



COMPANIES

NET
ZERO
2050



Nº 8 Distant and hard to measure, net zero commitments of companies lack credible transition plans and progress monitoring

- Since the Paris Agreement, “net zero emissions” has become the compass of corporate climate action and a driver for their growth strategies.
- Often unclear and limited to “operational” emissions (Scopes 1 & 2), these targets overlook value chain emissions (Scope 3), which represent 75% of companies’ carbon footprint.
- Corporate transition plans, which should specify the means to reach carbon neutrality, are lacking precision on the required investments and changes in business models.
- Carbon offsets via voluntary markets, gaining popularity among companies, requires greater methodological credibility and transparency, at a time when “carbon neutrality” claims are beginning to be regulated in Europe.

KEY FIGURES

Measuring emissions, a prerequisite to commitments but not yet universal

- **8,307 companies have committed to the Race to Zero.** 929 of the 2,000 biggest companies have set net-zero targets, 4% of them aligned with RtZ requirements ([Net Zero Tracker](#), 2023).
- **71% of companies disclose their operational emissions** (Scopes 1 & 2) out of the 4,000 biggest global firms, vs. 54% in 2015 (FTSE Russell).
- **22% disclose their Scope 3 emissions**, which represent 75% of their total emissions ([CDP](#), 2023).

Transition plans lack precision

- **3,960 companies supported the TCFD in 2022**, seven times more than in 2018 (571) ([TCFD](#), 2022).
- **2,079 “science-based” emissions reduction targets validated** by the STBi in 2022 (28 in 2015), out of 4,230 committed companies. 136 “net-zero” strategies validated ([SBTi](#), 2023).
- **0.4% transition plans judged credible.** Financial planning, science-based targets, and net-zero strategies were lacking ([CDP](#), 2023).
- **27.6/100** is the average score of company transition plans evaluated using the methodologies of the Assessing low-Carbon Transition® initiative set up by Ademe and the CDP ([WBA](#)).

Booming carbon markets shifting towards nature-based solutions

- **475 MtCO₂e of carbon credits put on the market in 2022**, the equivalent of Brazil’s CO₂ emissions. 55% financed renewable energy projects, and 17.6% financed the elimination of CO₂ in 2022 ([World Bank](#), 2022).
- **\$1.3 billion “nature-based” carbon credits exchanged in 2021**, 20 times more than in 2016, way ahead of renewable energy credits. This success comes up against questions concerning the integrity of emissions avoidance credits ([Ecosystem Marketplace](#), 2022).



FURTHER READING

TRENDS

- [The Net Zero Target: The Voluntary Carbon Market enters a new dimensions](#) (2022)
- [As it surges ahead, the ESG market seeks to standardise transparency norms](#) (2022)
- [Regulation: From China, to Europe, taxonomies are increasing the transparency of financial markets](#) (2022)
- [From Big Oil to Big Power? At the heart of the renewable energy boom, oil producers are dreaming of a low-carbon future](#) (2021)
- [With PPAs, businesses and cities are securing the production and supply of low-carbon electricity](#) (2021)



CASE STUDIES

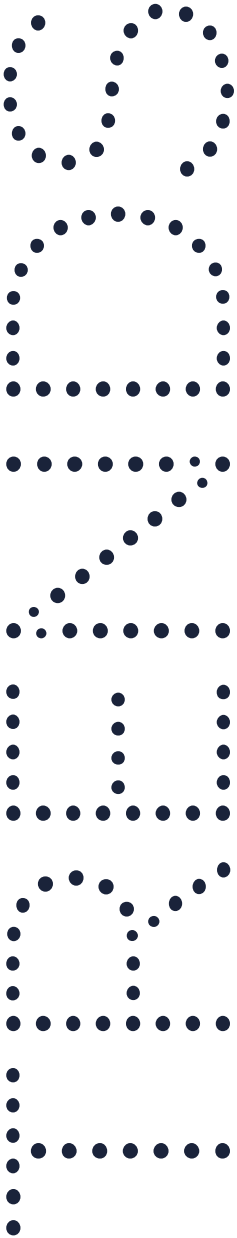
- **ALSACE** • [Towards a Made-in-Europe production of low-carbon lithium with the EuGeLi project](#) (2022)
- **ANGERS** • [EnergieSprong, an industrialized zero energy renovation project, a lever for mass uptake](#) (2022)



THE OBSERVATORY'S BLOG

- [Non-financial reporting standards: What impact on corporate climate accountability?](#) (2023)
- [UNFCCC Secretariat Recognition and Accountability Framework for non-party stakeholder climate action: What's to be expected?](#) (2023)





On the road to net zero, businesses have found the compass but not the map

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In the space of a few years, carbon neutrality has become the polestar of corporate climate action. The spate of commitments that followed the signature of the Paris Agreement was succeeded by a phase to reinforce reporting frameworks, progress measurement, and credibility assessments of low-carbon transition plans. Over and above accusations of greenwashing, companies aim to demonstrate a genuine capacity to reduce the carbon footprint of their business model, in line with the most ambitious scenarios. But a close look at their transition plans and real-life performances reveals that they still have a long way to go.

