PIMCO

2022

TCFD Report

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CEO Statement

The scientific community has repeatedly emphasized the potential far-reaching impacts of climate change on the global economy, which in turn impacts financial markets and issuers over an extended investment horizon.

At PIMCO, we have developed a comprehensive approach to integrating climate assessments into our investment research and decision-making processes when applicable, to assist our clients in achieving their investment objectives. This integration occurs throughout our time-tested investment process, encompassing both top-down and bottom-up analysis, where we can assess investments' financial resilience to potential climate-related risks. Our commitment to the integration of climate risks along with sustainability risks more broadly was reflected in PIMCO's decision to become a signatory to the UN Principles of Responsible Investment (PRI) in September 2011.

As part of our efforts to address relevant climate-related risks and opportunities, we developed a proprietary climate risk evaluation framework in 2019. This framework serves as a valuable tool for our clients in managing the risks and opportunities associated with climate change, as discussed in detail in the Risk Management section of this report.

Building upon this foundation, we have continued to develop our climate analysis in 2022. We introduced PIMCO's portfolio decarbonization framework, a specialized framework designed to provide targeted support to clients with explicit climate objectives. Concurrently, we have made continuous investments in resources and technology to seamlessly integrate climate data into our investment process, enabling us to develop bespoke climate assessment methodologies, exemplified by our proprietary carbon attribution tool that enables us to measure and report the contribution of various factors to carbon emissions across diverse corporate issuers within a portfolio. This can allow us to identify potential changes in real world emissions and understand to what extent the changes in the portfolio's carbon emissions have been driven by active portfolio management decisions.

PIMCO formally supports the TCFD recommendations, which aim to enhance climate-related financial disclosure. Within this report, we provide a comprehensive overview of how our climate risk and opportunity processes are primarily applied to PIMCO as an asset manager.

This document aims to offer a thorough depiction of our governance surrounding climate-related risks and opportunities and how these are identified, assessed, managed, and monitored by our firm. Additionally, we provide illustrative disclosures on the metrics utilized to measure and manage relevant and material climate-related risks and opportunities.

Emmanuel Roman
CEO of PIMCO

Introduction

In order to help stakeholders better understand an organization's climate-related risks and opportunities, the Financial Stability Board established the Task Force on Climate-related Financial Disclosures (TCFD). Enabling decision-useful and forward-looking information, the framework's four main areas are governance, strategy, risk management, and metrics and targets.

- Governance disclosures illustrate how an organization's board and management team monitor and assess climate risks and opportunities.
- Strategy disclosures provide insight on the actual and potential impact of climate risks and opportunities on the organization.
- Risk management disclosures highlight how the firm identifies, assesses, and manages these risks.
- The final section consists of the metrics and targets that are relevant to manage and assess these climate-related risks and opportunities, for example Scope 1, 2, and 3 greenhouse gas emissions.

Seeking to appropriately integrate material ESG factors, including climate-related risks and opportunities, into our investment decision making and portfolio construction process was one of the main drivers that led us to formalize our support to the Task Force on Climate-related Financial Disclosures (TCFD) in 2019. The purpose of this report is to disclose PIMCO's procedures and capabilities in these four areas, as well as share practical case studies to illustrate these efforts where relevant. Importantly, this report encompasses both PIMCO's sustainable investment solutions as well as those that do not follow a sustainability strategy. Therefore, the extent to which the frameworks, assessments, and metrics discussed are applied in individual portfolios will vary dependent on client-driven preferences.

Integrating relevant climate-related risks and opportunities into the evaluation process does not mean that this is the sole or primary consideration for an investment decision; instead, PIMCO's portfolio managers and analyst teams consider a variety of factors including the financial materiality of those factors to make investment decisions. Importantly, by increasing and diversifying the information available to the portfolio management team we are able to pursue a more holistic view of an investment, which we believe will ultimately benefit our clients.

As an asset manager and fiduciary, our duty is to seek to achieve our clients' stated investment objectives, which vary across portfolios based on investor direction. We offer solutions to support clients' ambitions to achieve decarbonization goals over a long-term horizon in their portfolios, but also recognize the diversity of strategies, approaches and commitments to get there. Our role as a fiduciary differs from asset owners that set targets to reduce their portfolio emissions. Without instruction to do so, we have not imposed any transition targets or climate-related exclusion policies on our client portfolios, as our fiduciary duty obliges us to manage portfolios consistent with our clients' preferences.

