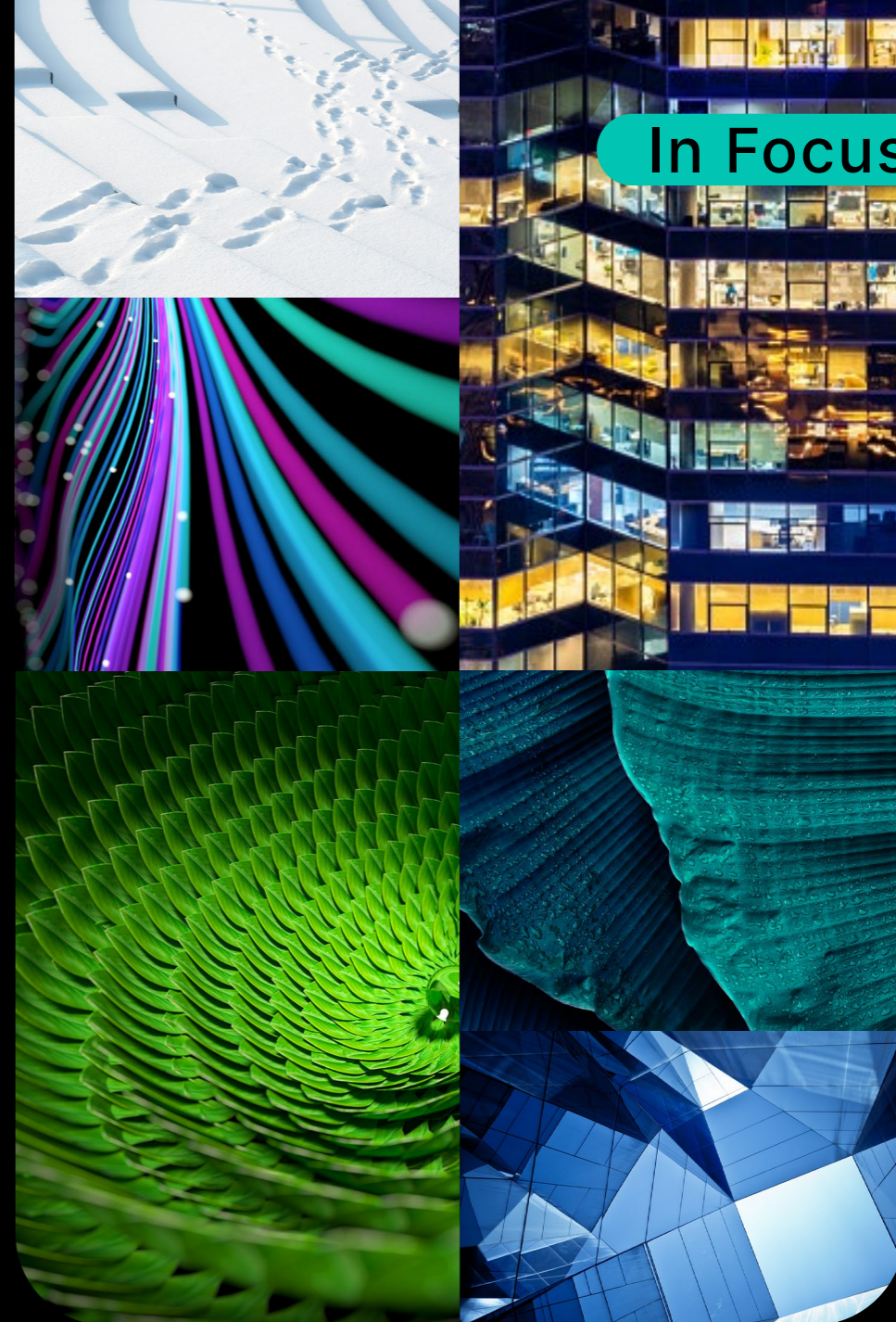




SUSTAINABILITY AND CLIMATE Trends to Watch

2025

In Focus



Introducing MSCI’s Sustainability and Climate Trends to Watch 2025

In a world that feels ever more uncertain, investors everywhere are looking for information that can give them an edge. Study after study shows that sustainability data can help identify more competitive, **more profitable, less risky** companies with higher long-term returns and a **lower cost of capital**.

The latter half of this decade will bring profound shifts, driven by geopolitics, disruptive technology breakthroughs and environmental challenges. Investors will need to contend with the sweeping effects of the **energy transition** on users and suppliers of energy, the escalating impact of **climate-related events** and new risks associated with the widespread **adoption of AI** across every sector of the economy.

Such unprecedented change brings unprecedented opportunity. The **energy system transformation** presents one of the most significant investment prospects of our time, with strong returns anticipated by many investors in low-carbon energy, green transportation and energy-storage solutions, especially in private markets.

Bolstered by strong fundamentals and new sources of demand, 2025 could be a pivotal year for **voluntary carbon markets**, offering critical funding for decarbonization in developing countries. Meanwhile, **climate-change-adaptation finance**, once the domain of governments, is also yielding investable opportunities for the private sector.

Beyond those themes, investors can systematically identify companies that are better-managed, more resilient and adaptable to change. **Research by MSCI** shows that firms managing **material social risks** — e.g., workforce issues, supply chains, product safety and community impact — consistently outperformed their peers.

Finally, growing momentum for **shareholder rights** — namely through a groundswell of support for majority voting — could offer public-market investors a greater ability to influence corporate behavior and drive sustainable value creation.

If you’re a long-time reader of our “Trends to Watch,” you might be wondering why **regulation** isn’t front and center this year. Since 2019, we’ve consistently written about the rising tide of regulation, but this year, we made a conscious decision not to feature it. That’s not because regulation is diminishing — in fact, **it is ramping up globally** — but because an intense focus on compliance and disclosure runs the risk of overshadowing the critical investment opportunities and challenges we’re here to address.

We’ll continue to monitor sustainability and climate regulations and do **everything we can to make them more understandable for you**. But ultimately, our mission remains focused on tackling the pressing, real-world investment challenges that drive your long-term success.



Laura Nishikawa
Head of ESG and
Climate R&D
New York

Acknowledgements

The Trends to Watch editorial team: Liz Houston, Bentley Kaplan, SK Kim, Jonathan Ponder

Contents



This is an
interactive page

This document is research for informational purposes only and is intended for institutional professionals with the analytical resources and tools necessary to interpret any performance information. Nothing herein is intended to promote or recommend any product, tool or service. For all references to laws, rules or regulations, please note that the information is provided “as is” and does not constitute legal advice or any binding interpretation. Any approach to comply with regulatory or policy initiatives should be discussed with your own legal counsel and/or the relevant competent authority, as needed.

Private Party? On the Hunt for Energy-Transition Solutions

Global investors are increasingly realizing that their net-zero portfolio targets may be slipping out of reach without accelerated progress in the real economy. To keep pace, many are shifting their focus to the energy transition — aiming not only to mitigate the risks of this shift but to capitalize on emerging investment opportunities in renewable energy and clean technology. But to seize these opportunities, investors first need a clear sense of where to direct their efforts.

Despite renewed commitments at recent global climate conferences to triple renewable-energy capacity and double energy efficiency, there is much uncertainty as to **how, where and how quickly that might happen**. And while publicly traded companies focusing on clean tech, green buildings and renewable energy saw a surge in valuations in 2020 and 2021, **they have struggled to maintain that momentum**.¹ But the situation in private markets looks very different — and a whole lot brighter.

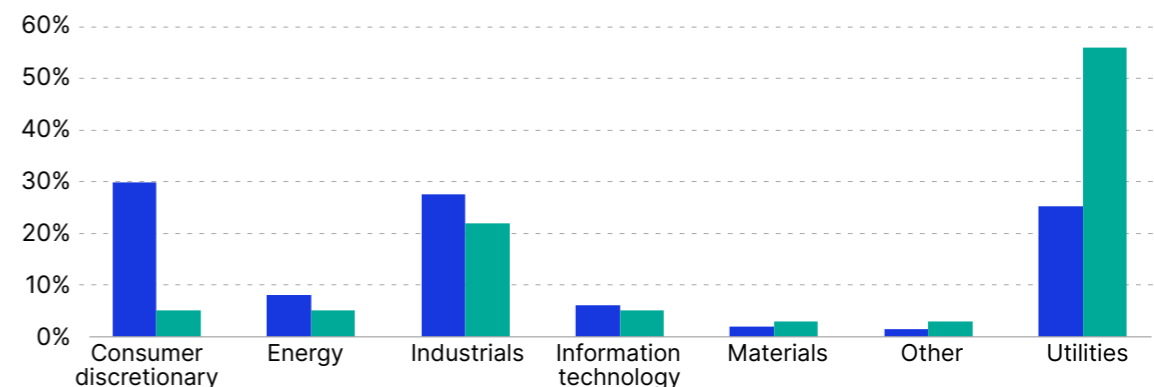
Finding exposure to low-carbon solutions in public and private markets

Low-carbon solutions encompass a range of technologies. But the core of what will drive the energy transition lies in three main categories: green(er) transportation, low-carbon power generation and energy storage. We identified companies with exposure to these themes in both public² and private³ markets and saw notable distinctions in where these markets had the most exposure.

In public markets, roughly 30% of the market value of the solutions peer set was in the consumer-discretionary sector, predominantly automobile manufacturers, which included electric vehicles (EVs).⁴ In private markets, over half the value of the solutions peer set was concentrated in utilities, with a strong emphasis on renewable electricity. Industrials had an important share in both markets — 27% in public and 22% in private — which included companies making power-generating equipment, charging stations and batteries.

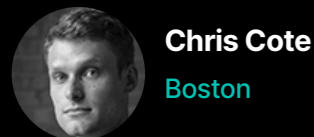
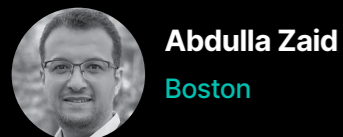
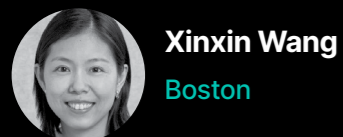
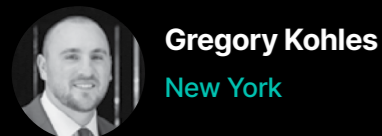
Exhibit 1: Sector exposure to select | low-carbon-transition opportunities across public and private markets

Exposure: Public - market cap | Private - NAV



● Public low-carbon-solutions providers peer set ● Private low-carbon-solutions providers peer set

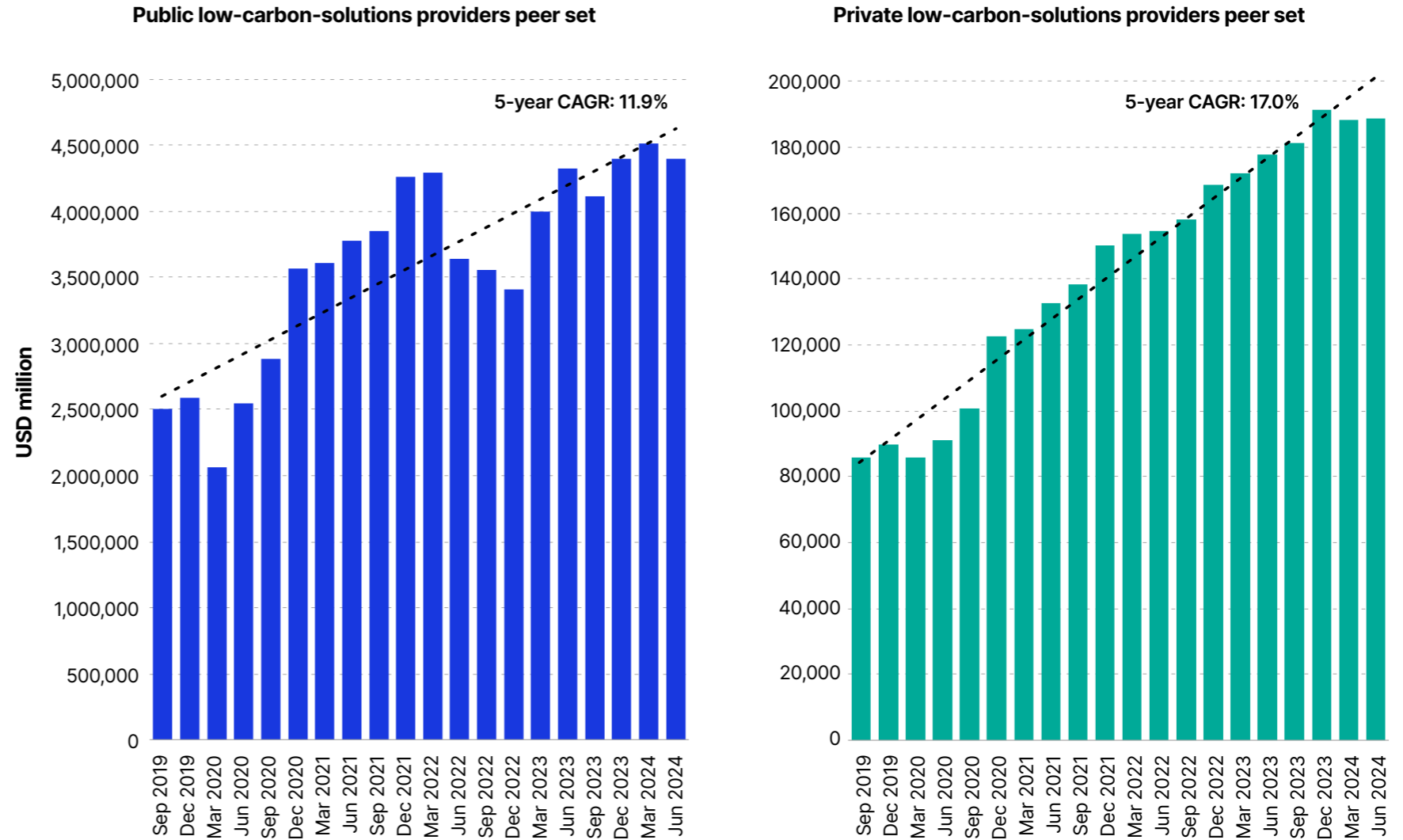
Data as of October 2024. The private net asset value (NAV) percentages reflect data as of June 30, 2024, and only focus on active investment holdings, consisting of 2,529 unique active investment holdings made by 1,193 unique private-capital funds in 1,779 unique portfolio companies that may have some connection with renewable energy, green mobility or energy storage as stated in endnote 3. The total underlying NAV is about USD 189 billion from the MSCI Private Capital data universe. The peer set of low-carbon-solutions providers in public markets included 569 constituents of the MSCI ACWI Investable Market Index (IMI) as of June 30, 2024, with five percent or greater estimated revenues from categories in the MSCI Sustainable Impact Metrics methodology associated with three themes: renewable and low-carbon power, green mobility and energy storage. Source: MSCI ESG Research, MSCI Private Capital



Higher value in public markets, but faster growth in privates

Unsurprisingly, the value of the public low-carbon-solutions peer set (market cap of USD 4.4 trillion) was much larger — nearly 23x — than the private solutions set (net asset value of USD 189 billion), as of June 2024. But the value of the private solutions set has been on a relative tear: The five-year compound annual growth rate was 17.0% through June 2024, while for the public set it was a more modest 11.9%.

