MSCI Sustainability Institute

July 2024

The MSCI Sustainability Institute Net-Zero Tracker

A periodic report on progress by the world's listed companies toward curbing climate risk

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Financing the Low-Carbon Transition

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Introduction

To understand how the shift to a low-carbon economy is progressing, follow the money.

The largest investors increasingly find that positioning their portfolios to take advantage of the transition to a clean-energy economy demands an intricate juggling act: investing in companies that are decarbonizing and allocating capital to climate solutions, all while financing the replacement of carbon emissions-heavy assets like coal-fired power plants and monitoring their portfolios' carbon footprint.

Implicit in transition finance, the industry catchall for these varied levers, is a practical problem: How to allocate capital toward decarbonizing the real economy, where greenhouse gas (GHG) emissions hover near record highs.[1] Measuring a company's carbon footprint or quantifying the carbon emissions of investments sets a foundation but will not, by itself, suggest where to invest the next dollar to most effectively deliver on commitments to drive global GHG emissions to net-zero. For that, investors rely on indicators designed to help them fine-tune their allocation strategies that tackle the decarbonization progress of high-emitting industries and hard-to-abate sectors such as cement, steel and agriculture.

This edition of our Net-Zero Tracker takes a practical view. We look at corporate climate progress through the lens of three indicators of net-zero alignment used by investors today:

- Where do the world's listed companies fall along the spectrum of "maturity" in their decarbonization journey, based on the Net Zero Investment Framework (NZIF) developed by the Paris Aligned Investment Initiative, a coalition of four investor networks?[2]
- How many companies have set science-based decarbonization targets as determined by the Science Based Targets initiative (SBTi), an arbiter of corporate climate commitments; and
- How aligned are listed companies with global climate goals, as measured by temperature metrics developed by SBTi and by MSCI ESG Research LLC that evaluate the distance of companies from their sectoral net-zero pathways?

We also take our regular snapshot of corporate climate progress and summarize the latest quarterly data on the use of carbon credits in the voluntary carbon market.

"Implicit in transition finance is a practical problem: How to allocate capital toward decarbonizing the real economy, where greenhouse gas emissions hover near record highs."

Allocating capital to low-carbon companies remains an essential part of investor climate action, yet cannot, by itself, change the composition of the economy to one that runs on higher levels of clean energy from one mainly powered by fossil fuels. Transition finance calls for use by investors of a series of approaches – from financing the managed phaseout of high-emitting assets to investment in low-carbon technologies — that, taken together with enabling policies, allows investors to achieve their financial objectives while helping to decarbonize every viable corner of the real economy.[3] The goal, after all, is to drastically decelerate climate change.

Key findings

A series of indicators that investors use to guide transition finance, while each answering different questions, suggest that the world's listed companies remain largely misaligned with global climate goals.

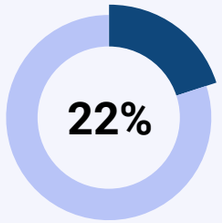
- Eighty-four percent of listed companies have yet to make a commitment to decarbonize in line with achieving net-zero, as of June 24, 2024, with little difference between those in the sectors deemed "high impact" by the NZIF and those in other sectors.
- 60% percent of companies that are aligning with a net-zero pathway based on the NZIF have set a science-based climate target while 81% of companies that already align with a net-zero pathway have set such a target.
- Nearly two-thirds of listed companies are on a trajectory that would warm the planet by more than 2°C (3.6°F) above preindustrial levels, based on implied temperature rise metrics from both MSCI ESG Research and the SBTi.

The number of companies that set science-based climate targets has ticked up but the overall share remains low.

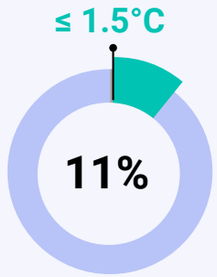
- Just over one-fifth (22%) of listed companies have set a decarbonization target that aims to reduce their financially relevant GHG emissions to net-zero by 2050 in line with a science-based pathway, as of May 31, 2024, an increase of eight percentage points from a year earlier.
- 40% of listed companies have set decarbonization targets that aim to reach net-zero, up about two percentage points over the same period.
- Just over half (56%) of listed companies have disclosed a GHG emissions-reduction commitment, up from 54% last year.

Companies are disclosing more of their carbon footprint.

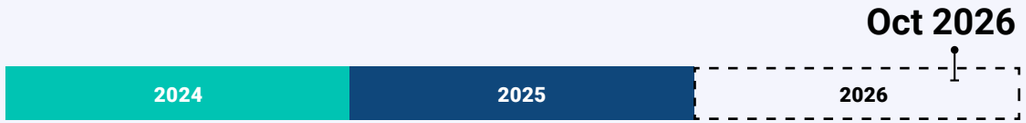
- Overall, 69% of listed companies disclosed their Scope 1 and/or Scope 2 emissions, as of May 31, 2024, an increase of 19 percentage points from a year earlier.



Share of listed companies that have set science-based climate targets



Share of listed companies that align with the goal of holding the rise in average global temperatures to 1.5°C above preindustrial levels



Date by which the world's listed companies are expected to burn through their remaining 1.5°C carbon budget

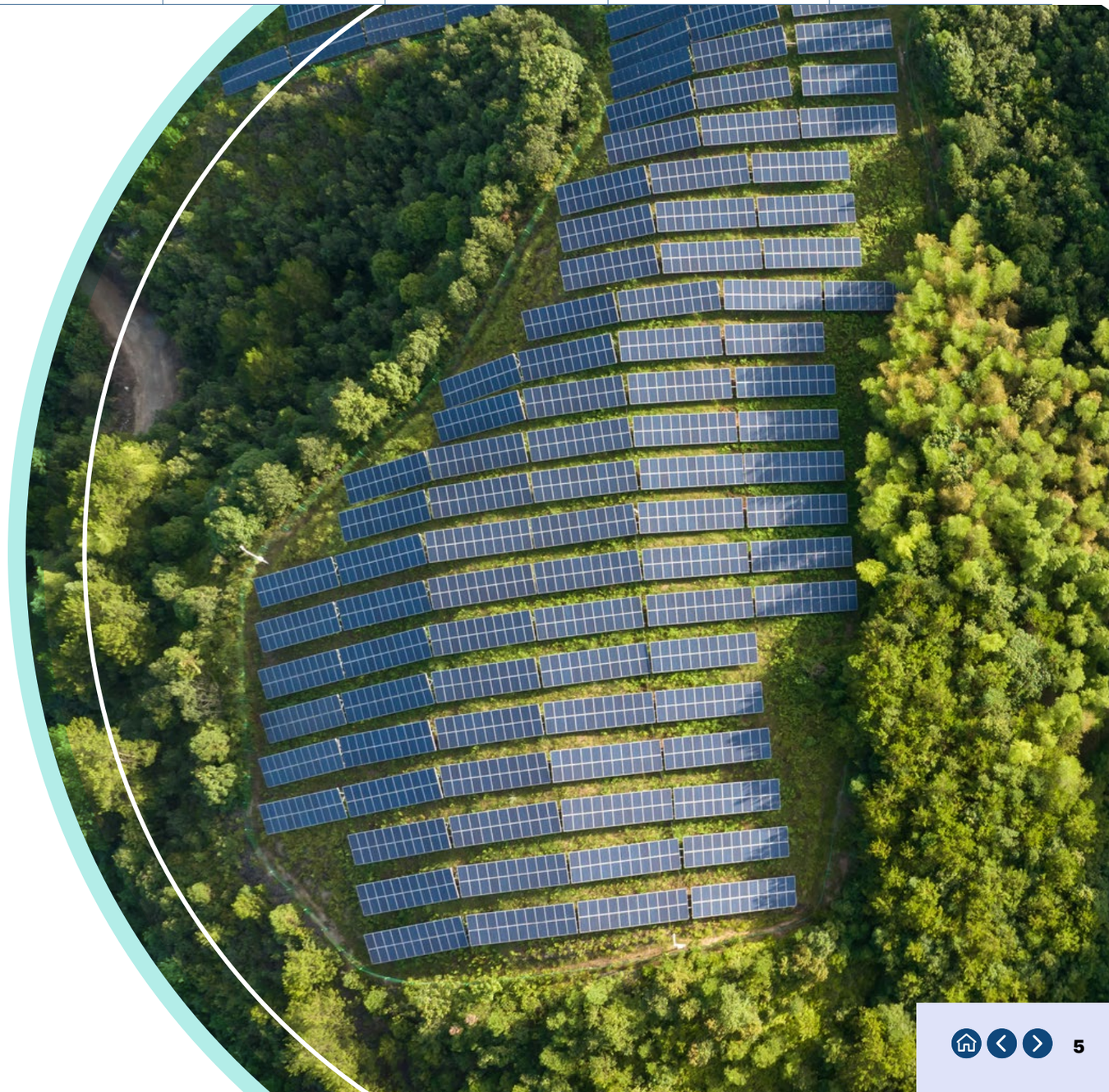
- Nearly half (47%) of listed companies disclose at least some of their Scope 3 emissions, up 10 percentage points from a year earlier.
- 38% of companies disclosed at least some of their upstream Scope 3 emissions, up eight percentage points from a year earlier, while 28% disclosed at least some of their downstream Scope 3 emissions, up seven percentage points over the same period.

