Effectiveness of Non-state Climate Action: Corporate climate policies and company-level emission reductions

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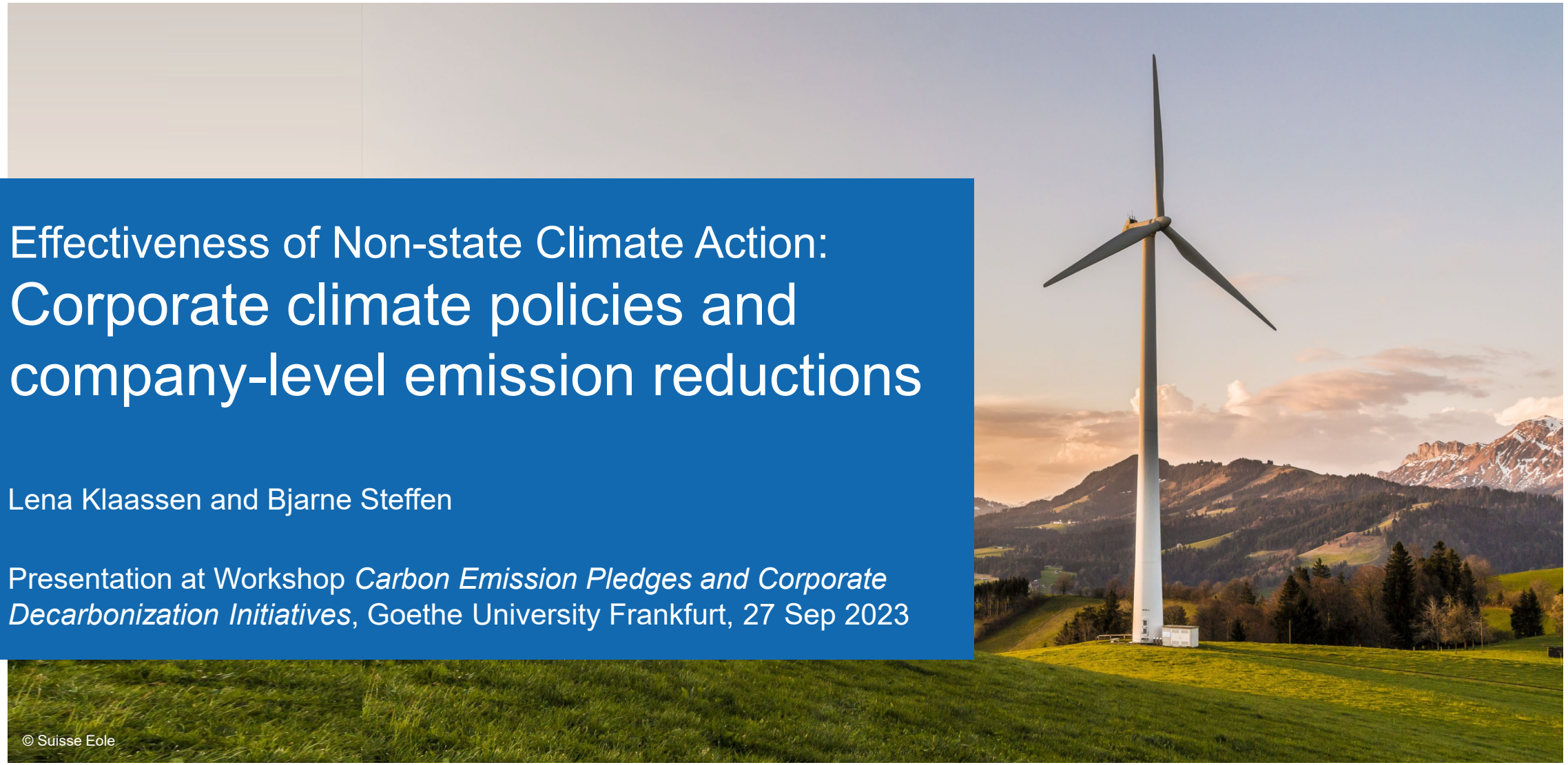

