AlliedOffsets

Corporate Emissions Data & Findings

An Exploration of Corporate Emissions Data and Latest Trends in Scope 1, 2 and 3 Emissions

Introduction

Executive Summary & Data Overview

This report is a deep dive into the latest corporate emissions data and trends from 2023, which we collect as part of our dataset on voluntary carbon market participants. Reporting quality has noticeably improved in the last year or so, with over 1,000 companies now communicating emissions by scope in their sustainability disclosures.

As expected, energy, materials, mining, and aviation are the most polluting sectors on average. The largest proportional shift in emissions across any sector or year occurred in aviation in 2020, aligning with the pandemic-related travel drop. However, levels nearly rebounded last year and are forecast to rise further.

On a more optimistic note, Scope 2 emissions have, on average, declined for at least three consecutive years in 17 out of 20 sectors. More than 80 companies have reported zero Scope 2 emissions at least once in the past four years.

However, over 400 companies with data for Scopes 1 and 2 lack Scope 3 figures. This is partly attributed to the difficulty of accounting for this category.

Definitions

Scope 1	Greenhouse gases that an organization emits from sources it owns or controls directly
Scope 2	Indirectly produced greenhouse gases associated with an organization's purchase of electricity, heat, steam, or cooling
Scope 3	Greenhouse gases from upstream and downstream of an organization's supply chain prior to production processes in Scope 1, or from the use or disposal or the product

Emissions Data

3,230

Number of individual sustainability reports

1,202

Number of companies with emissions data

83

Number of companies with 0 for scope 2 emissions

458

Number of companies with scope 1 & 2, but no scope 3 data

Introduction
Data Collection Process & Highlights

Our emissions data collection efforts emphasize the work AlliedOffsets is doing to provide sector-wide visibility on contributions to carbon dioxide emissions, and concomitantly to reveal the possible scale and role of carbon markets in response.

Underpinning AlliedOffsets's core offerings as the voluntary carbon market's (VCM) largest data provider is the increasingly pressing drive to reduce the emissions that carbon markets are attempting to counteract.

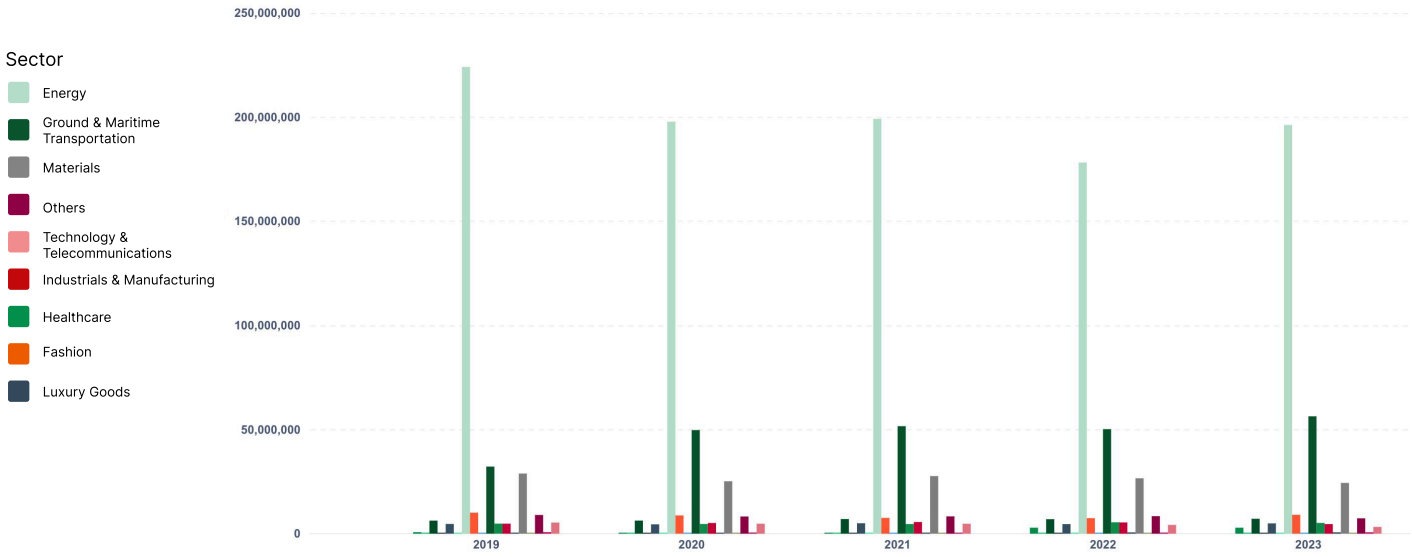
The case for richer corporate emissions data to complement our market-leading repository of credit transaction activity emerged in two forms over the last year: to provide sector-wide visibility on contributions to atmospheric carbon dioxide as recorded by companies themselves, and concomitantly to reveal the possible scale and role of carbon markets in response. There are myriad ways for this wealth of corporate emissions data to be used; indeed, the proportion of credits retired in relation to a company's footprint is already used to calculate AlliedOffsets buyer ratings. Interest has also been expressed in joining company-level disclosures with asset level emissions, improving public corporate accountability, and pinpointing industrial processes in need of urgent abatement technology intervention.