Listed companies are likely to burn through their share of the global carbon budget for limiting the rise in average global temperatures to 1.5°C (2.7°F) by October 2026.

- Listed companies are on track to produce an estimated 10.9 billion tons (gigatons) of Scope 1 GHG emissions this year, down about 7.7% from 2023, based on data as of May 31, 2024.
- Emissions from listed companies represent about 20% of global GHG emissions. Both global GHG emissions and emissions from listed companies are currently on track to tick down this year by roughly 7.7% from a year ago.[4]

Tracking the voluntary carbon market

- Monthly volume-weighted average spot prices for carbon credits across all project types rose to USD 5.8 per tonne of carbon dioxide equivalent (CO_2e) in the three months ended June 28, 2024, a 20% increase from the previous quarter but 11% below their level a year ago.
- Issuances of carbon credits in the second quarter of 2024 totaled 68 million tonnes (Mt) of CO_2e, down 22% from the same period a year earlier.
- The number of carbon credits retired during the second quarter totaled 34 Mt of CO_2e, down 11% from the same period a year earlier.



One transition, different approaches

Though investors are increasingly focused on financing the transition to a low-carbon economy, a consensus has yet to emerge on all the details of how to define transition finance, much less measure it. Below we compare and contrast three indicators used by investors.

Assessing alignment based on the Net Zero Investment Framework

The Net Zero Investment Framework (NZIF) is designed to help institutional asset owners and managers analyze alignment of their investments with the low-carbon transition and develop climate strategies and plans in line with global goals. Investor groups such as the Institutional Investors Group on Climate Change and the Net-Zero Asset Management Initiative endorse its use, contributing to the framework's adoption by investors.[5] Applying the voluntary framework to the world's listed companies offers one indication of their alignment with a science-based net-zero emissions trajectory.

The NZIF classifies companies into one of five categories that represent a progression of alignment with a net-zero pathway, with "not aligning" indicating the lowest degree of alignment with global climate goals and "achieving net zero" indicating full alignment. (Exhibit 1). The maturity scale, as the designations are known, reflects an expectation that by 2040 every asset would, at a minimum, align with a net-zero pathway.

Exhibit 1: The Net Zero Investment Framework maturity scale

Not aligning	Committed to aligning	Aligning to a net zero pathway	Aligned to a net-zero pathway	Achieving net zero
Companies without a commitment to decarbonize in a manner consistent with achieving net-zero emissions.	Companies with a long-term goal of reaching net-zero by 2050.	Companies that are not yet aligned with a net-zero pathway but have both a science-based target and a decarbonization plan that align with such a pathway.	Companies that have science-based targets, a decarbonization plan, and current absolute or emissions intensity at least equal to a net-zero pathway.	Companies that have current emissions at or near net- zero.

Source: NZIF 2.0, June 2024

The framework recommends six criteria designed to help investors assess alignment of companies with the framework's maturity scale (Exhibit 2). Four apply to companies in every sector; all six apply to companies in what the NZIF terms "high-impact" sectors based on the quantity of GHG emissions in their value chain.[6]

MSCI ESG Research has categorized each of the world's listed companies according to the NZIF maturity scale (Exhibit 3).[7] The mapping shows that the lion's share (84%) of listed companies were overwhelmingly misaligned with a net-zero pathway and thus may face risks (such as from changes in asset values or higher costs of doing business that could accompany the low-carbon transition) as defined by the NZIF maturity scale. That includes 83% of listed companies in high-impact sectors (which are responsible for the largest quantity of listed-company emissions) and 85% of listed companies in low-impact sectors (Exhibit 5).

The world's 100 most valuable companies were significantly more aligned with the net-zero transition (Exhibit 4). Nearly one-third (30%) were committed to aligning with net-zero (compared with 8% of listed companies generally), while 12% were aligning with net-zero (compared with 3% of listed companies generally.)

Exhibit 2: NZIF criteria underpinning alignment assessment for listed equities

	Not aligning	Committed to aligning	Aligning to a net zero pathway	Aligned to a net-zero pathway	Achieving net zero
Company with emissions intensity required by the sector and regional pathway for 2050 and whose operational model will maintain this performance.					✓
Emissions performance: Current absolute or emissions intensity is at least equal to a relevant net-zero pathway				✓	✓
Capital allocation alignment: A clear demonstration that capital expenditures are consistent with a relevant net zero pathway.				✓	✓
Decarbonization strategy: A quantified set of measures exists to achieve short- and medium-term science-based targets by reducing GHGs and increasing green revenues, when relevant			✓	✓	✓
Disclosure: Disclosure of operational scope 1, 2 and material scope 3 emissions.			✓	✓	✓
Targets: Short- and medium- term science-based targets to reduce GHG emissions			✓	✓	✓
Ambition: A long-term goal consistent with the global goal of achieving net-zero by 2050		✓	✓	✓	✓

Source: MSCI Sustainability Institute and NZIF 2.0 framework. Green-highlighted criteria apply to companies in high-impact sectors.

