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2022 ESG Trends to Watch

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Executive Summary

What will 2022 and the next decade bring? In recent years, climate change has come to surpass corporate governance as the most pressing ESG issue commanding investors' attention, and ESG investing truly has gone mainstream (and is attracting the regulatory attention to prove it). Yet there are new risks emerging for companies, investors and the planet in the coming decade that will test how well we have learned the lessons of the past.

CLIMATE AS FIRST AMONG EQUALS

1. The New 'Amazon Effect': Corporates Pushing Corporates for Net-Zero Supply Chains

Everyone buys from Amazon, but whom does Amazon buy from? In corporate board rooms the world over, the push to set a net-zero target is eliciting a common refrain: What do we do about our suppliers? As the world's biggest companies work to go net-zero, downward pressure on greenhouse-gas (GHG) emissions may become as familiar to suppliers as downward pressure on pricing.

2. Private-Company Emissions Under Public Scrutiny

Critics argue that privately held companies are becoming an opaque refuge for carbon-intensive fossil-fuel assets. But are those charges true? The jury is out, because the private-equity funds that own these companies aren't saying much.

3. The Coal Conundrum: Rethinking Divestment

If the goal is a net-zero portfolio, divesting might seem the path of least resistance, especially when it comes to coal. But it may hardly move the needle on achieving a net-zero *economy*. To do that, investors will likely look to expand their toolbox: engage where they can exert leverage, divest where they can't, plus insert themselves collectively into policy discussions to change the context.

4. No Planet B: Financing Climate Adaptation

Extreme natural disasters loom even if we succeed in limiting global warming to 1.5°C to 2°C above pre-industrial levels. There will be no escaping the need for projects that help us adapt to a changing climate. As governments and supranationals issue bonds to pay for them, they could drive a large-scale expansion of the market for green bonds.

THE MAINSTREAMING OF ESG

5. Greenwashing Recedes as Common ESG Language Emerges

Inflows to ESG funds in 2021 have been heady, but as ESG's star has risen, so too have questions about its credibility. Skeptics and idealists alike tout examples of greenwashing or social-responsibility spin. The good news is that we see an emerging common vocabulary that should aid transparency and, more importantly, clarify choice.

6. Regulation at a Crossroads: Convergence or Fragmentation?

With at least 34 regulatory bodies and standard setters in 12 markets undertaking official consultations on ESG in 2021 alone, it's no wonder that companies' and investors' heads are spinning. We see convergence in some core areas, yet there are signs of further fragmentation, driven by differing regional priorities.

7. Putting ESG Ratings in Their Rightful Place

A decade ago, only a handful of investors understood and used ESG ratings. Today, investors, companies, news media and the public all expect them to help answer a multitude of questions. Soon, both regulations and market forces could encourage codes of conduct for constructing ESG ratings, making clear what they capture and what they don't.

EMERGING RISKS AND OPPORTUNITIES

8. Coffee vs. Burgers: Biodiversity and the Future of Food

The COP26 Sustainable Agriculture Agenda and the targets of the Kunming Conference scheduled for spring 2022 reflect a dire reality: If we don't drastically change food production and eating habits, climate change and biodiversity loss will change them both for us. Either way, the food and agriculture industries are in for a radical reshaping.

9. Bacteria Rising: Another Health Crisis Looms

Even as we continue to battle COVID-19, the next global health crisis already threatens: By 2050, 10 million people a year could die from previously treatable bacterial infections. To meet this challenge, we need major investment in new antibiotics and a drastic reduction in their quotidian use over the next few years, especially in agriculture.

10. Just Transition: Finding the Nexus of Need and Investability

As the captains of private finance begin to steer global capital toward achieving net-zero, many are realizing that efforts to stem climate risk are unlikely to succeed on the systemic level if we leave behind the most vulnerable populations, communities and countries.

INTRODUCTION

What can the past tell us about the future?

A decade ago, when we first published our annual *ESG Trends to Watch*, climate change and the value of human and natural capital all made the list. These themes have been enduring, appearing in one form or another in each of the annual trends-to-watch installments that followed. Other trends have come and gone: among them, tax fairness and data privacy as emerging concerns that might have seemed niche then, but are now firmly recognized as material issues being addressed by companies the whole world over.

What will the next decade bring? Climate change has come to surpass corporate governance as the most pressing ESG issue commanding investors' attention, and ESG investing truly has gone mainstream (and is attracting the regulatory attention to prove it). Yet there are new risks emerging for companies, investors and the planet in the coming decade that will test how well we have learned the lessons of the past.

CLIMATE AS FIRST AMONG EQUALS

Climate is eclipsing governance and social issues at the top of the ESG agenda, reflecting both the existential threat of global temperature rise and the race against time to rein it in.

1 The New 'Amazon Effect': Corporates Pushing Corporates Toward Net-Zero Supply Chains

Everyone buys from Amazon, but whom does Amazon buy from? In corporate board rooms the world over, the push to set a net-zero target is eliciting a common refrain: What do we do about our suppliers? Value-chain interdependency means decarbonization interdependency, too. As the world's biggest companies work to go net-zero, downward emissions pressure may become as familiar to suppliers as downward price pressure.

Almost every company has energy companies and utilities in their upstream supply chain. So, if electricity producers convert from fossil fuels to renewable energy, the emissions savings would cascade downstream and help shrink emissions for the rest of the world. But those are not the only companies able to send ripple effects through corporate supply chains.

Take, for example, the top cloud-services providers: Amazon.com Inc., Microsoft Corp., Alphabet Inc. and Alibaba Group Holding Ltd. Together, these four companies

own two-thirds of the cloud market.[1] Almost everyone uses at least one of them, and cloud adoption is still growing fast.[2] If these companies were to go net-zero in their direct and energy-use emissions (Scope 1+2), they would reduce the upstream value chain's emissions (i.e., Scope 3 categories 1 and 2, also known as purchased goods and services and capital goods) for other companies across the economy, and about 0.5% of total global emissions.[3]

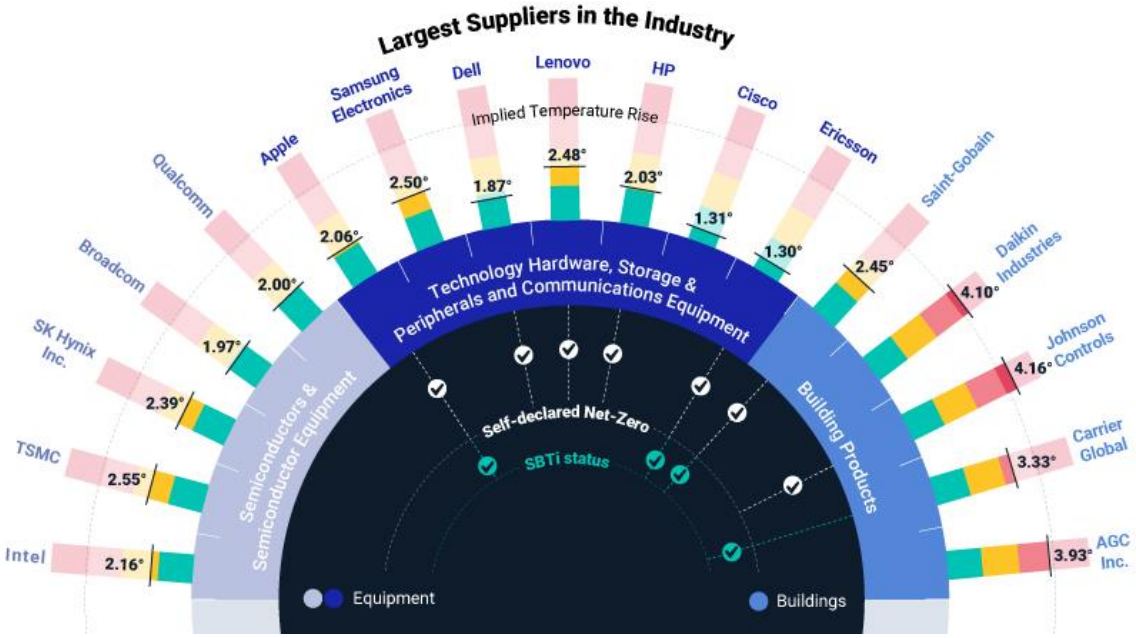
But who are the suppliers of the goods purchased by Amazon, Microsoft, Alphabet and Alibaba? Amazon differs from the other three because of the impact of its retail business. But for all four, we calculated that most of their upstream emissions come from the facilities they build and the high-tech equipment they buy — servers, networking equipment, cooling equipment for data centers and so on. According to their 2020 annual reports, Alphabet's fixed-asset register included USD 46 billion of information-technology equipment, while Amazon had up to USD 97 billion. If we look at the largest purveyors in technology hardware and semiconductors, we see companies like Lenovo Ltd., The Hewlett Packard Co., Intel Corp. and Taiwan Semiconductor Manufacturing Co., most of which have yet to commit to a net-zero target, as of November 2021. But they might soon have to.

[1] "Gartner Says Worldwide IaaS Public Cloud Services Market Grew 40.7% in 2020." Gartner, June 28, 2021.

[2] "IDG Cloud Computing Survey." IDG Communications, June 8, 2020.

[3] Calculated based on reported and estimated Scope 1, 2 and 3 emissions for the four companies as a portion of global emissions estimated by the UN Environment Programme and Carbon Monitor.

Exhibit 1: Net-Zero Initiatives of Top Upstream Providers to the Big Four Cloud-Services Companies



SBTI status: The Science Based Targets Initiative (SBTi) is an organization supported by CDP, the UN Global Compact, WRI and WWF. "Approved" status refers to companies that have had their decarbonization targets reviewed and validated by the SBTi.

MSCI's Implied Temperature Rise (ITR) model estimates what 2100 temperature rise would occur if the whole economy had the same over/undershoot level of greenhouse-gas (GHG) emissions versus budget as the company analyzed, based on the most recent Scope 1-3 projected emissions.