The task of collecting 2023 emissions data from corporate sustainability reports was initiated in the early summer of 2024. Locating and storing these records is an ongoing task that will also be refreshed for next year's batch of reports. Scroll to **Looking Forward** (page 9) for more on the integration of this compilation to AlliedOffsets's main database. As of October 2024, our archives contain over 3,000 unique reports.

The process of collating this data also revealed much about the evolving culture around corporate sustainability; an increasing breadth of metrics and ambitions spanning well beyond atmospheric greenhouse gas emissions suggests that the target setting and reporting process is something that is now taken more seriously and receives greter external attention. See the **Learnings section** (page 4) of this report for more information.

Below is a snapshot of the emissions data we have collected and visualised, presented as average total emissions by year, by buyer sector.

Total Average Emissions (tCO2e) by Buyer Sector, By Year



Introduction
Data Overview & Key Numbers

Methodology

Emissions data is retrieved directly from the sustainability, non-financial disclosures, and annual reports of companies in the AlliedOffsets buyer database, prioritised by volume of VCM retirements. This means that the dataset is smaller in sectors that are less active in the VCM, such as legal companies and education. Reports must be available online, in English. Documents are primarily drawn from the years 2020 to 2023, as reporting is noticeably patchier prior to this period.

Emissions are broken down by scopes, with numbers calculated using the market-based methodology prioritised over location-based where the choice is available, in order to provide more accurate readings for the specific energy contracts chosen by the companies. In total, our database now contains emissions for **1,202 discrete companies, which currently can be viewed on Buyer profiles.**

Given the huge variations in data and the sheer volume of documentation involved, two tiers of vetting are in place. Built into the internal AlliedOffsets database is a system for flagging and nullifying outliers from a company's same scope across different years, where:

- the total spread between minimum and maximum is greater than 10,000
- and the proportional spread between minimum and maximum is greater than 100%
- unless the outlier is "too low" and the year is 2020, in which case the values are kept because of the likelihood that emissions were dramatically reduced by COVID-19 pandemic.

Emissions are also sorted by sector, and scopes compared across companies, with those varying by a factor of ten or more – adjusted for the size of the company – queried back at the source document.

Nonetheless, errors are possible and we embrace corrections. The quality of our data is constantly improving as we become more adept at identifying outliers and innovating the data collection process. This includes becoming more familiar with the many ways in which seemingly well-defined data parameters can actually be represented, such as "equity approaches" to calculating the footprint of shared polluting assets. If you spot anything aberrant in these records or can offer more detail, **please reach out.**

Introduction
Learnings during the data collection process

As anticipated, the quality of reporting has improved in recent years.

In fact, over 1,000 companies disclosed their emissions by scopes, with many specifying if the reporting period is financial versus calendar year, and multinational corporations giving group and location-specific footprints.

