



Renewable & Appropriate Energy Laboratory

RAEL



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Climate Justice and Global Decarbonization

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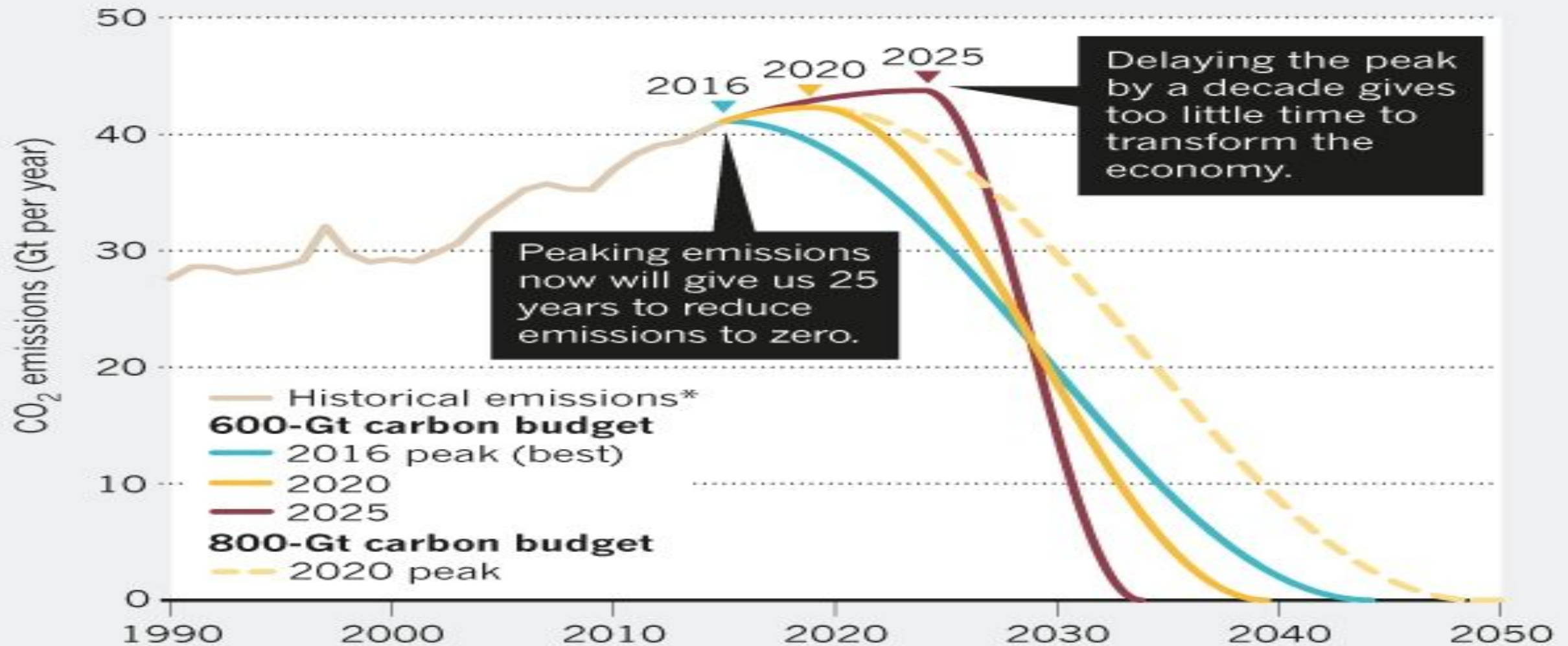
Former Science Envoy, United States Department of State

