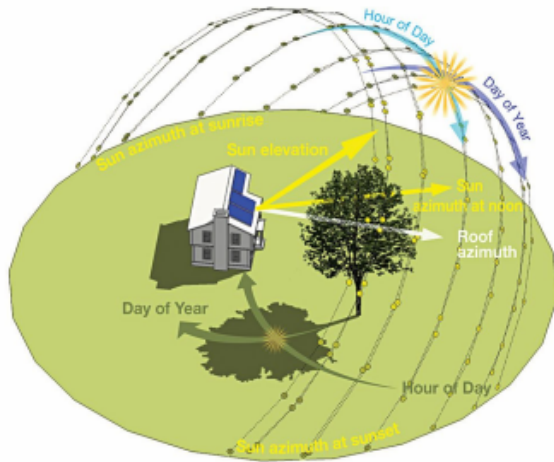


U.S. General Accounting Office. (1992). *Siting of hazardous waste landfills and their correlation with racial and economic status of surrounding communities*. Washington, D.C.

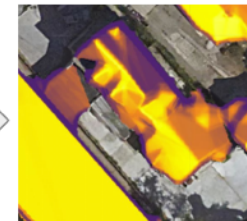
<https://www.ejnet.org/chester/delco-swat.pdf>

Collaboration with Google Project Sunroof

- Millions of oblique images acquired, processed, and refined.



