



How Would Facility Specific Caps Affect the Emissions Market in California?

Dallas Burtraw and Nicholas Roy

NOVEMBER 9, 2023



Science and policy are catching up with communities in recognizing the cumulative impacts of air pollution.


- A *Proceedings of the National Academy of Sciences* study (10/22) finds main regulatory strategies are ineffective in addressing racial-ethnic inequalities. These can be remedied using a “location-specific approach.”
- US EPA proposed (10/23) an update to its *Guideline on Air Quality Models* that newly emphasizes cumulative impacts of multiple pollution sources. EPA has proposed a “community risk” approach.
- US Office of Management and Budget proposed revisions to address distributional outcomes in regulatory analysis including the potential use of weights to measure benefits and costs accruing to different groups based on income (4/23).
- In CA under AB 617, *Blueprint 2.0* introduces community air grants and community-focused enforcement to empower residents in disadvantaged communities.



Our Motivation

- A carbon market or carbon tax intends to achieve emissions reductions where abatement costs are lowest.
- EJAC and several authors have asked whether greenhouse gas (GHG) emissions decline proportionately in disadvantaged communities and whether anticipated changes in air pollution have resulted.
- Could the carbon market accommodate restrictions that ensure an equitable distribution of environmental benefits?





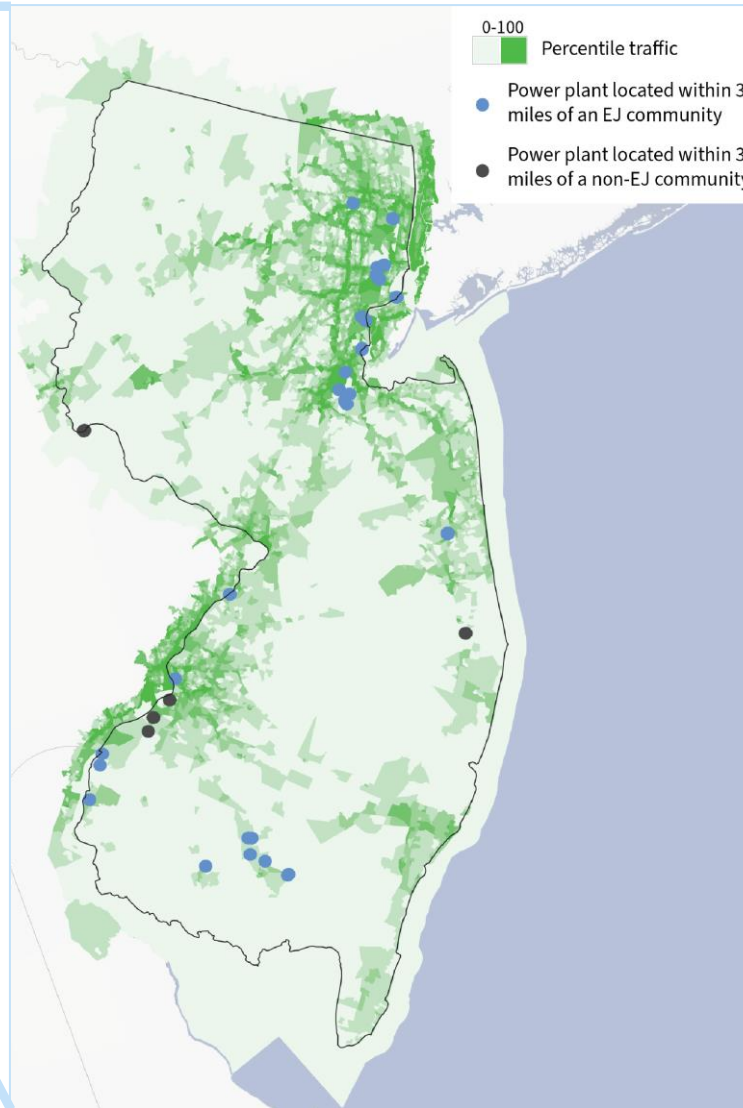
Mandatory Emissions Reductions
for Climate Mitigation in the Power Sector

New Jersey, Delaware, and Minnesota case studies

Bioky Ghanta, Adrienne Perovich, Anna Yulman, Jennifer Ventrella, Yujun Lee, and Ana Isabel Baptista

