



ALLIANCEBERNSTEIN®

June 2023

AllianceBernstein Climate Change Statement & Task Force on Climate-related Financial Disclosures Report



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A Note from Our Chief Responsibility Officer



Erin Bigley
AB Chief Responsibility Officer

At AllianceBernstein (AB), we believe that climate risk is an investment risk. It's important to understand the material, physical and transitional risks and opportunities of the issuers we invest in. And as a business, we scrutinize our own operational environmental practices.

The year 2022 was a challenging one. It was the fifth hottest year on record, and the world experienced record-breaking weather events, including extreme rainfall, wildfires and hurricanes.¹ Investors faced evolving regulation, increasing concerns about greenwashing and increasingly polarized views on environmental, social and governance (ESG) investing. Amid these challenges, we believe that the continued assessment of financially material ESG risks and opportunities, especially material climate-related risks and opportunities, is in our clients' best interest. We also believe that we should clearly disclose and report to our clients our progress on our activities, which we are presenting in this year's Climate Change Statement and Task Force on Climate-related Financial Disclosures (TCFD) Report.

Some of AB's highlights from the past year include our work on research, engagement and portfolio solutions. Our Environmental Research team advanced our research agenda—continuing our partnership with Columbia Climate School with work on carbon markets, food security and China's decarbonization pathway. We developed ESG integration processes—including those related to climate—in municipal bonds and grew our green bond allocations to more than US\$4.88 billion in assets under management (AUM; as of December 31, 2022).²

AB continued to participate in Climate Action 100+ (CA100+) engagements with emerging-market companies Eskom, Petrobras and Sasol. We became members of the Institutional Investors Group on Climate Change (IIGCC) and the One Planet Sovereign Wealth Funds initiative. At the firm level, we joined the Net Zero Asset Managers initiative (NZAMI), a body of over 300 signatories committed to supporting the goal of net zero greenhouse gas (GHG) emissions by 2050 or sooner.

Finally, AB continued to expand our climate-focused strategies under our Portfolios with Purpose platform, with the launch of our China Net Zero Solutions equity strategy and the onboarding of AB CarVal Investors' Clean Energy Funds. We also grew our Sustainable Thematic range of portfolios that invest in companies aligned with themes based on the United Nations Sustainable Development Goals (SDGs), with the addition of our Sustainable Euro High Yield strategy.

¹ Marianne Lehnis, "[2022 Was a Year of Record-Breaking Extreme Weather Events](#)," *Forbes* (December 29, 2022).

² The previously reported figure of US\$6 billion as of June 30, 2022, included other ESG structures.



Introduction

AllianceBernstein (AB) is a global asset management firm with more than 4,000 employees across 25 countries and jurisdictions. We serve our clients through three core businesses: asset management, independent sell-side research and brokerage services, and wealth management.

With US\$646 billion in AUM as of December 31, 2022, we deliver solutions across the capital markets, from fixed income to equity and from alternatives to multi-asset. Our broad range of investment expertise spans portfolio construction and investment management; fundamental, quantitative, economic and multi-asset research; wealth planning; and trading.

Fiduciary duty to our clients is paramount. That duty includes the incorporation of material risks and opportunities, which may include material climate risk considerations and opportunities. We want to understand the risks facing the issuers within our clients' investment universes and how they may be impacted by the transition to a lower-carbon world. The integration of these

material climate risks and opportunities informs our research and investment decision-making when optimizing risk and return for our clients in most of our actively managed strategies. As a firm, AB supports the Paris Agreement and has joined NZAMI at the firm level.

This Climate Change Statement represents AB's climate policy and annual climate report, complying with the reporting recommendations of the TCFD for asset managers. This statement covers the reporting period of January 1, 2022, to December 31, 2022. Please note that this is a shift in our reporting calendar, primarily to meet regulatory requirements in the UK. Our previous report covered July 1, 2021, to June 30, 2022.

AB's Approach to Climate Change

Climate Beliefs

We believe that climate risk can be a material investment risk. We should consider the material climate change–related physical and transitional risks and opportunities of the issuers we invest in, which can help generate long-term value for our clients. AB has pledged to achieve net zero at the firm level, and we are working to align certain client-driven investments with a 1.5-degree Celsius pathway by 2050, based on the following beliefs:

- Climate change can generate material investment risks and opportunities that the market misprices
- Understanding physical and transitional risks and opportunities across issuers, geographies and asset classes can give AB an investment edge

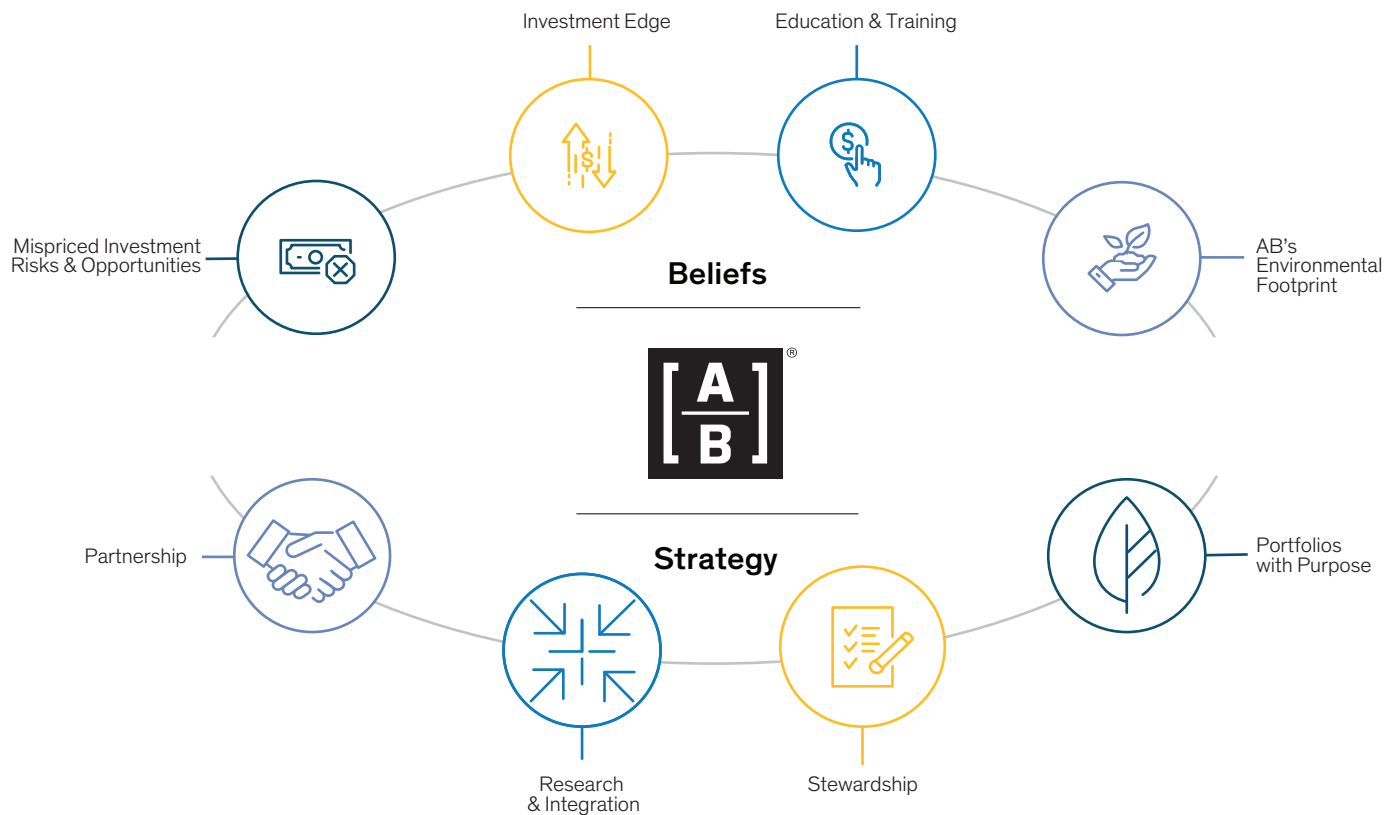
- Climate education can help investors and issuers manage the effects of climate change and develop new solutions
- At the corporate level, our own environmental footprint is important

Climate Strategy

AB's four-pillar climate strategy draws on expertise from academic and industry partners; works alongside deep research and integration; promotes active stewardship through engagement, proxy voting and policy advocacy; and provides investment solutions—our Portfolios with Purpose—that invest in climate innovators, improvers and low-emissions issuers (*Display 1*).

DISPLAY 1: AB'S CLIMATE BELIEFS AND STRATEGY

Managing Material Climate Risks and Opportunities Matters to Client Outcomes



Climate Goals

Our climate beliefs have led AB to establish the following goals for our climate strategy:

- Reduce our operations' contribution to global GHG emissions and align these to a 1.5-degree Celsius pathway by 2050
- Add to the growing pool of research and insight on the material investment impacts and opportunities of climate change
- Provide investment solutions to invest in climate-related opportunities, address the material risks and opportunities of climate change in most of our actively managed investment strategies and adapt client portfolios, when requested by clients, to benefit from climate opportunities
- Support clients in managing and reducing their own climate risks and meeting their net zero targets, when applicable
- Report transparently on the objectives of our investment strategies and business
- Advocate for policies that support investors' efforts to address the material risks and opportunities stemming from climate change on behalf of clients.

Net Zero

Net zero means working to align an organization's operations and activities to limit a global temperature increase to no more than 1.5 degrees Celsius, which generally aligns with the Paris Agreement. This trajectory is widely recognized by the scientific community as one that will help the world avoid the catastrophic impacts of climate change.

Operationally, we are working to reduce our carbon footprint and energy consumption. We will do this, in part, by locating 85% of

our employees in greener workspaces by 2025, helping to avoid emissions from less efficient offices. We are also exploring pathways to procure renewable energy for our operations.

We have not yet formally established net zero targets for our investments. At AB, we believe that climate risk is an investment risk, and that it's important to consider the material physical and transitional risks and opportunities of issuers we invest in. Our approach to climate risk management is grounded in engagement and stewardship with issuers, which is facilitated by data and tools, and complemented by partnerships—such as our relationship with Columbia Climate School. Our net zero target-setting approach will entail working with our clients to understand their specific net zero and climate-related goals and to provide strategies and solutions to help them achieve those goals.

Our partnership with Columbia Climate School has aided in the development of our net zero approach. Together, in 2021, we hosted a series of net zero roundtables not only to help educate but also to learn and better understand the challenges that clients face in addressing climate change as asset owners. Furthermore, we've worked on research and other client initiatives to continue to work toward net zero.

2030 Climate Action Plan

To achieve AB's climate goals, our 2030 climate action plan (*Display 2, page 5*) maps a set of activities that we plan to undertake over the rest of the decade. This plan aims to address material climate-related risks that we've identified in the short (one to three years) and medium (three to five years) term. AB's Chief Responsibility Officer will report on progress for this plan to AB's Board of Directors on an annual basis.



DISPLAY 2: AB 2030 CLIMATE ACTION PLAN

Strategy & Policy	<ul style="list-style-type: none"> Develop a climate strategy and climate action plan and incorporate climate considerations into relevant statements, policies and procedures Build and implement AB's approach to net zero
Research & Integration	<ul style="list-style-type: none"> Continue training investors and asset owners on climate science and its intersection with investment risks and opportunities Continue to provide investment teams across the business with access to and training on Climate Value-at-Risk (CVaR), as well as conduct scenario analysis and engage with ESG data providers on improving scenario-analysis products for the investor use case Understand net zero implications and pathways for investment holdings and portfolio construction Expand and build AB's institutional knowledge and capacity to manage climate risks and opportunities by developing tools, resources, training and partnerships that are accessible across the organization
Stewardship	<ul style="list-style-type: none"> Develop best practices, tools and guides for investors to engage on material environmental and climate issues Engage for insight and action on material climate issues Progress engagements on climate disclosure with companies materially impacted by climate strategy, metrics and targets to continue to identify issuers with material climate-related risks and opportunities and encourage them to disclose and manage these issues Engage with capital markets and issuers to ensure that ESG bond structures help companies meet their sustainability objectives and align issuer and investor incentives around energy transition Evaluate shareholder proposals to understand whether or how proposals promote genuine improvement in a company's management of material climate-related issues, thereby enhancing shareholder value and warranting AB's support based on AB's shareholder proposal framework, as described in our Proxy Voting and Governance Policy Engage with governments to advocate for policies that support investors' efforts to address the material risks and opportunities stemming from climate change on behalf of clients
Partnership	<ul style="list-style-type: none"> Continue to work with and learn from climate-related industry bodies such as the Asia Investor Group on Climate Change (AIGCC), CA100+, Climate Bonds Initiative, Ceres, IIGCC and NZAMI Share views with other investors to conduct research, build tools and design frameworks and methodology to promote industry understanding and effectiveness Support industry-wide standards and disclosure related to climate Grow and evolve our partnership with Columbia Climate School from education and training to research and corporate influence
Portfolios with Purpose	<ul style="list-style-type: none"> Establish and expand our range of offered investment strategies enabling clients to invest in low-carbon and climate-focused solutions Continue to grow the AUM and market share of our Portfolios with Purpose platform
Governance	<ul style="list-style-type: none"> Include climate risk, opportunity and net zero reporting in relevant board and committee monitoring processes Continue to incorporate board and management participation in climate risk training Update relevant boards and committees on climate action plan progress
Investor Disclosure	<ul style="list-style-type: none"> Develop and help set the industry standard on best-in-class product reporting on climate metrics Provide annual updates on the implementation of AB's climate strategy and action plan progress in alignment with TCFD reporting recommendations and global product disclosure regulations Participate regularly in industry-led material climate risk and opportunity reporting initiatives
Corporate Responsibility	<ul style="list-style-type: none"> Continue to expand operational carbon footprint measurement and improve data quality Reduce emissions by locating 85% of employees in green office buildings by 2025 Identify opportunities to procure renewable energy Educate employees on sustainability and engage employees in operating our business sustainably

The Governance Model Overseeing Our Climate Strategy

We've created a robust governance structure to oversee corporate responsibility, responsible investing and climate activities. In our 2019 Climate Change Statement and TCFD Report, we outlined that AB's oversight of climate risk involves a multilayered governance model that extends upward from our investment and operational teams through AB's Risk Management team and Operating Committee and ultimately to the Board of Directors—via our Audit and Risk Committee. In 2020, AB's Board of Directors and CEO established the position of Chief Responsibility Officer and a new Responsibility Strategic Business Unit (SBU) to increase our focus on and augment our capabilities in this area. Since establishing this supervisory structure, our diverse group of committees and business units have continued to evolve their response to the development, implementation and oversight of AB's climate strategy and risk-management approach.