CORE ELEMENTS OF RECOMMENDED CLIMATE-RELATED FINANCIAL DISCLOSURES

Source: TCFD. **For illustrative purposes only**

TCFD recommendations to Asset Managers		Section's focus	Title	Summary
Governance	Describe the board's oversight of climate related risks and opportunities and describe management's role in assessing and managing climate-related risks and opportunities.	PIMCO's governance concerning climate-related risks and opportunities.	Management´s role in assessing and managing climate-related risks and opportunities.	PIMCO´s governance framework includes defined roles and groups that are responsible for the facets of sustainable investing.
			Sustainability Leadership team and committees overseeing climate risks and business strategy.	Sustainability Leadership is responsible for overseeing climate risk integration into the investment process, guiding PIMCO's portfolio management team.
			PIMCO's Forums, Global Advisory Board, and specialized Committees.	Climate risks have been assessed as part of both PIMCO's Secular and Cyclical forums as well as regional committees.
				ESG risk (including climate-related risks) is considered as a risk category in PIMCO's risk taxonomy, risk management framework and risk appetite.
Strategy	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	Actual and potential impacts of climate-related risks and opportunities on PIMCO's business, strategy and financial planning.	Climate-related risks and opportunities: potential impacts, specific issues and time frames	Over the cyclical horizon (short term: 0-1 year), we see mixed trends for the energy transition and continued potential for weather-related disruptions. Over the secular horizon (medium to long term: 1-5 years and beyond), key developments suggest a structural rise in both transition and physical risks.
	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.		The impact of climate-related risks on PIMCO's business, strategy and financial planning	These potential impacts led us to continuously deepen our framework that aims to systematically integrate relevant climate factors into our investment process.
			The impact of climate-related opportunities on PIMCO's business, strategy and financial planning	PIMCO has developed a framework to seize opportunities linked to financing the transition. Introduced PIMCO's Net Zero Framework to Decarbonize Bond Portfolios to support clients with specified decarbonization goals.
	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.		How climate-related risks and opportunities are factored into PIMCO's investment strategy	Climate risks are embedded into PIMCO's process to integrate ESG factors into our credit research and investment process firm-wide, including frameworks for major asset classes relevant to PIMCO.
			Climate risks and impact embedded into PIMCO's sustainable investment solutions	In PIMCO's sustainable investment solutions, we embed climate change into our three-step approach of exclusion, evaluation and engagement.
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.		Climate scenario analysis models: assessing the resilience of assets from top-down from top-down to bottom-up	Our climate scenario models suggest it is important to pay attention to climate change now, before damage in the future becomes irreversible and much more severe.
			Collaboration to advance climate risk measurement and management	PIMCO assists with climate efforts in numerous regions and via multiple initiatives.

TCFD recommendations to Asset Managers		Section's focus	Title	Summary
Risk management	Describe the organization's processes for identifying and assessing climate-related risks.	How PIMCO identifies, assesses and manages climate-related risks.	Process for identifying, assessing and managing climate-related risks.	PIMCO measures and manages portfolio risk by focusing on a series of factor-based risk measures. PIMCO's ESG specialists designed proprietary climate tools and frameworks covering a range of perspectives and metrics. We engage with issuers for enhanced corporate disclosure on climate change.
	Describe the organization's processes for managing climate-related risks.			
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.			
	Describe, where appropriate, 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.			
	Asset managers should also describe how they 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.			
Metrics and Targets	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	Climate-focused investment exposure of PIMCO.	Metrics and targets: climate-focused investment exposure of sample PIMCO portfolios.	This section shows, for PIMCO, selected metrics linked to the recommendations of the Task Force on Climate-Related Financial Disclosures and similar disclosure frameworks. At present, given our role as a fiduciary, PIMCO does not employ any universal climate-related targets on the assets managed on behalf of our clients.
	Describe metrics used to assess climate-related risks and opportunities in each product or investment strategy. Where relevant, asset managers should also describe how these metrics have changed over time. Where appropriate, asset managers should provide metrics considered in investment decisions and monitoring.			
	Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.			
	Provide the weighted average carbon intensity, where data are available or can be reasonably estimated, for each product or investment strategy. In addition, asset managers should provide other metrics they believe are useful for decision-making along with a description of the methodology used.			
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.			

