

Presenter



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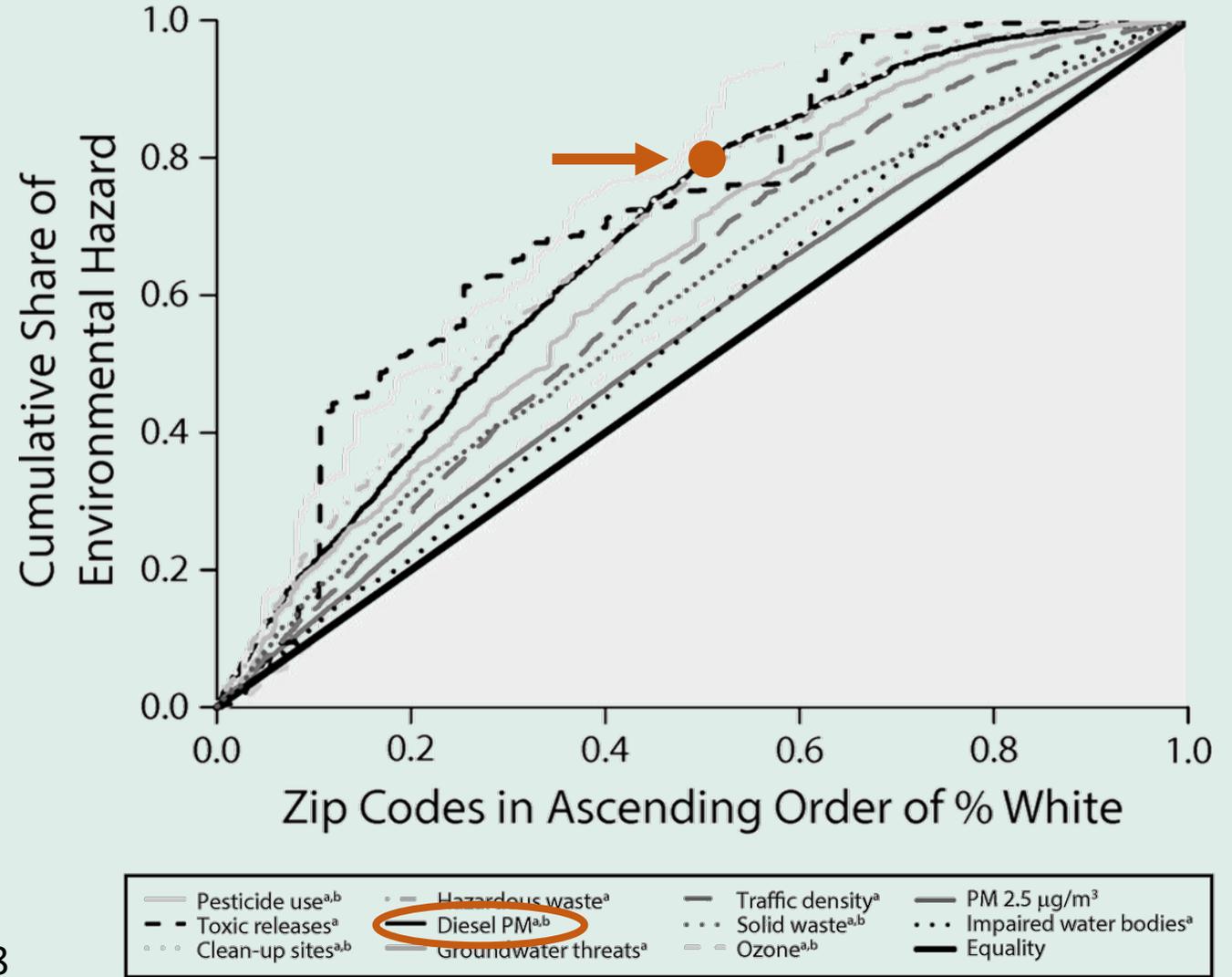
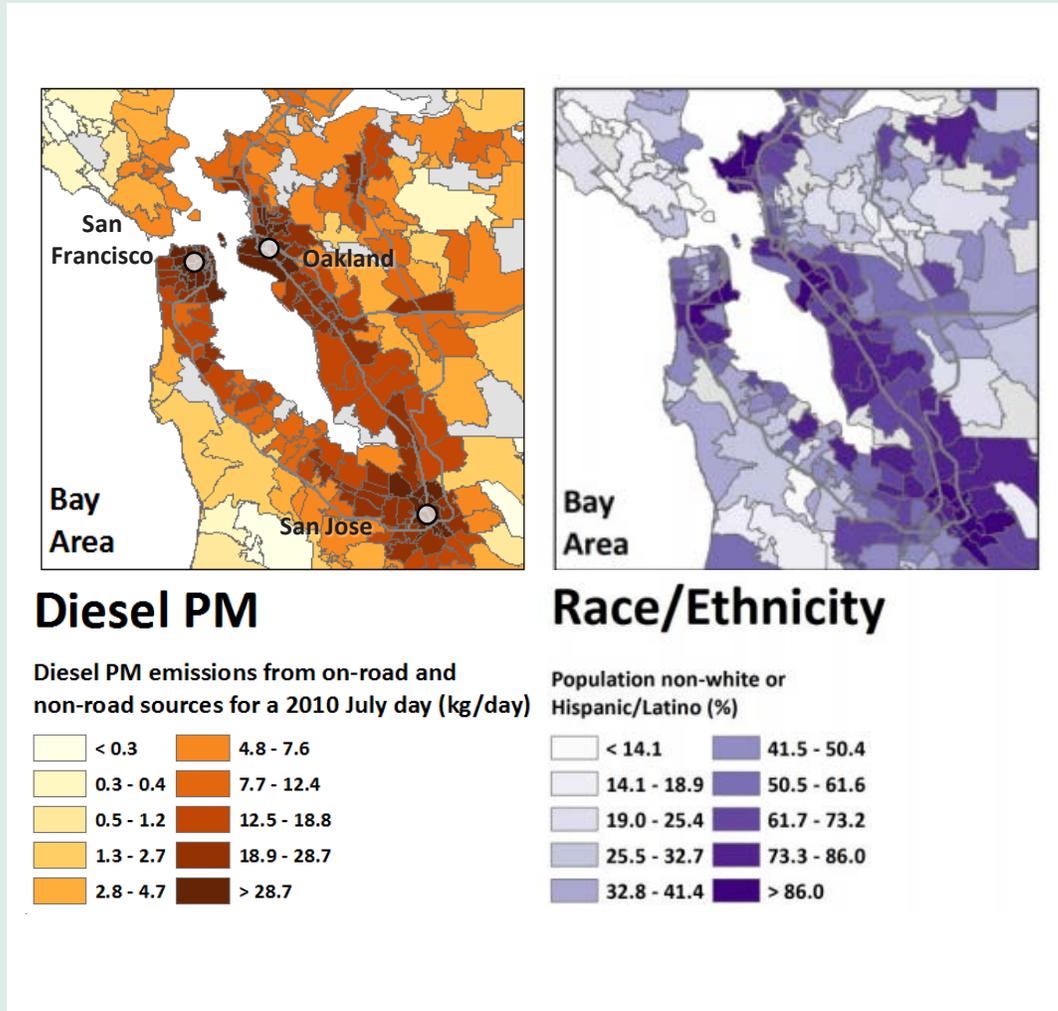
Environmental equity & California's efforts to address climate change