Continuing in their climate risk oversight roles:

- The Audit and Risk Committee of our Board of Directors provides formal oversight for responsibility and responsible investing, and receives annual updates on strategic direction. This ensures that members at the highest level of our organization play a role in overseeing our responsibility strategy. The Board also reviews and approves this Climate Change Statement and TCFD Report on an annual basis.
- AB's Risk Management team oversees AB's operational- and investment-related risks, ensuring that the firm has effective operational processes to manage client investment portfolios and the firm's corporate activities, including those related to climate strategy.
 - Our corporate business-continuity strategy, which is aligned with the ISO 22301 standard, is designed to allow business-critical functions to continue during significant disruptions, including those caused by severe weather and other climate-related phenomena. The goal is to enable us to continue serving our clients effectively. Developing our business-resumption strategies involves analysis, planning, implementation, maintenance, testing and awareness. Testing verifies the resources and requirements needed to recover business-critical functions and operate them in accordance with recovery specifications. Plans are continually updated to minimize recovery time. Business-response plans for each office include mobilization procedures, notification guidelines, call trees and other pertinent business information. They also include plans for crisis-management and executive-management personnel to coordinate command and control.
- The Responsibility Steering Committee, chaired by our Chief Responsibility Officer, serves as an advisory council to the Responsibility team. This committee, which meets quarterly, comprises senior professionals from across AB, giving different businesses within the firm an opportunity to shape AB's approach.
- Our Responsibility SBU is a team of subject-matter experts who partner with investors as they develop ESG and climate research insights and engage with issuers. In conjunction with our various ESG and climate working groups, the Responsibility SBU also develops proprietary frameworks and toolsets, manages our strategic ESG and climate partnerships, develops training programs, and executes our proxy votes. The team also develops our firm's approach to corporate responsibility and is responsible for partnering with our SBUs to embed our purpose and values into each SBU and region, and to strengthen corporate governance practices.
 - The team has a dedicated Director of Environmental Research and Engagement who works closely with our investment teams across asset classes to research, analyze and engage on climate with issuers globally. She also manages our relationship with the Columbia Climate School, which focuses on developing and executing research and training for investment professionals in climate science, policy, management, justice and other issues.
- Our investors—analysts, portfolio managers and traders—are at the heart of our responsible investing process. They engage with issuers, analyze and quantify material ESG factors and climate risks, and ultimately incorporate this information into their investment decisions. Investment teams collaborate with the Responsibility team, and some teams also have a dedicated ESG analyst. These specialists bring distinct ESG knowledge to bear on a specific asset class or investment strategy.
- Our Fixed Income Responsible Investing team sits within our fixed-income organization and is charged with promoting a best-in-class approach to ESG research and portfolio construction for our fixed-income investment strategies. This team is focused on accelerating efforts around ESG integration in our fixed-income strategies. Specific areas of focus include enhancing our ESG-focused, fixed-income portfolio management and research tools, developing innovative ESG frameworks specifically for fixed-income sectors (such as our ESG-Labeled-Bond Framework), and improving our reporting to clients. This team also leads our firm's efforts to build out our Portfolios with Purpose product platform with innovative fixed-income, ESG-focused funds and strategies.

Through the work of these committees and teams in 2022, we evolved our climate objectives, developed our strategic environmental research priorities, and continued to implement investor education and training around climate and environmental issues.



Understanding Climate Risks and Opportunities

Approach

At AB, understanding climate science is one of the key facets of successfully integrating material climate change considerations into our investment decisions, which we do for most of our actively managed strategies. While scenario analysis and stress-testing can be important, each of the four pillars of AB's climate strategy plays a role in improving our understanding of climate risks and opportunities and generating valuable insights.

Partnerships

AB recognizes that climate change is creating challenges that require partnership. Our partnership with the Columbia Climate School helps investors and academics partner to better understand material climate risks, develop solutions to support a green energy transition and provide transparency in climate disclosure.

The Columbia Climate School

AB: The Founding Member of the Columbia Climate School Corporate Affiliate Program

Our partnership with the Columbia Climate School involves the co-development of research, thought leadership, and curated training and events. AB became the Founding Member of the Corporate Affiliate Program at the Columbia Climate School in April 2021. This is the first purpose-built school of its kind focused on tackling climate change issues. Faculty and researchers in basic earth and environmental science, engineering, journalism, architecture, policy, public health, economics, business, and law come together with the Corporate Affiliate Program members to build mutual understanding across disciplines and sectors on:

- Executive and management education and training
- Student engagement
- Faculty and research engagement
- Sponsored research and consulting

Climate Research with Columbia

Our collaboration on curriculum development has also spurred ideas for joint research projects between AB's investors and Columbia's academics. AB and Columbia have embarked on a research agenda focused on leveraging and highlighting the intersection of climate science and academia with AB's investment processes. Research may be shared externally through thought leadership, workshops and other avenues to demonstrate how investors are using insights gleaned from scientists to inform investment-related decisions and stewardship activities.

The research enterprise comprises interactions between AB investment teams and Columbia's scientists and experts on the material climate issues that arise in the investing process across portfolios, sectors, asset classes and regions.

AB's investment teams are engaging with faculty and scientists on specific short- and long-term research projects. Past research has addressed questions and areas of interest on climate change, including renewable energy, fisheries and synthetic biology. More recent research includes investigating the ecosystem in which state-owned enterprises (SOEs) operate amid China's long-term carbon-neutrality plans. An AB investor partnered with one of Columbia's researchers to write an ESG in Action article, "China's State-Owned Enterprises Hold Keys to Carbon Neutrality" (see excerpt on [page 8](#)).

China's State-Owned Enterprises Hold Keys to Carbon Neutrality

China has pledged to reach carbon neutrality by 2060, and SOEs are responsible for half the country's CO₂ emissions. Yet SOEs are also major players in China's renewable and other low-carbon energy industries. It's important for investors to understand the ecosystem in which SOEs operate to gain insight on the macro and microeconomic challenges that will determine whether China's long-term carbon-neutrality plans are successful.

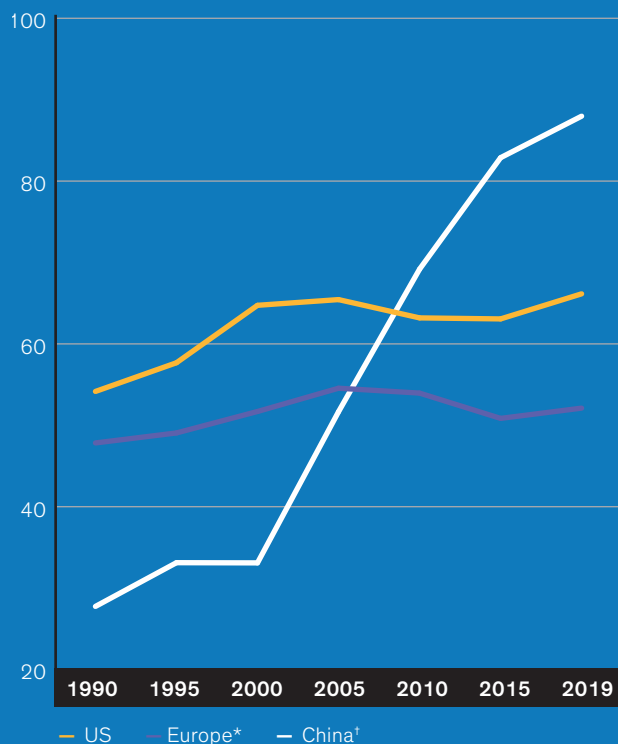
China's state-owned enterprises are huge CO₂ emitters. But they're also an essential component of efforts to reduce GHGs in the world's biggest emitter and second-largest economy.

Investors must understand the role of SOEs in the economy and what drives these companies to gain insight into opportunities being created by China's carbon-neutrality plans.

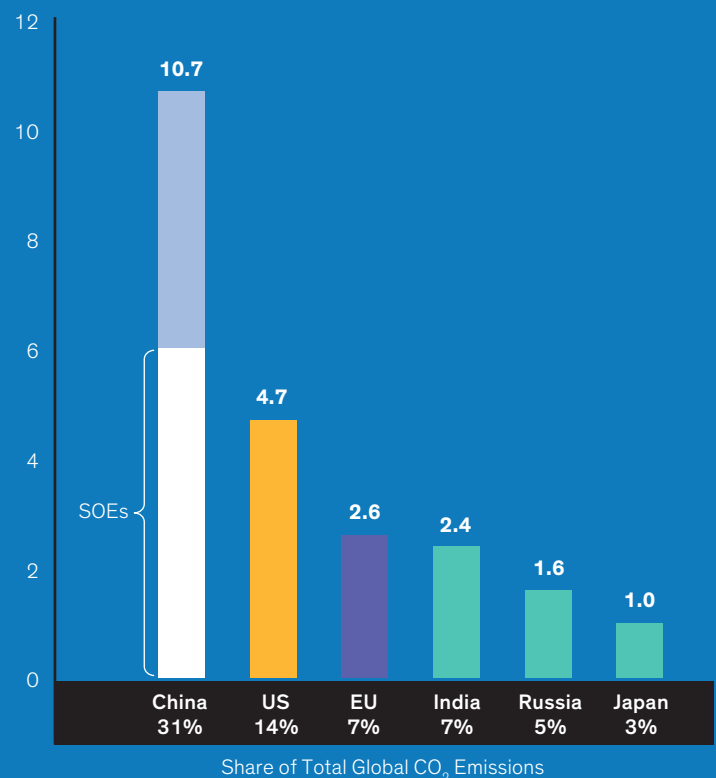
Global efforts to combat climate change won't be successful without China. Throughout the 21st century, China's rapid economic development has fueled a steady rise in energy consumption, in contrast to the US and European Union, where it has plateaued and even started to fall (*Display*). SOEs generated about six gigatons of CO₂ per year, accounting for about half of China's emissions—much more than all the emissions of the US or the EU.

CHINA IS INTEGRAL TO GLOBAL CLIMATE ACTION

Total Final Energy Consumption
Exajoules (EJ)



CO₂ Emissions
Billion Tons, 2020



Current analysis does not guarantee future results.

*Europe is based on the OECD definition of European countries.

†Including Hong Kong

Left display: Through December 31, 2019 | **Source:** International Energy Agency and AB

Right display: As of December 31, 2020 | **Source:** Columbia University Center on Global Energy Policy (for China SOE emissions estimates), Global Carbon Project and AB

Deciphering the Environmental Agenda

China's government has put environmental issues high on the national agenda. President Xi Jinping announced in 2020 plans to target peak CO₂ emissions by 2030 and to transition toward carbon neutrality by 2060. But deciphering the details of environmental efforts in a vast, state-run economy isn't easy. And since SOEs account for a significant share of China's business activity and an even bigger share of its emissions, they are an integral part of its carbon-neutrality equation.

For China, decarbonization considerations are tightly tethered to economic development and continued growth. China is a "hybrid superpower," meaning it has many attributes of both an advanced economy and a developing economy.¹ This combination of attributes, and notably its developing country characteristics, matter for energy consumption and policy, as projections by specialized energy agencies consistently point to further increases in energy demand for China, in stark contrast to advanced economies.

SOEs Are Everywhere

SOEs are at the heart of China's green reform story. Wherever you look in China's carbon-driven economy, you will find SOEs, from coal-fired utilities to oil suppliers, heavy industrial players, transportation groups and financial firms.

Yet SOEs are also dominant in China's renewables and other clean energy industries. The rapid proliferation of solar, wind and hydroelectric power in China couldn't happen without them.

Critics might say that SOEs are inefficient and poorly managed. But that reputation misses the point: SOEs are key players in China's effort to decarbonize its economies and, like private companies, aren't created equal and should be judged on their merits. What's more, SOEs account for about a third of listed Chinese shares, so they can't really be avoided by investors seeking to allocate to China's equity markets.

When it comes to green reforms, the ecosystem in which SOEs operate is a web of interlinked entities that underpin the implementation of government policy. Mechanisms of interaction between the government, regulators, shareholders and company management will shape the environmental shift.

In economies dominated by private companies, incentivizing reform is relatively straightforward. Private shareholders want to maximize profits, so policies such as emissions-trading systems

and carbon taxes can be very effective. Businesses that don't proactively adjust will pay a price—and earnings will suffer.

Government shareholders have much broader objectives. Despite its rapid development, China still faces the huge challenges of a developing economy, including major income disparities between regions and the lack of access to clean cooking for 400 million people. The government's policy goals include economic development, social development and access to energy, which must be considered along with efforts to reduce CO₂ emissions. As a result, we believe market-based policies are too one-dimensional for the Chinese system and won't necessarily achieve the desired objectives.

Case Study: Stranded Assets and the Economics of a Chinese Power Plant

These differences can be more sharply examined by analyzing the economics of a Chinese power plant and stranded-assets risk.

Stranded assets are a common theme in investment analysis of the global energy transition. It refers to the possibility that investors may overinvest in fossil fuels and not be able to recoup investments at a reasonable rate if green regulation curtails operations of dirty plants. Yet concern about stranded assets manifests itself very differently for private sector investors in publicly traded companies than for government holdings in SOEs. These differences help explain why China continues to build coal-fired power plants alongside increasing its decarbonization efforts.

In China, building a state-owned coal-fired power plant involves many SOEs (*Display, top, page 10*). These include a bank, local construction company, coal supplier and grid purchaser. Their relationships must be factored into the government's financial analysis of the power plant.

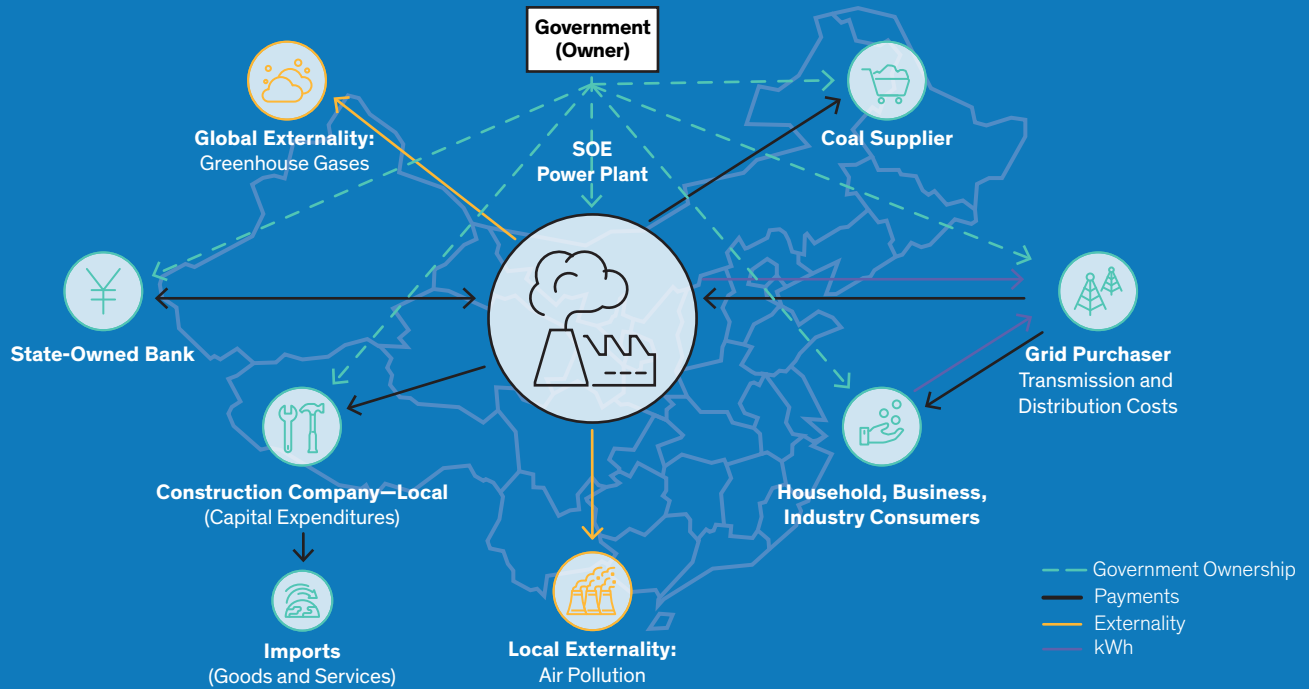
For our example, Columbia University's Center on Global Energy Policy has modeled the cost of electricity and capital costs by assuming an 80% debt/20% equity leverage ratio and capital and operating costs consistent with the Chinese market.² To evaluate stranded-assets risk, the key question is: How long does it take to generate an overall positive return to the company?