As of 31 December 2022, Source: PIMCO, MSCI. **For illustrative purposes only**

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GOVERNANCE

Roles and Responsibilities

Management's role in assessing and managing climate-related risks and opportunities.

PIMCO's governance framework includes defined roles and groups that are responsible for the facets of sustainable investing, including keeping our Risk Committee and Executive Committee apprised of our efforts.

Our Sustainability Leadership Team sets the strategic priorities for the platform and oversees our firm-wide integration efforts, including our research frameworks, systems, and tools. Key members of PIMCO's Sustainability Leadership team include:

- Executive Committee member who is responsible for oversight of the firm's Sustainability initiatives including ESG, as well as product development, marketing, and messaging for all of our Sustainable Investment Solutions and our firm-wide integration of ESG.
- Head of Corporate Sustainability who oversees all aspects of corporate sustainability including the firm's strategy, initiatives, and external partnerships
- Portfolio Management Lead for ESG Investing who is responsible for coordination with the broader credit research team and oversees the ESG analyst team responsible for evaluating and engaging with issuers globally, ESG integration across the trade floor, and consistent implementation of our research frameworks

Business Management group functions each have designated contacts to help coordinate functional support for sustainability efforts across areas such as Operations, Legal & Compliance, Information Technology, and Marketing.

Sustainability Leadership team and committees overseeing climate risks and business strategy

The Sustainability Leadership team, including Grover Burthey, PIMCO's Portfolio Management Lead for ESG Investing, manages PIMCO's ESG investment process that seeks to factor-in climate change risks across selected portfolio management teams, from credit and sovereign research to mortgage and municipal analysis.

The Sustainability Leadership team builds on inputs from PIMCO professionals focused on climate research and investing as well as analytics and technology teams who have developed tools available to assess climate risks. This involves portfolio screeners or a weekly dashboard shared with portfolio managers that is comprised of key data on ESG-labeled[1] bond issuances, pricing, and notable market observations including a list of news flows and research covering important developments linked to climate risks (e.g. regulatory updates).

PIMCO's Executive Committee is responsible for PIMCO's strategic direction and management including establishing firm-wide business strategy and deciding upon a range of financial, operational, and other material matters, while PIMCO's investment strategy is established by our Investment Committee, guided by our economic forums and subsequent strategy sessions. Notably, in recent years, our Investment Committee covered the topic of "stranded assets" defined as those that turn out to be worth less than expected as a result of changes associated with the energy transition.

1 **ESG-labeled** bonds are defined as green, social, sustainability and sustainability-linked bonds. **Green Bonds** are those issues with proceeds specifically earmarked to be used for climate and environmental projects. **Social Bonds** are use-of-proceeds bonds earmarked to finance new and existing projects or activities with positive social impacts. **Sustainability Bonds** are use-of-proceeds bonds earmarked to finance new and existing projects or activities with positive environmental and social impacts. **Sustainability-Linked Bonds (SLBs)** are any type of bond instrument for which the financial and/or structural characteristics can vary depending on whether the issuer achieves predefined Sustainability/ESG objectives.

PIMCO's Forums, Global Advisory Board, and specialized committees

PIMCO's active investment process combines our top-down macroeconomic view with bottom-up research and analysis. Top-down views are driven by our economic forums, consisting of the Secular and Cyclical forums.

During our Secular forums, the firm formulates its outlook for global financial markets over the next five years and, as relevant for such considerations or discussions, considers relevant climate-related issues. For example, in PIMCO's 2021 annual Secular forum, the transition from brown to green energy was highlighted as one of the major disruptive trends to likely drive a major transformation of the global economy and markets. In 2022, the Secular Forum addressed physical risks and climate resilience, including a focus on the agriculture sector. PIMCO's Global Advisory Board, which comprises macroeconomic thinkers and former policymakers, participates in these forums and typically provides insights on global economic, political and strategic developments and their relevance for financial markets. The impact of climate risks was notably highlighted by Mark Carney, UN Special Envoy on Climate Action and Finance, who is part of our Global Advisory Board. These topics are also analyzed in the context of PIMCO's quarterly Cyclical forums to the extent that they affect our bottom-up perspective, as well as growth and inflation forecasts over the business cycle horizon of the next 6-12 months. The momentum for green, sustainability, and sustainability-linked bonds associated with climate targets was explored during the latest quarterly forums held in 2022, for instance.