APHA Year of Climate Change and Health webinar series -- May 22, 2017



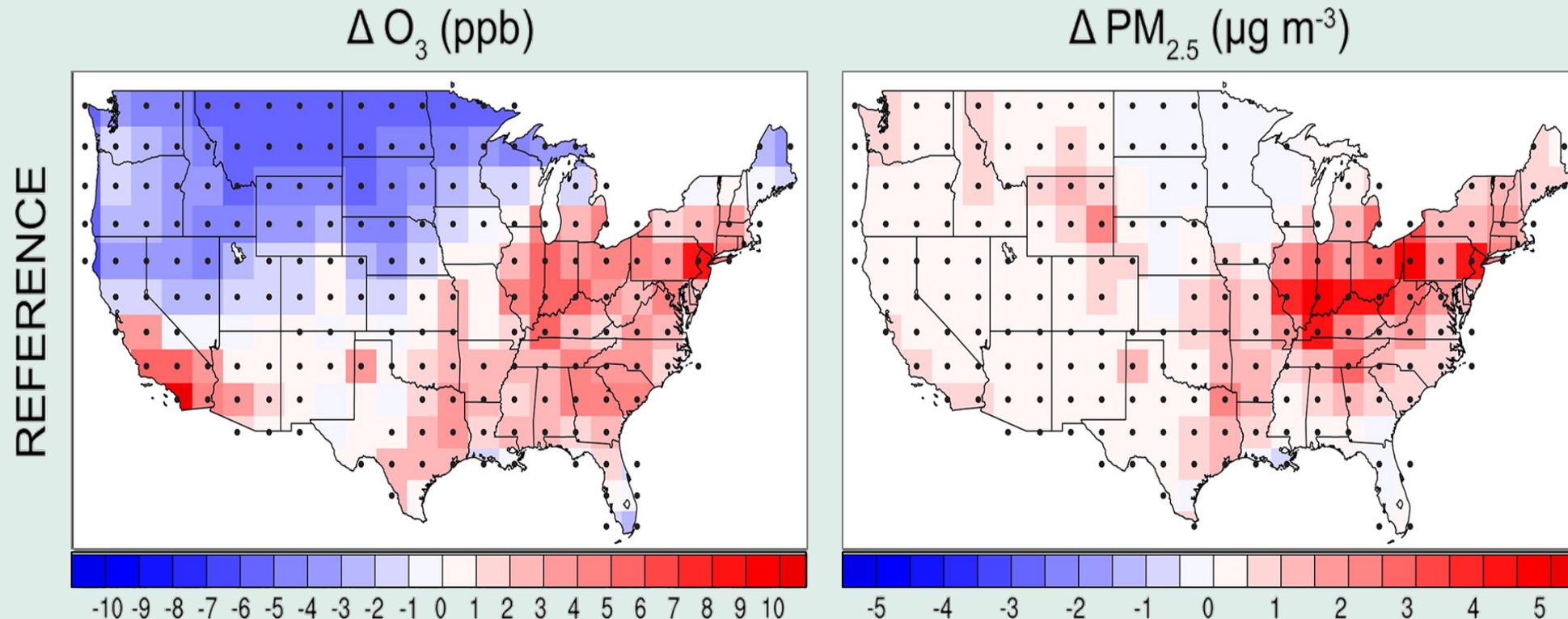
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Air pollution is unequally distributed in California