For a private plant, it could take more than 20 years. So if a coal-fired plant is forced to shut down 12 or 15 years after it was built, investors would get stuck with stranded assets and a negative return on their investment (*Display, bottom, page 10*). This is a real risk in the rapidly evolving regulatory environment.

¹ Philippe Benoit and Kevin Tu, *Is China Still a Developing Country? And Why It Matters for Energy and Climate*, Center on Global Energy Policy at Columbia University, July 23, 2020.

² Alex Clark, Philippe Benoit and Jonathan Walters, "Government Shareholders, Wasted Resources and Climate Ambitions: Why Is China Still Building New Coal-Fired Power Plants?" *Climate Policy* 23, no. 1 (April 2022): 25–40.

COUNTRY-LEVEL ECONOMIC ANALYSIS OF A CHINESE POWER PLANT

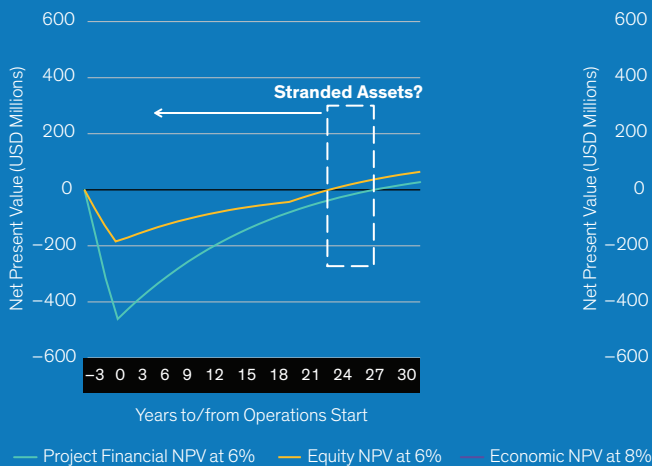


For illustrative purposes only.

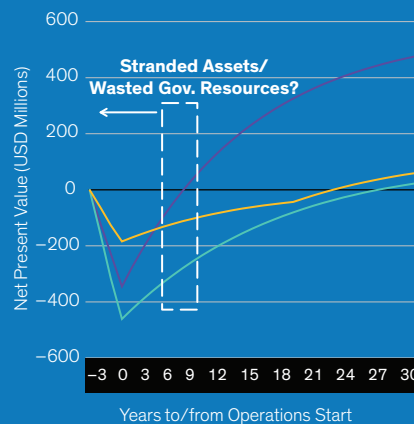
Source: Columbia University Center on Global Energy Policy

EVALUATING THE ECONOMICS OF A CHINESE POWER PLANT

Power Plants Take Many Years to Generate Financial Profitability



Chinese Economic Benefits Kick in Much Earlier



For illustrative purposes only.

NPV: net present value

As of April 2022 | **Source:** Alex Clark, Philippe Benoit and Jonathan Walters, "Government Shareholders, Wasted Resources and Climate Ambitions: Why Is China Still Building New Coal-Fired Power Plants?" *Climate Policy* 23, no. 1 (April 2022): 25–40.

The Chinese context is completely different. That’s because the shareholder of the power company is the government, which also owns multiple entities tied to the plant—and didn’t build the plant only to generate profits for the utility. The broader goal is to supply cost-effective electricity to households, businesses and consumers.

Seen through this lens, the Chinese SOE plant generates a much higher return than a privately owned plant. It turns an economic profit for the government shareholder by year eight in the modeled (albeit simplified) illustration above. As a result, assets would be stranded only if the plant shuts down before year eight—a highly unlikely scenario. This helps explain why even though some Western analysts say many Chinese plants are unprofitable, the Chinese government is not losing money on those facilities.

Based on this simulation, in a recent article published by *Climate Policy*, researchers Alex Clark, Philippe Benoit and Jonathan Walters argued that the standard metric for analyzing the cost of electricity production is too narrow for the Chinese reality. The

levelized cost of electricity (LCOE) is a well-known measure to determine whether it is economically sensible to invest in coal, solar or wind power through a standardized comparative analysis. But for China, the study proposed a levelized economic cost of electricity (LECOE) as a complementary and in some ways more appropriate way to gauge the government’s broader cost-benefit analysis. The LECOE incorporates key inputs (such as domestic versus foreign financing costs, import fuel prices versus domestic production costs, and taxes) in the evaluation using country-level economic methodologies, rather than traditional financial tools (*Display*).

Read more at our [website](#).

The views expressed herein do not constitute research, investment advice or trade recommendations and do not necessarily represent the views of all AB portfolio-management teams. Views are subject to change over time.

GOVERNMENT OBJECTIVES REQUIRE A DIFFERENT ANALYTICAL FRAMEWORK

Levelized Cost of Electricity (LCOE)
<ul style="list-style-type: none"> • Capital costs (e.g., engineering, procurement and construction) • Financing costs • Generation • Fuel costs • Operation and maintenance

Levelized Economic Cost of Electricity (LECOE)
<ul style="list-style-type: none"> • Economic capital cost: <ul style="list-style-type: none"> • Border prices • Economic labor, cement • Net taxes • Financing costs—different treatment between: <ul style="list-style-type: none"> • Domestic (internal) • Foreign (external) • Generation (same as LCOE) • Cost of fuel to economy: <ul style="list-style-type: none"> • Imports • Domestic production • Operation and maintenance (economic costs)

Source: Clark et al., “Government Shareholders,” *Climate Policy*, April 2022.

AB Investors Team Up with Columbia Experts

AB and Columbia University continue to partner in an ongoing effort to bridge the gap between finance and climate science, with a focus on helping investors better understand the material opportunities and risks inherent in the shift to a lower-carbon economy and the physical impacts of a warming world.

AB investors and experts from Columbia teamed up throughout 2022 to develop and produce a workshop on the global implications of China’s decarbonization pathway, as the country strives toward achieving its goals of peak carbon by 2030 and carbon neutrality by 2060. “The Making of a Green Giant: Decarbonization with Chinese Characteristics” is a series of training modules exploring the intersection of technology, investment opportunities and the energy transition in the context of China’s climate ambitions under President Xi Jinping.

AB and Columbia faculty and academics are also working to better evaluate the physical risks posed by climate change, particularly in the US. Many sectors and assets are exposed to risks from natural disasters, particularly those intensified or catalyzed by climate change. Existing tools that apply geospatial data to inform hazard risk aren’t as effective as they could be. They may lack the level of detail needed, exclude certain climate and weather data, or have accessibility issues.

AB investors are working on these challenges along with the National Center for Disaster Preparedness (NCDP) at the Columbia Climate School. The NCDP focuses on the readiness of governmental and nongovernmental systems, the complexities of population recovery, the power of community engagement and the risks of human vulnerability.

Through this partnership, AB and Columbia University are working together to upgrade the NCDP’s US Natural Hazards Index, which was designed in 2017 to help US households prepare for emergencies. The popular index has also been deployed by businesses (e.g., the banking industry and those who manage municipal bond ratings). The joint project will seek to upgrade and add new data on hazards from extreme weather to natural disasters and on social vulnerability. AB analysts are beginning to use this resource to evaluate climate risks and opportunities in mortgage-backed securities, credit risk–transfer securities and municipal bonds.

AB–Columbia Climate Finance Fellowship

AB’s partnership with the Columbia Climate School continues to evolve, with the 2022 debut of the inaugural AB–Columbia Climate Finance Fellowship. This exciting new position is focused on bringing together climate science insight and investing expertise to work toward a new understanding and new solutions to the mounting challenge of climate change. The Climate Finance Fellowship is intended to help shape the next generation of investment professionals striving to address the impact of climate change and develop new solutions by providing exceptional candidates with practical experience in integrating material climate change considerations into portfolio management, construction, security selection and other areas of asset management. In 2022, our Fellow researched portfolio carbon handprinting—measuring the positive impact, or carbon avoided, by the use of a company’s product or services. Some takeaways from that project can be found in our white paper, [Carbon Handprints: A New Approach to Climate-Focused Equity Investing](#).

Partnerships with Global Climate-Focused Organizations

Since AB became a signatory to the Principles for Responsible Investment in 2011, we’ve been an active participant in important climate-related industry organizations (*Display 3*).

DISPLAY 3: CLIMATE STEWARDSHIP VIA INDUSTRY GROUP MEMBERSHIPS

Advocating for Climate Solutions via Industry-Group Memberships



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AB supports the TCFD and its framework for consistent climate-related financial risk disclosures. We recently joined NZAMI and IIGCC, and we participate regularly in the Paris Aligned Investment Initiative working groups across AIGCC, Ceres and IIGCC. We participated in CDP Worldwide’s Non-Disclosure Campaign. AB is an investor participant in CA100+’s engagements with Eskom, Petrobras and Sasol. You can find more details about our roles in these organizations in the Climate Stewardship section on page 22.

Measuring Climate Risks and Opportunities

AB’s Carbon Footprint, Carbon Intensity and Scenario-Analysis Methodologies

AB uses one or more formulas, as recommended by the TCFD, when calculating and reporting carbon footprints and intensities for portfolios (*Display 4*). These may vary regionally in accordance with local regulations and client preferences and as global reporting standards evolve.

Enhancing Carbon Intensity for Bond Portfolios

One of the most common measures of a corporate fixed-income portfolio’s carbon footprint is its carbon intensity, which is carbon dioxide equivalent emissions per value of sales (tons of CO₂e/USD mil. sales). While this metric is informative, it is also important to understand a company’s commitment to future carbon reduction and well-considered strategies to achieve its goals.

Traditional metrics like carbon footprints don’t always tell the whole story, and in some cases can be misleading. There are other ways that a company can promote the transition to a low-carbon world that aren’t registered in carbon footprint data. A new approach to climate-focused investing involves measuring a company’s positive impact via the carbon avoided by using its products or services. Because disclosing carbon avoided is not an industry standard, our investors actively engage with management and conduct research to measure a company’s “handprint” accurately. Learn more about carbon handprints for bond portfolios in our blog “Carbon Handprint in Fixed Income: The Positive Power of Climate Solutions” (see excerpt on *page 14*).

DISPLAY 4: PORTFOLIO CARBON METRICS

Type of Metric	Metric Formula	Units
Total Financed Emissions	$\sum ((\$ \text{ current value investment/issuer's enterprise value including cash}) * \text{ Issuer's emissions})$	Tons of CO ₂ e
Total Financed Emissions per \$ Million Invested	$\sum ((\$ \text{ current value investment/issuer's enterprise value including cash}) * \text{ Issuer's emissions}) / \$\text{mil. invested in portfolio}$	Tons of CO ₂ e/\$mil. invested
Weighted Average Carbon Intensity—Corporates	$\sum ((\$ \text{ current value of corporate investment/current corporate portfolio value}) * (\text{Issuer's emissions}/\$ \text{mil. revenue of Issuer}))$	Tons of CO ₂ e/\$mil. sales
Weighted Average Carbon Intensity—Sovereigns	$\sum ((\$ \text{ current value of sovereign investment/current sovereign portfolio value}) * (\text{Issuer's emissions/capita}))$	Tons of CO ₂ e/capita

Carbon Handprint in Fixed Income: The Positive Power of Climate Solutions

Although carbon handprints are still underappreciated, we find what they say about a firm's GHG output useful across the fixed-income spectrum. There are different ways to quantify a carbon handprint for different types of climate solutions. But the unifying principle that anchors our analysis is how much carbon is avoided. This metric becomes the lens for identifying and evaluating a carbon handprint. For example, clean energy companies will be judged on the amount of zero-carbon energy generated, while resource efficiency companies are ranked on their ability to save energy for other companies and entities.

Handprints can stem from major construction of a new green-certified factory, the simple installation of energy-efficient lighting and so much in between. AB believes that solar and wind power, thermal insulation and electric vehicles (EVs) will have the most impact on GHG avoidance by 2030—in other words, the largest carbon handprints.

Carbon handprints are expressed in metric tons of CO₂ prevented or avoided, so they reveal whether an issuer produces more carbon than it prevents. For example, each metric ton of CO₂ that a thermal-insulation maker emits during production results in 200 metric tons of avoided carbon output for its customers, an impressive 200:1 handprint-to-footprint ratio. Ratios can vary widely, especially across company types but also within sectors. So, a firm's relatively small differences in handprint-to-footprint ratio can still reflect a big contribution to carbon avoidance within its industry.

Handprints Can Be Evaluated Based on Economics

Our research also shows that the cost to reduce or avoid carbon emissions varies widely by product and industry. For example, in commercial jetliner production, carbon fiber is by far the cheapest material to implement, primarily because it's so widely used for its superior strength and energy-saving lighter weight. Meanwhile, biofuels and cold storage are currently much less economical paths to increase carbon handprints. However, with future innovations likely, we think their costs will drop over the next decade, along

with the costs of electric-vehicle adoption and green construction materials, which are currently high but may decline.

The costs of carbon reduction have wide implications for fixed-income research, and not just in carbon-intensive sectors. Firms in all industries may want to improve their carbon handprints, but implementation costs matter. Companies tend to lean toward more cost-effective carbon handprint solutions such as LED lighting, thermal insulation and carbon fiber. We believe AB's cost research helps identify the businesses that stand to benefit from the demand.

Carbon Handprints Complete the Story When Comparing Bonds

As a comparative tool, a carbon handprint can broaden a climate-aware bond investor's perspective when screening for opportunities, especially among green bonds, which mandate a materially more detailed disclosure that helps investors compare carbon footprints and handprints more granularly. For instance, Brookfield Renewable Partners and Star Energy are two relatively similar issuers, both with highly credible green bond frameworks and environmentally friendly assets. They're both renewable electricity providers and advocates for climate improvement. But a two-tier analysis shows that one has a greater carbon handprint.

Based on Brookfield's green bond proceeds and annual output, its investment per unit of energy produced is slightly cheaper than Star Energy's, and its emissions (carbon footprint) are a respectable 24% lower.

Diving a little deeper, however, Star Energy has the bigger handprint, including over 700,000 more metric tons of avoided CO₂ output per year, which it reached at almost half the cost per ton compared with Brookfield. This nets it an impressive 110:1 handprint-to-footprint ratio (*Display, page 15*).

Read more on our [website](#).

