

SUSTAINABILITY & CLIMATE

Trends

to **2024**

Watch



CLARITY DRIVES ACTION

A welcome from our new head of ESG research

Welcome to the 2024 edition of MSCI ESG Research's Sustainability and Climate Trends to Watch (formerly known as ESG Trends to Watch, see what we did there?).

Yes, in 2023, much attention has been devoted to the **controversy around ESG investing**. While reports of ESG's demise have been overstated, it is fair to say the industry is in a period of transition. Confusing terminology, definitions and labels have fueled challenges to ESG's credibility from both skeptics and idealists alike. A positive outcome of the current backlash may be that years of inconsistency finally give way to **greater clarity around language, goals and intentions**.

Setting abbreviations aside, it has become clear over the last decade that **environmental, social and governance risks are financial risks**. What does that look like for the year ahead? Well, 2023 is virtually certain to go down as the **hottest year on record** (so far), underscoring the immediate and tangible challenges posed by climate change for households, workers and economies — with risks likely to only grow over time.

The **widespread adoption of AI** is reshaping our work landscape and transforming how companies deliver value. Issues like **forced labor** and **deforestation**, once relegated to ethical considerations, are suddenly turning up as regulatory risks with serious financial implications. When we add inflation and geopolitical instability to the mix, it becomes crucial to ask **whether corporate directors are up to the task**.

Amid the challenges, there are silver linings. The low-carbon energy transition could present a hefty investment opportunity. Coupled with an expansion in primary investment, **private capital is poised to play an outsized role in climate finance**. Beyond climate, **nature and biodiversity** have emerged as priority areas to tackle, with sustainability-oriented investors asking how to minimize harm to ecosystems or how to contribute positively to nature-based solutions.

As sustainable investment matures, regulators around the world are taking steps to enhance clarity for the end investor. In the European Union, the initial round of **Sustainable Finance Disclosure Regulation (SFDR) reporting brought a steep learning curve**, while in the U.S., the Securities and Exchange Commission's "fund names" rule seeks to provide clarity in a less prescriptive way. For many of us, 2023 was spent doing the hard work of tracking and complying with evolving regulations. But as the dust settles, we expect innovation to return in 2024, informed by a clearer articulation of investment objectives and **higher-quality disclosures** from investors and companies alike.

As you dig into the trends on the following pages, you'll find questions and thoughtful analyses from our global research team. We're especially pleased to include contributions from our newest colleagues in [MSCI Private Capital Solutions](#) and [MSCI Carbon Markets](#) (formerly Burgiss and Trove Research). We hope you'll find some useful insights and new ideas for the year ahead. Happy reading!



Laura Nishikawa
Head of ESG Research
New York

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Acknowledgements

THE TRENDS TO WATCH EDITORIAL TEAM



**Meggin
Eastman**
London



**Bentley
Kaplan**
Cape Town



**Liz
Houston**
London



SK Kim
Seoul



**Jonathan
Ponder**
Toronto

AND ADDITIONAL THANKS TO

Arun Sharvirala
Toronto

Aura Toader
London

Jamie Lambert
London



Cody Dong
Shanghai



Liz Houston
London



Matthias Kemter
Potsdam

1. Extreme weather hits home and work

Heat domes, atmospheric rivers, orange skies and unbreathable air. Shockingly unprecedented climate disasters and increasingly severe weather have peppered the globe in the last few years. No longer an abstract future concern, physical climate impacts are quite literally hitting home – and work – for millions of people, as well as the companies that rely on them. As the economic effects ripple outward with social and structural consequences yet to be fully understood, adaptation is becoming a must.

As we move through 2024, we may see more examples of how extreme weather is affecting where and how people live and work – and what that means for the companies that serve and employ them.

Homeowners feel the pinch

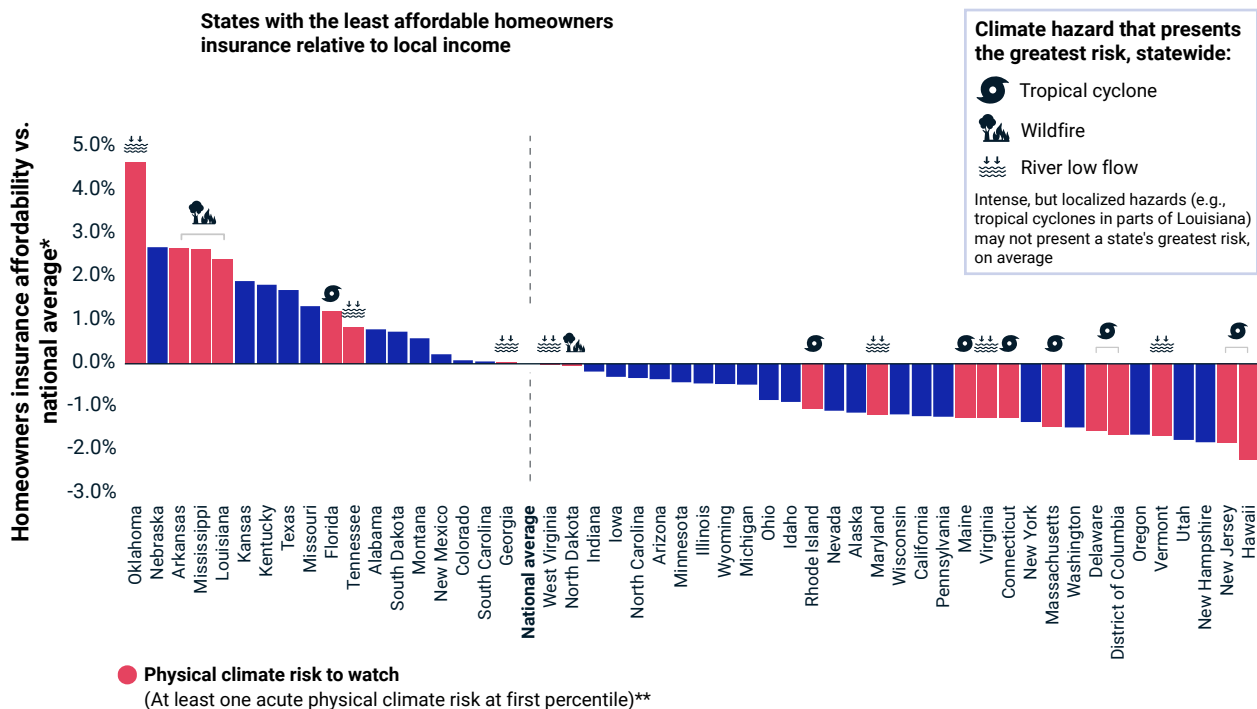
In 2023, major insurers retreated from Florida and California’s homeowner insurance markets.¹ As a result, individual households may find themselves having to weather unexpected costs to protect their homes. Policy efforts could help plug some gaps, but there may be longer-term implications for regional economic health and labor availability. For investors, the questions here are largely macroeconomic: What happens to the business environment as climate hazards affect where people choose to live and work? And how much will they have left over after paying all the costs of housing?

The rise in the average cost of U.S. homeowners insurance between 2001 and 2020 was notable – up to 145%² – and well in excess of the 61% increase in median household income over the same period.³ As climate change bites harder, more expensive policies and fewer options might worsen the financial burden on households already trying to navigate an inflationary economy.

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- 1 Michael Blood, “California insurance market rattled by withdraw of major companies.” Associated Press, June 6, 2023.
 - 2 “An In-Depth Guide About Homeowners Insurance.” Meadowbrook Financial Mortgage Bankers Corp., April 18, 2023.
 - 3 “Median Household Income in the United States.” Federal Reserve Economic Data, Federal Reserve Bank of St. Louis. Accessed on Oct. 13, 2023.

Homeowners are already looking to limit their exposure to some of these costs – more than 80% of U.S. homebuyers are now factoring in physical climate risk when shopping for a home.⁴

Exhibit 1: Climate hazards may add to the pressures on homeowners-insurance affordability



*Cost of insurance as a percentage of median household income vs. (minus) national average. Cost of homeowners insurance also includes cost of flood insurance, which is usually purchased separately in the U.S. **Acute-climate-hazard percentile score of 75 or more in 2050 under the Network for Greening the Financial System's 3-degree scenario, according to MSCI Physical Hazard Metrics. A hazard percentile score of 75 for an asset in the corresponding region implies the asset experiences more hazards than 75% of global assets (i.e., assets in the MSCI ACWI Index). Acute hazards of MSCI Physical Hazard Metrics include tropical cyclones, coastal flooding, fluvial flooding, river low flow and wildfires. While the average risk levels of some states appear to be moderate, city- and county-level risk levels may vary depending on locations. Data as of September 2023. Sources: MSCI ESG Research, Policy Genius, World Population View and Quote Wizard

In response to these intensifying hazards, insurance regulators, such as the National Association of Insurance Commissioners, have been asking for better disclosure from insurers on their climate-related risks.⁵ But for homeowners, the affordability of policies is likely to remain a key question. Options to limit the social impact of rising climate risk could include prioritizing support for vulnerable households.⁶ In Oklahoma, Arkansas and Mississippi, homeowners insurance relative to income is already among the least affordable in the U.S., and all three states are facing higher-

4 "Consumer Housing Trends Report 2023." Zillow, Aug. 23, 2023.

5 The National Association of Insurance Commissioners has strengthened regulations for insurers to disclose climate-related risks, aligning with the recommendations by the Task Force on Climate-related Financial Disclosures (TCFD). Some state regulators now mandate TCFD-aligned reporting, and New York and Connecticut have published detailed guidance on climate risk management for firms to implement.

6 Wesley Muller. "Fortify Homes' grants seek to lower insurance costs for Louisiana property owners." *Louisiana Illuminator*, June 15, 2023.

than-average risk exposure from acute climate hazards. But even for states with more affordable insurance, future climate impacts may cause longer-term premium hikes and fewer choices. For example, in Hawaii, a state with some of the cheapest homeowners insurance in the U.S., a deadly wildfire in August 2023 may already have insurance companies reevaluating their coverage.⁷

Workers feel the heat

The extraordinary heat waves of recent summers have sparked complaints and threats of industrial action from workers at firms such as UPS and Amazon as they struggled to cope with the global rise in temperatures.⁸ Rising levels of heat and humidity make work more difficult and hold back productivity, even without disruption caused by walkouts. There are questions here for policymakers, companies and workers themselves. For investors, the closest signposts are: Which companies are boosting the climate resilience of their workplaces, and where are the literal hotspots where frayed labor relations pose a threat to operations?

Higher wet-bulb globe temperatures (WBGTs) – a measure that combines both heat and humidity – can severely impact human health and functioning. The danger of higher WBGTs has long been understood for outdoor industries that require physical activity and cannot be temperature-controlled. But as WBGTs rise, the impact and risks are spreading indoors. We assessed different economic activities on their physical-exertion requirements and corresponding prevalence of air conditioning, looking at the potential impact on revenues from lower worker productivity. The results helped explain why logistics firms, in particular, have become vulnerable. Following this logic, manufacturing and mining companies could be next.

By 2050, if CO₂ emissions have risen sharply,⁹ the average logistics-warehouse worker in New York City could lose almost 50% more productivity to heat than they did in 2020. And that only counts productivity lost while at work – not the additional losses that could come from labor disputes or increased worker absences due to heat-related illnesses.