Climate-Safe California Policy Summit | August 5, 2021

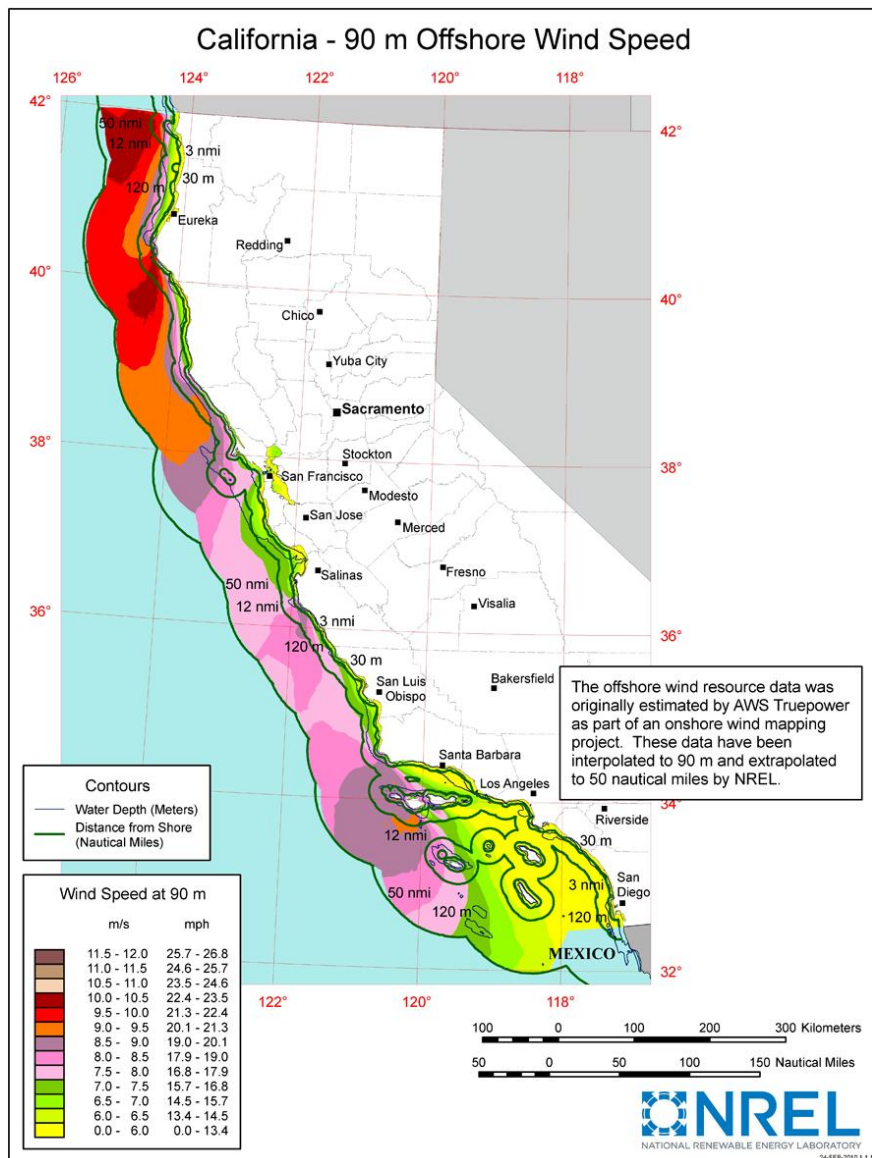
CARBON CRUNCH

C. Figueres, et al, 2017, *Nature*

There is a mean budget of around 600 gigatonnes (Gt) of carbon dioxide left to emit before the planet warms dangerously, by more than 1.5–2°C. Stretching the budget to 800 Gt buys another 10 years, but at a greater risk of exceeding the temperature limit.



Off-shore wind: fast growing source of US & overseas jobs



Europe, China, Japan, South Korea and the US have all begin massive expansions of off-shore energy (for electricity and Hydrogen)



OPINION // OPEN FORUM

Carbon neutral isn't good enough. California needs to be carbon negative by 2030

Daniel Kammen and Manuel Pastor

July 30, 2021 | Updated: July 31, 2021 4 a.m.



