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RESEARCH INSIGHT

Corporate Emissions Performance and the Use of Carbon Credits

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Executive summary

Thousands of companies around the world have been voluntarily making commitments to reduce their emissions and transition to net-zero. For some companies, these transition plans involve the use of carbon credits. The use of carbon credits has, however, been the subject of some criticism. One key challenge has focused on the assertion that companies that spend money on carbon credits commit fewer resources to reducing their own emissions.

This report expands on a previous study by Trove Research (acquired by MSCI in November 2023, and now known as MSCI Carbon Markets), providing detailed empirical analysis on the relationship between emissions performance and the use of carbon credits.

This new analysis finds that constituents of the MSCI ACWI Investable Markets Index (IMI) that use carbon credits perform better on a range of climate-performance metrics than those that have not used carbon credits. The key findings are:

- **Use of carbon credits among listed companies is still at an early stage.** Only 14% of MSCI ACWI IMI constituents had used carbon credits between 2017 and 2022, and 11% were "material" users of carbon credits.[1] For material users, the median credit use amounted to around 13% of Scope 1 and 2 emissions, but just 0.5% of Scope 1, 2 and 3 emissions.
- **Users of carbon credits have reduced their *absolute* Scope 1 and 2 emissions more than twice as fast as non-users over the last five years**, at a rate of 3.6% per annum (p.a.) vs. 1.5% p.a., based on our analysis of 624 material carbon-credit users and 2,041 non-users. This finding is statistically significant (i.e., unlikely to have occurred by chance) across regions and within six out of 11 sectors, and the relationship holds under different analytical assumptions. Of the material carbon-credit users, 75% reduced their emissions in absolute terms between 2017 and 2022, compared to 60% of non-users.
- **Users of carbon credits also reduced their Scope 1 and 2 emissions *intensity* faster than non-users** (5.6% p.a. for material credit users vs. 4.4% p.a. for non-users, with 82% showing a reduction in their Scope 1 and 2 emissions intensity, compared to 72% of non-users). This finding is statistically significant at the global level but is more varied at the sector level.
- **Material carbon-credit users were more likely to have set a climate target than non-users** (92% vs. 52%), and those targets were more likely to meet commonly accepted target-credibility criteria such as external validation by a third party, existence of short-term or interim targets and a demonstrated track record of achieving past targets.
- **Material carbon-credit users generated a greater share of revenue from low-carbon activities than non-users** across most sectors.

These findings contradict the notion that companies have used carbon credits as an alternative to investing in climate-mitigation activities within their businesses. While this research does not examine the causes of these conclusions, it is possible that, on average, firms that have devoted resources to engage in the carbon market also have more well-developed climate strategies as a whole. Some credit users did, however, increase their emissions during this period and a small number did so significantly. To understand corporate climate performance, it therefore remains important to consider each individual company's performance against multiple criteria.

[1] We define material users as those that have used more than 1,000 tCO2e of credits during 2017-2022.

1. Introduction

This report presents the analysis conducted by MSCI ESG Research to examine the connection between the emissions performance of corporates and their use of carbon credits.

Of the 8,844 constituents of the MSCI ACWI IMI, 5,068 (57%) have set some sort of climate target.[2] Carbon credits can play an important role in many corporate transition plans, given their ability to reduce a company's net cost of abatement, and neutralize residual emissions that cannot be otherwise easily or economically reduced. One key criticism, however, of the use of carbon credits has focused on the assertion that these companies that spend money on carbon credits will commit fewer resources to reducing their own emissions.

To test this assertion, a 2023 report from Trove Research (now MSCI Carbon Markets) examined the absolute emissions performance of some 4,000 private and public companies, comparing those that used and did not use carbon credits. The analysis concluded that firms that had used carbon credits had, on average, better absolute emissions performance than those that did not.

This report builds on that research, with a focus on the 8,844 constituents of the MSCI ACWI IMI. Of this universe, 1,227 (14%) of the firms used carbon credits between 2017 and 2022, with 970 (11%) of the firms considered to be material users and 257 (3%) to be non-material users.[3]

To better understand the evidence for the assertion that companies voluntarily using carbon credits are creating a "license to pollute," this report aims to answer the following questions:

- Which companies have used carbon credits?
- Are credit users more or less transparent about their emissions than non-users?
- Do credit users have a better or worse track record in reducing their Scope 1 and 2 emissions?
- Do credit users have a better or worse track record in reducing Scope 3 emissions?
- Are credit users more or less ambitious in setting targets?

The evidence of the last five years suggests the opposite of conventional wisdom — finding that users of carbon credits typically outperform non-users in disclosing and reducing their own emissions, setting targets and investing in low-carbon technologies.

[2] The MSCI ACWI IMI constituents referenced in the report are as of July 1, 2024. The MSCI ACWI IMI captures large and mid-cap representation across 23 developed markets and 24 emerging markets countries.

[3] Just over a third of the companies included in the analysis of Scope 1 and 2 emissions in this report were covered in the dataset analyzed by Trove Research in 2023. Of those, 278 companies are now classified as material carbon-credit users, as more data on their use of carbon credits has become available.

2. Which companies have used carbon credits?

Companies are not currently required to disclose their use of carbon credits, although regulations and industry standards are looking to mandate such disclosure.[4] Many companies do, however, voluntarily provide some information on their credit use in carbon-credit registries, sustainability reports or CDP submissions.[5] MSCI Carbon Markets has aggregated these sources to identify the corporate user for more than 85% of carbon-credit retirements between 2017 and 2022.

We estimate that around 59% of total credit use during that period — about 389 megatonnes (Mt) CO2e — was by the 8,844 constituents of the MSCI ACWI IMI. Of these, 14% (1,227 companies) used at least one credit between 2017 and 2022.[6]

The extent of carbon-credit use varies between companies (Exhibit 1). At the top end, 66 companies have used more than one million tCO2e of credits between 2017 and 2022, representing almost 80% of the total carbon-credit use during this period. At the lower end, 257 firms have used less than 1,000 tCO2e of credits during the same period, a relatively immaterial amount when compared to a typical company's emissions.[7]

In this report, we focus our analysis on comparing the 970 material users of credits, defined as those that have used more than 1,000 tCO2e of credits during 2017-2022, with the 7,617 non-users of credits.