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Exhibit 3: Listed companies by NZIF maturity scale category

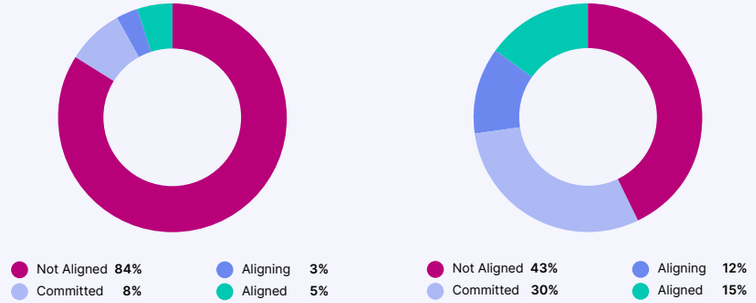
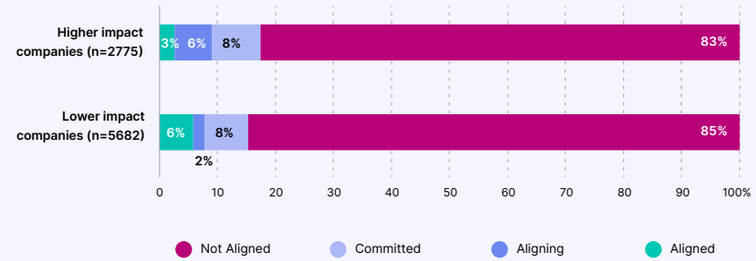


Exhibit 4: NZIF alignment of the 100 largest listed companies by market value

Source: MSCI Sustainability Institute, data as of June 24, 2024

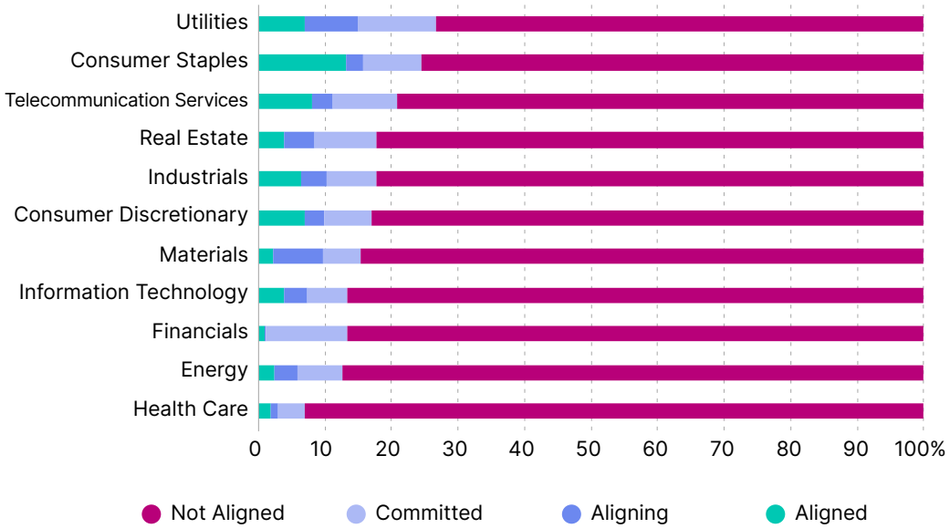
Exhibit 5: NZIF alignment of listed companies by impact category



Source: MSCI Sustainability Institute, data as of June 24, 2024

No listed companies were assessed as "achieving net zero" on the NZIF maturity scale, as of June 24, 2024; that is, no company has yet shown that it has, as described by NZIF, an "emissions intensity required by the sector and regional pathways for 2050 and whose operational model will maintain this performance." The consumer staples sector had the largest share (14%) of net-zero aligned companies (Exhibit 6). The health care sector had the largest proportion of companies that were not aligned (93%). The three largest companies by market value categorized as aligned were ASML Holding (information technology), Johnson & Johnson (health care) and Nestle (consumer staples).

Exhibit 6: Alignment of listed companies with the NZIF maturity scale by GICS® sector



Source: MSCI Sustainability Institute, data as of June 24, 2024. GICS is the global industry classification standard jointly developed by MSCI Inc. and S&P Global Market Intelligence. The GICS® structure comprises 11 sectors, 24 industry groups, 69 industries and 158 sub-industries.

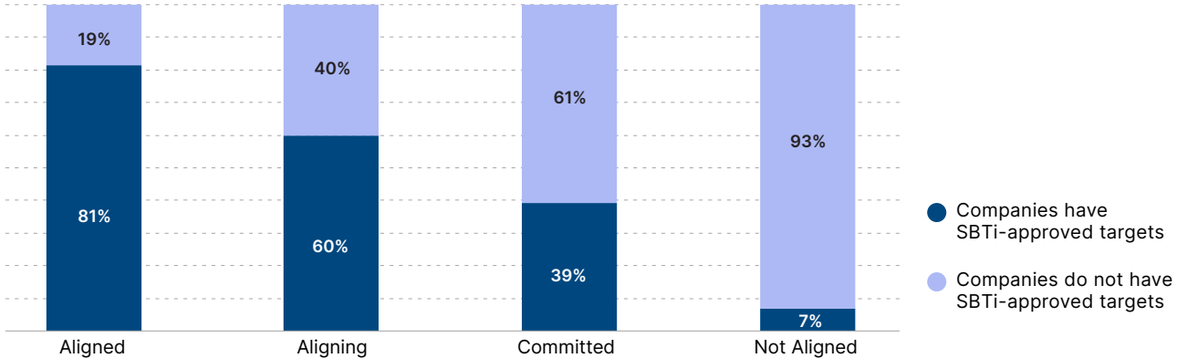
Of the 10 largest companies by market value, five were not aligning to a net-zero pathway based on the NZIF maturity scale, four were committed to aligning, and one was aligning, as of June 24, 2024 (Exhibit 7).

Exhibit 7: NZIF alignment of the 10 largest listed companies by market value

Company	GICS sector	NZIF maturity scale alignment	NZIF impact category
Apple Inc.	Information Technology	Not aligned	Higher impact
Microsoft Corporation	Information Technology	Aligning	Lower impact
Nvidia Corporation	Information Technology	Not aligned	Lower impact
Alphabet Inc.	Communication Services	Committed	Lower impact
Amazon.com, Inc.	Consumer Discretionary	Committed	Lower impact
Saudi Arabian Oil Company	Energy	Not aligned	Higher impact
Meta Platforms Inc.	Communication Services	Committed	Lower impact
Berkshire Hathaway Inc.	Financials	Not aligned	Higher impact
Eli Lilly and Company	Health Care	Not aligned	Lower impact
Taiwan Semiconductor Manufacturing Co., Ltd.	Information Technology	Committed	Lower impact

Source: MSCI Sustainability Institute, data as of June 24, 2024

Exhibit 8: Share of listed companies that have set science-based climate targets by NZIF maturity-scale category



Source: MSCI ESG Research, data as of June 24, 2024

Exhibit 9: MSCI Implied Temperature Rise bands

1.5°C ALIGNED	2°C ALIGNED	MISALIGNED	STRONGLY MISALIGNED
<=1.5°C (11%)	>1.5°C <=2°C (27%)	>2°C <=3.2°C (39%)	>3.2°C (23%)

Source: MSCI ESG Research

Companies' setting of science-based climate targets

Beside maturity frameworks such the NZIF, investors also commonly track the share of companies that have set climate targets in line with the goal of limiting global warming to 1.5°C above preindustrial levels. Companies that set targets in line with the standard developed by SBTi pledge to reduce their Scope 1, 2 and 3 emissions to net-zero in line with a pathway that would limit the rise in average global temperatures to 1.5°C and permanently neutralize any emissions that remain.[8] In all, just over one-fifth (22%) of listed companies have a climate target either approved by SBTi or designed to align with the SBTi standard, as of May 31, 2024 (Exhibit 10).