Exhibit 2: Market value of public- and private-solutions peer sets



Data as of October 2024. The peer set of low-carbon-solutions providers in public markets included constituents of the MSCI ACWI IMI as of Oct. 10, 2024, with 5% or greater estimated revenues from categories within the MSCI Sustainable Impact Metrics methodology associated with three themes: renewable and low-carbon power, green mobility and energy storage as stated in endnote 2. The peer set of low-carbon-solutions assets in private markets includes companies within the MSCI Private Capital data universe as of June 30, 2024, that may have some connection with renewable energy, green mobility or energy storage as stated in endnote 3. Source: MSCI ESG Research, MSCI Private Capital

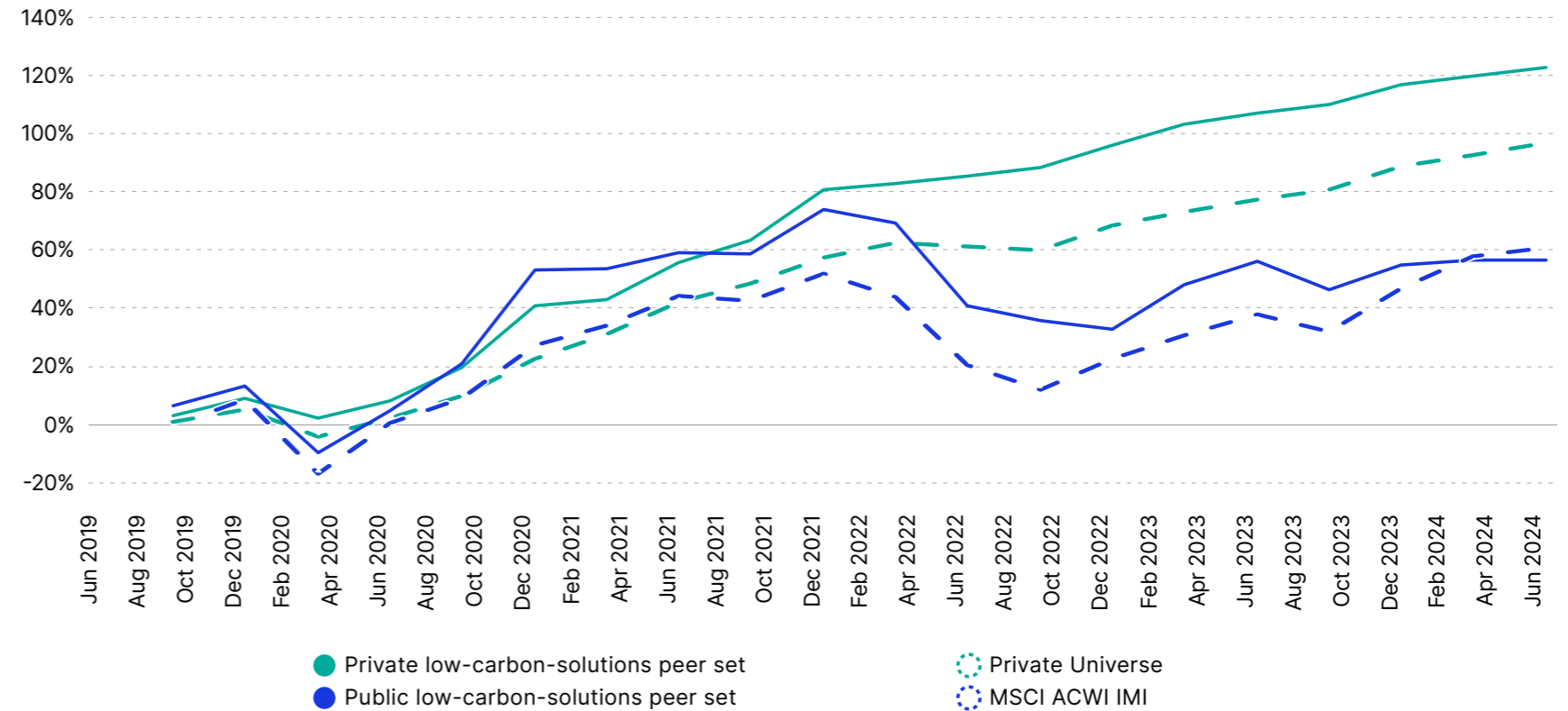
Outperformance in private low-carbon-solutions investments

The growth in private valuation translated to returns: The five-year cumulative returns from the private solutions peer set reached 123% by June 30, 2024 — outpacing the returns of the asset-class-reweighted private-capital universe (97%), the public solutions peer set (57%) and the MSCI ACWI IMI (61%).⁵

One word of caution: Investors may benefit from a careful review of the details when comparing returns across private and public assets, as the dynamics can differ. For example, the quarterly returns in the private markets were based on exited and active investment holdings, making them subject to factors such as lack of liquidity, irregular cash flows, subjective valuations and smoothing. In the private active investment holdings, valuation smoothing understates volatility, especially for shorter time horizons, while public-equity valuations are not subject to smoothing.

Still, in a segment of the market long known for its opacity, investors have more information than they may have thought to identify, size and evaluate opportunities across asset classes and markets. We see this information getting a closer look in 2025 as climate change intensifies and investors zero in on the search for solutions.

Exhibit 3: Cumulative return for low-carbon-solutions peer sets vs. benchmarks in private and public markets



Data as of October 2024. The peer set of low-carbon-solutions providers in public markets included constituents of the MSCI ACWI IMI as of Oct. 10, 2024, with 5% or greater estimated revenues from categories within the MSCI Sustainable Impact Metrics methodology associated with three themes: renewable and low-carbon power, green mobility and energy storage as stated in endnote 2. Low-carbon-solutions assets in the public market are identified based on the criteria listed in endnote 2. Cumulative returns and market-cap time series for the public low-carbon-solutions peer set were produced by MSCI Barra Portfolio Manager. The peer set of low-carbon-solutions providers in private markets includes investment holdings that may have some connection with renewable energy, green mobility or energy storage, as stated in endnote 3. Data from the MSCI Private Capital data universe as of June 30, 2024. Source: MSCI ESG Research, MSCI Private Capital



Katie Towey
 New York



Mathew Lee
 New York



Paribesh Pradhan
 Zurich



Umar Ashfaq
 New York



Liz Houston
 London

Special thanks to:

Alex Schober, Russ Bowdrey, Meghna Mehta,
 Cody Dong

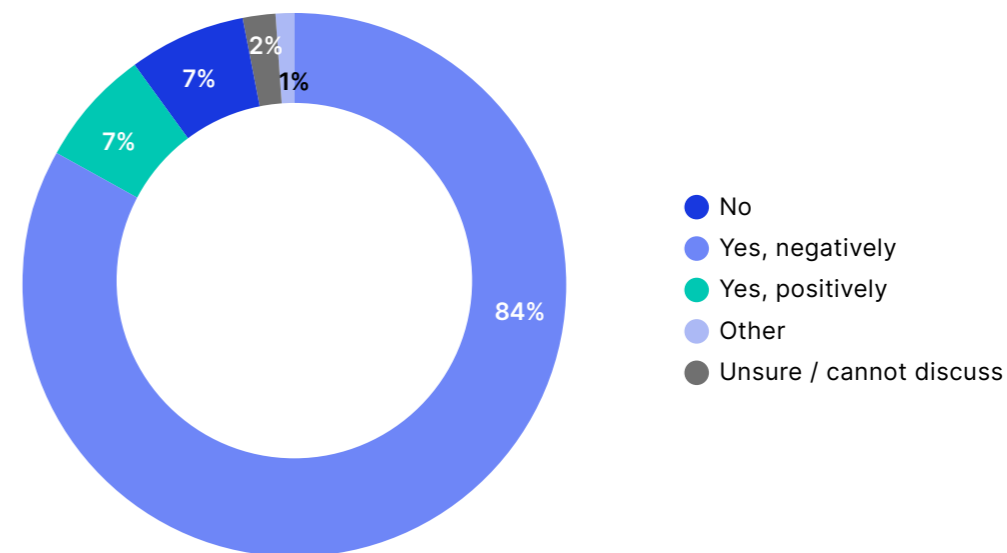
Facing the Reality of a Changing Climate

The summer of 2024 was the hottest on record globally.⁶ From heatwaves in India to floods in Europe and hurricanes in North America, the impact of a changing climate has been felt nearly everywhere. Although increasing physical risk has been a long-term trend, we now see a strong consensus among financial-market participants that extreme-weather events will cause significant damage to the macroeconomy. Against this backdrop, 2025 may signal a shift in how investors approach the risks and opportunities associated with climate adaptation.

Strong consensus on the economic impact of extreme weather

Almost all of the 350 surveyed financial-market participants agreed that changes in our physical environment due to global temperature rise would have a significant economic impact, according to the MSCI Sustainability Institute Climate Risk Survey.⁷ The survey asked participants across investments, banking, wealth management and insurance their views on climate risk, markets and the economy. Opinions on the outlook for emissions and temperature rise differed. One clear area of agreement, however, was on the potential for extreme weather to negatively impact the economy. As we go into 2025, this may be one of the few things that financial markets agree on.

Exhibit 4: Thinking about the next 10 years, would damage to infrastructure from extreme-weather events impact the regional economy?



Data as of October 2024. The 350 participants were professionals including asset owners, asset managers, banks and insurers and reflected regional differences, sectoral expectations and institutional priorities. Source: MSCI Sustainability Institute Climate Risk Survey 2024

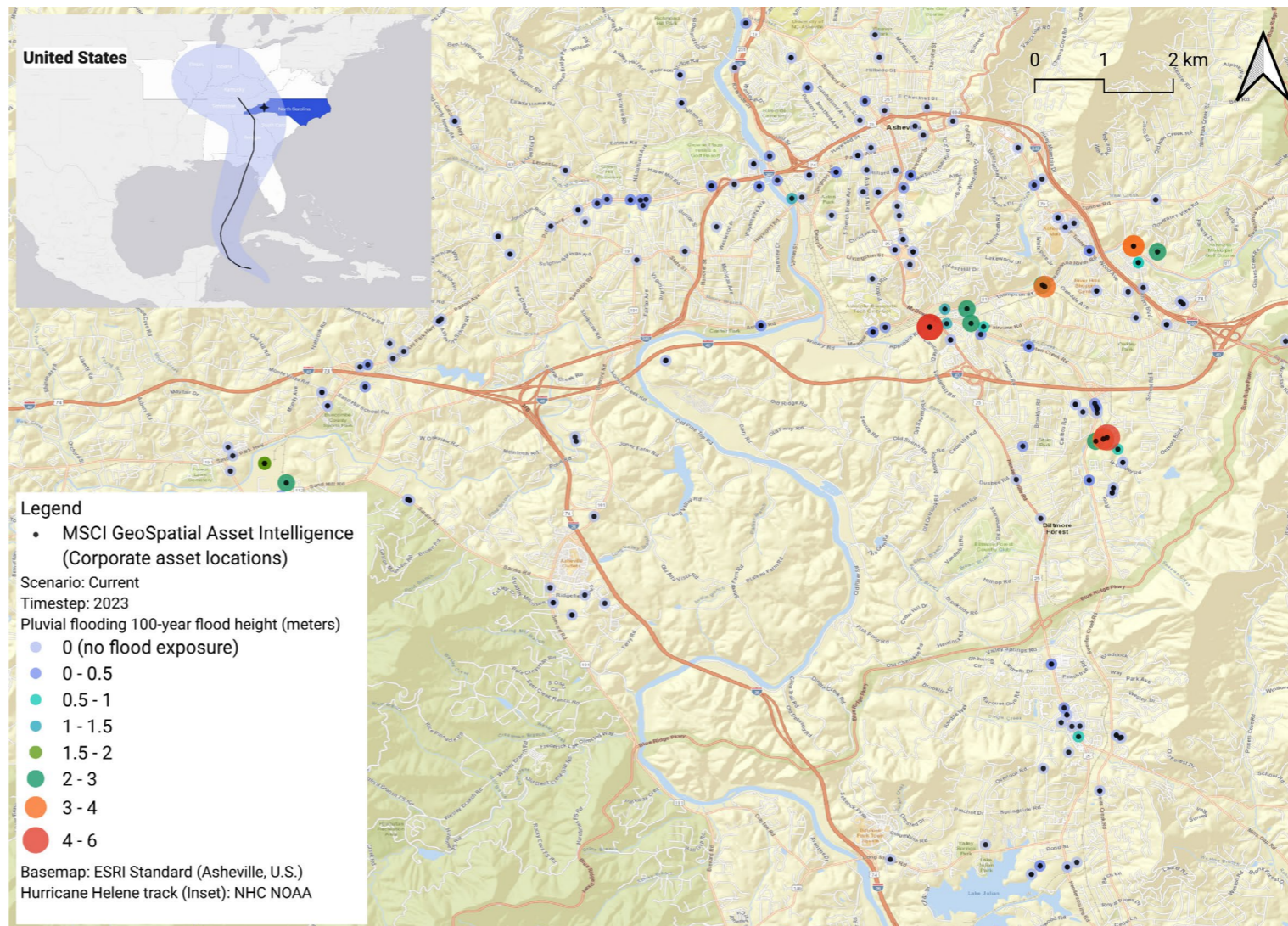
Managing physical risk: Not just a long-term concern

How worried should a diversified investor be about future physical risks from a changing climate? The answer may in part depend on the liquidity of the asset class in question, and their ability (or not) to divest. But 2024 has shown that extreme weather is already a risk that needs to be understood. And exposure to hazards can vary dramatically over very short distances.