Exhibit 1: Carbon-credit use among companies in the MSCI ACWI IMI, 2017-2022

Companies' credit use, 2017-22 (tCO2e)	Number of companies		% of companies	Total credits used (MtCO2e)	Credit use as % of Scope 1+2 emissions	Credit use as % of Scope 1+2+3 emissions	Report usage designation
Zero	7,617		86%	0	0.0%	0.0%	Non-users
1 to 1,000	257		3%	0.1	0.1%	0.0%	Immaterial users
1,001 to 10,000	970	359	4%	1.5	2.2%	0.1%	Material users
10,001 to 100,000		342	4%	13.4	21.3%	0.8%	
100,001 to 1,000,000		203	2%	64.8	49.2%	1.4%	
>1,000,000		66	1%	309	83.7%	2.7%	
MSCI ACWI IMI	**8,844**		**100%**	**389**	**4.7%**	**0.3%**	

Data as of July 1, 2024. Relative-to-emissions columns are based on the median percentage of credit users' average annual credit use as a proportion of their 2022 emissions. This exhibit used estimated emissions when company-reported emissions were not available. Source: MSCI Carbon Markets, MSCI ESG Research

[4] Ben St. Laurent, Jamie Saunders and Laura Buenaventura, "Transparency Is King When Using Carbon Credits," MSCI Carbon Markets, May 28, 2024. Note that in some cases, companies only disclose their purchase (not retirement) of carbon credits, and, where appropriate, MSCI includes their disclosed carbon-credit purchases in its datasets of corporate carbon-credit usage.

[5] CDP is a not-for-profit charity that runs an environmental disclosure system for companies and other entities.

[6] Of the 1,227 constituents of the MSCI ACW IMI that used carbon credits between 2017 and 2022, 21 companies have had multiple-share classes. Where stated, total tCO2e of credits used excludes any double counting of credits used by these 21 companies.

[7] We estimate the median annual Scope 1 and 2 emissions in 2022 of the MSCI ACWI IMI constituents to be 41,550 tCO2e.

To put companies' use of carbon credits into perspective, among the 970 material carbon-credit users, the median ratio of annualized credit usage relative to annual Scope 1 and 2 emissions was 13%, and relative to Scope 1, 2 and 3 emissions just 0.5% (Exhibit 2).

Just over half of the credits used were by companies in the industrials and energy sectors.[8] However, because firms in these sectors typically have very large emissions, their average annual credit use was relatively small when compared to their emissions, at just 4.7% and 2.0% respectively of annualized Scope 1 and 2 emissions.

Just over a fifth (22%) of all companies in the financials sector were material users, with a median ratio of credit usage relative to Scope 1 and 2 emissions of 101.4%. In other words, the credits used by most credit users in this sector exceeded the sum of their Scope 1 and 2 emissions for the period. Once all their Scope 3 emissions are considered, however, including financed emissions, the median ratio of emissions covered by credits was much lower at 0.7%.

The information-technology sector was another where material users have tended to cover a substantial proportion of their Scope 1 and 2 emissions with their credits, with a median ratio of 70%. The next highest credit-using sectors relative to their emissions are communication services and real estate, at 22% and 21%, respectively.

On a regional basis, usage is clearly higher among companies based in EMEA, followed by the Americas. Usage among companies in APAC is much lower, with only 6% of 3,804 companies classified as a material user. Among the material users in APAC, the median use of credits was equivalent to 3.9% of their Scope 1 and 2 emissions.

Exhibit 2: Median ratio of total carbon credits used relative to estimated annual emissions

	Number of non-users	Total credits used 2017-22 (MtCO2e)	Number of material users	Credit use as % of Scope 1+2 emissions in 2022	Credit use as % of Scope 1+2+3 emissions in 2022
Region					
EMEA	1,406	143	404 (29%)	22.9%	0.6%
Americas	2,407	190	349 (14%)	16.9%	0.5%
APAC	3,804	56	217 (6%)	3.9%	0.3%
Total	**7,617**	**389**	**970**	**13.0%**	**0.5%**
Sector					
Financials	964	28	208 (22%)	101.1%	0.7%
Industrials	1,367	120	177 (13%)	4.7%	0.3%
Consumer discretionary	954	35	103 (11%)	10.3%	0.3%
Information technology	937	18	85 (9%)	70.4%	2.5%
Consumer staples	477	15	77 (16%)	3.7%	0.3%
Utilities	233	22	61 (26%)	0.6%	0.2%
Communication services	315	31	60 (19%)	21.5%	1.4%
Materials	779	8	55 (7%)	0.8%	0.1%
Real estate	533	2	52 (10%)	21.2%	2.1%
Energy	278	87	48 (17%)	2.0%	0.1%
Health care	780	22	44 (6%)	5.5%	0.4%
Total	**7,617**	**389**	**970**	**13.0%**	**0.5%**

Data as of July 1, 2024. Relative-to-emissions columns are based on the median percentage of material users' average annual credit use as a proportion of their estimated 2022 emissions. Source: MSCI Carbon Markets, MSCI ESG Research

[8] We define sectors following the Global Industry Classification Standard (GICS®). GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.