NZIF categories correlate strongly with companies setting of science-based decarbonization targets, i.e., 81% of companies classified as "aligned" (the most mature NZIF category) have an SBTi-approved target (or have committed to set one) while 60% of companies that are in the second most mature category of "aligning" have an SBTI-approved target or have committed to set one (Exhibit 8).[9]

See page 10 for data on climate target-setting by listed companies

Tracking decarbonization progress with temperature alignment metrics

Finally, investors may also use temperature alignment metrics to track progress toward decarbonization because they provide a consistent way to measure companies' emissions trajectories across portfolios potentially comprising thousands of companies in multiple industries. Though methodologies can differ across providers of temperature alignment metrics, the investment industry has established common principles for the design of such metrics that are intended to promote choice and transparency for users.[10]

For example, key differences between a temperature rating methodology developed by SBTi and the Implied Temperature Rise (ITR) metric developed by MSCI ESG Research include the scope of emissions covered and the target year. SBTi's methodology measures the alignment of companies' near-term targets for Scope 1 and 2 emissions with varying scenarios for warming between now and the end of this century.[11] Our ITR, by contrast, projects an estimated rise in average global temperatures based on a company's over- or under-spending of its share of a sector-specific carbon budget across all three emissions scopes.[12] Though designed to measure alignment with net-zero trajectories differently, SBTi's temperature rating methodology and our ITR can correlate closely when the latter is adjusted to cover only Scope 1 and Scope 2 emissions (the parameters covered by SBTi), an analysis by MSCI ESG Research finds.[13]

As for what the temperature metrics show, 11% of listed companies aligned with projected warming of 1.5°C, as of May 31, 2024, based on MSCI ESG Research's ITR, while 27% aligned with a 2°C temperature rise (Exhibit 9). Nearly two-thirds (62%) of listed companies were on an emissions trajectory that would breach the 2°C threshold.[14] As it happens, SBTi's analysis also showed that 11% of companies aligned with 1.5°C warming, though the comparison has limits: As of July 2022, the SBTi has only accepted new target submissions that are aligned with 1.5°C.[15]

Assessing climate progress of listed companies

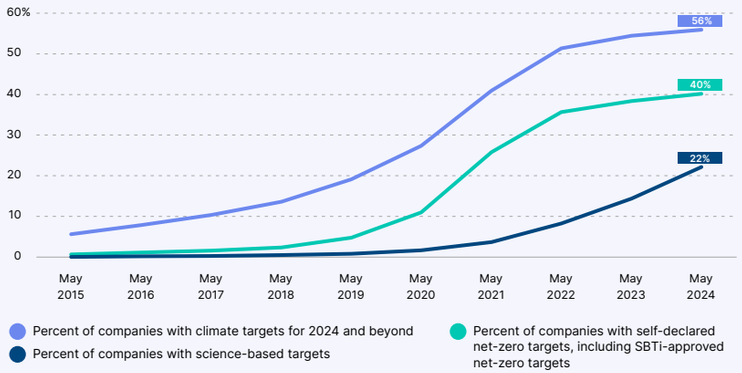
More companies are setting science-based climate targets but the overall share remains low

Just over one-fifth (22%) of listed companies have published an SBTi-approved or committed target as of May 31, 2024; that is, one that would reduce all of their financially relevant greenhouse gas emissions to net-zero in line with the corporate net-zero standard developed by the SBTi. The share of companies with a science-based target rose eight percentage points from a year earlier, yet this still means that nearly 80% of listed companies have yet to make such a climate commitment.

Forty percent (40%) of companies have set a target that aspires to reduce emissions to net-zero (though not necessarily in line with climate science), up about two percentage points over the same period. Overall, 56% of listed companies have published a climate commitment, up about two percentage points from a year ago. (Exhibit 10).

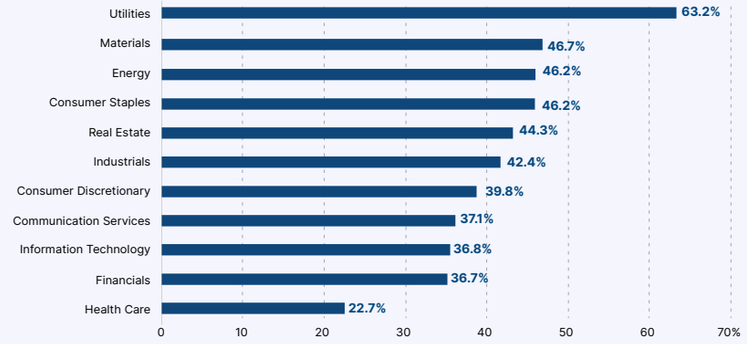
This section is interactive. Click on a chart to enlarge it. Click again to close.

Exhibit 10: Share of listed companies with climate targets by target type



Source: MSCI ESG Research, data as of May 31, 2024

Exhibit 11: Percentage of companies with self-declared net-zero targets by GICS® sector

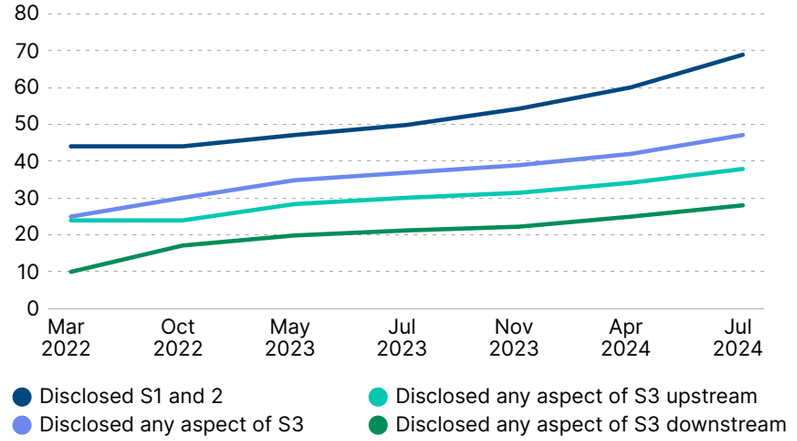


Source: MSCI ESG Research, data as of May 31, 2024

Scope 3 emissions reporting on the rise

Companies are increasingly reporting emissions across their value chain. Overall, 69% of listed companies disclosed their Scope 1 and/or Scope 2 emissions as of May 31, 2024, an increase of 19 percentage points from a year earlier. Nearly half (47%) of companies reported at least some of their Scope 3 emissions, a rise of 10 percentage points from a year earlier. Thirty-eight percent of companies disclosed at least some of their upstream Scope 3 emissions, up eight percentage points from a year earlier, while 28% disclosed at least some of their downstream Scope 3 emissions, up seven percentage points over the same period.