For example, in late September 2024, Hurricane Helene moved through the city of Asheville, North Carolina, bringing record rainfall and flood levels with devastating impact.⁸ The broader area has low exposure to the risk of pluvial flooding, but looking only at the regional level misses some key information about specific assets.⁹ We identified 259 assets in Asheville. While all of these assets currently face above-average exposure (at least at the 57th percentile) to extreme levels of precipitation, 83 assets also face higher exposure to pluvial flooding (at least at the 67th percentile), with 11 of these at the 100th percentile, potentially increasing their specific susceptibility to flood-related damage.¹⁰ This kind of information can help identify which locations are potentially most vulnerable to extreme weather. For investors, when combined with an analysis of which assets are “high value” for a business’s operations, it can help identify the highest sources of downside risk, and not just for those with long investment horizons.

As climate change increases the frequency and severity of extreme-weather events in highly insured regions like Europe and the U.S., corporates and homeowners may face rising insurance premiums or, in the worst-case scenario, find their properties uninsurable. This issue could also extend beyond the insurance industry and specific regions, and potentially affect the financing of properties and the entire real-estate market, which could create economy-wide negative impacts.¹¹

Exhibit 5: Current flood heights for 100-year pluvial flood event in Asheville, North Carolina



Data as of October 2024. Analysis covers MSCI GeoSpatial Asset Intelligence locations in Asheville, North Carolina. Flood heights for a 100-year pluvial flood event in 2023 are shown. Source: MSCI ESG Research

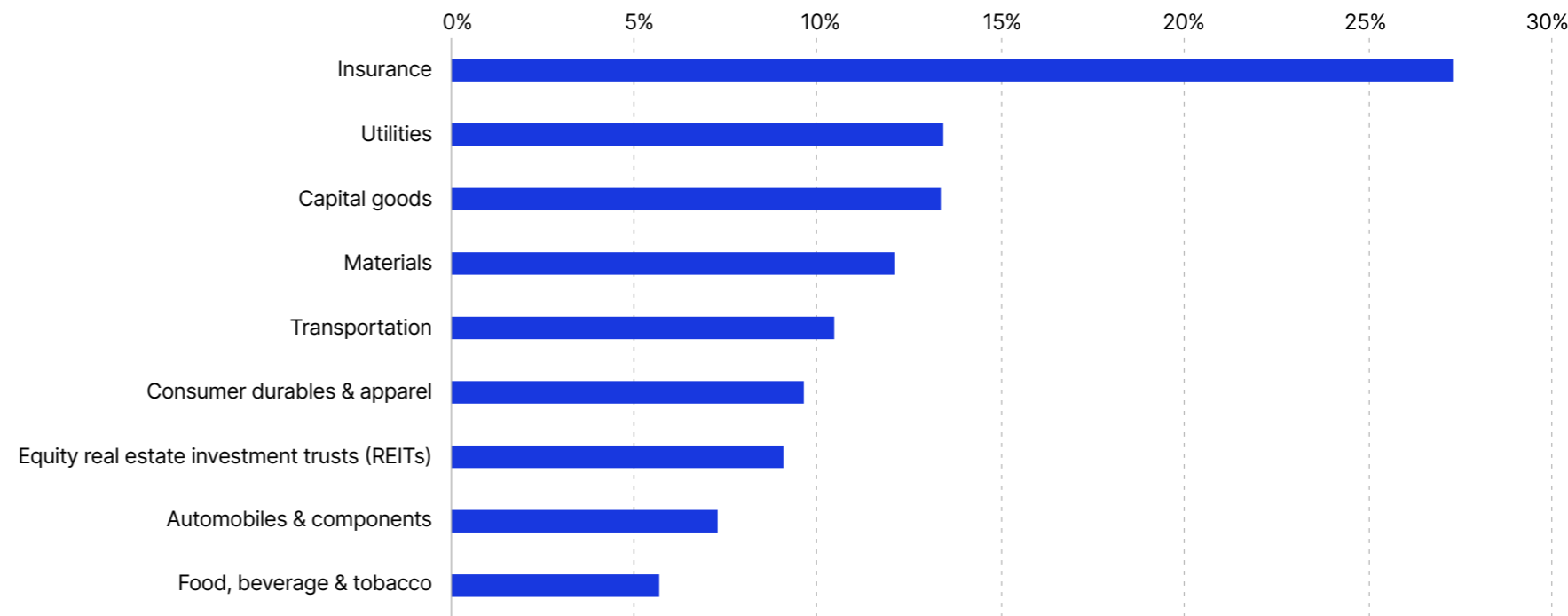
Capitalizing on adaptation spend

We have seen examples of companies investing in resilience to extreme-weather events, using funding from the green-bond market. For example, around 2016, when utilities began issuing green bonds, their proceeds largely financed renewables and energy efficiency. By 2023, **18% of utilities' green-bond proceeds financed adaptation**. For an example outside of utilities, **Central Nippon Expressway Company Ltd.** raised funds to protect its motorways from increasingly frequent and severe typhoons.¹² These examples are fairly limited in number and scale but may hint at more to come.

Not all adaptation spend comes in the form of big infrastructure projects. Solutions come in a wide variety of products and services, such as air cooling, water harvesting, drone transport for search and rescue or temporary flood barriers. For investors aiming to capitalize on the need for spending on adaptation, companies in public-equity markets offering adaptation and resilience solutions may be a good place to start.

Examples of solutions companies (and the solutions they provide) include **Watts Water Technologies Inc.** (drain-water management and rainwater harvesting), **Modine Manufacturing Co.** (cooling systems and refrigeration) and **MicroVision Inc.** (lidar technology for precision agriculture). The MSCI Sustainability Institute worked alongside the Global Adaptation and Resilience Investment (GARI) Working Group to identify a universe of over 800 public companies offering climate resilience and adaptation solutions.¹³ The aim was to identify companies with a “significant business offering of a technology, product, service and/or practice that enables others to prepare, prevent, respond to and recover from climate shocks and stresses.”

Exhibit 6: Percentage of companies in each industry group offering adaptation solutions



Data as of October 2024. Analysis shows the percentage of companies in each industry group that were identified as offering climate resilience and adaptation solutions, according to the [methodology](#) developed by the MSCI Sustainability Institute and GARI. Sub-industries with fewer than five solutions providers were excluded. Analysis covers constituents of the MSCI ACWI Investable Markets Index (IMI). Source: MSCI ESG Research

Based on the share of solutions companies per industry group, investors in insurance, utilities, capital goods, materials and transportation companies are most likely to see adaptation spend influence performance.¹⁴ Valuations do not currently appear to be factoring in any potential increase in revenue growth due to adaptation spend — companies that offered solutions were not trading at a premium to their sub-industry peers, as of October 2024.¹⁵

An uncomfortable reality

It's an uncomfortable reality that adaptation needs to be considered alongside transition. The lessons of the past year have shown that precise location data can help investors understand today's risks much more clearly. As extreme-weather events become more frequent, the ability to manage risks effectively will become ever more important. And as a changing climate drives a need to adapt and build resilience, solutions companies may offer an opportunity for investors in equity markets.



Guido Giese
 London



Zoltan Nagy
 Budapest



Drashti Shah
 Mumbai



Liz Houston
 London

Feeling Social? The Changing Shape of Sustainability Risk in Global Equity Markets

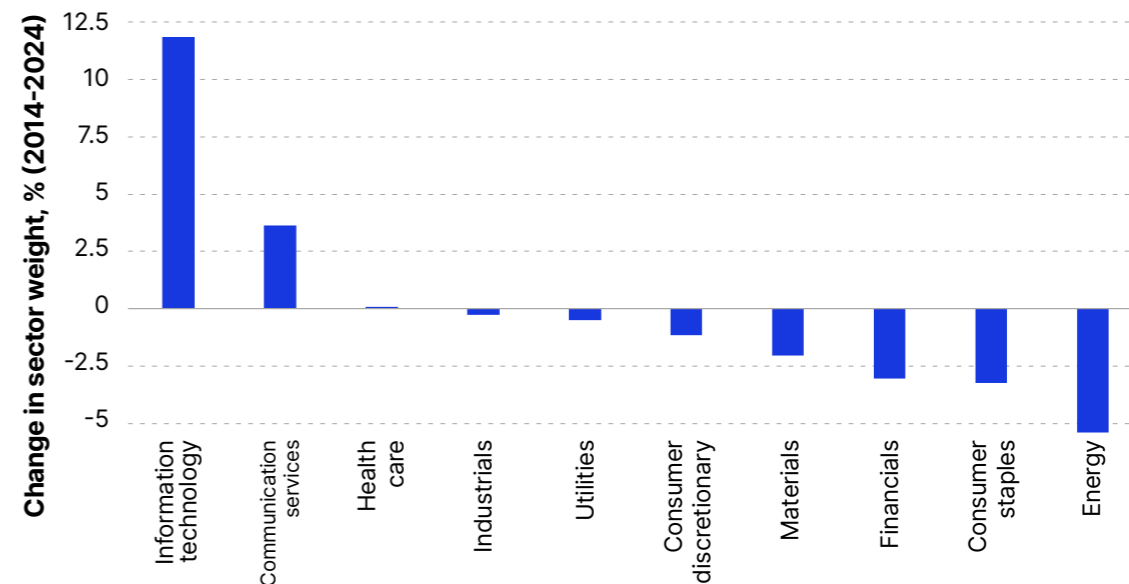
The heavyweight sectors dominating global equity markets today are not the big hitters of just a decade ago.¹⁶ The rise of the tech giants and their supporting players has pushed other sectors to the side and shrunk their weight in market-cap indexes. And the aggregate sustainability-risk landscape for investors in the broader equity market has changed markedly as a result — a fact best not overlooked given [long-running evidence of how much these risks can affect financial results](#).

Among other shifts, social risks carried far more weight in 2024 than they did 10 years ago. A surprise, perhaps — isn't everything about climate change now? The risks that are top of mind might not always be the ones that are top of portfolio. We're talking about a significant tilt toward information technology (IT), where matters of human capital and privacy and data security loom large. Heading into 2025, will this trend continue, or will the shifting landscape in global equity markets upend the balance again?

The changing face of global equity markets

Since 2014, the IT and communication-services sectors have grown significantly, both in the number of companies and their market capitalization.¹⁷ In doing so, they have shouldered aside higher-polluting sectors like energy, industrials, materials and utilities, along with consumer discretionary, consumer staples and financials. By mid-2024, IT was by far the biggest sector in the MSCI ACWI Index, accounting for twice as much of the index's weight as it had a decade prior.