“Net Zero”, the new buzzword of business commitment

8,307 businesses have joined the Race to Zero campaign since it was launched in 2021 by the High-level Champions of COP25 and COP26. More than other actors, financial and non-financial corporations have gradually taken on the principle of “carbon neutrality”, both as the ultimate target of their emissions reduction strategies, and as the narrative framework of their transition, which often forms the foundation of their growth strategy. Reaching carbon neutrality (or climate neutrality) means bringing net CO₂ emissions down to zero – in other words the quantity of emissions released must be equal to the quantity removed from the Earth’s atmosphere. To achieve this, actors need to activate three levers: avoid emissions; reduce the flux of greenhouse gases (GHGs) sent into the atmosphere; and remove carbon from the atmosphere with natural carbon

sinks (forests, oceans) or technological sinks (direct carbon capture from the air, carbon capture and storage at the point of production, etc.).

Companies have applied this target of stabilizing global emissions to the scale of their businesses, under the label “net zero”, usually coupled with the pathway of limiting global warming to 1.5°C above pre-industrial levels. **Of the 2,000 biggest listed companies in the world, 929 had established a net zero objective in June 2023, compared to 417 in December 2020, according to the annual report published by Net Zero Tracker.**¹ The movement has even been picked up in some of the highest-emitting sectors, like mining² and European oil majors, which by positioning themselves as energy service companies, have made carbon neutrality part of their growth and diversification strategies (cf. “ELECTRICITY” TRENDS).³ Yet only 4% of the 929 companies with a net zero target fulfil Race to Zero basic requirements, according to Net Zero Tracker. This raises the question of the quality

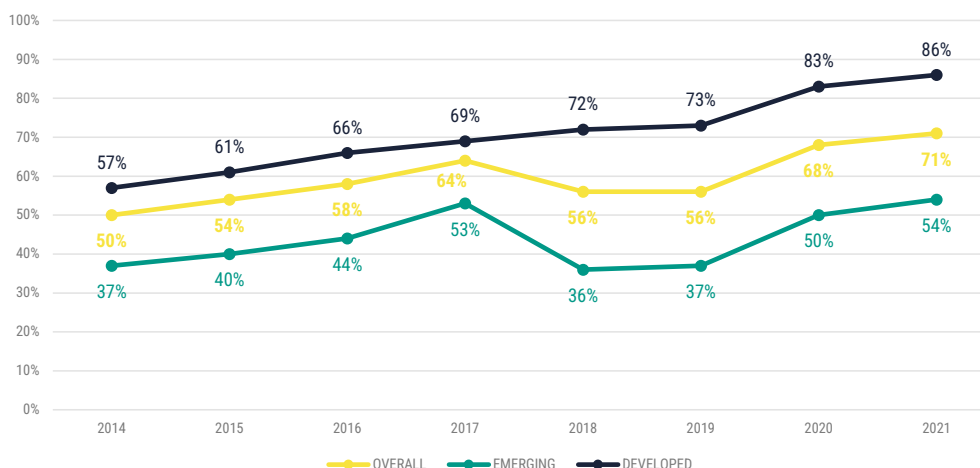
of the targets and transition plans behind business commitments. Although no standard system exists to measure, monitor and assess companies' progress,

a detailed analysis of numerous reports and studies makes it possible to identify the trends underway since the signature of the Paris Agreement.

FIGURE 1

RECENT PROGRESS IN CLOSING THE DISCLOSURE GAP

Source: Climate Chance based on data from FTSE Russell



Beyond commitments, monitoring remains unclear and actual performance is mixed

The principle of measuring emissions is understood but not yet widespread

Measuring and publishing corporate emissions is the cornerstone for building any decarbonization strategy. Since 2015, clear progress has been made in the area of "operational" emissions (Scopes 1 & 2), but measurements of emissions related to the value chain (Scope 3) are still very patchy.

71% of the 4,000 member companies of the FTSE All-World index, which covers 98% of investable market capitalization, published their operational emissions in 2021, compared to 54% in 2015 (FIGURE 1).⁴ The more capitalized a company is, the more frequent its disclosure practices (FIGURE 2). A high number of so-called "developed" businesses in Europe disclose their operational emissions (92%), far ahead of Chinese companies (42%), which release few statistics (FIGURE 3). The proportion of data disclosure is more uniform when it comes to sector of activity: the standard deviation is only 12 points between utilities

(76%) – the same level as energy companies – and businesses in the technology sector (62%) (FIGURE 4).

In 2022, 99% of the 18,600 companies that disclosed to the reporting platform CDP communicated their Scope 2 emissions, 71% for Scope 1, and only 22% for Scope 3.⁹ Yet on average Scope 3 emissions represent 75% of corporate emissions; up to 80% for oil and gas companies for example, and 99% for financial ones.⁵ In addition, barely 14% had their emissions verified by a third party⁶ (FIGURE 5).