Exhibit 12: Emissions disclosure rising



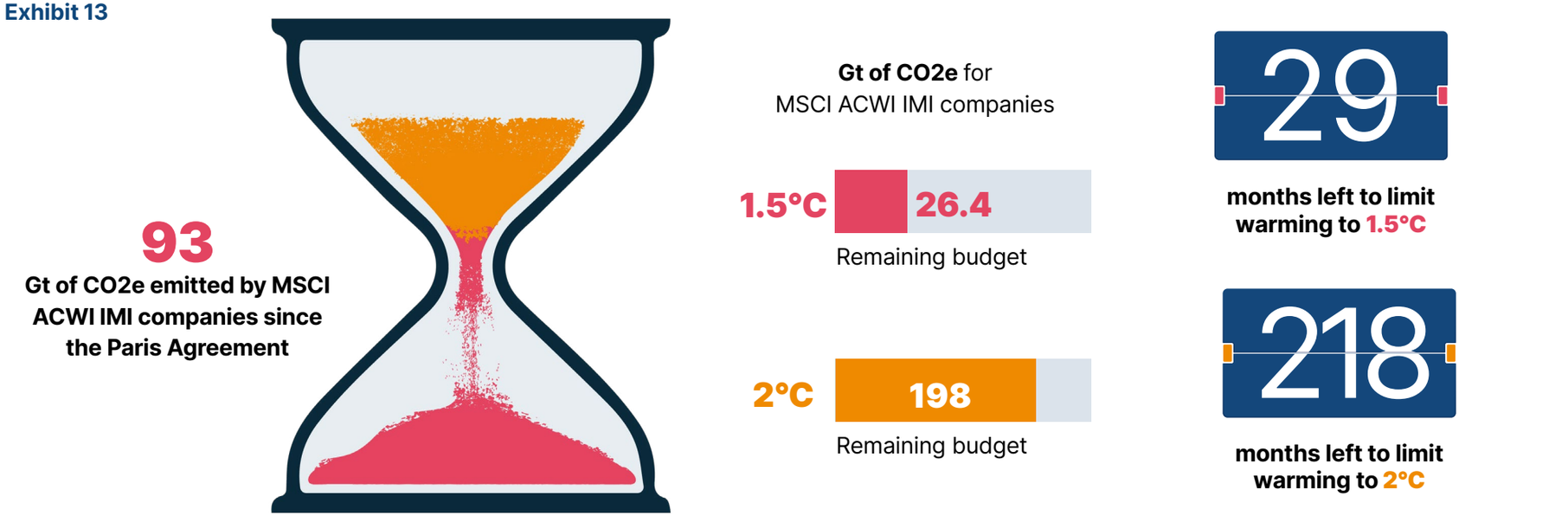
Source: MSCI ESG Research, data as of May 31, 2024

Time running out to rein in the worst impacts of a warming climate

Listed companies would deplete their share of the global carbon emissions budget for limiting temperature rise to 1.5°C by October 2026, based on their Scope 1 emissions as of May 31, 2024 (Exhibit 13).[16]

- To limit warming to 1.5°C, companies would need to collectively cap future Scope 1 emissions at 26.7 gigatons (Gt) of CO2e emissions by 2050. Without any change to their current emissions, companies would deplete their remaining emissions budget in 2 years, 5 months from May 31, 2024.
- To limit warming to 2°C, listed companies would need to collectively cap future Scope 1 emissions at 198 Gt of CO2e by 2050. Without any change to their current emissions, companies would deplete their remaining emissions budget in 18 years, 2 months from May 31, 2024.

Exhibit 13



MSCI ESG Research, data as of May 31, 2024

The hourglass and countdown clock show annual total Scope 1 emissions of MSCI ACWI IMI constituents (not index-weighted) based on listed companies' reported emissions data and MSCI estimates as of May 31, 2024. Emissions for 2023 that companies haven't yet reported are based solely on MSCI estimates, given a lag in company reporting. The remaining future emissions budget to achieve a 1.5°C and 2°C warming scenario are calculated based on bottom-up estimates (sum of remaining emissions budget of all MSCI ACWI IMI constituents) as of May 31, 2024.

Comparing global and listed-company GHG emissions

Scope 1 emissions of the world's listed companies represented about 20% global GHG emissions (Exhibit 14). The table at right shows total estimated global GHG emissions and Scope 1 emissions (sum for all index constituents without index weighting) for the MSCI ACWI Investable Market Index (IMI), as of May 31, 2024.

While both global GHG emissions and listed-company emissions are currently on track to tick down from last year, we caution against drawing conclusions from the data. Emissions estimates can change throughout the year based on reporting by companies or changes in estimates of global emissions.[17]

Exhibit 14: Global greenhouse gas emissions (Gt CO2e)

Historical greenhouse gas emissions [Gt C02e]	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Global greenhouse gas emissions*	51.7	51.8	51.9	53.5	55.3	59.1	55.7	58.8	59.7	59.9	55.3
MSCI ACWI IMI Scope 1**	10.4	10.2	9.6	10.2	11.4	11.4	10.4	11.6	11.8	11.8	10.9

Source: MSCI ESG Research, data as of May 31, 2024

* Global emissions through the end of 2023 are based on annual UN Environment Programme reports. The estimate for 2024 reflects changes in emissions as reported by Carbon Monitor. Data reflects cumulative GHG emissions.

** MSCI ACWI IMI emissions for 2023 as reported by companies or estimated by MSCI, where not reported. Emissions for 2024 are estimated from changes in emissions as reported by Carbon Monitor.

The 20 listed companies with the largest absolute carbon footprints

Exhibit 15

Company	Country	Total carbon emissions [million tons of CO2e]*	Scope 1 emissions [million tons of CO2e]	Scope 2 emissions [million tons of CO2e]	Scope 3 emissions [million tons of CO2e]
Saudi Arabian Oil Company	Saudi Arabia	2523.4	234.2	19.5	2269.7
Coal India Ltd.	India	1338.4	24.0	7.5	1306.9
PetroChina Company Limited	China	1287.3	119.7	40.9	1126.7
Exxon Mobil Corporation	U.S.	1166.3	109.0	7.0	1050.3
China Petroleum & Chemical Corporation	China	1002.4	137.7	24.1	840.6
Chevron Corporation	U.S.	887.2	53.0	4.0	830.2
Shell PLC	UK	790.8	82.0	8.0	700.8
China Shenhua Energy Company Limited	China	759.0	172.4	4.0	582.6
BP PLC	UK	681.0	33.9	1.6	645.5
SAIC Motor Corporation Limited	China	632.8	1.7	3.0	628.1
BHP Group Limited	Australia	536.2	8.0	1.8	526.4
Huaneng Power International Inc.	China	528.5	483.7	0.2	44.5
Equinor ASA	Norway	506.3	11.4	0.1	494.8
Porsche Automobil Holding SE**	Germany	503.3	2.4	1.1	499.8
Volkswagen Aktiengesellschaft	Germany	488.2	4.5	2.1	481.7
Toyota Motor Corporation	Japan	476.6	2.4	3.8	470.4
Marathon Petroleum Corporation	U.S.	473.8	33.7	6.7	433.4
Vale SA	Brazil	452.1	8.6	0.6	442.9
General Electric Company	U.S.	451.9	0.7	1.0	450.3
TotalEnergies SE	France	430.6	37.0	2.0	391.6

Source: MSCI ESG Research, data as of May 31, 2024

* Sum of reported or estimated Scope 1 and 2 emissions plus Scope 3 emissions estimates. If a company does not report its Scope 1 and 2 carbon emissions data, MSCI ESG Research estimates each scope separately based on either the company's previously reported emissions data or, if none, the carbon emissions intensity of the company's production or industry segments. We estimate Scope 3 emissions for all companies in our coverage based on company-specific information that considers both the revenue intensity of emissions and production data, in line with the Greenhouse Gas Protocol framework. For more information, please see: "MSCI Climate Change Metrics Methodology and Definition" and "Scope 3 Carbon Emissions Estimation Methodology," MSCI ESG Research.

** Porsche Automobil Holding SE owns Volkswagen Aktiengesellschaft and its companies (including both Volkswagen AG and Porsche AG) and hence owns the emissions of those carmakers.

Tracking the carbon credit market

Below we provide a snapshot of key indicators of the carbon credit market: Issuances of carbon credits by project type (an indicator of supply), retirements (an indicator of demand) and price, as of the three months ended June 30, 2024. See "Key Terms" section for definitions of carbon credit types.