Exhibit 7: The transformation of the MSCI ACWI Index



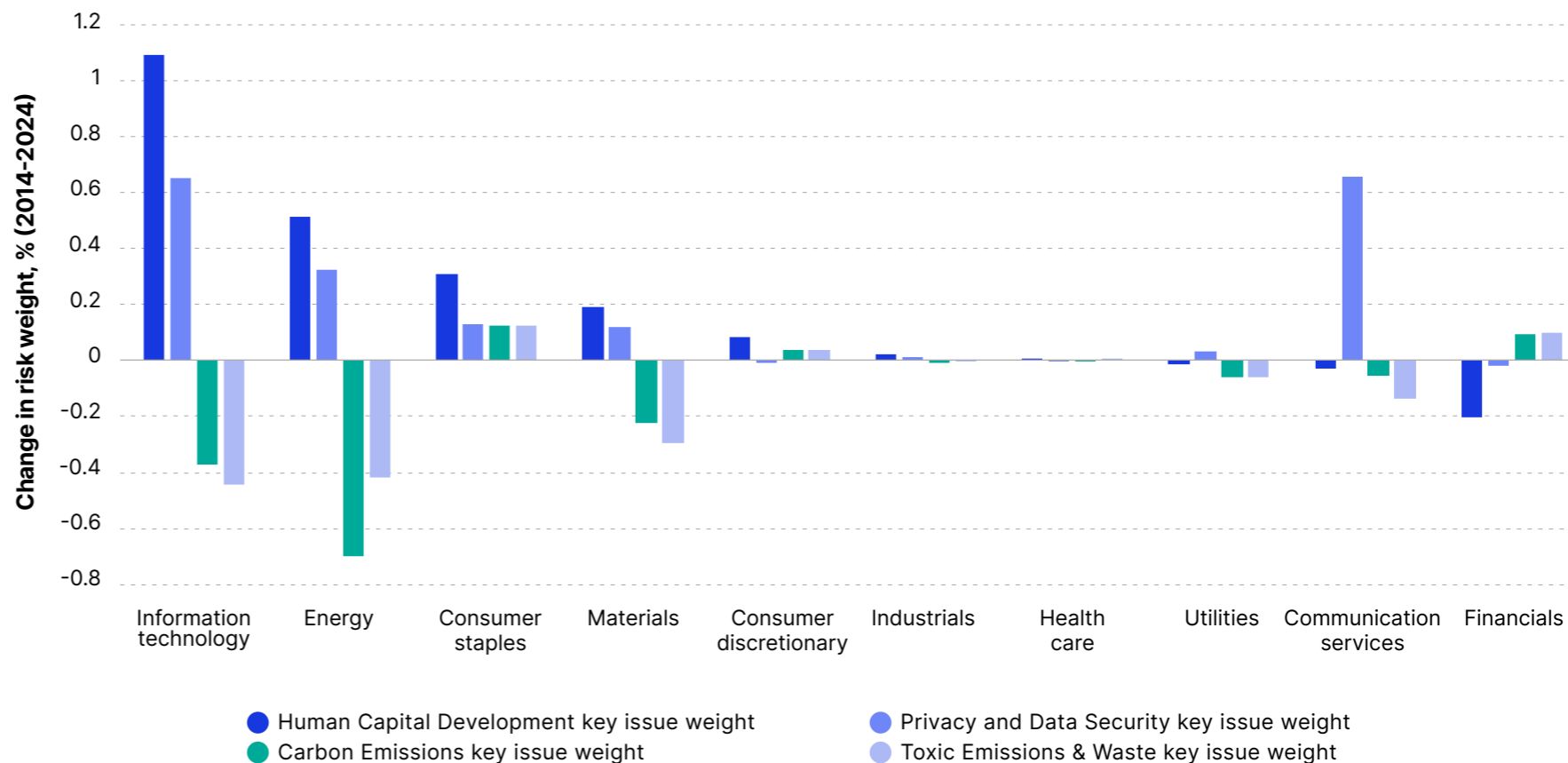
Data from January 2014 to September 2024. The chart shows the change in sector weights of the MSCI ACWI Index. Real-estate companies are included within financials, reflecting historical classification. Source: MSCI

Special thanks to:
 Xinxin Wang

An altered sustainability-risk landscape

The sustainability issues that could have the biggest financial impact on electric utilities or gold miners, for example, are very different from the ones that software or media companies need to worry about. Viewed through this lens, it makes sense that such a seismic shift in sector representation would also mean a change in the relative importance of social issues such as privacy and human-capital concerns compared to environmental issues such as toxic emissions or even climate risks.

Exhibit 8: Market-induced change in sustainability risks



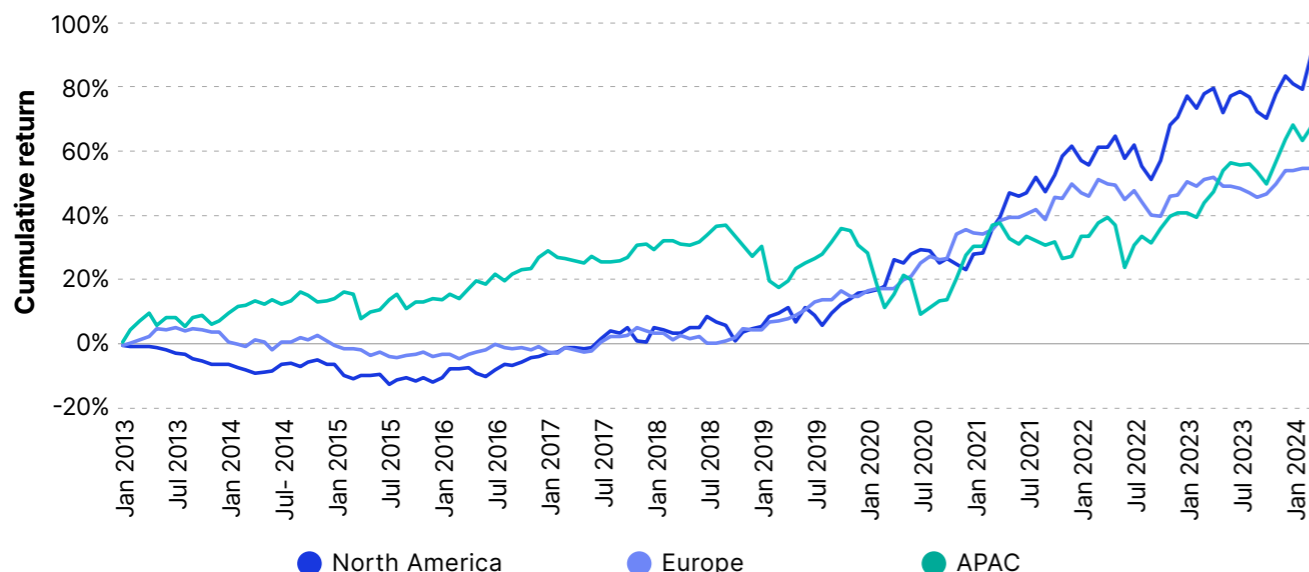
Data from January 2014 to September 2024. The chart shows the change in sustainability risks for the MSCI ACWI Index by sector. The environmental and social risks shown are those with the most change in relevance due to changing sector weights. Source: MSCI ESG Research

The quiet rise of social risks

The idea of social risks might sound a bit fuzzy, but we’ve already established that these include things like whether companies that depend on having the best talent can get it and keep it, and whether those whose businesses rely on personal data can keep that data safe and keep their use of it on the right side of the (changing) law. It also includes things like managing labor in the supply chain, where disruptions could keep the latest phone from reaching your pocket, and product safety, which can determine whether food companies can avoid recalls and airlines can keep their planes flying.

Indeed, over the past 11 years, we have seen that companies’ ability (or not) to manage social risks has been a leading indicator for [how they performed financially](#) compared to their peers.

Exhibit 9: Performance of highest- vs. lowest-rated MSCI ESG Rating social-pillar quintiles by region, equally weighted



Data from Dec. 31, 2012, to March 29, 2024. Quintiles are created every month based on a social score. We first regressed scores on market capitalization to eliminate any size bias. We then obtained the regression residuals and standardized them by region (North America, Europe and Asia-Pacific sub-indexes of the MSCI ACWI Index) and sector. Finally, we formed quintiles within each region and sector, based on these standardized z-scores. The chart shows the cumulative difference between the top and bottom quintiles’ performance. Not an indication of causality. Past performance — whether actual, backtested or simulated — is no indication or guarantee of future performance. Source: MSCI ESG Research

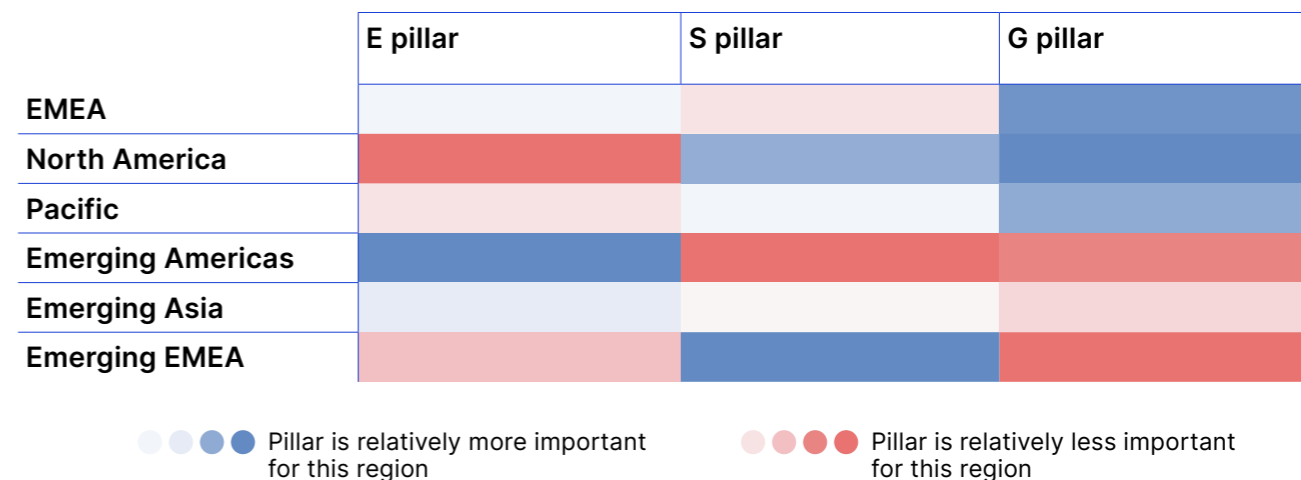
What’s over the next hill?

We have observed a clear trend in changing sector representation across global equities and the rising prevalence of social risks. But what is true for global equities is not necessarily true — or at least not to the same extent — for fixed-income or private markets, or for the real economy as a whole. Climate change is still the challenge of our lifetimes, and the distinct underlying makeup of different markets shapes their own aggregate risk-and-opportunity landscapes.

Similarly, while the global trend for equities has been unequivocal, it doesn’t look exactly the same across all regions. Developed and emerging markets, Americas, EMEA and APAC — each has its own particular mix of sectors and companies driving the relative importance of different sustainability issues. Investors setting asset-allocation targets need to understand, then, that not only can a switch between asset classes change the exposure to sustainability risks, but so can geographic exposure.

We can’t predict where we’ll be, globally or regionally, in another 10 years. But what we know is that it would be unwise to assume your risk profile across the markets today looks similar to yesterday’s or that it will remain stable tomorrow.

Exhibit 10: Regional pillar weights relative to global average



Data as of June 2024. Analysis covers constituents of the MSCI ACWI Index categorized by region. Please see [MSCI Market Classification](#) for more details. Source: MSCI

Attention, GenAI Models: The Data Buffet is Closing

Corporate spending plans for AI are as bullish as ever, with the number of companies investing heavily expected to double in 2025.¹⁸ Investors and regulators, however, may be less bullish. As we move beyond the initial hype phase, the pressure for companies to deliver a return on their investment is growing, as are demands for transparency and responsibility. And one of the biggest potential obstacles to success might also be one of the least expected — data.

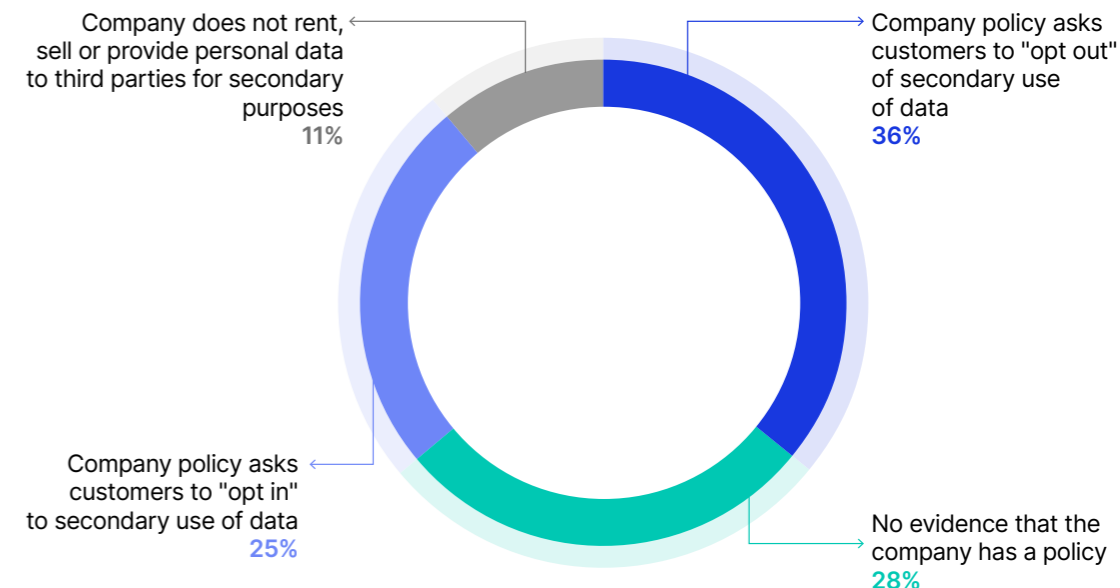
We're generating the stuff at a rate of hundreds of millions of terabytes every day, after all. That sounds like an "all-you-can-eat buffet" for AI models. But the reality is increasingly more constrained. As the free-for-all comes to an end, it will start to become apparent who has been building on a sound foundation and who has been taking short cuts.

Garbage in, garbage out: Cautionary tales from health care

AI has shown massive promise for the health-care sector.¹⁹ It is already transforming everything from improving the efficiency of clinical workflows to drug discovery. Relying on AI can improve the reach of advanced diagnostic tools. Since 2020, the market for AI or machine-learning (ML) devices has been rapidly expanding, with companies like **Siemens Healthineers AG** leading the pack.²⁰ But all that growth and promise hinge on access to the right kinds of training data in sufficient quantities.