Even in countries where accounting and reporting of emissions is now mandatory, companies sometimes fail to ensure regular, precise monitoring of their emissions. In France, for example, companies with more than 500 employees have been required to published their carbon footprint since 2012. Yet in 2021, only 43% of them had actually transmitted their carbon footprint to the French Agency for Ecological Transition (Ademe).⁷

a CDP does not verify the quality of data or their credibility, but instead refers to the responses to questions that companies answer on a voluntary basis.

FIGURE 2

SHARE OF COMPANIES DISCLOSING THEIR SCOPE 1 & 2 EMISSIONS IN 2021 IN THE FTSE ALL WORLD INDEX, BY SIZE

Source: Climate Chance based on data from FTSE Russell

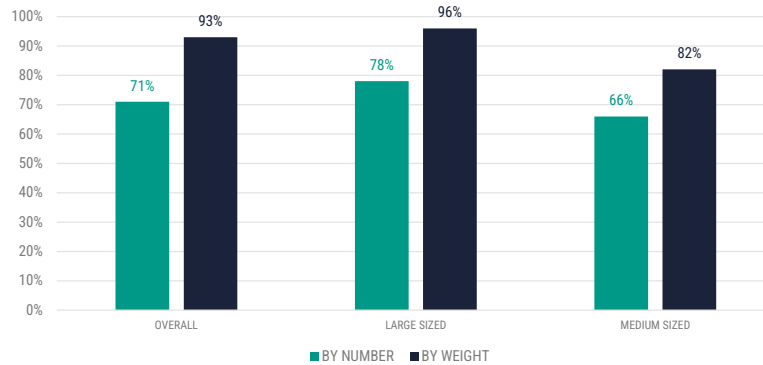


FIGURE 3

ONLY DEVELOPED EUROPE SHOWS A DISCLOSURE RATE ABOVE 90%