3. Are credit users more or less transparent about their emissions?

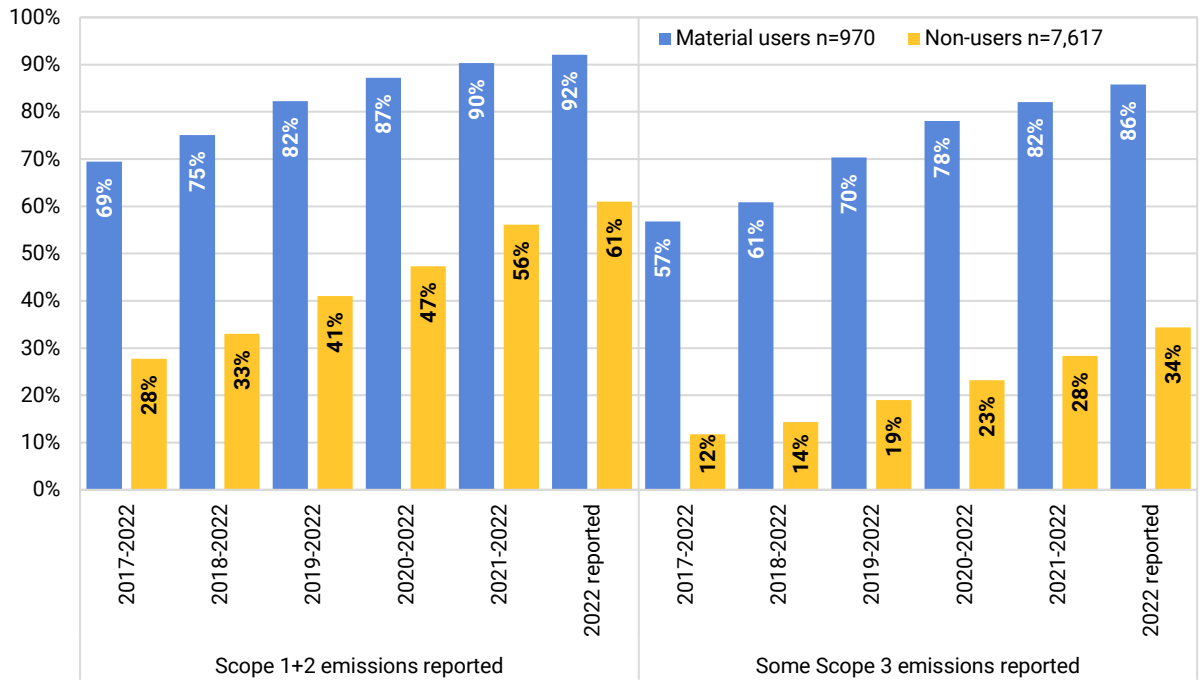
3.1 Emissions disclosure rates

Emissions disclosure among listed firms has increased over time. Of the 8,844 constituents of the MSCI ACWI IMI, the share of companies that disclosed their Scope 1 and 2 emissions increased from 33% to 64% between 2017 and 2022, and those that disclosed at least some categories of Scope 3 emissions increased from 18% to 41% during the same period.

The rates for emissions disclosure have been consistently higher among companies that used carbon credits compared to firms that did not (Exhibit 3). In 2022, for instance, material credit users were 1.5 times more likely than non-credit users to disclose their current Scope 1 and 2 emissions (92% vs. 61%), and 2.5 times more likely to disclose at least some of their current Scope 3 emissions (86% vs. 34%).

Further, 69% of material credit users disclosed their Scope 1 and 2 emissions every year from 2017 to 2022, vs. just 28% of non-users. Similarly, 57% of material credit users disclosed some categories of Scope 3 emissions every year during the same period, vs. just 12% of non-credit users.

Exhibit 3: Percentage of companies that reported Scope 1 and 2 and some categories of Scope 3 emissions each year



Data as of July 1, 2024. Analysis covers constituents of the MSCI ACWI Index. Source: MSCI Carbon Markets, MSCI ESG Research

4. Do credit users have a better or worse track record in reducing their Scope 1 and 2 emissions?

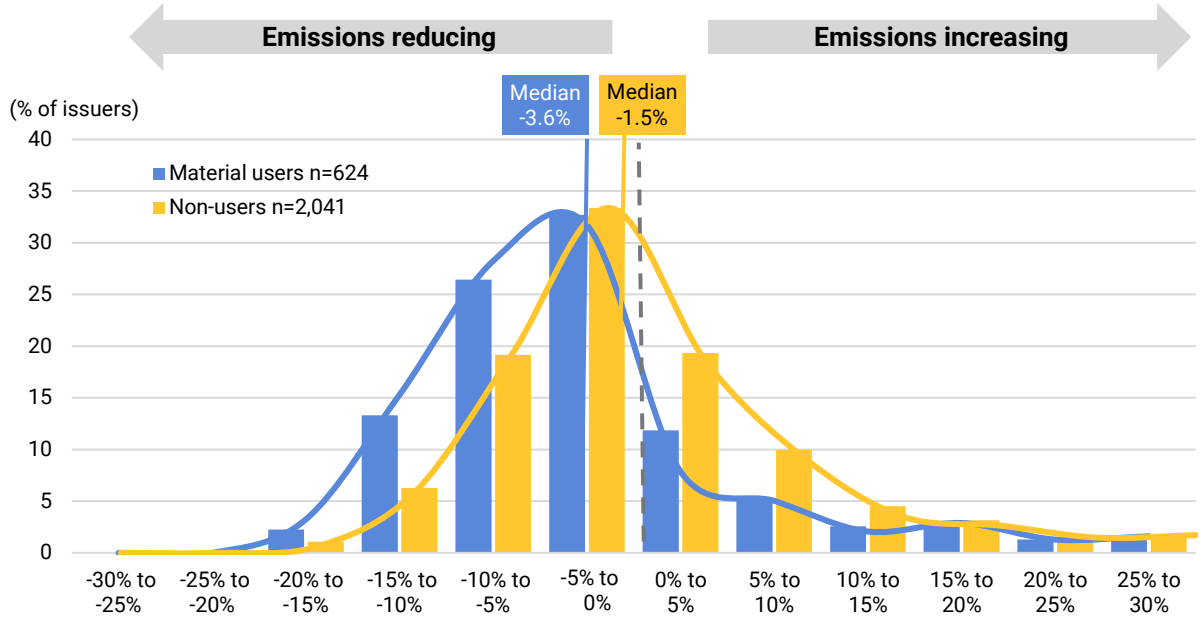
4.1 Absolute Scope 1 and 2 emissions performance

To investigate whether carbon-credit users have reduced emissions faster or slower than non-users, we focused our analysis on the 2,936 MSCI ACWI IMI constituents that reported their Scope 1 and 2 emissions for the full period from 2017 to 2022.[9]

Of these, 271 companies reported an average annual change in Scope 1 and 2 emissions of greater than ±30% year over year. These outlier companies were excluded from the analysis, given the likelihood that their change in emissions was driven by methodological or structural (e.g., acquisitions) changes, leaving 2,665 companies with complete emissions data.

It is important to note that the reported emissions used in this analysis exclude the impact of carbon-credit use or "offsets." The analysis looks at gross emissions figures rather than "net" emissions minus offsets.[10]

Exhibit 4: Distribution of annualized change in company-reported gross Scope 1 and 2 emissions for material credit users and non-users, 2017-2022



Data as of July 1, 2024. Only includes firms within the MSCI ACWI IMI that reported their Scope 1 and 2 emissions for every year between 2017 and 2022. Source: MSCI Carbon Markets, MSCI ESG Research

[9] 2023 emissions are excluded from the analysis as their reporting was still incomplete at the time of writing.

[10] Where reported, location-based Scope 2 emissions are used instead of market-based. But in a small number of cases where only market-based Scope 2 emissions are reported, these are used. Location-based emissions are calculated using the average emissions intensity of the power grid where a company consumes electricity, whereas market-based emissions reflect the electricity a company purchases for example through instruments such as renewable energy certificates (RECs) or power purchase agreements (PPAs).

Among the 2,665 companies analyzed, 624 (23%) were material users of carbon credits. Their median change in reported Scope 1 and 2 emissions between 2017 and 2022 was -3.6% p.a. Overall, 75% of the 624 material users reported a fall in their Scope 1 and 2 emissions over this period (Exhibit 4).

Both this median rate of reduction and the proportion of companies that reduced were greater among material carbon-credit users than among non-users. Among the 2,041 non-users, the median change in reported Scope 1 and 2 emissions was -1.5% p.a., less than half the rate of reduction of material credit users. Of the 2,041 non-users, 60% reported a drop in their Scope 1 and 2 emissions during the period, about two thirds the proportion of material credit users who reduced.