Self-declared Net-Zero: The company has published a Net-Zero GHG emissions commitment.

Companies in the table are selected as the largest industry constituents of the MSCI ACWI Index by revenues.

Source: MSCI ESG Research LLC, as of Nov. 18, 2021.

With regulators and standard setters proposing tougher rules for carbon reporting, many companies are now taking their first steps to understand their value-chain emissions. Amazon, Microsoft, Alphabet and Alibaba have all set net-zero commitments. Some are more comprehensive than others in how they define net-zero. But none of them can make a dent in their upstream supply-chain emissions without getting their server and chip purveyors to follow suit. As they discover how much their suppliers emit, "B2B engagement" could become the next frontier of climate influence.

2 Private-Company Emissions Under Public Scrutiny

Critics argue that privately held companies are becoming an opaque refuge for carbon-intensive fossil-fuel assets.[4] But are those charges true? The jury is out, because the private-equity funds that own these companies aren't saying much.

The case for the "prosecution" goes something like this: Private-equity funds have raised capital totaling almost USD 557 billion in the energy and utilities sectors from 2010 to Nov. 11, 2021.[5] Almost 80% of that was reportedly in non-renewables, according to an advocacy group's report.[6] In a sample of roughly 120,000 transactions between 2010 and November 2021, we found that deals for energy-related assets comprised 12.1% of total transaction value, with only 12.4% of *those* transactions designated as renewable-energy-related.[7]

Separately, we compared a sample of 18,562 private companies held in almost 4,000 private-equity funds against the 9,225 public companies in the MSCI ACWI Investable Market Index (IMI) and found that emissions were more concentrated among private companies than public ones.[8] These glimpses into the enigmatic world of companies held in private-equity funds suggest that investments in fossil-fuel-related assets remained robust, even as they have declined in the public universe.

Meanwhile, the "defense" argues that growth in private-equity funds hasn't been in the most carbon-intensive sectors. Energy, utilities and materials accounted for only 12.3% of our private-company set of 18,562 firms by revenue,[9] compared to 20.5% for the public-company set of 9,225 firms in the MSCI ACWI IMI. And if we compare the five years through 2015 against 2016 to November 2021, the portion of energy-related transactions for private equity as a percentage of total transaction value fell by more than half, from 19.5% to 8.5%.[10]

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[4] Tabuchi, Hiroko. "Private Equity Funds, Sensing Profit in Tumult, Are Propping Up Oil." *New York Times*, Oct. 13, 2021.

[5] MSCI ESG Research used a dataset from S&P Capital IQ of 121,797 transactions from Jan. 1, 2010, through Nov. 11, 2021, where private equity was a buyer. Transaction values were available for about 70% of transactions.

[6] Giachino, Alyssa, and Mehta-Neugebauer, Riddhi. "Private Equity Propels the Climate Crisis: The Risks of a Shadowy Industry's Massive Exposure to Oil, Gas and Coal." Private Equity Stakeholder Project, Oct. 12, 2021.

[7] The following industries were summed as "energy-related": coal and consumable fuels, electric utilities, gas utilities, independent power producers and energy traders, integrated oil and gas, oil and gas drilling, oil and gas equipment and services, oil and gas exploration and production, oil and gas refining and marketing, oil and gas storage and transportation and renewable electricity.

[8] Shakdwipee, Manish. "Understanding Carbon Exposure in Private Assets." MSCI Blog, Oct. 14, 2021.

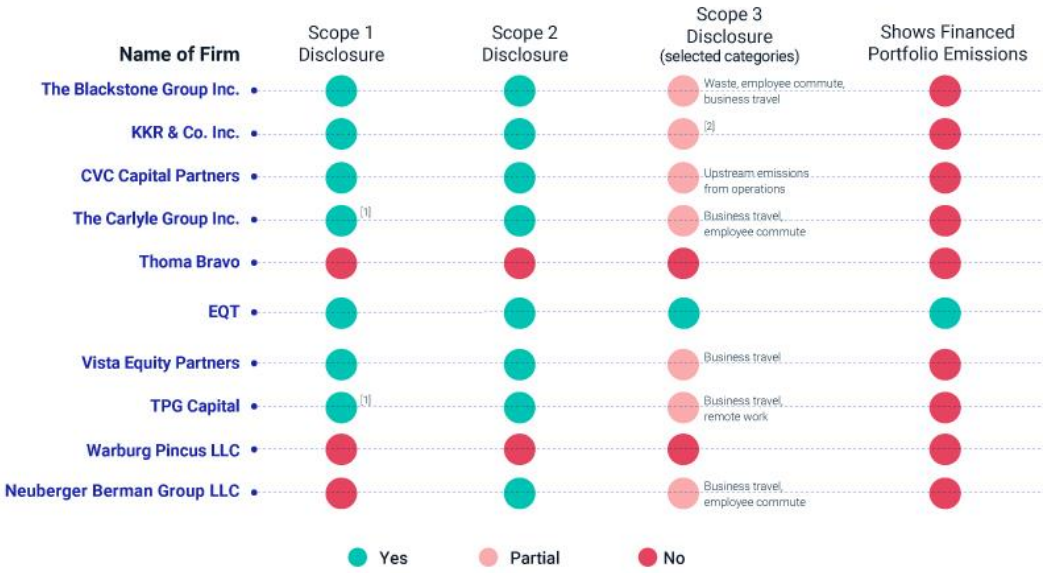
[9] Ibid.

[10] From 2010 to 2015, USD 331.7 billion out of USD 1.6 trillion of total reported transaction value by private-equity buyers was in energy, compared to USD 245 billion out of USD 2.9 trillion from 2016 through Nov. 11, 2021, according to a dataset MSCI ESG Research compiled from S&P Capital IQ.

So What's the Verdict?

The truth is, the jury is still out, and with good reason. Today, even the largest private-equity funds, including those that are publicly listed, have revealed little about the emissions footprint of their portfolio companies. Among the 10 largest private-equity funds as of April 2021,[11] most have reported something on their own operational footprint (Scope 1 and Scope 2 emissions), with a bit of business travel thrown in. But only one, EQT Partners, had a meaningful representation of emissions from its portfolio companies, although the Carlyle Group and TPG Capital have indicated that they have started to monitor their portfolio-company emissions.[12]

Exhibit 2: Top 10 Private-Equity Firms' Carbon-Emissions Reporting



Data as of Nov. 18, 2021. [1]Company stated they have no material scope 1 emissions. [2] Categories included are "numerous" but unspecified. See page 17 of "KKR Climate Action Report," November 2021. For Carlyle, see page 53 of "Impact Review," June 2021. For TPG, see "ESG Performance Report," September 2021. Source: MSCI ESG Research LLC

[11] Ranking by amount of private-equity direct-investment capital raised by firms between Jan. 1, 2016, and April 1, 2021, via Private Equity International. "PEI 300," June 2021.

[12] "TCFD Report 2020." The Carlyle Group, November 2020.

"2020-2021 ESG Performance Report." TPG Capital, 2021.

Anecdotal Evidence May Be Inadmissible

Many of the largest private-equity funds tout their investment in renewables and relate stories about achievements at select portfolio companies. This reliance on anecdotes, rather than quantitative and systematic accounting, is a tactic that publicly listed companies have also employed in the past when faced with calls for greater transparency. But publicly listed companies have learned over the past decade that skirting the question no longer satisfies investors, regulators and other stakeholders. They are now firmly in the world of mandatory reporting of increasingly standardized metrics covering their full range of climate risks and alignment with a sub-2°C world.

Managers of private-equity funds, too, may soon face similar requirements. More transparency and less conjecture are what investors, and the world, will need to complete the puzzle on where emissions come from and how to bring them down; case closed.

3 The Coal Conundrum: Rethinking Divestment

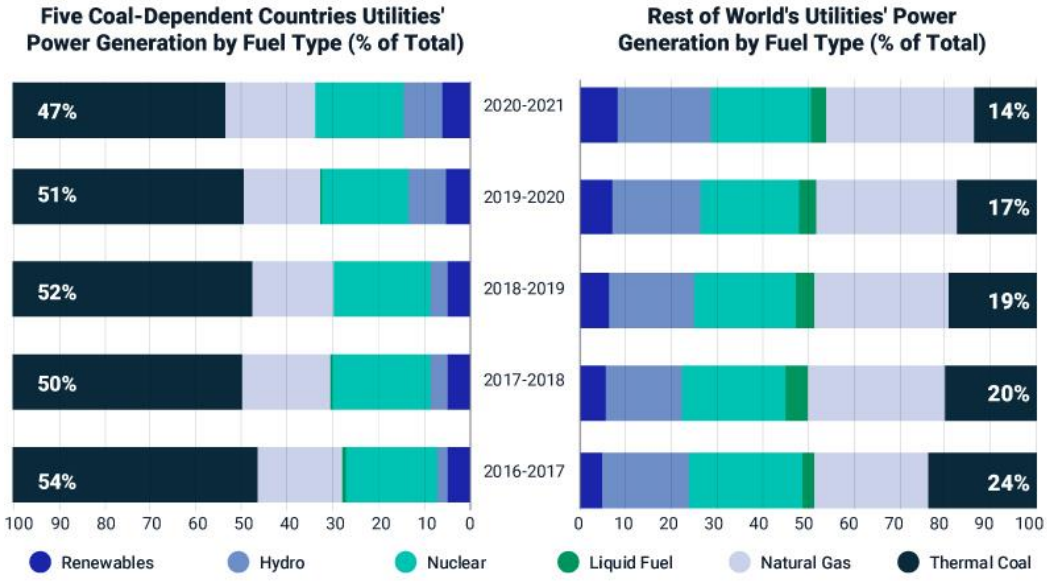
If the goal is a net-zero portfolio, divesting might seem the path of least resistance, especially when it comes to coal. In earlier days, it likely served to put companies on notice about the energy transition, and to relieve pressure from stakeholders. But it may hardly move the needle on achieving a net-zero *economy*. To do that, investors will likely look to expand their tool box: engage where they can exert leverage, divest where they can't, plus insert themselves collectively into policy discussions to change the context.