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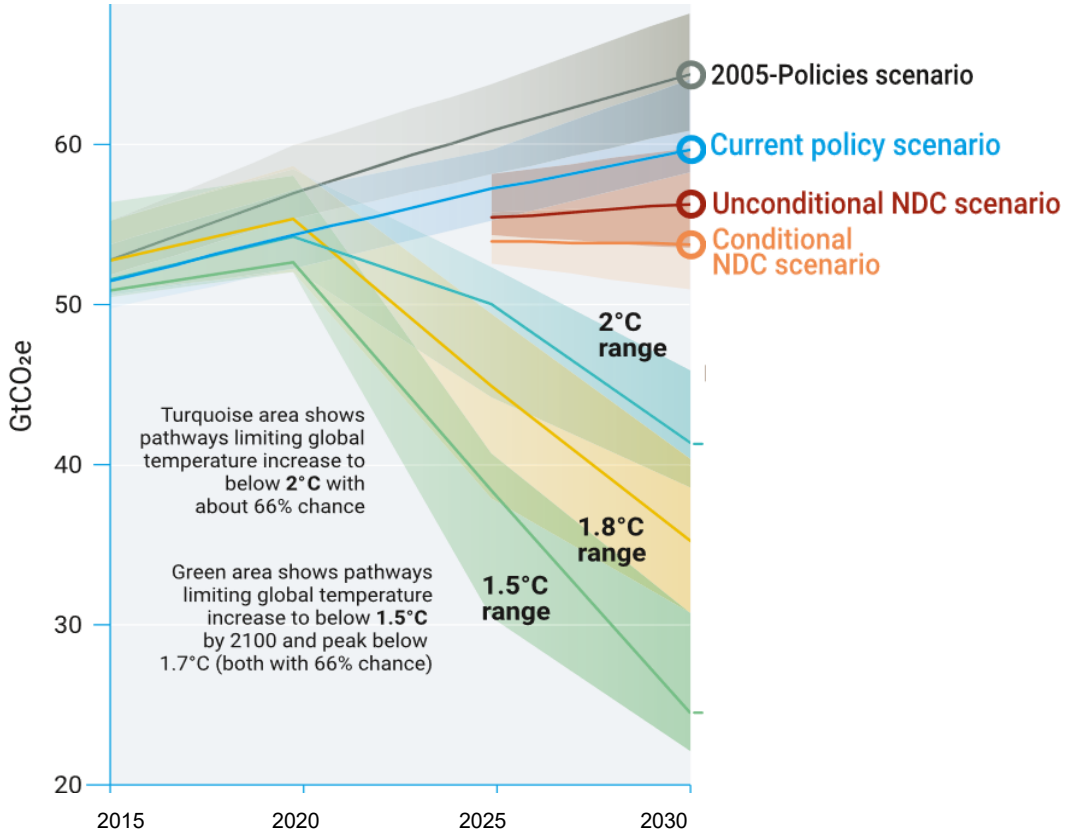
Agenda