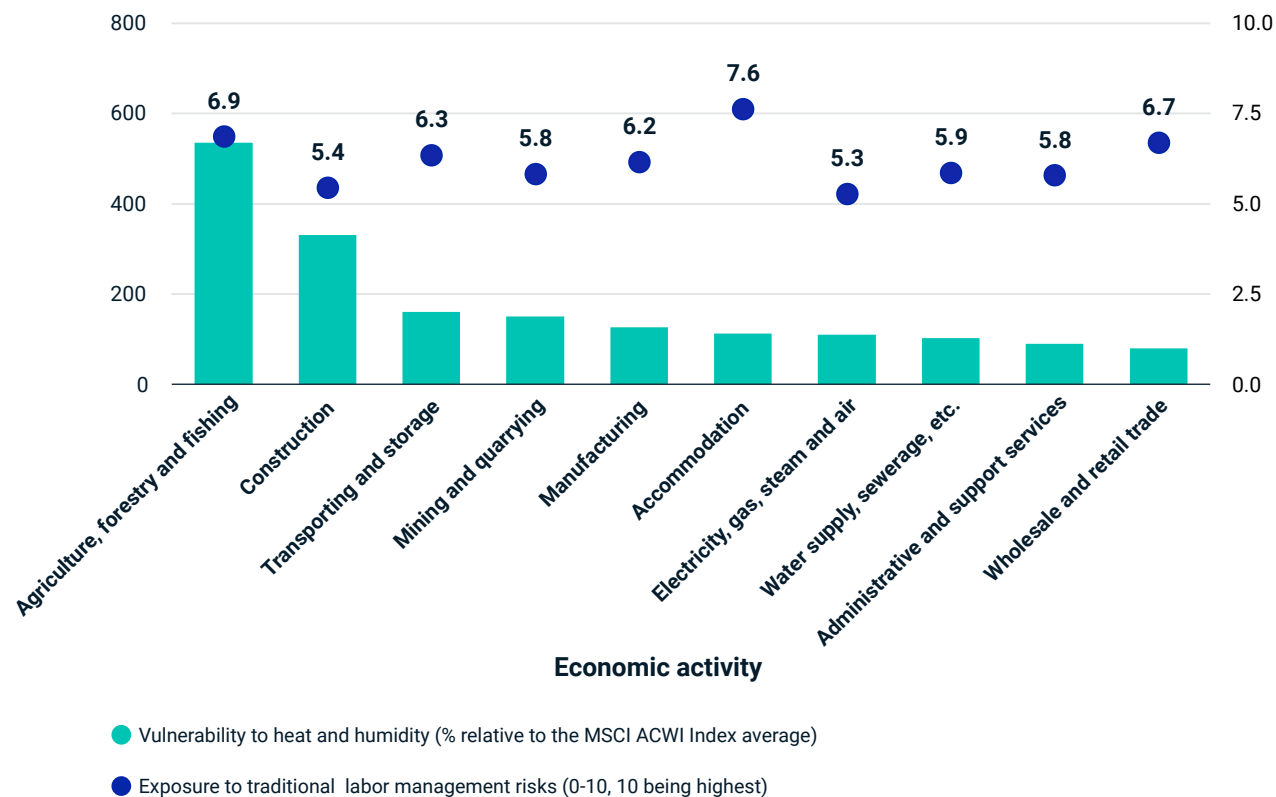
This analysis opens a new frontier in our understanding of the risks in managing the workforce of the future. Traditionally, measures such as revenue per employee, workforce size, geographical location or a history of unrest have been used to understand challenges in maximizing productivity. These measures still provide important insight and would have pointed to postal and courier services as the highest-risk area within logistics as a whole. But as we look to a hotter future, new measures of risk – and new ways of managing it – will be critical.

7 Alex Eichenstein. “Will the Maui Wildfires Cause Insurance Companies to Rethink Coverage in Hawaii?” *Honolulu Civil Beat*, Aug. 30, 2023.

8 Dharna Noor. “‘We’re going to see workers die’: extreme heat is key issue in UPS contract talks.” *Guardian*, July 23, 2023. Suhuana Hussain. “What it’s like working at Amazon during a Southern California heat wave.” *Los Angeles Times*, Sept. 21, 2022.

9 Shared socioeconomic pathways (SSPs) are climate-change scenarios of projected global socioeconomic changes up to 2100. The IPCC Sixth Assessment Report assessed the projected temperature outcomes of a set of five scenarios based on the framework of the SSPs. The names of these scenarios consist of the SSP on which they are based (SSP1-SSP5), combined with the expected level of radiative forcing in the year 2100 (1.9 to 8.5 W/m²). In the fossil-fuel-intensive scenario, SSP5-8.5, CO₂ emissions triple by 2075 compared to historical levels.

Exhibit 2: Labor-management risk exposure for the 10 most heat-vulnerable economic activities



Analysis covers constituents of the MSCI ACWI Index, categorized using NACE (European classification of economic activities) section codes, with the 10 most heat-vulnerable economic activities included in the chart. Our assessment of the vulnerability of each activity is based on the productivity loss at a WBGT of 22°C, looking at physical activity and prevalence of air conditioning – a higher value implies a higher vulnerability. Our assessment of exposure to traditional labor-management-related risks includes elements such as revenue per employee, workforce size, geographical location and a history of unrest, with a higher score implying a higher exposure to productivity-related risks. Data as of October 2023. Source: MSCI ESG Research



Jonathan Ponder
Toronto



Harlan Tufford
Toronto



Ahasan Amin
Toronto



Tanya Matanda
Toronto



Moeko Porter
Tokyo



Carrie Wang
New York



Anqi Liang
Frankfurt

2. Who’s minding the shop? Spotlight on corporate oversight

From climate change to geopolitics to workers who stubbornly refuse to return to the office, risks and opportunities are multiplying and amplifying the challenges involved in running a company. A range of scandals has sharpened the regulatory gaze on banks, risk expertise and auditors. CEOs are turning over faster, and boards are competing for expertise on unfamiliar topics.¹⁰ Corporate governance is changing as a result. If oversight is a spotlight, in 2024 it might be one with some fresh bulbs.

For investors, this raises some serious questions: Who exactly is minding the shop, and do they have what it takes to do the job well?

Auditing the auditors

One of the most dramatic changes we’ve observed over the last year has been in the behavior of audit regulators, which is sparking fresh attention to audit practices, board oversight and the quality of auditors themselves.

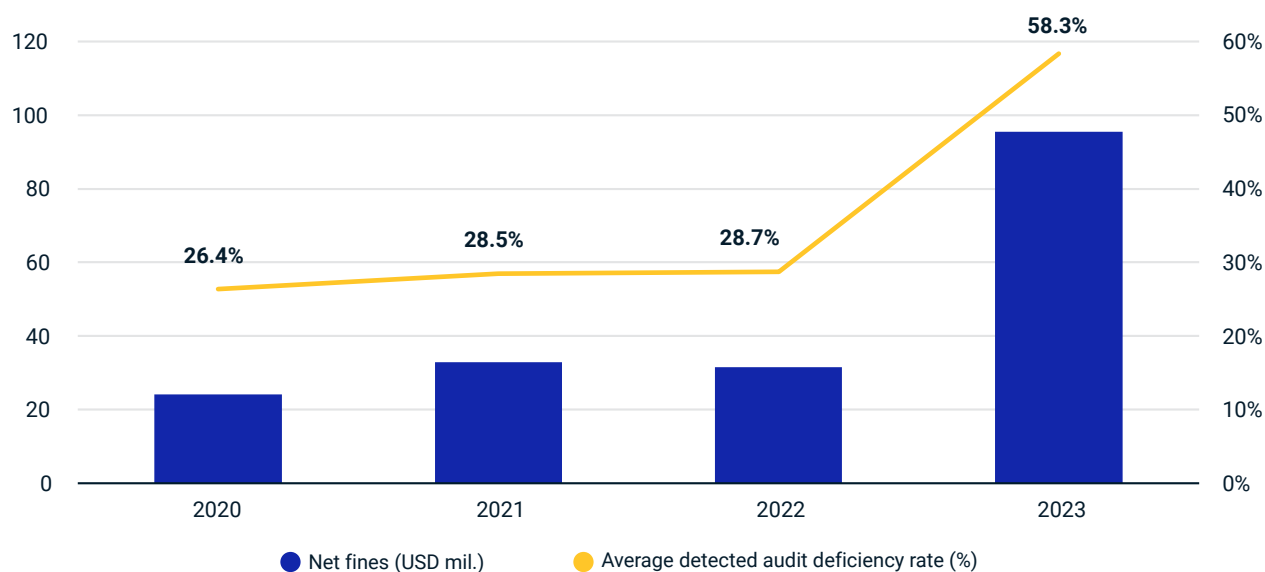
¹⁰ Falling retention rates for CEOs were observed across all MSCI ACWI Index constituents, whereby the absolute number of CEOs that held the role for at least four years fell by 6% from the periods of 2016–2020 and 2018–2022.

Auditors validate financial reporting, but it’s not always easy to assess the quality of their work or the track record of the audit firms. In 2023, however, audit regulators improved access to assessment data and audit firms’ engagement processes across several markets. This could well be an inflection point in transparency and enforcement efforts.¹¹

Preliminary findings are striking – across multiple markets, regulators spotted far more audit deficiencies and levied more financial penalties in 2023 than previous years. As of September 2023, financial penalties across three major regulators – the Public Company Accounting Oversight Board (PCAOB) in the U.S., Financial Reporting Council (FRC) in the U.K. and National Financial Reporting Authority (NFRA) in India – were up 302%, compared with 2022.¹² In the U.S., we found that detected deficiencies in audit engagements spiked 203% in the same period.¹³

While regulatory probes could impact investors’ portfolio companies, greater scrutiny and transparency also present a unique opportunity for investors to assess the suitability of specific auditors and vote their proxies accordingly. This information could also bear on investment decisions, as potential audit deficiencies may make it harder to detect financial risks at investee companies.

Exhibit 3: Regulatory penalties and deficiency rates by year



Data reflects year-by-year comparison of total regulatory penalties levied (PCAOB, FRC, NFRA) and detected-deficiency rates for audit engagements by regulatory agencies with sufficiently granular disclosure (PCAOB). Fine values and deficiency rates are collected from public disclosure provided by the regulators mentioned. Foreign-exchange rates as at the end of 2022. Issuers covered include all within the purview of these regulators, including voluntary registrants with the PCAOB. Data as of Sept. 1, 2023. Sources: MSCI ESG Research, PCAOB, FRC and NFRA

11 “Fact Sheet: PCAOB Secures Complete Access to Inspect, Investigate Chinese Firms for First Time in History.” PCAOB, Dec. 15, 2022.

12 Data accessed in September 2023, through public regulatory disclosures.

13 Deficiencies as defined by relevant regulatory authority. Analysis of the U.S. based on firm inspection reports from the PCAOB.

Investors might also look at the audit and risk-oversight capabilities of the boards of companies in their portfolios. The potential consequences of weak oversight were highlighted by 2023's U.S. banking crisis and the failure of Credit Suisse. We found that almost a quarter (24%) of the global banks we analyzed had been working with the same auditor for more than two decades, which may compromise independence.¹⁴ And while that's not necessarily problematic on its own, 42% of these companies also lacked an industry expert on their audit committee, and a majority (54%) had no risk management expert on the board. If the capabilities and track record of the outside auditor are essential to manage risks in a shifting landscape, boards' own capabilities are no less so. The good news is that many boards apparently recognize this fact.

Building better boards

Boards have always needed the right mix of skills, expertise and backgrounds to effectively oversee their firms. But defining that mix has never been harder. Risk matrices have ballooned to include ever more strategic threats – geopolitics, AI and CEOs' sex lives come to mind – while investors and regulators are pushing boards to diversify their members.¹⁵ These pressures are felt keenly by boards' nominating committees in particular, given the observed decline in CEO retention rates across MSCI ACWI Index constituents. The challenge for nomination committees may now be to balance adding new skills to address these emerging risks with maintaining boardroom basics.

In 2023, global large-cap companies¹⁶ saw an overall decrease in the number of board seats held by people who possess each of the three core competencies we track: financial expertise, risk management expertise and industry expertise.¹⁷ The prior year saw a deficit in two of these three skills, despite the average size of boards increasing in 2022 and holding steady in 2023. These recent declines contrast with the six-year period between 2016 and 2021, during which there was a net increase in board members with each of these skills.

This does not mean these boards have suddenly become bereft of core skills. Most boards still had multiple directors with financial, risk management and industry expertise.

Nonetheless, nominating committees appear to be prioritizing new skills. To find out which, we used generative AI to read the biographies of directors first elected in 2022 and 2023 and assign skills to each. Fittingly, technology and cybersecurity were the most commonly identified areas of expertise after general management experience. Other top-10 skillsets included engineering, ESG/sustainability and manufacturing/logistics.

¹⁴ Based on analysis as of Sept. 21, 2023, of 460 banking constituents of the MSCI ACWI Investable Market Index (IMI), within the regional-banks sub-industry (n=234) and the diversified-banks sub-industry (n=226), as defined by the Global Industry Classification Standard (GICS®). GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.