PIMCO's Secular and Cyclical forums build on PIMCO's research and economic data from presentations by the firm's three regional portfolio committees and the ESG research team, among others. Our regional committees are supplemented by additional committees focused on certain sectors (e.g., PIMCO's European Credit Committee) meeting weekly and addressing a broad range of climate-related risks throughout the year. In recent years, these presentations examined topics such as the US, Asian or European climate policy agenda for businesses and the finance sector in particular (such as the US Inflation Reduction Act or the EU taxonomy for sustainable activities), and the consequences of the international climate policy ambition (takeaways of the United Nations Climate Change conferences). These presentations were led by PIMCO's ESG research team in collaboration with credit research analysts and portfolio managers. Metrics included a review of portfolio greenhouse gas emissions, and net zero alignment methodologies or portfolios' exposure to long-dated bonds in the energy and fossil fuel industries, with a focus on issuers whose transition plan is less advanced.

Further, over the past few years, we have conducted a number of climate-focused educational sessions for PIMCO's investment professionals with internal and external experts focusing on specific topics, including meeting client targets for decarbonization of their portfolios, green bonds or carbon pricing risks. In 2022, PIMCO leveraged a Climate Risk Working Group, which included representation from the firm's economists as well as the Risk, Analytics, Client Solutions, Credit and Portfolio Management teams. The group's focus areas included further embedding climate-related risk into existing PIMCO core stress-testing tools, portfolio risk-profiling, and research.

Specifically in regards to enterprise risk management, ESG risk is considered as a risk category in PIMCO's risk management framework, both for the top-down (top risk assessments and risk appetite statement) and the bottom-up part (risk inventory, risk control self-assessments). The processes described in the risk management section hence systematically consider ESG risks and mitigations. Additionally, PIMCO broadly takes into account a wide array of risk categories, including those related to distribution and marketing risk side, regulatory and compliance risk, and vendor risk.

STRATEGY

Climate Risk Integration

PIMCO's role in the transition to a low-carbon economy

PIMCO is committed to providing appropriate advice and solutions for clients on a range of sustainability issues, including climate change. PIMCO, as an asset manager, recognizes the distinct role that it plays relative to asset owners, who each have varying investment objectives, preferences, and regulatory environments. Our role is to manage our clients' assets using the parameters that they have set out, which can often incorporate climate risk considerations but will do so to varying degrees and in varying formats. Consequently, PIMCO has not imposed universal climate targets on portfolios the firm manages. However, as clients begin or continue to assess the possibility of adding these targets, we work collaboratively with them on assessing the feasibility of structuring and managing these.

Our strategy has been to:

Provide clients with investment solutions to help meet their decarbonization ambitions

Develop portfolio analytics available to our portfolio managers to use in evaluating investments and managing portfolios

Engage with issuers, where relevant, to evaluate their transition plans to maximize value for investors

Work with relevant industry groups that meet internal criteria to develop standards and educate constituents

As part of our support to clients with specified decarbonization goals, we have developed a four-pronged approach of 1. reducing the carbon footprint, 2. investing in climate leaders, 3. supporting climate solutions and 4. influencing change through engagements.

Climate-related risks and opportunities: potential impacts, specific issues, and time frames

PIMCO recognizes that climate change may have a profound impact on the global economy, financial markets, and issuers. While the horizon of climate models can span a very long period, which we typically characterize as the secular or super-secular horizon (1-5 years and beyond), the pace of change can be swift and relate to our cyclical horizon (0-1 year). Risks and opportunities related to climate change may materialize in unexpected ways, and can affect investments across asset classes, including a wide range of fixed income securities, such as corporate credit, mortgage-backed securities, sovereign debt, and municipalities. The impact on financial markets and bond prices may be abrupt and sudden.

How climate-related risks and opportunities are factored into PIMCO's investment strategy