Of the 624 material users shown in Exhibit 4, about a quarter grew their reported Scope 1 and 2 emissions between 2017 and 2022, and about 3% (18 companies) increased their annual emissions by more than 20% p.a. These 18 companies represent about 2% of the total credit usage during 2017 and 2022.

The finding that material credit users outperformed non-users on their reported Scope 1 and 2 emissions was found to be statistically significant, using the Mann-Whitney U test (see Appendix II). It was also found to be insensitive to any of the main parameters used in the analysis such as the period analyzed or the threshold for determining material users, as shown in Exhibit 5.

For example, material credit users outperformed non-users on reducing their reported Scope 1 and 2 emissions in all time periods analyzed, whether starting in 2017, 2018 or 2019 to 2021 or 2022. Similarly, credit users were seen to have outperformed non-users regardless of what threshold of credit use is set to define a material user, and even if no threshold is used at all. The outperformance is stronger, however, the higher the threshold is set, indicating that the largest users of credits have, on average, reduced their reported emissions the fastest.

Exhibit 5: Scope 1 and 2 emissions performance of MSCI ACWI IMI constituents for different time periods and credit-use categorizations

	Time period	Credit user threshold (tCO2e)	Number of issuers		% of issuers that reduced Scope 1 + 2 emissions		Median % change p.a. in Scope 1 + 2 emissions		Statistical significance
			Credit users	Non-users	Credit users	Non-users	Credit users	Non-users	
Reported Scope 1 and 2 emissions									
Main scenario	**2017-2022**	**1,000**	**624**	**2,041**	**75**	**60**	**-3.6**	**-1.5**	**Yes**
Different time periods	2017-2021	1,000	612	2,027	76	59	-4.1	-1.5	Yes
	2018-2022	1,000	623	2,029	75	63	-4.5	-2.1	Yes
	2018-2021	1,000	616	2,016	76	62	-5.0	-2.3	Yes
	2019-2022	1,000	621	2,020	75	65	-5.0	-2.6	Yes
	2019-2021	1,000	599	1,978	74	63	-6.3	-2.7	Yes
Different thresholds for credit users	2017-2022	1	794	1,871	73	59	-3.3	-1.5	Yes
	2017-2022	100	717	1,948	74	59	-3.5	-1.5	Yes
	2017-2022	10,000	425	2,240	77	61	-4.2	-1.6	Yes
Including estimated Scope 1 and 2 emissions									
Main scenario	**2017-2022**	**1,000**	**818**	**5,250**	**66**	**47**	**-2.7**	**+0.6**	**Yes**
Different time periods	2017-2021	1,000	796	5,174	68	47	-3.3	+0.8	Yes
	2018-2022	1,000	814	5,262	67	50	-3.6	-0.1	Yes
	2018-2021	1,000	794	5,142	69	50	-4.1	-0.1	Yes
	2019-2022	1,000	813	5,221	70	54	-4.0	-0.9	Yes
	2019-2021	1,000	772	4,980	71	54	-5.2	-1.1	Yes
Different thresholds for credit users	2017-2022	1	1047	5,021	65	46	-2.5	+0.7	Yes
	2017-2022	100	947	5,121	66	46	-2.7	+0.7	Yes
	2017-2022	10,000	524	5,544	69	48	-3.1	0.5	Yes

Data as of July 1, 2024. The table only includes firms within the MSCI ACWI IMI where reported and/or estimated Scope 1 and 2 emissions were available for every year between 2017 and 2022. Green text used to highlight if users or non-users of credits had the greatest reductions in each region/sector. Source: MSCI Carbon Markets, MSCI ESG Research

We ran the same analysis after supplementing company-reported emissions data with MSCI estimates where reported data was not available. This approach has the advantage of increasing the sample size — from 2,665 to 6,068 companies[11] — and may help reduce selection bias in company reporting. On the other hand, changes in estimated emissions are mainly driven by changes in economic data at the company and industry level, such as sales data, power-generation data and industry-average emissions-intensity data. These assumptions can make results based on estimates less accurate than those based on company-reported emissions data.

[11] About 20% of the constituents of the MSCI ACWI IMI are excluded due to an absence of historically comparable data and/or being recent additions to the index. Note that reported Scope 1 and 2 emissions are used when reported rather than estimated values. An overview of the emissions estimation method can be found in Appendix I.

The results using estimated data largely mirrored the findings based on reported data, albeit with lower emissions reductions across the board (see Exhibit 5). The median change in Scope 1 and 2 emissions among material credit users was -2.7% p.a., compared to an increase of 0.6% p.a. among non-users. Overall, we estimate that 66% of material users reduced their Scope 1 and 2 emissions over this period, compared to 47% of non-users.

4.2 Scope 1 and 2 emissions performance by region and sector

The finding that material credit users have reduced emissions, on average, more quickly than non-credit users was consistent across regions, as shown in Exhibit 6. This outperformance was most pronounced in the APAC region, where the median pace of reduction in Scope 1 and 2 emissions of material credit users was four times the pace of non-users.

Credit users reported greater emissions reductions than non-users in all 11 sectors, with statistical significance in six of them. The sole outlier was the real-estate sector, where material credit users were less likely than non-users to have reported reduced absolute emissions over the period, though this was not found to be statistically significant.

Exhibit 6: Scope 1 and 2 emissions performance by region and sector, 2017-2022

Time period 2017-2022	Number of issuers		% of issuers that reduced Scope 1+2 emissions		Median % change p.a. in Scope 1+2 emissions		Statistical significance
	Material users	Non-users	Material users	Non-users	Material users	Non-users	
Region							
Americas	295	546	78	68	-4.8	-3.1	Yes
EMEA	190	428	74	63	-3.5	-1.8	Yes
APAC	139	1,067	69	54	-2.4	-0.6	Yes
Total	**624**	**2,041**	**75**	**60**	**-3.6**	**-1.5**	**Yes**
Sector							
Consumer discretionary	66	250	85	69	-4.6	-3.0	Yes
Communication services	35	63	83	68	-4.9	-2.0	Yes
Financials	132	204	82	73	-6.7	-4.1	Yes
Utilities	37	82	81	61	-3.5	-1.6	No
Consumer staples	54	157	74	59	-2.0	-1.3	No
Materials	39	309	72	51	-1.4	-0.1	Yes
Industrials	118	416	69	58	-2.6	-1.1	Yes
Information technology	45	210	69	56	-3.8	-0.6	No
Health care	32	127	69	40	-2.5	+1.5	Yes
Real estate	37	132	62	73	-5.0	-4.4	No
Energy	29	91	59	55	-1.7	-1.3	No
Total	**624**	**2,041**	**75**	**60**	**-3.6**	**-1.5**	**Yes**