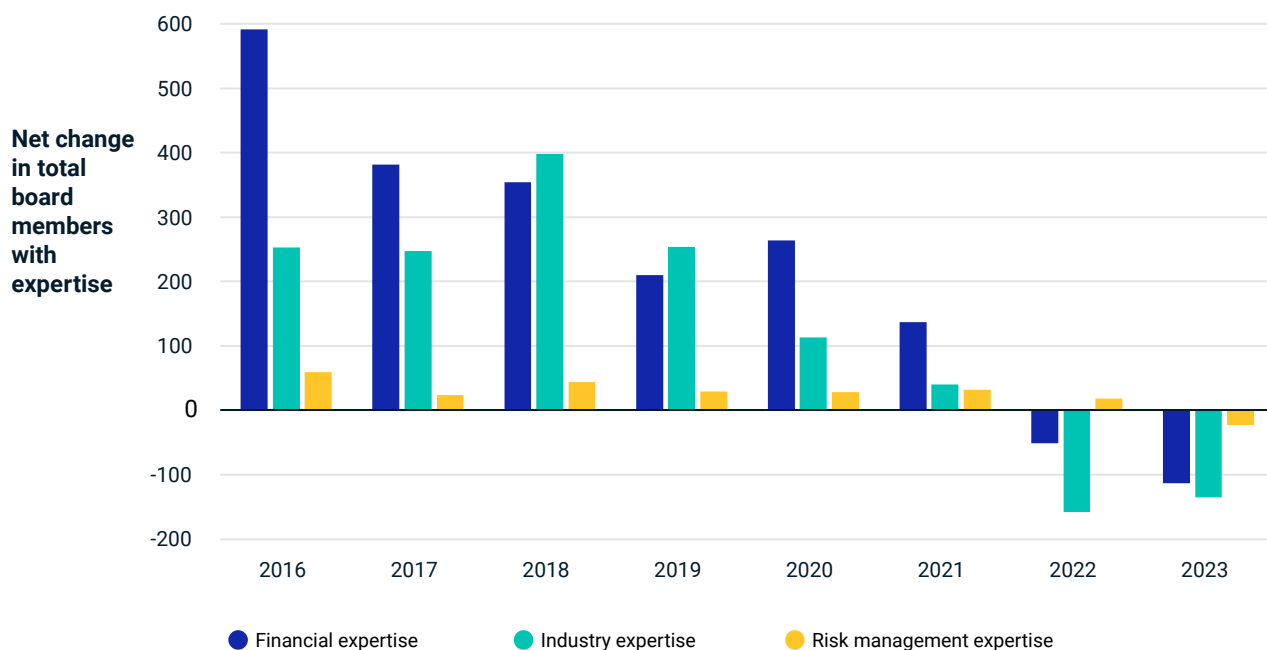
¹⁵ Emelin Denis. "Enhancing gender diversity on boards and in senior management of listed companies." OECD Corporate Governance Working Papers No. 28, OECD, 2022.

¹⁶ Constituents of the MSCI ACWI Index, based on analysis of data up to Sept. 12, 2023.

¹⁷ We assess expertise based on a review of director biographies. Financial expertise reflects professional experience (e.g., as auditors, accountants and CFOs) and credentials (CFAs and accounting designations). Industry expertise reflects executive experience at a company in the same industry as the company where the director serves. Risk management expertise reflects specific professional or academic experience related to risk management (e.g., experience as a chief risk officer, actuarial training and a risk management consulting practice). General statements about "risk management expertise" are not sufficient. Refer to "Board Key Issue" within the [MSCI ESG Ratings Methodology](#) for further information.

This rising demand may make finding candidates who are not already filling director roles elsewhere more difficult. Notably, we have observed that female directors, directors with risk management expertise and those with financial expertise tend to sit on more boards than average.¹⁸ This was more pronounced among nonexecutive directors, raising concern over time commitments for those directors who are most crucial to the independent oversight of management.

Exhibit 4: Net change in director expertise, 2016-2023



This chart shows the number of new directors assessed as possessing a skill who were appointed to a board during a year minus the number of existing directors assessed as possessing a skill who left a board during the same year. Board composition was evaluated as of Sept. 12 in every year. Includes current and former directors of constituents of the MSCI ACWI Index as of Sept. 12, 2023 (2,679 issuers; 49,354 board memberships). Source: MSCI ESG Research

¹⁸ Based on analysis of 23,711 nonexecutive board seats across constituents of the MSCI ACWI Index (n=2,686) as of Sept. 25, 2023. Boards of directors (one-tier board structure) and supervisory boards (two-tier board structure) were considered in this assessment.



Ye Jun Kim
Seoul



Siyu Liu
New York



Yoon Young Chung
Boston

3. Managing AI: The basics still matter

Generative AI has grabbed the lever of technological change and looks poised to disrupt sectors from finance to health care. Policymakers, academics and industry leaders are actively debating how best to realize the upside potential while reining in the possibility of disaster. And while some risks do look monumental, others are more mundane and more within companies’ direct control.

So as the scramble ensues, and AI rollouts are urgently scheduled, investors might well be thinking about guardrails. What are companies’ current approaches to risk management, regulatory compliance, privacy and talent management? And how might they build on those existing best practices to counter new risks?

Data privacy: As regulators race to catch up to the tech, companies must catch up to the regs

Generative-AI models and applications are opening up new ways in which consumers’ personal data can be used. Trained on massive datasets, generative-AI applications like search or personal assistance tools may harvest behavior data without clear consent,¹⁹ for example, and then use it to further train models,²⁰ while image-rendering apps may collect users’ biometric data without stating any purposes other than completing the service. Policymakers have begun moving to protect their citizens’ privacy rights in response.

The EU’s General Data Protection Regulation has centered around user rights, consent and secondary purposes, as well as a “privacy-by-design” principle in product development.²¹ But that’s evolving. Cautionary voices from the AI developers’ community have recommended self-governing

19 Matt Burgess. “ChatGPT Has a Big Privacy Problem.” *Wired*, April 4, 2023.

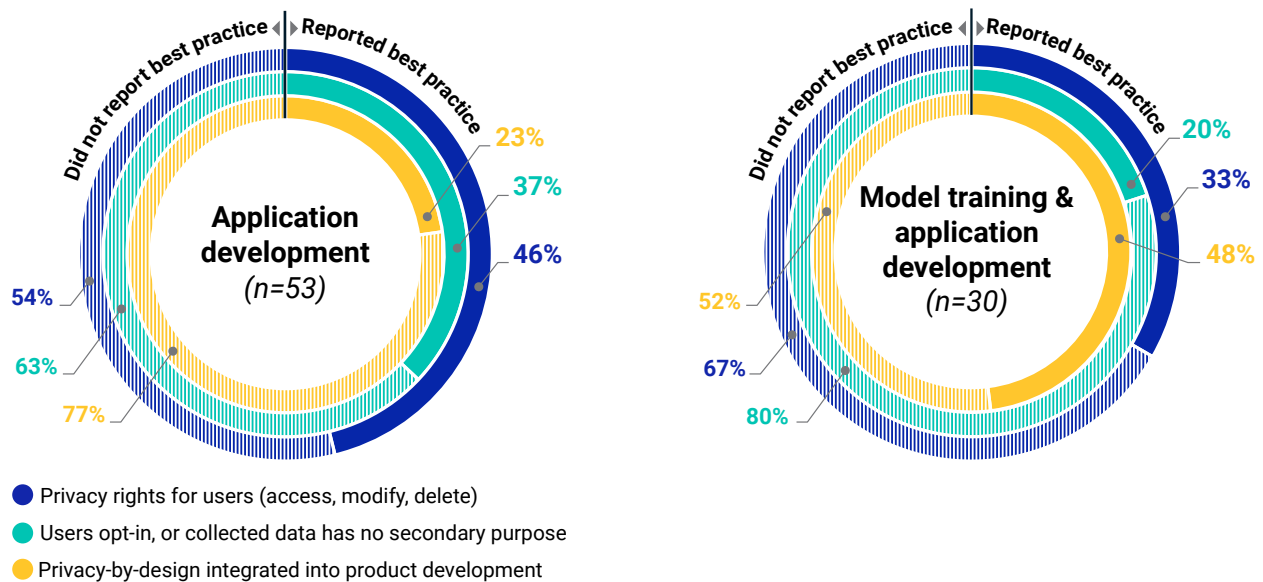
20 Nicholas Carlini. “Privacy Considerations in Large Language Models.” Google Research Blog, Dec. 15, 2020.

21 “Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance).” European Commission, April 2016

guidelines covering privacy and the ethical development of AI products.²² And the EU’s proposed AI Act includes a comprehensive governance framework for AI systems, from ethical product development to extending best practices for data privacy.²³

To get a sense of how ready companies are for the evolving AI regulatory landscape, we looked at three indicators as a proxy for the ability to protect consumer data from misuse or exploitation. Our analysis suggests that technology companies involved in the development of both AI foundation models and applications may need to integrate more-effective guardrails, while those developing AI-driven applications for consumer use may need to expand their privacy provisions to ensure safe deployment.

Exhibit 5: Companies across the AI value chain may need better guardrails and privacy provisions



Universe of analysis: 83 companies with three or more patents in areas related to “generative AI” (Google Patent search terms: generative AI, large language model, deep learning and neural networks) that were constituents of the MSCI ACWI Index, as of Sept. 25, 2023. Companies were then grouped into two camps: 1) those involved in both AI foundation-model training and development of applications, such as companies in semiconductors and semiconductor equipment, interactive media and services and software and services; and 2) those mainly engaged in developing applications leveraging AI technologies, such as health-care and consumer-goods companies. Source: MSCI ESG Research

22 Markus Anderljung et al. “Frontier AI Regulation: Managing Emerging Risks to Public Safety.” arXivpreprint arXiv:2307.03718 (2023), OpenAI, as of August 2023.

23 “EU AI Act: First regulation on artificial intelligence.” European Parliament, August 2023.

Talent management: Minding the gap

The combination of job cuts and workforce transformation, driven by the adoption of generative-AI technologies, have become a reality as companies seek to unlock the full potential of labor-productivity improvements.²⁴ As much as 80% of the U.S. workforce could have at least 10% of their tasks affected by the introduction of generative AI.²⁵ But it's a two-way street: AI may displace human tasks, but it could also enhance human productivity when workforces are trained with the necessary new skills. Which companies will invest in their employees alongside AI, and which will limit their focus to cutting costs?

Despite job cuts, high-growth technology industries desperately need new talent. There could be a projected talent gap of 1.4 million workers in these industries in the U.S. by 2030, including computer scientists, engineers and technicians.²⁶ We used companies' current workforce-related efforts to gauge their capacity to adjust to the realities of the workplace in the AI era by examining two key areas: their efforts to upskill existing employees and their strategy for acquiring any new talent required for their next growth phase.

We found that utilities, commercial- and professional-services companies and REITs appeared better prepared for workforce transformations on average, while companies in real-estate management and development, software and services, technology hardware and equipment and media and entertainment lagged on these measures. But effective talent strategy is complex, and companies across the spectrum may need to take a closer look at their human-capital investments to fully reap the benefit of AI-powered productivity gains.

24 In 2023, IBM, BT and Dropbox announced AI-induced hiring freezes or cuts to their workforce:

Brody Ford. "IBM to Pause Hiring for Jobs that AI Could Do." Bloomberg, May 1, 2023.