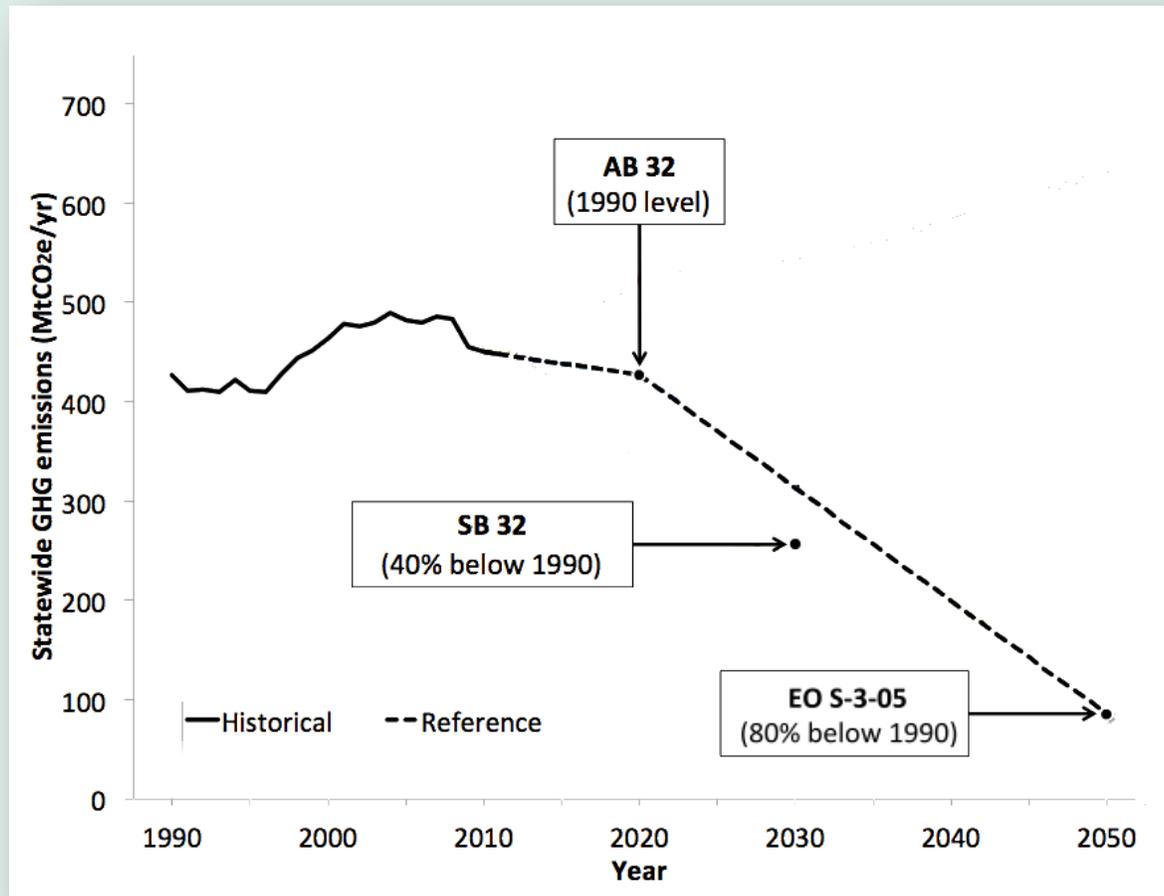
Cushing *et al.* (2015) *AJPH* 105(11): 2341-2348

Climate change is likely to worsen air quality and exacerbate inequalities

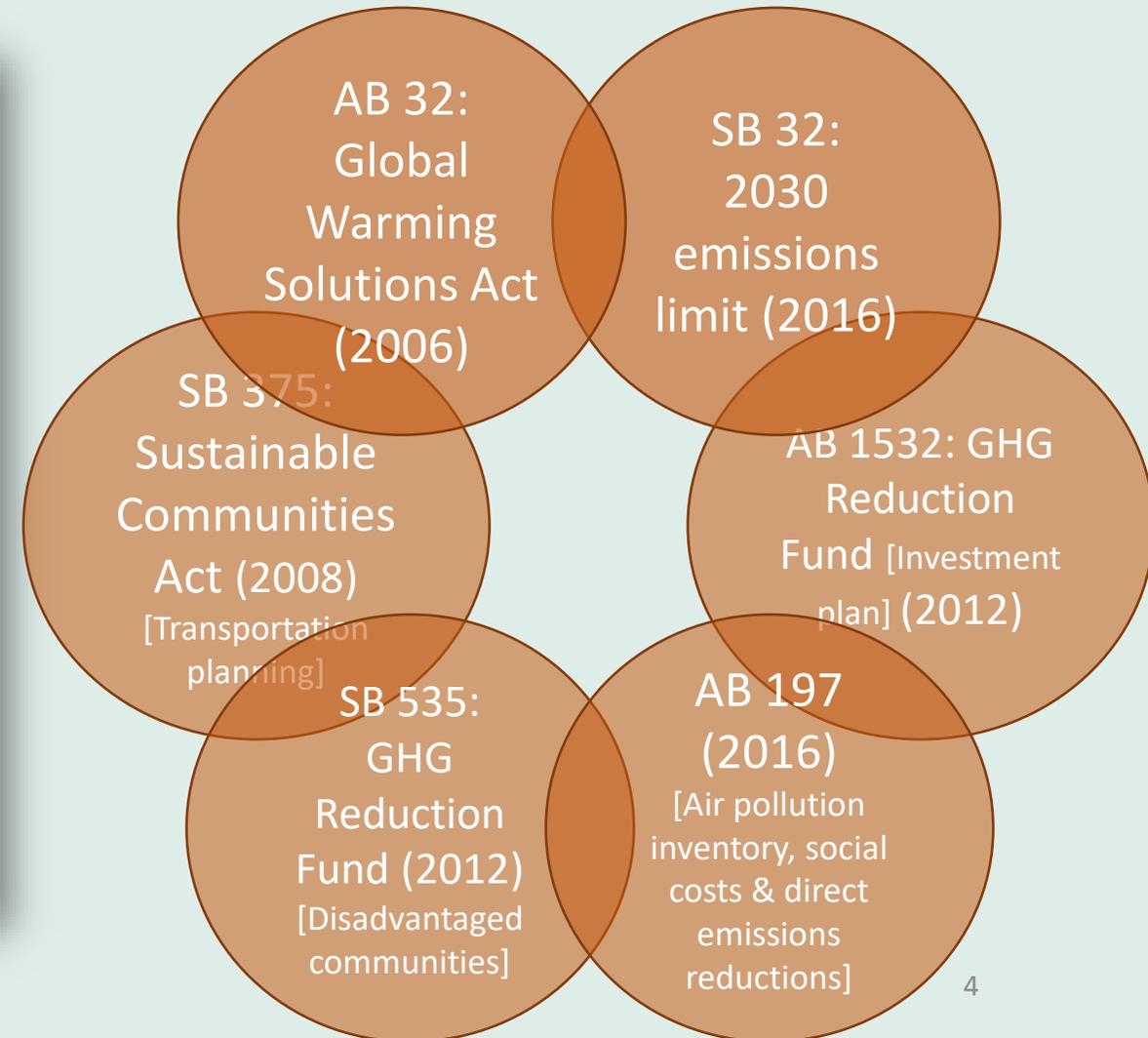


Ensemble-mean climate-induced change in annual-average ground-level 8-h-max O₃ and PM_{2.5} from 2000 to 2100 under a business-as-usual scenario. Changes identified as statistically significant are indicated by black dots.