Data as of July 1, 2024. Analysis covers constituents of the MSCI ACWI IMI. The table only includes those firms within the MSCI ACWI IMI that reported their Scope 1 and 2 emissions for every year between 2017 and 2022. Green text used to highlight if users or non-users of credits had the greatest reductions in each region/sector. Source: MSCI Carbon Markets, MSCI ESG Research

4.3. Scope 1 and 2 emissions intensity performance

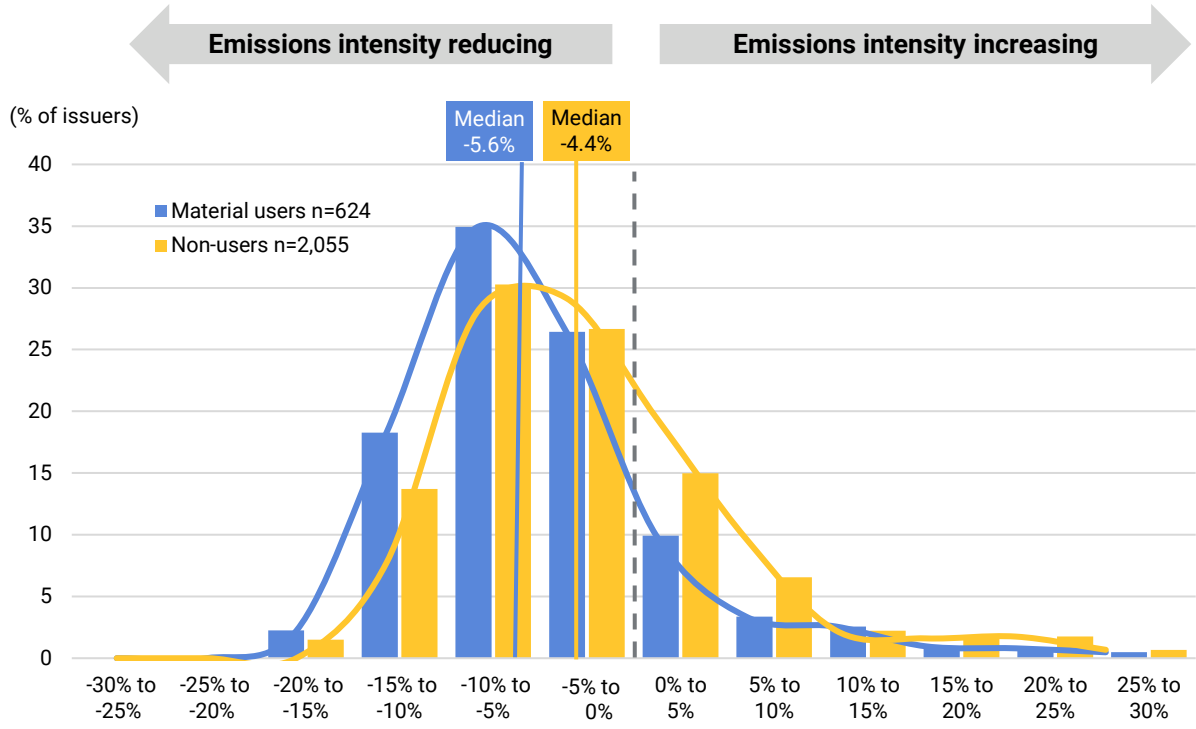
In general, companies were able to reduce their carbon intensity (i.e., emissions per USD of revenue) more quickly than their absolute emissions. This effect is seen across both material credit users and non-users, with credit users sustaining their statistically significant outperformance vs. non-users on this measure of emissions.

The median reduction in reported Scope 1 and 2 emissions intensity between 2017 and 2022 was 5.6% p.a. for material credit users vs. 4.4% p.a. for non-users. As shown in Exhibit 7, among the 624 material credit users, 82% reported a reduction in their Scope 1 and 2 emissions intensity. In contrast, 72% of non-credit users did the same.

On a global basis, the emissions intensity outperformance of material credit users vs. non-users was found to be statistically significant. Similar to absolute emissions, it was also found to be insensitive to any of the main parameters used in the analysis such as the period analyzed or the threshold for determining material users.

While emissions-intensity outperformance by material credit users was seen across regions and sectors, this was found to be statistically significant in only four sectors: consumer discretionary, health care, industrials and information technology.

Exhibit 7: Distribution of annualized change in company-reported gross Scope 1 and 2 emissions intensity, 2017-2022



Data as of July 1, 2024. Only includes firms within the MSCI ACWI IMI that reported their Scope 1 and 2 emissions for every year between 2017 and 2022. Source: MSCI Carbon Markets, MSCI ESG Research

5. Do credit users have a better or worse track record in reducing Scope 3 emissions than non-users?

5.1 State of Scope 3 emissions disclosure at category levels

Companies can use carbon credits to compensate for value-chain emissions that fall beyond their direct control. Consequently, examining credit users' emissions performance is incomplete without considering Scope 3 emissions, though this analysis encounters significant data challenges.

Our analysis shows that corporate disclosure rates for Scope 3 emissions improved between 2017 and 2022, moving from 20% to 41% (Exhibit 8). Further, the percentage of those firms that disclosed at least one category of Scope 3 emissions reached 86% among 970 material credit users, compared to only 34% among the 7,617 non-users (Exhibit 3).

Fewer companies, however, reported Scope 3 emissions at the category level and total reported Scope 3 figures are often incomplete. Reporting was more common for the upstream parts of the value chain than for downstream, though even upstream disclosure rates peaked at 35% (category 6 — business travel-related emissions).