Source: Climate Chance based on data from FTSE Russell

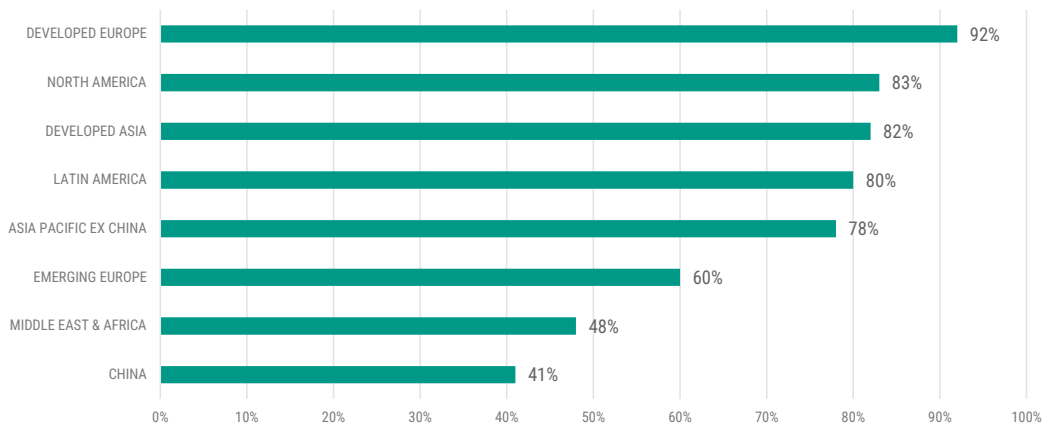


FIGURE 4

CARBON-INTENSIVE SECTORS SHOW A HIGH DISCLOSURE RATE

Source: Climate Chance based on data from FTSE Russell

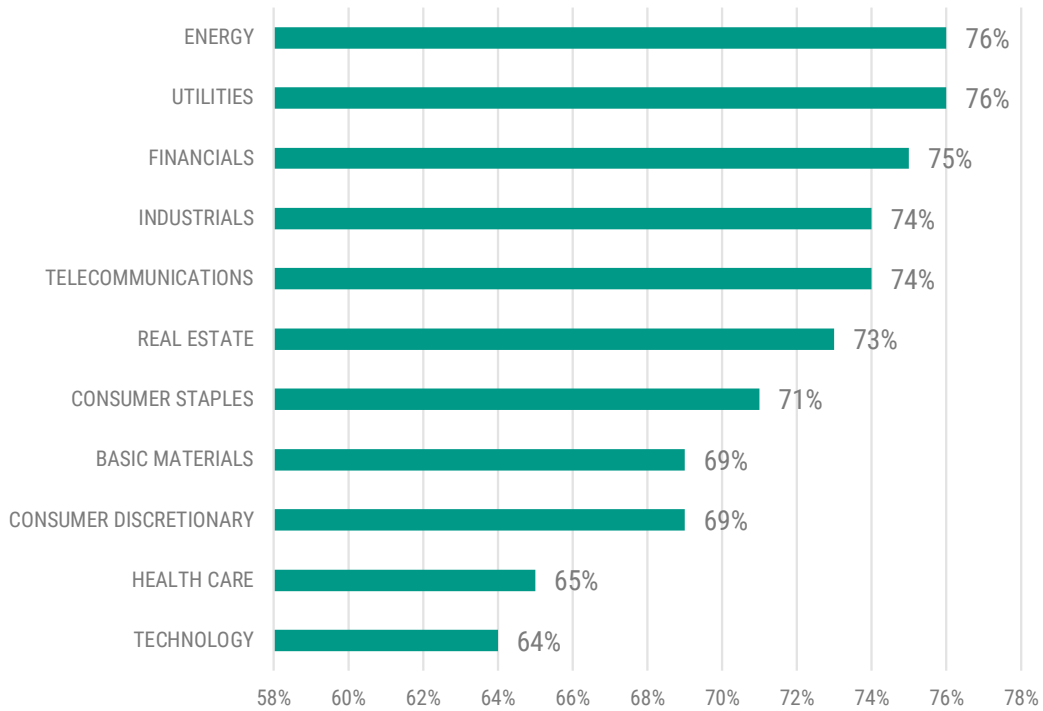
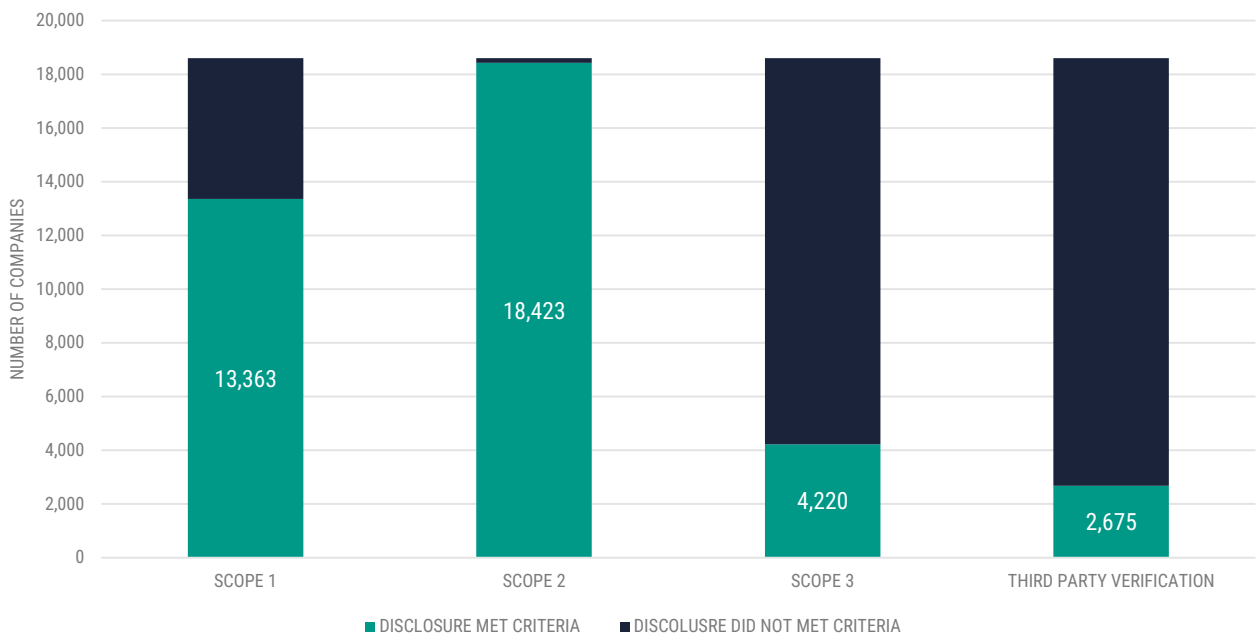


FIGURE 5

ACCOUNTING OF SCOPES 1, 2 AND 3, WITH VERIFICATION

Source: CDP, 2023





Credibility of targets on the rise

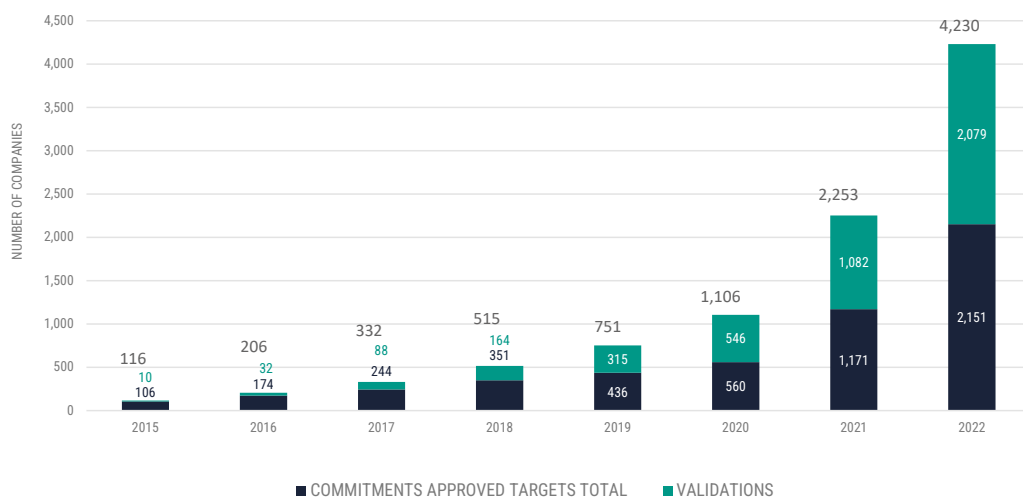
The number of companies requesting validation of their emissions reduction targets from the Science-Based Target initiative (SBTi)^b has rocketed in recent years, from 28 in 2015 to 4,230 in December 2022 (FIGURE 6). Currently, 34% of the global economy, expressed in market value, has made a commitment to the SBTi. The targets set by 2,079 companies have received science-based validation, in other words