Training a model on limited, poor-quality or biased data can mean your product doesn't work as hoped. Take **IBM Watson Health**, for example. After investing billions of dollars in a program to revolutionize cancer treatment through AI, IBM was forced to abandon the project entirely.²¹ Among other problems, the system had been trained on a limited dataset, which introduced bias and hindered its applicability to broader patient populations.²²

Exhibit 11: Health-care companies' consent policies on use of personal data for secondary purposes



Data as of Oct. 1, 2024. Analysis covers health-care constituents of the MSCI ACWI Investable Market Index (IMI) assessed on the key issue of Privacy and Data Security (n=168). Source: MSCI ESG Research



Namita Nair
London



Yoon Young Chung
Boston



Liz Houston
London

Access to bigger datasets can help with the training challenge, but legal risks loom if they don't come with proper consent. **Google's Project Nightingale** raised concerns when it was revealed that the company had gained access to millions of **Ascension Health's** records without the patients' prior knowledge, prompting an investigation by the U.S. Department of Health and Human Services.²³ Privacy regulations require companies to obtain consent from patients to use their data for anything other than their treatments, but not all companies are upfront about what their consent policies are.

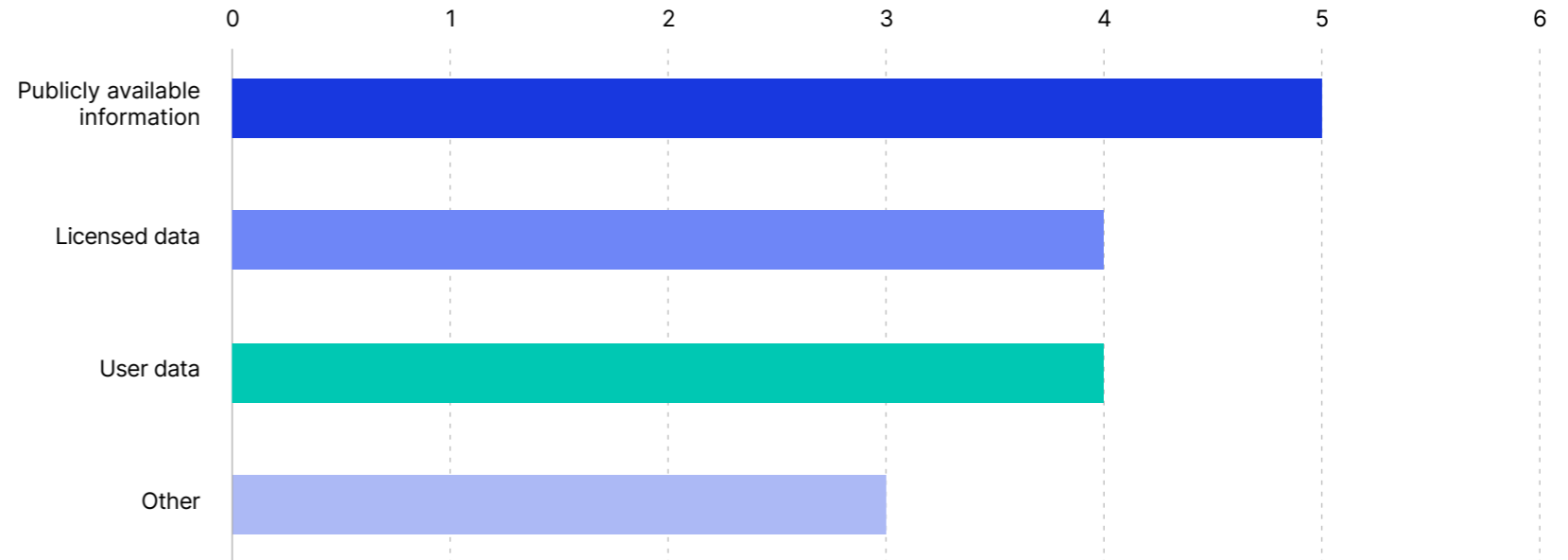
For more than a quarter of the companies we looked at, it was simply a mystery whether they had any policy at all (Exhibit 11).

Matters of consent: Cutting off the data supply

Further regulatory constraints on legal access to data are a very real possibility as the coming year sees incoming AI-specific legislation in major markets, on top of existing privacy laws. The EU AI Act starts to take effect in 2025, and California — home, of course, to the Silicon Valley giants — will require companies to start disclosing information about the datasets used to develop AI systems or services.²⁴

When we looked at seven leading developers of AI models, as of October 2024 only five had given an indication of the data used to train their models.²⁵ All five were using some combination of publicly available information, licensed data and user data. This may sound reasonable, but just because information is “public” doesn't automatically mean it can be used for commercial purposes without breaching privacy or copyright rules. **Microsoft Corp.** moved to assuage concerns of corporate clients that use their AI tools, by committing to pay for any adverse judgements if they are sued for copyright infringement.²⁶

Exhibit 12: Number of major developers (out of seven) that disclose using each data source



Data as of October 2024. Source: MSCI ESG Research, company disclosures

Publicly available information — potentially everything ever published online — may also come with reliability issues and historic biases that can impact the quality of results. But perhaps even more significantly, the amount of that data that is available for AI models to use is shrinking. Between 2023 and 2024, as website owners took steps to block web crawlers from accessing their content, there was a 25% reduction in the availability of high-quality data, according to a study from the Data Provenance Initiative.²⁷

The outlook for AI regulation is still evolving, and that adds an element of risk for both companies and investors. We don't know how this will look in the future, but we do know some of the potential negative impacts on consumers and end users that regulators may focus on. Privacy, copyright and discrimination or bias are frequent concerns. Getting ahead of these questions could make the difference between AI-driven success and a hype-driven spending spree with limited tangible benefits.

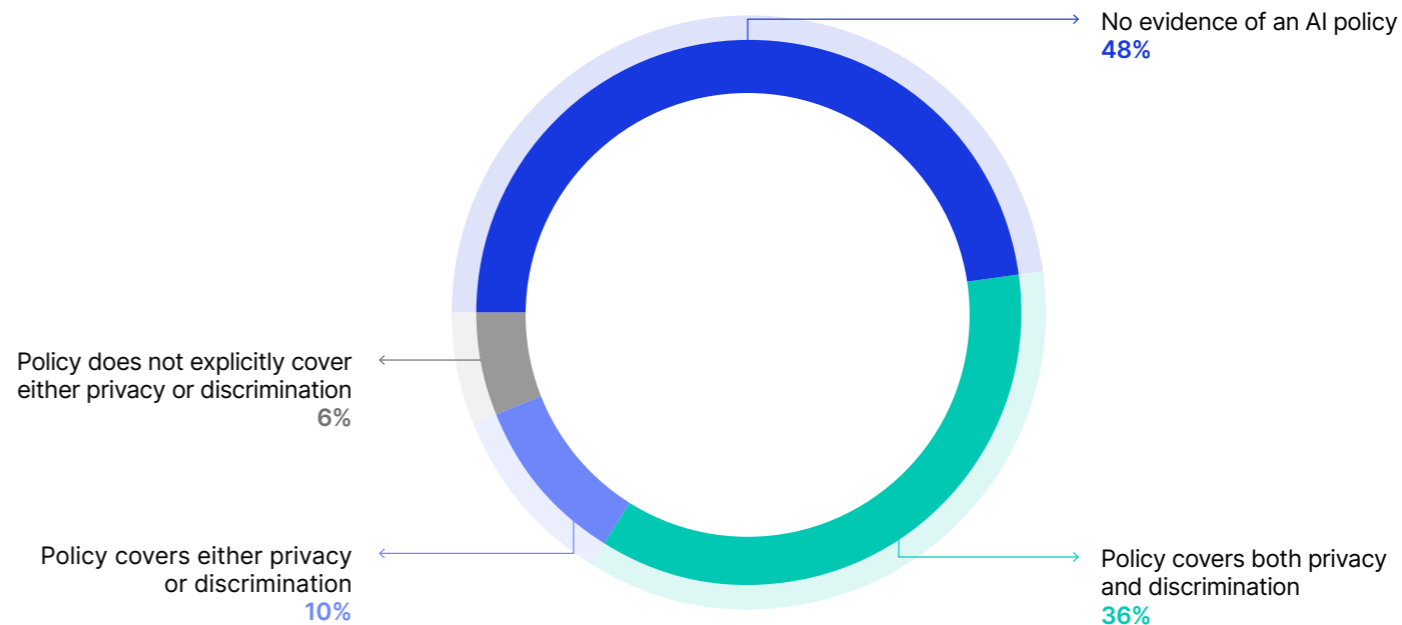
Missing the data on use of data: Understanding corporate policy

Use of AI has spread far beyond the early adopters. Our analysis shows that all the biggest consumer-facing companies globally are already integrating it into products or operations.²⁸ But it can be difficult for investors to understand the approach of these companies toward the responsible or ethical use of AI. As of October 2024, almost half did not disclose a policy on its responsible use. Of the companies we looked at, only one (**Adobe Inc.**) explicitly committed to respect copyright laws and not use “publicly available online data.” It should be noted that Adobe is able to make this commitment as it has access to a library of licensed content, with contributors compensated for its use.²⁹ Elsewhere, the lack of clarity from companies may frustrate investors who are trying to judge the size of the opportunity or the risks posed by changing regulations or data accessibility.

Is transparency on the menu in 2025?

The first wave of investments in generative AI was built on high hopes and expectations. For the next wave to flow, companies may need to show their investors that their data foundations (quality and access) are solid.

Exhibit 13: Company adoption of policies on responsible use of AI across consumer-facing sectors



Data as of Oct. 12, 2024. Analysis covers the 50 largest companies by market cap in those sectors where the MSCI Impact Materiality Assessment (client access only) identified the potential for material-information-related impacts on consumers and end users. These companies fell into the following sectors: communication services, consumer discretionary, consumer staples, financials, health care and information technology. Source: MSCI ESG Research, company disclosures



Ahasan Amin
Toronto



Jonathan Ponder
Toronto

Majority Voting for US Directors: The Silver Ballot?

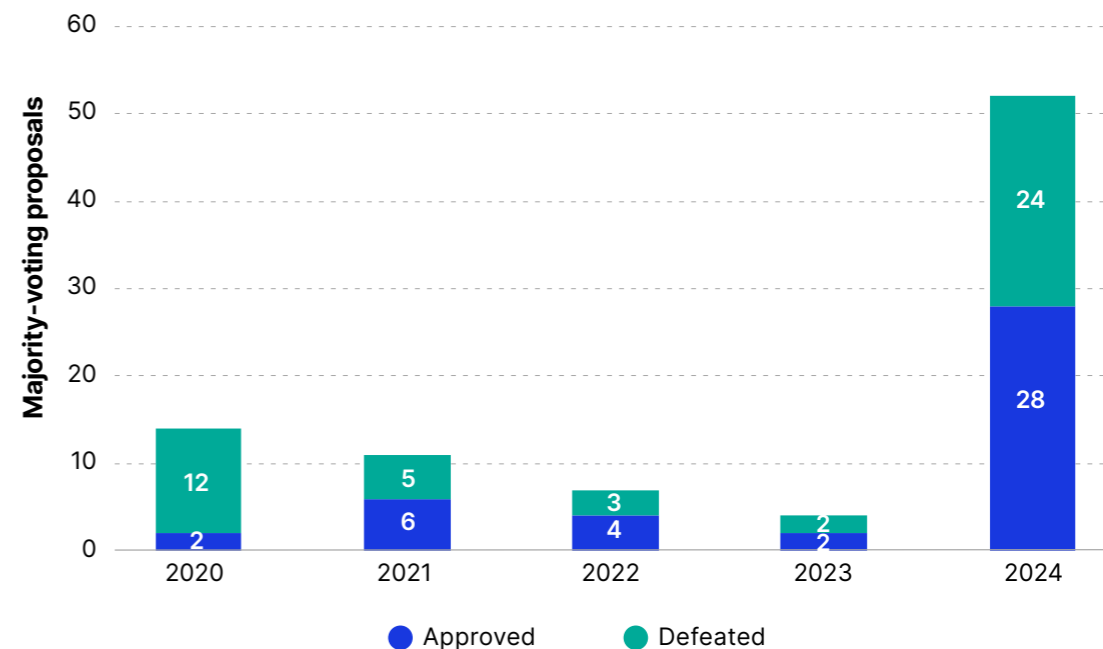
Something unexpected happened in the 2024 proxy season. Shareholders flexed their muscles, making a big play to expand their own rights through a virtual landslide of proposals seeking binding majority voting for directors. Shareholders in U.S. companies seem to have decided they'd had enough and it was time to move their investees' governance practices closer to what they see in other markets. We won't know until next year whether this groundswell of support continues. But with many of these proposals getting majority support and [fresh evidence of the connection between better governance and equity-market outperformance](#), it may turn out that the 2024 season was only the beginning.

A majority in favor of majority voting

The 2024 surge in shareholder-rights proposals featured a 13x increase year over year in those requesting binding majority voting, i.e., requiring directors to immediately resign if they fail to receive a majority (> 50%) of votes cast at uncontested elections.³⁰ This policy is legally mandated in some markets and is generally considered best practice, but in the U.S., directors who don't get majority support are not required to leave — rather, the board gets the final say.³¹ And the board often says “stay” — this year only one out of every five directors actually resigned after they were rejected by shareholders at companies within the MSCI USA Investable Market Index (IMI).