THE NEW SCHOOL Tishman Environment and Design Center

Oct. 2023

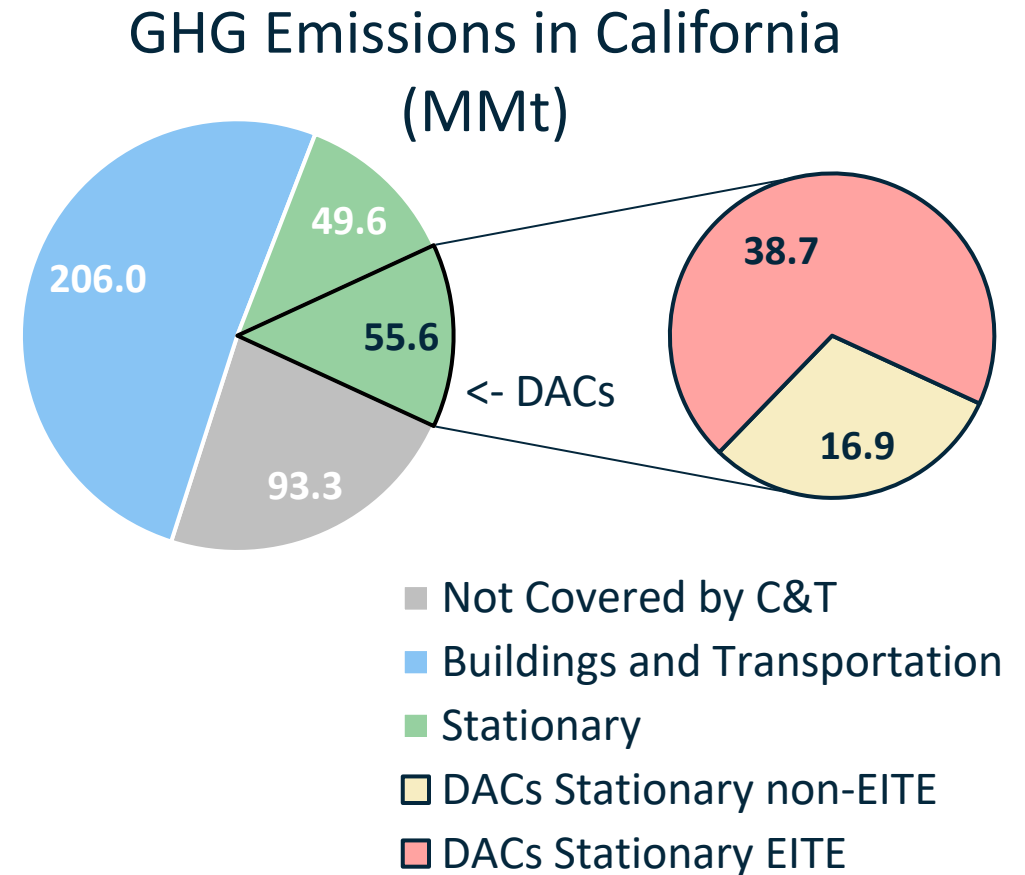


New Jersey power plant locations and traffic density around disadvantaged communities (DACs)



What portion of statewide emissions occur in DACs?

- 1/4 of GHG emissions and 1/3 of emissions covered by the carbon market occur at stationary sources.
- A little more than half of covered stationary source emissions are in disadvantaged communities (DACs).
- 2/3 of stationary source emissions in DACs are from energy intensive trade exposed (EITE) industrial facilities that receive free allocation.