1. Introduction
2. Hypotheses
3. Empirical Methods
4. Results
5. Discussion

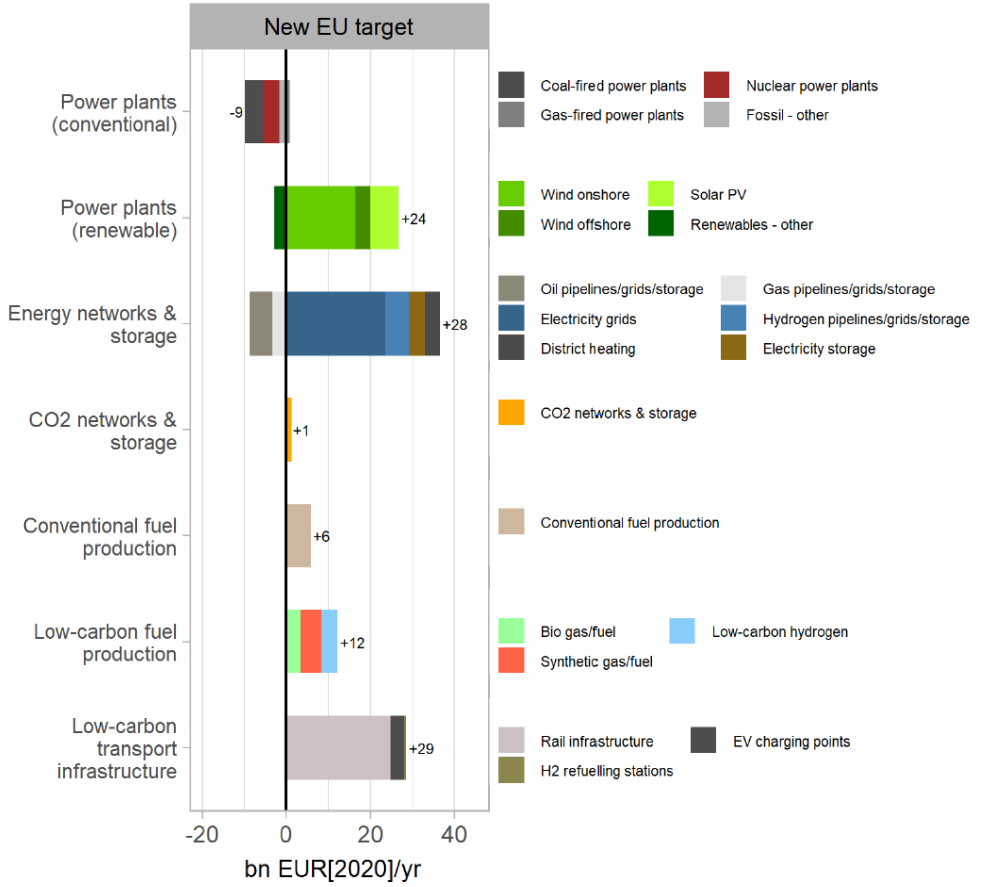
Introduction

Slowing down climate change needs rapid redirection of capital flows

CO_2 emission reductions required to reach Paris Agreement targets



Annual infrastructure investment shifts required between 2016–2020 and 2021–2025

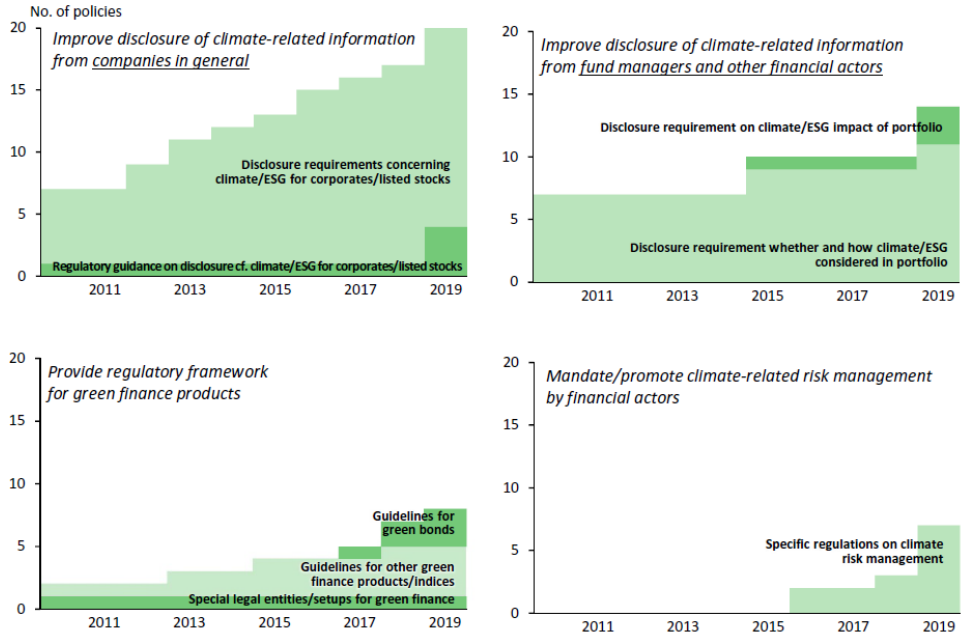


Source (left): UNEP (2020), Emissions Gap Report. Source (right): Klaaßen, L., & Steffen, B. (2023). Meta-analysis on necessary investment shifts to reach net zero pathways in Europe. *Nature Climate Change*, 1-9.

Despite the emphasize on the role of disclosure to reallocate capital, evidence on the effectiveness of *corporate policies* remains inconclusive

Status quo

- **Increasing pressure** for investors to help mitigate CC and **reduce portfolio emissions**
- Policymakers and financial sector **emphasize role of corporate climate disclosure**



Research gap

- To enable CC-conscious investor decisions, disclosed info should be informative concerning a **company's future GHG emissions**
- Effectiveness of climate-related disclosure for re-directing capital **is increasingly challenged** (Ameli, Drummond, Bisaro, Grubb, & Chenet, 2020; Ameli, Kothari, & Grubb, 2021; Bhandary et al., 2021)
- Empirical evidence remains **inconclusive** and exhibits two major shortcomings
  - *(1) Small sample sizes*
    → impeding time-lagged analyses and controlling for company-specific fixed effects
  - *(2) Focus on effect of single corporate climate policies in isolation (e.g., targets)*

Source: Steffen, B. (2021). A comparative analysis of green financial policy output in OECD countries. *Environmental Research Letters*, 16(7), 74031.

