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Original research article

Filling the climate governance gap: Do corporate decarbonization initiatives matter as much as state and local government policy?

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ABSTRACT

Companies and subnational governments are actively attempting to fill the greenhouse gas (GHG) mitigation gap left by weak national policy, but how effective are their efforts in reducing GHG emissions? This is the first study to disaggregate corporate GHG reporting from CDP (formerly Carbon Disclosure Project), down to the facility level to analyze the respective roles of corporate initiatives and subnational public policies in driving corporate decarbonization in the United States from 2010 to 2019. We find that although corporate decarbonization initiatives are associated with GHG reductions, the primary drivers of corporate facility decarbonization are state-level climate policies, in particular financial incentives for energy efficiency. Given that the same types of incentives are significantly expanded under the 2022 Inflation Reduction Act (IRA), our finding suggests that state and local government mobilization of new incentives will play a crucial role in achieving private sector decarbonization goals. Last, total emissions by CDP-disclosing corporations increased substantially over our sample period, meaning that expansion of subnational climate action and corporate initiatives may be vital to reduce overall U.S. corporate emissions.

Overview of Project

- Uses data disclosed to the CDP
- Tracks 1,316 facilities over period 2010-2019
- Contains both Scope 1 and Scope 2 data
- We aim to assess the effects of
  - Corporate initiatives
  - City climate action plans
  - State climate policies
- Use facility fixed effects regression techniques throughout, in order to account for any unobserved time-invariant features of individual facilities.