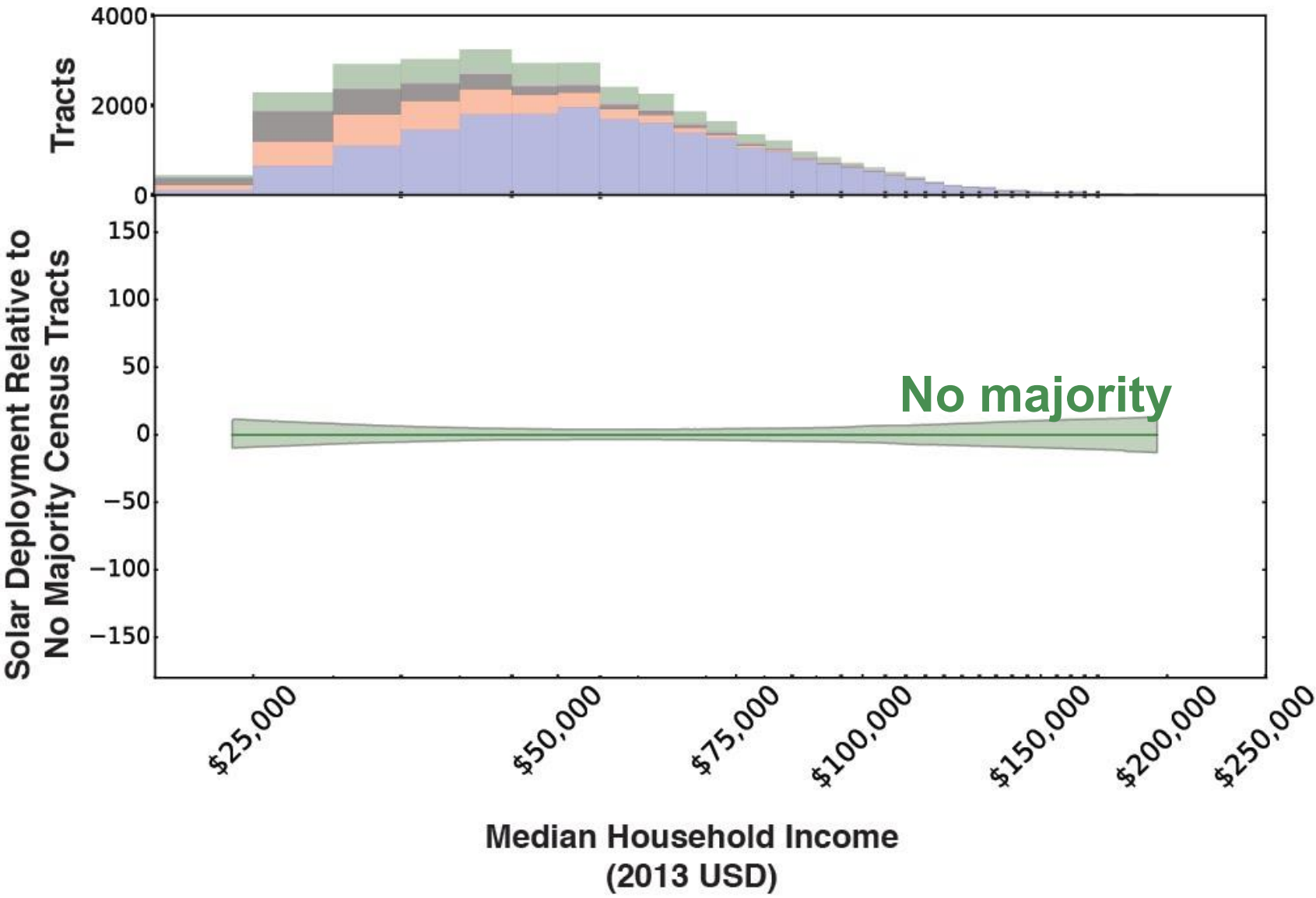
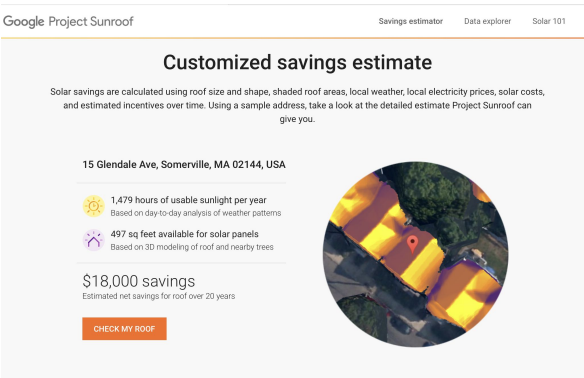
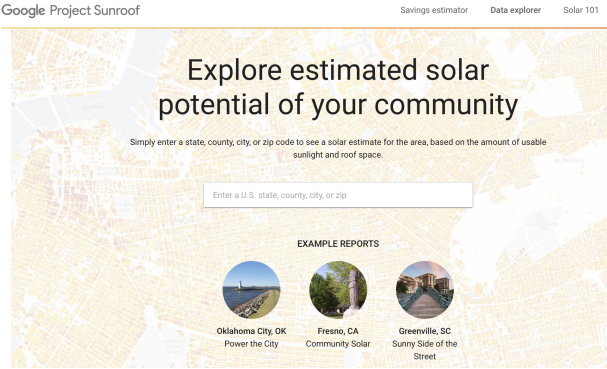
- Carbon negative pathways exist leveraging mitigation and nature-based solutions
- Environmental and social justice define a *virtuous cycle* to address climate change and under-served communities

Disparities in rooftop photovoltaics deployment in the United States by race and ethnicity

Deborah A. **Sunter** ^{1,2,3,4*}, Sergio **Castellanos** ^{3,4,5,6*} and Daniel M. **Kammen** ^{3,4,7}

