Carbon Offsets: Decarbonization or Transition-Washing?

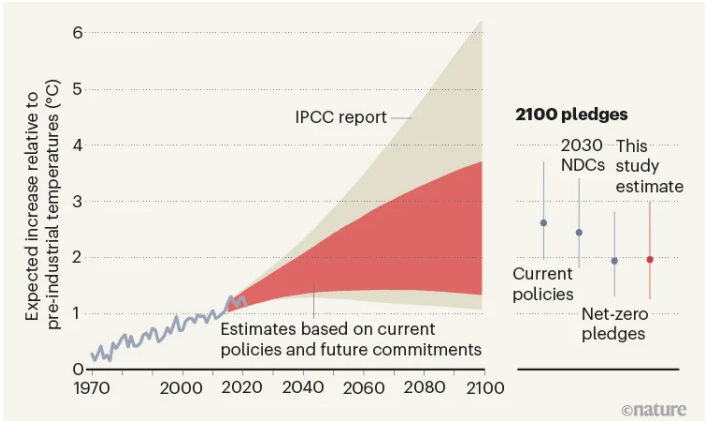
Financial Intermediation Research Society (FIRS)

Kunal Sachdeva (University of Michigan, Ross)

May 30th, 2025

Net-Zero Commitments Could Limit Warming

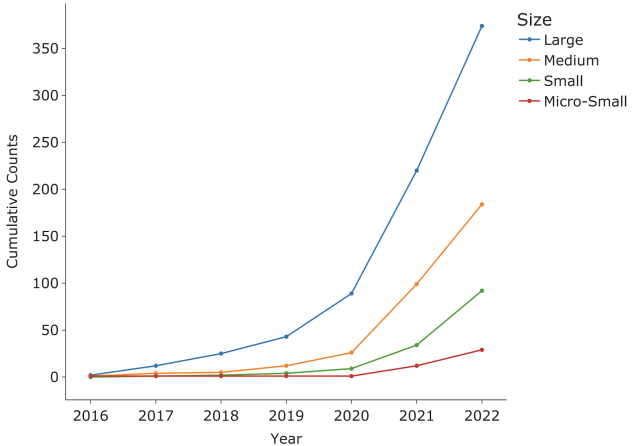
Commitments may limit global warming – but only if backed up by short-term policies.



Hausfather, Z., & Moore, F. C. (2022). Net-zero commitments could limit warming to below 2 °C. Nature, 604(7905), 247-248. https://doi.org/10.1038/d41586-022-00874-1

Commitments to Decarbonize, Net-Zero Commitments

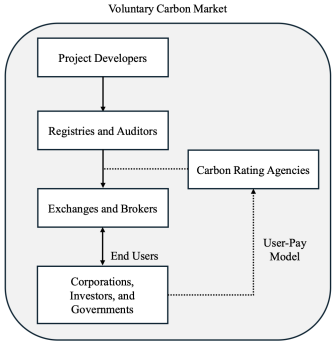
Many firms are committing, but the "how" is crucial

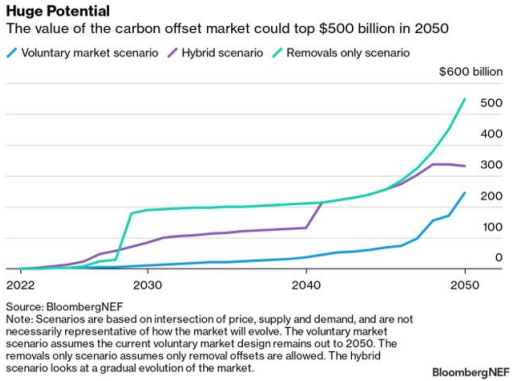


Acharya, V V, R Engle and O Wang (2024), "Strategic commitments to decarbonize: The role of large firms, common ownership, and governments", Working Paper, New York University Stern School of Business.

Carbon Offsets May Be an Important Tool

Voluntary carbon markets are projected to grow significantly, highlighting their potential role





Why and how are corporations using carbon offsets?

Core Question: Decarbonization or Transition-Washing?

Investigate why and how corporations use carbon offsets

Are corporate offset decisions driven by true green incentives, or by abatement-cost curves and ratings?