Coal has got to go, according to the consensus from the United Nations and others aiming to limit warming to 1.5°C to 2°C.[13] But five key markets — the U.S., Australia, China, Russia and India,[14] together accounting for 75% of global coal consumption — were notably absent[15] from new phase-out pledges made at COP26 in Glasgow. If their coal usage continues apace, a 1.5°C world is almost certainly out of reach.[16]

Three of these big markets are heavily dependent on coal for electricity production, according to the International Energy Agency — China (60% coal-based), India (70%) and Australia (54%) — and two may have more political, or other motivations, to keep the coal fires burning — the U.S. (19% coal-based) and Russia (15%).[17] Their dependence is apparent in this group of five's utilities' fuel mix: 47% coal-based for the MSCI ACWI Index utilities constituents in these countries, versus 14% for constituents located elsewhere. This, in turn, means much higher average Scope 1+2 carbon intensity, at 3,362.37 tons of CO2 equivalent per USD million in sales for these utilities in coal-dependent countries, versus 1,826.69 for utilities constituents throughout the rest of the world.

[13] "Global Warming of 1.5°C. An IPCC Special Report." IPCC, 2018.
[14] "Global Coal to Clean Power Transition Statement." UN Climate Change Conference UK 2021 website, Nov. 4, 2011.
[15] "Statistical Review of World Energy 2021: 70th edition." BP, 2021.
[16] FT reporters. "IEA warns Paris climate target at risk as US and China shun coal pact." *Financial Times*, Nov. 4, 2021.
[17] "Coal." International Energy Agency website, Oct. 12, 2021.

Exhibit 3: Global Electric Utilities' Fuel Mix



The five coal-dependent countries: Australia, China, India, Russia and the U.S. MSCI ACWI Index constituents and data selected on an annual basis. Figures represent a simple average of values for the companies included. Source: MSCI ESG Research LLC

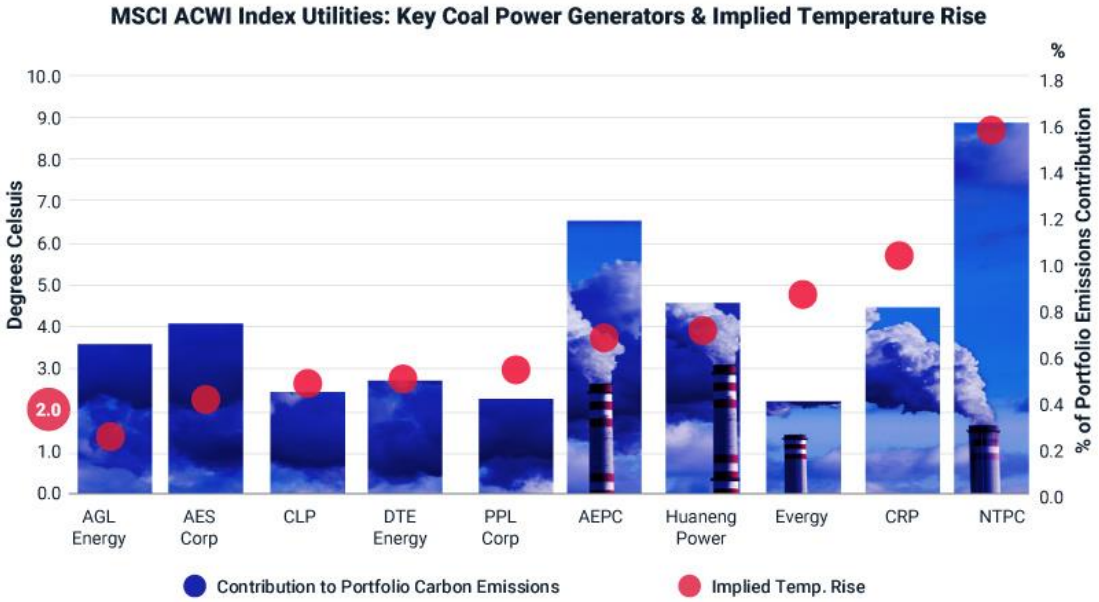
So, IS Divestment the Answer?

One solution to decarbonize a portfolio is simply to drop these countries' utilities stocks (69 in total). That would remove 19.5% of emissions from a hypothetical MSCI ACWI Index-based portfolio, while giving up only 1.65% of the portfolio's weight, too little to radically change overall risk and return. But there are two reasons this might be short-sighted.

First, divesting would do little to directly reduce real-world emissions or curb global warming, which could mean greater climate risk in the long run.

Second, there are stark differences in the directions in which these companies are currently headed. For example, according to our Implied Temperature Rise metric, AGL Energy Ltd., which currently has 85% coal-fired power generation, has committed to emissions-reduction plans that would imply alignment with a temperature rise of 1.4°C by 2050. An investor might want to hold the company in that transition, in part to ensure that it delivers on that promise through continued monitoring and engagement. At the other end of the scale, China Resources Power Holdings Company Ltd., also at 85% use of coal, is headed for 5.7°C rise and NTPC Ltd. in India for more than 8°C.

Exhibit 4: Key Coal-Power Generators and Implied Temperature Rise



AEPC: American Electric Power Co.; CRP: China Resources Power. Companies selected have over 50% generation from coal and make the highest contribution to the carbon emissions of a hypothetical portfolio based on the MSCI ACWI Index, as of November 2021. Source: MSCI ESG Research LLC

Rather than hold all or divest all, some investors might take a mixed approach based on individual companies' climate trajectories and where they see the greatest potential for influence. Several of the companies in Exhibit 4 are state-controlled, which could make them less responsive to engagement by minority shareholders. Here, change is more likely through exercising policy influence. While investors have increasingly banded in coalitions to influence companies on ESG issues as active owners, collective activism has not yet been asserted to nearly the same extent on policy discussions.

Will Cooler Heads Prevail?

Over the past decade, institutional investors have debated the merits of divestment or engagement as tools to effect decarbonization. Now, as companies and governments set themselves on different paths and timelines in the energy transition, it is becoming clearer to investors that they will need to deftly wield both levers in the coming decade – plus, assert a greater voice in climate policy discussions.

4 No Planet B: Financing Climate Adaptation

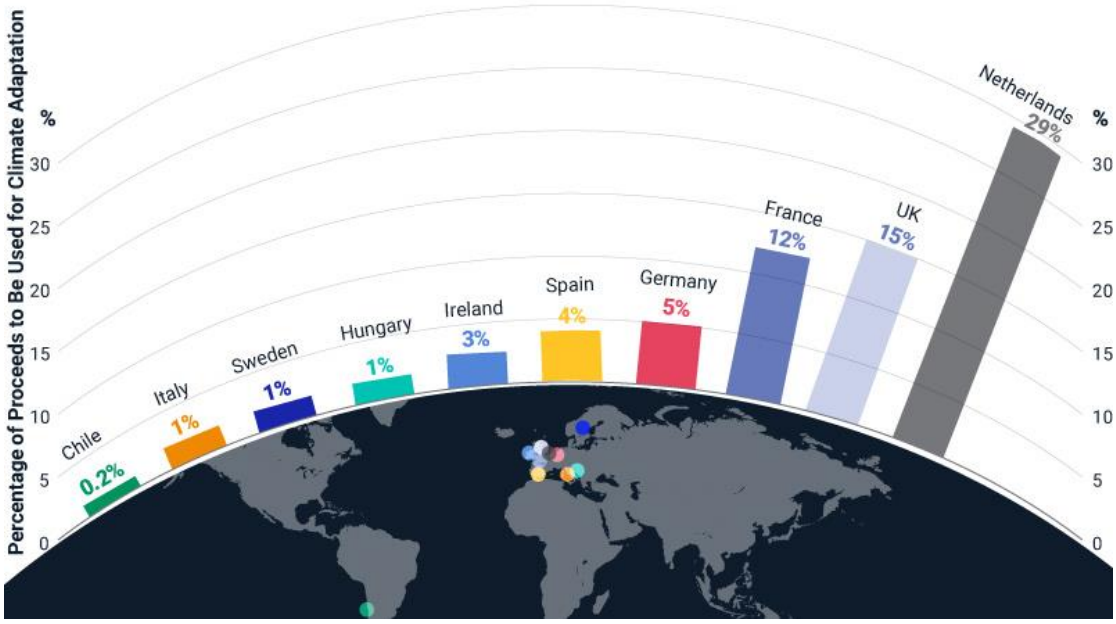
Extreme natural disasters loom even if we succeed in limiting global warming to 1.5°C to 2°C above pre-industrial levels. Already, Californians are choking on smoke, North Africans are running out of water, Southeast Asians are fleeing from floods[18] and major cities around the world risk inundation as sea levels rise. There will be no escaping the need for projects that help us adapt to a changing climate. As governments and supranationals issue bonds to pay for them, they could drive a large-scale expansion of the market for green bonds.

Green bonds raise proceeds explicitly designated for environmental projects. The market has grown dramatically since 2015, but total issuance is still small compared to the overall bond market.[19] If we look at bonds eligible for the Bloomberg Barclays MSCI Green Bond Index, we see that, historically, most of the bonds for climate projects focused on curbing emissions, not adapting to extreme weather. But that's beginning to change.

First, sovereigns and supranationals have begun to outpace corporate issuers with larger green-bond issuance values. And second, in 2020 and 2021, all but one of the new sovereign green bonds eligible for the index also included climate-change-adaptation projects — ranging from flood mitigation to improvements in climate-modeling capabilities.

[18] Lustgarten, Abrahm. "The Great Climate Migration." *New York Times*, July 23, 2020.
[19] Mehta, Meghna. "Green Bonds — Trends and Beyond." MSCI Research Insight, June 4, 2020.