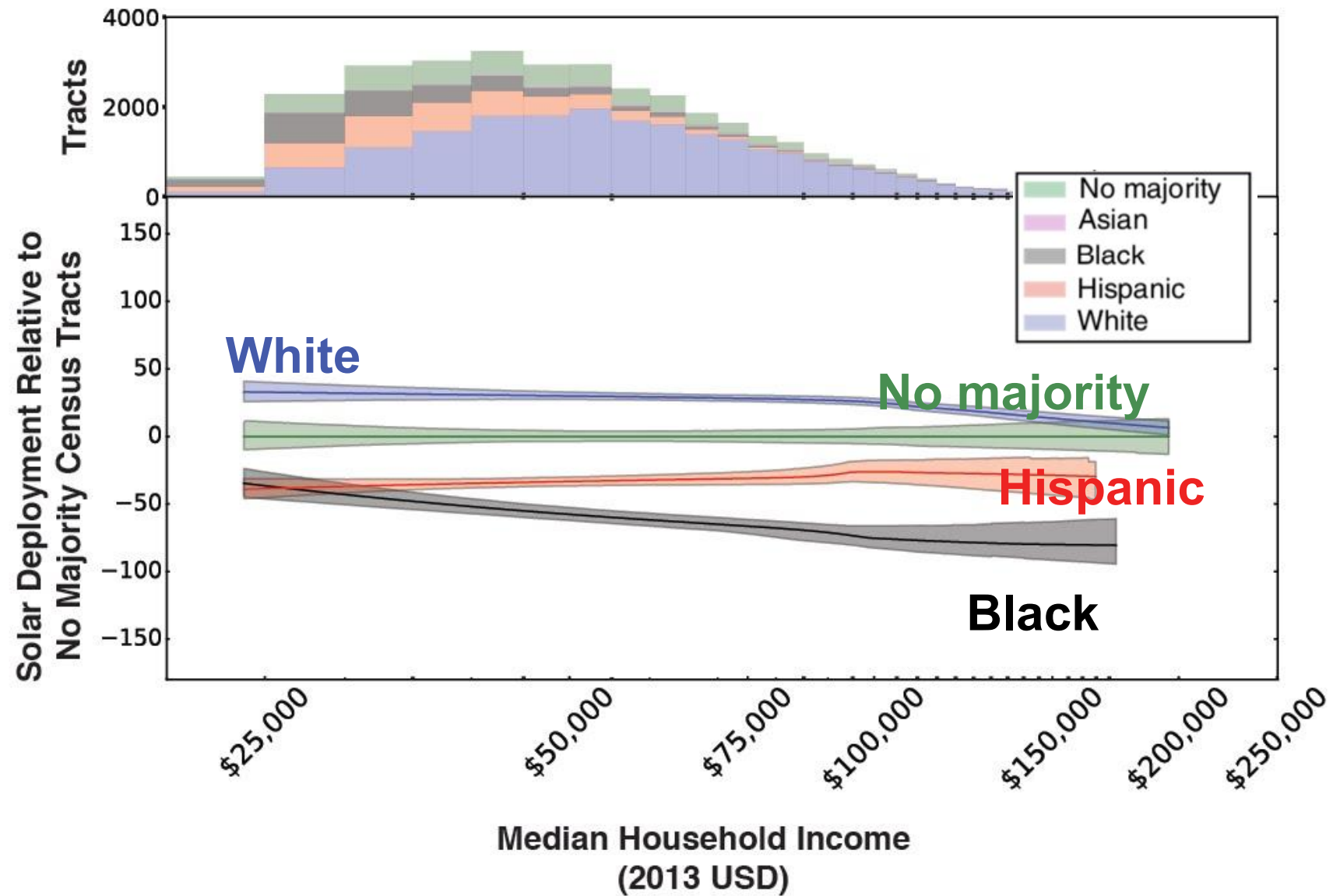
Q1 The rooftop solar industry in the United States has experienced dramatic growth—roughly 50% per year since 2012, along with steadily falling prices. Although the opportunities this affords for clean, reliable power are transformative, the benefits might not accrue to all individuals and communities. Combining the location of existing and potential sites for rooftop photovoltaics (PV) from Google's Project Sunroof and demographic information from the American Community Survey, the relative adoption of rooftop PV is compared across census tracts grouped by racial and ethnic majority. Black- and Hispanic-majority census tracts show on average significantly less rooftop PV installed. This disparity is often attributed to racial and ethnic differences in household income and home ownership. In this study, significant racial disparity remains even after we account for these differences. For the same median household income, black- and Hispanic-majority census tracts have installed less rooftop PV compared with no-majority tracts by 69 and 30%, respectively, while white-majority census tracts have installed 21% more. When correcting for home ownership, black- and Hispanic-majority census tracts have installed less rooftop PV compared with no-majority tracts by 61 and 45%, respectively, while white-majority census tracts have installed 37% more.