Supply. Issuances of carbon credits in the second quarter fell 25%, to 68 Mt CO2e, from the same period a year earlier (Exhibit 16). The slowdown in the supply of credits was driven predominantly by a drop in nature-based issuances, which saw their lowest quarter in six years.

While news media coverage of carbon credit quality continued to buffet the market, the quarter also included two more positive developments of note.[18] The Integrity Council for the Voluntary Carbon Market announced the first carbon-crediting methodologies that meet its Core Carbon Principles, an emerging industry standard for carbon credit quality.[19] The first seven approved methodologies cover 99 carbon credit projects representing 1.2% of total credits issued to date. The quarter also included the first ever issuance of registered credits for CO2 removal via direct air capture.[20] Though tiny in scale at just 158 tonnes of CO2 captured so far, the project developed by Climeworks and based in Iceland has a theoretical annual capture capacity of up to 4,000 metric tonnes.

Demand. Companies retired 34 MtCO2e of carbon credits during the second quarter of 2024, down 11% from the same period a year earlier (Exhibit 17), a drop driven largely by lower demand for renewable energy credits. Primax SA, Civitas Resources and Boeing topped the list of companies that retired the most carbon credits in the period. (Exhibit 18).

While retirements reflect demand for carbon credits today, they do not include today's demand for credits in the future. Long-term forward agreements (or offtakes) for credits are becoming increasingly common among climate-active firms. Microsoft during the quarter announced both the largest-ever nature-based offtake, for 8 Mt of CO2e from BTG Pactual TI, and the largest-ever engineered carbon-removal offtake, with the tech giant's agreeing to buy 3.3 Mt of BECCS removals from Stokholm Exergi to be delivered over 10 years beginning in 2028.[21]

Exhibit 16: Quarterly issuances of voluntary carbon credits by project type (MtCO2e)

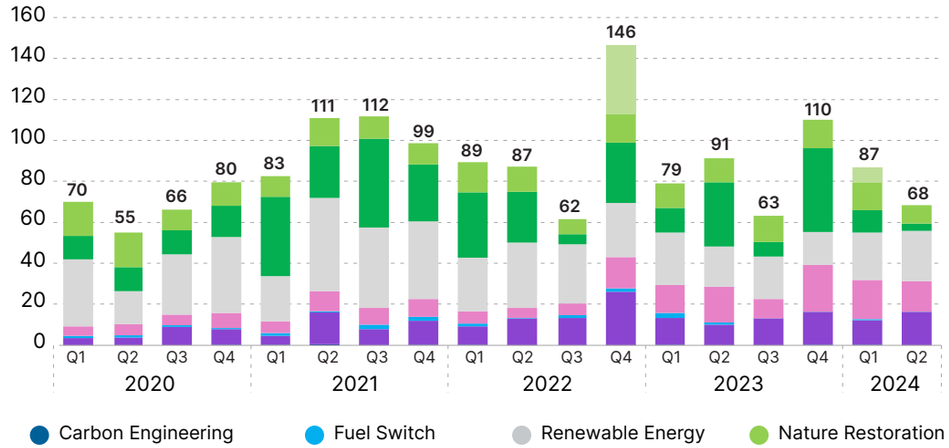
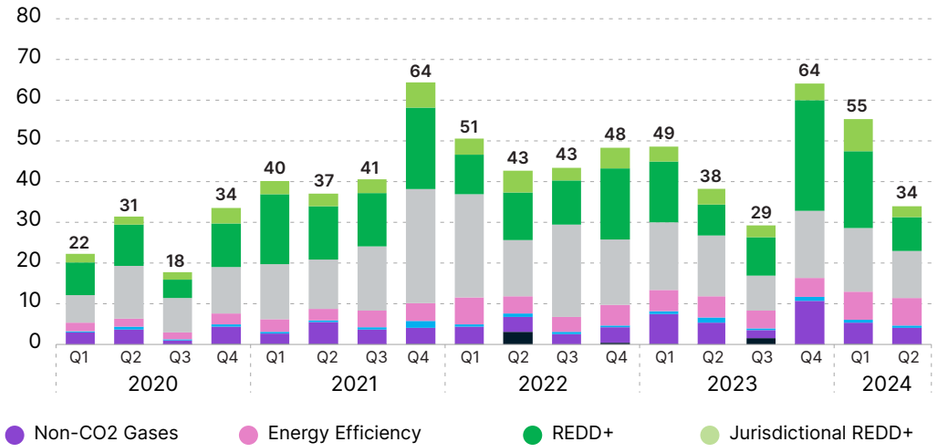
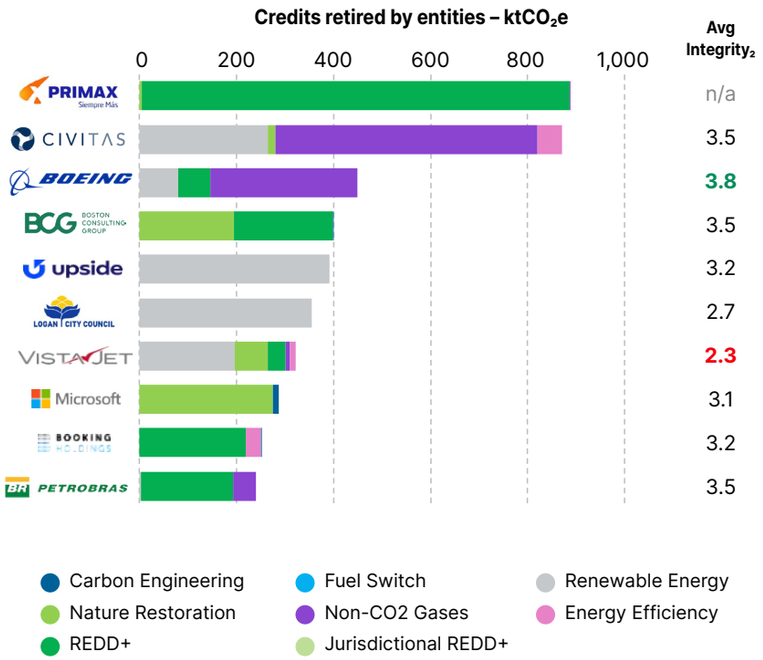


Exhibit 17: Quarterly retirements of voluntary carbon credits by project type (MtCO2e)



Registries included: Verra, Gold Standard, ACR, CAR, CDM - NDC Eligible, Climate Forward, ART Trees, Puro Earth, EcoRegistry, BioCarbon, GCC & ACCU; Source: MSCI Carbon Markets, as of June 30, 2024. Note that the scale, as depicted by the y-axis, differs between Exhibits 16 and 17.