California's commitment to reduce greenhouse gas emissions can improve air quality

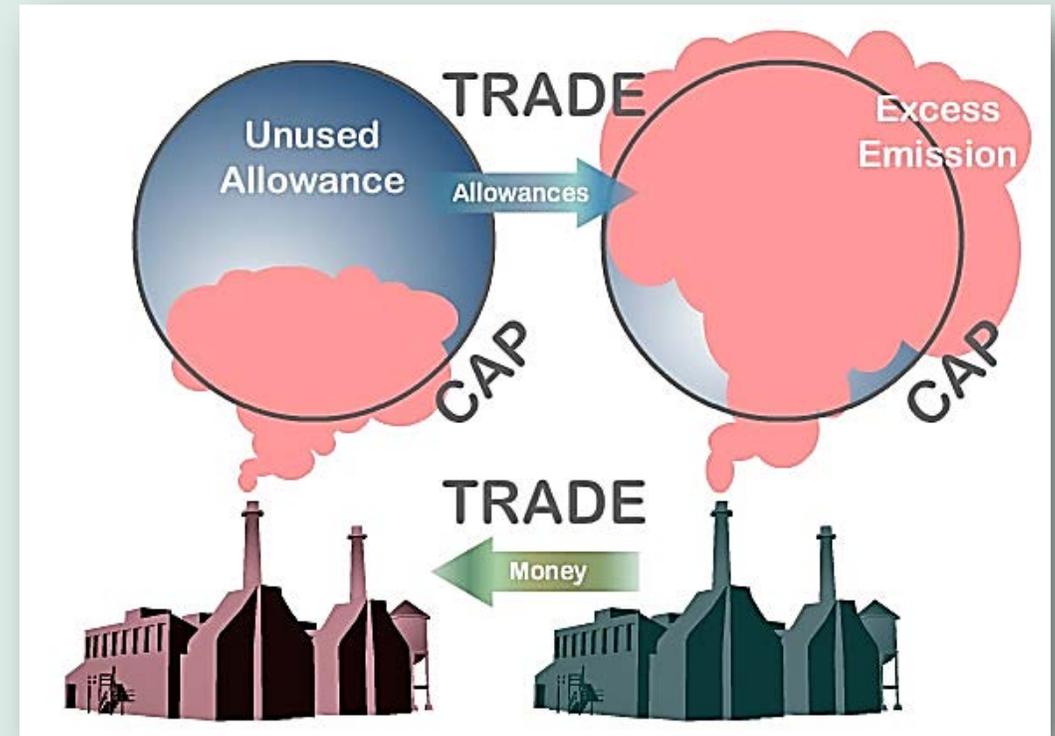


Adapted from Greenblatt *Energy Policy* 78 (2015) 158–172



California's Cap-and-Trade Program

- Goal is to reduce greenhouse gas (GHG) emissions from large stationary sources
- Allowance trading began in 2013
- Revenues are reinvested into mitigation projects
 - At least 25% of funds must benefit disadvantaged communities

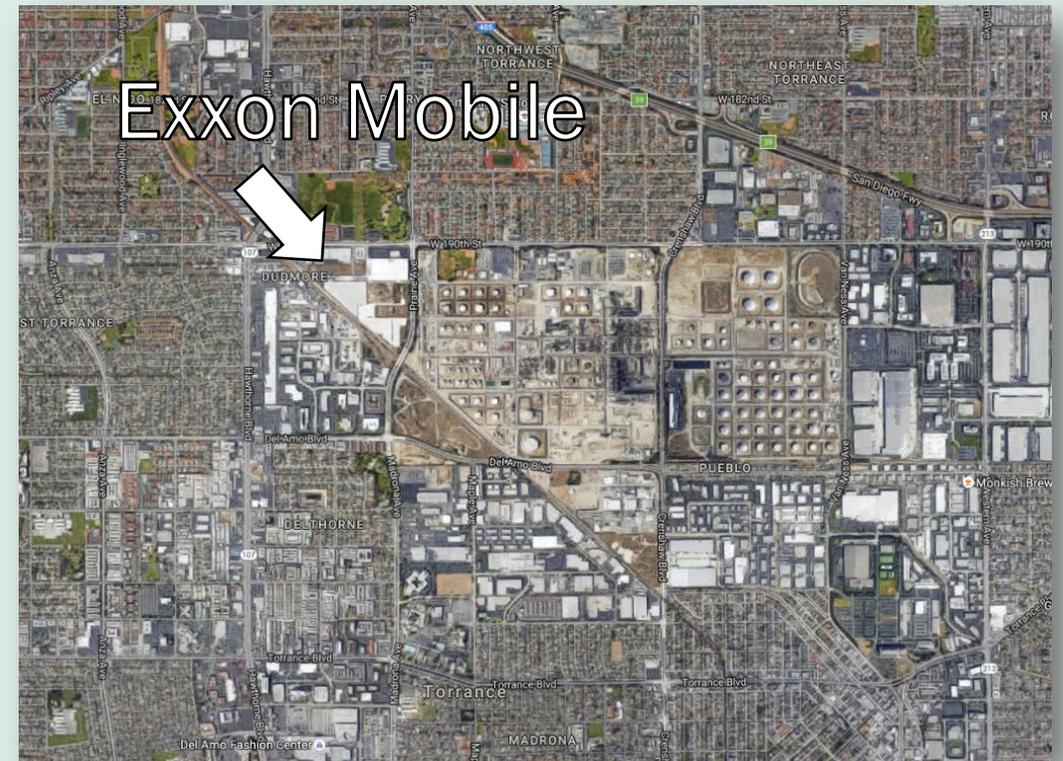


Variable health benefits of emissions reductions

Power plant near Bakersfield, CA



Oil refinery in Torrance, CA



Both facilities emitted between 2.5-2.8 million tons of GHGs in 2014 (MT CO_{2e})