Initial
images



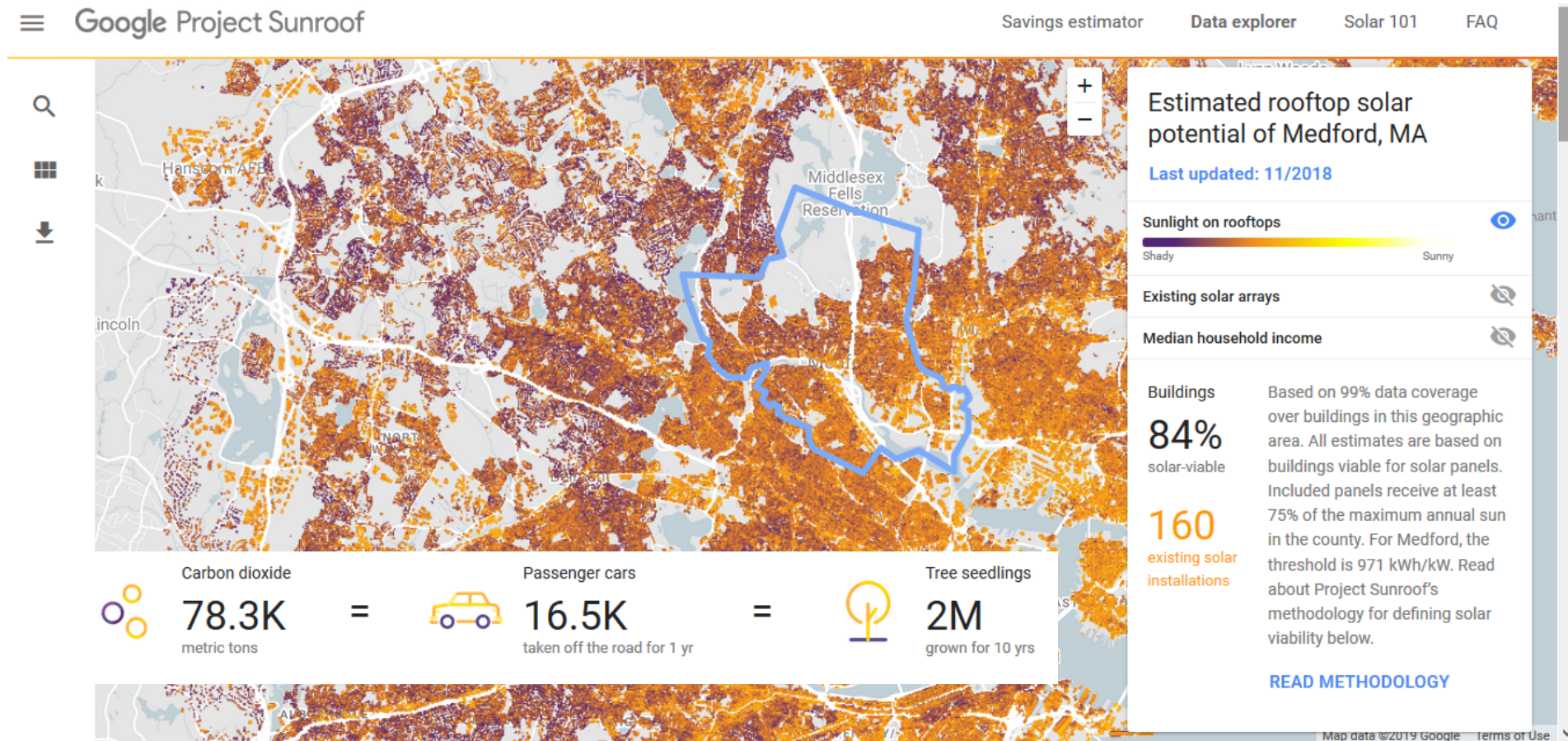
heuristic refinement

Google Brain

Better roof maps

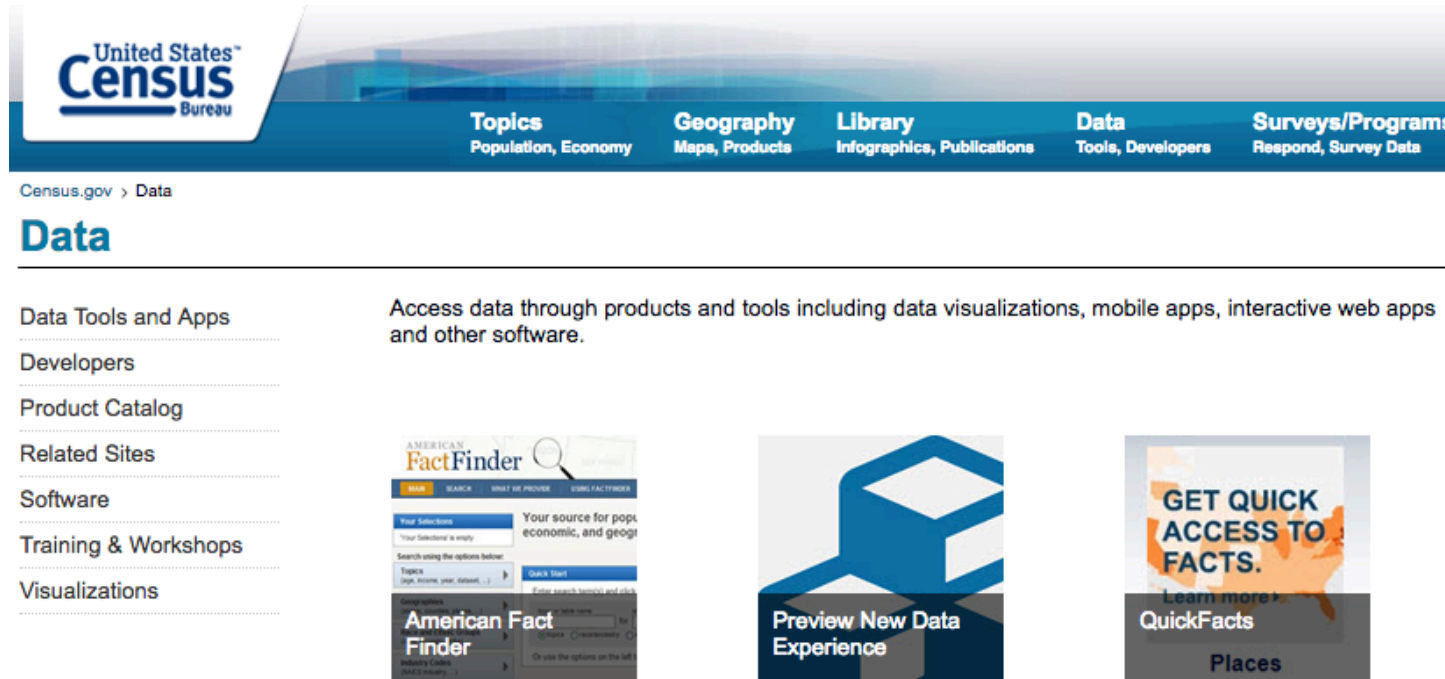
Images: Joel Conkling – Philomathia Forum presentation on Google Sunroof