Supplementary Figure 1. Corporate facilities per city, 2010-2019

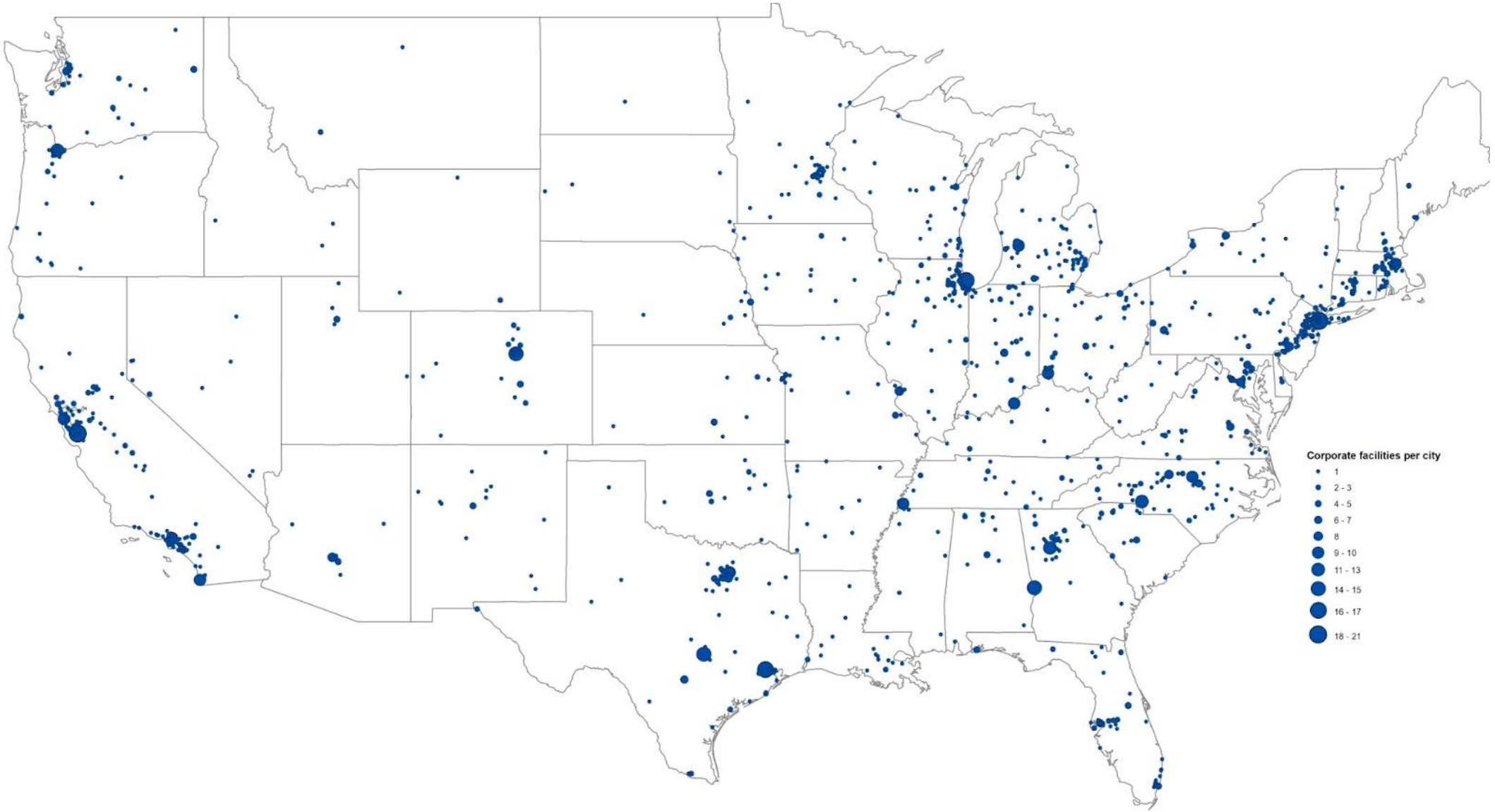


Table 1
Descriptive statistics of variables.

Variable	Mean (st. dev.)	Range	Source
Dependent variable			
Facility scope 1 + 2 GHGs (tons), natural log	7.4 (2.8)	0.26–16.3	CDP, 2010–2019
Independent variables			
Firm-level			
Facilities	18.5 (21)	1–75	CDP, 2010–2019
All corporate decarbonization initiatives	17 (20.5)	0–127	CDP, 2010–2019
Building energy efficiency	8.8 (12.2)	0–90	
Production process energy efficiency	7 (10.1)	0–83	
Transportation fleet	1.5 (1.6)	0–20	
Low carbon energy purchases	2.2 (2.1)	0–15	
Low carbon energy installations	2.1 (2.6)	0–25	
Green project finance	1.1 (0.12)	0–3	
Fugitive emissions reduction	1.1 (0.62)	0–6	
Local-level			
City climate action plan	0.30 (0.45)	0–1	Leffel (2022)
State climate policies	22.1 (8.3)	0–43	DSIRE
Financial incentives	16.8 (7.4)	3–36	
Regulatory policies	5.3 (2.6)	0–11	
Per capita income			U.S. Census
ENGOs	3.6 (7.6)	0–56	ReferenceUSA
Democratic voters	0.54 (0.14)	0.12–0.90	MIT Election Data
Corporate tax rate	6.2 (3.0)	0–12	Tax Policy Center

The most common corporate initiatives are

- Building energy efficiency
- Production process energy efficiency

30% of cities have climate action plans

Descriptive statistics of variables

Variable	Mean (St. Dev.)	Range	Source
Sales ($USD)	134,395 (668,878)	0 - 15,000,000	ReferenceUSA, 2010-2017
Scope 1 + 2 GHGs (tons)	67,003 (523,243)	0 - 12,290,973	CDP, 2010-2019
Firm-level			
Building energy efficiency initiatives	8.8 (12.2)	0 - 90	CDP, 2010-2019
Production energy efficiency	7 (10.1)	0 – 83	
Transportation fleet	1.5 (1.6)	0 – 20	
Low carbon energy purchases	2.2 (2.1)	0 – 15	
Low carbon energy installations	2.1 (2.6)	0 – 25	
Green project finance	1.1 (.12)	0 – 3	
Fugitive emissions reduction	1.1 (.62)	0 – 6	
Local-level			
City climate action plan	.30 (.45)	0 - 1	Leffel (2022)
State climate laws	15.6 (12)	0 - 88	U.S. DOE
Population	378,446 (1,073,473)	545 - 8,622,698	U.S. Census
Income ($USD)	82,363 (60,762)	9,040 - 596,443	U.S. Census
Obs.	5,872		