Shareholders appear to be getting fed up with this — we saw wide support for binding majority-voting proposals across diverse investor classes, with votes in favor reaching as high as 98.8%.³² While shareholder proposals in the U.S. are technically nonbinding — meaning there is no legal requirement for companies to implement them — this sends a strong message to boards that their shareholders want change.

Exhibit 14: Submitted vs. approved majority voting shareholder proposals over the last five years



Data as of Oct. 15, 2024. Analysis based on all shareholder proposals to implement binding majority voting in director elections submitted to companies within the MSCI USA IMI between 2020 and 2024. Source: MSCI ESG Research

Special thanks to:

Harlan Tufford, Xinxin Wang, Drashti Shah

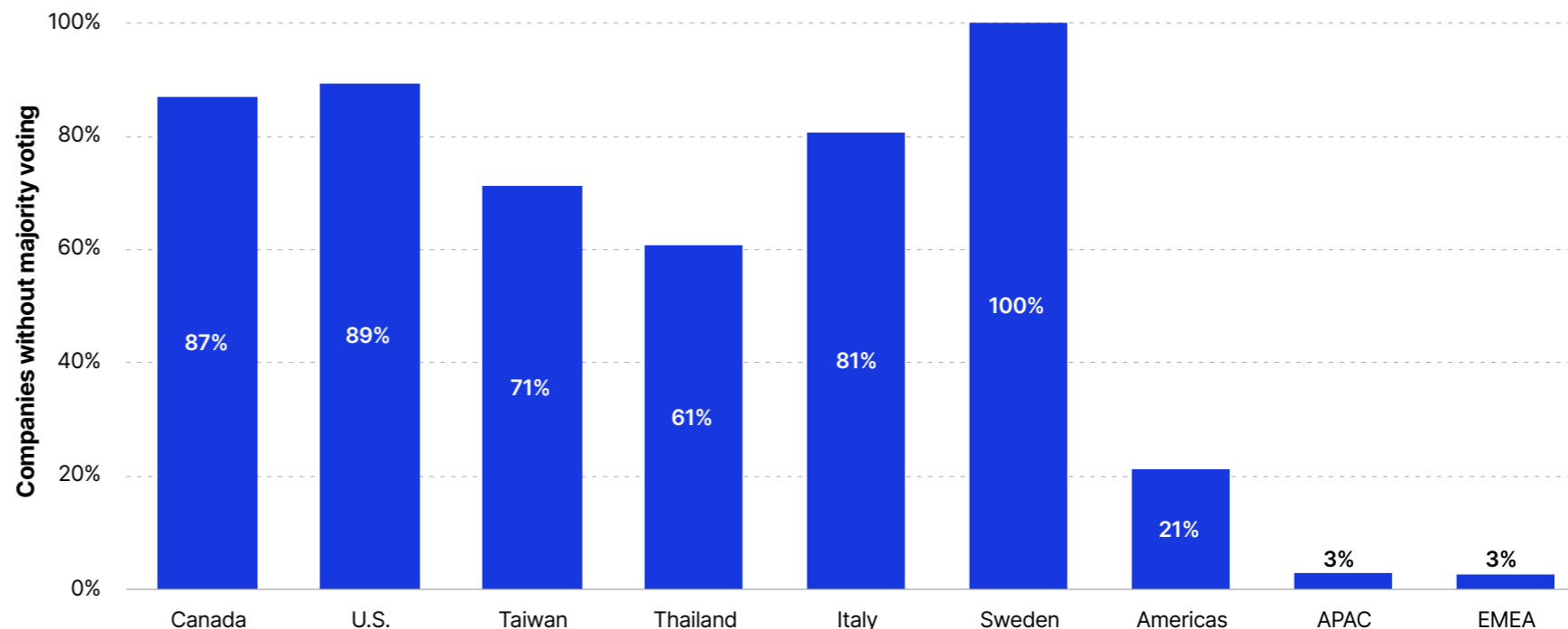
Of the 206 governance-related proposals shareholders submitted at companies in the MSCI USA IMI in 2024, a quarter (52) called for implementing binding majority voting in director elections, more than any other single category. This was dramatically higher than in 2023 (when there were four) and exceeded the number for the previous four years combined (36). Significantly, these proposals received elevated support in 2024 when compared to previous years, with an average of 54.3% votes in favor vs. 44.1% over the prior five years.

Keeping up with the global neighbors

This change in volume and relative success of majority-voting proposals seems to be a phenomenon of its own. There was not a corresponding uptick in the number of shareholder proposals generally. The 2024 U.S. proxy season to date saw 569 of them in total, which is actually down from 2023, when 605 proposals went to a vote. The filers of majority-voting proposals were diverse as well, including large pension funds and serial shareholder-rights advocates. So, what has changed to get investors seemingly so fired up about shareholder rights?

Neither the proposals themselves nor the voting data really answer this question. One possibility is that asset managers are an increasingly global bunch, tuned into practices in other markets where they appreciate what they see. More than ever before, shareholders are aware of the governance nuances across different regions. The U.S., for example, is one of only a handful of markets where binding majority voting in director elections is not the norm.

Exhibit 15: Companies lacking majority voting concentrated in a handful of markets



Data as of Oct. 15, 2024. Analysis based on 2,615 companies within the MSCI ACWI Index, using the Majority Voting key metric, which flags companies that do not have a binding majority-voting policy or bylaw. Percentages for the Americas, APAC and EMEA regions do not include Canada, U.S., Taiwan, Thailand, Italy and Sweden. The six highlighted markets were the only ones in our coverage with more than 25% of companies flagged for the Majority Voting key metric. Source: MSCI ESG Research

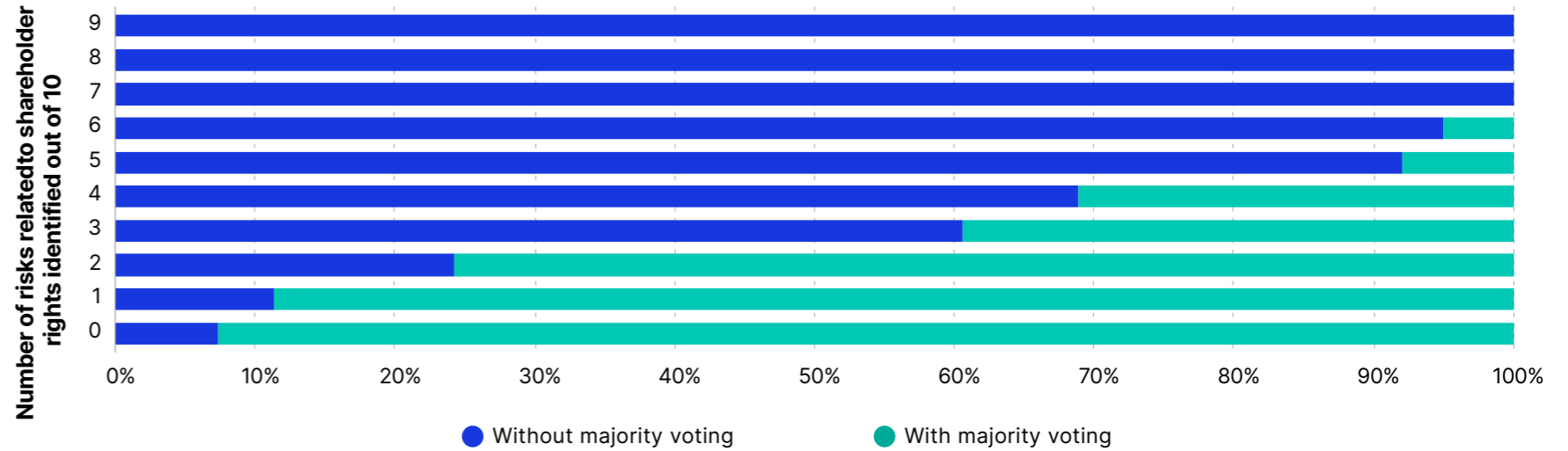
It's not just about voting

Strong shareholder rights and protections seem to be self-reinforcing and tend to come as a package. Globally, companies with binding majority voting in director elections tend to have other governance best practices too. This is evident in our model for assessing corporate governance, where we can see that companies without binding majority voting were far more likely to also lack other shareholder-rights protections, including those related to director elections.

This is correlation and not necessarily causation. But there's no question that shareholder rights are a fundamental component of good corporate governance. And **good governance has been historically associated with financial outperformance**, especially in developed markets. U.S. governance leaders consistently outperformed laggards between 2018-2023, with top-scoring companies delivering a cumulative return 26.3% higher than their worst-scoring peers. Well-governed companies bounced back more strongly in the months following the global COVID-19 pandemic and maintained their gains in the years that followed.

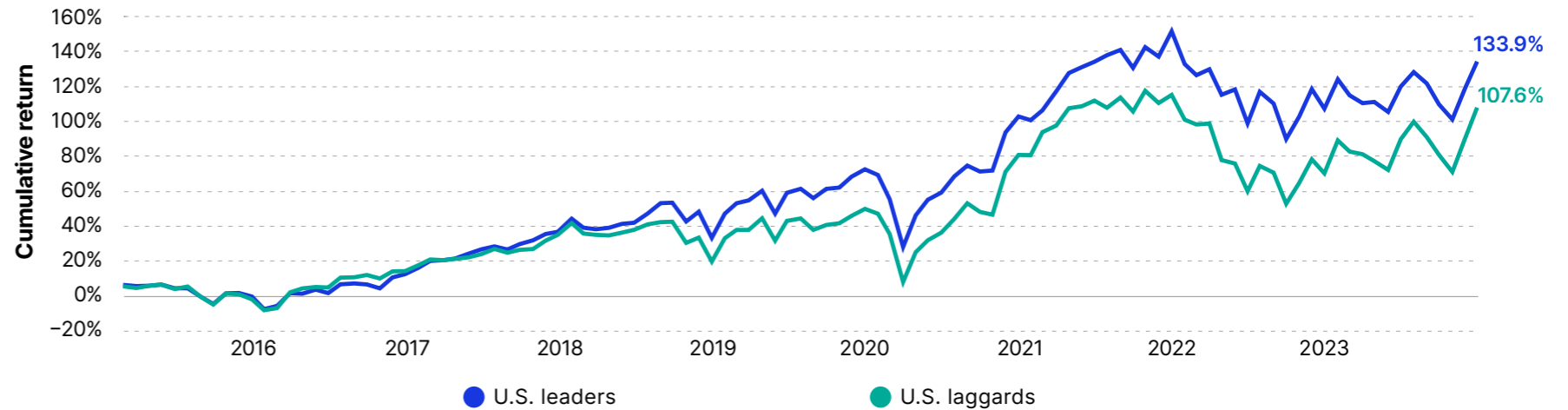
Clearly, there is a big push among investors in U.S. companies to improve shareholder rights as a key component of a firm's overall governance practices. Governance best practices have been associated with improved returns in recent years, so investors in U.S. companies may have a strong incentive to continue pushing for shareholder rights and governance enhancements in 2025.

Exhibit 16: Companies without majority voting were more often flagged for other risks related to shareholder rights



Data as of Oct. 15, 2024. Analysis based on 2,615 companies within the MSCI ACWI Index, includes all key metrics in the Shareholder Rights (5) and Director Elections (5) categories under the Ownership & Control key issue, other than the Majority Voting key metric. Source: MSCI ESG Research

Exhibit 17: Companies with good governance consistently outperformed in the US



Data from January 2015 to December 2023. Quintiles are created every month based on governance pillar score. We first regressed scores on market capitalization to eliminate any size bias. The chart shows the cumulative difference between the top and bottom quintiles' performance. Not an indication of causality. Past performance not indicative of future results. Source: MSCI ESG Research



Guy Turner
London



Tristan Loffler
London



Jamie Saunders
London

Special thanks to:
Lucien Georgeson, Kenji Watanabe

Will 2025 Be a Turning Point for Carbon Markets?

It's fair to say that the last few years have been a period of consolidation and self-examination for the global voluntary carbon credit market. The previous strong growth in the number of transactions and prices has given way to a new phase in which the quality of certain credits has come under scrutiny, and volumes and pricing have largely gone sideways. But this could all be on the cusp of change.

The underlying fundamentals for carbon markets have stayed robust — particularly with the ever-rising number of companies making voluntary Science Based Targets Initiative (SBTi) energy-transition and climate commitments. The realization of the need to shift to a lower-carbon economy the last couple of years is bringing about a gradual improvement in the quality of the market.