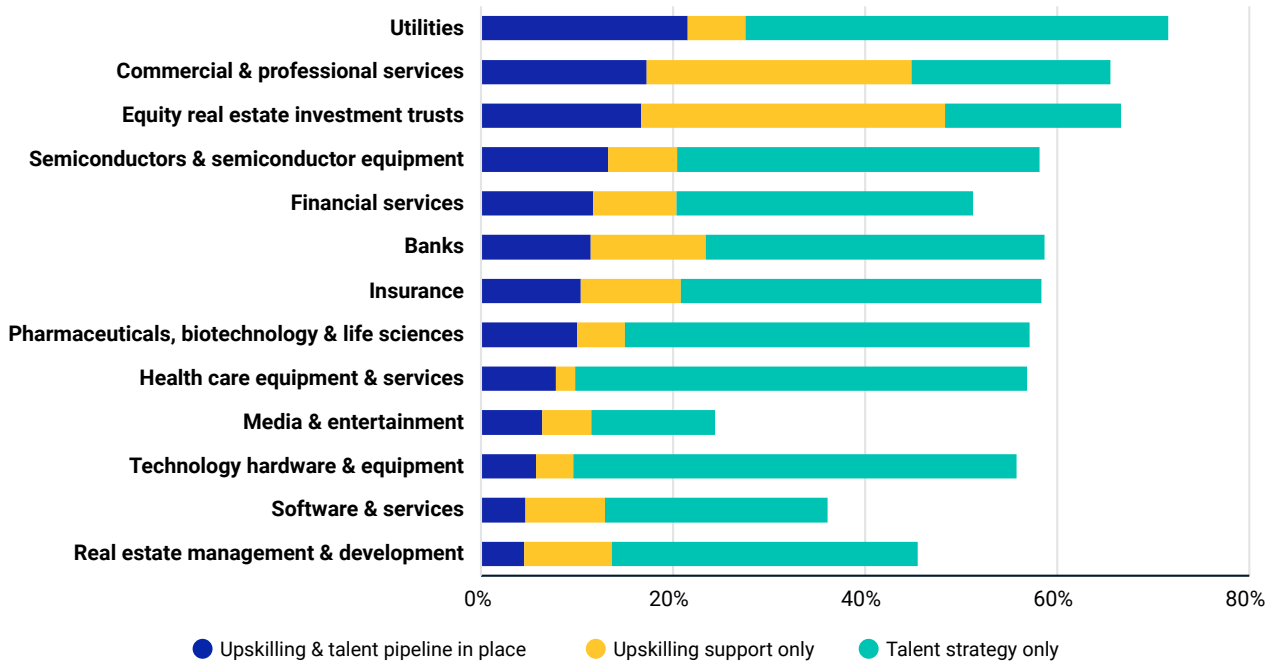
Mark Sweney. "BT to axe up to 55,000 jobs by 2030 as it pushes into AI." *Guardian*, May 18, 2023.

Ingrid Lunden. "Dropbox lays off 500 employees, 16% of staff, CEO says due to slowing growth and 'the era of AI.'" TechCrunch, April 27, 2023.

25 "GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models." Working paper by OpenAI, OpenResearch and University of Pennsylvania, Aug. 22, 2023.

26 High-growth technology industries include clean energy, AI, next-generation communications and advanced manufacturing, among others, as mentioned in the report: "Chipping away: assessing and addressing the labor market gap facing the U.S. Semiconductor Industry." Semiconductor Industry Association and Oxford Economics, July 2023.

Exhibit 6: Key measures of companies' preparedness for workforce transformation, by industry group



We analyzed two workforce-related indicators, "Professional-development degree programs and certifications" and "Formal talent-pipeline-development strategy," for companies in industry groups where we identify talent scarcity as one of the important risk drivers for long-term financial performance. The analysis covers constituents of the MSCI ACWI Index belonging to one of these industry groups (n=1,213) as of Sept. 30, 2023. We excluded industry groups with fewer than 15 constituents. Source: MSCI ESG Research



Cole Martin
London



Liz Houston
London



Kuldeep Yadav
Sydney

4. Supply-chain due diligence becomes the law as regulators target action alongside disclosure

Complex, global supply chains are a fact of modern-day business. When constructed well, these chains offer specialization, efficiency and competitive advantage. But they are not without risk, from key-material shortages to quality-assurance failures. The sheer number of players involved at each stage of production can make it difficult to keep track of who's trading with whom. For major brands, the actions of a subcontractor somewhere deep in the chain can cause real reputational harm. But key regulators are now raising the stakes significantly further. New policies are making companies explicitly responsible for what happens all the way back to the source – and may impose a hefty penalty on those found lacking.

Policymakers are coming at the issue from different angles, both environmental and social. In an example of the first, EU regulation focused on preserving nature and biodiversity will soon come into effect and require companies to prove that products sold in the EU don't contain commodities produced on recently deforested land.²⁷

The EU has also been active on the social side of supply chains, and it is far from alone. Requirements meant to put curbs on modern slavery have been passed and proposed in several large markets, and they are increasingly requiring due diligence – that is, preventive actions – in addition to risk assessments and reporting.

In all cases, the key questions for companies and investors alike are: Who's ready to act, and how are they going to solve the traceability problem?

²⁷ "Regulation 2021/0366 (COD)." European Commission, Nov. 17, 2021.

Following the food chain

The EU's deforestation law applies to a wide variety of commodities and finished products, but it takes only one industry to bring the challenge into focus. Let's take food as an example.

Food products can have astonishingly complex supply chains, especially when incorporating raw inputs like cocoa, coffee, palm oil and soybeans. These ingredients are largely sourced from emerging markets, where monitoring and reporting can be patchy. But the days of shrugging off the difficulty of tracing commodities are fast coming to an end. New anti-deforestation and corporate due-diligence laws in the EU have put traceability front and center.²⁸ And 2024 may be the year we find out which companies can respond to this new regulatory pressure and actually report on where their ingredients are sourced.

Coming to grips with multiple tiers of any supply chain can be messy, but a quick glance at current traceability efforts for food production reveals a scene not unlike a two-year-old's dinner. As of September 2023, only 11% of food-products companies that relied on soybeans had traceability programs in place, and only 8% of those relying on cocoa.²⁹ Under the EU's new anti-deforestation law,³⁰ companies sourcing or selling any of these and other commodities (and their derivatives) in the bloc's market will soon need to prove they did not come from deforested land.³¹

Incremental improvements are not going to cut it — food-products companies will need a sea change in their traceability efforts. This may draw new players into the market that can offer high-tech solutions to the problem: satellite monitoring for crops, electronic tagging for cattle and block-chain for grain. Whether that's an agricultural-technology startup with deft timing and a tracing tool, a collaboration between industry participants³² or something out of left field — the opportunity is there for any large food company that can crack this tracing challenge as competitors are soon to feel the regulatory squeeze.

Traceability isn't just about protecting the environment, though. Working conditions in supply chains have been a source of concern for decades — and now some jurisdictions are forcing companies to try to do something about it.

28 "Missing the Forests for the Food." MSCI Research, June 2023. (Client access only)

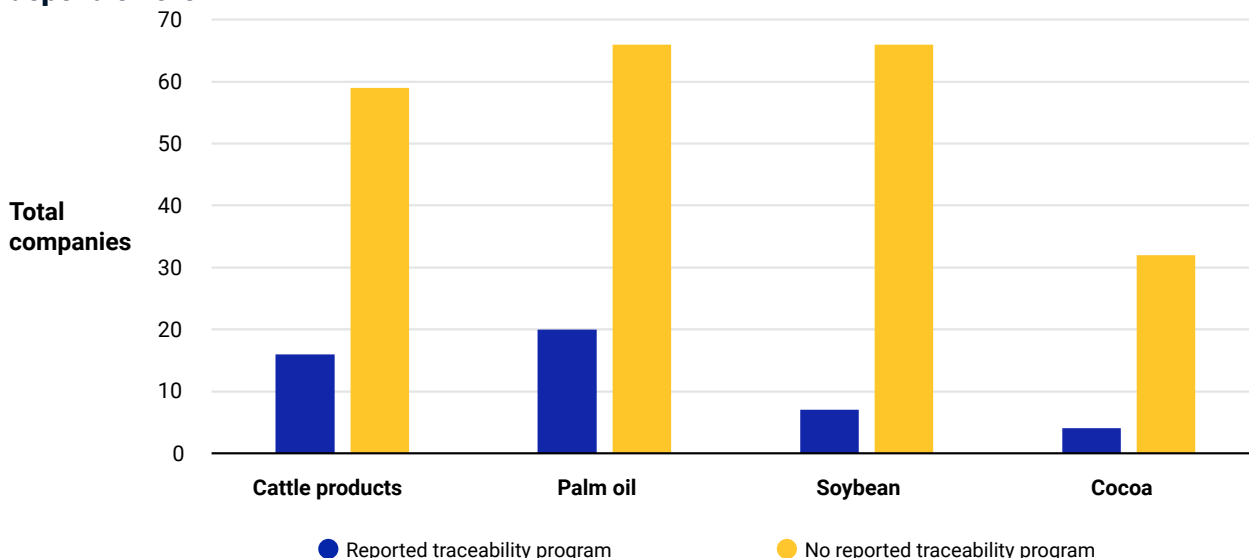
29 Using a combination of data from MSCI ESG Research and CDP Forest and referencing food-products constituents of the MSCI ACWI Investable Market Index.

30 Regulation 2021/0366 (COD)." European Commission, Nov. 17, 2021.

31 This will be completed via a due-diligence statement that involves providing the geolocated coordinates of "the plots of land where the commodities were produced," along with other elements such as an annual risk assessment and a description of risk-mitigation practices, including relevant policies and a demonstration of how the data was gathered. Companies importing commodities from countries ultimately deemed to have reduced risks of deforestation, along with small and medium-sized enterprises, will have reduced reporting requirements.

32 For example, see: Felix Thompson. "Covantis blockchain platform for soft commodities trade goes live." *Global Trade Review*, March 3, 2021.

Exhibit 7: Commodity traceability has a long way to go, including for companies that depend on them



Analysis includes food-products constituents of the MSCI ACWI Investable Market Index, as of Oct. 17, 2023, with at least 20% estimated revenue reliant on either cattle products (n=75), soybean (n=73), cocoa (n=36) or palm oil (n=86). Companies may be included under more than one commodity. The revenue-reliance data used in the chart is derived from the “Raw Material Sourcing” key issue, part of the MSCI ESG Ratings model. Traceability is a combination of MSCI data and company disclosures to CDP Forest and/or Cocoa Barometer. Data as of October 2023. Sources: MSCI ESG Research, company disclosures, Cocoa Barometer and CDP Forest

Breaking the modern-slavery chain

We’ve seen a marked increase in recent years in the volume and stringency of modern-slavery-related regulations for companies and, in some regions, for investors. We estimate that about 79% of global large-cap companies³³ were subject to at least one such regulation, as of late 2023, increasing to 83% once the EU Corporate Sustainability Due Diligence Directive (CSDDD) is adopted.³⁴

Modern-slavery regulation is not new, but has been evolving and growing in reach. Once limited to voluntary reporting, several regions now include rules on exactly what companies must disclose. The value of goods stopped at the U.S. border because of forced-labor concerns in the first 11 months of 2023 was almost three times that of FY2022.³⁵ Under the CSDDD, due diligence will become mandatory, with possible financial penalties of up to 5% of a company’s global turnover and improved access to justice for victims.³⁶ Will financial institutions also have to comply? It’s unclear at this stage, but we may find out in 2024.

³³ Measured as constituents of the MSCI ACWI Index as of October 2023.

³⁴ The CSDDD, which requires environmental and human rights due diligence, was adopted by the European Parliament on June 1, 2023, and is now entering inter-institutional negotiations until formal adoption (not expected until sometime in 2024).

³⁵ “Trade Statistics.” U.S. Customs and Border Protection, accessed Oct. 8, 2023.

³⁶ As of April 25, 2023, the EU’s Legal Affairs Committee adopted its position on the proposed CSDDD, including calling for fines of “at least 5%” of net turnover. The proposed directive has not yet been agreed and is subject to change or withdrawal. For more details, please see: “Corporate sustainability: firms to tackle impact on human rights and environment.” European Parliament Press Room, April 25, 2023.

CSDDD aside, human rights (and by extension, modern-slavery) due diligence already forms part of the regulations covering sustainable investments in the EU. The Sustainable Finance Disclosure Regulation requires a “do no significant harm” assessment of investee companies, which includes reporting on violations of, and lack of processes to ensure compliance with, global norms.³⁷ And the EU Taxonomy Regulation introduced the concept of minimum safeguards, whereby even the greenest investments cannot be “taxonomy-aligned” unless they, too, adhere to those global norms.

Regulations on modern slavery have increased the risk of operational disruption, reputational damage, civil liabilities and financial penalties for companies and are raising the bar on what can be considered for portfolios of “sustainable” investments. Investors have more reasons than ever to take a closer look at how comprehensively companies are addressing this risk.

Exhibit 8: Modern-slavery-related regulations and reporting requirements

Requirements of legislation						
	Public statement Requirement for a public anti-slavery or modern-slavery report with no mandatory content?	Risk assessment Requirement for assessing risk exposure to modern slavery in supply chains?	Risk disclosure Required to publicly report on this risk exposure?	Compliance reporting Requirement for compliance disclosure in public modern-slavery reports?	Due diligence Companies must commit to ongoing monitoring of risks, tracking of mitigation actions and to report ongoing progress	% Exposed % MSCI ACWI Index, by market capitalization
US* (Calif.)	Yes					62.8%
UK	Yes					3.7%
Switzerland	Yes	Yes	Yes			2.4%
Canada	Yes	Yes	Yes			2.8%
Norway	Yes	Yes	Yes	Yes		0.2%
Australia (Federal)	Yes	Yes	Yes	Yes		1.7%
France	Yes	Yes	Yes	Yes	Yes	2.9%
Netherlands	Yes	Yes	Yes	Yes	Yes	1.0%
Germany	Yes	Yes	Yes	Yes	Yes	2.0%
EU**	Yes	Yes	Yes	Yes	Yes	12.1%

*U.S. legislation referred to here applies to companies doing business in California, while exposure number refers to total U.S.