aligned with the 1.5 °C or 2 °C objectives established in the Paris Agreement, based on SBTi methodology. Europe alone is home to 54% of the committed, validated companies. Service companies (1,320) make up the biggest share, far ahead of energy companies (85) which take last place. 53% of businesses with a validated SBT reported their progress on all of their targets in 2022, compared to 45% in 2020.⁸

FIGURE 6

CUMULATIVE ANNUAL NUMBER OF COMPANIES SETTING AND VALIDATING TARGETS, 2015 – 2022

Source: *Science-based Target initiative, 2023*



In October 2021, the SBTi launched the “Corporate Net-Zero Standard” (CNZS), which is the first standard in the world to help businesses set their own “net zero” targets aligned with the 1.5 °C and 2 °C objectives in the Paris Agreement. The standard is based on four principles: 1) prioritize rapid, deep emission reductions with near-term targets (-50% by 2030); 2) set long-term targets (-90% by 2050); 3) offset residual emissions; 4) finance carbon reduction beyond the value chain. A company is only considered to have reached net-zero when it has achieved its long-term science-based target and “neutralized” its residual emissions.⁹

In late December 2022, 136 organizations had fulfilled the first two criteria and received “science-based” certification for their net-zero targets, including 38% (52) small and medium-sized enterprises, for which the

SBTi applies a specific methodology. Nevertheless, a report by the NewClimate Institute and Carbon Market Watch, focused on 22 multinationals from a range of sectors and validated by the SBTi, esteemed that in early 2023 the established targets only resulted in a median reduction of 15% between 2019 and 2030, and that only five companies presented a deep reduction target by 2050.¹⁰ Yet according to the IPCC, limiting the temperature increase to 1.5 °C above pre-industrial levels will require a 43% reduction of emissions by 2030 compared to 2019, and 84% by 2050.¹¹

^b The SBTi is an organization that drives science-based greenhouse gas emission reduction targets and net-zero strategies by private actors (companies, financial institutions). With the backing of expert committees, it defines assessment criteria and provides technical support to committed companies.

FIGURE 7

ACT AND JUST TRANSITION SCORES OF COMPANIES FROM DIFFERENT SECTORS - Source: Data from WBA, 2023

SECTOR	NUMBER OF EVALUATED COMPANIES	YEAR OF EVALUATION	SCORE								
			TOTAL (/100)			ACT (60% of the total score)			SOCIAL AND JUST TRANSITION (40% of the total score)		
			AVERAGE	MEDIAN	MAX	AVERAGE	MEDIAN	MAX	AVERAGE	MEDIAN	MAX
OIL & GAS	99	2023	15%	14%	56%	13%	8%	67%	19%	16%	65%
BUILDINGS	50	2023	20%	17%	50%	27%	21%	78%	10%	9%	28%
TRANSPORT	50	2022	21%	19%	48%	27%	24%	72%	11%	11%	31%
AUTOMAKERS	30	2021	-	-	-	34%	29%	71%	-	-	-
ELECTRIC UTILITIES	50	2021	-	-	-	37%	27%	96%	-	-	-

Long road ahead to make transition plans credible

At a global scale, less than 0.4% of businesses have put forward a credible transition plan.

These are the results of the CDP assessment mentioned above, which were obtained from responses to a questionnaire answered by over 18,600 companies around the world. Of these, 4,100 stated that they had developed a transition plan corresponding to a 1.5 °C pathway. However, only 81 businesses were able to reply to the 21 key indicators that featured in the 2022 version of the questionnaire, which is fewer than in 2021 when 135 companies met with requirements, despite the fact that 40% more companies responded to the questionnaire in 2022. The companies that responded turned out to be particularly inefficient in terms of planning the financing of their transition plan (3%), setting science-based targets (4%), and establishing net-zero strategies (7%). Performances were better for identifying risks and opportunities (33%) and setting up governance for the transition (24%).

How does the CDP establish that a transition plan is credible? In its technical note, which describes the questionnaire method, the CDP states that its definition of a "climate transition plan" is 100% aligned with the ACT – Assessing low-Carbon Transition® methodology, an initiative jointly launched with Ademe in 2018. ACT evaluates the credibility of the transition plans presented by businesses in comparison with International Energy Agency scenarios. More than 407 companies have been evaluated by ACT and received scores across three dimensions:

- A Performance score, measuring alignment with the transition scenario (1 to 20)
- An Assessment score, reflecting the overall quality of the transition plan (E to A)
- A Trend score, measuring anticipation of future transformations (+, - or =).