We investigate the link btw. corporate policies & improved climate performance

Research question: Are disclosed corporate climate policies (or a mix of them) associated with improved climate performance and thus may be a helpful indicator for investors to consider in a climate-conscious investment strategy?

- **Large-n analysis** based on new dataset built on CDP and Refinitiv with
  - Data from 1,625 companies based in OECD countries
  - More than 15,000 year-observations from 2010–2021
- Enables us to
  - Analyze the emissions performance related to **different corporate climate policies** and how they potentially work in a **policy mix**
  - Analyze **time-lagged effects** and control for **company-level fixed effects**

Hypotheses

The management-oriented view of sustainability disclosure suggests that (more) corporate climate policies lead to less emissions in the future

Literature stream

Sustainability disclosure theory (and theory of change behind TCFD etc.)

Theoretical background

- ***Management-oriented view:*** disclosed corporate climate policies can drive climate performance (Boons & Strannegård, 2000; Burritt & Schaltegger, 2010; Schaltegger & Wagner, 2006)
- In contrast: ***Legitimacy view:*** disclosed climate policies are not linked to actual climate performance improvements (Castelo Branco & Lima Rodrigues, 2006; Cormier, Gordon, & Magnan, 2004; Patten, 2002, 2015)

Existing research

- **Increasing number of studies** investigating the link between disclosed corporate climate policies and subsequent emission reductions
- Investigated corporate climate policies can be **classified in four areas**: (1) targets, (2) governance, (3) implementation as well as (4) monitoring, reporting and verification (MRV)
- Mostly limited to single policy instruments and small sample sizes, leading to **methodological weaknesses**

Hypothesis

H1: The existence of (disclosed) corporate climate policies is associated with an improvement in climate performance.

Building on public policy, we hypothesize that a company must adopt a mix of corporate climate policies for improved climate performance

Literature stream

Public policy design

Theoretical background

- Public policy literature has investigated how **different policies work in conjunction** for an effective mix (Kern & Howlett, 2009; Rogge & Reichardt, 2016; Schmidt & Sewerin, 2019; van den Bergh et al., 2021)
  - *Comprehensiveness:* Beyond targets and high-level planning elements, there is the need for instruments dedicated to implementation, and for continuous monitoring
  - *Stringency:* Individual instruments reaching a certain level of ambition/effort

Existing research

- Positive impact of *comprehensiveness* and *stringency* on policy outcome shown for public policy in the area of climate/energy (Costantini, Crespi, & Palma, 2017; Reichardt & Rogge, 2016)
- Very **scarce research** on the effect of corporate climate policy mixes on climate performance