PM₁₀ emissions: 42 MT

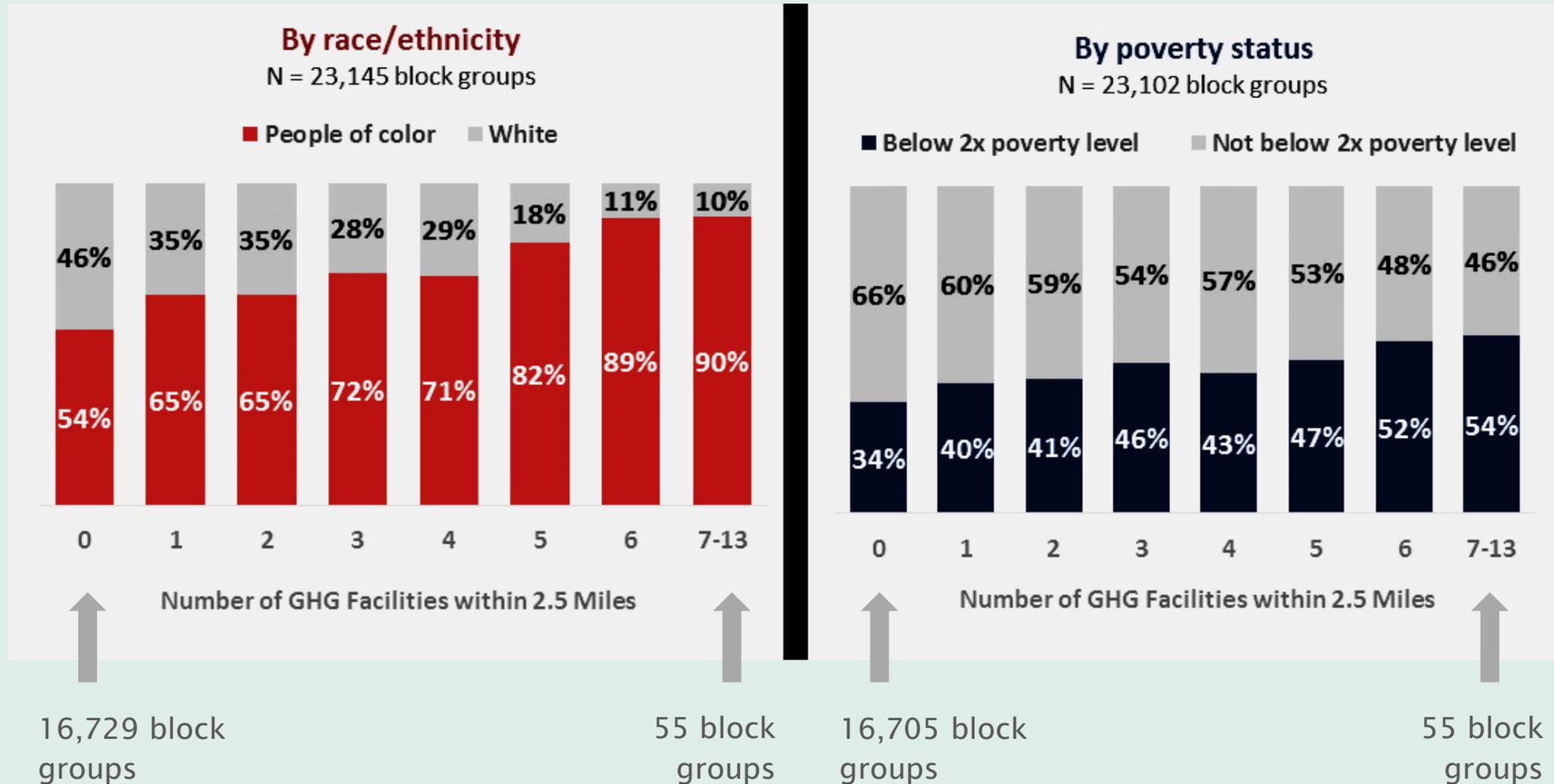
Population within 6-mi radius: ~1,000

PM₁₀ emissions: 416 MT

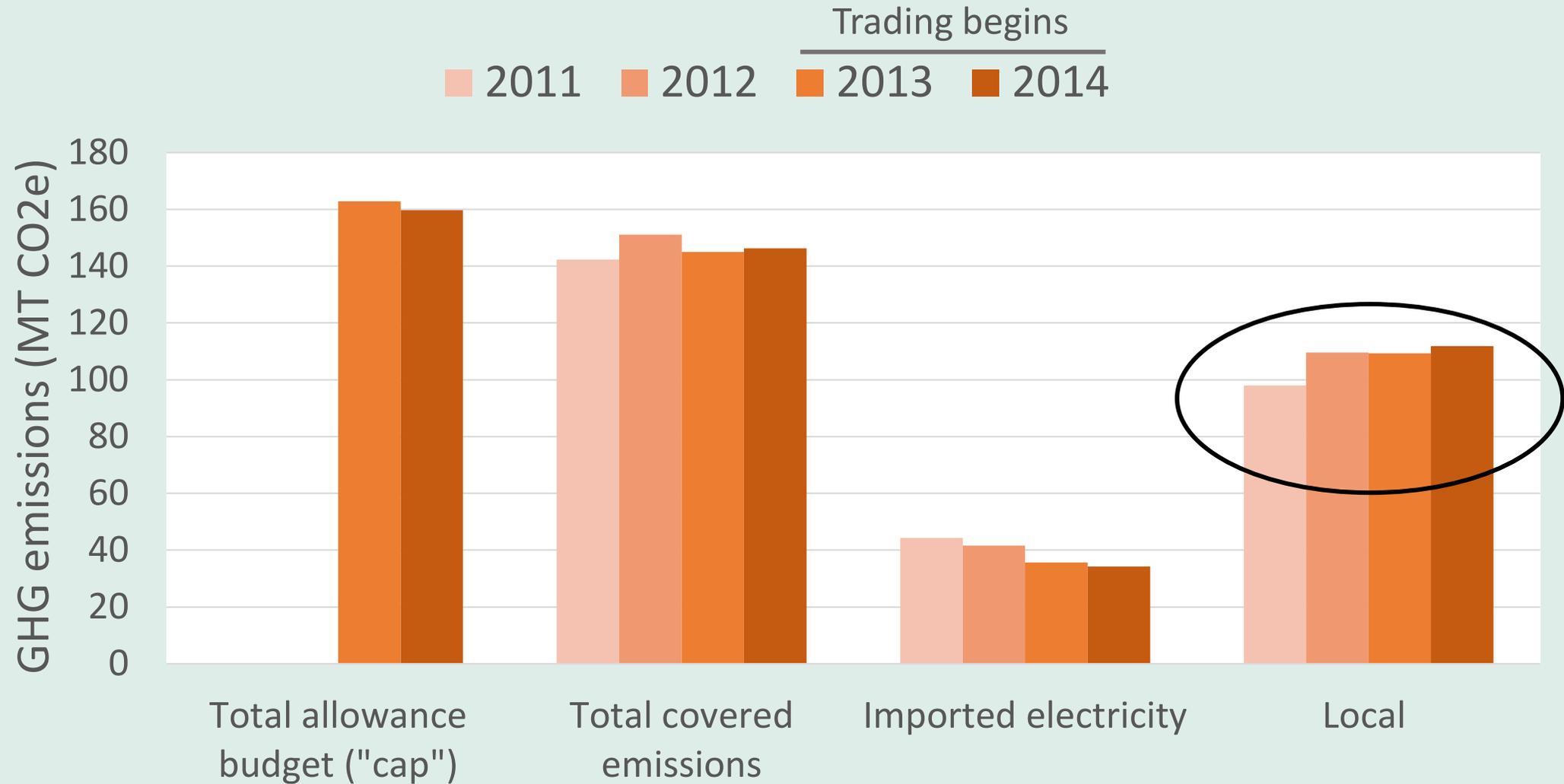
Population within 6-mi radius: ~802,700

People of color & the poor are more likely to live near regulated facilities

Number of GHG-emitting facilities near block groups by race/ethnicity and by poverty status