Reports from the last two years also display a higher rate of references to the use of specific accounting standards, like the **GHG Protocol** (e.g. Man Group, BASF) or **Global Reporting Initiative** (e.g. Samarco). Energy management systems like ISO50001 have also been used to identify improvement opportunities and decrease emissions while maintaining growth (e.g. Paiho Group). As much as its stance on the use of carbon credits for scope 3 emissions has stoked ire and criticism from within the VCM, the prevalence of reports including mid-term decarbonisation goals guided by SBTI (e.g. Cargill) show that it offers a useful time-bound structure for corporations. Many companies' footprints had been audited (e.g. Lockton) by a range of specialised consultancies such as Carbon Footprint Ltd. and well known ones such as PWC.

Sticking points in this process have revealed the weakness inherent to voluntary climate impact disclosures, however. Work to retrieve more 2019 and 2020 data continues, as records from this time are peppered with broken links, archived pages, or inconsistencies in the data. Most reports lack named individuals responsible for the authorship and maintenance of these resources, and low response rate to outreach may be due in part to testimonies collected by **NASDAQ** on how small sustainability teams tend to be, even at very large companies.

Separately, otherwise polished reports might refer to ambitions and percentage decreases in emissions, but obfuscate raw numbers to an extent that seems hard to attribute to limited human capacity. All of this opacity has two negative implications: greater difficulty in ensuring that major polluters are accountable for their greenhouse gases, and reduction in the accuracy with which emissions forecasts and rates of decarbonisation can be calculated.

A less anticipated learning from this process is the prevalence of values being retroactively revised due to changes in accounting methodology (Terpel), baselining (e.g. Taylor Wimpey), expansion of the reporting scope (e.g. Cosentino), or business acquisitions. One particularly detailed example of this comes from the Thai power company PTT Group, whose Scope 1 and 2 data for 2019 - 2022 underwent recalculations in 2023 due to expansion of the organisational boundary.

This pertained to changes across numerous subsidiaries, the consolidation of Thai Oil Power and TP operations in 2021, and the acquisition of power and steam generation operations of GLOW Group in 2019. **As a result, the Scope 2 data for 2022 in the report from that year was revised by dramatic 850,000tCO2e down to 45,390,000tCO2e.** This emphasises the importance of checking the profile of each company individually and annually.

To better illustrate the shifts in emissions data, we have compiled findings from our own research, including the text box below. Here we highlight in brief some of the most dramatic year on year changes we've recorded, but please see more in the appendix on **page 10.**

Examples: Changes in Scope 1, 2 & 3 Emissions between 2022 and 2023

1. Tata Consumer Products reported a **837% increase** in scope 1 emissions
2. British Land reported a **121% increase** in scope 2 emissions
3. A2A reported a **+266% increase** in scope 3 emissions

On a more positive note:

1. Sourceful reported a **99% decrease** in scope 1 emissions
2. Signify reported a **100% decrease** in scope 2 emissions
3. Singtel reported a **56% decrease** in scope 3 emissions

See the appendix on page 10 for more examples →

Emissions Data Coverage & Findings

Scope 1 Emissions

As anticipated, energy, materials, mining, and aviation are the most polluting industries.