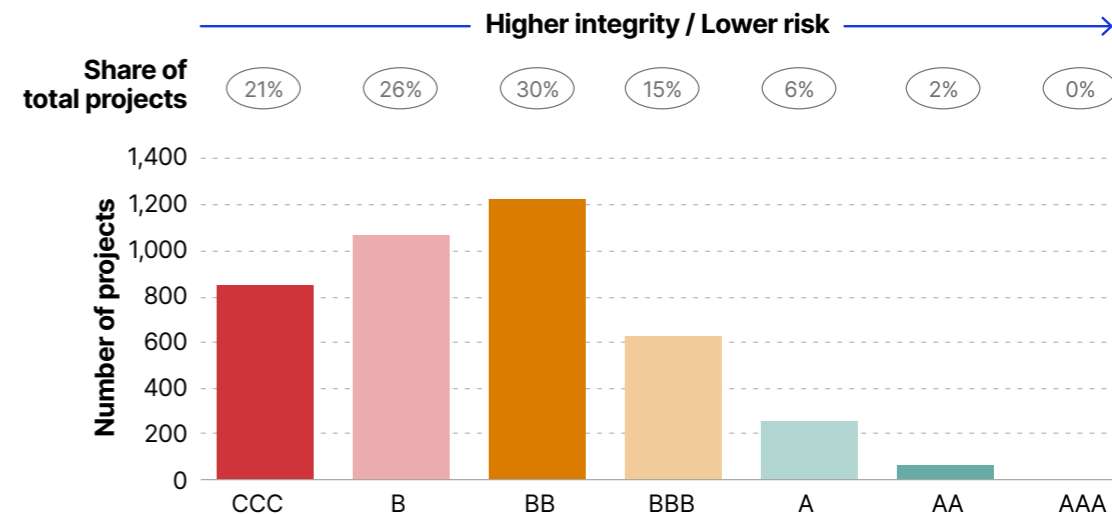
New sources of demand are also emerging, such as via the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA) scheme and potentially via “compliance” (i.e., official) carbon markets allowing the use of credits.³³ COP29 also saw significant progress toward establishing the [long-awaited Paris Agreement Crediting Mechanism \(PACM\)](#), through which carbon credits can be formally transferred between countries and companies under Article 6 of the Paris Agreement. The year 2025 may, therefore, be a turning point for the market.

Quality over quantity

Recent analysis by [MSCI Carbon Markets](#) of more than 4,000 registered voluntary carbon projects showed that 47% of credits “retired” (i.e., used and claimed) up until July 2024 have come from projects with an [MSCI Carbon Project Rating](#) of B or lower, compared to only 8% of projects rated between A and AA, with no projects qualifying for our highest rating of AAA.³⁴

Despite no AAA ratings, the trend is toward an improvement in carbon-project integrity. Over the last two years (Q2 2022 to Q2 2024), the proportion of retired credits with the lowest ratings, CCC, fell from 29% to 15%, while the use of A or AA credits doubled, from 6% to 12%. This is despite the fact that the highest-integrity carbon credits have been hard to identify and have been in relatively limited supply.

Exhibit 18: Number of registered projects by MSCI Carbon Project Rating



Data as of September 2024. Source: MSCI Carbon Markets

For the next frontier, new projects being developed now also appear to be, on average, of higher integrity. This is especially the case for projects, both engineered and nature-based, that remove carbon dioxide from the atmosphere. The standard-setting bodies for carbon markets have also zoomed in on quality. In June 2024, the Integrity Council for the Voluntary Carbon Market (ICVCM) announced the first set of carbon-crediting methodologies (and hence projects) that qualify for its Core Carbon Principles (CCPs).³⁵

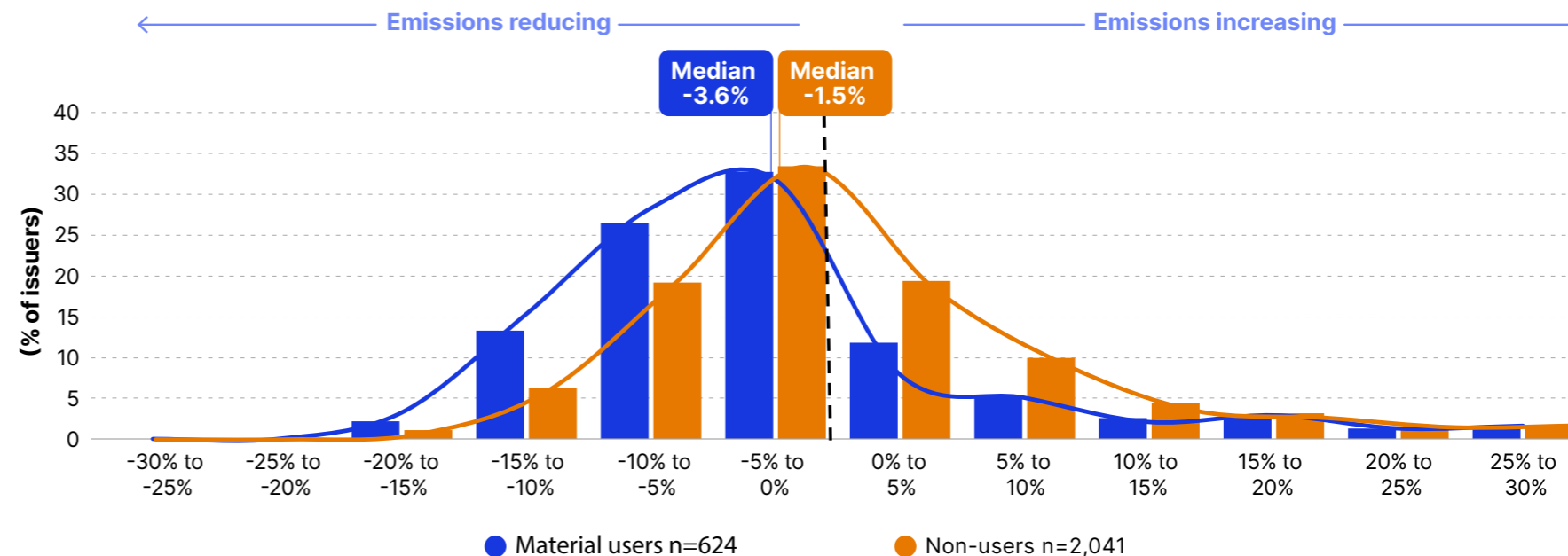
Material users of carbon credits performed better on a range of climate metrics

One of the key criticisms that have arguably held back the voluntary carbon market in recent years has been the allegation that companies that were choosing to buy, and retire, credits might be doing so instead of cutting their own carbon emissions. We found, however, that of 8,844 firms in the MSCI ACWI Investable Market Index (IMI), those that used carbon credits during 2017 to 2022 **performed better on a range of climate-performance metrics** than those that had not used them.

Firms that were using carbon credits were more transparent than nonusers in disclosing their Scope 1, 2 and 3 emissions — and more likely to have set credible emissions-reduction targets. Material users of carbon credits were also more likely than nonusers to have reduced their underlying Scope 1 and 2 emissions at a median rate of 3.6% per year between 2017 and 2022, compared to 1.5% per year among nonusers.³⁶

This analysis doesn't show how companies using carbon credits would have performed in terms of changes in emissions if they had not used them, but it does show that carbon credits tend to be used as part of a company's climate strategy, not as an alternative.

Exhibit 19: Distribution of annualized change in company-reported gross Scope 1+2 emissions between 2017 and 2022, for material credit users and non-users



Analysis as of July 1, 2024 for period 2017-2022. Only includes firms within the MSCI ACWI IMI that reported their Scope 1 and 2 emissions for every year between 2017-2022. Material users are defined as those that have used more than 1,000 tCO₂e of credits during 2017-2022. Excludes outliers — see “[Corporate Emissions Performance and the Use of Carbon Credits](#),” for detailed methodology. Source: MSCI Carbon Markets, MSCI ESG Research

New sources of demand on the rise

National and regional carbon markets have been cautious about allowing the use of carbon credits for compliance purposes, especially since 2012, when international carbon credits were no longer allowed to be used in the European Union Emissions Trading Scheme (ETS). This is partly due to uncertainty over the equivalence of the credits compared to actual units of emissions, but also because of a desire to keep the emissions reductions within the region of the compliance scheme. However, with specific eligibility requirements, some

countries have been supportive of the use of carbon credits and others are now following suit. Domestic carbon credits have been part of the Australian emissions tax and trading scheme for over 10 years, and South Africa has allowed up to 10% of the country's carbon tax to be offset by carbon credits since 2019. Elsewhere, Colombia has allowed the use of credits to offset 50% of the domestic carbon tax since 2022, and in January 2024 Singapore permitted carbon credits to be used for up to 5% of taxable emissions.³⁷

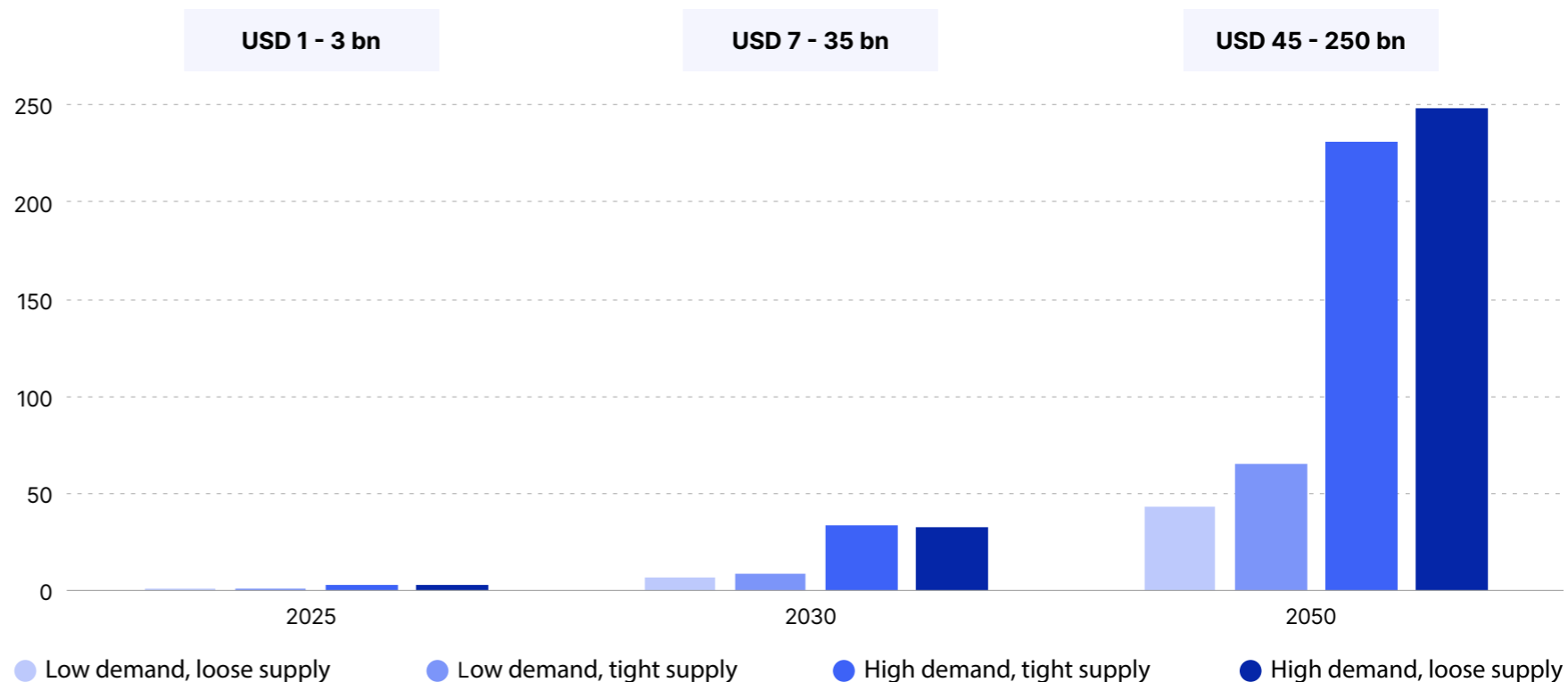
Meanwhile, the U.K. is consulting on whether to allow some types of carbon credits to be used in its own ETS. The largest compliance market of all, the European Union ETS, has signaled that it may allow the use of some credits from projects that remove CO2 from the atmosphere.³⁸

Perhaps most relevant for carbon credits in the next few years is CORSIA. Launched by the International Civil Aviation Organization (ICAO) in 2016, this mechanism requires the use of carbon credits or sustainable aviation fuels to offset any growth in international aviation emissions above their baseline level, currently set at 85% of 2019 emissions.

CORSIA is being implemented in phases, with 126 countries participating in Phase 1 between 2024 and 2026.³⁹ [Analysis by MSCI Carbon Markets](#) estimates that up to 140 million tonnes of carbon credits could be required in this first phase.

In addition, for the first time in three years, significant progress was made at COP29 in establishing carbon trading under Article 6 of the Paris Agreement. For the UN-backed carbon market (established under Article 6.4, now known as PACM), the high-level standards for carbon-project methodologies, and other rules for addressing environmental and social impacts, were agreed. As a result, more detailed rules and methodologies can now be developed during 2025, potentially enabling the first credits under the PACM to come to market in late 2025. These will likely follow similar standards to other voluntary credits, but may appeal to certain companies or investors that wish to explicitly show that their climate strategies support the Paris Agreement, as well as countries themselves. In another boost to the market, further clarifications and rules were also agreed for direct country-to-country credit transfers (governed by Article 6.2).

Exhibit 20: Projected credit retired market size (USD billions, 2024 prices) by scenario



Source: MSCI Carbon Markets, MSCI ESG Research

Voluntary carbon markets at a turning point?

Identifying a turning point only becomes clear in retrospect. But there are enough indicators to suggest that 2025 might be the year in which the global carbon credit market reestablishes its positive momentum. If it does, the impact could be significant.

Our analysis suggests that the total value of the carbon credit market could grow from around USD 1.5 billion in 2024 to between USD 7 and 35 billion in 2030 and USD 45 and 250 billion in 2050, should companies and governments stick to their climate commitments.