Exhibit 5: Percentage of Sovereign Green-Bond Issuance Allocated to Climate Adaptation



Aggregate data as of Nov. 1, 2021. Note that numbers for bonds that have not released their green-bond annual reports as of Nov. 1, 2021, are based on approximations. Source: Bloomberg MSCI Green Bond Index, MSCI ESG Research LLC

The UN estimates that the annual amount spent globally on adapting to climate change needs to be five to 10 times higher than that currently spent.[20] Yet there has been little progress to date on the concrete policy levers, definitions and standards that could help catalyze and direct investments.[21] That, too, could change, given the mutual interest of issuers and investors in the growth of this market. As capital flows toward necessary projects, investors will demand not only an accounting of the financial risk and returns, but measures of their impact — and ways to qualify these investments as "green." That could drive a virtuous circle of green assurance and capital flow toward shoring up the resilience of our communities.

[20] "The Gathering Storm: Adapting to climate change in a post-pandemic world." United Nations Environment Programme, Nov. 1, 2021.

[21] For example, the EU Taxonomy lists climate adaptation as one of six priority environmental objectives, but the classification system lacks definitions of qualifying projects. Similarly, the Green Bond Principles is missing details, though a working-group report from late 2020 provides some guidance.

THE MAINSTREAMING OF ESG

5 Greenwashing Recedes as Common ESG Language Emerges

Inflows to ESG funds in 2021 have been heady,[22] but as ESG's star has risen, so too have questions about its credibility. Skeptics and idealists alike tout examples of greenwashing[23] or social-responsibility spin. The good news is we see an emerging common vocabulary that should aid transparency and, importantly, clarify choice. Painting a green sheen on funds will get harder, and verifying environmental claims easier, providing more diverse and credible routes to achieve ESG objectives.

Today's investors wrestle with confusing ESG terminology, definitions and labels. Ask 10 portfolio managers to define "green investment" and you are likely to get 10 different answers. A "climate" fund could be one trying to engage big emitters to decarbonize, avoid fossil-fuel producers, actively finance clean energy or some combination of all three. Even something as seemingly straightforward as a "fossil-fuel-free" fund may mean excluding companies with some activities, such as ownership of oil and gas reserves, but including companies with others, such as oil refining. That likely meets some investors' objectives — and *a priori* assumptions — while not meeting others', providing fodder for click-bait journalism that is screaming of greenwashing.

Label Makers to the Rescue?

Institutional investors can already draw on a number of tools to assess a fund, be it the PRI's transparency reports, CFA Institute's disclosure standards[24] or MSCI ESG Fund Ratings.

For individual investors with fewer tools, regulations and labels are emerging in select markets to provide transparency and verifications of ESG claims. And standards are solidifying rapidly. Our research suggests the EU's mandated Sustainable Finance Disclosure Regulation (SFDR) classifications (Articles 6, 8 and 9) are strengthening the quality of disclosures in Europe's ESG funds.[25] In the U.S., the Securities and Exchange Commission has put the investment industry on notice

[22] Murugaboopathy, Patturaja, and Maan, Anurag. "Global sustainable fund assets hit record $3.9 trillion in Q3, says Morningstar." Reuters, Oct. 29, 2021.

[23] Mooney, Attracta, and Flood, Chris. "DWS probes spark fears of greenwashing claims across investment industry." *Financial Times,* Aug. 31, 2021.

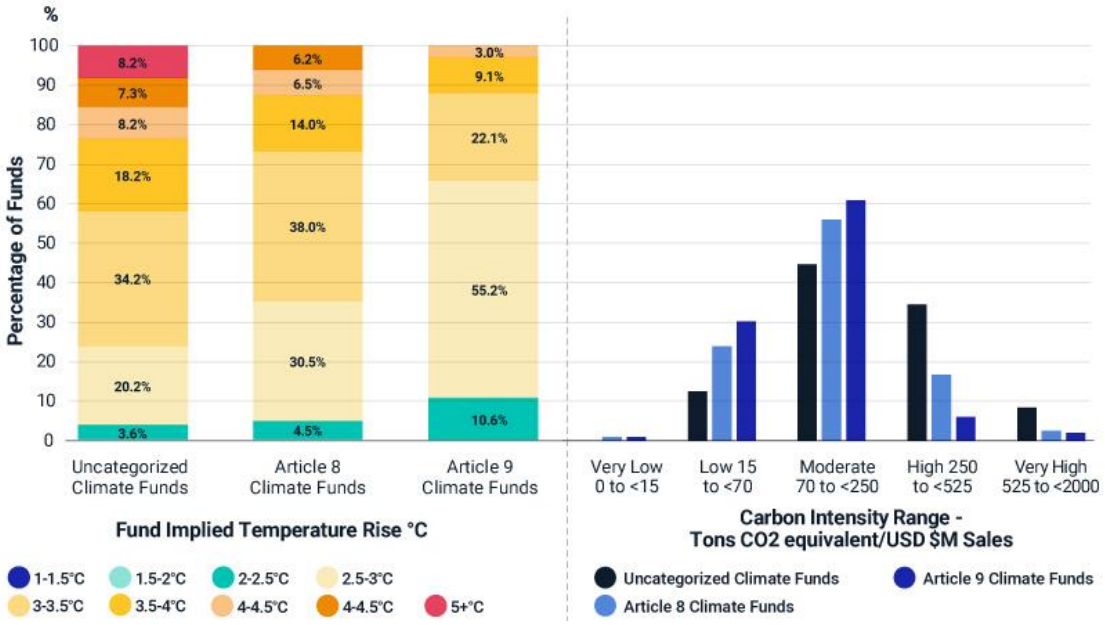
[24] "Global ESG Disclosure Standards for Investment Products." CFA Institute, Nov. 1, 2021.

[25] Disabato, Michael, and Ng, Katherine Nell. "The SFDR's Articles 8 and 9: The Funds Behind the Labels." MSCI Research Insight, July 6, 2021.

with pronouncements and bulletins highlighting deficiencies in disclosure and practices in its examinations of funds' ESG claims.[26]

Using the MSCI Implied Temperature Rise, we found that self-described "Climate" equity funds categorized under SFDR articles 8 and 9 were closer to aligning with a 1.5°C to 2°C trajectory versus peer uncategorized funds. These funds were also more distributed toward the lower end of the carbon-intensity spectrum ("very low" and "low") and less toward the higher end relative to the entire fund universe. (See Exhibit 6.)

Exhibit 6: Implied Temperature Rise and Carbon Intensity of Self-Described 'Climate' Equity Funds



Climate funds defined as mutual funds and ETFs that have "climate" in the product name and include climate-specific considerations in the investment strategy. Uncategorized Climate Funds = 106, Article 8 Climate Funds = 45, Article 9 Climate Funds = 72. Data as of Nov. 11, 2021. MSCI ESG Research LLC

ESG funds are diverse because investors are diverse. They have different ESG goals and want a choice of routes toward their destination. Avoiding greenwashing and making more-informed choices could soon become a lot easier, as disclosures about a fund's ESG objectives, approach(es) and quantitative financial and nonfinancial characteristics all become part of the default information set for all investors.

[26] Gensler, Gary. "Remarks before the European Parliament Committee on Economic and Monetary Affairs." U.S. Securities and Exchange Commission, Sept. 1, 2021.
"The Division of Examinations' Review of ESG Investing." U.S. Securities and Exchange Commission, Division of Examinations Risk Alert, April 9, 2021.

6 Regulation at a Crossroads: Convergence or Fragmentation?

As if the alphabet soup of sustainable-investing standards weren't confusing enough already, in come additional acronyms like TCFD, SFDR and NGFS. With at least 34 regulatory bodies and standard setters in 12 markets undertaking official consultations on ESG in 2021 alone,[27] it's no wonder that companies' and investors' heads are spinning.

How to make sense of the flood of new mandates and proposals? Are we finally reaching consensus on definitions and standards? Well, yes and no. While we see convergence on some core areas, there are signs of further fragmentation, driven by differing regional priorities.

Our preliminary analysis compared the current pipeline of rules and proposals from select agencies in key jurisdictions along five dimensions: reporting target; objectives; materiality; stringency; and uniformity of reporting. (See Exhibit 7).

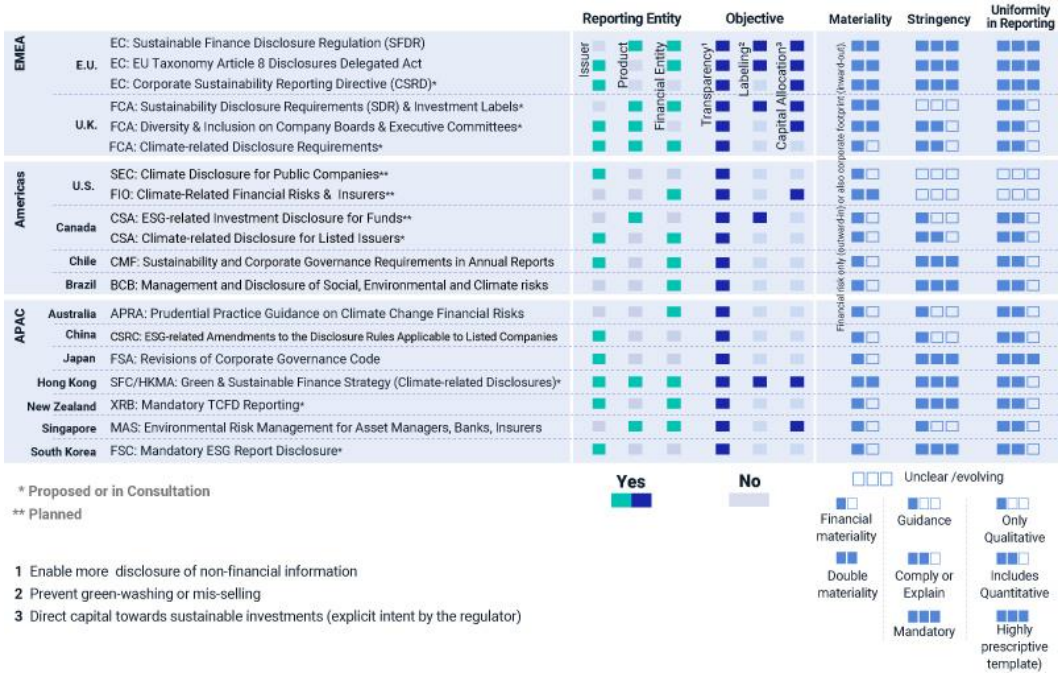
On the matter of objectives, virtually all the proposed rules we analyzed seek to enable transparency, while only a relative handful take aim at potential mis-selling and even fewer look to explicitly direct capital to "sustainable" or "green" investments. Proposed stringency of compliance requirements varies but currently appears weakest in the U.S. and Canada. For uniformity of reporting, the EU favors data templates, while other regions showed a mix of potential approaches. And while there are proposed rules in all regions that target issuers and financial entities, the U.S. stands out for an absence of proposals targeting financial products, or at least it does so far.