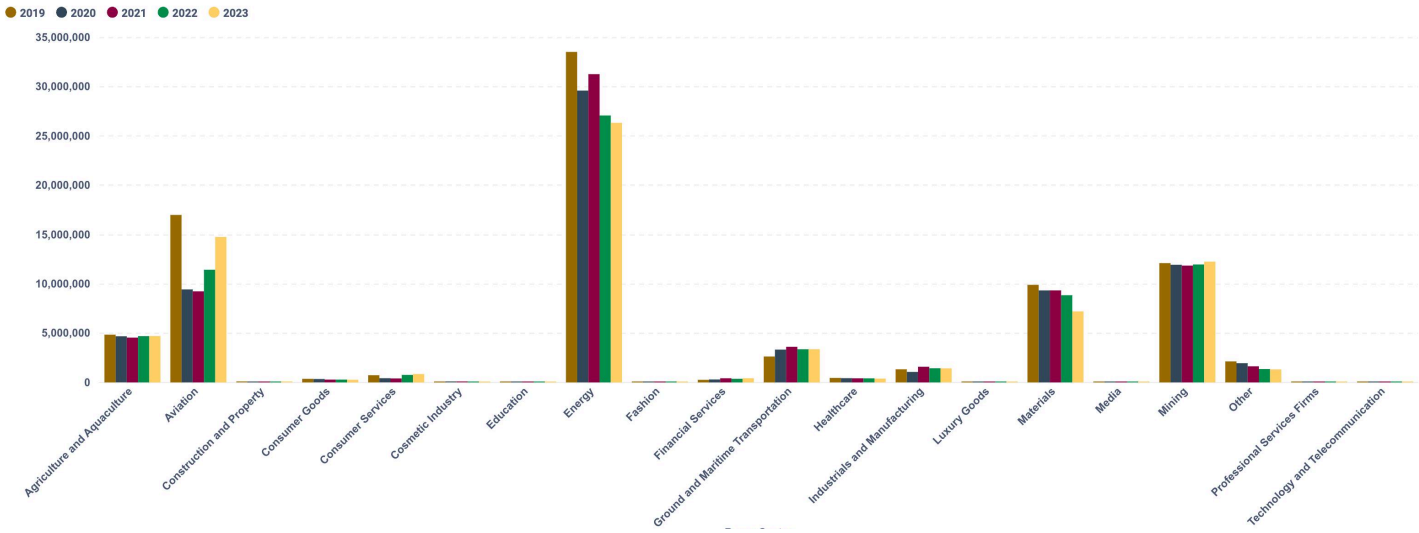
While new additions to the AlliedOffsets emissions database primarily represent activity from 2022 and 2023, the bar charts of average emissions by sector below go back to 2019 to show broader patterns of change. As anticipated, energy, materials, mining, and aviation are the most polluting industries.

The former leads by a significant margin; at an average of 33,507,719tCO2e, energy's average 2019 emissions are almost twice as large as the next biggest sector, aviation. By both volume and regularity of retirements, it is companies from these sectors which also most consistently feature in the top ten of our **Buyer rankings,** such as Eni and Volkswagen.

Caveats to the findings

1. In order to show coherent trends, only companies for which we have all five years of data are included. This means that some sectors are better represented in terms of the number of companies involved than others.
2. AlliedOffsets sector mapping is relatively broad both in terms of the types of companies covered by one label, and the size of companies included. There can be significant variation in emissions ranges as a result. Therefore, outlying companies operating on a smaller scale which have very low footprints below 100tCO2e have been excluded from the graphs.
3. Quality assurance of this extensive dataset is ongoing and numbers may be subject to correction.

Scope 1 Emissions (tons of CO2e) by Company Sector



The most striking change in average emissions comes from aviation in 2020, coinciding neatly with the drop in pandemic travel and almost recovering last year.

Two of the companies in this set - Delta Air Lines and easyJet - are SBTi-committed to 2035 emissions reductions targets, while the others are aiming for net zero by 2050. Given the predicted continued rise in both consumer and business air travel in tension with the lack of commercial supply of sustainable aviation fuel, it remains to be seen how this sector can decarbonise.

The cause for the change in the materials sector was less immediately apparent and has been the subject of particular scrutiny during the data gathering process.

This category includes companies producing chemicals, metals, and cementitious goods, which are all emissions-intensive due in part to high energy consumption requirements, often fulfilled by coal or methane-rich natural gas. More in-depth investigation of the reports pointed to common reasons for the decrease in Scope 1 and 2 (see below) from 2022 to 2023: increased use of renewable energy through a combination of investments in solar and wind assets, improved resource efficiency such as thermal recycling, and installation of abatement technology at point sources. High or fluctuating prices of natural gas also stemmed production levels, ergo reducing emissions.

Emissions Data Coverage & Findings

Scope 2 Emissions

While it would have once been met with suspicion, many companies are now correctly reporting a 0 value for Scope 2 thanks to switches to renewable energy providers, power purchase agreements and renewable energy certificates. Over 80 companies have reported 0 Scope 2 emissions at some point in the last four years. This is proving to be one change that is true across all sectors, with examples ranging from Asana (Technology and Telecommunications) and BASF (Materials and Chemicals), to SCX - Banco de Chile (Financial Services) and CBO Holding (Ground and Maritime Transportation). Emissions have decreased for at least three consecutive years in 17 out of 20 sectors.