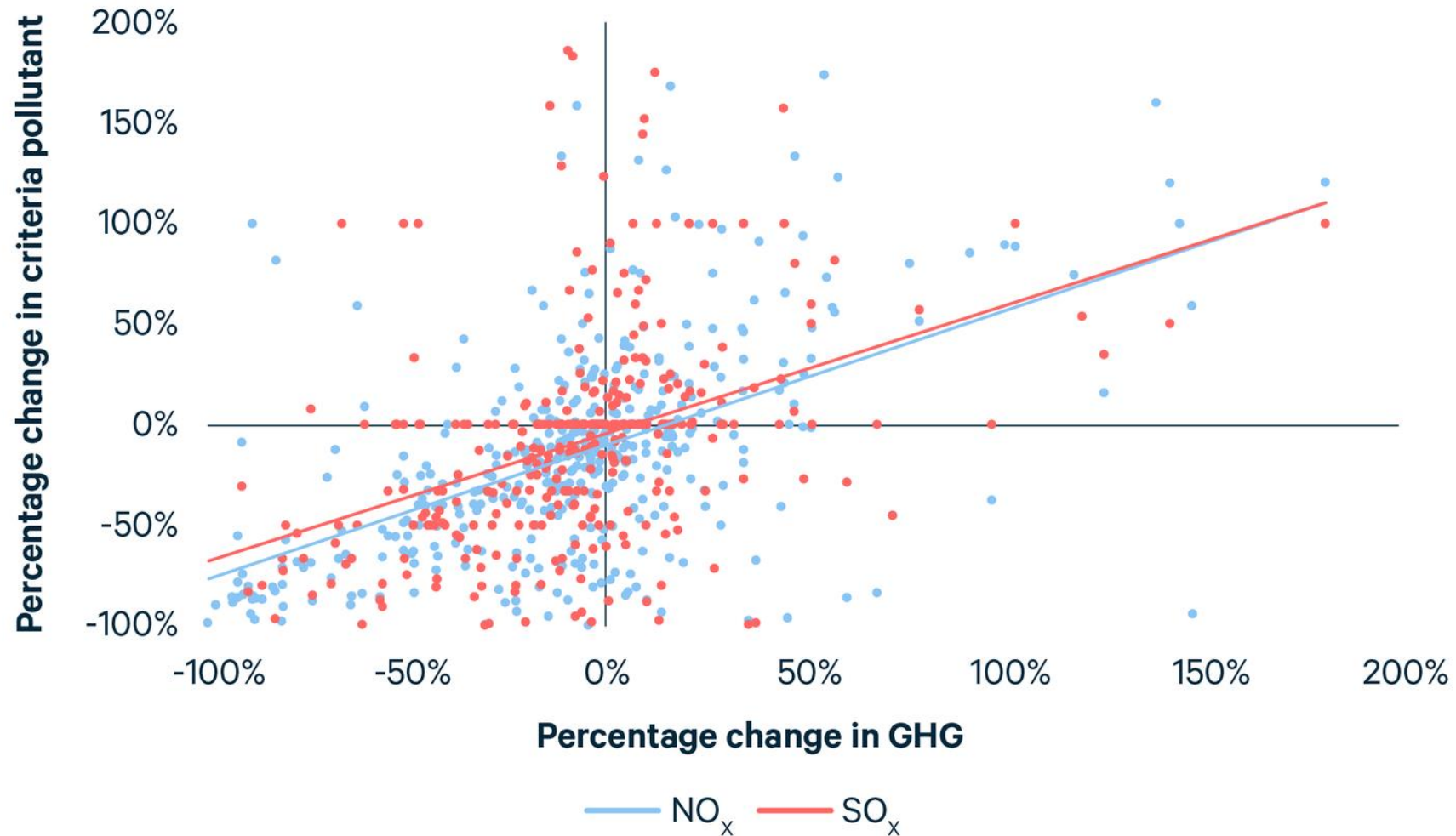


Our Findings

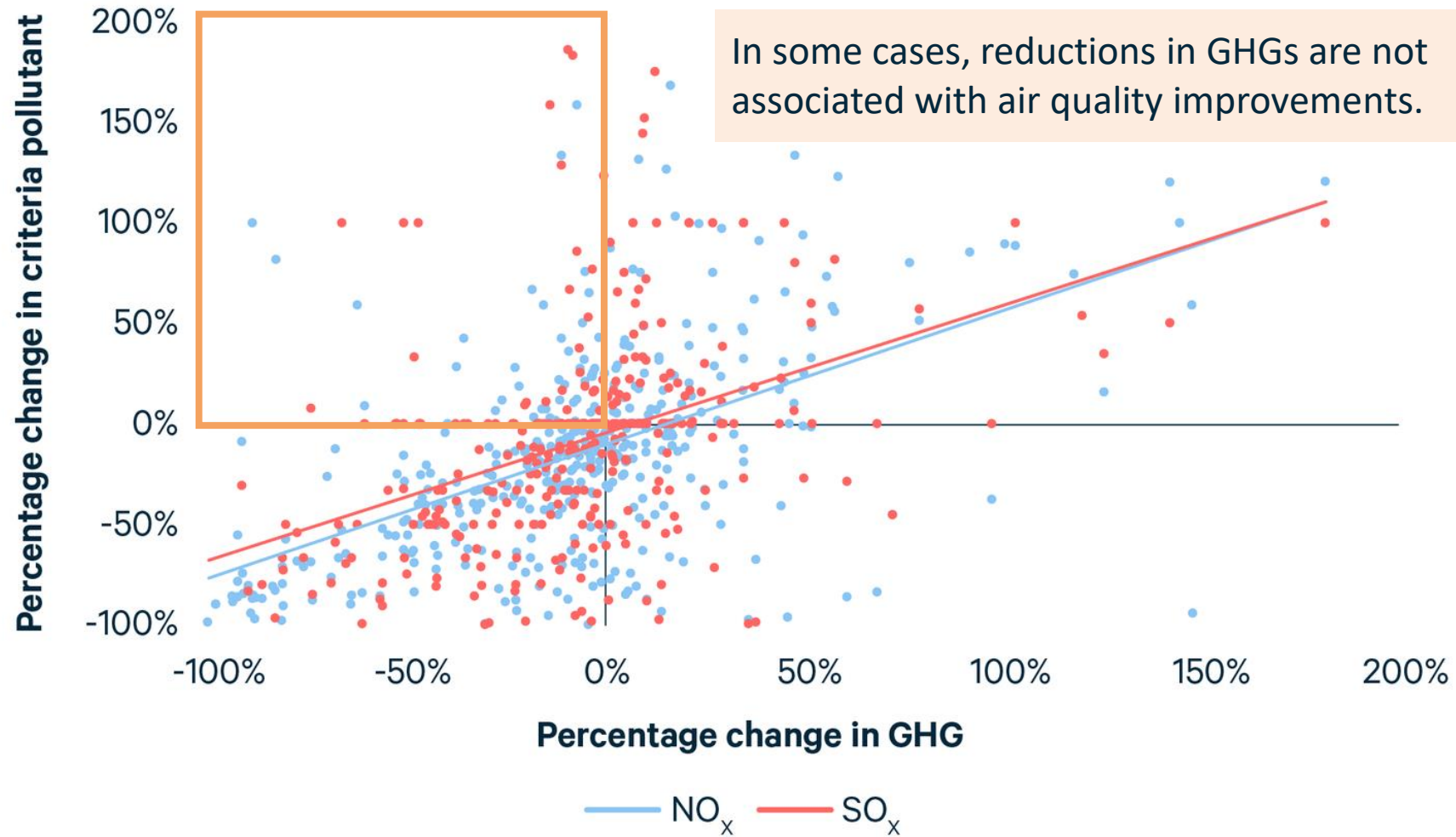
- California greenhouse gas (GHG) cap-and-trade yields different rates of emissions reductions in different communities.
 - GHG emissions are in many cases associated with criteria air pollutants.
 - Criteria pollutant reductions are uneven.
- Average emissions from stationary sources in disadvantaged communities have fallen as quickly as the state average.
 - However, there are notable outliers often in densely populated areas.



GHGs correlate with other pollutants, but the relationship is imperfect.



GHGs correlate with other pollutants, but the relationship is imperfect.



Variation among stationary sources

- Refineries and oil & gas operations show the fewest reductions in GHGs (tons and %) in DACs and statewide.
- On average these sources also show among the greatest reductions in NO_x and SO_x , with reductions exceeding the statewide average at all stationary sources.
 - These reductions are concentrated at fewer than half the sources.
 - NO_x and SO_x emissions are regulated through stationary source permits which is the responsibility of California's 35 local air districts.