Definitions of materiality, however, form one of the clearest fault lines. Agencies in the U.S., Singapore and Japan[28] have focused on disclosures specifically relevant to financial materiality, while the EU, U.K. and Hong Kong explicitly include disclosures on broader societal impact (sometimes referred to as "double materiality"). Such differences could prove to be a persistent obstacle to global convergence on ESG-related regulations.

[27] The 12 markets are: Canada, Chile, China, the EU, Hong Kong, India, Malaysia, New Zealand, Singapore, Thailand, the U.K. and the U.S. Global standard setters include the Bank for International Settlements (BIS), IFRS Foundation, the International Organization of Securities Commissions (IOSCO), the Sustainability Accounting Standards Board (SASB) and the Task Force on Climate-related Financial Disclosures (TCFD).

[28] Agencies include the Securities and Exchange Commission (SEC) and the Federal Insurance Office (FIO) in the U.S., the Monetary Authority of Singapore (MAS) and the Financial Services Agency in Japan. See Exhibit 7 for the proposed codes and regulations.

Exhibit 7: Selected Global Sustainability Regulatory Initiatives Expected by 2025



The table shows a representative selection of regulatory initiatives from around the world that meet three criteria: (1) directly affect financing activities and/or investors' reporting; (2) are aimed at improving investors' decision-making processes; (3) come into effect in the next five years. We included only initiatives with sufficient details disclosed to allow assessment against the parameters laid out in the table.[29] Other ESG regulatory initiatives not assessed, include taxonomies[30] and prudential regulation.[31] Abbreviations used: APRA - Australian Prudential Regulation Authority; BCB - Central Bank Of Brazil; CMF - Financial Market Commission Of Chile; CSA - Canadian Securities Administrator; CSRC - China Securities Regulatory Commission; EC - European Commission; FCA - UK Financial Conduct Authority; FIO - U.S. Federal Insurance Office; FSA - Japan Financial Services Agency; FSC - Financial Services Commission South Korea; HKMA - Hong Kong Monetary Authority; MAS - Monetary Authority Of Singapore; SEC - U.S. Securities Exchange Commission; SFC - HONG KONG Securities And Future Commission; TCFD - Taskforce For Climate-related Financial Disclosure; XRB - External Reporting Board New Zealand.

[29] Initiatives that have been announced with limited detail as of the time of writing include: the U.S. SEC disclosure on human-capital management and board diversity; the Swiss Federal Council planning mandatory climate reporting for large Swiss companies and for financial-market players; the EU Sustainable Corporate Governance Directive (expected for Q4 2021); and the UK FCA Sustainability Disclosure Requirements for Companies.

[30] As of the time of this writing, taxonomies existed or were in the proposal stage in many parts of the world: EU, China, Hong Kong, Malaysia, Singapore, UK, and the ASEAN region, plus the Common Ground developed between the EU and China.

[31] Inclusion of climate-related stress tests into prudential regulation is being promoted by the Network for Greening the Financial System (NGFS) with over 100 central banks. Climate stress tests for banks are currently being undertaken or planned in many jurisdictions — e.g., Canada, the EU, Hong Kong, Malaysia, U.K. and U.S.

Will Climate Lead the Way?

We see the most hopeful signs of convergence in climate-related disclosures, especially those focused on core company-level metrics, like greenhouse-gas emissions, and on advancing common parameters for climate-risk analysis. Guidance from the Task Force on Climate-related Financial Disclosures (TCFD) has become a common reference point across global financial policymakers and regulators, with the U.K. Financial Conduct Authority, European Commission and Hong Kong Monetary Authority all referencing it as a blueprint for their proposed disclosure frameworks. In particular, the TCFD's balance between universal reporting requirements and additional industry-specific disclosures appeals to regulators mindful of the costs of disclosure, especially for smaller entities. We also see growing consensus for the usefulness of common reference scenarios for stress testing, notably those being advanced by the Central Banks and Supervisors Network for Greening the Financial System (NGFS).

The main differences in climate-disclosure requirements are in uniformity of reporting and timing. As of this writing, the EU has been the most progressive jurisdiction in instituting mandatory sustainability reporting by 2023. The reporting compelled by the EU is highly uniform, while other jurisdictions such as the U.S. and much of the Asia-Pacific region may be more likely to issue guidance on reporting metrics, at least in their initial iteration.

Beyond climate risk, however, convergence looks more elusive. For example, while multiple markets have explored disclosure requirements related to human capital and workforce diversity, both the proposed and actual reporting requirements are highly fragmented, depending on each market's key focus (Exhibit 8).

Exhibit 8: Sample of Global Standards for Reporting on Diversity and Human Capital

Disclosure Standard	Applicability	Type	Key focus
GRI 400 series	Voluntary	Materiality based	Comprehensive
SASB	Voluntary	Industry specific approach	Industry specific
SEC	Required for SEC registered cos	Materiality based	Efforts to Attract, Develop, Retain
IIRC	Voluntary	Stakeholder approach	Concise set of standard metrics
ISO 30414:2018	Voluntary	Materiality based	Comprehensive
ShareAction	Voluntary	Stakeholder approach	Comprehensive
EU directive 2014/95/EU	Companies with >500 employees	Materiality based	Follows existing standards, like ISO
UN Global Compact	Voluntary	Stakeholder approach	Labor rights, human rights
...			
US: Equal Employment Opportunity Commission	Companies with >100 employees	Diversity & Inclusion	Racial, Ethnic and Gender Diversity
UK: Equality and Human Rights Commission	Companies with >250 employees	Gender equality	Gender Pay Gap

Data as of November 2021. Source: MSCI ESG Research LLC

Three Guiding Principles

As regulators and standard setters stand at the crossroads of convergence and fragmentation, we believe that adopting a few key principles could help forge a shared path toward better-informed investment decisions.

1. Require quantitative metrics to be disclosed, not qualitative "explanations" that may devolve into boilerplate language — e.g., Scope 1, 2 and 3 emissions across all categories.
2. Specify disclosures of raw data, such as number of employees, tons of emissions and location of facilities, not outputs in the form of percentages that are likely to be inconsistently calculated and hence not comparable.
3. Impose minimum mandatory core disclosures across a broad range of participants beyond public companies — to avoid inconsistent sets of rules.

These principles would enable comparability and accountability and a level playing field across all markets. And whatever an investor's ESG priority — climate risk, human capital or overall business resilience — a foundation of consistent disclosures would underpin more-informed investment decisions.

7 Putting ESG Ratings in Their Rightful Place

What are ESG ratings for? A decade ago, only a handful of investors understood and used them. Today, investors, companies, news media and the public all expect ESG ratings to help answer a multitude of questions, from whether a company is climate-friendly or has a diverse workforce to how its risk profile fits within an investment strategy. But an ESG rating remains what it always was: a lens for looking at one specific dimension of the many ESG characteristics that stakeholders care about.

Both regulation and market forces could encourage codes of conduct for constructing ESG ratings, making clear what they capture and what they don't. In the coming years, we will likely see ESG ratings move back to their intended purpose of improving the investment process and as one part of the larger ESG ecosystem.

Do They Make '*Poly*-Focals'?

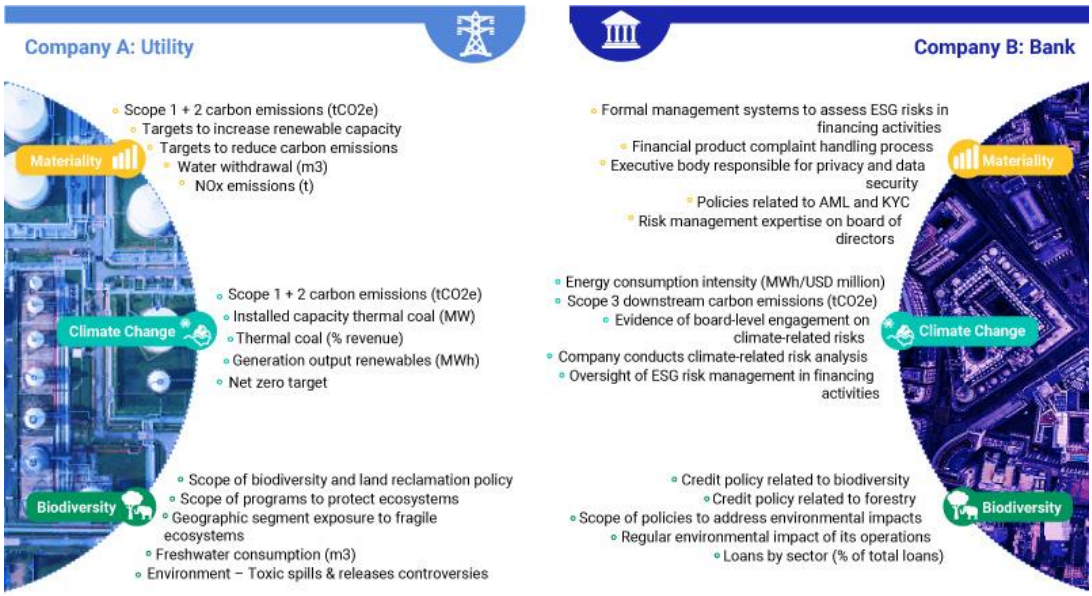
The staggering range of ESG questions from stakeholders with varied preferences will continue to grow. But no single score or rating can answer them all, at least not well.[32] An ESG rating provides only one lens — a financial-relevance lens that zooms in on questions of business resilience, by selecting and weighing only a subset of ESG factors. That means answering other questions requires using other lenses.