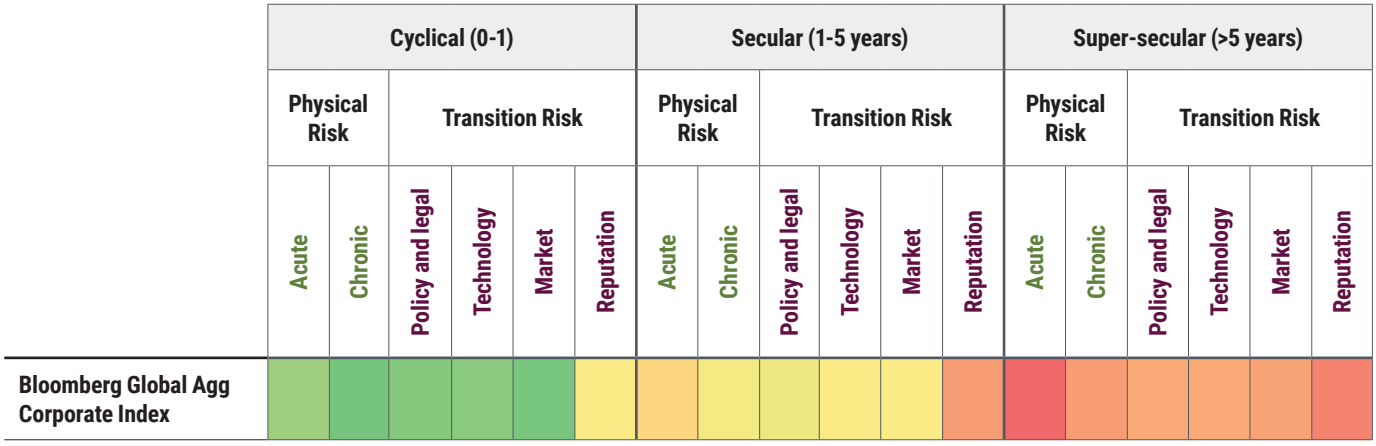
When evaluating climate-related risks of specific sectors and issuers as part of PIMCO's integration of ESG factors into our investment process firm wide, we begin with two broad categories:

1. **Transition risks,** including policy, legal, technology, market, and reputation risks (e.g., tighter regulations on carbon emissions, climate-related litigation).
2. **Physical risks,** including both acute and chronic. Acute are event driven, such as hurricanes and wildfires. Chronic risks are longer-term shifts in climate patterns, such as how the rising intensity and frequency of extreme weather events affects critical assets and natural resources used by the issuer.

	Transition Risk	Physical Risk
Examples	• Carbon regulation (e.g. tax or cap and trade systems) • Energy-related technology changes (e.g. rise of low-carbon sources of energy such as renewables) • Shifting customer preferences • Liability (e.g. litigation against governments and companies due to a lack of action)	• Acute physical risks (e.g. increased severity of extreme weather events, such as cyclones and floods) • Chronic physical risks (e.g. changes in precipitation patterns and extreme variability in weather patterns, rising mean temperatures and sea levels) • Air pollution • Water stress • Forest and land degradation
Corporates	Autos, Energy, Coal mining	Insurance Property and Casualty (P&C), Utilities, Refining
Sovereign	Fossil fuel-exporting and energy-intensive sovereigns, depending on their fiscal positions and savings	Developing countries, especially those lacking diversification (e.g., economic sectors, energy sources)
Munis	Coal-fired generation among utilities	Significant risks of water shortages for US water utilities connected with regional and local governments
Mortgage- and asset-backed securities (MBS and ABS)	**ABS:** Aircraft, auto loans, leases affected by carbon regulations; MBS: 'Brown' assets lacking compliance with energy efficiency and environmental standards	**MBS:** Holders of residuals or Mortgage Servicing Rights, activities with concentrated exposure to specific geographies, such as Commercial Real Estate lending

As of 31 December 2022. **Illustrative climate risk drivers and assets exposed to these drivers**

PIMCO has developed a climate risk scoring methodology that evaluates corporate sectors' exposure to these two climate risks over different time horizons, the cyclical (0-1 year), secular (1-5 years), and super-secular (>5 years). This assessment serves as a starting point before drilling down into specific issuers. The graphic below provides an illustration of this scoring methodology, examining a corporate credit-focused benchmark.



As of 31 December 2022. Source: Moody's, PIMCO, IPCC, IEA, DNB, IPR Climate Transition Forecasting Consortium.

For Illustrative Purposes Only

The following table provides more information on the time horizons we use to assess climate-related risks and opportunities, alongside selected issues identified and analyzed in terms of potential investment implications (illustrative given that PIMCO's global footprint across various asset classes involves a broad range of climate-related risk drivers) and other types of impacts, such as on our clients or PIMCO from a regulatory or reputational perspective.