Exhibit 8: Disclosure rates of Scope 3 emissions per category

Reporting year		2017	2018	2019	2020	2021	2022
# of MSCI ACWI IMI issuers		8,844	8,844	8,844	8,844	8,844	8,844
Scope 3 upstream	Category 1: Purchased goods and services	12%	13%	18%	22%	27%	30%
	Category 2: Capital goods	8%	9%	12%	15%	19%	22%
	Category 3: Fuel and energy related activities	11%	13%	17%	21%	25%	28%
	Category 4: Transportation and distribution	11%	12%	15%	18%	23%	25%
	Category 5: Waste generated in operation	12%	13%	18%	22%	26%	29%
	Category 6: Business travel	17%	19%	24%	28%	32%	35%
	Category 7: Employee commuting	11%	13%	17%	20%	25%	28%
	Category 8: Leased assets	5%	5%	6%	8%	10%	11%
Scope 3 downstream	Category 9: Transportation and distribution	8%	9%	11%	13%	16%	17%
	Category 10: Processing of sold products	4%	4%	4%	5%	7%	7%
	Category 11: Use of sold products	7%	8%	10%	13%	15%	17%
	Category 12: End-of-life treatment of sold products	6%	7%	8%	10%	13%	15%
	Category 13: Leased assets	5%	5%	6%	8%	10%	12%
	Category 14: Franchises	3%	3%	3%	4%	5%	5%
	Category 15: Investments	4%	4%	5%	6%	8%	9%
% of issuers that reported at least one Scope 3 category		**20%**	**23%**	**29%**	**34%**	**40%**	**41%**

Data as of July 1, 2024. When companies did not define the categories of Scope 3 emissions they disclosed, we assumed they reported on all categories in the table above. At the time of this research, we were in the process of collecting corporate-emissions data for 2022 and 2023. Source: CDP, MSCI Carbon Markets, MSCI ESG Research

5.2 Reported Scope 3 emissions performance by category

Varying disclosure levels across companies mean that it is more reasonable to assess reported Scope 3 emissions performance at the category level than at the scope level. In line with the approach used in the analysis of reported Scope 1 and 2 emissions, our assessment applied an outlier removal ratio of ±30% year over year, and credit user thresholds of 1,000 tCO2e of carbon credit used.

Using this approach, we were only able to find evidence that material users of credits outperformed non-users in the reduction of category 6 (business travel) emissions (Exhibit 9). Category 6 is typically one of the smallest in terms of contribution to overall value-chain emissions and makes up only 0.5% of estimated total emissions for companies in the MSCI ACWI IMI.

Overall, the results are inconclusive, but this could be a useful area to explore in the future by enriching the analysis with estimated data.

Exhibit 9: Distribution of companies that reported Scope 3 emissions reduction at category level by region and sector, 2019-2022

Scope 3 Category		Number of issuers		% of issuers that reduced Scope 3		Median change in Scope 3 p.a.		Statistical significance
		Material users	Non-users	Material users	Non-users	Material users	Non-users	
Scope 3: upstream	1. Purchased goods and services	60	135	60.0	68.9	-0.9	-2.9	No
	2. Capital goods	34	76	58.8	51.3	-1.0	-0.2	No
	3. Fuel and energy related	49	106	65.3	61.3	-3.0	-1.1	No
	4. Upstream transport / dist.	42	87	45.2	52.9	+0.6	-1.0	No
	5. Waste generated in operations	44	102	68.2	56.9	-6.3	-0.9	No
	6. Business travel	82	139	90.2	77.7	-15.3	-8.1	Yes
	7. Employee commuting	47	93	63.8	64.5	-1.9	-2.1	No
	8. Upstream leased assets	6	20	33.3	65.0	+9.0	-3.6	No
Scope 3: downstream	9. Downstream transport / dist.	23	52	65.2	55.8	-1.1	-0.1	No
	10. Processing of sold products	7	16	57.1	87.5	-6.5	-5.1	No
	11. Use of sold products	34	65	70.6	61.5	-3.6	-2.6	No
	12. End of life treatment	26	49	50.0	53.1	+0.1	-0.2	No
	13. Downstream leased assets	9	20	66.7	75.0	-2.4	-6.2	No
	14. Franchises	5	8	60.0	62.5	-1.3	-2.5	No
	15. Investments	5	13	60.0	46.2	-0.5	+1.6	No

Data as of July 1, 2024. The table only includes those firms within the MSCI ACWI IMI that reported their Scope 3 emissions at the category level between 2019 and 2022. Source: MSCI Carbon Markets, MSCI ESG Research

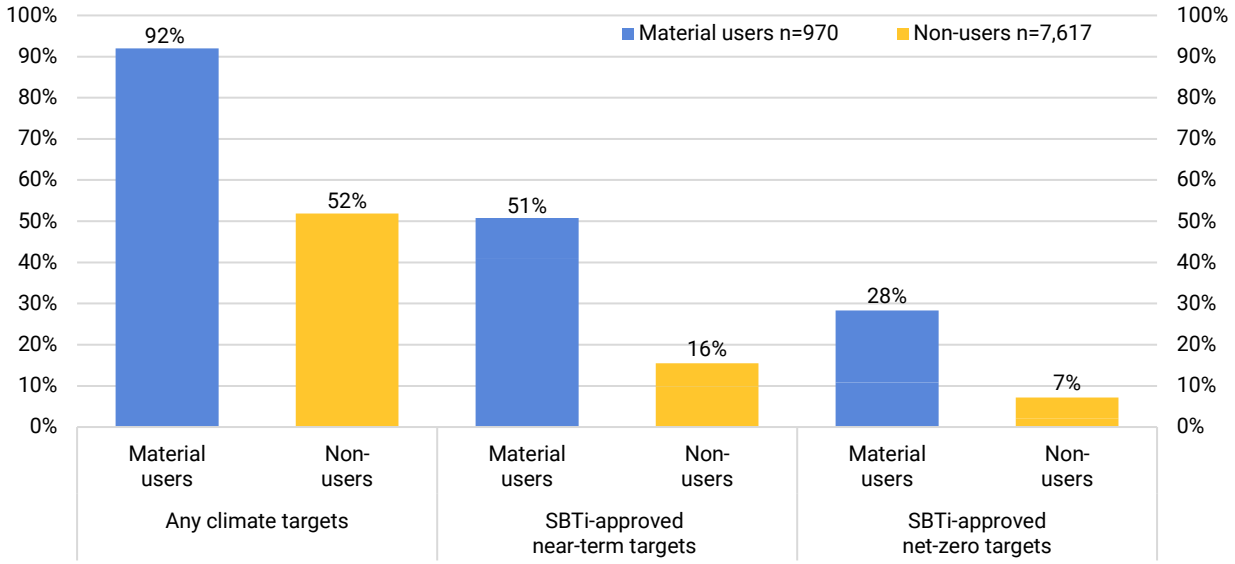
6. Are credit users more or less ambitious in setting targets?

6.1 Climate-target setting

Climate-target setting indicates a company's intent to reduce its emissions below current levels. As shown in Exhibit 10, almost all (92%) of the 970 material users in the MSCI ACWI IMI have set some type of climate target. This is nearly double the proportion (52%) of the 7,617 non-users.

Of the 970 material users, 51% have set, or committed to set, near-term emissions reduction targets that have been approved by the Science Based Targets initiative (SBTi), and 28% of them have set, or committed to set, an SBTi-approved net-zero target. This is more than triple the proportion of non-users that have set SBTi-approved targets, which stands at only 16% and 7%, respectively.