1. **Outsourcing Hypothesis**
   - → Firms with smaller footprints use offsets due to lower marginal costs for indirect reduction
   - → Heavy emitters reduce in-house

2. **Certification Hypothesis**
   - → Firms use offsets strategically to signal commitment and improve ESG ratings
   - → This is pronounced especially after downgrades
   - → Firms care about their credentials with outside stakeholders

What Does the Paper Do?

- **Novel Data on Carbon Credits**
  - → Data on carbon credits to offset their greenhouse gas emissions, how many credits they retire in a given year, and which carbon offset projects those credits originate from
  - → Manually merge this data to Compustat North America and Global universe
- **Document Basic Facts About Market**
  - → Characteristics of carbon offset projects around the world
  - → US firms tend to use third-party rated offsets
  - → Low-emission industries (e.g. financials) are more intensive in their use of offsets emissions
- **Considers certification channel**
  - → Uses new methodology adopted by Sustainalytics
  - → The average downgraded firm offsets an additional 21.7% of its direct emissions
  - → Firms in low gap industries retire more low quality offsets
  - → High emitters, post downgrade, tend to increase the quality of their offsets

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>> ***Suggestive that carbon offsets are strategically used for certification and ranking purposes***

Important, Well Presented

The Paper Largely Confirms Many of My Priors

Carbon Offsets: Decarbonization or Transition-Washing?

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This draft: May 2025

Abstract

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>> ***My comments are centered on sharpening the findings***

Comment 1 – Heterogeneity in Marginal Abatement Cost (MAC)

Numerical Example

Consider two firms in the same industry with a $1M abatement budget and offset price $25/t:

	Firm L (Low-Intensity)	Firm H (High-Intensity)
Emissions	500,000t	100,000t
Revenue	$10,000M	$1,000M
Intensity (t/$ M)	50 (no downgrade)	100 (downgraded at t=0)
In-house MAC	$8/t	$80/t
Average Offset Price	$25/t	
Max In-house Abatement	125,000t	12,500t
Max Offsets @ $25/t	40,000t	

>> Only the high-intensity firm faces the downgrade shock and steep MAC.

Comment 1 – Heterogeneity in Marginal Abatement Cost (MAC)

Numerical Example, Cont...

>> The DiD setup may conflate cheap-offset cost responses with certification incentives.

- **Slope heterogeneity:**
  - → Firm H: steep MAC ($80/t) → buys 40 kt offsets.
  - → Firm L: flat MAC ($8/t) → abates 125 kt in-house.

- **Wont Fixed Effects (FE) Address This?**
  - → **Firm FE:** removes each firm's *average* offset level, want to study the MAC curve.
  - → **Industry × Year FE:** captures common price shocks; ignores within-industry cost-curve differences.

- **The paper tries to address this**
  - → Considers splits the sample into below- vs. above-median emitters
  - → Also considers low- vs. high-gap industries

Comment 1 – Heterogeneity in Marginal Abatement Cost (MAC)

Pinning down the certification hypothesis

Can the paper better isolate pure certification incentives?

- **Suggestion 1:** Control for MAC Slope
  → Include firm-level proxies (e.g. pollution-control CAPEX or estimated first-unit MAC slope).

- **Suggestion 2:** Heterogeneity Tests
  → Split sample by emitter size/intensity — verify certification effect persists after accounting for cost-curve differences.

Comment 2 – Offset Quality Selection

Observability vs. True Quality

Are downgraded firms truly buying lower-quality credits, or simply opting for unrated projects?

	Rated (13%)	**Unrated (87%)**
Total Projects (1,000)	130	870
True Quality Avg.	8.0	7.0
Coded Quality (if unrated)	—	5.0

Example: Firm H purchases 200 credits:

$$50 \text{ rated at } 8.0, \quad 150 \text{ unrated (true } 7.0\text{, coded } 5.0)$$

$$\Delta = \underbrace{\frac{50 \times 8 + 150 \times 7}{200}}_{\text{True avg. quality}} - \underbrace{\frac{50 \times 8 + 150 \times 5}{200}}_{\text{Measured avg. quality}} = 1.50 \quad \text{quality points}$$

Comment 2 – Offset Quality Selection

Observability vs. True Quality

Selection on rating availability—not true choice—drives the observed quality drop.