The World Benchmarking Alliance (WBA) uses the ACT methodology to rate businesses with a score out of 100, weighted since 2022 based on the quality of low-carbon transition plans (60%), and just transition and social indicators (40%). Taken overall – notwithstanding the specific features of each sector, which are subject to a particular methodology, and changing methodologies over the years – the scores obtained by companies primarily highlight inadequate just transition and social policies (FIGURE 7). The climate transition plans evaluated using ACT are of a slightly higher quality, although still well below average (27.6%). No obvious correlation can be made between these two categories, meaning that the climate leaders are not necessarily the best placed when it comes to a just transition, and vice-versa.

The average scores are much higher than the median scores, indicating that a handful of companies pull up the average in each sector. This is the case for the electricity company Ørsted, which received a score of 96/100 for its low-carbon transition plan, mostly thanks to a deep decarbonization target for its operational emissions (-98 % by 2025), and its business model and investments centred on renewable energy.

A comparison of sectoral benchmarks identifies recurrent shortfalls in corporate climate transition plans, which coincides with the CDP analysis: targets to reduce operational emissions (Scopes 1 & 2) not aligned with the IEA's 1.5 °C scenario, few intermediate targets punctuating the trajectory, inadequate financial planning for the transition, very few analyses backed by scenarios, and a lack of vision to transform companies' economic models.

Monitoring and measuring impact over time: a mirage in a data desert

Since the Paris Agreement, followed by the launch



of the Marrakesh Partnership for Global Climate Action, numerous researchers have attempted to evaluate *ex ante* the potential impact of mitigation by non-state actors. In 2019, one study for example estimated at 1.2-2 GtCO₂e/year the reduction potential of individual commitments put forward by non-state actors (businesses, cities and regions) in the ten biggest emitting economies.¹² But how much progress has really been made? *Ex post* research of *real* results obtained by actors on their targets is almost inexistant, due to low-quality data and disparate accounting and reporting practices.

In June 2023, a study published in the journal *Nature Communications* produced results on a small sample. In 2015-2019, the 102 high-revenue companies studied (listed on the Forbes 500 index), which were committed to the SBTi and the RE100 initiative, had reduced their Scope 1 and 2 emissions by 35.6% compared to their reference level of 808.7 MtCO₂e.^c The 63 businesses that had set absolute reduction targets with the SBTi had reduced their emissions by 7.8%, exceeding their objectives of 34 MtCO₂. However, the authors point out that 75% of companies provide low-quality monitoring data (i.e. little verification by third parties, no indication about the supply of renewable energy, etc.). As a result, 86% of the total reduction observed can be attributed to only eight companies in the "electricity production" and "energy-intensive industry" sectors.¹³

Reporting frameworks designed for financial markets come up against conservative resistance

To offset the weak monitoring and evaluation practices of the companies observed above, several private organizations and public institutions have attempted to devise standards in order to encourage or oblige businesses to report credible, comparable environmental, social and governance (ESG) data. Given that companies would on average require four CEO mandates to reach "zero net emissions", according to a calculation made by the Financial Times and S&P Global,¹⁴ the stability of reporting frameworks is crucial to guarantee long-term follow-up on progress made.

The search for financial stability drives non-financial reporting rules

Since 2015, financial authorities have mainly been behind the standards established for corporate ESG reporting. Created in 2015 at the initiative of the Financial Stability Board (FSB) of the G20, the Task Force on Climate-related Financial Disclosure (TCFD) makes recommendations to economic and financial actors on disclosure practices to measure their exposure to climate risks and opportunities. The task force also advises that they compare their current activities and future strategies with climate scenarios, including at least one low-carbon scenario. Applying these recommendations is voluntary: **in October 2022, the TCFD recorded 3,960 "supporters",^d which is seven times more than in 2018 (571).**¹⁵

At the start of the 2020s, new non-financial reporting standards were released. The new IFRS Foundation standards, developed by the International Sustainability Standard Board (ISSB) since COP26, are private and voluntary, and a response to the request to standardize non-financial reporting frameworks¹⁶ made by the G20 and the International Organization of Securities Commissions (IOSCO), which brings together the world's securities regulators. In terms of climate, the IFRS requires the publication of a transition plan, a resilience analysis, a set of metrics (Scope 1, 2 & 3 emissions, low-carbon investment expenditure, etc.), and targets with figures. Their scope of application depends on whether they are adopted by national financial regulators wanting to refer to them to establish regulations: this is the case, for example in Australia¹⁷ and for the Hong Kong stock exchange.¹⁸

In the United States, it was also the financial market authority, the Securities and Exchange Commission (SEC), that proposed a regulation obliging listed companies to publish their greenhouse gas emission levels (Scopes 1 & 2), and have them audited by a third party. US and foreign firms registered with the SEC would also publish an annual emissions reduction plan. Currently, the regulations oblige companies to publish Scope 3 emissions only if they are considered to be "material" or are part of the company's mitigation targets. They are not necessarily subject to evaluation by a third party and protected from all legal responsibility. Companies would also establish a decarbonization plan and a calendar. The adoption of the text, which has been postponed several times,

^c Which is a little less than emissions from Indonesia in 2022 (823.5 MtCO₂e), the 6th global emitter, according to Enerdata statistics.