Key Findings: Effects of Initiatives on Facility GHG Emissions

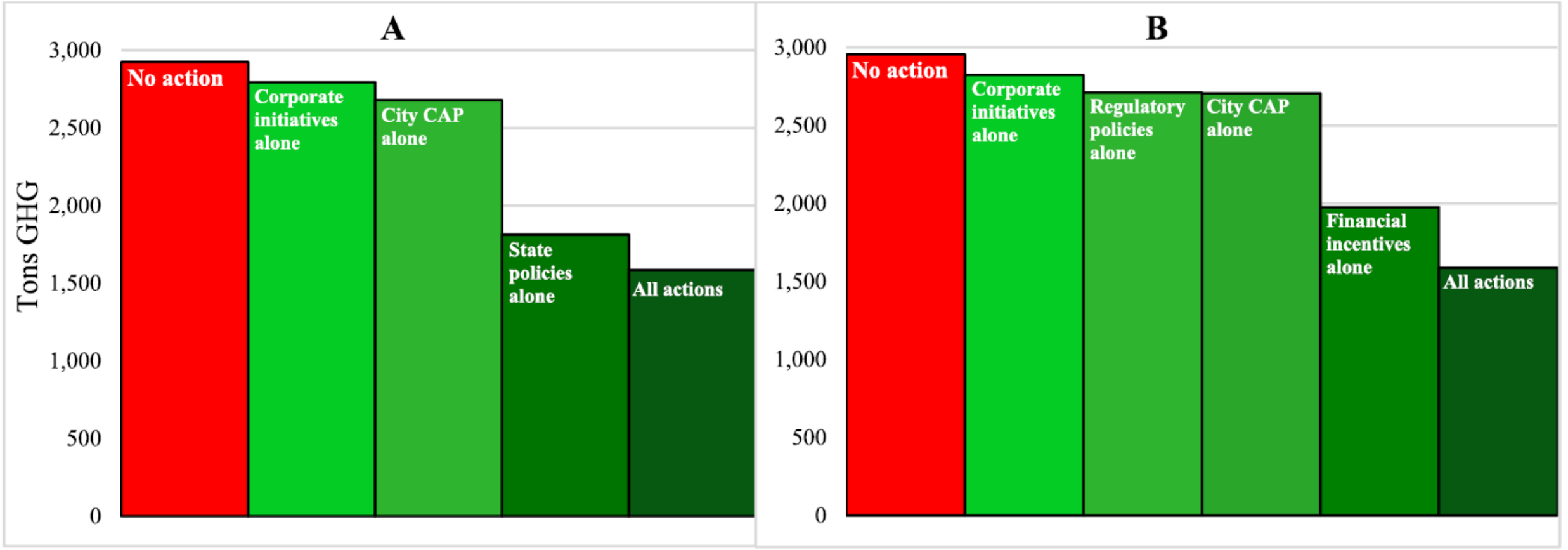
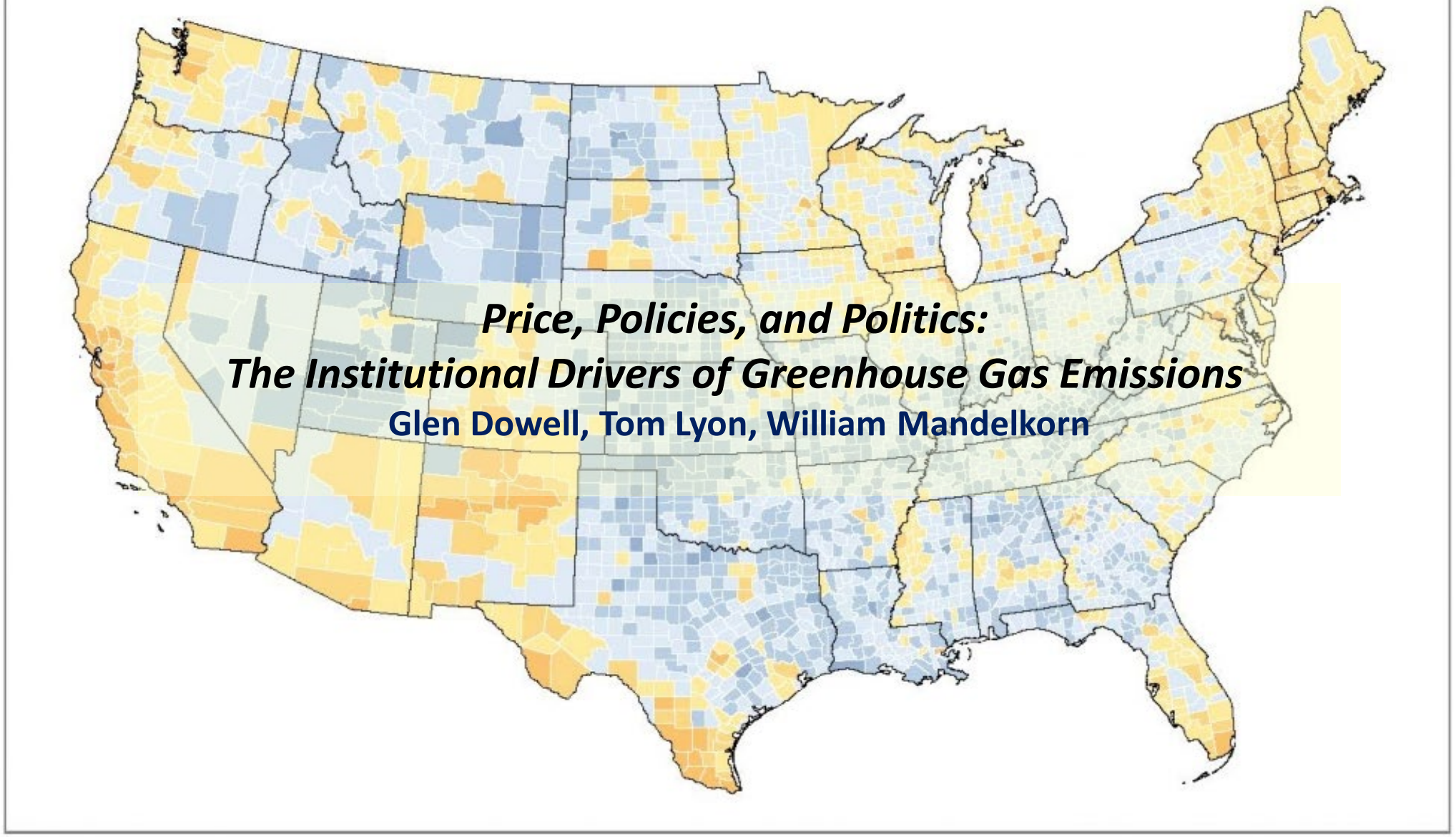