**Final wording of EU CSDDD still to be confirmed and formal adoption is not expected until sometime in 2024. Data as of Oct. 6, 2023. Source: MSCI ESG Research

37 Such as the OECD Guidelines for Multinational Enterprises.



Zohir Uddin
London



Emma Wu
Singapore



Mathew Lee
New York



Elchin Mammadov
London

5. Regulation drives more corporate climate disclosures, but mind the fine print

The next few years could see a game-changing volume of corporate climate disclosures become available to global investors. The regulatory drive behind mandatory reporting is substantial. It covers a range of major markets, and there’s more to come. And while it will no doubt place a certain burden on firms not already in the habit of this sort of measurement and disclosure, it holds out the promise of richly enhancing investors’ and financiers’ ability to make properly informed decisions and comparisons. But as to whether that promise becomes reality ... well, the devil is in the details.

Disclosure regulation: The ISSB is coming soon to a market near you

Following the launch of the International Sustainability Standards Board’s (ISSB) disclosure standards in mid-2023, a number of jurisdictions have announced plans to implement ISSB-aligned reporting rules within their local regulatory frameworks over the coming year or so.³⁸ As 2024 unfolds we may see whether the speed, scale and rigor with which they implement the ISSB standards matches the ambition for it to become a global baseline for sustainability reporting.

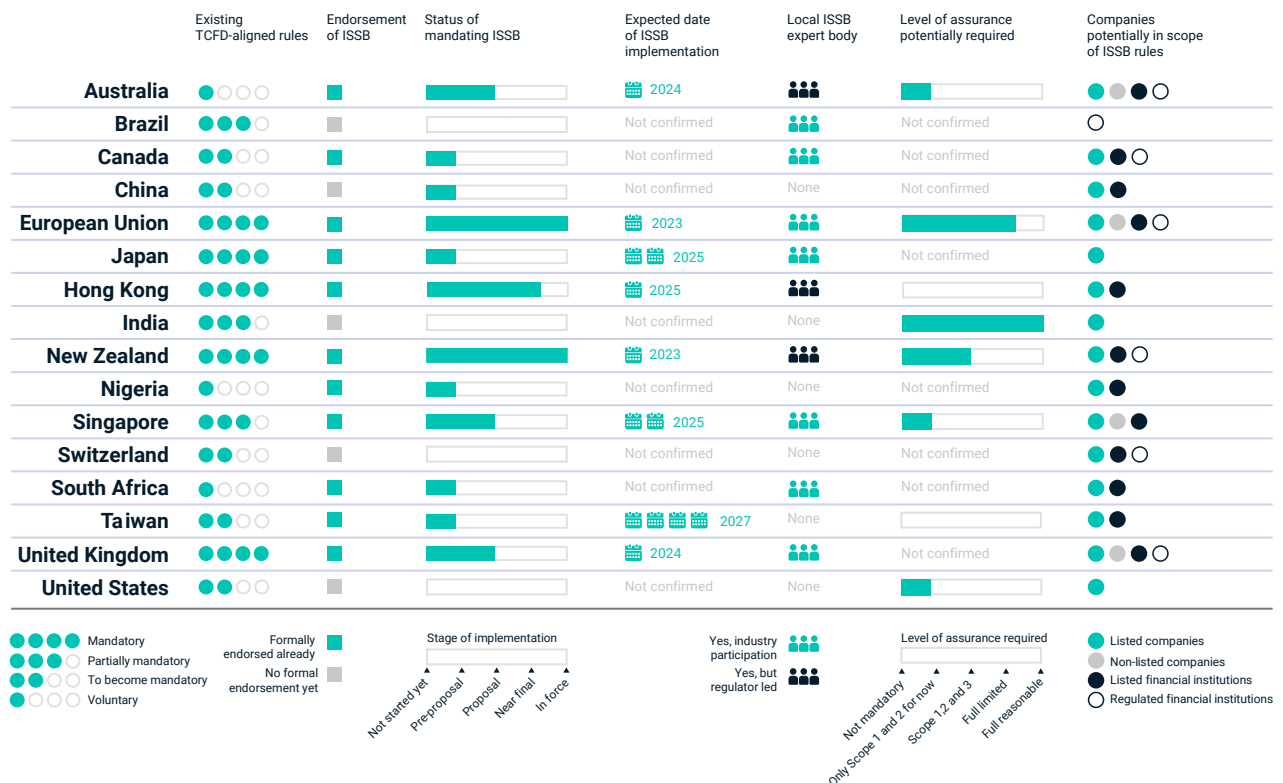
Some jurisdictions have taken the lead and have proposed detailed ISSB-aligned disclosure requirements. In some cases, these build on existing disclosure regulations based on the recommendations by the Task Force on Climate-related Financial Disclosures (TCFD). The TCFD was officially incorporated into the ISSB in 2023.

³⁸ “IFRS - ISSB issues inaugural global sustainability disclosure standards.” International Financial Reporting Standards Foundation (IFRS), June 2023.

In the EU, companies will need to report along the lines of the European Sustainability Reporting Standards, which are designed to be interoperable with the ISSB.³⁹ Hong Kong was expected to introduce the world’s first set of ISSB-specific rules in January 2024 but postponed to January 2025.⁴⁰ The U.K. is set to launch its own ISSB-aligned disclosure standards for registered companies by the summer of 2024,⁴¹ while Australia intends to finalize its ISSB-aligned reporting framework for large firms by July 2024.⁴²

Looking further down the road, ISSB-aligned disclosures are expected to become mandatory in Japan⁴³ and Singapore in 2025.⁴⁴ However, the world’s two largest economies, the U.S. and China, have yet to announce any formal plans to introduce ISSB-aligned reporting frameworks.

Exhibit 9: The ISSB’s disclosure standards are being adopted at different speeds around the world



Data as of October 2023. Source: MSCI ESG Research

39 “European Commission, EFRAG and ISSB confirm high degree of climate-disclosure alignment.” IFRS, July 31, 2023.
 40 “Update on consultation on enhancement of climate disclosures under ESG framework.” Hong Kong Exchanges and Clearing Limited, November 3, 2023.
 41 “UK Sustainability Disclosure Standards.” Department for Business and Trade, August 2023.
 42 “Exposure Draft ED SR1 Australian Sustainability Reporting Standards – Disclosure of Climate-related Financial Information.” Australian Accounting Standards Board, Oct. 27, 2023.
 43 Takashi Nagaoka. “Future of Integrated Thinking and Reporting in Japan and Globally.” Financial Services Agency, June 12, 2023.
 44 “Singapore’s Sustainability Reporting Advisory Committee Recommends Mandatory Climate Reporting for Listed and Large Non-Listed Companies.” Sustainability Reporting Advisory Council, July 6, 2023.

As ISSB standards are gradually rolled out, investors will watch two things closely. First, the speed at which they will be able to access new disclosures and any fresh insights into the performance of investee companies on climate. Second, the consistency of disclosures across different regions: Without a harmonized approach, it will be much harder to draw meaningful conclusions when comparing performance globally.

The rise of ‘orphaned emissions?’ Reading the fine print of sustainability reports

As the low-carbon energy transition encounters headwinds from inflation and higher input costs, companies may be tempted to slow down plans to decarbonize. But walking back climate promises can draw criticism. And it may be these sorts of criticisms that have given rise to footnotes and exceptions in climate reporting that allow companies to stay connected to certain fossil-fuel assets without counting their emissions in top-line tallies. Going into 2024, it may be increasingly important to read the fine print to sort the active transition plans from the differences in accounting.

We have seen companies employ several methods to reduce their reported emissions:⁴⁵

- Excluding the emissions of assets or subsidiaries that are not wholly operated by the company – joint ventures (JVs) are relatively common in energy exploration.⁴⁶
- Deconsolidating emissions of pollutive assets after transferring them into a new JV or spinoff, while continuing to incorporate their share of net income.⁴⁷
- Excluding emissions from business units that are planned for sale.⁴⁸
- Switching from location-based to market-based emissions accounting.⁴⁹
- Structuring finance as corporate debt issued by a special-purpose vehicle with a lower reported emissions footprint, rather than linked to specific fossil-fuel projects.⁵⁰

45 The company examples provided here are illustrative only and are not a commentary on any individual company’s practices.

46 Brookfield Asset Management’s 2022 sustainability report (p. 4) states that it “does not address the sustainability practices of Oaktree Capital Management,” in which it owns a majority interest. The Carlyle Group’s 2022 sustainability report did not include its majority-owned portfolio company NGP Energy Capital Management, LLC. Ed Davey. “Emissions Declarations by Equity Firm Carlyle Under Question.” Associated Press, Sept. 26, 2022.

47 Chubu Electric Power Co., Inc. did not account for JERA Co., Inc, a JV it established with Tokyo Electric Power Company in its direct (Scope 1) emissions profile in 2021 (p.20).

48 Centrica originally excluded a gas-related business in its 2021 annual report (p. 246), citing plans for its sale. The business was later included in its 2022 annual report (p. 262).

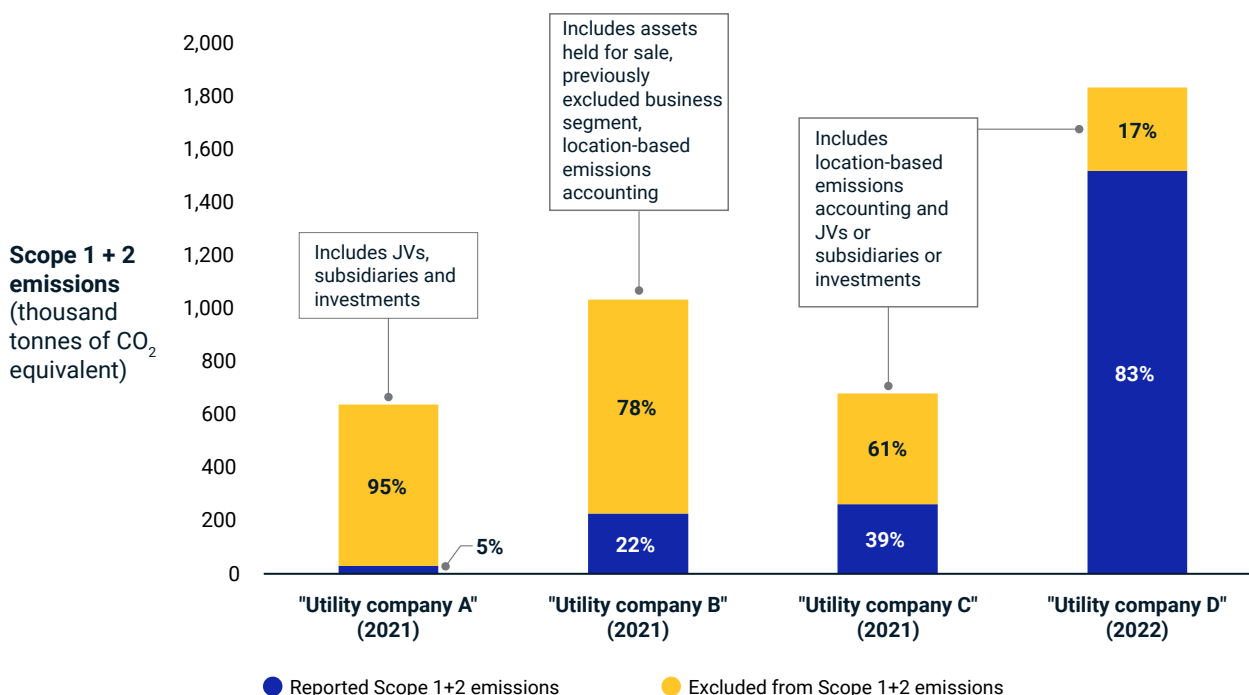
49 Snam S.p.A., based on its 2022 sustainability report (p. 81, 82, 84) and Enagas, S.A., based on its 2022 annual report (p. 61, 69). Location-based emissions reporting reflects the average emissions intensity of grids on which energy consumption occurs. Market-based emissions reporting reflects how a company chooses to buy its energy and focuses on specific contractual arrangements. The widely accepted standard-setter for emissions reporting, the Greenhouse Gas (GHG) Protocol, currently allows both location- and market-based approaches for Scope 2 emissions. Switching between methods may affect the comparability of company emissions. The GHG Protocol is reviewing this dual-reporting approach, and published the full scope of comments received in favor of continuing dual reporting or picking one over the other on their webpage, “Survey on Need for GHG Protocol Corporate Standards and Guidance Updates.” July 2023.