Collaboration with Google Project Sunroof



<https://www.google.com/get/sunroof/data-explorer/>

Demographic Data



American
Community
Survey
(ACS)
5 yrs. estimates
2010–2014

- ACS
 - Asian (NH), Black (NH), Hispanic (any race), White (NH)
 - Median Household Income
 - Percentage of households occupied by renters
- Majority: 50% of the population identifies with same race/ethnicity

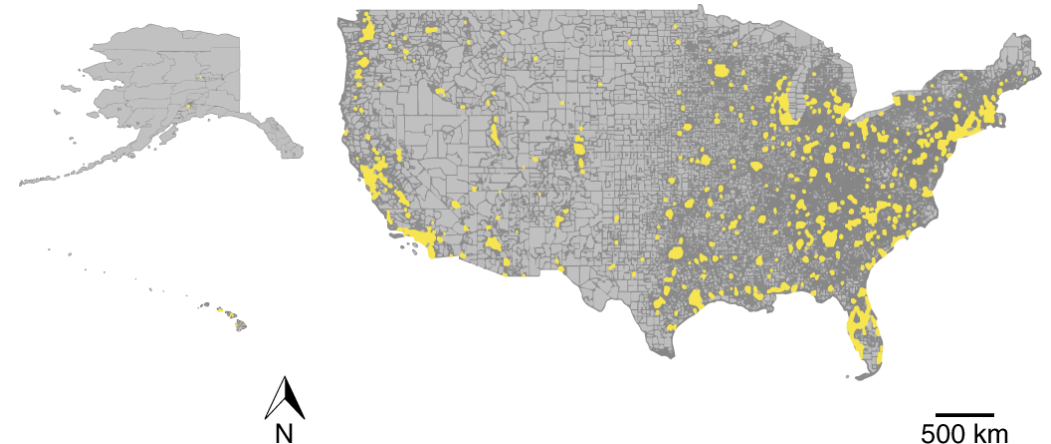
Data Analysis

$$\text{Rooftop PV Deployment} = \frac{\text{\# systems}}{\text{\# potential systems}}$$

$$\text{State normalized Rooftop PV Deployment} = \frac{\text{Rooftop PV Deployment}}{\text{Avg. census tract deployment performance in that state}}$$

Variations across states were mitigated by normalizing the rooftop PV adoption by the average solar adoption of all census tracts in each state