TWO SIMILAR GREEN BONDS, TWO DIFFERENT IMPACTS

	Brookfield Renewable Partners	Star Energy	Difference
Green Bond Investment (USD millions)	637	580	
Electricity Production (MWh/year)	2,153,512	1,944,184	
Investment per Unit of Energy (USD/MWh)	296 ✓	298	-1%
Emissions Intensity (CO ₂ ton/MWh)	6.00	7.92	-24%
CO ₂ Avoided (annual tons)	913,089	1,676,046 ✓	84%
Investment per Ton of CO ₂ Avoided: Annually (USD millions)	698	346	102%
Investment per Ton of CO ₂ Avoided: Lifetime (USD millions)	47	23 ✓	102%
Carbon Handprint-to-Footprint Ratio	71.7×	109.9× ✓	53%

Brookfield's **Carbon Footprint** is smaller...

- 1% better investment per unit of power generated
- 24% less emissions produced

...Star Energy's **Carbon Handprint** is larger...

- 84% more emissions avoided
- 102% better cost per ton of carbon avoidance (annually and lifetime)

...handprint-to-footprint ratio 53% higher for Star Energy

As of October 19, 2022 | **Source:** Company reports and AB

The views expressed herein do not constitute research, investment advice or trade recommendations, do not necessarily represent the views of all AB portfolio-management teams and are subject to revision over time.

References to specific securities are presented to illustrate the application of our investment philosophy only and are not to be considered recommendations by AB. The specific securities identified and described do not represent all of the securities purchased, sold or recommended for the portfolio, and it should not be assumed that investments in the securities identified were or will be profitable.

Carbon Handprints for Equity Portfolios

Carbon handprints can also be measured for equity portfolios. Using carbon handprints to invest in climate-focused companies can help investors create differentiated portfolios. The three investing principles for carbon handprints include searching for climate solutions across regions and sectors, making sure that companies

have solid fundamentals, and actively engaging with portfolio companies on material issues. We believe that capturing a diverse set of companies with enduring carbon handprints can foster long-term return potential in a climate portfolio.

Learn more about carbon handprints in our white paper [Carbon Handprints: A New Approach to Climate-Focused Equity Investing](#).

Scenario Analysis at AB

AB has chosen to use MSCI's CVaR model for the majority of the climate scenario analysis conducted at the firm. This model calculates the present value of aggregate future policy-risk costs, technology opportunity profits, and extreme-weather-event costs and profits—expressed as a percentage of portfolio market value—across a variety of policy, technology and physical risk scenarios (*Display 5*).

The scenario analysis model employs a hybrid top-down and bottom-up methodology to identify and calculate the potential value at risk of the various transitional risks and opportunities that each portfolio holding is exposed to. These include, but are not limited to, future policies targeting emissions reductions, the potential of low-carbon technologies, and

indirect climate-related risk impacts from electricity consumption and the supply chain (Scopes 2 and 3). The model also forecasts the potential impacts of extreme weather events by modeling costs from both asset damage and business interruption.

AB is planning to systematically use scenarios developed by the Network for Central Banks and Supervisors for Greening the Financial System. We use the 1.5 REMIND Orderly, 2.0 REMIND Disorderly and 3.0 REMIND Hot House World transition scenarios, with the aggressive physical scenario held constant across the three transition scenarios in certain portfolios. We will continue to evaluate new scenarios as they are developed. For more details on MSCI's CVaR models and methodologies, please refer to the [MSCI website](#).

DISPLAY 5: CLIMATE SCENARIO ANALYSIS RISK FACTORS

Climate Value-at-Risk = Transition Risks + Tech Opportunities + Physical Risks

Risk Type	Detail	Short Description
Transition Risks	Emission Reduction Costs (Scope 1)	Company-owned facilities and vehicles
	Electricity Pass-Through Costs (Scope 2)	Purchased or leased electricity, stream, heating and cooling
	Value Chain Impacts (Scope 3)	Upstream and downstream
Tech Opportunities	Clean Tech Revenues	Corporate earnings from green revenues
	Patents	Corporate earnings from patents
Physical Risks	Extreme Cold	Productivity impact: construction, labor availability, increased heating costs
	Extreme Heat	Reduced labor availability, decreased productivity, etc.
	Heavy Precipitation	Transportation and mobility risks can affect construction
	Heavy Snowfall	Transport and logistics interruptions
	Extreme Wind	Asset damage or limiting outside activity, transportation, wind power generation
	Coastal Flooding	Asset damage and prolonged business interruption
	Fluvial Flooding	Infrastructure and real estate damage and displacement
	Tropical Cyclones	Most devastating natural hazard
	Wildfires	Warmer and drier weather conditions impact fire ignition, spread, intensity and vulnerability
River Low Flow	Water scarcity on the power production sector	

For illustrative purposes only.

As of December 31, 2021 | Source: MSCI and AB

Integrating Climate Change into AB's Risk Management Framework

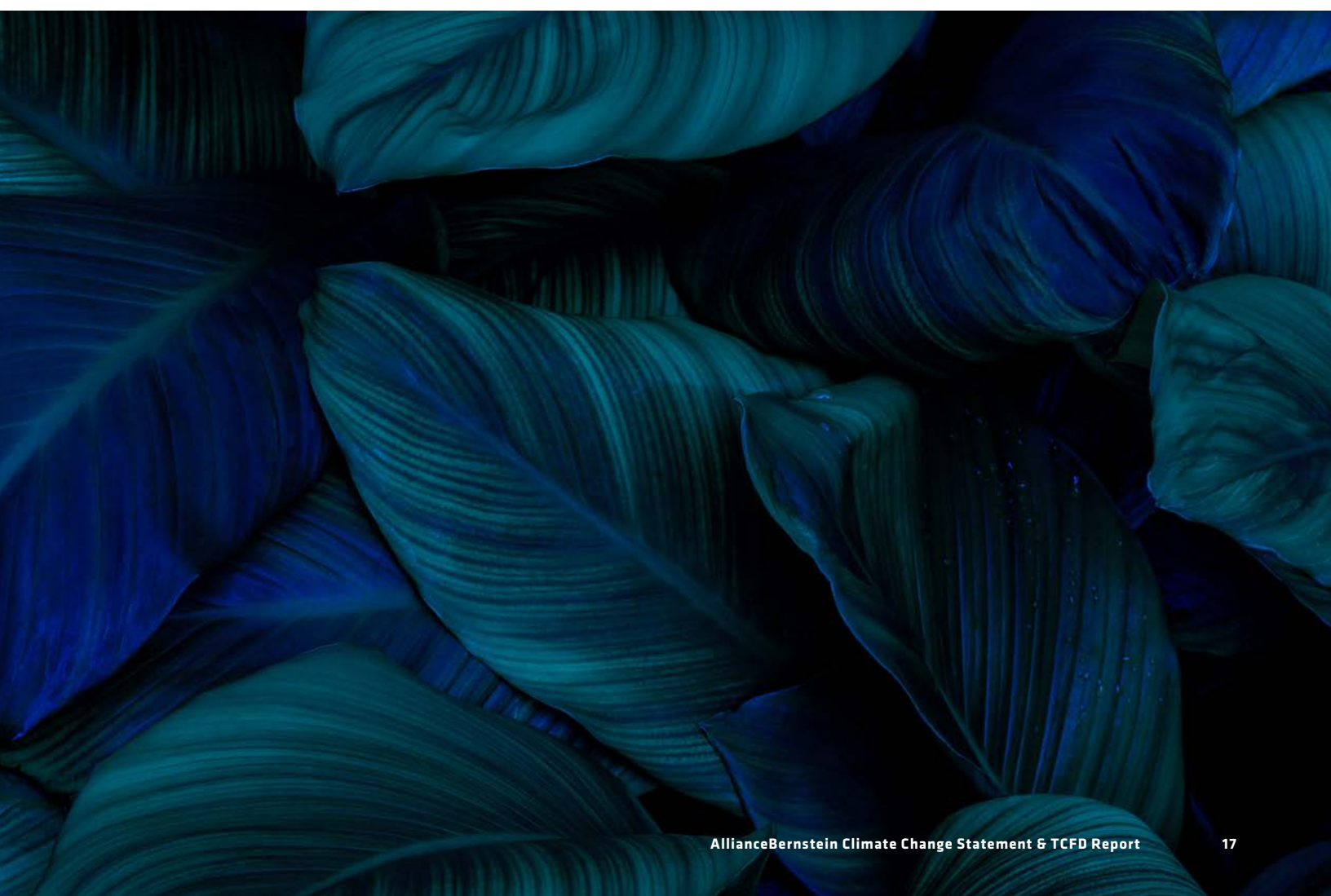
AB utilizes a "Three Lines Model" for investment and operational risk management, where first-line risk is owned by strategic-business units, second-line risk is overseen by control functions, and third-line risk ownership and oversight is validated by audit. AB's approach to second-line climate risk management is to embed climate risks into our second-line control functions, including both Risk Management and Compliance.

In 2022, AB's independent second-line Risk Management and Compliance teams worked in partnership with AB's Responsibility team to enhance the firm's frameworks for identifying material risks and exposures, including both operational and investment impacts. This included:

- Establishing new methodologies for second-line oversight of risk in investment portfolios;
- Monitoring for compliance in investment processes; and
- Delivering training and guidance to operational and control functions that support our investment teams.

In 2023, the Risk, Compliance and Responsibility teams will continue to:

- Support the development and implementation of new products by ensuring robust new business checks are conducted prior to launch, focusing on the infrastructure needed to support each product;
- Support a unified data management strategy that will enable the organization to work from a harmonized and commonly understood data framework;
- Support the development of AB's resilience strategy to defend the firm from weather-related disruptions, and speed resumption of business services; and
- Track and implement global regulatory changes related to climate.





Integrating Material Climate Risks and Opportunities into the Investment Process

Approach

AB integrates material climate-related risks and opportunities into the security selection and portfolio construction of the majority of our fundamental active strategies. We do this by combining deep research insights captured from our engagements, collaboration with our partners, climate metrics, and the evaluation of material climate considerations throughout our investment processes and recommendations, where applicable.

As investors, we believe that climate risk is an investment risk and that we should consider the material physical and transitional risks and opportunities of the issuers we invest in. This approach helps to ensure that we're endeavoring to accurately forecast cash flows and valuations and that we're incorporating material climate risk considerations when optimizing risk and return for our clients.

We broadly consider material climate-related investment risks and opportunities across three buckets:

- Transition risks and opportunities are generated by the policy, legal, technology and market changes that occur amid a transition to a lower-carbon economy, which may be driven by mitigation activities (efforts to prevent or reduce GHG emissions) or adaptation activities (efforts to anticipate and prevent or minimize the adverse effects of climate change). Transition risks may pose financial or reputational risks to organizations.

- Physical risks and opportunities are associated with event-driven (i.e., acute) and longer-term (i.e., chronic) shifts in climate patterns. Organizations may be impacted directly by damage to assets or indirectly by supply chain disruption. Physical risks include, but are not limited to, extreme heat and cold, heavy precipitation, heavy snowfall, extreme wind, flooding, wildfires and more.
- Technological risks and opportunities present themselves as organizations try to mitigate or adapt to climate change. For example, issuers might develop green technology or issue green bonds.

In-House Climate Research

Our partnership with Columbia Climate School has enabled AB investment teams to better understand the scientific impacts of climate change. We also continue to develop our own research and frameworks on climate change risks and investment opportunities.

In 2022, we produced multiple blogs, "ESG in Action" articles and white papers on climate change-related topics, sharing insights from the 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) with other investors and asset owners, our thoughts on how climate change is affecting the world, and how we're identifying investment opportunities in the pursuit of 1.5 degrees Celsius and the transition to a low-carbon economy. One of our recent blogs, "[COP27: Shifting the Global Climate-Change Debate](#)," is featured on page 19.

COP27: Shifting the Global Climate-Change Debate

COP27, the latest United Nations Conference of the Parties, concluded recently with mixed results on some of the key agenda items. In our view, though, the event will be remembered more for the way it shifted the global climate change debate.

For the first time in recent years, emerging nations were front and center at the conference, shaping the agenda and receiving clear recognition of their importance in the world's response to climate change. As one speaker put it, "The battle for climate change will be won or lost in Asia, the Middle East and Latin America."

The biggest impact may have been from adding two key topics onto the agenda. The first is adaptation—the need for countries, industries and consumers to prepare for further physical impacts from climate change, adjusting their behaviors accordingly. The second topic is loss and damage, which touches on accountability for adverse climate impacts. In fact, emerging nations successfully fought to include a roadmap to a loss-and-damage fund in the COP27 agreement.

A Small Win for Adaptation, a Bigger One for Loss and Damage

The adaptation and loss-and-damage topics cut straight to the scale and on-the-ground reality of climate change impacts and the expense of addressing them. Just 7.5% of all climate financing is channeled to adaptation; the rest is used for reducing carbon emissions. Of the estimated US\$2.4 trillion a year needed to fund emerging countries' 2030 transition efforts, more than half will come from external sources, according to a report from the London School of Economics and Political Science released at the conference.

In a modest win for adaptation, countries agreed to commit a total of US\$3.18 billion over five years to fund early warning systems. Though the amount is relatively small, the deal was encouraging, given that adaptation was on the agenda for the first time. A bigger win was an agreement to work toward establishing a fund for loss and damage—another agenda first-timer—to help poorer countries recover from climate-related damage.

Progress on the fund may not be smooth or immediate, but language in the agreement seeks to spread capital sourcing beyond developed countries to financial institutions and other organizations. The first step: establishing a transitional committee to explore ways to make the fund operational, which will be reviewed at COP28 next year.

More Urgent Action Needed to Tackle Emissions

Data published during the conference highlighted the urgency of the climate challenge. A draft of the US government's Fifth National Climate Assessment found that the US, historically the biggest polluter, has warmed 68% faster than the planet as a whole over the past half century.

In its provisional State of the Global Climate in 2022 report, the World Meteorological Organization noted unprecedented rates of rising sea levels, record ocean heat waves and severe weather events. The world has warmed by 1.15 degrees Celsius, leaving little wiggle room to achieve the 1.5-degree goal under the Paris Agreement.

Given the urgency of the backdrop, there was general disappointment in the actions taken to tackle emissions. The final COP27 agreement called on countries to accelerate "efforts towards the phasedown of unabated coal power and phase-out of inefficient fossil fuel subsidies," instead of phasing down all fossil fuels. This language also left the door open for more use of natural gas—though cleaner than coal, it still releases significant amounts of CO₂ and methane. Also, the agreement called for countries to renew targets every five years instead of yearly. In a departure from discussions at previous COPs, this year's agreement did not call for emissions to peak by 2025.

Partnership: A Key to Effective Financing Solutions

The financing challenge focused attention on ways to better channel capital to emerging markets, particularly in support of adaptation efforts and low-carbon projects. A key issue at hand is investors' ability to feel confident about governments' commitments to the energy transition and a steady flow of investable projects.

To that end, a new level of partnership between public agencies and private sectors is critical—one that transcends traditional interactions between development-finance institutions and governments. There must be more innovative structures involving a wider range of stakeholders to help ensure a predictable supply of projects at suitable scale.

Partnerships should also promote and facilitate innovative public-private finance approaches, with instruments backed, where relevant, by concessional, philanthropic and blended finance—the use of development finance to attract other forms of funding. Connecting with partners on the ground and using local as well as international banks and finance services is essential.

South Africa, for example, has mapped out the use of a US\$8.5 billion financing package from wealthier nations to decommission coal-fired generation and develop renewables, among other efforts. Meanwhile, the US and Japan are among a group of countries offering Indonesia as much as US\$20 billion to transition its power-generation mix away from coal.