Exhibit 10: Proportion of firms setting different types of climate targets



Data as of July 1, 2024. Of 970 material users, 10% and 18% committed to set SBTi-approved near-term and net-zero targets, respectively, but have not yet had those targets approved; and of 7,617 non-users, 6% and 5% committed to set SBTi-approved near-term and net-zero targets, respectively, but have not yet had them approved. Source: SBTi, MSCI Carbon Markets, MSCI ESG Research

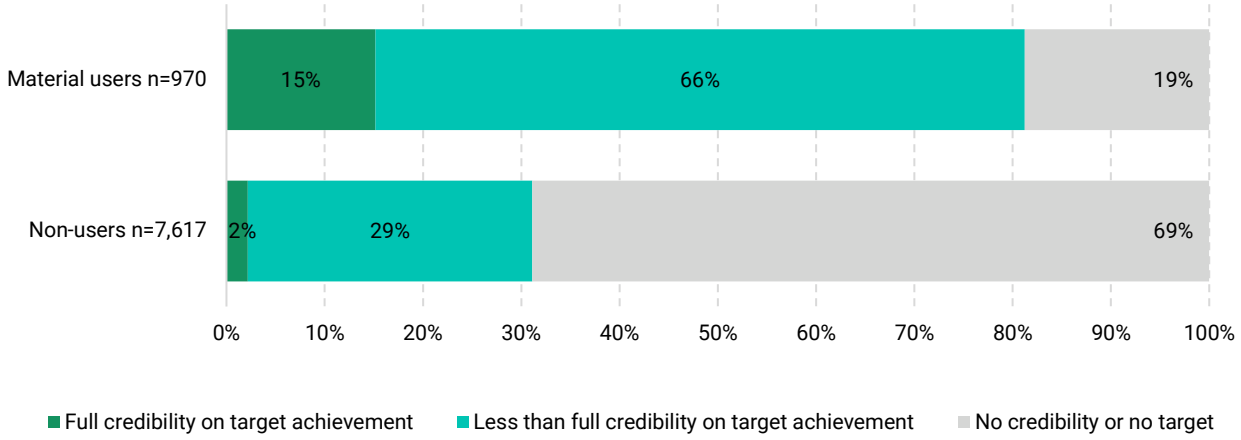
6.2 Target credibility

Achieving climate targets remains a more demanding prospect than setting them. Using several key indicators recommended by the Glasgow Financial Alliance for Net Zero (GFANZ), MSCI has created a target-credibility weighting system to help investors assess whether companies have taken the steps necessary to achieve their targets. To assess the credibility of a company's climate target, we look at four indicators:

- At least one short-term target for the relevant scope
- At least one externally validated target
- A track record of achieving past targets
- A current trajectory to meet at least some ongoing targets

As shown in Exhibit 11, 15% of material users are considered to have full credibility in achieving their emissions-reduction targets, meaning they met all four of the above criteria vs. only 2% of non-users. Further, a higher proportion of the material credit users than non-users (66% vs. 29%) met at least one of these criteria. In other words, not only do a higher proportion of credit users than non-users have a climate target, but a higher proportion of their targets appear to be credible.

Exhibit 11: Credibility of climate targets set by material users and non-users of credits



Data as of July 1, 2024. Analysis covers constituents of the MSCI ACWI IMI. Source: MSCI Carbon Markets, MSCI ESG Research

6.3 Low-carbon technologies

Transitioning to a net-zero economy depends on industry reducing its emissions through innovation.[12] In the long term, companies can innovate and adjust their business strategies to reposition themselves to reduce emissions while gaining a competitive advantage in the marketplace.[13]

One measure of a company's commitment to developing low-carbon technologies is the proportion of its revenue derived from low-carbon solutions. Our analysis indicated that credit users showed higher estimated shares of revenues from low-carbon-technology solutions than non-users (6.2% vs. 4.8%). This was observed across all sectors except for industrials and consumer staples.

Exhibit 12: Estimated share of revenues from low-carbon solutions

Sector	% of revenues from low-carbon solutions	
	Credit users	Non-users
Real estate	36.4	14.9
Utilities	21.4	20.7
Industrials	7.8	8.1
Information technology	5.5	5.2
Materials	5.3	3.8
Consumer discretionary	3.6	3.5
Energy	3.3	1.7
Consumer staples	1.7	2.1
Communication services	0.5	0.4
Financials	0.1	0.1
Health care	0.1	0.1
Total	**6.2**	**4.8**

Data as of July 1, 2024. Only includes firms within the MSCI ACWI IMI that reported their Scope 3 emissions between 2017 and 2022. Source: MSCI Carbon Markets, MSCI ESG Research

[12] Craig A. Hart, *Climate Change and the Private Sector: Scaling Up Private Sector Response to Climate Change* (Routledge, 2013).

[13] Ibid.

7. Conclusion

7.1 Summary of key findings

Among the 8,844 constituents of the MSCI ACWI IMI as of July 2024, carbon credits had been used by around 14% of companies between 2017 and 2022. Our research found that material carbon-credit users were more transparent than non-users in disclosing their Scope 1, 2 and 3 emissions and were more likely to have set credible emissions-reduction targets. In addition, they had a higher share of low-carbon revenues than non-users, which can contribute to real-economy decarbonization.

Credit users outperformed non-users on almost all measures of emissions performance between 2017 and 2022. Material users of carbon credits were more likely than non-users to have reduced their Scope 1 and 2 emissions, at a median rate of 3.6% p.a., compared to 1.5% p.a. among non-users.

While carbon-credit users generally reduced emissions faster than non-users, some credit users still increased their emissions during this period and a small number did so significantly. To understand corporate climate performance, it therefore remains important to consider each individual company's performance against multiple criteria.

7.2 Implications

These findings contradict the assertion that companies voluntarily using carbon credits are creating a license to pollute. In fact, the evidence of the last five years suggests the opposite — that users of carbon credits typically outperform non-users in disclosing and reducing their own emissions, setting targets and investing in low-carbon technologies.

Existing data is insufficient to determine causality — are climate leaders more likely to use carbon credits or are carbon-credit users more likely to become climate leaders? But there is reason to believe that carbon-credit use can be complementary to a company's climate-change strategy. This could be, in part, because when purchasing credits, companies voluntarily attach a price to their emissions, which may strengthen the internal business case to reduce emissions. It seems that firms engaging with credits are likely to take their climate impact seriously, though it remains to be seen whether this relationship holds over time or is unique to the first wave of adopters.

Analyzing companies' historical emissions, targets and low-carbon investments alongside carbon-credit usage can help investors understand a company's true climate performance. There are data and tools that might eventually guide the implementation of stricter criteria on the use of carbon credits by companies and enhance market confidence in the voluntary carbon market.