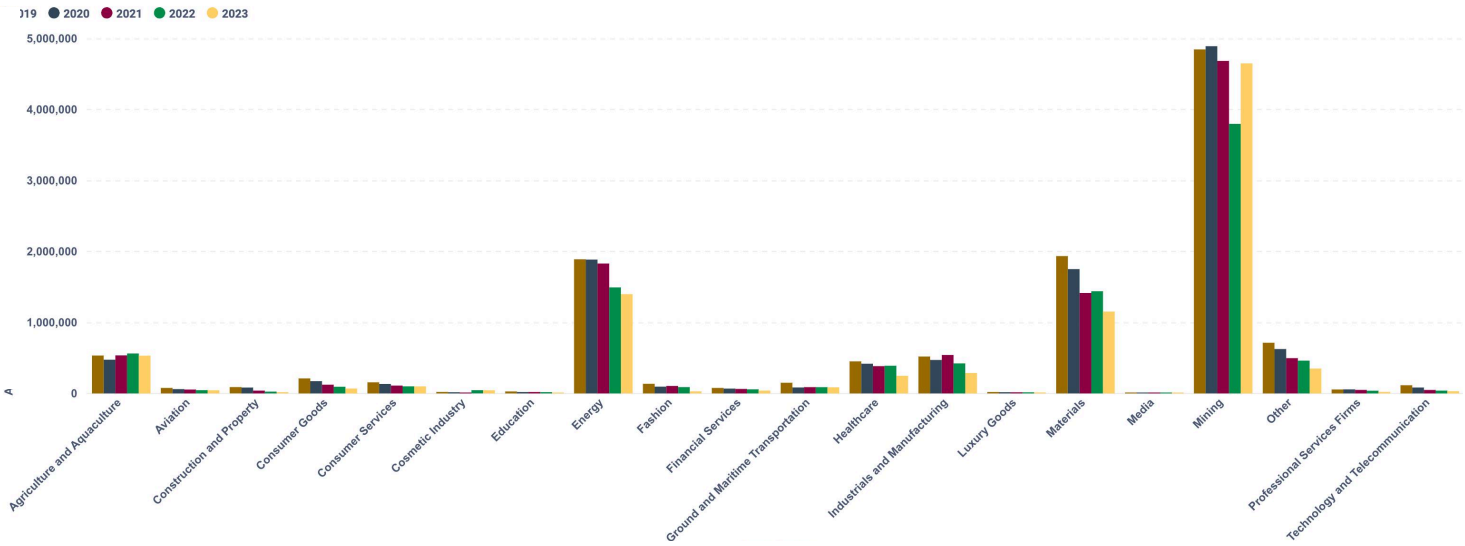
Among them is the FTSE100-listed mining company Antofagasta. Since April 2022, the conversion of all electricity supply at its four mining sites to renewable contracts led to a reduction of 873,695tCO2e in its Scope 2 emissions compared to the previous year.*

The overall decline in this category of emissions over the last five years has declined steadily by around 20% year on year, bar mining.

For companies that have switched purchased energy sources, Scope 2 undergoes a step change (see the table of biggest percentage changes between years). For example, Antofagasta's emissions in this category are now a mere 16tCO2e. However, emissions from companies that are yet to make the change remain largely similar over time, therefore obscuring the progress elsewhere when all the values are averaged together. Challenges to scaling the renewables market in specific regions may be a contributing factor to this uneven progress: in the UK, the waiting time for grid connection for new renewable energy projects remains at over a **decade.**

Emissions have decreased for at least three consecutive years in 17 out of 20 sectors.