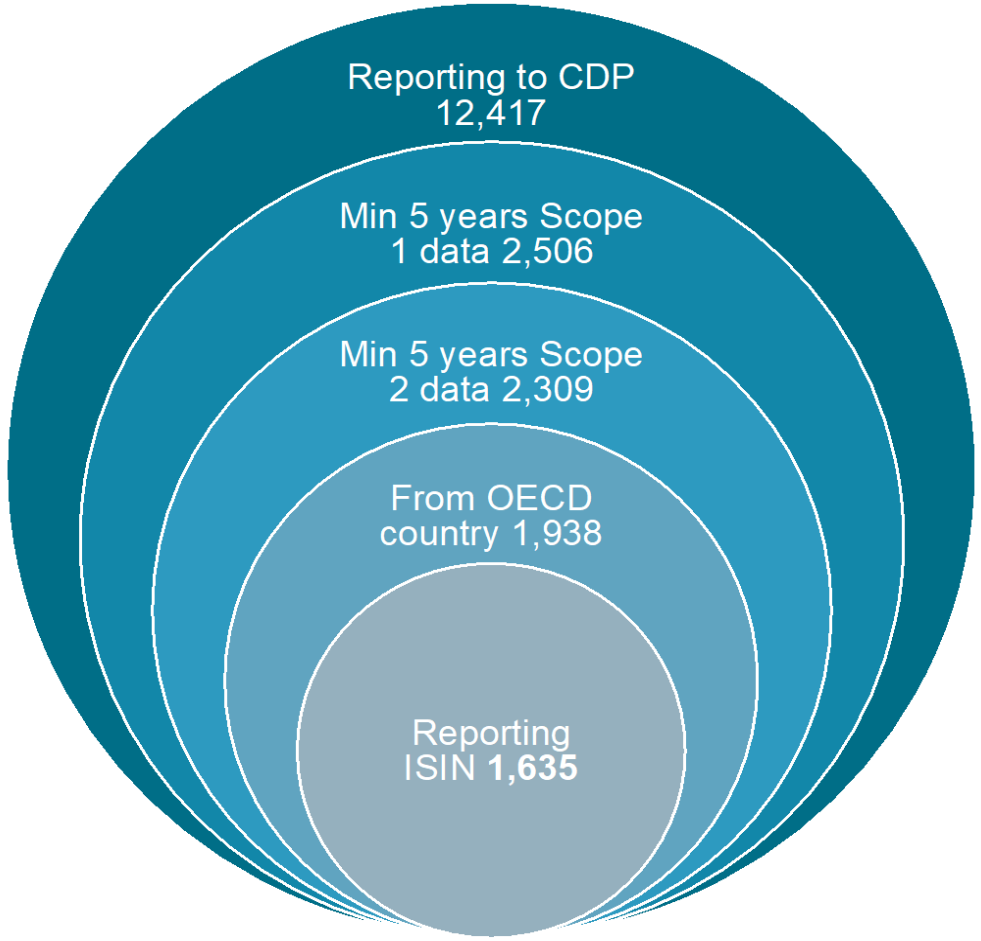
Hypotheses

H2: Companies with a *'comprehensive corporate climate policy mix'** are associated with an improvement in climate performance.
H3: Companies with a *'vanguard corporate climate policy mix'*** are associated with an improvement in climate performance.

*which includes policies from all key areas – targets, governance, implementation, and MRV
**which includes policies with low adoption from all key areas – targets, governance, implementation, and MRV

Empirical methods

Sample: Focus on OECD, 1,635 companies and 15,270 observations



- We built our dataset on the basis of CDP questionnaires from 2010-2021
- We limit the sample to the companies reporting GHG emission data (scope 1 and 2) **for at least 5 years**
- We focus on companies **based in OECD countries** where disclosure mandates are primarily introduced or considered so far
- We reduce the sample to companies that **report an ISIN**

Data: Combining *CDP* questionnaire and *Refinitiv* company fundamentals

Dependent variable

Climate performance:

(1) Absolute emissions
(scope 1 and scope 2 location-based)

(2) Emission intensity
(absolute emissions divided by revenues)

Independent variables

Area	Corporate climate policy	Available since year	# Observations	
Targets	Absolute target	2010	15,270	
	Intensity target	2010	15,270	
	Science-based target	2017	6,680	
Governance	Board-level oversight	2010	15,270	
	Incentives	2010	15,270	High correlation
	Monetary incentives	2010	15,270	
	Internal carbon price	2015	9,462	
Implementation	Mitigation initiatives	2012	13,240	
	Strategic integration	2011	14,324	
	Value-chain engagement	2013	12,060	
Monitoring, reporting, and verification (MRV)	Scope 1 verification	2010	15,270	High correlation
	Scope 2 verification	2010	15,270	
	Scope 3 disclosure	2010	15,270	

Time-lagged fixed effects model, with year- and company-fixed effects

- To test **H1**, we study each corporate climate policy separately (as did the vast majority of previous studies) and analyze the policies together in a regression model including them all

$$Carbon\ performance_{i,t+1} = \sum_a \beta_{1,a} Corporate\ Climate\ Policy_{i,t,a} + \beta_2 \ln\left(Revenue_{i,t}\right) + \alpha_t + \gamma_c + \varepsilon_{i,t,c}$$

- To test **H2 and H3**, we regress a dummy which indicates whether a company discloses a comprehensive policy mix* or vanguard policy mix**