Adaptation and related physical risks brought the role of insurers into sharp relief at COP27. The most advanced firms in this area are partnering with governments to develop networks focused on repairing assets to prioritize resistance to climate change and future-proofing. These networks are also thinking through commercial opportunities from de-risking transition-critical assets; insurers recognize that adapted assets are lower-risk. Better data for early warning, monitoring and other uses is also an imperative.

Carbon Offsets and the Role of Biodiversity

Carbon offsets and markets, initially expected to dominate COP27, were upstaged by adaptation and loss and damage. However, a statement from the International Monetary Fund that carbon would need to be priced at US\$75/ton in order to meet a 1.5-degree trajectory created headlines.

The US announced an Energy Transition Accelerator, an initiative to create a new class of carbon offsets based on investments that help accelerate renewable energy projects or resilience in emerging countries, though there are concerns that it might reduce the impetus for governments and companies to remove or lower their own real-world emissions.

Much of the discussion about carbon offsets focused on nature-based solutions such as planting trees, agricultural projects or protecting forests from destruction—and the potential opportunity for emerging countries in this arena. There was also significant emphasis on the role of nature and biodiversity in addressing the physical risks of climate change.

Evolving Opportunities and the Need for a Just Transition

Conversations about possible transition-related commercial opportunities could usher in what was referred to as a “second era” of climate finance.

The first era focused on setting standards, making commitments and scaling up renewables in developed markets. The second

would target implementation and action: sustainable consumption patterns, decarbonizing food systems and buildings, scaling emerging technologies and materials, and growing the role of nature and renewables in emerging markets. Businesses recognized the consumer demand for nature-based and climate-positive processes, systems, products and services. But they also called on governments to do more to incentivize consumer spending and help businesses that deliver environmentally safe goods and services.

Another key issue is ensuring a just transition that doesn't leave some groups behind, yet there's a shortage of human talent with sustainability and climate skills. Investing in education and training must be a priority for the public sector, along with cultivating entrepreneurs and startups. This imperative applies to companies, developed markets and financial-services firms.

Investors Will Need to Go Beyond Their Comfort Zones

Several speakers pointed to the need for investors to understand and manage the risks of adaptation for issuers, arguing that investors should research these risks with the same level of commitment they give to emissions reductions—their main focus to date.

Discussions about the structure and financing mechanisms of the proposed loss-and-damage fund will be of particular interest to credit investors: it's likely to become one of the main intersections of climate-change and country risks, especially for lower-income countries initially.

Institutional investors admitted that enhanced partnership-finance or blended-finance arrangements would require them to go outside their comfort zones to embrace a number of firsts, such as investing directly in infrastructure or in private rather than public companies, as well as engaging in new markets and with new counterparties that have different shades of political risk.

To sum things up, the formal part of COP27 is over, but the real work for investors has just started—implementing its lessons into their research and strategies.

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Climate-Related Engagement and Analysis

Engagement-Led

Engagement is a cornerstone of responsibility at AB. When our investment analysts engage with issuers, they typically speak directly with management, the board directors or other key officers, discussing the material ESG risks a company faces. Dialogues include discussions about how companies identify and disclose material ESG issues and how they're integrating these considerations into their businesses.

We engage for insight to understand how companies are identifying, assessing and managing climate change risks and opportunities that are material to their businesses. We engage for action to encourage issuers to better address material ESG risks or take advantage of ESG opportunities, in our clients' best interests. This can include encouraging issuers to report basic emissions metrics; better understanding the feasibility of their goals and assessing the thoroughness of their transition plans; or escalating through engagement, policy advocacy and proxy voting.

For more information on the climate-related engagement, voting and policy advocacy activity that AB undertook in 2022, see pages 23–26.

Analyzing NDC Commitments in Sovereign Bond Assessments

Climate change poses significant physical and transition risks for most sovereigns, vulnerabilities that are captured by hard data or qualitative adjustments in the Sustainability and Environment scores of our proprietary sovereign ESG scoring framework. Our ESG scores feed our economists' overall emerging-market fundamental country score and can influence emerging-market country selection. Within developed markets, our economists use these baseline scores, combined with other real-time factors, to shape our view on the direction of politics and policy going forward. These in turn will impact our views about growth and volatility, and thus have the potential to impact government bond and risk asset returns.

Our climate change research rests on a number of key premises. First, forward-looking climate analysis necessitates a clear understanding of sovereigns' climate mitigation and adaptation pledges. In this regard, over the course of 2021, we started to assess nationally determined contributions (NDCs) for a number of developed- and emerging-market countries. NDCs are key documents outlining governments' ambitions in terms of GHG reduction efforts, target years for net zero implementation and other adaptation strategies. Second, we also started tracking the evolution of domestic policy agendas and implementation schedules to reach these climate targets and reduce climate change vulnerabilities over time. Our ambition is to systematize NDC and policy analysis across major economies within our coverage universe over the coming year. Engagement with government entities enables us to access the latest data and policy objectives and communicate the importance of taking climate action and how this action informs our ESG framework and overall investment process.

Addressing Climate Change in Commercial Mortgage-Backed Securities (CMBS)

Within the CMBS sector, we believe the primary ESG risk is in the underlying commercial properties' exposure to natural hazards (e.g., earthquakes in California, hurricanes in Florida), which can result in permanent property damage not covered by insurance and/or cash-flow impacts due to business interruptions. While many commercial properties carry hazard insurance and supplemental insurance, recent storms and extreme weather events have proven that weather pattern changes can severely affect even inland areas, and most regions have overlapping concerns. The problem is significant—and growing—as climate change drives more frequent and catastrophic natural disasters.

How can fixed-income investors address this problem? We believe that the answer is to quantify the risk for individual properties based on models that consider specific types of potential disasters region by region. Through this in-depth analysis, investors can better understand CMBS risk exposure, either demanding better pricing on riskier deals or avoiding them altogether. To assess this risk across the approximately 20,000 properties within the conduit and single borrower markets, we utilize data from Risk Management Solutions, a company that specializes in evaluating catastrophe risk for insurance and reinsurance companies. We evaluate each loan and each deal's exposure to elevated natural hazard risk. From a governance perspective, we focus on potential conflicts of interest if and when the special servicer is also the controlling class representative on a deal. From a social perspective, we evaluate where (primary, secondary or tertiary markets) loans are being made within the CMBS deals.

CMBS investors who understand the material ESG implications within their investments will be better positioned to avoid specific hazards and have a better chance to guard against climate-related losses. We also believe that they'll ultimately be fairly compensated for the risks they choose to take.

Considering Climate Risks on Municipal Bond Values

In 2021, AB introduced a proprietary ESG scoring model for our broad-based municipal bond universe. The model integrates material ESG factors in each applicable step from the bottom up, bringing together ESG data specific to each type of municipal sector (state, city, school district, hospital, etc.) to develop a proprietary ESG score. Within the environmental category, the team evaluates factors including municipals' susceptibility to climate-related natural disasters, water and air pollution, and energy mix. Analysts assign weights to ESG components and subcomponents based on their assessment of the degree to which changes in each category may lead to a credit rating change. ESG data are converted to a standardized scale, and very high and very low ESG scores may impact the valuation AB is willing to accept for investment in the municipality's bonds, if deemed to be material.

Climate Stewardship

AB's approach to understanding and integrating material climate risks and opportunities doesn't stop once we've made an investment. As shareholders and bondholders, we have an ongoing open dialogue with issuers and stakeholders on climate change, when posing a material risk, to encourage issuers to deploy strategies and take actions that we believe could drive better financial outcomes for our clients. Depending on the nature and influence of our engagement, these conversations may generate positive outcomes for other stakeholders, including employees, suppliers, clients and communities, and the environment. AB engages with issuers in five ways: fundamental engagement, thematic engagement, collaborative engagement, proxy voting and policy advocacy.

Fundamental Engagement for Insight and Action

Engaging for insight enhances our climate research process, generating insight into issuers' climate strategies and competitive positioning. It also reveals how management teams address and manage medium- and long-term climate risks and opportunities, including material ESG considerations.

By engaging, we're also better able to assess the quality of an issuer's management, strategy, operations and corporate

governance structure. We incorporate this valuable information into our quantitative and qualitative security analysis and investment decisions—with the ultimate goal of generating enhanced risk-adjusted returns for our clients.

Engaging for action helps us support our clients' interests—enabling us to share our climate risk management strategy and corporate governance policies to effect positive and sustainable change with issuers. Discussions can focus on strategic, financial and material ESG- and climate-related issues, but the goal is always the same: to encourage firms to make decisions with a long-term view that supports positive, sustainable financial outcomes for them and that is in the best interest of each of our clients.

In 2022, AB held more than 7,600 issuer meetings,³ many focused on material ESG issues, including 1,186 meetings on environmental and climate issues. Of those engagements, 840 discussed carbon emissions, 156 discussed opportunities in renewable energy, 154 discussed opportunities in clean tech, 124 discussed opportunities in green buildings, 115 discussed water management and 111 discussed product carbon footprints. Each meeting may have discussed multiple topics.



³ Multiple AB analysts may have attended a single meeting. In 2021, we disclosed more than 13,900 meetings, which counted by analyst. The corresponding figure in 2022 is more than 12,000 meetings.

Engagement Examples

We engage issuers on many different material environmental risks and opportunities. When engaging issuers for action, we may consider four types of action: measurement, setting a strategy and targets, improving disclosure and transparency, and making meaningful progress. We encourage actions that can support sustainable financial outcomes and that are in the best interests of our clients.

Toxic Emissions and Hazardous Waste

The Issue

While carbon emissions are a large focus globally, toxic emissions have been increasingly scrutinized and are often linked to suspicions of causing cancer or birth defects. More stringent emissions standards and laws are coming down the pipe to help combat this issue. To address these risks and associated regulation, companies should set a strategy and corresponding targets.

The Ask

On the topic of toxic emissions and hazardous waste, we ask issuers whether they monitor, reduce and dispose of hazardous waste and whether they have an approach to tackle toxic emissions. If a company has developed a strategy, emissions-reduction targets should follow to help it measure progress against goals.

Issuer: First Quantum Minerals

Sector: Materials

Region: North America

First Quantum Minerals is a Canadian-listed mining company that operates primarily in Panama and Zambia. Past engagements with the firm focused on modern slavery risks and carbon emissions. First Quantum has yet to set emissions-reduction targets for toxic emissions, although it publishes its nitrogen dioxide and sulfur dioxide emissions publicly.

We engaged with the Group ESG Controller and a representative from investor relations (IR), making clear our desire for the company to adopt a strategy for its toxic emissions in the near future. We learned about internal policies on risk management for tailings dams. We gained a better appreciation for its policies, but we also encouraged the company to publish an independent audit of its tailings dam safety.

In adopting more comprehensive measures on this issue, we believe that the company would move to be in line with its peers and limit future risks. First Quantum was receptive to our suggestion of publishing independent audits of its tailings dam safety. We'll continue to encourage these practices and monitor its progress annually.

Water Management

The Issue

Water management involves the planning and monitoring of water resources, guided by regulations and company policy. Poor management of water can run the risk of water scarcity or water pollution and pose material risks to companies by way of fines and other penalties.

The Ask

When engaging issuers on water management, we seek to understand how they address their risk exposure to water stress or scarcity, what initiatives or compliance measures they have in place for regulations, and how their operations affect the surrounding water sources and local communities. We encourage issuers to reduce their water footprint, maximize water usage efficiency and improve water quality.

Issuer: Kering

Sector: Consumer Discretionary

Region: EMEA

Kering is a France-based multinational corporation specializing in luxury goods, including clothing, leather goods and jewelry from fashion houses Gucci, Yves Saint Laurent, Bottega Veneta, Balenciaga, Alexander McQueen and more. The company's 2025 Sustainability Strategy covers three focus areas: Care for the Planet, Collaborate with People and Create New Business Models.

Specifically, Care for the Planet includes targets for a 50% reduction in carbon emissions, reducing environmental profit-and-loss (EP&L) accounting intensity by at least 40%, promoting suppliers' adoption of Kering Standards (71% of key raw materials are aligned with those standards), striving for sustainable design and traceability (90% of key raw materials are traceable), creating innovation labs, and offsetting carbon.

A main focus of our meeting with the company's head of Sustainability Impact Disclosure and a representative from IR was water management. Water consumption and water pollution are two of six key EP&L indicators—together, they account for 18% of the firm's environmental impact. There's discussion within Kering around limiting water pollutants, but impending EU regulation will create more stringent guidelines around microfibers. Kering noted that the first microfiber loss occurs during the first wash of clothing at the supplier level, so debate continues on who bears responsibility for microfibers—the supplier, Kering or washing-machine firms?

The Kering Materials Innovation Lab launched a pilot in 2021 to test an industrial-scale microfiber filtration system in its supply chain. The results and feedback from this pilot will be used to further optimize and refine the filter and to validate efficiency in capturing microfibers; results will also be shared with the broader industry. We encouraged ongoing exploration of filtration systems. Kering appears to be well aware of the material environmental and regulatory risks and is taking action to mitigate exposure to them.

This engagement confirmed our perception that Kering is being thoughtful about managing these risks. The company appreciated our concerns and planned to relay them to management. We'll reengage the issuer to track progress on how microfiber-filtration initiatives evolve.

Engaging Through Climate Action 100+

AB has been a signatory to the CA100+ initiative since 2017, participating in engagements across the aerospace and defense, energy, and industrials sectors. These engagements are instrumental in improving the management of material risks and opportunities at the world's largest corporate emitters and also provide a unique opportunity for investors to learn and share best practices for working with issuers to manage the financially material risks and opportunities stemming from climate change.

In 2022, AB continued to participate in CA100+ engagements with emerging-market energy companies, focusing on their climate change disclosures, policies and impact. For example, in early 2022, with our investor cohort through the CA100+ engagement, we sent a letter to Sasol's board emphasizing the importance of implementing its decarbonization plans and commending Sasol's progress on its transition plan, while also advocating for further action to limit future risk. We met with the company's new CFO this year, and we believe that we successfully established a relationship that will position us to work closely with him in the future. Our engagement with Petrobras is overviewed below.

Issuer: Petrobras

Sector: Energy

Region: Latin America

Petrobras is a major state-owned, Brazilian oil and gas producer and has one of the largest corporate carbon footprints in Latin America. AB participates in the Petrobras CA100+ investor cohort and has held a series of engagements on the company's climate strategy since joining the initiative.

During AB's tenure on this engagement, Petrobras has continued to progress its climate strategy, despite persistent changes in top leadership and operating in the context of a dynamic political environment.

In the most recent Petrobras engagement, the Environmental Defense Fund (EDF) joined AB and the investor cohort to provide perspective and expertise on managing risks related to methane emissions, which are major contributors to climate change, given that methane's warming potential is much greater than CO₂'s.

AB and the other investors also encouraged Petrobras to join the Oil & Gas Methane Partnership 2.0 (OGMP 2.0). The OGMP 2.0 is a multistakeholder initiative launched by the United Nations Environmental Programme and the Climate & Clean Air Coalition, which works with major oil and gas companies to help tackle methane emissions, which pose financially material risks and opportunities to issuers that we seek to manage on behalf of our clients.