^d TCFD "supporters" are organizations that have publicly expressed their support for the TCFD recommendations by filling in a form on the TCFD website.



is not expected before autumn 2023.¹⁹ The State of California is in the process of adopting its own bill obliging all firms generating over \$1 billion turnover to publish their Scope 1, 2 and 3 emissions.²⁰

The European Commission is also reinforcing its standardized reporting framework on corporate ESG data. The Corporate Sustainability Reporting Directive (CSRD) came into force in January 2023, and extends the obligation for ESG reporting from 11,000 to 50,000 companies. This is the third pillar of the European Union's strategy for financing the transition to a sustainable economy which is part of the European Green Deal, along with the Sustainable Finance Disclosure Regulation (SFDR) on non-financial reporting by investors, and the Green Taxonomy, which precisely defines the list of activities judged to be "green" or "brown". The ESRS (European Sustainability Reporting Standards) adopted by the Commission in August 2023 comprise over 80 disclosure requirements, bringing together over 1,000 data points.

By clarifying the definitions of "green" and "brown" investments in the bond market, financial taxonomies are a way of identifying the share of corporate activities that are compatible and aligned with precise environmental targets. Fifteen taxonomies have been adopted around the world, 29 are being developed, and eight are under discussion, according to the Climate Bonds Initiative. In 2012, China began working on a green taxonomy, and in 2015 adopted a green bond catalogue, known as the "Chinese Green Bond Taxonomy". The Association of Southeast Asian Nations (ASEAN) adopted then updated its own taxonomy in 2021,²¹ followed by Thailand in 2023.²² In Europe, companies above a certain size are now obliged to evaluate and publish the alignment of their activities with the EU taxonomy.

"Materiality", the Gordian knot of corporate climate accountability

The TCFD recommendations, IFRS standards and SEC rules have another thing in common: they identify pertinent data based on "simple materiality", which is only financial. In accounting terms, "materiality" means relevant information to include in corporate reporting. Financial materiality consists in evaluating the risks and opportunities of the environment/climate change for a company's financial performance. In contrast, impact materiality evaluates the economic, environmental and social impacts of a company for all stakeholders.²³ Depending on the type of materiality, reporting has two different objectives: the stability of financial markets (financial materiality), and corporate accountability (impact

materiality). "Double materiality" is when reporting frameworks apply both of these approaches. When aligned to financial materiality only, reporting standards are driven by shared confidence in market discipline and investors' capacity to make rational, self-determined decisions based on the information available.

Unlike the three frameworks mentioned above, the European Union's ESG (ESRS) disclosure rules are subject to legislative work by political institutions within the community. After making them dependent on the principle of "double materiality", the European Commission then backtracked and granted companies more freedom in assessing the materiality of some data, such as measuring Scope 3 emissions. Initially intended to be mandatory, transition plans on biodiversity are now voluntary.²⁴ This easier application has without doubt facilitated convergence with the other international standards, but has resulted in a scaled-down ambition and reduced consistency with the other EU standards, according to observers.²⁵

This backtracking corresponds to an "anti-ESG" outcry, particularly in the USA since the early 2020s. In the *West Virginia v. Environmental Protection Agency* decision dating from June 2022, the US Supreme Court esteemed that state agencies, like the EPA and the SEC, must obtain approval from Congress to create environmental rules with major economic and political impacts.²⁶ In May 2023, the leader of the movement, governor of Florida Ron DeSantis, signed into law a bill aimed at preventing state officials from investigating the ESG impact of public expenditure, and prohibiting ESG bond sales.²⁷

Booming carbon offsets in search of integrity

Although available studies show that companies have more or less integrated the issue of reducing their operational emissions (Scope 1 & 2) through decarbonizing their electricity supply (CF. "ELECTRICITY" TRENDS), converting their company car fleets (CF. "TRANSPORT" TRENDS) and carrying out energy renovations of offices and production sites (CF. "BUILDINGS" TRENDS), Scope 3 reduction and avoidance actions, which are generally not measured, are significantly rarer. Given this situation, emission offsets through the purchase of carbon credits on voluntary markets has boomed in recent years. The voluntary carbon market is designed to act as a new instrument to direct private funding towards action to avoid, reduce or remove carbon while giving firms the possibility of offsetting their carbon emissions: 90% of companies questioned

in Europe and the USA said they planned to use the system to offset their unabated emissions.²⁸