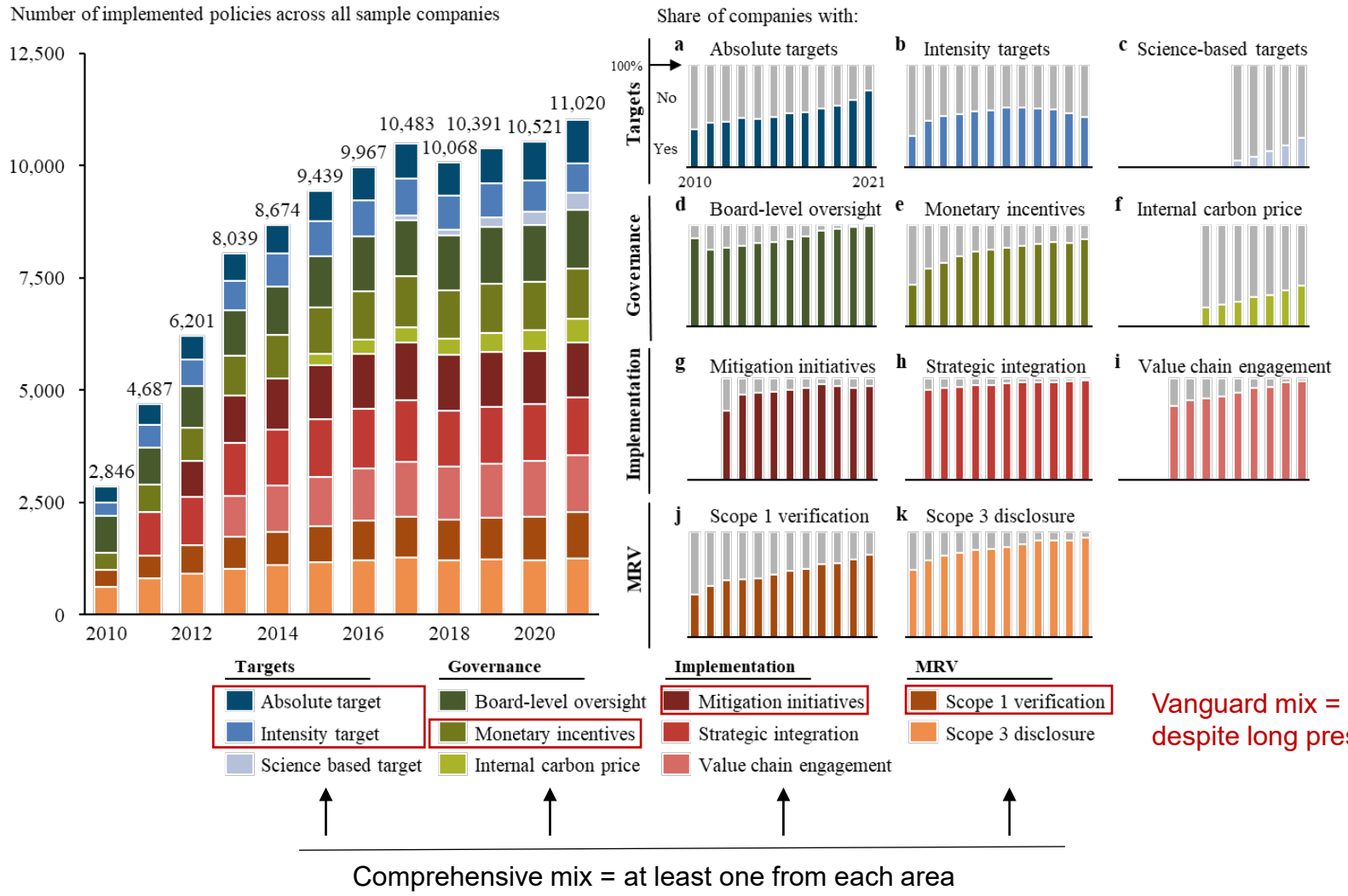
$$Carbon\ performance_{i,t+1} = \beta_1 Corporate\ Climate\ Policy\ Mix_{i,t} + \beta_2 \ln\left(Revenue_{i,t}\right) + \alpha_t + \gamma_c + \varepsilon_{i,t,c}$$

- To control for additional confounders, all equations also include fixed effects at the year (α_t) and company level (γ_c) as well as log-transformed revenue serving as the control variable representing company size
- To compare our results to the results of previous studies, we also calculate each specification with year, region and sector fixed effects

*at least one policy from each area
**includes the policy with the lowest adoption from each area (assumption: high effort implies lower adoption)