Time horizons	Time horizon label	Short term (0-1 year)	Medium term (1-5 years)	Long term (>5 years)
	PIMCO's investment process (forums' terms)	Cyclical	Secular	Super-secular
	Perspective	How to identify potential changes in monetary and fiscal policies, market risk premiums, and relative valuations that drive portfolio positioning	How to position portfolios to benefit from structural changes and trends in the global economy	
Transition Risk	Policy and Legal	Greater support for low-carbon energy sources, such as renewable energy and storage, as part of government's response to the energy shock	Carbon price increase in terms of value and coverage of greenhouse gas emissions phase-out (including bans) of certain high carbon sources of energy, technologies and products	
	Technology	Record growth of renewables capacity additions amid improved competitiveness	Renewable energy emerges as the dominant source of electricity generation	Deployment at scale of advanced batteries, hydrogen electrolysers, and direct air capture and storage
	Market	Increased uncertainties and growing demand for fossil fuel ESG-labelled bonds growth and diversification (e.g. transition-related green bonds and sustainability-linked bonds)	Increased investments into renewable energy and lower investment into fossil fuels supply Growth in climate-related requirements and requests from clients	Declining demand for fossil fuels, especially oil
	Reputation	Increased scrutiny and concerns over "greenwashing" (e.g., misrepresentation of climate characteristics of an issuer or financial product), including ESG data and standards integrity		
Physical Risk	Acute	Rising costs of disasters such as hurricanes, wildfires, floods		
	Chronic	Disruptions to energy supply brought about by droughts	Heatwaves could result in labor productivity and crop yield losses, disrupting soft commodity supply	

As of 31 December 2022. Source: IEA, PIMCO, S&P, Munich Re, Swiss Re. **For Illustrative Purposes Only.**

Over the cyclical horizon we see some geopolitical uncertainties and other sources of energy market volatility and continued potential for weather-related disruption impacting our investments, as seen in previous years. Over the long term, key developments suggest a structural rise in both transition and physical risks.

The impact of climate-related risks on PIMCO's business

In recent years, we built out our proprietary climate risk evaluation framework, which we have been continuously expanding and enhancing. This led to the development of tools and methods that seek to integrate over time relevant climate risk evaluations in our investment decisions as per applicable investment guidelines or business considerations.

PIMCO aims to consider all potential risks and opportunities that could affect particular issuers or industries where appropriate, including climate-related risks – both physical and transition. For instance, PIMCO's fundamental analysis of credits in the energy sector closely examines companies' exposure to different types of energy sources and extraction methods, environmental and regulatory risks to their business activities, the relative cost positions of companies and their commitments, and steps taken to diversify into lower-carbon sources of energy.

Ultimately, we look to map the extent to which long-term climate risks can be reflected in our credit views and bond prices where applicable, and, if they are not, what this could mean for issuers' credit quality considering bond characteristics (e.g., duration) over time.

The impact of climate-related opportunities on PIMCO's business

As risks mount, many issuers around the world are shifting from climate awareness to action, giving rise to new investment opportunities. Investors are monitoring government responses to climate risks in the form of regulation, carbon taxes, and public investment, as well as shifts in consumer sentiment and business models. We expect these trends to materially change the investment landscape: the transition away from fossil fuels toward clean energy, for example, could create attractive investment opportunities not just limited to the energy sector (e.g. clean transport, energy-efficient buildings) and significantly transform the global economy.

Fixed income markets, in our view, currently offer a diverse array of sustainable investment options and even more so in the years to come. The sustainable bond market, including green and sustainability-linked bonds, continues to grow at a rapid pace, offering compelling opportunities to finance – among others – the climate transition. PIMCO's ESG analyst team has published best practices for issuers of ESG-labelled bonds in both the corporate, sovereign, and municipality space, as well as specific viewpoints on sustainability-linked bonds.

For clients looking to implement decarbonization targets, PIMCO has developed a four-pillar decarbonization framework to help investors target long-term objectives to reduce portfolio exposure to greenhouse gases. This framework provides a meaningful and realistic approach to decarbonizing fixed income portfolios over time, while engaging and investing in the climate solutions and leaders best positioned to contribute to real-economy emissions reductions.

As certain asset owners explore the possibility of incorporating decarbonization targets in their investment portfolios, PIMCO has collaborated with numerous clients on assessing the feasibility and portfolio implications of implementing decarbonization targets.