50 Greg Ritchie. “An ESG Loophole Helps Drive Billions into Gulf Fossil Fuel Giants.” Bloomberg, July 11, 2023.

This complicates emissions calculations and apples-to-apples comparisons of different companies or of year-over-year trends, because fundamental data (i.e., profits, oil and gas reserves, refining capacity, power generation, etc.) may be reported based on ownership stakes, but not the associated emissions.

Our research on four publicly traded utilities that had omitted some direct emissions from their reporting by attributing them to a combination of JVs, subsidiaries and investments, and/or switching to market-based emissions accounting found they were excluding a wide range (17-95%) of what their overall emissions footprint could be. Although these gray areas in emissions-reporting practices may ultimately be clarified by regulations, in the interim, investors may need to be wary of “orphaned emissions.”

Exhibit 10: Reported vs. adjusted emissions for four publicly listed utility companies



Actual company names anonymized. Company A excluded JVs, subsidiaries and investments. Company B excluded assets held for sale and an entire business segment and switched to using market-based accounting for its overall emissions. Companies C and D both excluded JVs, subsidiaries and investments and switched to using market-based accounting for their overall emissions. Data as of September 2023. Source: MSCI ESG Research, public company disclosures



Raphael Klein
Zurich



Simone Ruiz-Vergote
Frankfurt

6. The SFDR's unintended consequences for emerging markets

To meet net-zero ambitions by 2050, we need USD 5 trillion in global investments every year between now and 2030. And 40% of that needs to go to emerging markets.⁵¹ But with the first major round of reporting in the books in 2023, it's become apparent that efforts to direct this capital might bump into an unexpected – and unintended – obstacle in the form of the EU's Sustainable Finance Disclosure Regulation (SFDR). In a nutshell, there just aren't that many emerging-market firms that meet the SFDR's high bar for a sustainable investment. How will emerging-market investors approach this dilemma, and will regulators address any unintended restrictions in forthcoming legislative reviews?

The SFDR came about together with the EU Taxonomy and the European Green Deal, all part of an ambitious package intended to reorient financing and business to a more sustainable economy and drive toward net-zero. So where are the roadblocks coming from?

EU funds with a sustainability objective (Article 9 funds) need to consider “principal adverse impact” indicators (PAIs), as prescribed by the SFDR under the principle of “do no significant harm” (DNSH).⁵²

(Not as) easy as PAIs

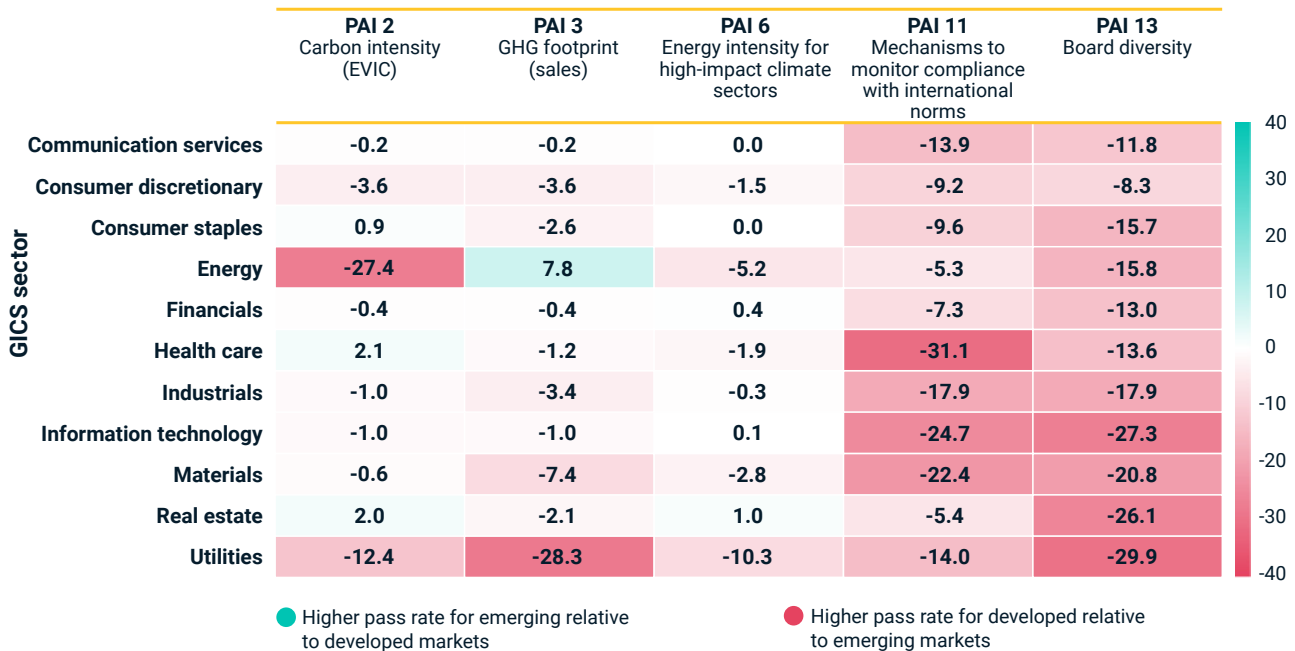
When we looked at PAIs that had good data availability and were suited for quantitative thresholds, we saw key implications for both emerging- and developed-market issuers. Across all sectors, the most striking differences were in social indicators (PAIs 11 and 13). In both cases, emerging-market issuers fell short far more often than their developed-market peers. They also tended to trail on carbon-and energy-related indicators (PAIs 2, 3 and 6).

⁵¹ “Global Financial Stability Report.” International Monetary Fund, October 2023.

⁵² “Commission Delegated Regulation (EU) 2022/1288.” EU, April 2022 (Annex 1 lists the PAIs). “Sustainable Finance Disclosure Regulation (EU) 2019/2088.” EU, 2019 (Article 2(17) defines the requirements for a sustainable investment).

The upshot of emerging-market companies’ failing to meet the DNSH criteria is that they effectively become ineligible for many investors’ portfolios.⁵³ Key sectors to a net-zero transition, like utilities, are particularly disadvantaged compared to their developed-market peers. And for markets that desperately need transition capital, this would be a big blow. But the door has not shut completely; legislative revisions to the SFDR’s DNSH approach are anticipated some time in 2024.⁵⁴ Investors may be watching for any changes that affect how their capital is steered and for any shift in the balance between sustainable-investment objectives and imperatives for a global climate transition.

Exhibit 11: Emerging-market companies may find it harder to meet criteria for select PAIs than their developed-market peers



Analysis based on constituents of the MSCI ACWI Index as of June 2023, which included 1,205 emerging-market issuers and 1,490 developed-market issuers. We compared the percentage of emerging-market issuers in each sector that pass the PAI criteria to the pass rate for their developed-market counterparts. Thresholds are set at the level of the applicable universe (the worst 10% of performers) and at the sector level (the worst 5% of performers get screened out) for PAIs 2, 3 and 6. PAI 11 is a pass or fail (building on reported policy data as per the forthcoming review of MSCI SFDR PAI 11); PAI 13, board diversity, requires a minimum of one woman. A negative figure means the pass rate was higher for developed-market companies while a positive figure means the pass rate was higher for emerging-market companies. Sectors were defined by the Global Industry Classification Standard (GICS®). GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence. Source: MSCI ESG Research

53 “Funds and the State of European Sustainable Finance.” MSCI ESG Research, July 2023. SFDR Article 8 and 9 funds collectively accounted for over EUR 6 trillion in assets as of April 2023 (55% of assets under management in Europe). While the DNSH consideration is only required for Article 9 funds, Article 8 funds are often built referencing PAIs as the social or environmental characteristics they aim to improve on.

54 Based on the forthcoming “European Supervisory Report to the European Commission on the Commission Delegated Regulation (EU) 2022/1288.” European Supervisory Authorities. The EU Commission is expected to legislate changes to the SFDR’s regulatory technical standards, including the PAIs. This is separate from the ongoing consultation on the SFDR primary legislative text, which is expected to take several years before coming into effect.



Jakub Malich
Hong Kong



Abdulla Zaid
Boston



Anett Husi
Budapest



Michael Ridley
London



Sylvain Vanston
Paris

7. Private debt takes a seat at the climate-transition table

Unlisted assets have seen staggering growth and now account for more than 25% of major asset owners’ portfolios.⁵⁵ Private-market participants have an important role to play in the transition to a net-zero world by channeling capital toward less emissions-intensive investments and green solutions.⁵⁶ And with the low-carbon transition estimated to cost up to USD 100 trillion, opportunities to provide financing could prove plentiful.⁵⁷

However, this comes with structural challenges for private-asset owners and managers. While listed-asset markets are more transparent and face higher public scrutiny, private markets are relatively opaque. This obscurity has fueled concerns that “dirty” assets divested from public markets may have ended up in private-asset portfolios.⁵⁸ More generally, it may leave investors in the dark about transition risk. That’s starting to change, though. And as data becomes more available, some of those myths and misconceptions can be dispelled and private-market investors can move forward with genuine insights into climate risk.

⁵⁵ “Global Pension Assets Study | 2023.” Thinking Ahead Institute, Willis Towers Watson, 2023.

⁵⁶ In line with broadly accepted climate scenarios and their investment mandates.

⁵⁷ Delphine Strauss and Emma Agyemang. “The \$100tn path to net zero.” *Financial Times*, Sept. 6, 2023.

Shamik Dhar and Brian Davidson. “An investor’s guide to net zero by 2050: Understanding the investment risks and opportunities created in what may be the largest redeployment of capital in history.” BNY Mellon Investment Management and Fathom Consulting, October 2022.

⁵⁸ Sarah Murray. “Can Private Equity Meet Public Responsibilities?” *Financial Times*, October 11, 2023

Nina Lakhani. “Private Equity Still Investing Billions in Dirty Energy Despite Pledge To Clean Up.” *Guardian*, Sept. 14, 2022.

Increasing visibility into private assets' carbon intensity

Until recently, the general lack of transparency in the private markets meant that measuring assets' carbon intensity was intensely difficult. Now it's starting to get easier. While reported data is still quite scarce, estimates are becoming more available.

Leveraging some of this analysis, we did find real differences in estimated carbon intensity between public equities and private-equity funds. But contrary to conventional wisdom, the numbers suggested that carbon intensity is lower in private-equity funds⁵⁹ than it is in public markets – perhaps not so “dirty” after all.⁶⁰

Insight into the carbon intensity of different types of asset classes is an important first step. But lower carbon intensity at a headline level doesn't mean that the entire asset class faces lower transition risk. Investors concerned about the potential impact of higher carbon prices on their portfolio may choose to dig a little deeper.

Better data = better risk assessments

Transition risk is multifaceted and may affect different assets differently depending on how it plays out. As but one example, we estimated the impact of a hypothetical global carbon-price floor of USD 75/tCO₂e on the EBITDA margins of the underlying private portfolio companies across different forms of private debt.

Under this particular scenario, and after accounting for any existing carbon prices,⁶¹ distressed-debt funds appeared to be facing the highest levels of climate-transition risk compared to other private-equity or -debt asset classes.⁶² In this model, private companies in distressed-debt funds' portfolios may see an average decline in their EBITDA margins of 133 basis points in an environment with a carbon-price floor of USD 75/tCO₂e.

There are, of course, many other potential scenarios to analyze, with varying degrees of complexity. But for investors, the universal need to make those analyses useful is data. And while we noted that more private-asset emissions data is becoming available, many of those figures are estimated based on public-market data – because that's where a majority of reported numbers can be found.

59 Carbon-intensity estimates are only calculated for companies within the MSCI Private Capital Solutions data. Therefore, properties, natural-resource investments and infrastructure assets generally do not have available estimates yet. The aggregate investment valuation is almost USD 4 trillion, corresponding to ~90% of the Burgiss Manager Universe, in portfolio companies with carbon-intensity estimates: ~96% in private equity and ~57% in private debt.