Fig. 3. Predictive margins for effects of corporate and subnational climate policy impacts on facility GHG emissions.

Insights on Scope 1 vs. Scope 2 Impacts

- Scope 1
  - Only factor that significantly reduced Scope 1 emissions was city climate action plans!
- Scope 2
  - Corporate initiatives only significantly reduced Scope 2 emissions
    - Building energy efficiency initiatives were especially helpful
  - Facilities owned by firms with more siblings facilities reduced more, perhaps due to learning across facilities
  - State climate policies only significantly reduced Scope 2 emissions
    - Financial incentives were the most effective



Price, Policies, and Politics: The Institutional Drivers of Greenhouse Gas Emissions

Glen Dowell, Tom Lyon, William Mandelkorn

Stepping Back: What *Should* Affect GHG Emissions?

- Price: carbon taxes or cost of fuels should reduce emissions intensity, though firms in communities with stronger environmental norms may be less sensitive to prices.
- Policies: not only existing policies (e.g. renewable portfolio standards) but anticipated policies can affect firms' behaviors
  - But uncertainty over future regulations can forestall investments in reductions.
- Politics: the degree to which both community members and managers sympathize with the issue in question.

Dependent Variable

- Emissions as reported to the mandatory Greenhouse Gas Reporting Program (GHGRP) in United States
  - Requires annual report on GHG emissions by 'large emitters' (>25,000 MTCO2e/year)
  - Over 8,000 facilities, estimated to cover ~ 85% industrial emissions over observation period
  - We use the natural log of a facility's total emissions as DV
  - Cover period from 2010 - 2021