To track a company's progress toward net-zero, reach for a climate lens. If you're wondering about corporate diversity and equality, you want a workforce lens. And if you're gauging a company's impact on ecosystems, a green-tinged biodiversity lens would be your go-to.

Exhibit 9 shows what these lenses can offer by looking at metrics for two hypothetical companies — an electric utility and a bank. Let's start with Scope 1 and 2 GHG emissions. Through a materiality lens, these emissions matter for the electric utility but not so much for the bank, where oversight of risks in the lending process sends a more meaningful signal. With a climate-change lens, what matters for the utility is how much coal it's burning. For the bank, it's all about how much coal it's financing through its loan book. Looking at biodiversity, you might want to know if the utility operates in fragile ecosystems, while for the bank, credit policies regarding biodiversity would be the more relevant metric.

[32] Lee, Linda-Eling. "What Does ESG Investing Really Mean? Implications for Investors of Separating Financial Materiality and Social Objectives." Wharton Pension Research Council Working Paper No. 2021-18, September 2021. Available at SSRN: https://ssrn.com/abstract=3936023 or http://dx.doi.org/10.2139/ssrn.3936023

Exhibit 9: Different Lenses for Two Different Hypothetical Companies



Source: MSCI ESG Research LLC

For many institutional investors, this is nothing new. Using different ESG data and scores to meet varying objectives has long been a part of their process. If these investors want to construct a portfolio that focuses only on climate risk, they use climate metrics designed to capture the targeted characteristics — and that's it. The remaining smorgasbord of ESG-related data, such as board diversity, product-safety records or questions around waste management, are simply superfluous to that target objective.

If All You Have Is a Hammer, Everything Looks Like a Nail

For the rest of the market, emerging labeling standards and transparency initiatives for funds are tightening the connection between different ESG questions and the information needed to answer them. Data that answers questions about implications of "social harms" is different from data that answer questions about alignment with a 1.5°C emissions pathway. ESG ratings, whether for individual holdings or overall funds, can answer only some of these questions.

As regulators and standard-setting bodies turn their gaze on ESG ratings, one possible outcome could be the adoption of best practices that spell out the purpose of an ESG rating and its data sources and methodological choices. Such transparency could free ratings from unrealistic expectations of what they represent

— neither a measure of corporate “goodness” nor a barometer on any single issue — to concentrate on what they do best.

As ESG ratings evolve with ever-sharper focus, investors may come to find them indispensable for understanding financial resilience. For other questions, it’s time to reach for a different lens.

WHAT'S NEXT?
EMERGING RISKS AND OPPORTUNITIES

8 Coffee vs. Burgers: Biodiversity and the Future of Food

Meat or your morning brew? Which would you give up if you had to choose? It's not just a theoretical question. The COP26 Sustainable Agriculture Agenda and the targets of the Kunming Conference scheduled for spring 2022 reflect a dire reality: The global food system accounts for about a third of global greenhouse-gas emissions[33] and destroys more nature every year than any other industry.[34] If we don't drastically change food production and eating habits, climate change and biodiversity loss will change them for us. Either way, the food and agriculture industries are in for a radical reshaping.

Take coffee as an example. The largest producer and exporter of coffee is Brazil,[35] a fact that has to do, at least in part, with the Amazon rainforest. But the Amazon continues to be burned or cut down to produce beef and soy.[36] That means the "lungs of the planet" are taking in less carbon dioxide every day, accelerating climate change. But those lungs don't just pump oxygen and CO2 — they also pump water vapor from the oceans inland, bringing essential moisture for crops like coffee. Or at least they used to.

Just How Much Would You Pay for That Latte?

In 2021, Brazil saw its worst droughts in a century,[37] making for a poor coffee harvest and raising the price on your daily dose of caffeine.[38] Coffee beans need special conditions to grow — warm and humid, not too cool, not too hot — and by

[33] "Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems." IPCC, 2020.

[34] "The global assessment report on Biodiversity and Ecosystem Services." IPBES, 2019.

[35] "Top Coffee Producing Countries." World Atlas, 2020.

[36] López-Alcalá, Mario. 2020. "Investment Risks from Deforestation in the Brazilian Amazon and Cerrado Regions." MSCI Research Insight

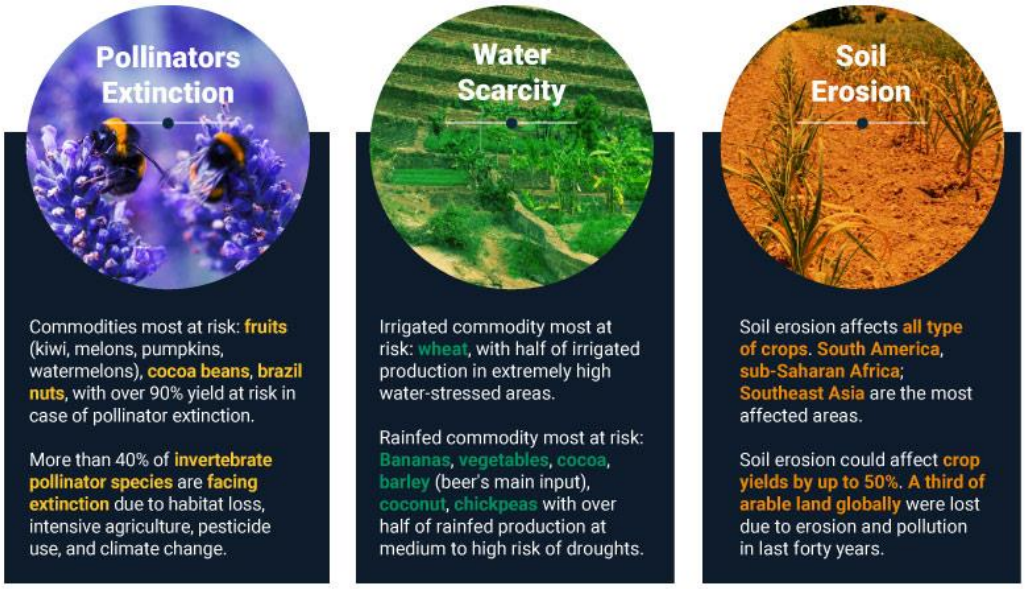
[37] Branford, Sue, and Borges, Thais. "Amazon and Cerrado deforestation, warming spark record drought in urban Brazil." *Mongabay*, July 22, 2021.

[38] Kurmelovs, Royce. "Coffee bean price spike just a taste of what's to come with climate change." *Guardian*, Sept. 30, 2021.

2050, the amount of suitable land globally could be cut in half.[39] Time to switch to tea? Alas, the outlook is just as grim.[40] Ditto for chocolate.[41]

And our favorite sources of caffeine are hardly alone: fruits, vegetables, grains and beans are all threatened in one way or another.

Exhibit 10: Climate Change and Biodiversity Loss Threaten Staples and Luxuries Alike



Source: Pollinator extinction; Ritchie, Hannah. "How much of the world's food production is dependent on pollinators?" Our World in Data, Aug. 2, 2021; "The global assessment report on Biodiversity and Ecosystem Services." IPBES, 2016. Water Scarcity: World Resources Institute Aqueduct Food tool, wri.org. Soil Erosion: "Let's #StopSoilErosion to ensure a food secure future." Food and Agriculture Organization of the United Nations, May 15, 2019; Cat, Linh Anh, "Soil Erosion Washes Away $8 Billion Annually." Forbes.com, May 21, 2019.

The upshot? We need to produce food differently. From vertical farming[42] to regenerative agriculture to the application of AI and robotics to agricultural operations that enhance water and energy-efficiency techniques,[43] there are publicly

[39] "Coping with 32°." World Coffee Research, June 21, 2018.

[40] Nowogrodzki, Anna. "How climate change might affect tea." *nature.com*, Feb. 6, 2019. Kramer, Katherine, and Ware, Joe. "Reading the tea leaves: Climate change and the British cuppa." *christian aid,* May 2021.

[41] Scott, Michon. "Climate & Chocolate" NOAA Climate.gov, Sept. 10, 2021.

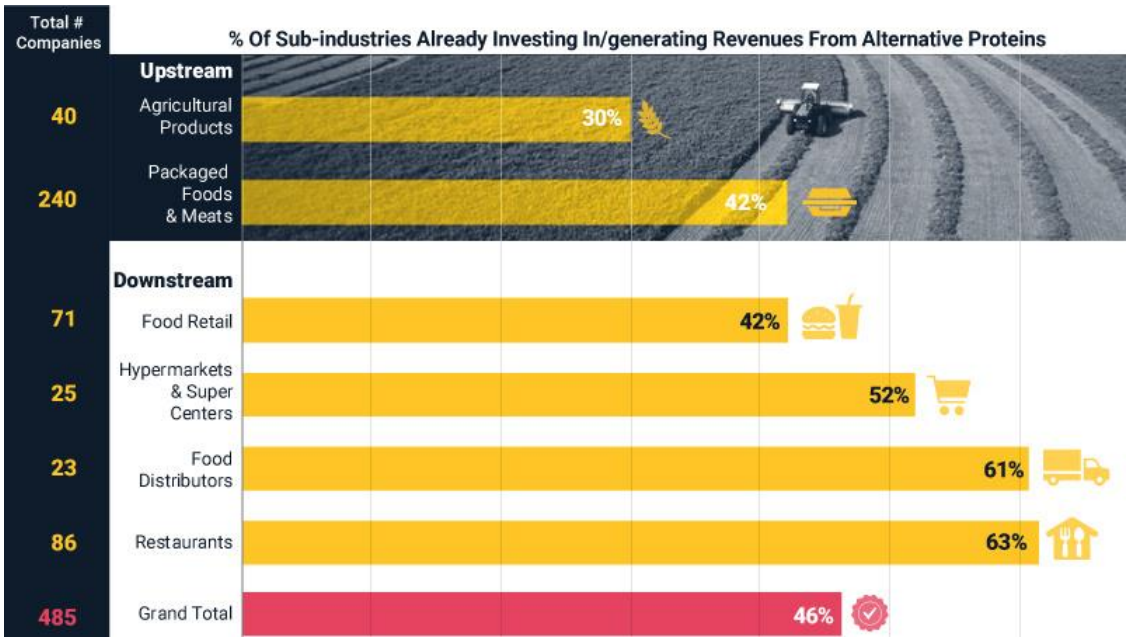
[42] Avgoustaki, Dafni, and Xydis, George. 2020. "How energy innovation in indoor vertical farming can improve food security, sustainability, and food safety?" *ScienceDirect* 5: 1-51.