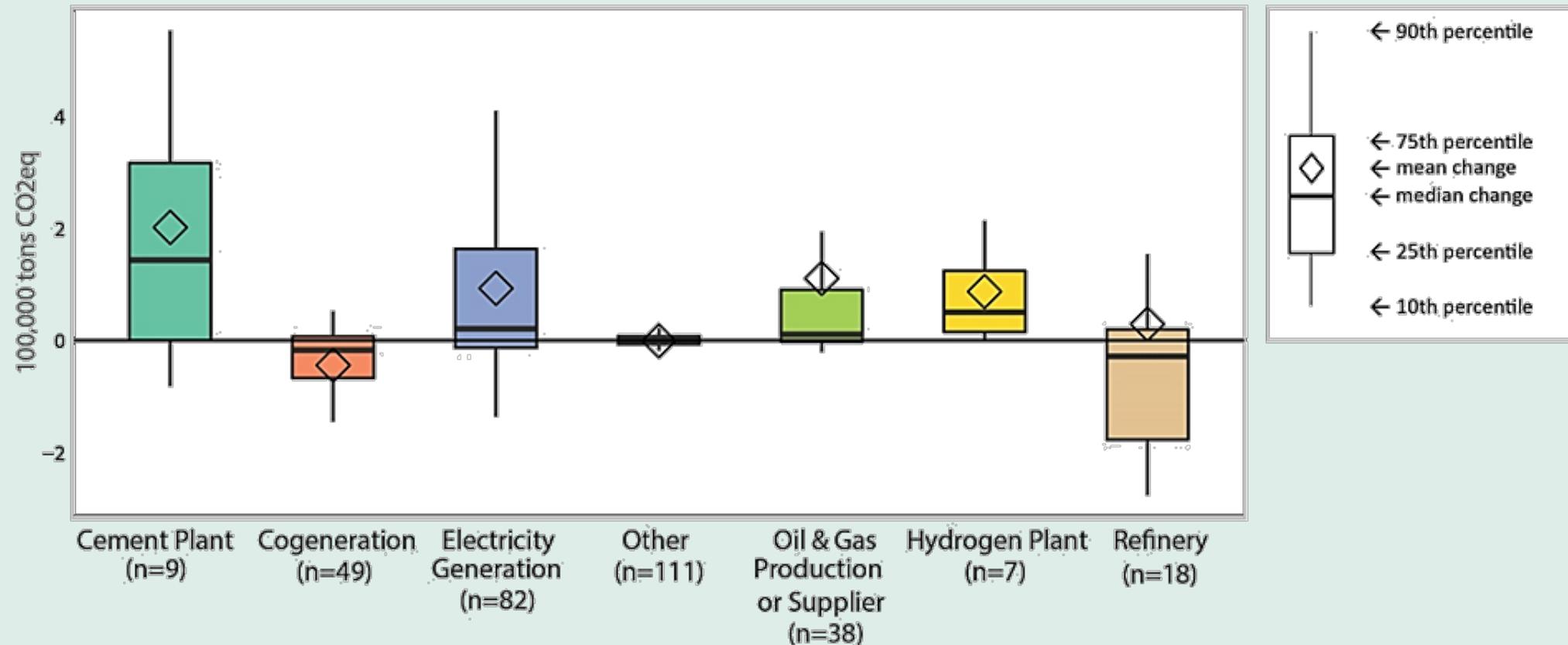


In-state GHG emissions have increased since trading began

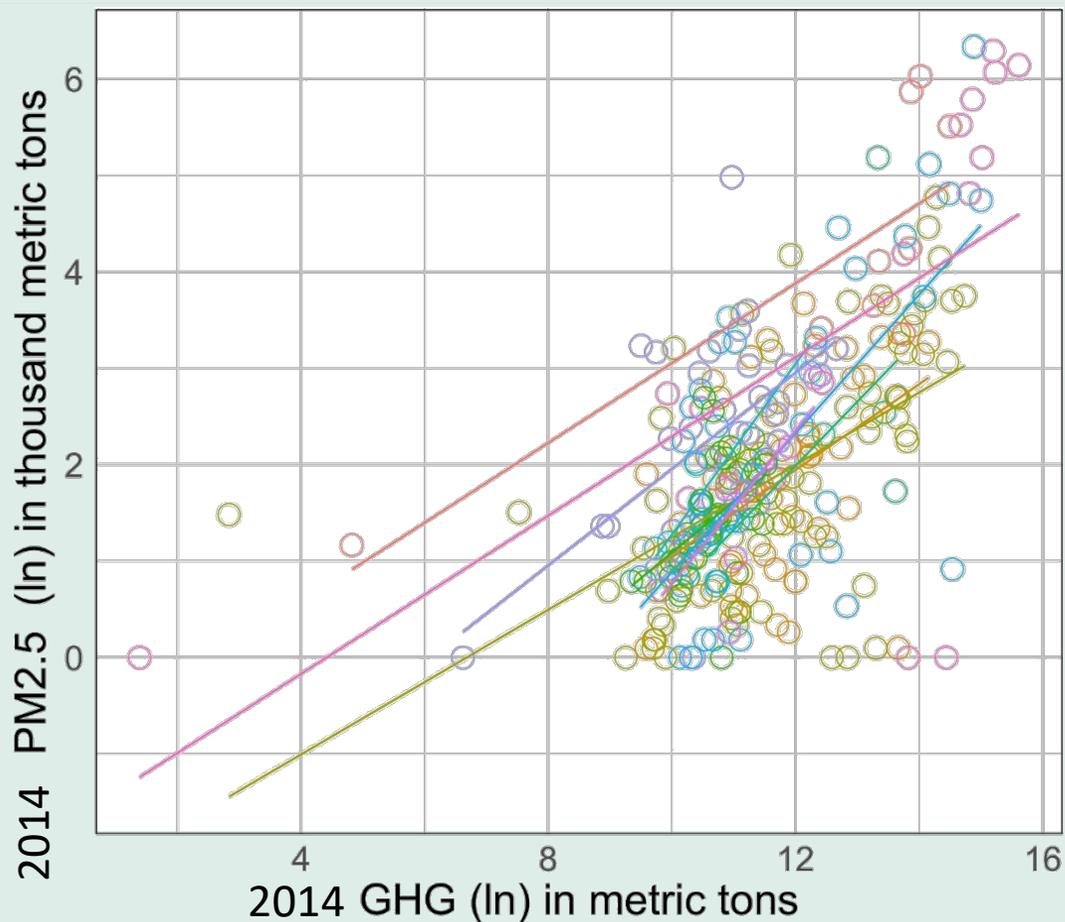


In-state GHG emissions have increased since trading began

Change in emitter covered emissions between 2011-12 & 2013-14



Large GHG emitters emit more particulates

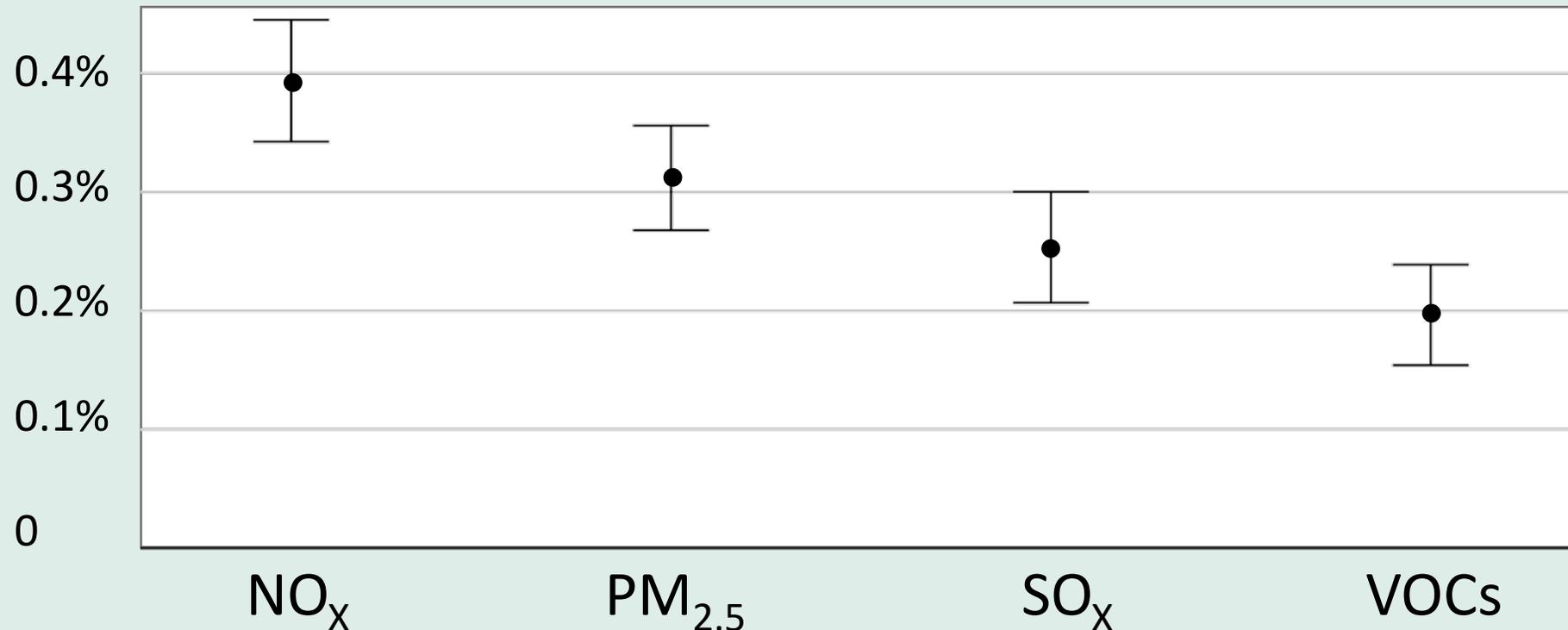


	N	Slope	R ²
 Cement Plant	9	0.4	0.66**
 Cogeneration	51	0.4	0.23***
 Electricity Generation	75	0.4	0.33***
 Food and Beverage Manufacturing	40	0.5	0.22**
 Hydrogen Plant	7	0.7	0.39
 Metal and Machinery Manufacturing	11	0.9	0.42*
 Oil & Gas Production / Supplier	41	0.7	0.48***
 Other Manufacturing	33	0.5	0.31***
 Public Services	12	0.8	0.54**
 Refinery	17	0.4	0.39**

Increases in GHG emissions were accompanied by increases in co-pollutant emissions