By joining OGMP 2.0, members commit to disclosing against the OGMP 2.0 reporting framework, which works to improve the transparency and accuracy of methane emissions reporting. In previous dialogues, Petrobras expressed concerns over the technical feasibility of adhering to this reporting framework, attributing this concern to particular features of the company's offshore drilling operations. However, AB and investors were able to leverage the expertise of EDF to help address some of these concerns. Petrobras has since indicated that the prospect of joining OGMP 2.0 membership is currently progressing through its internal approval processes.

AB has noted the progress made on evolving the company's climate strategy, as well as efforts to take investor priorities seriously.

Proxy Voting

At AB, we actively exercise our right to vote proxies, and we have a robust, global rules- and principles-based in-house Proxy Voting and Governance Policy and process that is applicable to all our voting activities across all geographies. We're shareholder advocates, and we make investment and proxy-voting decisions in our clients' best interests. All internally managed equity assets are covered by our policy; AB has authority to vote proxies relating to securities in certain client portfolios across active and passive equity funds. Accordingly, AB's fiduciary obligations extend to AB's exercise of such proxy-voting authority for each client for which AB has agreed to exercise that duty. Where clients have specifically requested to override our house policy, we have the ability to arrange such measures, but it is not our standard approach. We do not allow clients to directly vote in segregated or pooled accounts.

Our proxy-voting guidelines on climate change-related resolutions are both principles- and rules-based. There are many proposals addressing climate change concerns, and their scopes vary. Climate change increasingly receives investor attention as a potentially critical and material risk to the sustainability of a wide range of business-specific activities. Related proposals may include asking companies to adopt emissions standards, quantitative goals and impact assessments.

AB assesses shareholder proposals based on its Shareholder Proposal Assessment Framework (“Framework”), as described in its Proxy Voting and Governance Policy. The Framework considers elements such as the materiality of the issue, the company’s relevant practice and policy, and the context of the shareholder proposal. AB’s commitment to maximize the long-term value of clients’ portfolios drives how we analyze shareholder proposals. We believe material ESG and climate considerations are important elements that help improve the accuracy of our valuation of companies. We think it is in our clients’ best interests to incorporate a more comprehensive set of risks and opportunities, such as material ESG and climate issues, where applicable from a long-term shareholder value perspective. Rather than opting to automatically support all shareholder proposals

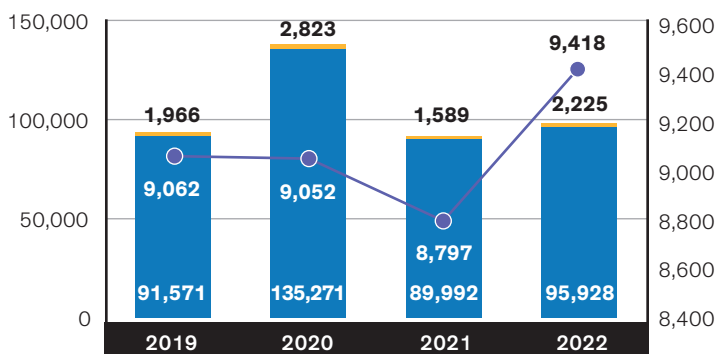
that mention an ESG or climate issue, we evaluate whether each shareholder proposal promotes genuine improvement in the way a company addresses an ESG or climate issue, thereby enhancing shareholder value for our clients in managing a more comprehensive set of risks and opportunities for the company’s business.

Summary of 2022 Voting Activity

In 2022, AB voted on 98,153 total management and shareholder proposals across 9,418 companies globally (*Display 6*). We voted at 99% of the company meetings eligible. The 1% accounts for cases where we were not able to exercise our vote, generally due to unreasonable operational hurdles imposed by custodians or issuers in certain markets. We vote all our proxies internally; we do not outsource this activity.

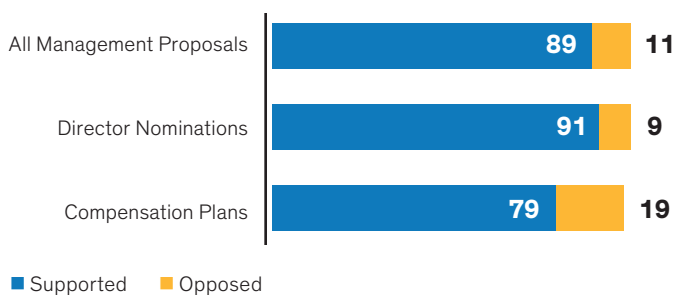
DISPLAY 6: AB GLOBAL PROXY VOTING STATISTICS

Global Proxy Voting: Year over Year



■ Management Proposals (Left Scale) ■ Shareholder Proposals (Left Scale)
— Total Meetings

2022 Proxy-Voting Record (Percent)*



*Numbers may not sum to 100%, as frequency votes have been excluded.

As of December 31, 2022 | Source: AB



Voting Season: January 2022–December 2022

While environmental proposal submission was up in 2022 compared with 2021, many of the climate-related shareholder proposals submitted this year were withdrawn, reflecting the increasing number of companies proactively approaching climate risk management in their businesses.

Even with this trend, the number of those proposals that were voted on more than doubled from 2021; however, average support across the industry decreased to 27% from 53% in the prior year when looking at the environmental shareholder proposals voted at Russell 3000 companies.⁴ Both the enhanced disclosures and increased number of companies adopting emissions reduction targets contributed to the lower support rate, as well as the macro-level considerations on energy supply in light of the war in Ukraine. In terms of the requested action, shareholder proposals calling for companies to adopt or enhance GHG emissions reduction targets represent the most common environmental subcategory, similar to 2021.

We reviewed the results of some of our climate engagements to understand if any voting escalations were warranted—for example, in cases of organizations that either would not consider any changes to their current climate processes in both 2020 and 2021 or those where we experienced a significant decrease in willingness to do so from 2020 to 2021. In those cases, we typically held a discussion with the covering analyst to determine the best path of escalation through voting at any upcoming 2022 proxy events, rather than institute a blanket policy of escalation for the year.

Policy Advocacy

AB engages with governments, regulators and other drivers of public policy when we feel it's in our clients' best interests. These engagements take the form of comment letters, appearances at formal meetings of regulatory bodies and direct engagement with key government stakeholders. They often center on investment impacts or stewardship concerns from existing or proposed regulatory changes, such as share classes, reporting requirements, and treatment of ESG and climate issues.

Recently, AB has responded to the following climate-related regulatory consultations either on our own or as part of an investor coalition. These responses include:

- Engaging the US Department of Labor on retirement savings and climate-related risks
- Engaging the US Securities and Exchange Commission on pay versus performance and climate disclosures
- Engaging the Commodities Futures Trading Commission (CFTC) and the Integrity Council for the Voluntary Carbon Market on voluntary carbon markets
- Submitting feedback to the Investment Company Institute on the International Sustainability Standards Board sustainability and climate disclosures
- Consulting on the CFTC request for information on climate-related financial risk
- Providing input to the Taiwan Securities and Futures Bureau on how to think about climate change integration, risk, reporting and scenario analysis
- Consulting on enhancements to the Net Zero Company Benchmark to the CA100+
- Providing comments through the ESG Working Group of the Financial Services Council to the Australian Treasury on climate-related financial disclosure
- Providing feedback through EY to the Securities Investment Trust & Consulting Association on climate scenario analysis
- Actively participating in the Investment Association's climate working groups and committees, including providing feedback on consultation responses

⁴ Subodh Mishra, "A Graphical Look at U.S. Shareholder Proposals in 2022," *Harvard Law School Forum on Corporate Governance* (October 21, 2022), <https://corpgov.law.harvard.edu/2022/10/21/a-graphical-look-at-u-s-shareholder-proposals-in-2022/>.

Investing in Climate Solutions: AB's Portfolios with Purpose

The fourth pillar of AB's climate strategy—providing innovative solutions that invest in climate opportunities and finance the transition to a low-carbon economy—draws on our other climate efforts: learnings from climate partnerships, knowledge from climate research on risks and opportunities, and insights from engaging with corporations and others.

AB's Portfolios with Purpose offer clients a range of solutions that may be climate-focused or that incorporate climate along with the other ESG pillars. We've organized these solutions into areas of focus based on their ESG-related goals. The three buckets of our Portfolios with Purpose include: Responsible+, Sustainable and Impact.

AB manages approximately US\$24 billion in our Portfolios with Purpose platform as of December 31, 2022. We hope to launch more strategies in 2023, advancing our goals to provide solutions that invest in climate opportunities and to support our clients in managing and mitigating their own climate risks.

In 2022, we launched Bernstein Impact Alternatives (BIA) within the Impact strategies of our Portfolios with Purpose platform. BIA is a private equity and venture capital fund of funds vehicle

that invests Bernstein client capital into impact private equity, growth stage and venture capital funds. Those funds are sourced and reviewed by a subadvisor, Impact Engine, that seeks to invest across three impact themes: environmental sustainability, health equity and economic opportunity.

In 2022, we also launched China Net Zero Solutions and onboarded AB CarVal Investors' Clean Energy Funds. These portfolios fall within the Climate Conscious bucket of our Responsible+ Portfolios with Purpose, which have a dedicated ESG focus, such as carbon neutrality, and adopt a range of approaches—including negative and positive screens, carbon emissions and pricing filters, and active-ownership strategies—to improve investee companies' management of material ESG issues.

Other Climate Conscious Portfolios with Purpose include our AB Global and Asia Low Carbon Equity solutions, as well as the AB Australian Green Managed Volatility Equity strategy, both of which target significantly lower carbon exposure and volatility than their respective benchmarks, using a variety of approaches—carbon emissions, carbon pricing, Paris alignment and fossil-fuel exclusion—in security selection and portfolio construction.

Portfolios with Purpose Case Study: Bernstein Impact Alternatives

Bernstein Impact Alternatives is an impact strategy focused on investing in private equity, growth-stage and venture capital managers invested in fast-growing, middle market companies in sectors ranging from clean energy and sustainable food to healthcare and financial access. This proprietary offering, designed for Bernstein Private Wealth clients, is sub-advised by Impact Engine—a leader in the impact space since 2012.

Impact Engine looks for managers and companies solving issues in environmental sustainability, economic opportunity and health equity. One of the late-stage growth equity managers they're invested in is Carbon Direct Capital Management, which utilizes a team of more than two dozen PhDs who provide scientific advisory services and investment capital to the carbon management ecosystem—including things like carbon capture, removal and utilization, as well as clean hydrogen. Two examples of Carbon Direct Capital Management's unique portfolio companies are Twelve and Syzygy Plasmonics.

Twelve is a carbon utilization company that uses artificial, industrial photosynthesis to convert carbon dioxide into carbon that can be used to make petrochemicals used in shampoo, solar panels, plastic packaging and more. By replacing conventional chemicals traditionally made from fossil fuels with Twelve's products, companies can decarbonize their products without sacrificing quality or performance.

Syzygy Plasmonics is a low-carbon hydrogen company that uses light instead of traditional, carbon-intensive steam methane reforming to transform ammonia into hydrogen, which can then be used in power generation or other applications. Importantly, when hydrogen burns, it produces only heat and water instead of GHGs like traditional fuels. Syzygy is dedicated to decarbonizing the chemical processes that make modern life possible.

These are just a few examples of portfolio companies that are striving to make a real impact on climate change—related risks and opportunities.

Where Climate Understanding and Integration Merge: AB China Net Zero Solutions

International efforts to combat global warming have grown drastically in the last few years. Over 130 countries have made net zero commitments, representing a combined share of about 91% of global gross domestic product.⁵ In 2020, President Xi Jinping announced China's plan to reach peak carbon dioxide emissions levels by 2030 and transition toward carbon neutrality by 2060 (*Display 7*). China's net zero policy coincides with its political ambitions for energy and technological self-sufficiency, revealing how it envisions the country's economic future. Specifically, this campaign lays out how Beijing sees the country's manufacturing landscape evolving over the next 40 years and provides opportunities for the investors who align with the companies that may benefit from this secular shift.

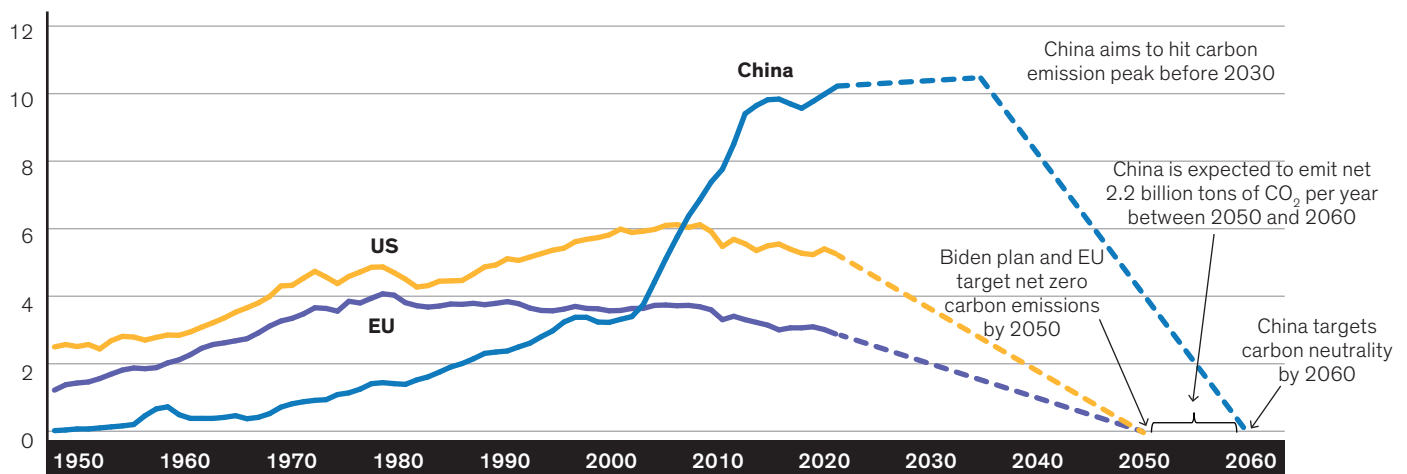
As global consensus to combat climate change continues to gain momentum, China is poised to lead in green technology manufacturing—including EVs, solar panels, wind turbines and more. In our view, the following actions will help establish China's multi-decade strategy:

- **Curbing Industrial Emissions**—China has already begun cutting emissions from the most polluting industries and closing smaller, less-efficient factories.
- **Promoting Green Power**—By replacing the current power generation infrastructure, more sustainable energy sources such as solar, wind and hydrogen can be incorporated.
- **Facilitating Cleaner Transportation**—While EV adoption is proceeding rapidly, the transition away from internal combustion engines cannot completely solve China's carbon problems, especially if electricity is generated primarily from coal burning.

AB's China Net Zero Solutions strategy aims to deliver differentiated alpha by investing in the Chinese listed industry leaders that are benefiting from and contributing to both China's and the world's net zero carbon goals. In addition to the environmental outcome of contributing to China's transition to a lower-carbon economy, material ESG factors are integrated throughout the strategy's equity research and investment process to help focus on the opportunities associated with the pursuit of China's net zero policy goals. Instead of just focusing on companies' carbon emissions, the strategy seeks companies that are disrupting the green technology space and taking advantage of climate opportunities.