[43] Kang, Liz. "Is the biggest greenhouse in the US the future of farming?" CNN.com, Oct. 6, 2021.

traded firms developing methods to dramatically increase yield per unit of land and decrease water use and carbon emissions.

And then there is the nascent boom in "alternative proteins," made from plants, fungi or lab-grown meat. None of these require cutting down rainforest for grazing land, and while carbon-intensity varies, they're all lower-carbon than meat.[44] As a percent of revenues at most companies, the figures are still small, but they are projected to account for 11% of the protein market by 2035.[45]

Exhibit 11: Food and Agriculture Involvement in Plant-Based and Alternative Proteins



Percentage of companies from among the MSCI ACWI IMI constituents belonging to the following Global Industry Classification Standard (GICS®) sub-industries: agricultural products, packaged foods and meats, food retail, food distributors, hypermarkets and super centers and restaurants, which generate revenues or invested in traditional plant-based and alternative proteins, across the food value chain, as of July 15, 2021. Source: MSCI ESG Research LLC

Which means, if you want to wake up to a hot cup of coffee (or tea) tomorrow morning, your best move might be to find a non-meat substitute for dinner tonight — and it also may pay to have a closer look at what the food and agriculture companies in your portfolio are up to.

[44] "Environmental impacts of animal and plant-based food." Blue Horizon, October 2020.

[45] Morach, Ben, Witte, Björn, Walker, Decker, von Koeller, Elfrun, Grosse-Holz, Friederike, Rogg, Jürgen, Brigl, Michael, Dehnert, Nico, Obloj, Przemek, Koktenturk, Sedef, and Schulze, Ulrik. "Food for Thought: The Protein Transformation." Boston Consulting Group, March 24, 2021.

9 Bacteria Rising: Another Health Crisis Looms

Despite years of warnings from epidemiologists,[46] the COVID-19 outbreak caught the world off guard. Even as we continue to battle this pandemic, the next global health crisis is already looming: By 2050, 10 million people a year could die from previously treatable bacterial infections.[47] That's more than triple the number who died of COVID-19 in 2020 alone.[48] To meet this challenge, we need major investment in new antibiotics and a drastic reduction in their quotidian use over the next few years, especially in agriculture.

On the positive side, the pandemic has shown how fast we can invent a solution given global collaboration and the right financial incentives. Once a backwater market with generally unappealing investment returns compared to more profitable drugs, vaccine development has found its footing.[49] Under the right circumstances, novel antibiotic development could potentially follow suit. The breakthrough mRNA vaccine technology was in part developed at small, private companies, and that's where much of the early, and possibly innovative, antibiotic work is happening too.[50] Building that pipeline and getting novel compounds into clinical trials is the next big hurdle. Investors may bear in mind how these efforts align with a focus on social impact and the U.N. Sustainable Development Goals.

[46] Lederberg, Joshua. 1988. "Medical science, infectious disease, and the unity of humankind." *JAMA* 260: 684-685.

Sanger, David, Lipton, Eric, Sullivan, Eileen, and Crowley, Michael. "Before Virus Outbreak, a Cascade of Warnings Went Unheeded." *New York Times,* March 19, 2020.

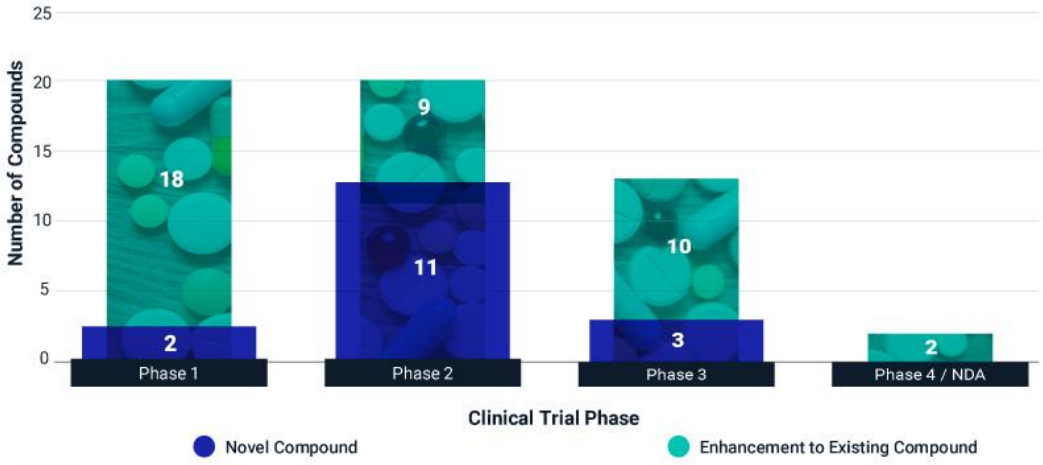
[47] Giguere-Morello, Julia, and Ratte, Aurélie. "Resistance to antibiotics: Checkmate." MSCI ESG Research, Dec. 15, 2019. (Client access only)

[48] "The true death toll of COVID-19: Estimating global excess mortality." World Health Organization, May 2021.

[49] "A brief history of vaccination." Immunisation Advisory Centre, January 2020.

[50] Of the 245 antimicrobial compounds in preclinical development globally, as of December 2020, 73% were by private companies. "2020 antibacterial agents in clinical and preclinical development: an overview and analysis." World Health Organization, 2021.

Exhibit 12: Global Antibiotics Development Pipeline by Clinical Trial Phase



Definitions:
1) Phase 1 clinical trial: effects of the medication on a small group of people with no underlying health condition;
2) Phase 2 clinical trial: trial extended to larger group of individuals living with the condition the drug aims to treat;
3) Phase 3 clinical trial: trial extended to even larger group of people living with the condition the drug aims to treat; analysis of how the new drug works compared to existing drugs already on the market;
4) Phase 4 / New Drug Application (NDA): more analysis about long term benefits and side effects of drug; request for authorization to sell and market drug.

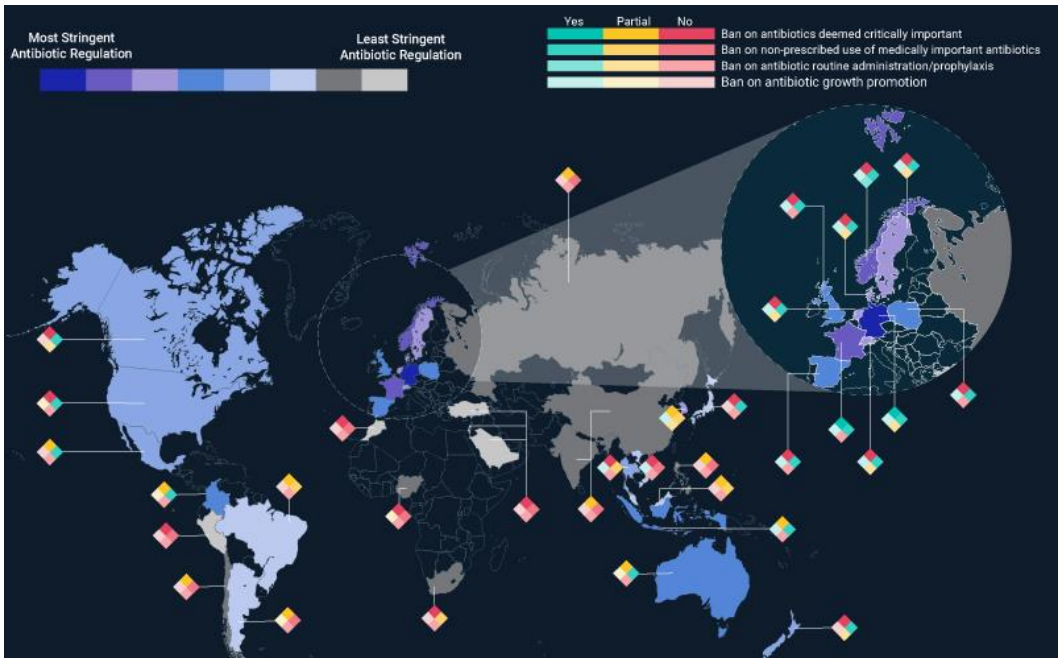
Source: Pew Charitable Trusts, Antibiotics Currently in Global Clinical Development, data as of March 2021. World Health Organization, 2020 Antibacterial agents in clinical and preclinical development: an overview and analysis, data as of December 2020. MSCI ESG Research, as of October 2021.

All this innovation could be for naught if we can't rein in the practices that got us into this mess in the first place. The biggest culprit is excessive use of prophylactic antibiotics and as growth promoters in livestock production.[51]

Developed-market regulators, especially in Europe, have begun to restrict agricultural antibiotic use. In emerging markets, such as China and Brazil, it has remained relatively unfettered — until recently, giving some cause for hope.[52]

[51] Van Boeckel, Thomas P., Brower, Charles, Gilbert, Marius, Grenfell, Brian T., Levin, Simon, A., Robinson, Timothy P., Teillant, Aude, and Laxminarayan, Ramanan. 2015. "Global trends in antimicrobial use in food animals." *Proceedings of the National Academy of Sciences of the United States of America*, 112: 5649–5654.
[52] Schoenmakers, Kevin. "How China is getting its farmers to kick their antibiotics habit." *Nature*, Oct. 21, 2021.