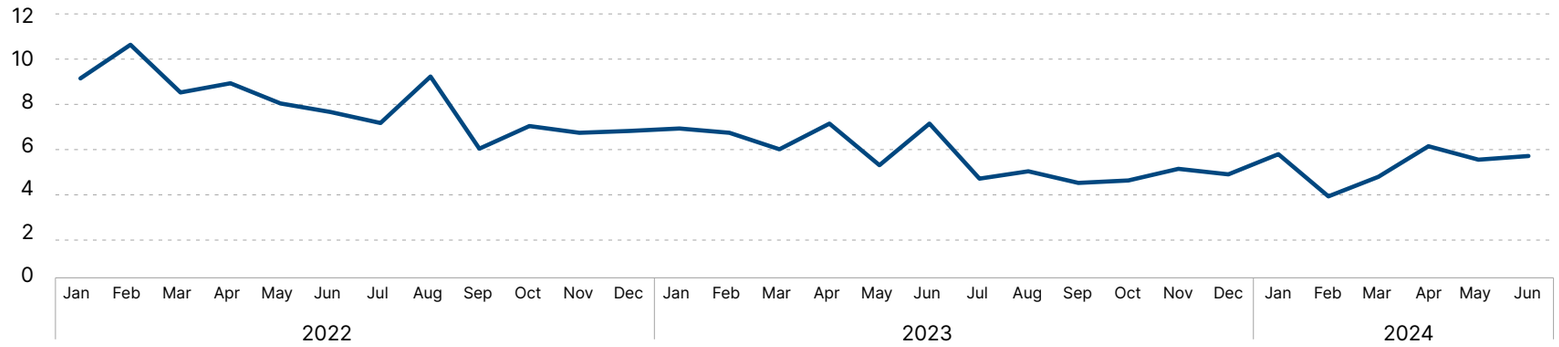
Exhibit 18: Top 10 disclosed retirees, second quarter 2024



Registries included: Verra, Gold Standard, ACR, CAR, CDM - NDC Eligible, Climate Forward, ART Trees, Puro Earth, EcoRegistry, BioCarbon, GCC & ACCU; Source: MSCI Carbon Markets, as of June 30, 2024

Price. Monthly volume-weighted average spot prices for carbon credits across all project types rose to USD 5.8 per tonne of CO2e in the second quarter, a 20% increase from the previous quarter but 11% below their level a year ago (Exhibit 18). Nature restoration credits continued to command a premium, with prices averaging more than double those of all other credit types. Prices were strongest among non-CO2 gas credits, which rose 60% in the quarter, driven mainly by a shift away from lower-priced Ozone Depleting Substance credits and toward Landfill Gas credits.

Exhibit 19: Monthly average spot credit price - all project types (USD/tCO2e)



Registries included: Verra and Gold Standard. Source: MSCI Carbon Markets, as of June 30, 2024.

Conclusion

Transition finance reflects a recognition that mitigating climate change means decarbonizing the whole of the real economy, where greenhouse gas emissions hover near record highs.

Investors are increasingly using a series of levers, from financing emissions-intensive industries and hard-to-abate sectors to investing in climate solutions and replacing emissions-heavy assets like coal-fired power plants, designed to drive emissions to net-zero while preventing the worst impacts of a warming planet.

It's a balancing act that demands new types of measures and analysis. Measuring financed emissions may create a foundation for investor climate action, but that alone may not help investors know where (or when) to allocate the next dollar of capital for real-economy decarbonization. For that, investors are turning to investment frameworks and climate indicators designed to help them fine-tune their strategies for credibly financing decarbonization over time. Understanding the differences between them is a key part of the transition finance journey.

Finally, financing the transition to a greener economy will demand trillions of dollars in investment. The shift to low-carbon energy from fossil fuels alone could demand as much as USD 70 trillion in new capital in the next 25 years.[22] As much as 70% of that capital could come from the private sector.[23]

Yet while private capital is a prerequisite for the climate transition, so is policy. As our analysis suggests, even the most finely tuned climate investment strategies may not drive down global emissions of greenhouse gases (and, hence, reduce risk to lives and livelihoods) without policies that produce a level playing field and a mix of activity in the real economy that investors can finance.

"Measuring financed emissions may create a foundation for investor climate action, but that alone may not help investors know where (or when) to allocate the next dollar of capital for real-economy decarbonization."

Key terms

Bioenergy Carbon Capture and Storage (BECCS): A technique for producing energy from burning plant materials and other biomass to generate energy and then capturing the resulting CO2 emissions.

Carbon budget: The amount of greenhouse gas that society can release into the atmosphere before breaching key temperature thresholds.

Carbon credit: A unit representing the avoidance or removal of 1 tonne of CO_2e, created by an activity or set of activities in relation to a counterfactual baseline that considers what emissions would be but for the activity or activities.

Carbon dioxide equivalent ($C0_2e$): Greenhouse gas emissions with the same global warming potential as 1 metric tonne of carbon.

Carbon emissions revenue intensity: Greenhouse gas emissions in metric tons that a company emits to generate every USD 1 million of revenue.

Carbon Engineering: Carbon credit projects that remove and store carbon dioxide emissions from the atmosphere and into materials that do not create or increase biomass carbon stocks.

Energy Efficiency: Carbon credit projects that reduce CO_2 emissions by decreasing the energy needed by equipment (either domestic or industrial), energy systems, and single power generation units.

Financed emissions: Greenhouse gas emissions associated with investments, loans and insurance.

Fuel Switch: Carbon credit projects that change the energy source within an energy system or its individual beneficiaries (such as power plants and vehicles) without adding or removing any installed capacity.

GICS®: The global industry classification standard jointly developed by MSCI Inc. and S&P Global Market Intelligence. The GICS® structure comprises 11 sectors, 24 industry groups, 69 industries and 158 sub-industries.

Gigaton [Gt]: 1 billion tons (of emissions).

Implied Temperature Rise: A forward-looking climate impact metric that estimates the increase in average global temperature that would occur this century if the economy were to overshoot or undershoot the global carbon budget by the same amount as the company or investment portfolio in question.

Jurisdictional REDD+: Projects that reduce carbon dioxide emissions through the avoidance of deforestation on a national or subnational scale.

Landfill Gas credits: Carbon credits that promote the flaring or use of gas from landfills for energy production.

Megaton [Mt]: 1 million tons (of emissions).

MSCI ACWI Investable Market Index (MSCI ACWI IMI): Captures large-, mid- and small-cap listed companies across 23 developed markets and 27 emerging market countries. With 8,847 constituents, the index covers approximately 99% of the global equity investment opportunity set, as of June 28, 2024.

Nature Restoration: Carbon credit projects that increase GHG sequestration into the biosphere by restoring living biomass and soils towards their pre-disturbance state. Includes most emissions "removals" alongside carbon engineering.

Non-CO_2 gases: Carbon credit projects that primarily reduce greenhouse gas emissions other than carbon dioxide (notably methane), including landfills, waste treatment systems and fugitive emissions.

Ozone Depleting Substance credits: Carbon credits associated with the destruction of ozone-depleting substances that would have otherwise been released into the atmosphere.

REDD+ (Reducing emissions from deforestation in developing countries plus): Carbon credit projects that reduce carbon dioxide emissions through the avoidance of deforestation, either planned or unplanned.

Remaining emissions budget: A company's future GHG emissions budget, in tons of CO_2e, for limiting warming this century to 1.5°C or 2°C above preindustrial levels.

Renewable Energy: The installation of new power generation capacity that uses carbon-free energy sources.

Science Based Targets initiative: A nonprofit organization established by CDP, the U.N. Global Compact, the World Resources Institute, the U.N. and the World Wildlife Foundation to assess corporate climate targets.

Scope 1 emissions: Listed companies' direct greenhouse gas emissions in tons of CO_2e.

Scope 2 emissions: Listed companies' greenhouse gas emissions from electricity use in tons of $C0_2e$.

Scope 3 emissions: Listed companies' indirect greenhouse gas emissions in tons of CO_2e from their upstream supply chain, emissions inherent in products and services or emissions from portfolio companies.

Target comprehensiveness: Percentage of listed companies' Scopes 1, 2 and 3 emissions covered by emissions reporting or target setting.