DISPLAY 7: NET ZERO COMMITMENTS

Annual CO₂ Emissions (Billion Tons per Year)



Current analysis does not guarantee future results.

Carbon dioxide (CO₂) emissions from the burning of fossil fuels for energy and cement production. US and EU targets are in terms of GHG emissions, where CO₂ is a major component but not exhaustive. Targets are net.

As of March 31, 2022 | **Source:** Goldman Sachs, Our World in Data, UBS and AB

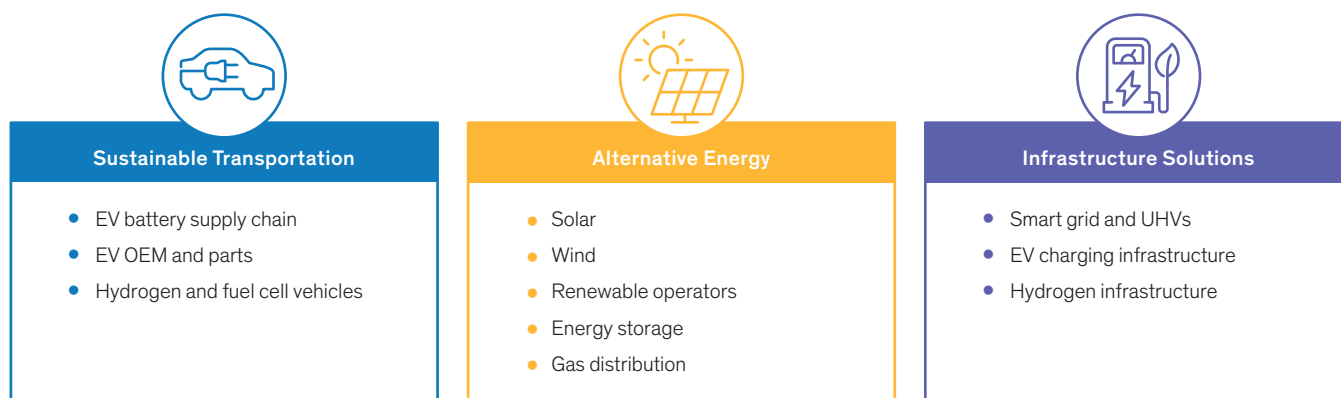
⁵ Net Zero Tracker (website), accessed December 31, 2022, <https://zerotracker.net/>.

We've identified broad clusters of opportunities that may arise from the delivery of China's policy goals. Through this, we aim to understand whether companies in the opportunity set are taking action to address climate change or provide climate change solutions and whether China and global net zero carbon goals are a significant driver of the company's business outlook. Our investment process is built around three key themes: sustainable transportation, alternative energy and infrastructure solutions (*Display 8*).

Engaging with issuers on material ESG issues is an important part of our investment and research process for China Net Zero Solutions—our investment team actively engages with corporates to encourage them to better address and mitigate climate change to help align their businesses with broader environmental goals. During 2022, we engaged with issuers in the strategy on a number of environmental issues (*Display 9*).

DISPLAY 8: CHINA NET ZERO THEMES PROVIDE COMPELLING INVESTMENT OPPORTUNITIES

Three Primary Themes Supported by Dynamic, Narrow and Definable Sub-Themes



For informational purposes only.

OEM: original equipment manufacturer; UHV: ultra-high voltage

As of January 31, 2023 | **Source:** AB

DISPLAY 9: 2022 CHINA NET ZERO ENGAGEMENTS

Theme	Number of Engagements
Carbon Emissions	50
Net Zero	9
Opportunities in Renewable Energy	7
Opportunities in Clean Tech	6
Water Management	4
Environmental Biodiversity and Land Use	3
International Norms	2
Toxic Emissions and Hazardous Waste	2
Product Carbon Footprint	1
Resource Management	1

As of December 31, 2022 | **Source:** AB

China Net Zero Engagement Examples

China Resources Gas (Energy)

During our most recent engagement with the chief financial officer (CFO) of China Resources Gas, we discussed updates related to the company's carbon-reduction efforts and executive compensation. The company is principally engaged in the city gas distribution business for residential, commercial and industrial users. To address environmental concerns, the CFO of China Resources Gas indicated that the company had successfully reduced carbon emissions compared with last year. This improvement was attributed to the company's annual carbon reduction target, although the company has not set an overall carbon-neutral target.

China Yangtze Power (Utilities)

We also engaged with China Yangtze Power, a hydroelectric power generation company. As the world's largest power station in terms of installed capacity, the Three Gorges Dam has the potential to cause extensive biodiversity and geological damage—a risk long overlooked, in our view. In our most recent engagements with the company, we discussed its initiative to manage biodiversity risk and carbon reduction targets among other topics across ESG. Management explained that it takes investor concerns on risk around the scale of its power generation seriously and that it has formed a research institute to study the impact on biodiversity from the dam and how to protect freshwater ecosystems and preserve the species in the area. In terms of carbon emissions targets, the company has committed to peak carbon emissions by 2023 and carbon neutrality by 2040. Recently, China Yangtze also implemented stricter energy recovery policies, now requiring 100% recovery of sulfur hexafluoride during the maintenance of related equipment.

Great Wall Motor (Automotive OEM)

During a recent engagement with the senior management at Great Wall Motor, an automobile manufacturer, we focused on the company's progress related to carbon neutrality, among other material ESG issues. We learned that the company had established a detailed ESG framework and identified the relevant ESG issues to its businesses. Great Wall Motor has set a carbon neutrality target that it aims to achieve by 2045. In order to do so, the company will adopt measures such as technological innovation and energy conservation management, and it will introduce distributed photovoltaics as a source of solar energy. The company also plans to build its first "zero-carbon" factory in 2023.

Investors who understand the nuances of China's policy and the economic landscape can find resilient, long-term opportunities. China's commitment to reaching carbon neutrality by 2060 is a key long-term policy trend that should support companies involved in the transition.

There are plenty of companies to choose from in sectors ranging from industrials to utilities, materials, consumer discretionary and technology. Investors can find the strongest candidates by looking for industry leaders that are contributing to carbon transition goals and addressing material climate risks. Investment candidates should also have business models with wide competitive moats, the ability to generate sustainable long-term growth and attractively valued shares.

Despite challenging macroeconomic conditions, we think the push to wean the global economy off fossil fuels will continue unabated. This should translate into persistent growth drivers for companies empowering the energy transition. By focusing on Chinese companies with solid fundamentals that are deeply embedded in this global green effort, we believe that portfolios can capture an attractive source of return potential that has gone largely unnoticed by investment managers.



AB as a Business

As a business, we are working to reduce our greenhouse gas footprint. In 2022, we continued to enhance our greenhouse gas data management, made progress toward emissions reduction, and engaged employees on sustainability.

Enhanced Data Management

We continue to develop new processes to manage our environmental data. In 2021, we expanded our emissions inventory to include our business centers and small offices. In partnership with our finance and technology teams, we implemented new emissions data management software and internal structures to help drive our ongoing effort toward higher-quality data. Our 2022 inventory includes our data centers.

Display 10 reflects our Scope 1 and 2 emissions from AB's offices, business centers, and data centers, and our Scope 3 emissions from air and rail travel. In 2022, we added data centers to our GHG inventory and enhanced our natural gas calculations. As a result, we have recalculated our data from past years, which reflect an increase in total emissions when compared with GHG data previously reported.

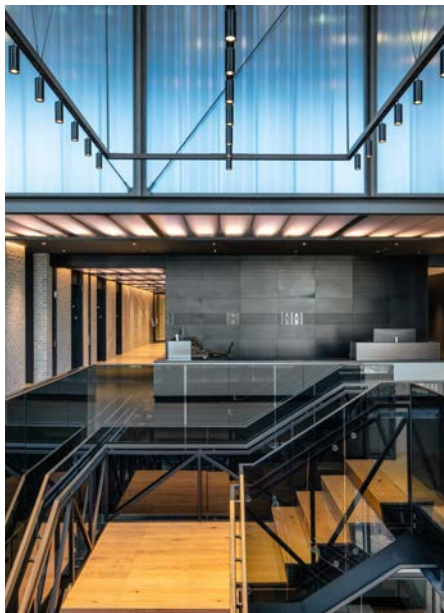
Our total emissions increased this year, primarily due to the return to business travel after the COVID-19 pandemic. However, our emissions per capita and emissions per square foot remain below our 2019 baseline year.

We plan to continue to enhance the quality and breadth of our GHG data as we work toward decreasing our emissions.

DISPLAY 10: AB'S OPERATIONAL CARBON FOOTPRINT

	2019		2020		2021		2022	
	Consumption	Emissions	Consumption	Emissions	Consumption	Emissions	Consumption	Emissions
Scope 1								
Fuel	2,705,753.00 ft ³	153.00 tCO ₂ e	2,602,938.00 ft ³	151.00 tCO ₂ e	1,832,613.00 ft ³	118.00 tCO ₂ e	1,849,950.00 ft ³	102.00 tCO ₂ e
Scope 2								
Electricity	22,075,172.00 kWh	7,019.00 tCO ₂ e	19,237,803.00 kWh	6,115.00 tCO ₂ e	21,881,090.00 kWh	7,117.00 tCO ₂ e	22,306,659.00 kWh	7,361.00 tCO ₂ e
Scope 3								
Air & Rail Business Travel	36,712,974.00 miles	7,207.00 tCO ₂ e	7,116,566.00 miles	1,216.00 tCO ₂ e	3,549,421.00 miles	572.00 tCO ₂ e	16,767,556.00 miles	2,926.00 tCO ₂ e
Occupancy	3,512 people		3,877 people		4,129 people		3,841 people	
Area	1,153,953.00 Sq. ft. of AB footprint		1,381,361.00 Sq. ft. of AB footprint		1,310,672.00 Sq. ft. of AB footprint		1,351,036.00 Sq. ft. of AB footprint	
Total emissions	14,379.00 tCO ₂ e		7,482.00 tCO ₂ e		7,807.00 tCO ₂ e		10,389.00 tCO ₂ e	
Total per square foot	0.01246 tCO ₂ e/total sq. ft.		0.00542 tCO ₂ e/total sq. ft.		0.00596 tCO ₂ e/total sq. ft.		0.00769 tCO ₂ e/total sq. ft.	
Total per capita	4.09 tCO ₂ e/person		1.93 tCO ₂ e/person		1.89 tCO ₂ e/person		2.70 tCO ₂ e/person	

Data were extracted on June 27, 2023 from our sustainability data management platform. The display does not include 2021 US rail data.



Emissions Reduction

AB is on a multiyear journey to enhance our work environment by relocating 85% of our employees to new or refurbished, greener office spaces by 2025. As of March 2023, 60% of our employees work in greener workspaces. These workspaces encourage collaboration and foster engagement and wellness. We also anticipate emission reductions from these greener buildings and a decrease in our total real estate footprint.

Greener Workspaces

Nashville: In 2021, we moved into our global headquarters in Nashville, Tennessee, in the 501 Commerce building at 5th and Broadway in the heart of downtown Nashville. 501 Commerce is LEED Silver,⁶ and AB's Workspace is Fitwel two-star certified.⁷

Energy efficiency features selected by AB include dimming controls to reduce light levels in brighter areas and motion detection lighting in meeting spaces. We also utilize biodegradable felt wall coverings, Cradle to Cradle–certified carpet and Living Product–certified wood flooring. We offer composting and recycling, as well as e-waste and a seasonal community-supported agriculture (CSA) box opportunity.

Wellness features for people and planet include bicycle parking, EV chargers, meditation rooms, lactation rooms with workstations and outdoor green space.

London: In 2023, we opened the doors of our new London office at 60 London Wall. The building has been awarded a Building Research Establishment Environmental Assessment Method (BREEAM)

“outstanding” rating for being in the top 1% of UK domestic refurbishments.⁸ It also features a two-star Fitwel rating and utilizes renewable energy.

New York: In 2024, we will relocate our New York office to Hudson Yards. While the building is still under construction, it is targeting LEED certification.

Community and Employee Engagement

Since relocating to Nashville, we've sought to play a positive role in the Nashville community. Our director of Corporate Responsibility and our managing director of Bernstein Private Wealth Management served on the Nashville mayor's Sustainability Advisory Committee, which is tasked with leveraging the power of the business community to make Nashville a more sustainable city.

Employees around the world are invited to engage in AB's environmental goals by joining our Sustainable Employee Wellness Group (EWG). The Sustainable EWG is dedicated to sustaining the environment through AB, both as a firm and as individual employees. The group hosts regular events to engage and educate employees on topics including solar energy, recycling and composting, safe water, and sustainable eating.

In Nashville, we partnered with Bloomsbury Farm, a local organic farm, to offer a CSA pickup during the summer. We also used the produce from the CSA in our corporate kitchen.

⁶ To achieve LEED certification, a project earns points by adhering to prerequisites and credits that address carbon, energy, water, waste, transportation, materials, health and indoor environmental quality.

⁷ Fitwel is a commercial building rating system that provides guidelines on how to design and operate healthier buildings.

⁸ BREEAM's third-party certified standards have helped improve asset performance at every stage, from design through construction to use and refurbishment.

Appendix

AllianceBernstein Limited (ABL) Supplement

ABL is an investment manager authorized and regulated by the UK-based Financial Conduct Authority (FCA). It is in scope for the TCFD disclosure requirements under the FCA's Environmental, Social and Governance Sourcebook. In the following section we set out how ABL takes climate-related risks and opportunities into account in relation to the assets it manages for clients.

As it is part of AB and its legal entities globally ("AB Group"), ABL leverages the AB Group's approach to identifying and addressing climate-related risks and opportunities.

Governance

AB Group's oversight of climate risk involves a multilayered governance model that extends upward from our investment and operational teams through our Risk Management team and Operating Committee and ultimately to the AllianceBernstein L.P. Board of Directors—via our Audit and Risk Committee. For more details on AB Group's governance structure, see "The Governance Model Overseeing Our Climate Strategy," *page 6*.

Throughout 2022 the ABL Board received updates on ESG- and climate-related initiatives from members of the Responsibility and Investment teams. The ABL Board delegates responsibility for risk oversight to the ABL Audit, Risk and Compliance Committee (ARCC). In 2022, the ARCC engaged with the Responsibility team to present on and discuss risks and challenges arising from the firm's strategic activity, responsibility activities and operational practices.

Beginning in early 2023, the ABL Board instituted quarterly reporting that covers strategy, environmental initiatives and social initiatives. In 2023, the ABL Board also reviewed and discussed the AB Group's net zero initiative, including how this initiative connects to AB Group's purpose, mission and values at an operational level, and received an update on the development of a net zero "dashboard" that can be used to monitor progress. The ABL Board is continuing to evolve its climate-related governance framework, and going forward, it plans to:

1. Receive quarterly updates from the Responsibility team in relation to ESG, including climate change
2. Undertake training to support the execution of its responsibilities on climate-related issues

3. Amend its Terms of Reference to reflect that the Board and its committees will be overseeing aspects of ABL's approach to managing climate-related risks and opportunities
4. Approve the ABL TCFD report on an annual basis

Going forward, climate and other ESG considerations will be embedded in the Statements of Responsibility for the relevant ABL Senior Management Function (SMF) role holders, where applicable.