- **Potential Selection in BeZero Ratings**
  - → Only 10–16% of projects carry a BeZero rating (Table 1).
  - → Ratings skew to large, forestry-based, North American projects (Table 2).
- **Directional Prediction**
  - → Downgrade × Post coefficient on quality may shrink in magnitude
- **Finding Selection is Interesting!**
  - → Tells us a new and interesting story about the user pay model for ratings!
  - → This is related to an older line of research studying the addition of credit rating companies

Comment 2 – Offset Quality Selection

Suggestions to Consider

Try to Separate Quality Choices from Sample Selection Bias

- **Suggestion 1:** Heckman Two-Stage Correction:
  - → Stage 1: Probit selection model into BeZero rating (size, region, project type).
  - → Stage 2: Include Inverse Mills Ratio in the firm-level regression of offset quality choice (e.g., Table 8 specification) or in the DiD with quality-differentiated quantities.
- **Suggestion 2:** Consider a Triple-Difference Approach, DiD × Quality, (or use Price as Quality!)
  - → Construct a firm-year-quality measure, then estimate the DiD with quality interaction
  - → Alternatively, consider using price (or historical spot price) of offset to proxy for quality
- **Suggestion 3:** Bounding Approach:
  - → Compute worst- and best-case bounds by varying assumed unrated quality within a plausible range (e.g. 6–8).

Comment 3 – Incentives to be Strategic?

Pinning Down Incentives of Firms

>> ***Why are high emitters increasing the quality of offsets post downgrade?***

Table 7. Quality of Carbon Offsets Conditional on Using Offsets (continued)

Panel B: Offset credits with BeZero rating of BBB or higher

	Full sample	Emissions as of 2018		Industry gap as of 2018	
		Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)
Post × Rating downgrade	0.120*	-0.082	0.168**	-0.051	0.184***
	[1.71]	[-0.65]	[2.28]	[-0.33]	[2.60]
log(assets)	-0.006	0.162	-0.023	0.008	-0.027
	[-0.40]	[1.03]	[-1.48]	[0.33]	[-1.12]
Leverage	0.126	0.342	0.775*	0.256	0.064
	[0.45]	[0.79]	[1.76]	[0.69]	[0.17]
ROA	1.561*	5.068***	0.490	2.709**	0.081
	[1.91]	[4.44]	[0.60]	[2.31]	[0.08]
Institutional ownership	-0.565	-0.304	-0.477	-1.302	-0.104
	[-1.30]	[-0.51]	[-0.87]	[-1.33]	[-0.24]
Firm FE	Y	Y	Y	Y	Y
Industry-year FE	Y	Y	Y	Y	Y
Observations	602	163	394	264	333
R-squared	0.799	0.823	0.824	0.763	0.834
% (Dependent variable = 1)	27.4%	33.3%	25.8%	25.4%	28.8%

Comment 3 – Incentives to be Strategic?

Pinning Down Incentives of Firms

Can the paper better pin-down the strategic use of offsets?

- **Suggestion 1:** Does Firm-Level Pollution, or Pollution Intensity Matter?
  - → Exploit variation in baseline Scope 1 intensity (CO per $ of revenue).
  - → Triple-difference: Downgrade × High-intensity firm × Post-downgrade.
- **Suggestion 2:** Provide Additional Evidence of the Strategic Use of Offsets
  - → Does offset spikes with negative ESG news or shareholder resolution dates?
  - → Examine whether firms purchase offsets immediately after media-covered environmental scandals.
- **Suggestion 3:** Consider Subsamples Where Strategic Use Would be High/Low
  - → Split firms by B2C vs. B2B: do consumer-facing firms show larger offset responses?
  - → Compare offset behavior across firms with high vs. low ESG-focused investor ownership.
  - → Consider firms that are upgraded, do they stop using offsets?

Excited for this Paper!

Provides insights into this potentially large and important market

- Provides crucial insights into the burgeoning carbon offset market.
- Highlights the challenges and potential pitfalls of relying on offsets for genuine decarbonization.
- Connects to the important debate on market design, regulation, and transparency.

Best of luck through the review process!