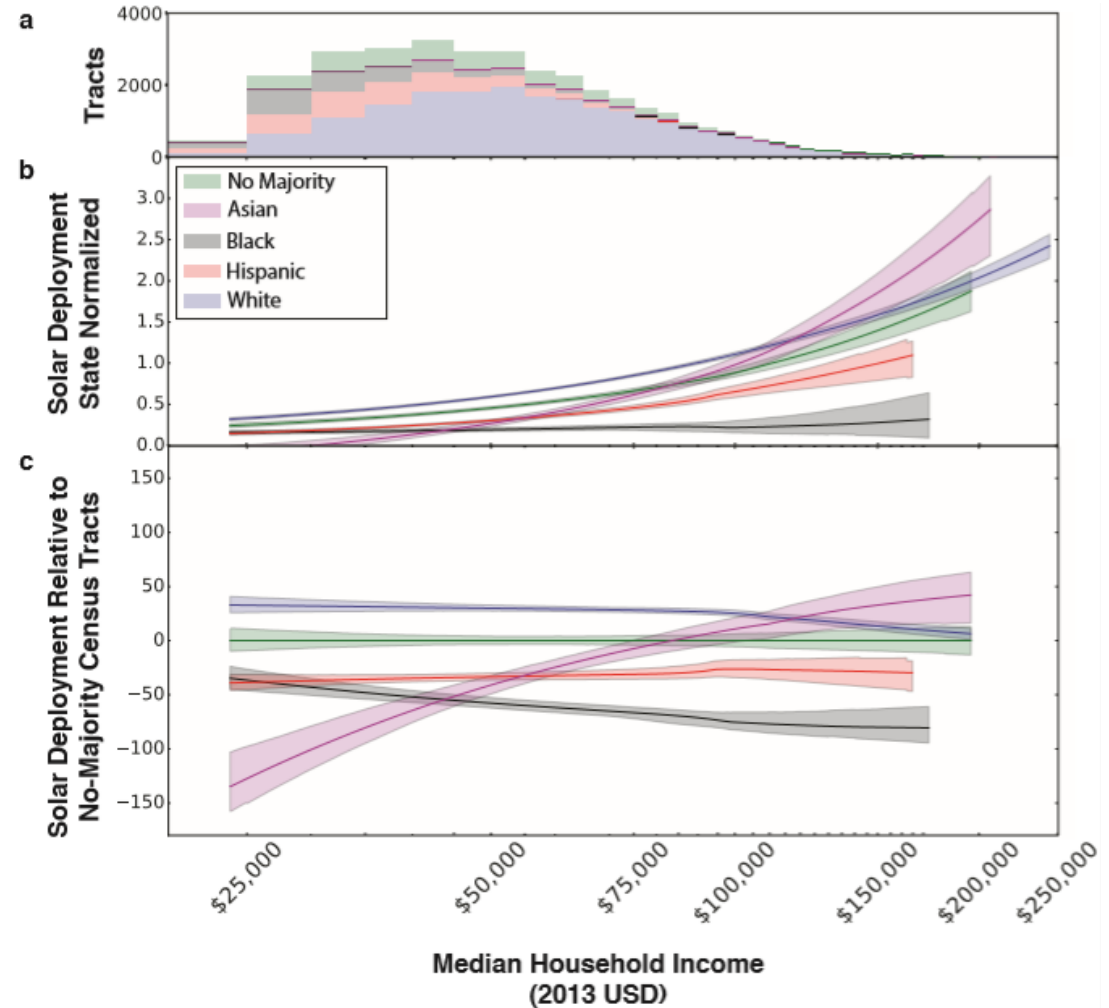
- available solar resources
- incentive programs and policies
- electricity prices



Racial disparity is observed – even at same income

When compared to no-majority census tracts:

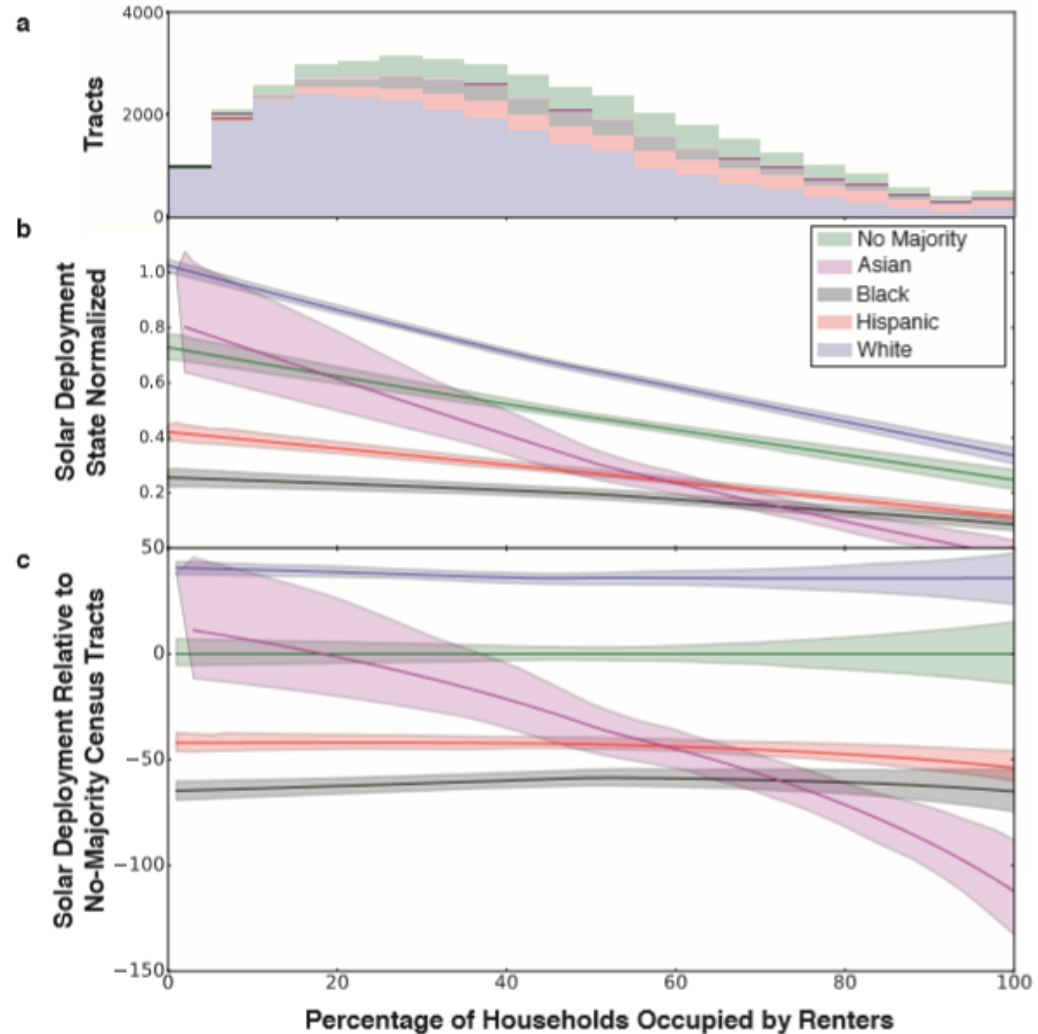
- Black-majority census tracts installed **69% less**
- Hispanic-majority census tracts have installed **30% less**
- White-majority census tracts have installed **21% more**



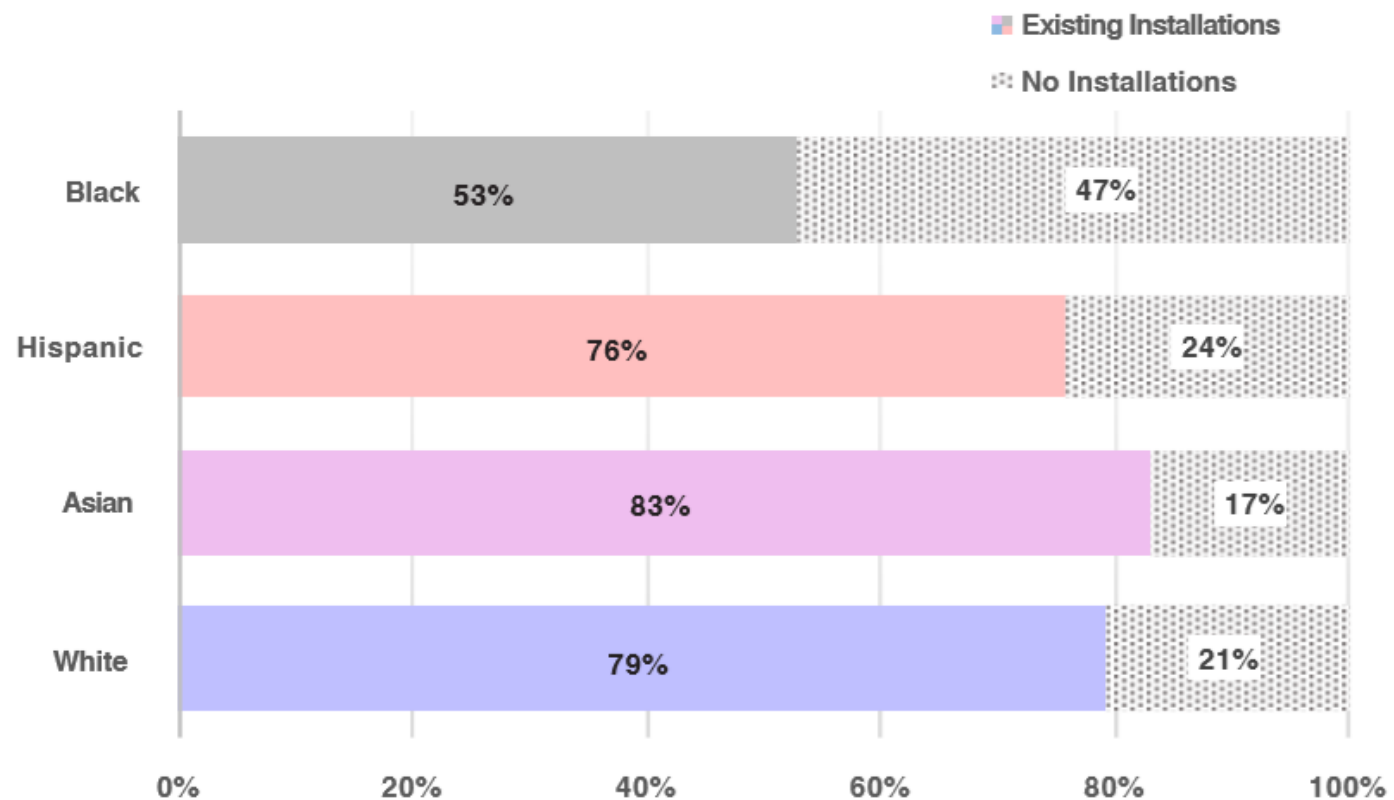
Racial disparity is observed – even at home ownership