Scope 2 Emissions (tons of CO2e) by Company Sector



**This exact number is no longer true as Scope 2 figures for 2020 and 2021 have been restated applying the GHG Protocol market-based reporting method. Previously, average emission factors for the entire country of Chile were used.*

Data Findings & Trends

Scope 3 Emissions

Accounting for Scope 3 presents a conundrum which is distinct from the other emissions areas. Larger companies are likely to have longer and more complex supply chains spanning multiple geographies, which make collection of standardised emissions data more challenging, yet they also have more resources to do so by hiring dedicated, specialised staff, or exerting disclosure requirements on suppliers. It is still relatively early days for Scope 3 calculation, eluding more than 400 companies which have data for the first two scopes, but lack any for the third. This category was also subject to especially drastic revisions, such as Terpel's reallocation of fuel consumption by the fleet of vehicles used for plant-to-plant fuel transfers from Scope 3 to Scope 1 in **2023.** As a result, we would advise interpreting the graph as a representation of the changes taking place at a much smaller sample size.

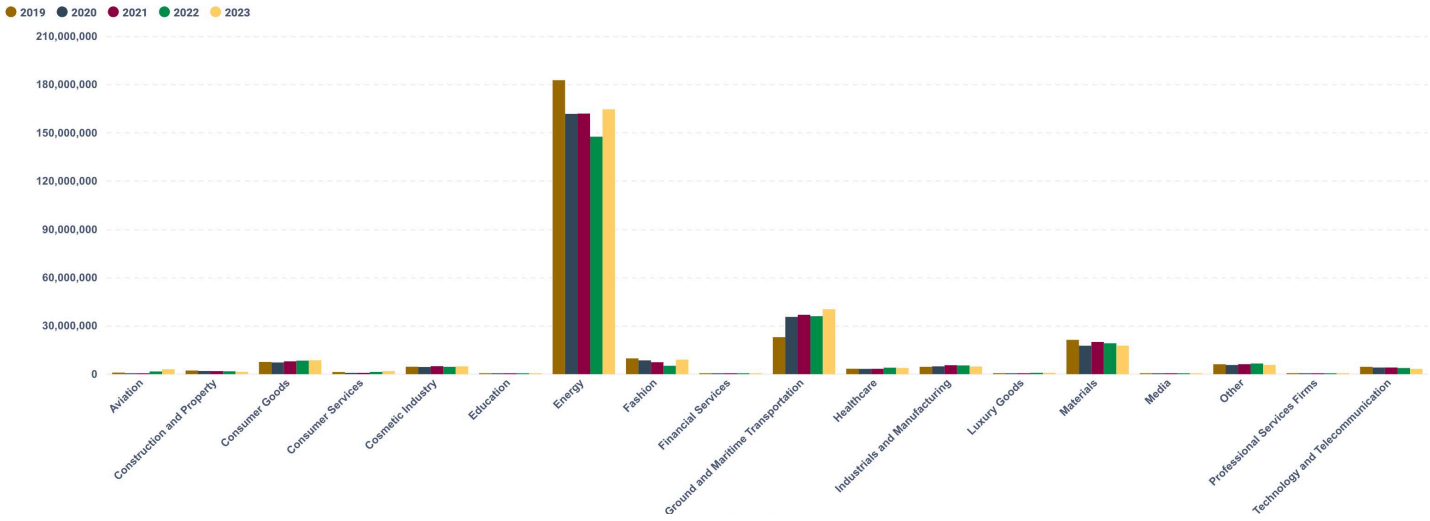
In the case of Fortune 500 Professional Services group Adecco, a survey into the commuting habits of employees in France was conducted in 2022 with the goal of establishing a baseline of commuting-associated emissions for the calculation of future science-based targets.

Adecco is far from the only company to set such a recent baseline against which to measure future changes, despite the **shrinking carbon budget.**

As it emerged, employee, consultant, and associate commuting is the most significant contributor to Group emissions, and inclusion of this in the Scope 3 inventory caused a jump from **26,885tCO2e in 2021 to 777,528tCO2e in 2022.**

Where faced with missing values, companies making an effort to grapple with scope 3 across a range of operational boundaries often resort to proxy data from the Greenhouse Gas Protocol, UK Government Conversion Factors, or other relevant national equivalents and country energy mixes. This is then combined with site-specific data, such as the square footage of office buildings, and the resulting emissions extrapolated out.