Endnotes

- 1 The relatively low threshold, 5%, to include companies that provide low-carbon revenues may have contributed — these companies are positioned for growth from these business lines, but they are less exposed than “pure play” solutions providers, for example, that earn more than 50% of their revenues from these types of products or services.
- 2 For the sector comparison, the peer set of low-carbon-solutions providers in public markets included 553 constituents of the MSCI ACWI Investable Market Index (IMI) as of Oct. 10, 2024, with 5% or greater estimated revenues from categories within the MSCI Sustainable Impact Metrics methodology associated with three themes: renewable and low-carbon power, green mobility and energy storage. We set the threshold at 5% in part to ensure comparability with the private-markets approach, which differed (see endnote 3). The average solutions revenue among the peer set was 29% and the median was 16%. 276 companies were affiliated with renewable power or equipment, 253 with green mobility and 54 with energy storage, with 28 firms having exposure to more than one solutions theme.
- 3 The private-market peer set was based on a keyword search from descriptions of portfolio companies in the MSCI private-capital universe dataset across three transition themes: renewable energy, green mobility and energy storage. While this peer set may not encompass all companies in the three transition themes, this sample may provide insights around sector composition and returns. For a more detailed breakdown of private-market transition opportunities by region, sector and asset class, see: Abdulla Zaid, [“Watt Opportunity? Plugging Private Markets into the Energy-Transition Circuit,”](#) MSCI ESG Research, Oct. 16, 2024.
- 4 Sectors refer to the Global Industry Classification Standard (GICS®) sectors. GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.
- 5 The cash flows in the private-capital universe were reweighted to reflect the asset-class weighting of the low-carbon-solutions providers.
- 6 “Copernicus: Summer 2024 – Hottest on record globally and for Europe,” Copernicus, Sept. 6, 2024.
- 7 “What the Market Thinks: A Climate Risk Survey,” MSCI Sustainability Institute, October 2024.
- 8 “Devastating Rainfall from Hurricane Helene,” Nasa Earth Observatory, accessed Oct. 17, 2024.
- 9 Pluvial flooding refers to inland floods that are often associated with high-intensity, short-duration (<1 day) precipitation events. This type of flood occurs when the ground cannot absorb rainwater quickly enough (resulting in a flash flood) or when the capacity of urban drainage systems is exceeded due to excessive water flows (surface water floods).
- 10 Hazard percentiles indicate a location’s hazard exposure relative to the constituents of the MSCI ACWI Index (considered the global benchmark). A higher hazard percentile indicates greater exposure. Hazard percentiles at the regional level are calculated based on synthetic locations (independent of MSCI GeoSpatial Asset Intelligence locations) within the geographical boundary of a given region.
- 11 Felicia Khoo and Jeffery Yong, “Too hot to insure – avoiding the insurability tipping point,” Bank for International Settlements, Financial Stability Institute, FSI Insights on policy implementation No 54, November 2023.
- 12 “Final Terms,” Central Nippon Expressway Company Ltd., Feb. 24, 2022.
- 13 “The Unavoidable Opportunity: Investing in the Growing Market for Climate Resilience Solutions,” GARI Working Group, March 2024.
- 14 Sectors refer to the Global Industry Classification Standard (GICS®) sectors. GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.
- 15 Our analysis compared the estimated current-year price-to-earnings multiple for companies in each sub-industry that were identified as offering climate resilience and adaptation solutions to the average for each sub-industry. As of Oct. 17, 2024, covers constituents of the MSCI ACWI IMI. Estimated current-year price-to-earnings multiple based on consensus (Source: Refinitiv).
- 16 In this analysis we used the MSCI ACWI Index as a proxy for global equity markets. This index captures large- and mid-cap representation across 23 developed-market and 24 developing-market countries and had 2,687 constituents, as of Sept. 30, 2024. The index covers approximately 85% of the global investable equity opportunity set.
- 17 Sectors refer to the Global Industry Classification Standard (GICS®) sectors. GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.
- 18 “New EY research finds AI investment is surging, with senior leaders seeing more positive ROI as hype continues to become reality,” EY, July 15, 2024.
- 19 Sectors refer to Global Industry Classification Standard (GICS®) sectors. GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.
- 20 In 2023, the U.S. Food and Drug Administration (FDA) approved 221 applications, up from 155 in 2022. Siemens Healthineers had the highest number of AI/ML-enabled medical device approvals among such medical devices legally marketed in the U.S. (64 between 2014 and 2024), as of May 13, 2024.
- 21 “2022 Annual Report,” IBM, Feb. 28, 2023.
- 22 Casey Ross and Ike Swetlitz, “IBM Pitched Its Watson Supercomputer as a Revolution in Cancer Care. It’s Nowhere Close.” STAT, Sept. 5, 2017.
- 23 Rob Copeland and Sarah E. Needleman, “Google’s ‘Project Nightingale’ Triggers Federal Inquiry,” *Wall Street Journal*, Nov. 12, 2019.
- 24 “EU AI Act: first regulation on artificial intelligence,” European Parliament, June 18, 2024. “AB-2013 Generative artificial intelligence: training data transparency,” California Legislative Information, Sept. 30, 2024.
- 25 Amazon.com Inc., Anthropic PBC, Alphabet Inc., Inflection AI Inc., Meta Platforms Inc., Microsoft Corp. and OpenAI. We focused on this group of companies as they have been identified as leaders by the U.S. government. “FACT SHEET: Biden-Harris Administration Secures Voluntary Commitments from Leading Artificial Intelligence Companies to Manage the Risks Posed by AI,” White House, July 21, 2023.
- 26 “Microsoft announces new Copilot Copyright Commitment for customers,” Microsoft, Sept. 7, 2023.
- 27 Shayne Longpre, Robert Mahari, Ariel Lee et al., “Consent in Crisis: The Rapid Decline of the AI Data Commons,” Data Provenance Initiative, July 2024.
- 28 Analysis based on disclosures from the 50 largest companies (in total) by market cap across the following sectors: communication services, consumer discretionary, consumer staples, financials, health care and information technology.
- 29 “Our approach to generative AI with Adobe Firefly,” Adobe.com, accessed Oct. 15, 2024.
- 30 Based on 52 majority-voting shareholder proposals submitted in 2024 and four submitted in 2023 to constituents of the MSCI USA IMI, as of Oct. 15, 2024. Source: MSCI ESG Research.
- 31 “ICGN Global Governance Principles,” International Corporate Governance Network, 2021.
- 32 The 98.8% figure was recorded at ConocoPhillips: “Form 8-K: Submission of Matters to a Vote of Security Holders.” ConocoPhillips, May 16, 2024.
- 33 CORSIA is the Carbon Offsetting and Reduction Scheme for International Aviation developed by the International Civil Aviation Organization (ICAO).
- 34 Each project is rated on a seven-grade letter-based scale, from AAA to CCC, where AAA represents the highest Carbon Project Rating. For AAA-rated credits, there is a very high likelihood that these projects will deliver and support both at least 1 tonne of CO2 equivalent of emissions impact per credit and a range of positive social and/or environmental outcomes while upholding legal and ethical standards.
- 35 “Integrity Council announces first high-integrity CCP-labelled carbon credits, as assessments continue.” ICVCM, June 6, 2024.
- 36 Material users defined as those using more than 1,000 tonnes of credits between 2017 and 2022.
- 37 Source: MSCI Carbon Markets policy analysis
- 38 “Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system,” European Union, May 10, 2023.
- 39 “CORSIA Homepage,” ICAO, accessed Nov. 1, 2024.

About MSCI

MSCI is a leading provider of critical decision support tools and services for the global investment community. With over 50 years of expertise in research, data and technology, we power better investment decisions by enabling clients to understand and analyze key drivers of risk and return and confidently build more effective portfolios. We create industry-leading research-enhanced solutions that clients use to gain insight into and improve transparency across the investment process.

About MSCI ESG Research Products and Services

MSCI ESG Research products and services are provided by MSCI ESG Research LLC, and are designed to provide in-depth research, ratings and analysis of environmental, social and governance-related business practices to companies worldwide. ESG ratings, data and analysis from MSCI ESG Research LLC. are also used in the construction of the MSCI ESG Indexes. MSCI ESG Research LLC is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc.

To learn more, please visit www.msci.com.

Notice and disclaimer

This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the "Information") is the property of MSCI Inc. or its subsidiaries (collectively, "MSCI"), or MSCI's licensors, direct or indirect suppliers or any third party involved in making or compiling any Information (collectively, with MSCI, the "Information Providers") and is provided for informational purposes only. The Information may not be modified, reverse-engineered, reproduced or disseminated in whole or in part without prior written permission from MSCI. All rights in the Information are reserved by MSCI and/or its Information Providers.

The Information may not be used to create derivative works or to verify or correct other data or information. For example (but without limitation), the Information may not be used to create indexes, databases, risk models, analytics, software, or in connection with the issuing, offering, sponsoring, managing or marketing of any securities, portfolios, financial products or other investment vehicles utilizing or based on, linked to, tracking or otherwise derived from the Information or any other MSCI data, information, products or services.

The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF THE INFORMATION PROVIDERS MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EACH INFORMATION PROVIDER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

Without limiting any of the foregoing and to the maximum extent permitted by applicable law, in no event shall any Information Provider have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited, including without limitation (as applicable), any liability for death or personal injury to the extent that such injury results from the negligence or willful default of itself, its servants, agents or sub-contractors.

Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results.

The Information may include "Signals," defined as quantitative attributes or the product of methods or formulas that describe or are derived from calculations using historical data. Neither these Signals nor any description of historical data are intended to provide investment advice or a recommendation to make (or refrain from making) any investment decision or asset allocation and should not be relied upon as such. Signals are inherently backward-looking because of their use of historical data, and they are not intended to predict the future. The relevance, correlations and accuracy of Signals frequently will change materially.

The Information should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), any security, financial product or other investment vehicle or any trading strategy.

It is not possible to invest directly in an index. Exposure to an asset class or trading strategy or other category represented by an index is only available through third party investable instruments (if any) based on that index. MSCI does not issue, sponsor, endorse, market, offer, review or otherwise express any opinion regarding any fund, ETF, derivative or other security, investment, financial product or trading strategy that is based on, linked to or seeks to provide an investment return related to the performance of any MSCI index (collectively, "Index Linked Investments"). MSCI makes no assurance that any Index Linked Investments will accurately track index performance or provide positive investment returns. MSCI Inc. is not an investment adviser or fiduciary and MSCI makes no representation regarding the advisability of investing in any Index Linked Investments.

Index returns do not represent the results of actual trading of investable assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. The calculation of indexes and index returns may deviate from the stated methodology. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index or Index Linked Investments. The imposition of these fees and charges would cause the performance of an Index Linked Investment to be different than the MSCI index performance.

The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy.

Constituents of MSCI equity indexes are listed companies, which are included in or excluded from the indexes according to the application of the relevant index methodologies. Accordingly, constituents in MSCI equity indexes may include MSCI Inc., clients of MSCI or suppliers to MSCI. Inclusion of a security within an MSCI index is not a recommendation by MSCI to buy, sell, or hold such security, nor is it considered to be investment advice.

Data and information produced by various affiliates of MSCI Inc., including MSCI ESG Research LLC and Barra LLC, may be used in calculating certain MSCI indexes. More information can be found in the relevant index methodologies on www.msci.com.

MSCI receives compensation in connection with licensing its indexes to third parties. MSCI Inc.'s revenue includes fees based on assets in Index Linked Investments. Information can be found in MSCI Inc.'s company filings on the Investor Relations section of msci.com.

MSCI ESG Research LLC is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. Neither MSCI nor any of its products or services recommends, endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies and MSCI's products or services are not a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such, provided that applicable products or services from MSCI ESG Research may constitute investment advice. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body. MSCI ESG and climate ratings, research and data are produced by MSCI ESG Research LLC, a subsidiary of MSCI Inc. MSCI ESG Indexes, Analytics and Real Estate are products of MSCI Inc. that utilize information from MSCI ESG Research LLC. MSCI Indexes are administered by MSCI Limited (UK).

Please note that the issuers mentioned in MSCI ESG Research materials sometimes have commercial relationships with MSCI ESG Research and/or MSCI Inc. (collectively, "MSCI") and that these relationships create potential conflicts of interest. In some cases, the issuers or their affiliates purchase research or other products or services from one or more MSCI affiliates. In other cases, MSCI ESG Research rates financial products such as mutual funds or ETFs that are managed by MSCI's clients or their affiliates, or are based on MSCI Inc. Indexes. In addition, constituents in MSCI Inc. equity indexes include companies that subscribe to MSCI products or services. In some cases, MSCI clients pay fees based in whole or part on the assets they manage. MSCI ESG Research has taken a number of steps to mitigate potential conflicts of interest and safeguard the integrity and independence of its research and ratings. More information about these conflict mitigation measures is available in our Form ADV, available at <https://adviserinfo.sec.gov/firm/summary/169222>.

Any use of or access to products, services or information of MSCI requires a license from MSCI. MSCI, Barra, RiskMetrics, IPD and other MSCI brands and product names are the trademarks, service marks, or registered trademarks of MSCI or its subsidiaries in the United States and other jurisdictions. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and S&P Global Market Intelligence. "Global Industry Classification Standard (GICS)" is a service mark of MSCI and S&P Global Market Intelligence.

MIFID2/MIFIR notice: MSCI ESG Research LLC does not distribute or act as an intermediary for financial instruments or structured deposits, nor does it deal on its own account, provide execution services for others or manage client accounts. No MSCI ESG Research product or service supports, promotes or is intended to support or promote any such activity. MSCI ESG Research is an independent provider of ESG data.

Privacy notice: For information about how MSCI collects and uses personal data, please refer to our Privacy Notice at <https://www.msci.com/privacy-pledge>.

©2024 MSCI Inc. All rights reserved | CBR1224