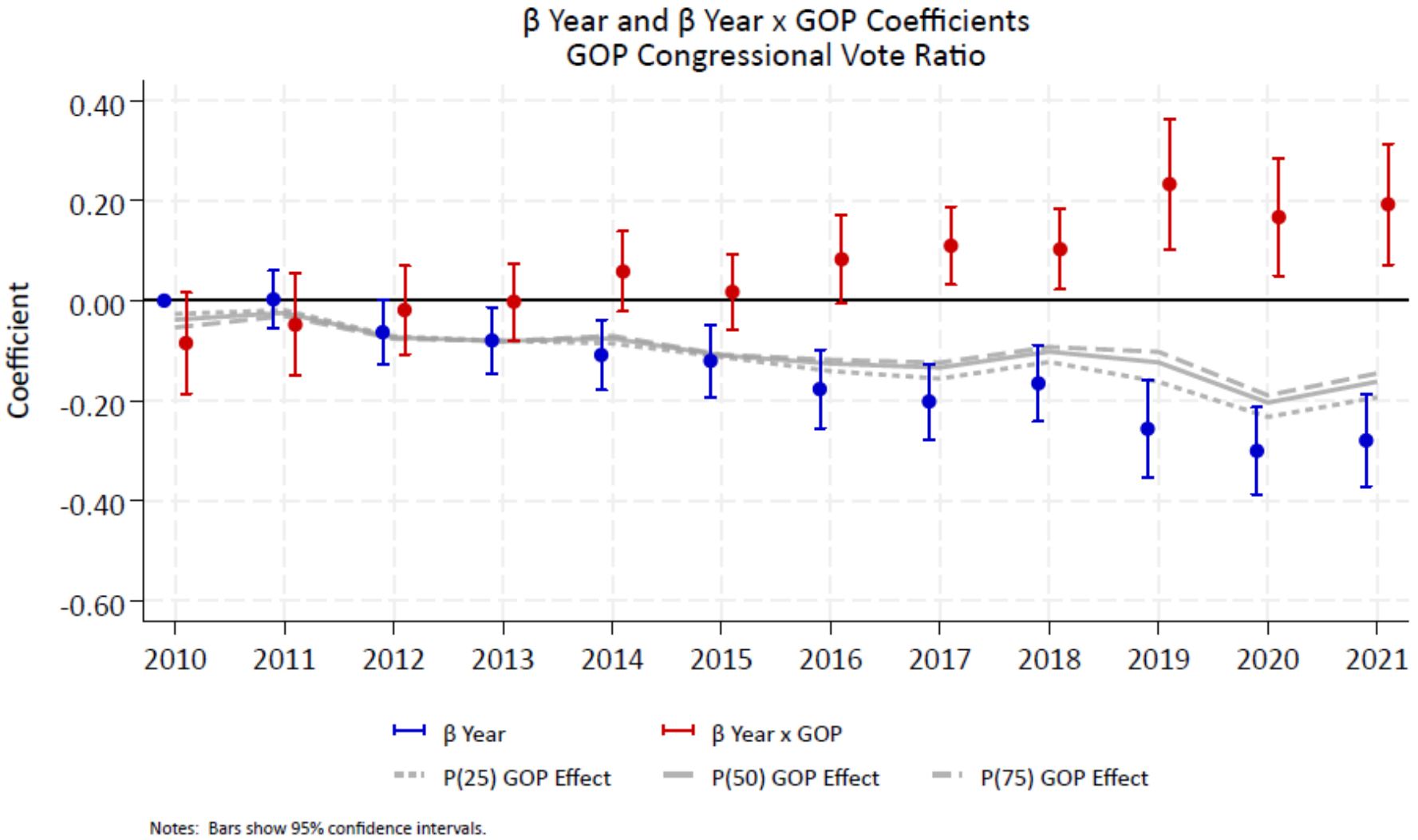
Independent Variables

- Local GOP share of vote in (a) most recent presidential election, or (b) congressional elections.
- Prices of natural gas and carbon (if relevant).
- Count of state energy and climate policies (from DSIRE).

Results of Study 2

- Basic economic drivers help to explain GHG reductions over time.
  - Facility output, state carbon prices, state policies all matter.
  - State policies have had the greatest impact to date, as next table shows.
- There is an overall trend of reduced emissions over time, controlling for output (blue dots in figure below).
- Yet there is also a growing partisan political effect (red dots in figure below), with plants in Red counties increasingly falling behind, especially in the post-Trump years.
- Size of the partisanship effect is larger than anything except state policies, as shown in following table.

GOP House Vote Share Results



Notes: Bars show 95% confidence intervals.

Marginal Effects of a One Standard Deviation Increase

Production Ratio	3%
Count of state policies	-12%
Price Natural Gas	2%
Price of Carbon	-1%
GOP Ratio House	5%
Carbon Pricing Details	
Price of Carbon – CA	-3%
Price of Carbon -- RGGI	-2%
Price of Carbon -- $0 to $50	-38%
Price of Carbon -- $0 to $200	-85%

Summary of Results from Both Studies

- State policies have been a powerful driver of reduced GHG emissions, especially for Scope 2 emissions.
- State carbon prices have had a much smaller effect, in part because they have been quite low to date.
- Corporate initiatives, especially building energy efficiency programs, have reduced Scope 2 emissions.
- There is an overall trend of reduced emissions over time, controlling for output.
- Yet there is also a growing partisan political effect, with plants in Blue counties increasingly pulling ahead, especially in the post-Trump years. The size of the partisanship effect is larger than anything except state policies.

Thank you!

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