Google's Sunroof: 60 million roofs:



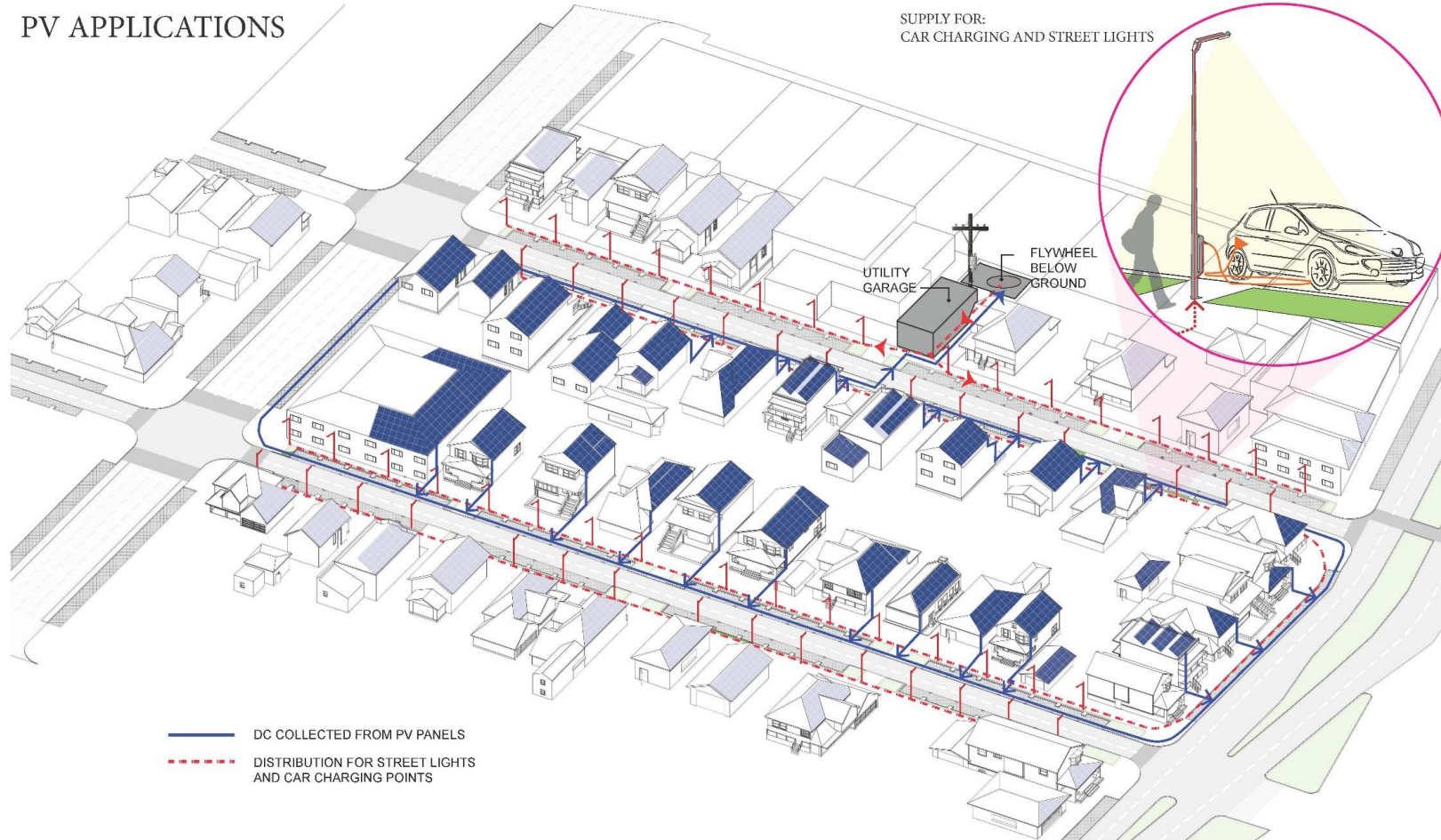
Summary:
Across income levels, solar is:

- 30% more likely in majority White communities
- 30%+ less likely in majority Hispanic communities
- 60%+ less likely in majority Black communities



The EcoBlock: Clean energy and transportation for under-served communities

PV APPLICATIONS



Community
conversations
even during
COVID-19



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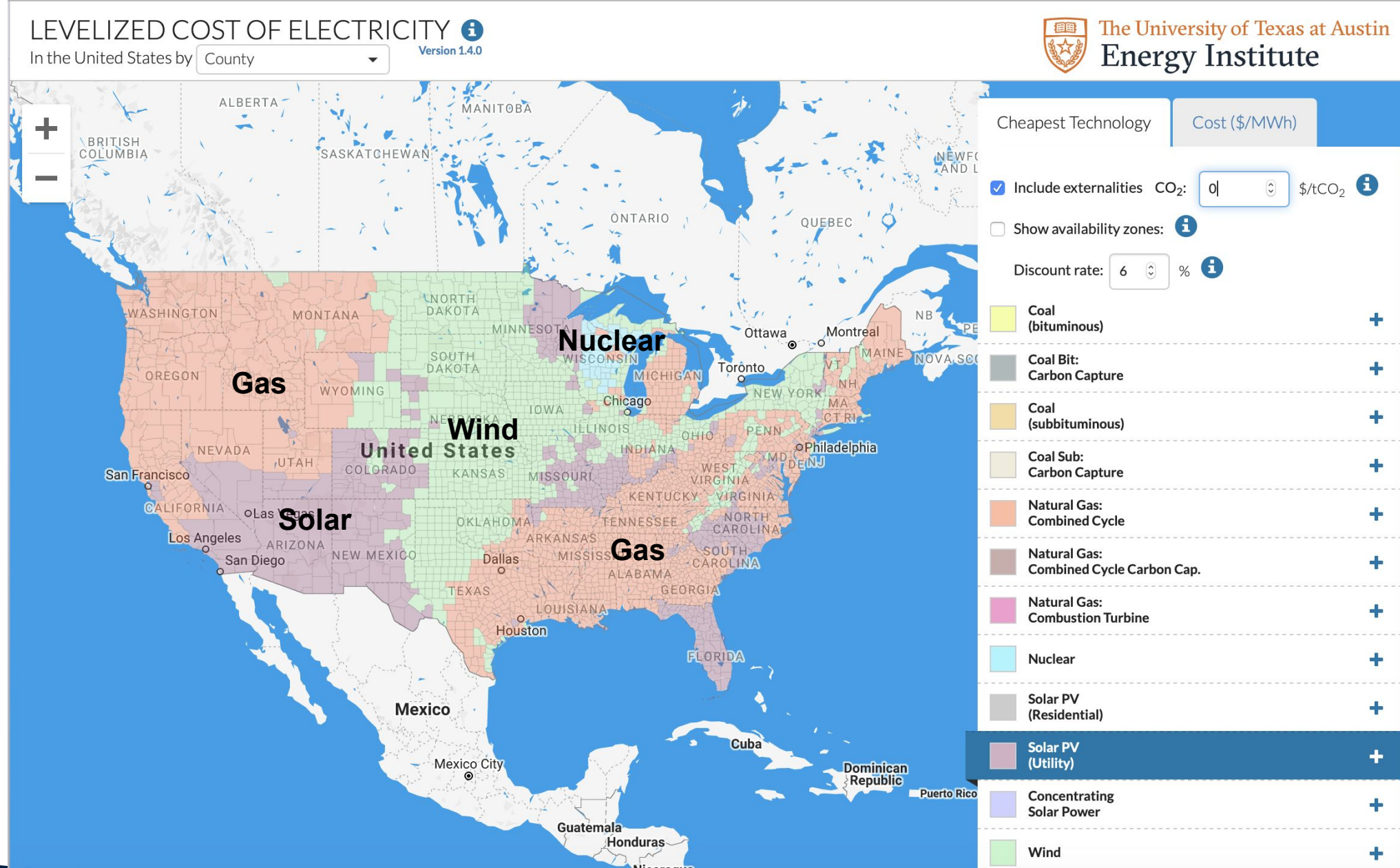
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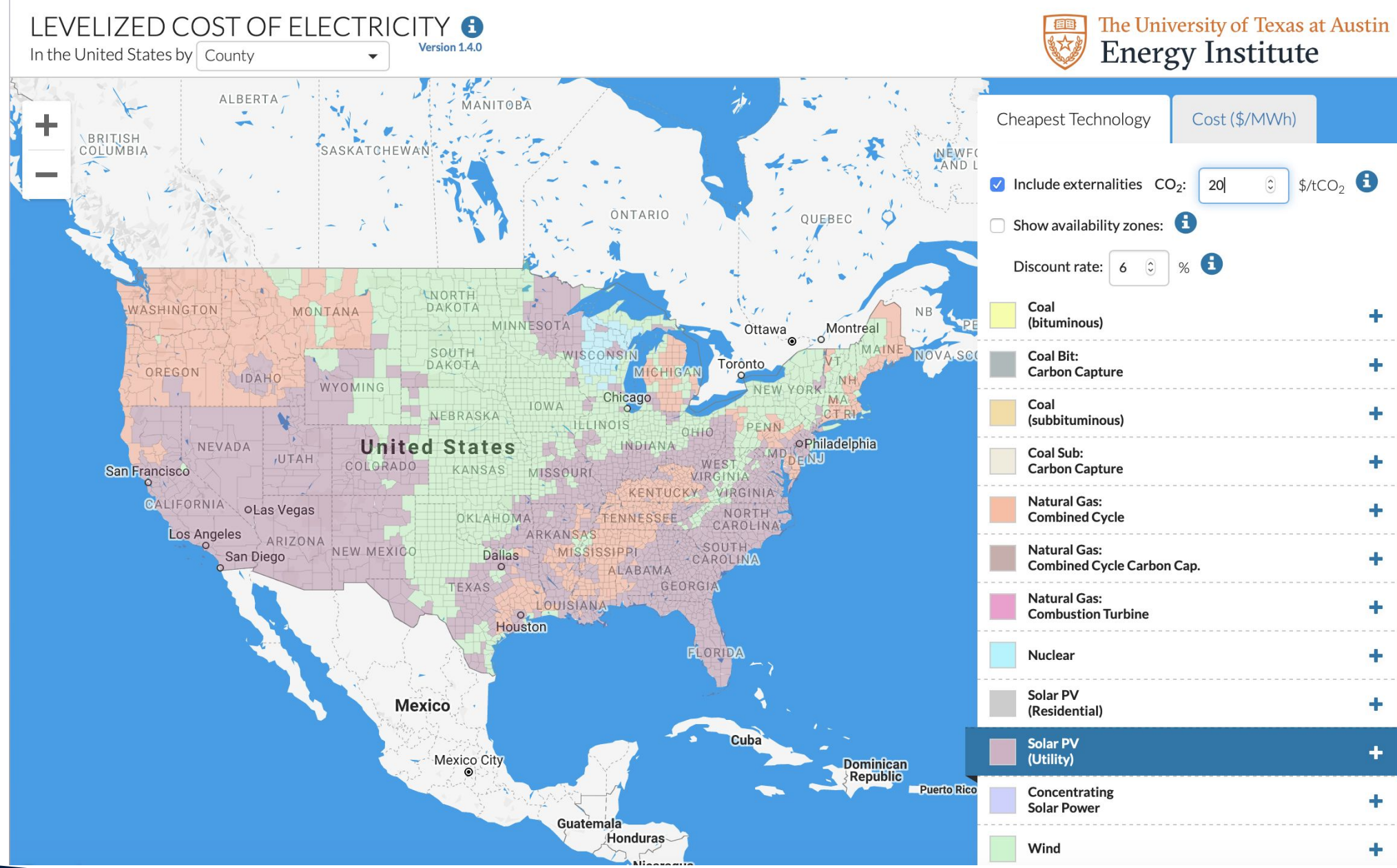
Overnight
Energy costs:

$\$0/\text{tCO}_2$

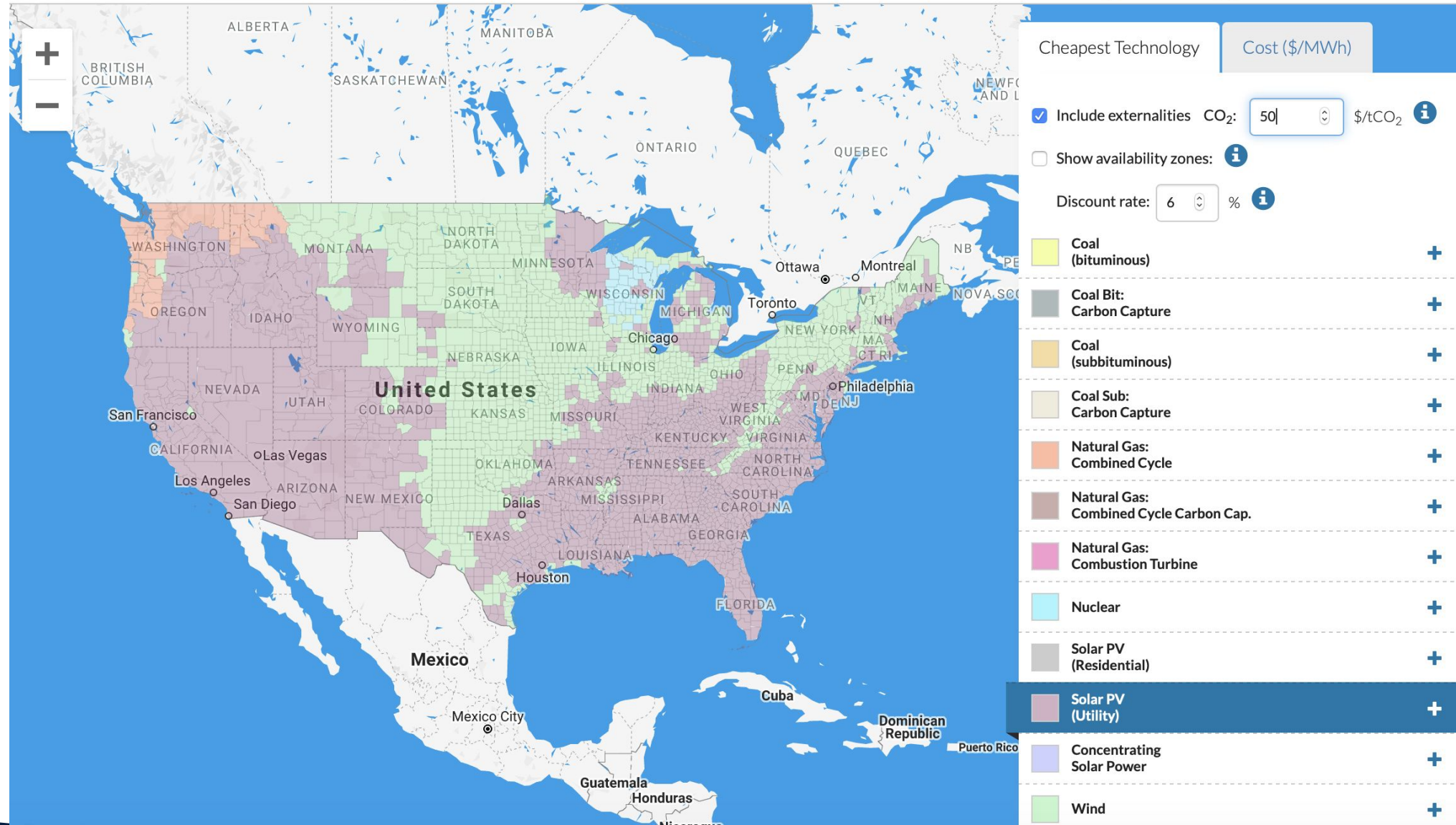


California &
Quebec:

\$20/tCO₂



Social Cost of
Carbon:
\$50/tCO₂



The social cost of carbon now in use in the USA

THE WHITE HOUSE



BRIEFING ROOM

Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis

JANUARY 20, 2021 • PRESIDENTIAL ACTIONS

Sec. 5. Accounting for the Benefits of Reducing Climate Pollution. (a) It is essential that agencies capture the full costs of greenhouse gas emissions as accurately as possible, including by taking global damages into account. Doing so facilitates sound decision-making, recognizes the breadth of climate impacts, and supports the international leadership of the United States on climate issues. The “social cost of carbon” (SCC), “social cost of nitrous oxide” (SCN), and “social cost of methane” (SCM) are estimates of the monetized damages associated with incremental increases in greenhouse gas emissions. They are intended to include changes in net agricultural productivity, human health, property damage from increased flood risk, and the value of ecosystem services. An accurate social cost is essential for agencies to accurately determine the social benefits of reducing greenhouse gas emissions when conducting cost-benefit analyses of regulatory and other actions.



Social justice is core to a healthy climate

- Data analytics are critical to focusing and tracking innovation and outcomes that foster racial and climate justice.
 - *CalEnviroScreen* (California) and the Social Cost of Carbon are both excellent examples
- Examples: Housing policy is climate and justice policy
- Innovation is limited when diverse voices are not included in program design & implementation
- Diversity in STEM education is key, but so too is active investment in minority clean energy and efficiency businesses