Endnotes

1 "No sign of greenhouse gases increases slowing in 2023," National Oceanic and Atmospheric Administration, April 5, 2024

2 Listed companies are represented by the MSCI ACWI Investable Market Index (IMI), which captures large-, mid- and small-cap listed companies across 23 developed markets and 24 emerging market countries. With 8,847 constituents, the index covers approximately 99% of the global equity investment opportunity set, as of June 28, 2024. The Paris Aligned Investment Initiative comprises the Investor Group on Climate Change– Europe, the Asia Investment Group on Climate Change, Ceres – North America, and the Investor Group on Climate Change – Australasia. See, "NZIF 2.0: The Net Zero Investment Framework," June 2024.

3 See, "Financing the Climate Transition," MSCI Research, June 2024

4 That does not necessarily mean that global or listed-company emissions will fall in 2024; emissions estimates for any given period can and do change over time based on emissions reported by companies or tracking of daily emissions by Carbon Monitor, which produces the data we use in our estimate.

5 See "The Net Zero Asset Managers Commitment," The Net Zero Asset Managers initiative.

6 High-impact sectors comprise companies on the focus list created by the engagement initiative Climate Action 100+, those in high-impact sectors defined by the Transition Pathway Initiative (such as oil and gas, mining and power generation), as well as banks, real estate, agriculture, forestry and fishing. Those sectors equate to 18 industries, including airlines, cement, chemicals, electric utilities, industrials, oil and gas, shipping, steel and transportation. See, "NZIF 2.0: The Net Zero Investment Framework," June 2024.

7 Categorization based on NZIF 1.0. See, "Net Zero Investment Framework Implementation Guide," April 13, 2021.

8 See "SBTi Corporate Net Zero Standard," Version 1.2, Science Based Targets initiative, March 2024

9 The NZIF does not require corporate net-zero targets to be accepted and validated by SBTi but recommends that science-based targets companies set be equivalent in terms of robustness. See, "NZIF 2.0: The Net Zero Investment Framework," June 2024.

10 See GFANZ: "Measuring Portfolio Alignment: Driving Enhancement, Convergence, and Adoption," November 2022, and "Measuring Portfolio Alignment: Technical Considerations," 2021.

11 See "Temperature Rating Methodology," CDP Worldwide and WWF International, Version 1.0, Oct. 1, 2020

12 "MSCI Implied Temperature Rise Model Update," February 2024

13 See "Different, Not Diverging: Aligning Temperature-Alignment Metrics," MSCI ESG Research, June 26, 2024

14 SBTi has proposed that financial institutions be able to use non-SBTi temperature-alignment methodologies. See, "The SBTi Financial Institutions Net-Zero Standard," Conceptual Framework and Initial Criteria, Consultation Draft, June 2023

15 See "SBTi Monitoring Report 2022," Science Based Targets initiative, August 2023

16 Note that this refers to the remaining carbon emissions budget for listed companies and not to global temperatures.

17 See note 4. Though climate scientists have published preliminary analysis of annual GHG emissions in December, conclusive tallies tend to be published in the first part of the following calendar year. See, for example, "Year in Review: Global carbon emissions in 2023,' Carbon Monitor, April 4, 2024; "CO2 Emissions in 2023," International Energy Agency, March 2024; "Global carbon emissions in 2023," Zhu Liu, et al., Nature Reviews Earth & Environment, April 4, 2024; and "No sign of greenhouse gases increases slowing in 2023," U.S. National Oceanic and Atmospheric Administration, April 4, 2024.

18 See, for example, "Cookstove carbon offsets overstate climate benefit by 1,000%, study finds," The Guardian, Jan. 23, 2024

19 "The First Core Carbon Principles-Qualifying Projects — the VCM Steps on the Gas," MSCI Carbon Markets, June 6, 2024

20 See "Climeworks becomes world's first direct air capture company certified under the Puro Standard," May 23, 2024

21 See "BTG Pactual Timberland Investment Group to provide Microsoft with 8 million carbon removal credits," BTG Pactual Timberland Investment Group, June 18, 2024, and "Stockholm Exergi announces permanent carbon removal agreement with Microsoft, world's largest to date," Beccs Stockholm, May 6, 2024

22 "Financing the Net-Zero Transition," MSCI ESG Research, June 2024

23 See, "What's the cost of net zero?," UN High-Level Climate Champions, Nov. 3, 2021

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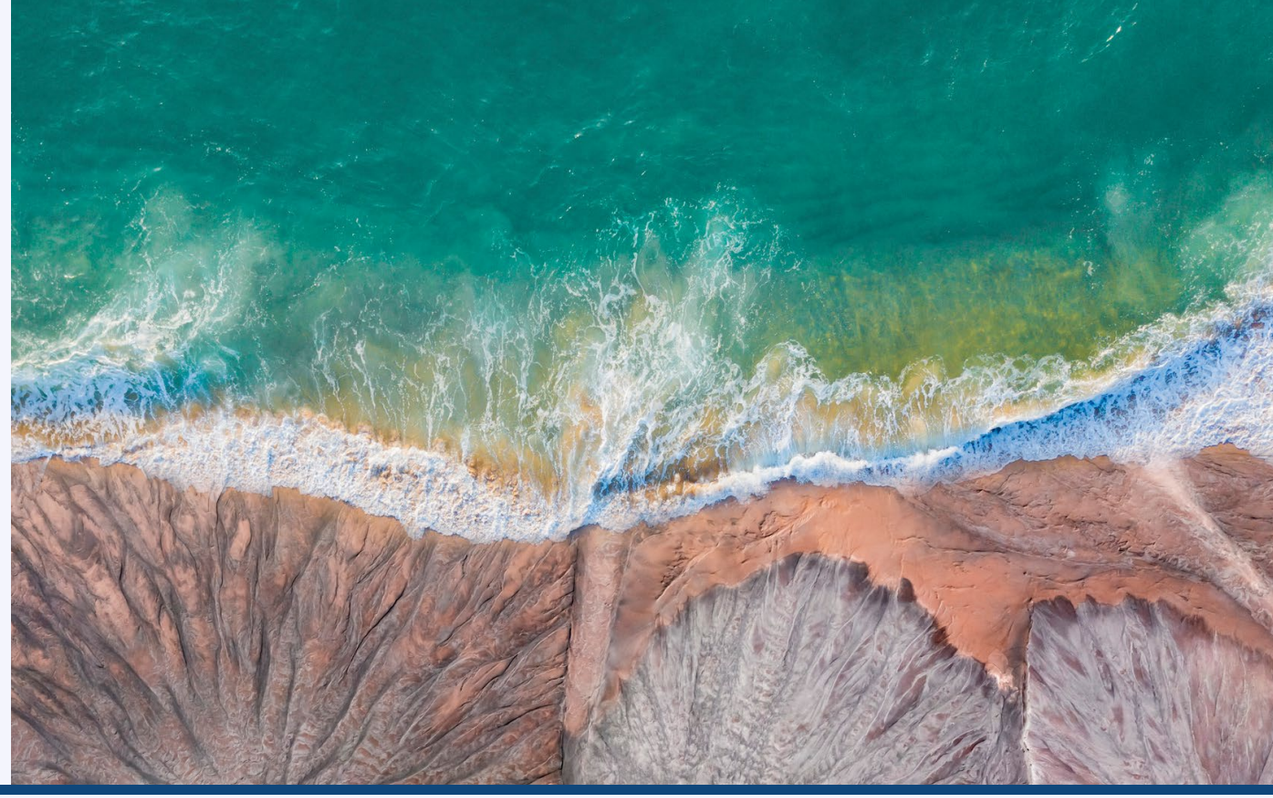

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