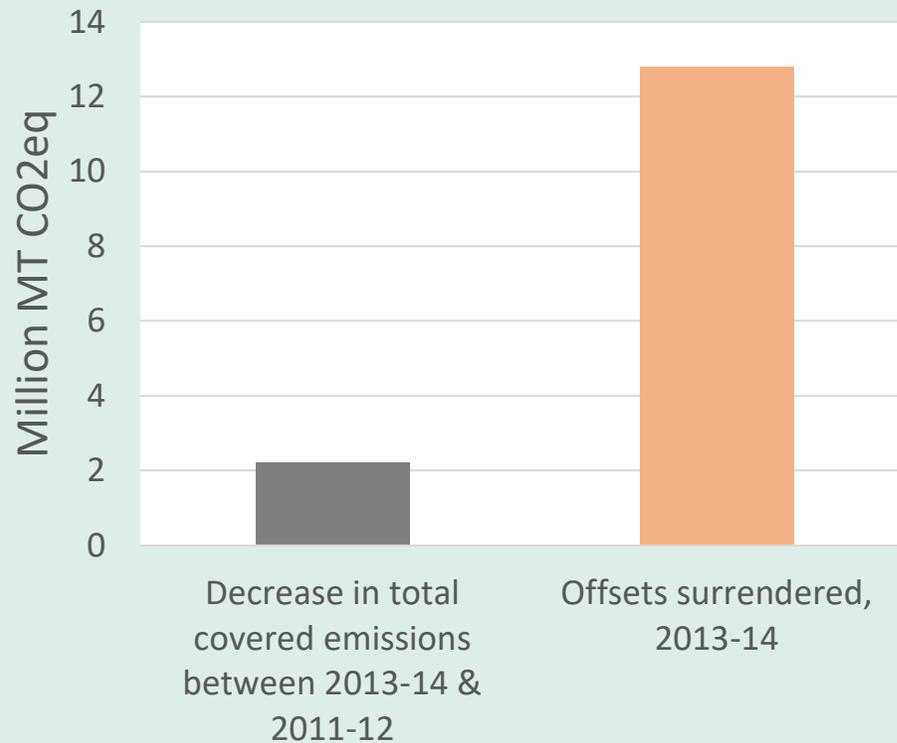
Mean % change [95% CI] associated with a 1% change in annual GHG emissions

Linear regression with a fixed effect for facility (N=256 facilities over 4 yrs.)

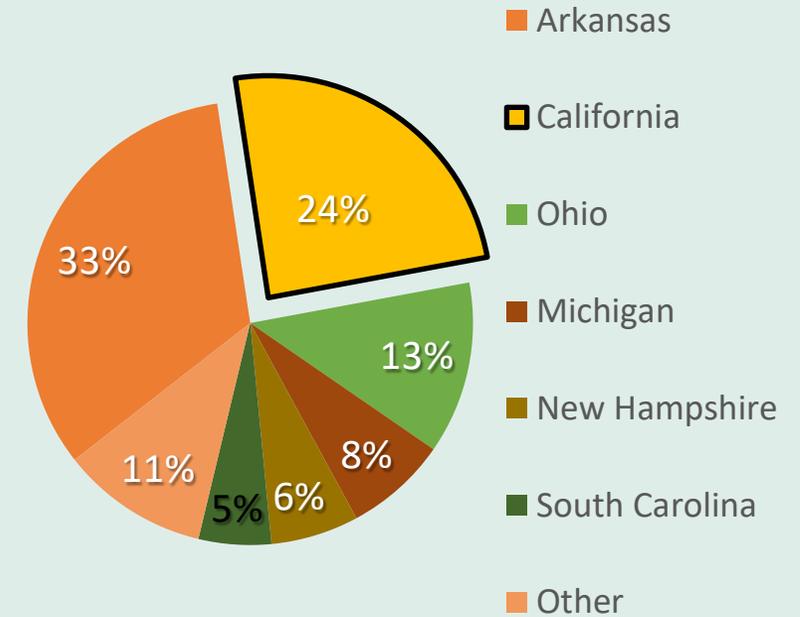


The role of offsets

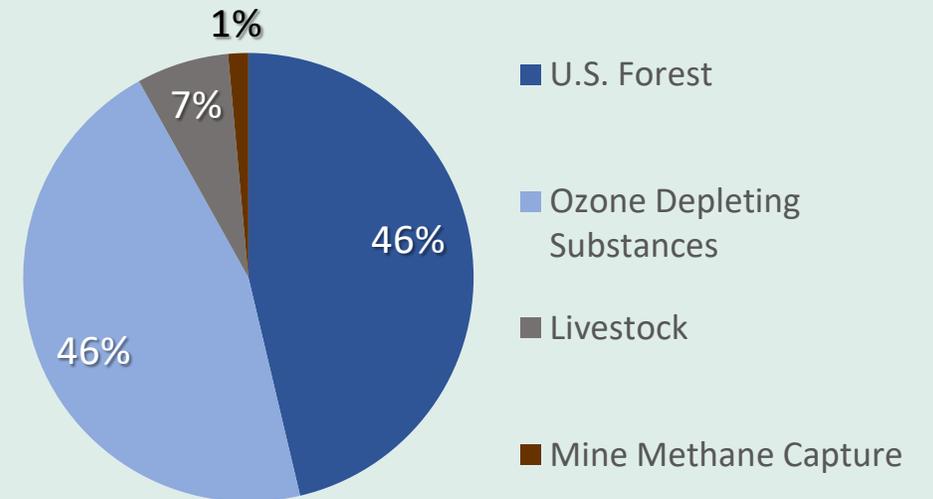
Offset Credits vs. Decrease in Covered Emissions



Origin of Offset Credits



Offset Credits by Project Type



Summary of findings

- 1) GHG-emitting facilities are located in neighborhoods with higher proportions of residents of color and residents living in poverty.



- 2) On average, in-state GHG emissions have increased for several industry sectors since the advent of California's cap-and-trade program, with many high-emitting companies using offsets to meet their compliance obligations.
- 3) At the facility level, increases in GHG emissions have been accompanied by increases in hazardous co-pollutants emissions.

Recommendations

- 1) The public health and equity co-benefits of climate mitigations efforts could be enhanced through more localized emissions reductions in disproportionately impacted communities.



- 2) Harmonized emissions reporting requirements would enable us to better track progress toward climate & environmental equity goals.





A PRELIMINARY ENVIRONMENTAL EQUITY ASSESSMENT OF CALIFORNIA'S CAP-AND-TRADE PROGRAM

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