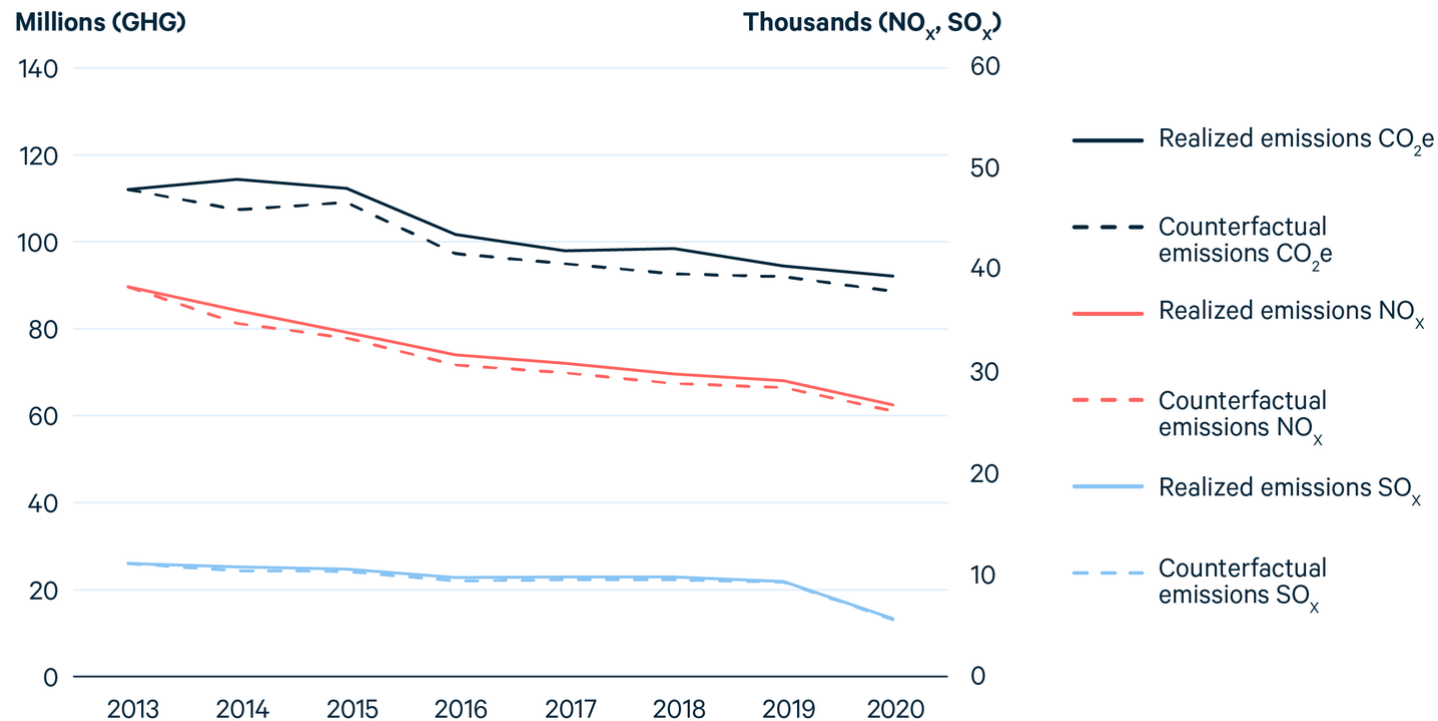


Could restrictions in the carbon market ensure equitable outcomes?

- One approach might prevent facilities operating in disadvantaged communities from banking or trading emissions allowances, effectively removing these facilities from the market, i.e., no trade zones.
- We model a similar facility-specific emissions cap.
- Outcomes will be similar as we model them, but differences may arise between these two when considering implementation.