60 “The MSCI Net-Zero Tracker.” MSCI ESG Research, May 2023.

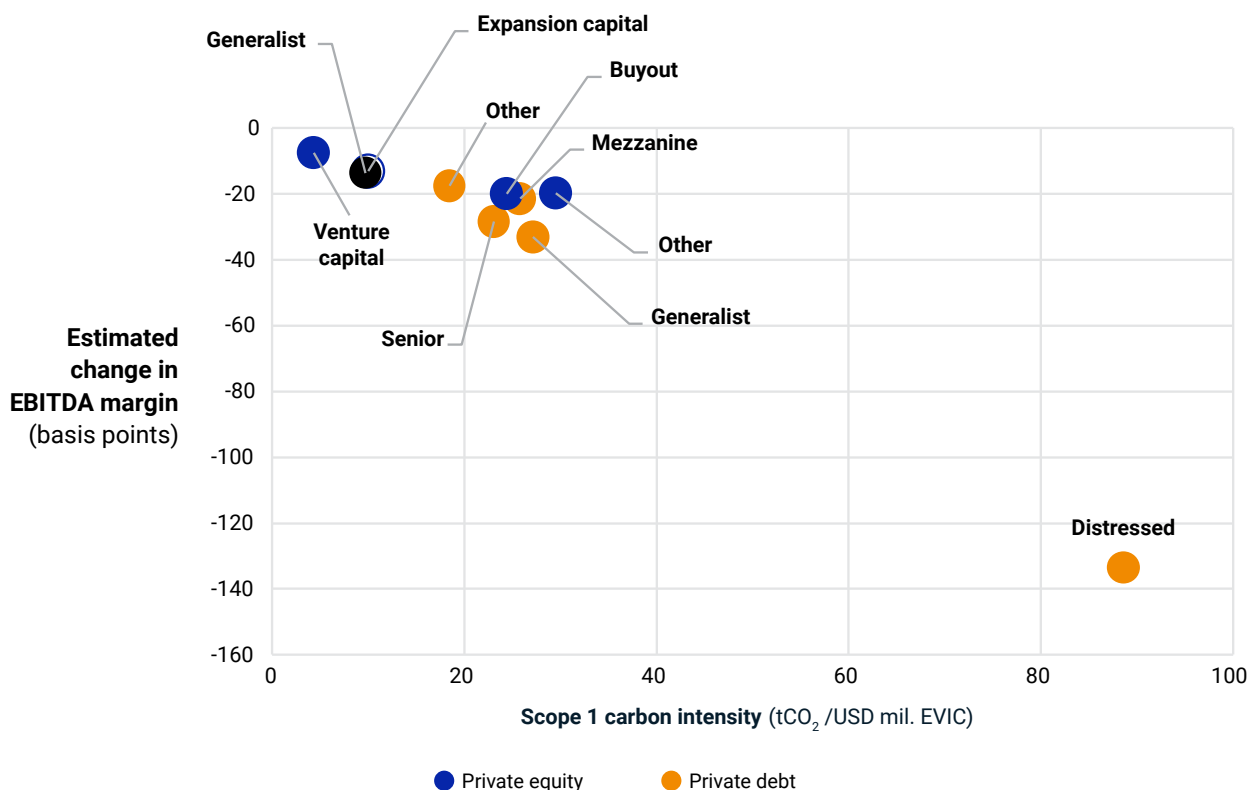
61 Carbon-price data from the World Bank's Carbon Pricing Dashboard. Data as of March 31, 2023.

62 The carbon-risk estimation methodology relies on the portfolio company's *revenue carbon-intensity estimate* (tCO₂e/USD million revenue) and the difference between the *hypothetical global carbon-price floor* of USD 75/tCO₂e and the existing carbon price in the company's geographical location and sector (USD/tCO₂e) from the World Bank's Carbon Pricing Dashboard.

EBITDA Margin Shock = – Revenue Carbon Intensity x Δ Carbon Price.

For further information, see: “Climate Transition Risk Part Three: Are Private Asset Managers Ready for Stricter Climate Regulations.” MSCI Private Capital Solutions (formerly Burgiss), 2023.

Exhibit 12: Carbon intensity vs. estimated change in EBITDA margin when carbon price moves to USD75/tCO2e



Carbon-intensity estimates are calculated only for companies within the MSCI Private Capital Solutions data universe. Therefore, properties, natural-resource investments and infrastructure assets generally do not have available estimates yet. The aggregate investment valuation is almost USD 4 trillion, corresponding to ~90% of the Burgiss Manager Universe, in portfolio companies with carbon-intensity estimates: ~96% in private equity and ~57% in private debt. The carbon prices are based on the World Bank's Carbon Pricing Dashboard. Data as of June 2023. Source: MSCI ESG Research and MSCI Private Capital Solutions (formerly Burgiss)

Going into 2024, we have our eye on prospects for an increase in reported private-market data. The ESG Integrated Disclosure Project (IDP) is one example of an initiative that could encourage more consistent private-market disclosure and facilitate material comparison between assets and firms financed in private markets: In the future, participants may be able to compare actual reported private-market emissions data.⁶³

63 See "ESG Integrated Disclosure Project (ESG IDP)." ESG IDP, 2023.



Arne Klug
Frankfurt



Mark Jwaideh
London



Theresa Bodner
London



Levon Kameryan
Frankfurt



Pam Palena
Zurich

8. Investing in nature

Nature and biodiversity have rapidly moved up the global regulatory agenda in recent years and captured investors’ attention. Nature is irrevocably interlinked with climate, but the possibility of biodiversity collapse presents an additional range of systematic risks at least as far-reaching as those of climate change. The World Economic Forum estimates that more than half of global economic output is at least moderately dependent on nature.⁶⁴ Mitigating these risks calls for the preservation and restoration of nature.

Investors are starting to tackle that challenge in a variety of ways. One is attempting to measure where portfolio impacts occur, as a first step to managing or reducing them. Another is finding investment opportunities in nature conservation or ecological-improvement projects, which are becoming increasingly available to private investors through mechanisms like debt-for-nature swaps and carbon credits. Debt-for-nature swaps allow countries to refinance their debt in return for commitments to ecosystem conservation. Investments in funds or projects that generate carbon credits for the voluntary carbon market can generate returns for nature as well as climate.

Measuring to manage or managing to measure?

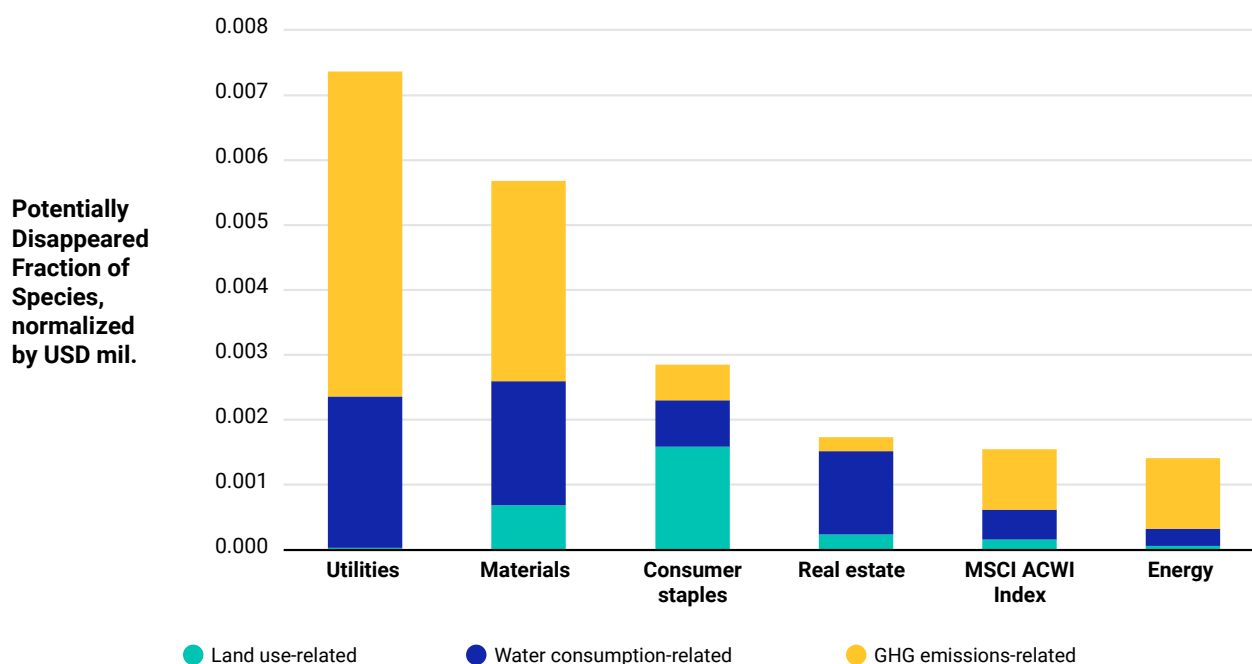
Investors may increasingly see the links between biodiversity loss and financial risk, both specific and systematic, but understanding how investee companies contribute to the problem remains a challenge. The good news is that there are signs of progress.

A common understanding of what we mean when we talk about biodiversity impact would be a major step toward impact reduction. If you can’t measure it and compare it with any consistency, it’s hard to do anything about it.

⁶⁴ Amanda Russo. “Half of World’s GDP Moderately or Highly Dependent on Nature, Says New Report.” World Economic Forum, Jan. 19, 2020.

Without a biodiversity counterpart to carbon-dioxide equivalents (CO₂e), biodiversity models and methodologies vary widely, making comparisons and benchmarking difficult. The Taskforce on Nature-related Financial Disclosures framework suggests the risk of global species extinction as an indicator.⁶⁵ Even that’s not straightforward, as there are many ways to approach this calculation. But as an example, the “potentially disappeared fraction of species” (PDF) offers one way to measure it by focusing on ways a company puts pressure on the environment in specific locations. The way that companies use natural resources such as land or water and their contributions to climate change all put stress on local ecosystems: The more land, more water and more emissions, the greater the stress. Aggregating impacts across ecosystems and locations can provide insight into a company’s total potential impact on biodiversity and nature.⁶⁶

Exhibit 13: Contribution to global species loss differs substantially between sectors



The chart shows five sectors with the highest potential contribution to global species extinction, with the average for all constituents of the MSCI ACWI Index for reference. We have calculated the PDF, based on company-specific land use, water consumption and GHG emissions. For this purpose, we have created estimation models to fill data gaps to create an emissions inventory and focused on the direct operations of a company only. We have translated these location-specific pressures into the “midpoint” impacts such as habitat change, climate change, acidification or ecotoxicity according to the scientific models developed by LC-IMPACT. We have used the MSCI Asset Location Database to identify location-specific company activities. We have aggregated these midpoints into endpoint impacts on terrestrial, freshwater or marine biodiversity. The resulting PDF metric is a fraction and therefore “unitless.” We have calculated the average PDF per sector and normalized it by revenues (in USD millions). Sectors refer to GICS® sectors. GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence. Data refers to all constituents of the MSCI ACWI Index as of Nov. 2, 2023. Source: MSCI ESG Research

65 “Recommendations of the Taskforce on Nature-related Financial Disclosures.” Taskforce on Nature-related Financial Disclosures, 2023.

66 Francesca Veronesi, Stefanie Hellweg, Assumpció Antón, et al. 2020. “LC-IMPACT: A Regionalized Life Cycle Damage Assessment Method.” *Journal of Industrial Ecology* 24(6): 1201-1219.

When we combined land use, water consumption and greenhouse-gas (GHG) emissions from companies' direct operations, we found that those in the utilities, materials and consumer-staples sectors had the highest potential contribution to global species extinction.⁶⁷ For example, agricultural-products companies in the consumer-staples sector use large areas of land to produce their goods, while utilities companies predominantly contribute to species loss via high GHG emissions.

Assessing biodiversity risks is a complex task, but a vital first step is agreeing on what to measure. We'll be watching whether metrics such as the PDF become the common ground for investors looking to measure how their portfolio companies may drive biodiversity loss.

The reemergence of debt-for-nature swaps

The evident investor interest in supporting nature-based solutions suggests the possibility of growing appetite for investment in nature-oriented assets. In green bonds, a quarter of new issuances in 2023 were linked to nature-based projects such as biodiversity, forestry and sustainable agriculture – this number having tripled in the past five years.⁶⁸ And then there are debt-for-nature swaps. While these have been around since the 1980s,⁶⁹ they weren't previously very accessible for private investors. But growing interest in biodiversity financing and the entry of some new players may be changing that.