CASE STUDY: PORTFOLIO LEVEL DECARBONIZATION TARGETS IN CREDIT MANDATES

PIMCO recently worked with an Asia-based insurance client to explore the potential implementation of a near-term portfolio decarbonization target. This target was aligned with the company's firm-wide commitment, and consisted of a 30% reduction in its weighted-average carbon intensity by 2024 compared to a 2019 baseline. PIMCO's tailored solution assessed numerous possible ways to implement this, balancing the greenhouse gas emissions reduction with minimizing portfolio impact (e.g., transaction costs, constraints on investment universe).

At PIMCO, we realize that every client has different needs and ambitions. Importantly, PIMCO's decarbonization framework can be adapted to account for investors' preferences, as well as support those who have opted not to follow a specific pre-defined approach.

PIMCO's Assessment of Climate Risks Across Asset Classes – Case Studies[2]

This section provides details on climate risks identified and analyzed for major asset classes relevant to PIMCO (for illustrative purposes only), including how they may be affected by the transition to a lower-carbon economy: Corporate, Sovereign, Municipal, Securitized, and Alternative.

While the findings of this climate risk assessment may inform various actions (e.g. engagement), the examples below illustrate how they impact our research and investment decisions. They broadly show that our evaluation of climate risks fits into PIMCO's global investment process, including the assessment of issuer's credit quality and whether we are appropriately compensated for the climate-related financial risks analyzed.

CASE STUDY: CORPORATE CREDIT CLIMATE-RELATED RISKS AND OPPORTUNITIES

Physical risks: There have been a limited number of instances where acute risks already had a more significant impact on corporate issuers. In these scenarios, the impact has been on a rather small number of corporate issuers (e.g. hurricanes for US refiners or chemicals, or floods in Europe for financials). Chronic risks, such as heatwaves and reduced rainfall, may have a more significant impact over the medium term. In the short term, heatwaves and reduced rainfall are two examples of risks that had a limited and temporary impact on corporate issuers' financials, for example, for food and beverages and utilities in Europe. Climate models suggest that these impacts may be exacerbated in the very long term (second part of the century) and could potentially remain moderate in the coming decade (e.g. by 2035).

Transition risks: Policy, technology, market, and reputation transition risks have had a significant impact on sectors like utilities and the automobile industry. As the energy transition accelerates, these risks are likely to become more prominent in high-carbon sectors.

Below are select examples which illustrate how material climate factors may affect a PIMCO analyst's overall credit view on a corporate issuer.

Issuer	EM Infrastructure	Multinational Utility	US Utility
Asset Class/Sector	**Corporate**	**Corporate**	**Corporate**
Climate risk type	Transition risk	Transition risk	Physical risk
Issuer profile	Transportation services	Global power generation company	US-focused power generation company
Material climate factors affecting analyst overall view	Related party transactions from controlling shareholder which owns and develops coal assets Refinancing risks associated with coal businesses	Ambitious low-carbon transition plan will benefit from infrastructure package and demand for renewable energy R&D toward battery storage, hydrogen and other emerging energies likely accretive to enterprise value	High climate physical risk exposure for the coming decades compared to peers Historical impacts of physical risks also considered (wider spreads given financial losses, reputational damages and regulatory action)
PIMCO Credit research and investment implication	Lower PIMCO Credit Rating, relative to the Agency Rating	Higher PIMCO Credit Rating, relative to the Agency Rating	Risk already reflected into bond prices, PIMCO and Agency Ratings

As of 31 December 2022 except the multinational utility which is as of April 2022; Source: PIMCO. **For Illustrative Purposes Only.**

2 **The examples above are presented for illustrative purposes only,** as a general example of PIMCO's ESG research and engagement capability and is not intended to represent any specific portfolio's performance or how a portfolio will be invested or allocated at any particular time. PIMCO's ESG processes may yield different results than other investment managers' and a company's ESG rankings and factors may change over time. All data is as of 31 December 2022, unless otherwise stated.

CASE STUDY: SOVEREIGN CREDIT CLIMATE-RELATED RISKS AND OPPORTUNITIES

Physical risks: Countries are increasingly exposed to both acute and chronic physical risks, such as wildfires, flooding, and sea level rise. Countries around the equator and those reliant on agriculture are particularly vulnerable. Climate hazards can affect countries and their wealth over a long-term horizon through direct damage to their physical capital stock (loss of land, changing crop yields, depleted natural resources, damage to infrastructure etc.). These hazards can also affect countries and their wealth via indirect social impacts (food insecurity, productivity loss, international migration, civil unrest etc.), or biodiversity loss and international trade disruptions (climate change impacts on supply chains).