When compared to no-majority census tracts:

- Black-majority census tracts installed **61% less**
- Hispanic-majority census tracts have installed **45% less**
- White-majority census tracts have installed **37% more**



A significant amount of tracts lack PV installations



- Lack of installation in cases ~2x (Black)
- Similar seeding patterns in Hispanics/Asian/White

Challenges = Opportunities

- Industry

- Business models that leverage on the observed gap
- Racial diversity in employees and customer acquisition process

- Government

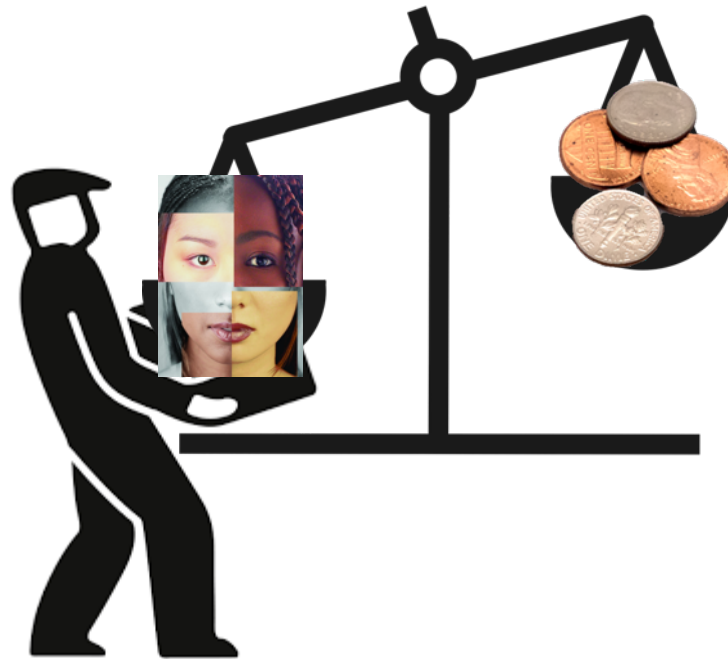
- Tailored policy interventions that target segregated tracts
- Create/modify incentives for PV deployment

- Academia

- Understand and further study root causes of observed disparity
- Leverage power of increasingly available datasets to spur discussions with both Industry and Government

+ more...

Recognizing a Problem is the First Step Towards Fixing it



Thank You