Results

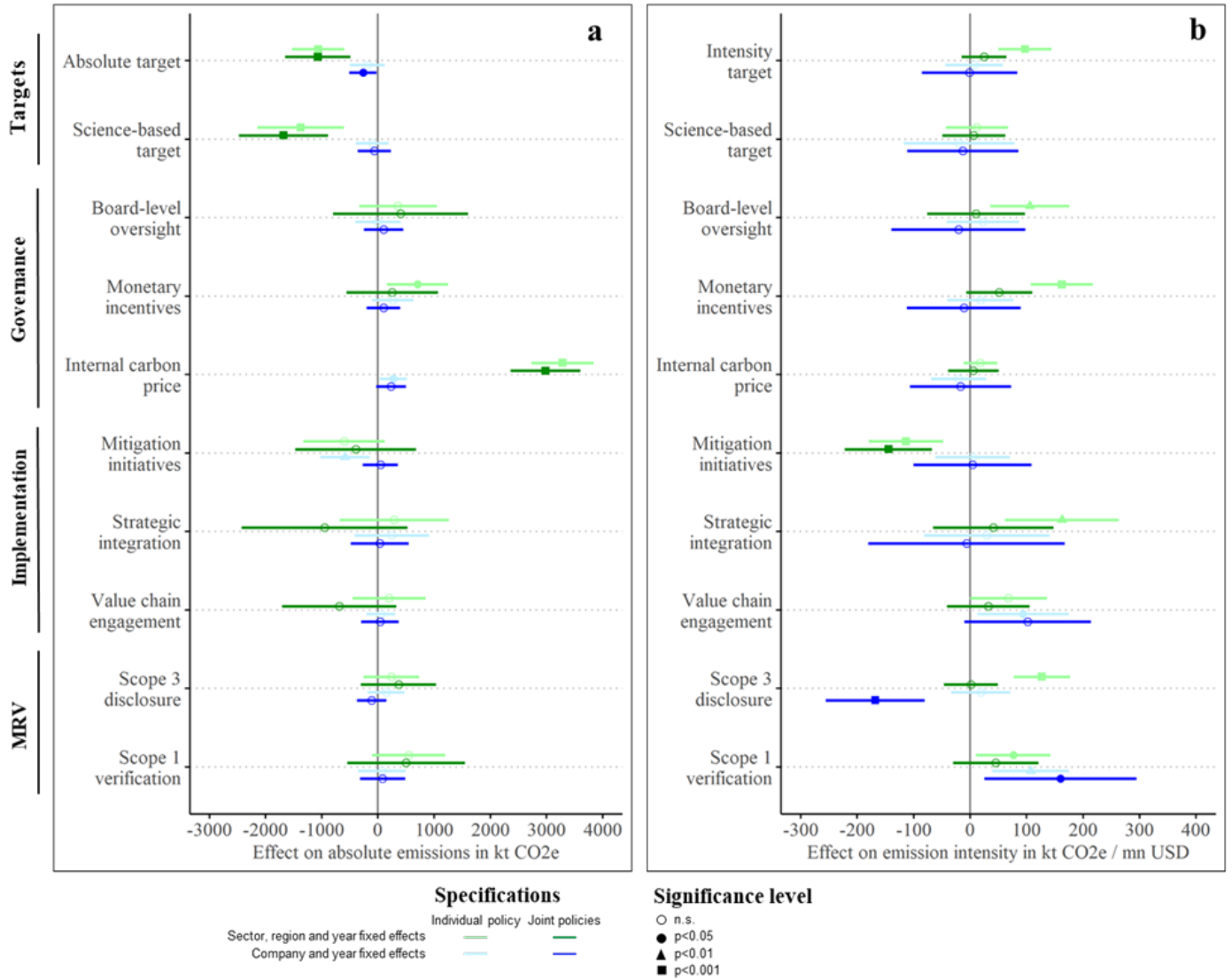
The number of disclosed implemented policies has grown from below 3,000 in 2010 to more than 11,000 in 2021



- The adoption rates of the single policies **have risen**
- Also **new policy instruments** were introduced
- Some policies were adopted **very quickly after their introduction** to CDP, while others entered on a rather low adoption level