Scope 3 Emissions (tons of CO2e) by Company Sector



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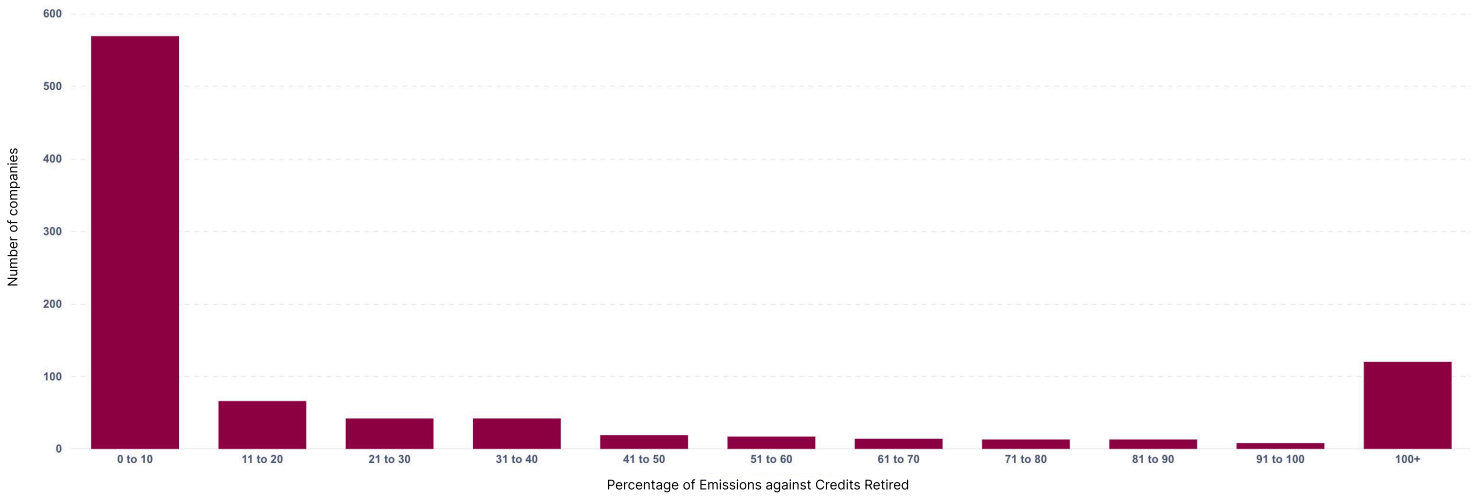
Carbon Credit Usage

Emissions versus offsetting* activity

The histogram below represents on the X axis the classes of percentages of the emissions against carbon credits purchased by each company. Both the total emissions and total credits retired are drawn from 2019-2023 activity. The distinct bimodal distribution with 570 companies retiring 0-10% of their emissions versus 120 companies with over 100% accounted for may reveal the two most common ways of engaging with the VCM, if at all. Overarchingly, there is limited association between emissions and credits retired for most companies in this dataset.

For the companies which have retired such proportionally small volumes, use of carbon credits is either nominal or its exact purpose to the company is yet to be established. However, the 13% of companies that have retired a volume equal to or greater than their reported footprint are highly likely to be motivated towards carbon neutrality. The increasingly low number of companies falling into the bins close to 100% in contrast to the cohort at 100%+ may be the expression of a "go hard or go home" attitude to retiring credits at a higher proportion in relation to emissions.

Number of companies by proportions of emissions (from 2019-2023) "offset"



Without more detail about offsetting strategies in sustainability reports, it is difficult to anticipate how the shape of this histogram may change in the future. A similarly high leftward peak could indicate a number of new market entrants, while a rise in the right hand peak would suggest more companies actioning net zero plans. Without further context, a graph like this does not necessarily mean that few companies are doing enough to tackle their emissions. As the corporate data team at AlliedOffsets has noted from market intelligence, some companies only offset residual emissions, others exclusively use offsets for particular products advertised as being carbon neutral, while many choose to prioritise spending on immediate decarbonisation before turning to the VCM.

*The soft use of the word "offsets" is for ease understanding i.e. the number of companies that have offset different proportions of their emissions. However, carbon credits can formally only be referred to as offsets if they are being retired with the intent of using them to compensate for or "equal out" an emission, as opposed to being a considered a "climate contribution" or an investment, for example. Most credits in the VCM are retired without direct reference to offsetting or carbon neutrality.