Exhibit 13: Agricultural-Product Companies Face the Brunt of Antibiotic Regulations



Source: MSCI ESG Research; global regulation on antibiotics, Farm Animal Investment Risk and Return (FAIRR); ArcGIS Online (as of Nov. 2021)

Microbes don't respect geopolitical borders. As antibiotic-resistant strains evolve, they won't stay where they started, and that makes antimicrobial resistance a global problem. As we have seen with the COVID-19 pandemic, as long as some parts of the world remain vulnerable, we all remain vulnerable — all the more reason for companies and investors to take heed and start asking hard questions about whether their agricultural supply chains are seeding the next systemic risk.

10 Financing a Just Transition: Finding the Nexus of Need and Investability

As the captains of private finance begin to steer global capital toward achieving net-zero, many are realizing that efforts to stem climate risk are unlikely to succeed on the systemic level if we leave behind the most vulnerable populations, communities and countries. For investors and companies in the private sector, protecting those most vulnerable to climate risks and the energy transition would seem the domain of policymakers and development banks. But the lines that mark this division of labor may be blurring.

The core concern is that the populations that could suffer the most are also least able to bear the cost, finding their job skills no longer relevant, livelihoods gone and homes wiped out by extreme weather and sea-level rise. This concern goes beyond these populations. Suffering on such a large scale could trigger mass unemployment and migration, civil unrest and political instability. And policies to support the climate transition could be next to impossible to implement against such a backdrop.

What's an Investor to Do?

We recognize these challenges seem overwhelming and difficult to address through the typical institutional investment portfolio. But, given the criticality of the systemic social and climate risk, it is imperative to consider what levers investors might be able to pull.

Today, the typical institutional portfolio is largely invested in both public securities and private assets, with a focus on parts of the economy where capital-market infrastructure is highly developed. What results is a sizable disconnect between where private capital goes and where the public needs it. Take, for example, the publicly listed equity investment universe, where 88% of global public markets by capitalization, and over 60% of companies, are based in developed markets, as shown in Exhibit 14. But over 85% of the global population lives and operates in emerging and frontier markets.[53]

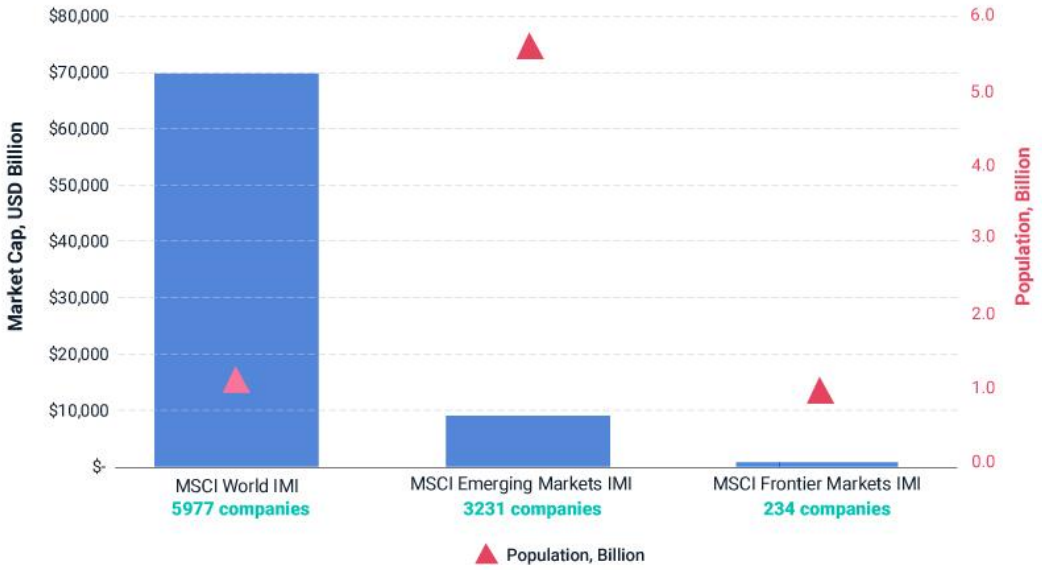
Total debt issuance in developed economies is four times that of emerging economies,[54] despite the developed world's having just one-fifth of the population. And in private equity and debt, our analysis found most funds were predominantly

[53] World Bank, 2021.

[54] Global Issuance Data, Bank of International Settlements, 2021.

exposed to North America and Europe, and had a less than 5% allocation to emerging economies.[55]

Exhibit 14: Relative Size of Global Public-Equity Markets vs. Population

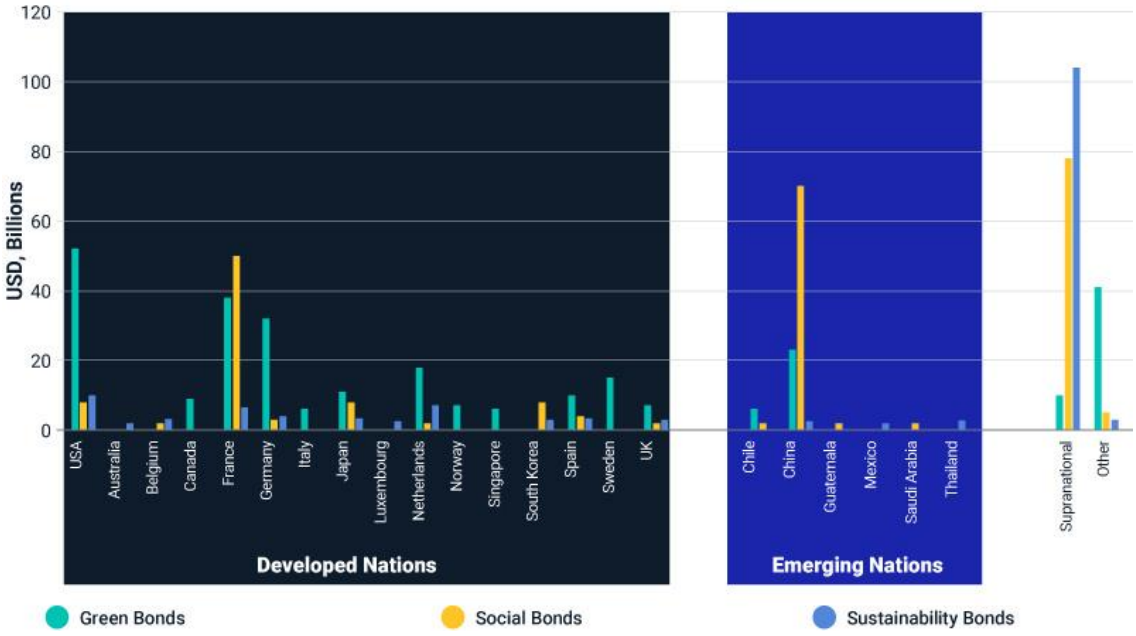


Data as of Nov. 11, 2021. Source: MSCI ESG Research LLC, World Bank

In public-equity allocations, investors may be best placed to focus on fair treatment of displaced workers, retraining initiatives, full consideration of companies' impact on communities and decarbonization as fast as possible throughout the value chain. But debt markets might offer more impact, especially in markets with greater need. Green, sustainability and social bonds issued by sovereign and sub-sovereign entities, particularly in emerging- or even frontier-market countries, could all be vectors for job creation and training, speeding the energy transition or implementing adaptation and resiliency measures. Infrastructure bonds, too, could have potential for funding needed adaptation projects.

[55] Mahmood, Rumi, and Zaid, Abdullah. "New Frontiers in Carbon Footprinting: Private-Equity and -Debt Funds." MSCI Blog, Nov. 30, 2021.

Exhibit 15: Global Green, Social and Sustainability Bond Issuance



Source: Climate Bonds Initiative, 2020

That's a Great Start, but …

These efforts, unfortunately, won't be enough. To facilitate a just transition, developing and frontier markets — and those not even sufficiently developed to qualify as frontier markets — need more and creative conduits if they hope for wider investor financing. The Net Zero Asset Owners' Alliance, for example, has called for "scaling blended finance" to tackle such barriers as market accessibility and a data gap to reflect the actual versus perceived risks in investing in these markets.[56] And multilateral development banks, foundations and public-private partnerships are actively exploring ways to create a pipeline of projects whose risk profiles may be better matched to investors' needs.

The Seychelles Blue Bond, for example, raised USD 15 million of investment from Calvert Impact Capital, Nuveen and Prudential Financial Inc. at a lower-than-prevailing coupon rate (2% to 3%, rather than 8% based on interest rates in the country) with a World Bank guarantee and Global Environment Facility low-interest

[56] "Scaling Blending Finance." Net Zero Asset Owner Alliance. Nov. 2021.

(0.25%) loan.[57] And Climate Fund Managers, a joint venture between Dutch development bank FMO and South African insurance conglomerate Sanlam aims to raise USD 750 million from private and institutional investors in its Climate Fund Two. Creative experiments and pilots such as these could be useful examples for future endeavors.

It is becoming all too apparent that it will be extremely challenging for private finance to achieve net-zero emissions across all investments and financing. After all, the net-zero aspiration is not merely a massive accounting exercise of summing up the carbon emitted, avoided or removed on the portfolio balance sheet. It is nothing less than shorthand for retooling global capital markets to work toward an economy and society that can be sustainable. Over the next decade, as investors and companies (hopefully) deliver on their net-zero pledges, the world will increasingly look to how they execute a "climate-plus" strategy — one that does not abandon *people* for the sake of saving the planet and preserving profit.

[57] "Seychelles Finance Plan for Biodiversity Conservation 2019-2023." The Biodiversity Finance Initiative, February 2019.

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