ABL's Investment groups engage with issuers, analyze and quantify material ESG factors and climate risks, and ultimately incorporate this information into their investment decisions. Investment teams collaborate with the Responsibility team, and some teams also have a dedicated ESG analyst. These specialists bring distinct ESG knowledge to bear on a specific asset class or investment strategy. For more details on how the Investment and Responsibility teams interact with other committees and bodies, see "The Governance Model Overseeing Our Climate Strategy," *page 6*.

ABL only delegates portfolio management of client mandates within AB Group, which has a consistent approach to climate risk management and strategy, as set out in the firmwide report.

Strategy and Risk Management

AB Group's commitment to climate is informed by climate beliefs: climate change generates investment risks and opportunities that the market misprices; understanding physical and transitional risks and opportunities can give AB an investment edge; climate education can help investors and issuers manage the effects of climate change and develop new solutions; and as a responsible company, AB's own environmental footprint is important.

These beliefs inform AB Group's strategy, which includes drawing on expertise from academic and industry partners; researching climate risks and opportunities, and integrating those findings into the investment decision-making process for AB's ESG integrated strategies, which comprise most of AB's actively managed strategies, excluding passive and index funds; promoting continued stewardship practices through active engagement, proxy voting and policy advocacy; and providing investment solutions that invest in climate innovators, improvers and low-emissions issuers.

This strategy is actualized through AB Group's 2030 Climate Action Plan. For more details on AB Group's climate beliefs, strategy and action plan, see "AB's Approach to Climate Change," page 3.

Most of the climate-related risks and opportunities that ABL faces over the short-, medium- and long-term concern our investment portfolios. ABL takes AB Group's approach to understanding and

integrating climate-related risks and opportunities. As an investment manager, climate risk impacts our business in two ways. First, physically, through extreme weather events that our global offices may experience, and second, through transitional risk such as increased regulation generated by the rapid evolution of financial-services climate-related products (*Display 11*).

DISPLAY 11: CLIMATE-RELATED RISKS AND OPPORTUNITIES THAT ABL FACES OVER TIME HORIZONS

Risk	Description	Physical or Transitional	Time Horizon	Level
Acute weather event	Disruption to business continuity and operational resilience (e.g., flooding to our outsourced office in Pune, India; storms and power outages in London)	Physical	Short (one to three years)	Moderate
Chronic weather event	Sea level rise, coastal erosion, flooding, a sustained increase in temperatures and drought that could directly impact AB's operations and business continuity	Physical	Long (five+ years)	Limited
Greenwashing	Risk of misselling to clients based on ESG factors	Transitional	Short (one to three years)	Moderate
Impact of regulatory change	Impact of implementing and ensuring compliance with emerging and changing regulation	Transitional	Medium (three to five years)	Moderate

AB Group's partnership with the Columbia Climate School and its partnerships with other climate-focused organizations informs and enhances analysts' and portfolio managers' climate research and understanding of the latest climate science. Investment teams also conduct proprietary research that enhances issuer engagement efforts. These research and engagement insights help identify material climate-related opportunities over the short, medium and long term. Investment teams consider material climate-related risks and opportunities across different investment time horizons, which will vary by asset class and investment opportunity but can range from a few months to a few years.

AB Group's extensive research and engagement work is bolstered by ongoing stewardship practices, including voting and involvement

in the broader investment community. AB also participates in policy advocacy, as appropriate.

For more details on AB Group's approach to climate-related investment risks and opportunities, see "Understanding Climate Risks and Opportunities," page 7, "Integrating Material Climate Risks and Opportunities into the Investment Process," page 18 and "Climate Stewardship," page 22.

For more details on how climate-related risks and opportunities are factored into investment strategies, as well as how each product or investment strategy might be affected by the transition to a low carbon economy, please refer to the ABL product reports, which are provided upon request to clients of ABL.

Financial Resilience and Material Risks

Each year ABL undertakes an assessment of material risks arising from its business model and in pursuit of its business strategy. This includes business scenario analysis as well as stress-testing a five-year financial forecast. The following material risks are linked to climate risk: business disruption risk (linked to physical climate risk); legal and regulatory risk; product misselling risk; and business strategy and revenue risk (linked to climate transition risks). Business scenario analysis is used to assess the impact of these first three risk categories, while stress-testing is used to model business strategy and revenue risk. Many factors beyond climate risk are incorporated into the analysis, resulting in a final determination by the ABL Board of an adequate capitalization ratio for the business, pursuant to UK FCA requirements. While the focus is on overall financial resilience, not just climate resilience, the ABL Board has been able to identify and assess, through its Internal Capital Adequacy and Risk Assessment, where climate physical and transitional risks have the potential to impact ABL's financial resilience and have been able to ensure the business remains well-capitalized and prepared to respond to material risks.

Metrics and Targets

Like AB Group more broadly, ABL assesses climate-related risks and opportunities for its ESG integrated strategies, which comprise most of AB's actively managed strategies. We do not set climate-related targets for our strategies beyond client-directed targets for their own mandates.

ABL measures and monitors key climate-related metrics for its ESG-integrated strategies, which comprise most of its actively managed strategies (*Display 12*). These data are provided upon request to clients of ABL. For more details on how these metrics are used by investment teams, see "Measuring Climate Risks and Opportunities," page 13.

Carbon Emissions: Financed emissions per million dollars invested is a normalized measure of a portfolio's contribution to climate change per USD million invested, on the basis of enterprise value including cash (EVIC).⁹ Weighted average carbon intensity indicates a portfolio's exposure to carbon-intensive issuers and is agnostic to ownership share. Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of consumed energy.

DISPLAY 12: CLIMATE-RELATED METRICS FOR ABL'S ESG-INTEGRATED STRATEGIES

Type of Metric	Metric Formula	Units
Scope 1 + Scope 2 Financed Emissions	$\sum ((\$ \text{ current value investment / issuer's enterprise value including cash}) * (\text{issuer's Scope 1 emissions and issuer's Scope 2 emissions}))$	Tons of CO ₂ e
Scope 3 Financed Emissions*	$\sum ((\$ \text{ current value investment / issuer's enterprise value including cash}) * (\text{issuer's Scope 3 emissions}))$	Tons of CO ₂ e
Total Financed Emissions	$\sum ((\$ \text{ current value investment / issuer's enterprise value including cash}) * (\text{issuer's Scope 1, 2 and 3 emissions}))$	Tons of CO ₂ e
Scope 1 and Scope 2 Financed Emissions Per Million Dollars Invested	$\sum ((\$ \text{ current value investment / issuer's enterprise value including cash}) * (\text{issuer's Scope 1 and 2 emissions}) / \$\text{mil. current portfolio value})$	Tons of CO ₂ e/\$mil. invested
Scope 1 and 2 Weighted Average Carbon Intensity—Corporates	$\sum ((\$ \text{ current value of corporate issuer investment / current corporate portfolio value}) * (\text{issuer's Scope 1 and 2 emissions} / \$\text{mil. revenue of issuer}))$	Tons of CO ₂ e/\$mil. sales
Weighted Average Carbon Intensity—Sovereigns*	$\sum ((\$ \text{ current value of sovereign investment / current sovereign portfolio value}) * (\text{issuer's emissions} / \text{capita}))$	Tons of CO ₂ e/capita

*The Partnership for Carbon Accounting Financials does not currently publish guidance on these calculations.

⁹ While TCFD guidance generally uses market capitalization to allocate carbon emissions, we have elected to use EVIC based on the latest developments in market best practice, as evidenced by the latest guidance from the Partnership for Carbon Accounting Financials.

Climate Value-at-Risk: The portfolio's Climate Value-at-Risk (CVaR) is a weighted aggregation of each securities' CVaR. CVaR analysis determines climate risks along a range of transitional and physical climate risk scenarios, typically shown as the present value of the aggregated future policy risk costs, technology opportunity profits, and extreme weather event costs and profits expressed as a percentage of the portfolio's market value should the scenario in question be realized.

The standard CVaR scenarios we typically analyze include the 1.5 REMIND Orderly, 2.0 REMIND Disorderly and 3.0 REMIND Hot House World transition scenarios as described in "Scenario Analysis at AB" on page 16, with the aggressive physical scenario held constant across the three transition scenarios in certain portfolios.

Portfolio Warming Potential: The Warming Potential metric encapsulates a portfolio's contribution to rising temperatures. The

metric aims to quantify the alignment of a portfolio's activities against pathways commensurate with future temperature goals. This concept draws on the Intergovernmental Panel on Climate Change warning to limit global temperature increases by the year 2100 to 2°C or lower compared to preindustrial levels. This metric allows investors to assess compliance with globally agreed temperature thresholds, such as "well below 2°C," enshrined in the Paris Agreement.

ABL measured the carbon emissions, CVaR and portfolio warming potential for its aggregate AUM at year-end 2022 (*Display 13*). The total AUM in scope is US\$61.1 billion, as of December 31, 2022. Note that this analysis does not include security look-throughs for exposure to funds where AB Group is not the underlying manager. This analysis does not include funds managed by AB where we can't look through, because they are managed outside of our core accounting systems.

DISPLAY 13: ABL'S AGGREGATE AUM CLIMATE DATA

Field	Value	Coverage	Absolute Weight
Financed Carbon Emissions Scope 1	1,997,027 tCO ₂ e	88.2%	59%
Financed Carbon Emissions Scope 2	414,457 tCO ₂ e	88.2%	59%
Financed Carbon Emissions Scope 3	14,224,587 tCO ₂ e	88.2%	59%
Financed Carbon Emissions Scope 1 and 2	2,411,484 tCO ₂ e	88.2%	59%
Total Financed Emissions	16,636,071 tCO ₂ e	88.2%	59%
Financed Emissions Scope 1 and 2 per \$1 Million Invested	39.1 tCO ₂ e/\$mil invested	88.2%	59%
Scope 1 and 2 Intensity (Sales USD)	120.9 tCO ₂ e/\$mil sales	87.6%	59%
GHG Intensity (Per Capita)	13.0 tCO ₂ e/capita	95.8%	18%

CVAR					
Scenario	Physical Risk	Policy Risk	Tech Opp.	Total CVAR	Coverage
Orderly	-7.0%	-8.2%	4.4%	-10.8%	85%
Disorderly	-7.6%	-19.7%	9.0%	-18.3%	85%
Hothouse	-8.3%	-1.1%	0.2%	-9.3%	85%
ITR	2.58				
ITR Coverage	88%				

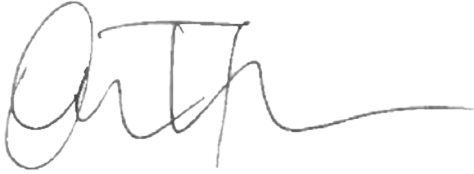
Like AB Group, ABL primarily uses data from MSCI. Reported Scope 1 and 2 emissions data are used when available, while figures estimated by MSCI are used when reported data are not available. Scope 3 emissions, CVaR and portfolio warming potential data are estimated by MSCI. To provide clients with greater transparency, we disclose data coverage percentages alongside a product-level statistic. We do not disclose metrics or quantitative scenario analysis or examples where there are gaps in underlying data or methodological challenges that cannot be addressed by proxy data or assumptions without the resulting disclosure being misleading.

Remuneration for our investment teams—our analysts, portfolio managers and traders, who are also responsible for ESG integration—is designed to align with our mission and values.

Remuneration includes both quantitative and qualitative components. The most significant quantitative component focuses on measures of absolute and relative investment performance in client portfolios for portfolio managers, as well as on contribution to that performance for research analysts. The qualitative portion is determined by individual goals set at the beginning of the year, with measurement and feedback on how those goals are being achieved provided at regular intervals. Some portfolio managers and analysts have goals that promote the integration of material ESG and sustainability factors—including climate-related factors—in their investment processes. The exact goals will vary, depending on the individual's role and responsibilities.

The disclosures in this ABL Supplement comply with the requirements of the FCA ESG sourcebook and have been approved by the ABL Board of Directors on June 30, 2023, for the period of the 12 months ended December 31, 2022.

Signed for and on behalf of ABL:

A handwritten signature in black ink, appearing to read 'Ian Foster', written over a horizontal line.

Ian Foster

Chief Operations Officer—EMEA and Chair of the ABL Board of Directors

Alignment with TCFD Recommendations

TCFD Recommendations		AB Section
Governance		
1.a.	Describe the board's oversight of climate-related risks and opportunities.	<ul style="list-style-type: none"> The Governance Model Overseeing Our Climate Strategy ABL Supplement: Governance
1.b.	Describe management's role in assessing and managing climate-related risks and opportunities.	
1.b. Supp 1	Describe how climate-related risks and opportunities are factored into relevant products or investment strategies. Asset managers should also describe how each product or investment strategy might be affected by the transition to a lower-carbon economy.	<ul style="list-style-type: none"> AB's Approach to Climate Change Understanding Climate Risks and Opportunities Integrating Material Climate Risks and Opportunities into the Investment Process Investing in Climate Solutions: AB's Portfolios with Purpose ABL Supplement: Governance
Strategy		
2.a.	Describe the climate-related risks and opportunities the organization has identified over the short, medium and long terms.	
2.a. Supp 1	Describe engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks in order to improve data availability and asset managers' ability to assess climate-related risks.	
2.a. Supp 2	Describe how we identify and assess material climate-related risks for each product or investment strategy. This might include a description of the resources and tools used in the process.	<ul style="list-style-type: none"> AB's Approach to Climate Change Understanding Climate Risks and Opportunities Integrating Material Climate Risks and Opportunities into the Investment Process
2.b.	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.	<ul style="list-style-type: none"> Investing in Climate Solutions: AB's Portfolios with Purpose ABL Supplement: Strategy and Risk Management
2.b. Supp 1	Describe how climate-related risks and opportunities are factored into relevant products or investment strategies.	
2.b. Supp 2	Describe how each product or investment strategy might be affected by the transition to a lower-carbon economy.	
2.c.	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2 degrees Celsius or lower scenario.	
Risk Management		
3.a.	Describe the organization's processes for identifying and assessing climate-related risks.	<ul style="list-style-type: none"> Understanding Climate Risks and Opportunities Integrating Material Climate Risks and Opportunities into the Investment Process ABL Supplement: Strategy and Risk Management
3.b.	Describe the organization's processes for managing climate-related risks.	<ul style="list-style-type: none"> Understanding Climate Risks and Opportunities Integrating Material Climate Risks and Opportunities into the Investment Process Investing in Climate Solutions: AB's Portfolios with Purpose Climate Stewardship ABL Supplement: Strategy and Risk Management
3.c.	Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management.	<ul style="list-style-type: none"> AB's Approach to Climate Change Understanding Climate Risks and Opportunities: Scenario Analysis at AB ABL Supplement: Metrics and Targets
Metrics and Targets		
4.a.	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk-management process.	<ul style="list-style-type: none"> AB's Approach to Climate Change Understanding Climate Risks and Opportunities: Scenario Analysis at AB ABL Supplement: Metrics and Targets
4.b.	Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 GHG emissions and the related risks.	<ul style="list-style-type: none"> AB as a Business ABL Supplement: Metrics and Targets
4.c.	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	<ul style="list-style-type: none"> AB's Approach to Climate Change ABL Supplement: Metrics and Targets

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IMA-382247-2023-05-10
AB-8104-0623
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