These swap transactions provide discounts or debt relief on a developing country's foreign debt in exchange for a commitment to finance land- or marine-conservation measures.⁷⁰ Given increasing risks of debt distress – more than half of low-income countries are considered to be in debt distress or at high risk of it⁷¹ – and an average annual global biodiversity financing gap estimated, as of June 2020, at over USD 700 billion by 2030,⁷² we expect the market for debt-for-nature swaps to grow. A number of developing countries most vulnerable to climate change have called for more of these swaps, with some potential deals under consideration.⁷³

With a growth potential estimated by one source at more than USD 800 billion,⁷⁴ innovation in transaction forms and new entrants in the market, we are starting to see more interest from private investors looking for conservation-linked investment opportunities. Risk guarantees provided by multilateral development banks (MDBs) on transactions related to debt-for-nature swaps could help.

67 To allow for comparison between companies we looked at this metric on a revenue-intensity basis.

68 As of Nov. 15, 2023, 296 bonds issued in 2023 were considered eligible under the MSCI Green Bond Methodology. 73 of these were intended to fund activities and projects including (but not limited to) the protection and conservation of biodiversity, sustainable forestry and afforestation projects and sustainable agricultural projects. This compares to 24 (out of a total of 126) green bonds intended for similar projects in 2018.

69 "Lessons Learnt from Experience with Debt-for-Environment Swaps in Economies in Transition." Organisation for Economic Co-operation and Development, 2007.

70 "Climate finance: What are debt-for-nature swaps and how can they help countries?" World Economic Forum, June 23, 2023.

71 "Debt Sustainability Analysis Low-Income Countries." IMF, Aug. 31, 2023.

72 Andrew Deutz et al. "Financing Nature: Closing the Global Biodiversity Financing Gap." Paulson Institute, Nature Conservancy and Cornell Atkinson Center for Sustainability, 2020.

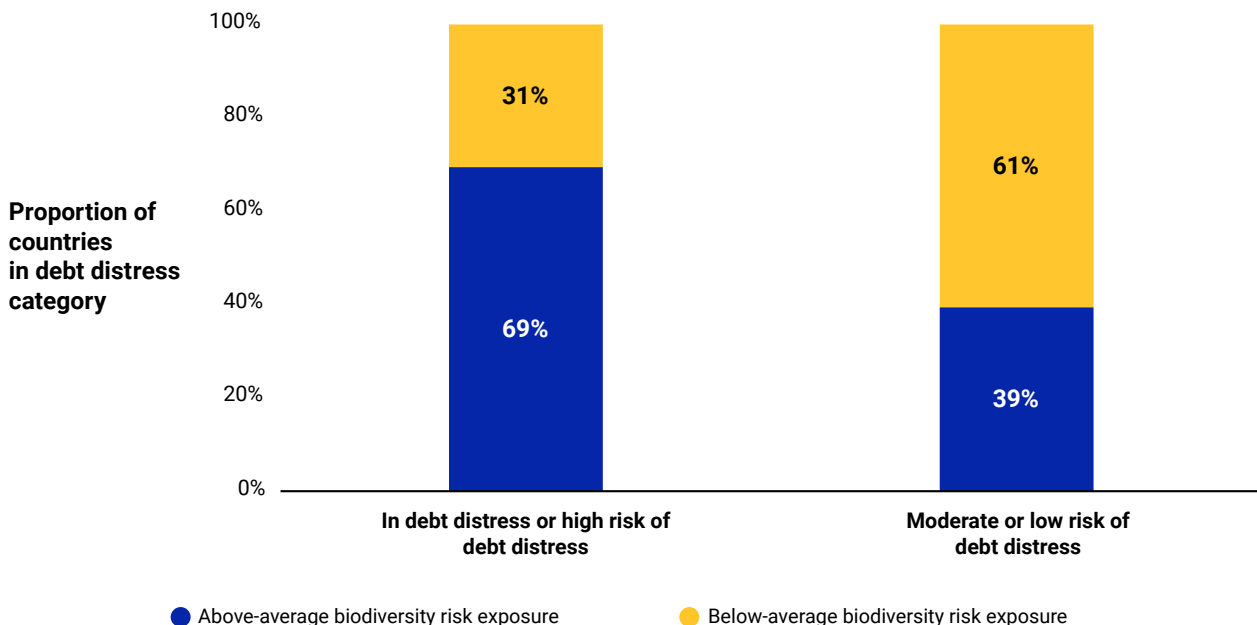
73 "A new wave of debt swaps for climate or nature," United Nations Development Programme, 2023.

74 Patrick Greenfield. "Are debt-for-nature swaps the way forward for conservation?" *Guardian*, June 21, 2023.

Several MDBs have already done so or expressed an interest, as they are under increasing pressure from shareholders to mobilize funding for environmental projects in developing countries.⁷⁵

The scaling-up of this market is not without challenges and depends, in part, on the success of recent transactions. Structuring can be lengthy and complex, and the environmental benefits might be hard to assess. In addition, changing political and macroeconomic conditions in debtor countries could test investor confidence. The example of Gabon, where power changed hands in a coup just two weeks after the country finalized its first debt-for-nature swap, could serve as a landmark case in terms of repayment insurance and long-term environmental commitments.⁷⁶ Ecuador completed the world’s largest debt-for-nature swap to date in 2023, allowing them to buy back debt with a notional value of USD 1.6 billion.⁷⁷ The deal gives Ecuador access to cheaper financing and gives investors access to bonds linked to the conservation of the Galapagos Islands.

Exhibit 14: Many countries with high debt-distress risk also face above-average biodiversity risk



Universe of countries (n=69) is restricted to those covered by the IMF-World Bank Debt Sustainability Framework, as of August 2023. Biodiversity risk refers to the MSCI Government Biodiversity Risk Exposure score, which is a composite risk metric on a standardized scale of 0 to 10 (0 represents lowest risk, and 10 represents highest risk), derived from: (1) share of endangered species; (2) richness and endemism in four terrestrial vertebrate classes and vascular plants; and (3) species represented in each country, species’ threat status and the diversity of habitat types, as of November 2023. Sources: MSCI ESG Research, IMF, World Bank, UN

⁷⁵ “AfDB Report Assesses Feasibility of Debt-for-Nature Swaps in Africa.” International Institute for Sustainable Development, Oct. 19, 2022.

⁷⁶ “Gabon Shakes Emerging Debt-for-Nature Swap Market.” Carboncredits.com, Aug. 31, 2023.

Investments in nature via the voluntary carbon market

Investments in nature are already a central capital flow in the voluntary carbon market. Projects that generate carbon credits for this market have come under increasing scrutiny in recent years. These criticisms are often directed at older projects created under outdated standards or more relaxed approaches to verification. As new pledges mount for 2024 and beyond, investors looking for high-quality carbon credits will face the challenge of differentiating those projects that have integrity from those that do not.

As of June 2023, there were over 850 registered (active) nature-based projects in the voluntary carbon market, focusing on the protection and enhancement of natural carbon stocks in forests, farmlands and coastal ecosystems. Another 2,100 projects were already in development, creating a combined project area the equivalent size of Colombia.⁷⁸

From 2012 to 2022, a total of USD 16 billion was invested in nature-based projects, and we project a further investment of USD 9 billion until 2025 in projects currently in development. The rate of investments has increased steadily, and by 2022 reached two and a half times the total primary market value of USD 1.5 billion, indicative of an industry planning for significant future growth.⁷⁹ New capital raises and announcements cover an additional USD 20 billion up to 2030. Most of these new commitments have come from asset owners or institutional investors (42%), corporate investors (29%) and fund managers (17%).

But investors looking for high-quality carbon credits need to be able to identify the right projects. Projects with high integrity have a positive impact for climate and nature, support a positive reputation for investors and buyers and produce high-quality carbon credits. We consider four elements of integrity as key for all nature-based projects: additionality, quantification, permanence and “co-benefits” (positive impacts beyond carbon).

A project is considered additional if there is evidence that it would not have been viable without the revenue from carbon credits. This ensures that the project supports the trajectory toward net-zero emissions by 2050. Carbon credits must accurately represent one tonne of CO₂e removed or reduced; accurate quantification of a project’s emissions impact is complex but crucial for reducing the risk of over-crediting. The resulting carbon credits should also have low “permanence risk,” by which we mean that the protection and enhancement of the natural carbon stocks will not easily be reversed. Additionally, nature-based projects can often deliver multiple co-benefits to match investor preferences, such as local community support or biodiversity conservation.

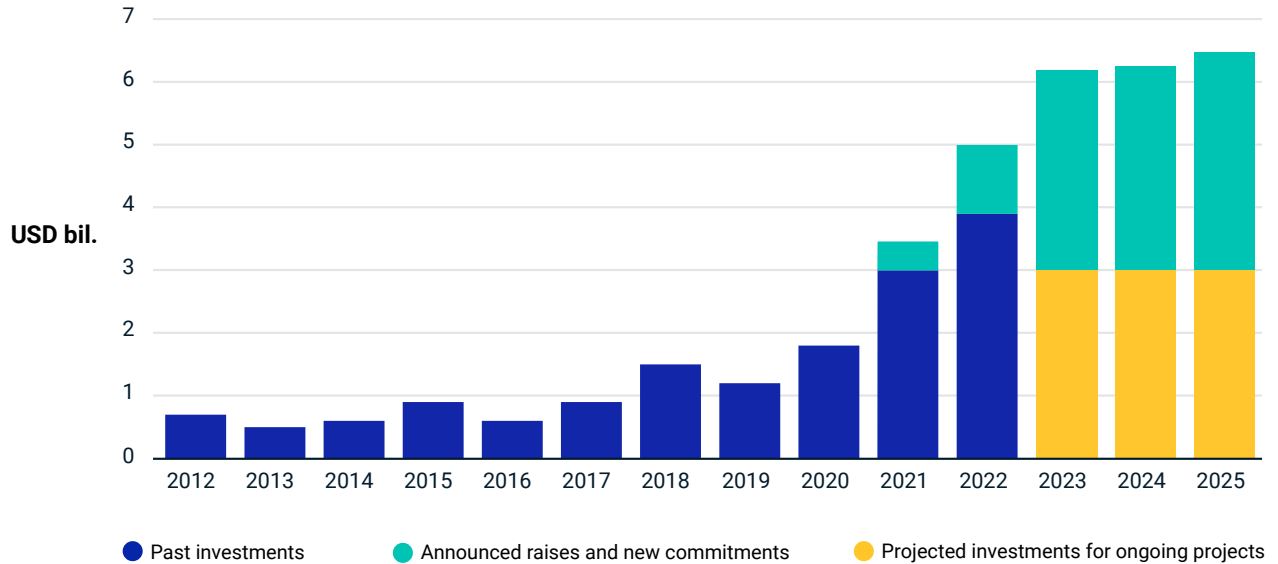
As we go into 2024, the importance of investments in nature will only increase. The landscape of opportunities and risks is complex, however, and investors will need to carefully investigate which projects are indeed credible in maximizing climate and nature returns.

⁷⁷ “Ecuador Completes World’s Largest Debt-for-Nature Conversion with IDB and DFC Support.” Inter-American Development Bank, May 9, 2023.

⁷⁸ “Investment trends and outcomes in the global carbon credit market.” MSCI Carbon Markets (formerly Trove Research), Sept. 14, 2023.

⁷⁹ The primary market for carbon credits — defined as the volume of carbon credits retired multiplied by the yearly average price — was worth around USD 1.5 billion in 2022.

Exhibit 15: Nature is becoming a much more investable prospect



Data has been obtained from three main sources: (1) a survey of market participants conducted during April and May 2023, (2) analysis of more than 400 public announcements of capital raises for low-carbon funds and (3) modeled investment for over 7,000 projects, both registered and in the development pipeline. Data as of June 30, 2023. Source: MSCI Carbon Markets (formerly Trove Research)

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AMERICAS

United States	+ 1 888 588 4567 *
Canada	+ 1 416 687 6270
Brazil	+ 55 11 4040 7830
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EUROPE, MIDDLE EAST & AFRICA

South Africa	+ 27 21 673 0103
Germany	+ 49 69 133 859 00
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France	+ 33 17 6769 810

ASIA PACIFIC

China	+ 86 21 61326611
Hong Kong	+ 852 2844 9333
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