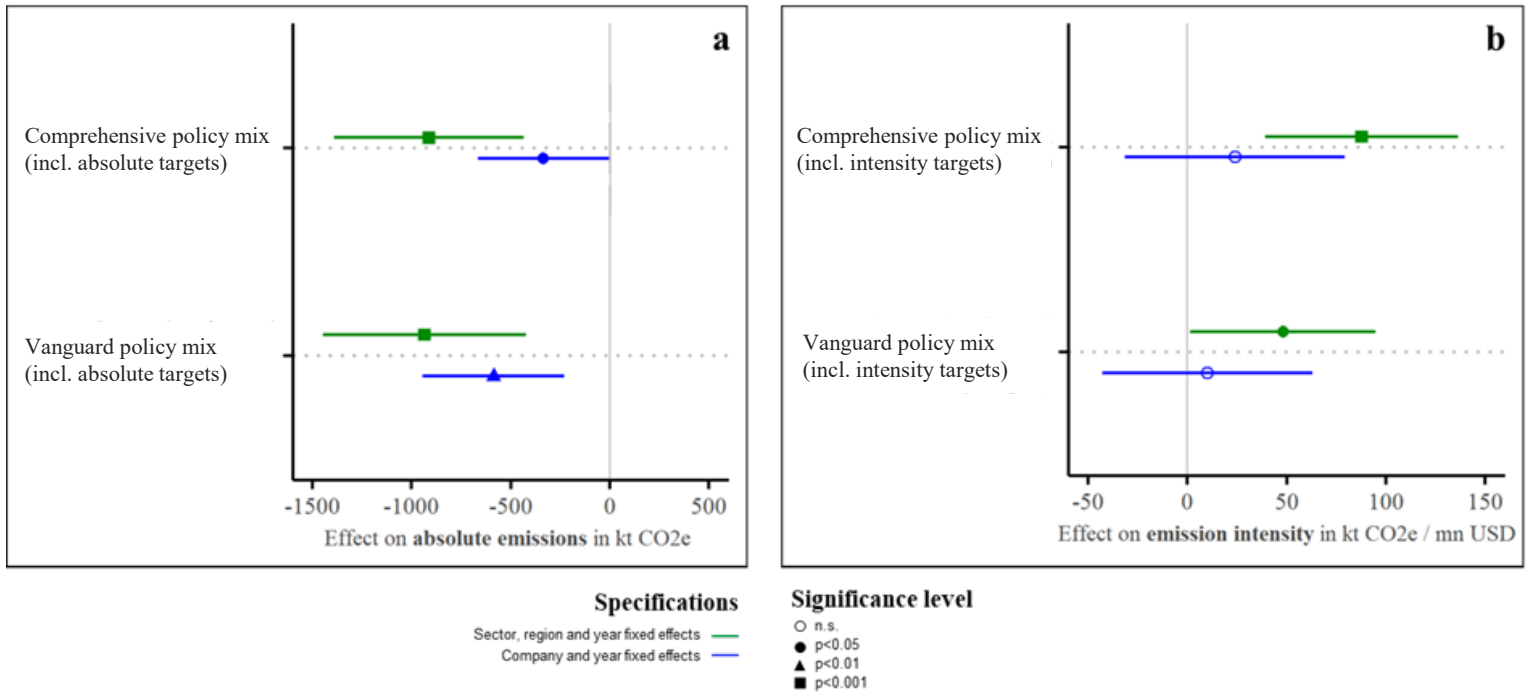
Vanguard mix = the one from each area with lowest adoption despite long presence in CDP

Hardly any signal for individual corporate climate policies being associated with an improvement of climate performance



- No corporate climate policy shows a **significant effect across all** specifications
- All effects turn insignificant when including **company FEs instead** of sector and region FEs
- Based on the results, we cannot support or reject H1

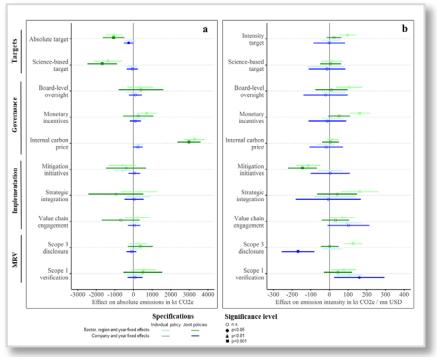
We find significant effects for the comprehensive policy mix and the vanguard policy mix for absolute emissions



- For ***absolute emissions***, we find both types of policy mixes to be significantly correlated with lower absolute emissions
- For ***emission intensities***, the effects turn insignificant when including company and year FEs
- We find support for H2 and H3 but **only for absolute emissions** as the dependent variable

Discussion

Discussion



In sum, we find rather limited evidence for a link between corporate climate policies and climate performance – and, by extension, limited informative value for investors

- Our results show only a weak link between individual corporate climate policies and company-level emissions when controlling for company-level fixed effects
- We find that effective corporate climate policy requires a mix of complementary policy instruments – but results only holds for absolute emissions

For policymakers, relying too heavily on the power of disclosure seems illusive

- Initial evidence on potential effectiveness of corporate climate policy *mixes* may represent a starting point in the design of mandatory disclosure requirements
- However, mandating the disclosure of corporate carbon policies may at best complement a public policy mix aiming to redirect capital flows

Future research should zoom into sectors (we plan to do that), and think about ways to quantify the stringency of disclosed policies (e.g., based on textual information)

Thank you for your attention

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