Looking Forward

Developments over the next year

Having the privilege of being able to see both the carbon credit demand side of the VCM and the emissions that partly drive it, the corporate data team at AlliedOffsets observe that company reports rarely explain how offsetting is formally incorporated to their decarbonisation strategies. Explicit links between a company's emissions profile and its carbon credit purchases would offer rich insight. This could include timelines for credit utilisation, which scopes are eligible for offsetting, and alternative uses of carbon markets - from tools of beyond value chain mitigation to pricing tools that apply financial pressure on a company to decarbonise.

While there are exceptions in the form of manufacturers based in East Asia (Yili Group, Wilmar Oleochemicals, Sinopec) and the DACH region (Heidelberg, Gallus), it is very much not the norm for transaction notes to directly attribute offsets to specific activities, products or time periods of emissions.

Indeed, it is usually unclear whether emissions that have been compensated for with carbon credits are included in later footprint calculations at all, depending on each company's interpretation of offsetting.

The exceptions are Shopify, Swedish outdoor goods company **Haglöfs** and Canadian food group **Maple Leaf Foods.** We hope to see distinctly improved clarity and evidence of more cohesive use of carbon credits as part of wider sustainability strategies in next year's round of reports.

In the meantime, AlliedOffsets will be working on making the current archive of corporate sustainability reports available on our main platform on Metabase in Q1 2025 . The new year will also see the addition of emissions data for SBTI-committed companies irrespective of their engagement in the VCM.

This will give users an even more expansive view of sectoral trends and the ability to identify contrasting emissions between credit-purchasing and non credit-purchasing companies. Please sign up here to be kept up to date on this progress and let us know how you would like to use this data.

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Sign up here

Appendix

Changes in Scope 1, 2 & 3 Emissions (2022-2023)

The table below shows which companies from each sector had the largest proportional change in emissions from 2022 to 2023, per the numbers available from the most recent sustainability report in the AlliedOffsets record. Percentages are rounded to the next whole number.

Sector	Scope 1	Scope 1 % Change	Scope 2	Scope 2 % Change	Scope 3	Scope 3 % Change
Agriculture & Aquaculture	Syngenta	-21%	Syngenta	**-36%**	Syngenta	**+35%**
Aviation	Schiphol Airport	-15%	Lufthansa	-28%	easyJet	**+39%**
Consumer Goods	Tata Consumer Products	**+837%**	Heineken	**-60%**	Maple Leaf Foods	**+57%**
Consumer Services	Shopify	**-76%**	Booking.com	**-68%**	Trainline	**+45%**
Construction & Property	Arup	-20%	British Land	**+121%**	Goodman Group	**+49%**
Cosmetic Industry	International Flavors & Fragrances	-16%	Oriflame	**-58%**	International Flavors & Fragrances	**-33%**
Energy	Uniper Energy	**-65%**	RWE	**+100%**	A2A	**+266%**
Fashion	Moncler	+24%	Moncler	**-99%**	Salvatore Ferragamo	**-47%**
Financial Services	Vontobel	**-70%**	Royal Bank of Canada	**-100%**	Aviva	**+94%**
Ground & Maritime Transportation	ALD Automotive	**-52%**	Bentley	**-93%**	DP World	**+53%**
Industrials & Manufacturing	Kingspan	**-57%**	Signify	**-100%**	Severfield	**+102%**
Materials	Sourceful	**-99%**	Sourceful	**-78%**	Brenntag	+26%
Mining	Endeavour Mining	-23%	Antofagasta	**-100%**	Triple Flag Precious Metals Corp	**+67%**
Professional Services Firms	Kin and Carta	**-79%**	Accenture	**-43%**	DNV	**+138%**
Technology & Telecommunication	Cadence Design Systems	**-63%**	Darktrace	**-95%**	Singtel	**-56%**

AlliedOffsets

AlliedOffsets is the world's largest database and market intelligence provider for the voluntary carbon market. We aggregate and analyze data to present the most comprehensive dataset on carbon offsetting activity globally. Our dashboard includes data and analysis of over 32,000 projects, including information on pricing, buyers, transactions, brokers, and more.

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