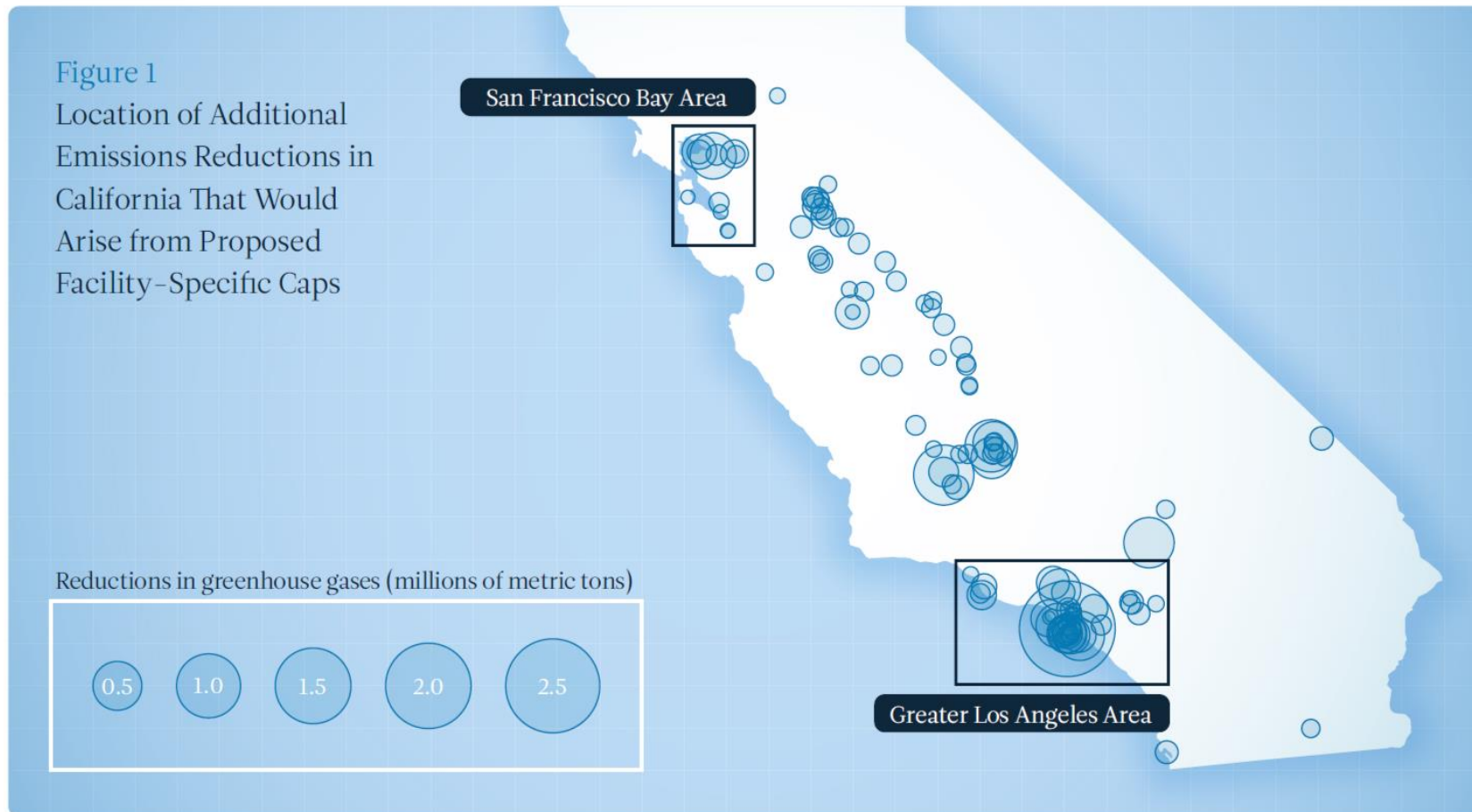
If facility-specific caps had existed, GHG and criteria pollutants in disadvantaged communities would have been lower.



- Require rate of GHG reductions at facilities in DACs greater than or equal to statewide average.
- Assume historical relationship between criteria pollutants and GHGs.



The additional GHG emissions reductions would have occurred in some of California's most densely populated communities.



How do we prevent emissions increasing elsewhere?

- To prevent facility-specific caps from increasing emissions elsewhere (the waterbed effect) EJAC proposed an adjustment to allowance supply.
 - EJAC *also proposed* an Emissions Containment Reserve (ECR) which could also mitigate this effect.
- We estimate less than 2 MMT reduction in GHG allowance supply is needed to prevent this.
 - CARB is currently considering *adjusting supply by over 100 MMT from 2025-2030.*



“Waterbed Effect”



How does the supply adjustment impact costs of the program?

- Carbon price impacts:
 - Low price (price floor) scenario: no change in price, 0.6% decrease in government revenues.
 - High price scenario: 3.3% increase in price, 2.5% increase in revenues.
- Overall minimal impact on carbon price -> minimal impact on business.
- Could lead to increased prices from products at hard to abate facilities.
 - Ex.) Refineries



Summary of Facility Specific Caps

- Effects on the carbon market would be small.
 - Small decrease in allowance supply; minimal effect on the price.
- Air quality benefits would accrue among the most densely populated areas in the state.
 - Analysis may differ if including facilities near to or upwind of DACs.
- If GHG reductions can only result from reductions in industry output, there could be economic dislocations which we haven't examined.
- The primary mechanisms for air quality improvements stem from regulatory authorities other than GHG cap and trade....
- ...*Nonetheless*, assurances that overburdened communities will see benefits at least as great as the state average could build support for California's policies.





Thank you.

- Find out more about RFF online: www.rff.org
- Follow us on Twitter: [@rff](https://twitter.com/rff)
- Subscribe to receive updates: rff.org/subscribe