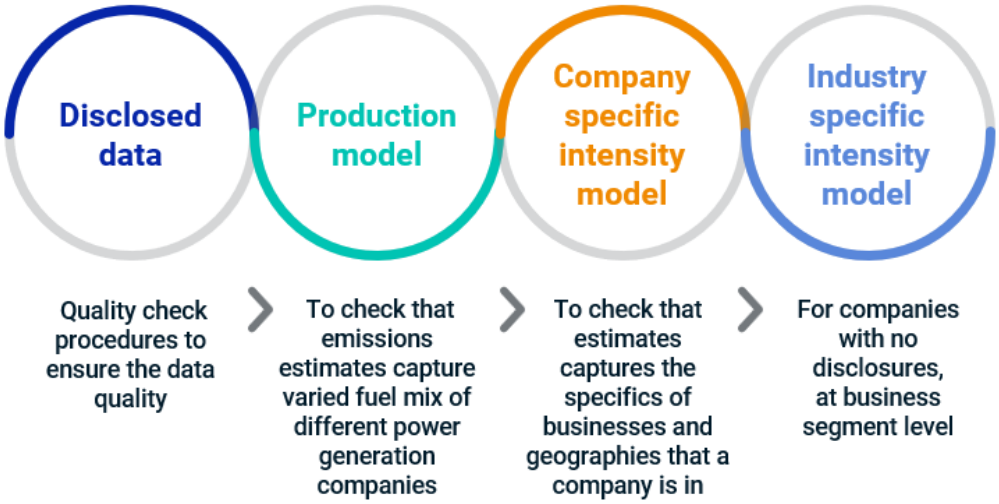
Appendix I: Scope 1 and 2 emissions estimation

MSCI collects carbon-emissions data reported by companies. To ensure consistency, however, estimates are made for emissions if a company's reporting does not align with the Greenhouse Gas Protocol framework or does not represent emissions across all its geographies and operations. To do so, we apply our proprietary Scope 1 and 2 carbon-emissions estimation models. The same applies for companies that do not report Scope 1 and 2 carbon-emissions data.

Under this approach, data disclosed by companies (current and historical) is used to estimate carbon-emissions intensity at the company level and at the industry-segment level.

MSCI ESG Research estimates a company's carbon emissions using one out of following three models in the given order of preference — production model, company-specific intensity model and industry-segment-specific intensity model. Scope 1 and Scope 2 carbon emissions are separately estimated, which allows us to consider partly disclosed data (e.g., only Scope 1 or Scope 2) and use the best model, from below-mentioned options, after considering the disclosed data availability.[14]

Exhibit A1: Scope 1 and 2 emissions estimation methodology



Source: MSCI ESG Research

[14] For further details, see "MSCI Greenhouse Gas Emissions Methodologies," MSCI ESG Research, June 2024 (client access only).

Appendix II: Statistical methods

Objective of statistical analysis

The goal in this research was to analyze the distribution of carbon-emissions data for two distinct groups: companies classified as material carbon-credit users and non-users. The first step in the analysis was to determine whether the emissions changes in these groups followed a normal distribution, in order to decide which statistical tests are appropriate for evaluating the trends of carbon-credit users on emissions.

Statistical tests conducted for normality check

To assess whether the emissions data for the two groups (users and non-users) followed a normal distribution, we performed two common tests for normality for each:

1. **Shapiro-Wilk test**: This test was chosen for its power in detecting departures from normality, particularly for smaller sample sizes. It evaluates whether the data differs significantly from a normal distribution by comparing the observed distribution of the data to a theoretical normal distribution.
2. **D'Agostino's K-squared test**: This test is useful for detecting deviations from normality by looking at both the skewness (asymmetry of the data) and kurtosis (tailedness of the data). It complements the Shapiro-Wilk test by providing a broader perspective on the data's distribution.

Why the normality check is important

The normality of data influences the type of statistical test we can use to evaluate differences between groups. If the data follows a normal distribution, parametric tests like the t-test are suitable. If the data is not normally distributed, non-parametric alternatives such as the Mann-Whitney U test are preferred. Non-parametric tests do not assume normality and can provide more robust results when the data contains significant deviations from normality.

Why we used the Mann-Whitney U test over a simple t-test

After conducting our normality tests, both the Shapiro-Wilk and D'Agostino's K-squared tests indicated that the data for both users and non-users did not follow a normal distribution (p-values < 0.05 for both tests). Given these results, a parametric test like the t-test would not be appropriate, as it assumes normally distributed data.

Instead, we used the Mann-Whitney U test as a non-parametric alternative to the t-test, as it is better for comparing two independent groups when the data is non-normal. It evaluates whether the distributions of the two groups are different without making assumptions about the shape of the distributions. This test was chosen because it is more robust for skewed or non-normal data, which our analysis revealed.

How we processed the data

To ensure data quality and remove the impact of extreme outliers that could skew the results, we took the following steps:

1. **Outlier removal using compound annual growth rate (CAGR)**: We applied a filter to exclude companies with absolute emissions-change values outside the range of +30% to -30%, based on their CAGR. This helped us focus on companies with more realistic changes in emissions over time.
2. **Additional outlier removal**: Another layer of outlier removal was applied to eliminate companies with extreme percentage changes that could be attributed to corporate actions (e.g., mergers or acquisitions) that the previous CAGR method might not have captured. This further refined our dataset by removing noise that could distort the statistical analysis.

By performing these steps, we ensured that the emissions data for both users and non-users represented a more accurate picture of true changes in emissions, allowing for a cleaner comparison between the two groups.

Detailed results of normality tests

The results of our normality tests are shown in Exhibit A2.

As both tests indicated significant deviations from normality in both datasets, we proceeded with the Mann-Whitney U test to compare the emissions changes between credit users and non-users.

Given that both datasets failed the normality tests, we employed the Mann-Whitney U test to assess the impact of carbon-credit users on emissions. This non-parametric test was chosen over the t-test due to the non-normal distribution of the data. By ensuring robust data handling (through outlier removal and appropriate statistical tests), we were able to conduct a reliable analysis of the relationship between carbon-credit purchasing and emissions changes.

Exhibit A2: Detailed results of normality tests

Dataset	Test	Test statistic	p-value	Conclusion
Credit users	Shapiro-Wilk	0.87	0.0000	Not normally distributed
Credit users	D'Agostino's K-squared	172.15	0.0000	Not normally distributed
Non-users	Shapiro-Wilk	0.92	0.0000	Not normally distributed
Non-users	D'Agostino's K-squared	394.08	0.0000	Not normally distributed

Data as of July 1, 2024. Source: MSCI Carbon Markets, MSCI ESG Research

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