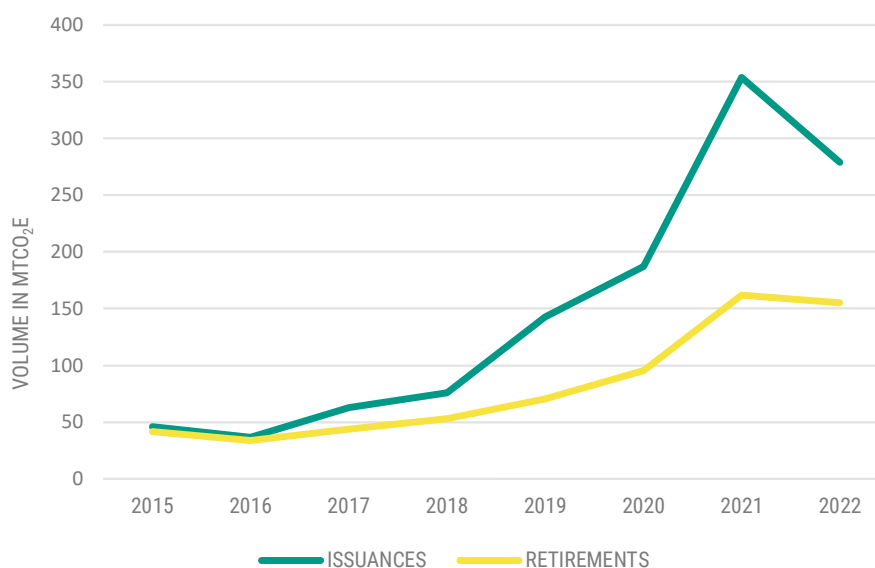
On the supply side, new carbon credits issued in 2022 amounted to an estimated 475 MtCO₂e^e (-22% compared to 2021), according to the World Bank. They are mostly made up of credits certified by private organizations for “offsetting” purposes (58%) – e.g. Gold Standard, Verra and Plan Vivo – followed by credits issued under the Clean Development Mecha-

nism (CDM) of the Kyoto Protocol (32%), and credits issued under domestic regulations (10%). 55% of new credits are issued to finance renewable energy installation projects. However, the steady drop in the cost of these technologies over more than a decade (cf. “ELECTRICITY” TRENDS) does not guarantee any real additional financing through carbon credits: the growth of the renewables market means that the projects would have seen the day with or without credits.²⁹

FIGURE 8

ISSUANCES AND RETIREMENTS OF CARBON CREDITS, 2015-2022

Source: *Climate Focus*, 2023



Nature-based Solutions (NbS) constitute one-third of new credits certified by private organizations (93/279 MtCO₂e), just behind renewable energy credits (35%), according to Climate Focus.³⁰ Two-thirds of these NbS credits are projects to *avoid* emissions, to prevent deforestation or land conversion. Credits aimed at financing the *elimination* of CO₂ via reforestation, afforestation, improved forestry practices, or the restoration of wetlands (27.6 MtCO₂e) in reality only make up 30% of NbS credits, and therefore 17.6% of the total credits put on the market in 2022. Afforestation and reforestation activities nevertheless constituted half of new projects registered for certification in 2022, while the credibility of counterfactual scenarios employed to measure “avoided emissions” has been challenged by several critical studies in 2023.^{31, 32} The Integrity Council for Voluntary Carbon

Markets (IC-VCM), an initiative dating from COP26, has published a series of “Core Carbon Principles”, a “meta standard” that should serve as a common denominator for certification methods in view of promoting high-quality, transparent carbon credits.³³

On the demand side, 196 million credits were “retired” in 2022 – in other words, counted in the carbon footprint of a company, which can no longer put the credit on the market and sell it. This is a slight annual drop (-1.3%), but the figure remains much higher than in previous years. 52% of retired credits relate to renewable energy projects (44% in 2021), among the cheapest on the market. However, NbS credits are worth more: their transaction volume increased twenty-fold from 2016 (\$0.067 billion) and 2021 (\$1.328 billion), way ahead of renewable energy

^e Which is the equivalent of the CO₂ emissions of Brazil in 2022 (475.3 MtCO₂e), the world’s 13th biggest emitter according to data published by Enerdata.



projects (\$0.479 billion in 2021).³⁴ The average prices of different types of credit exchanged on the market, based on the cost of implementing the projects and consumer preferences, have followed a double downward and converging trend in recent years. Elimination credits and projects with joint social benefits or biodiversity benefits are particularly sought after.³⁵ The surplus that ultimately results from the gap between supply and demand for carbon credits is likely to drive down their value; but it also reflects a certain financialization of the voluntary carbon market, with the emergence of numerous intermediary players who buy credits without retiring them in order to increase their value on resale (**FIGURE 8**).

Carbon offsets are attractive to companies because they can ultimately claim that they or their activities are “carbon neutral”. Yet the relevance of this notion applied at the scale of a product, event, organization, or even a state, is debateable.³⁶ before it extended the definition, for a long time the IPCC restricted carbon neutrality to a planetary scale. To counter unjustified, ill-founded claims, the European Union is preparing draft regulations prohibiting the use of “carbon-neutral”, “green” and “eco-responsible” declarations for 2026.³⁷ In June 2022, the Voluntary Carbon Markets Integrity Initiative (VCMI) presented a “Claims Code of Practice”, recommending certification of the SBTi’s Net Zero standard, the purchase of mitigation credits beyond an organization’s value chain, and the use of quality credits.³⁸

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