Public finance could be particularly affected by climate shocks (e.g. loss of revenues, increasing insurance costs, loss of value), leading to greater debt burdens that can undermine the financial stability of a country (e.g. increased probability of default). Different sovereigns will have differing levels of buffer to absorb the impacts of physical climate risks and results will vary according to policy responses that governments may take to manage and adapt to such risks. Opportunities could arise from mitigation actions, including climate resilience investments (e.g. seawalls, climate-smart agriculture, and infrastructure that is more resilient to high heat and extreme storms).

Below is an example which illustrates how material climate factors may affect a PIMCO analyst's fundamental valuation on a sovereign.

Issuer	EM country
Asset Class/Sector	**Sovereign**
Climate risk type	Physical risks
Issuer profile	Asian country
Material climate factors affecting analyst overall view	While the country is among the lowest greenhouse gases emitters, they are among the countries most vulnerable to the effects of climate change (and highly dependent on climate-sensitive sectors, such as agriculture, water, and natural resources) with limited adaptation capacity. A recent uptick in extreme climate events and a lack of infrastructure capacity has resulted in major loss of lives, infrastructural damage, and massive economic losses further deteriorating the economic position of the country and deepening the country's dependence on external funding.
PIMCO Credit research and investment implication	Lower fundamental valuations vs market pricing

As of 31 May 2022. Source: PIMCO. **For Illustrative Purposes Only.**

Transition risks: The impact of transition risks varies across different countries and sectors. For example, sovereigns with a large dependence on fossil fuels may face budget pressures due to tightening climate-related legislation. The general trend towards more aggressive carbon targets and tightening carbon policies across carbon intensive sectors could entail material implications for businesses, households, and government spending. Mitigation actions partly depend on countries' response and resilience. Significant opportunities could arise on the back of low-carbon technology and governments propping up these sectors could in turn foster their economic growth. Transition policies that would help advance the global net zero target in an orderly fashion could alleviate these risks.

CASE STUDY: SECURITIZED CREDIT CLIMATE-RELATED RISKS AND OPPORTUNITIES

Similar to other financial assets, securitized products are subject to transition and physical risks, which can be material.

Select Securitized Credit Potential Materiality Exposure

	Transition Risk	Physical Risk
Residential Mortgage-Backed Securities (RMBS)	High	High
Commercial Mortgage-Backed Securities (CMBS)	High	High
Auto Asset-Backed Securities (Auto ABS)	High	
Student Loan ABS		
Credit Card ABS		
Collateralized Loan Obligation (CLO)	Medium	Medium
Covered Bond	Medium	Medium

As of 31 December 2022. Source: PIMCO. **For illustrative purpose only.**

High Medium Low

Note: High/Medium/Low refer to the perceived materiality (potential exposure) in scenarios that may be deemed extreme relative to the current situation and unfold over several decades from now (e.g., disorderly transition to net zero, or limited climate action resulting in a significant increase in the intensity and frequency of extreme weather events). 'Low' includes areas where there is a particularly low visibility given data availability and quality.

Physical risks: We view physical risk affecting securitized credit predominantly through the risk that natural hazards could impose on the underlying collateral.

For those where collateral is mostly concentrated in real assets, such as Residential Mortgage-Backed Securities (RMBS) or Commercial Mortgage-Backed Securities (CMBS), we utilize proprietary tools to locate the real estate assets in the underlying pool and combine the geographic data with climate research data (e.g. Federal Emergency Management Agency) to estimate the aggregated historical impact of various natural hazards (e.g. Hurricanes or Wildfire) on these assets.

For those where collateral is mostly concentrated in financial assets, such as Collateralized Loan Obligations (CLOs), we look to leverage physical risk tools, including forward-looking data that we are developing for the underlying corporates, but further extend the analysis to the CLO manager and structure level.

Transition risks: The main transition risk focus for securitized credit stems from the potential impacts of an acceleration of the energy transition and tightening carbon regulations on the underlying sectors and assets (e.g. reduced value for those lacking compliance with energy efficiency and environmental standards). Therefore, we leverage internal corporate sector frameworks designed to evaluate climate risks for those relevant to the underlying loans, such as automotive, banks, or real estate.

Below are select examples which illustrate how material climate factors may affect a PIMCO analyst's overall view on a securitized investment opportunity.

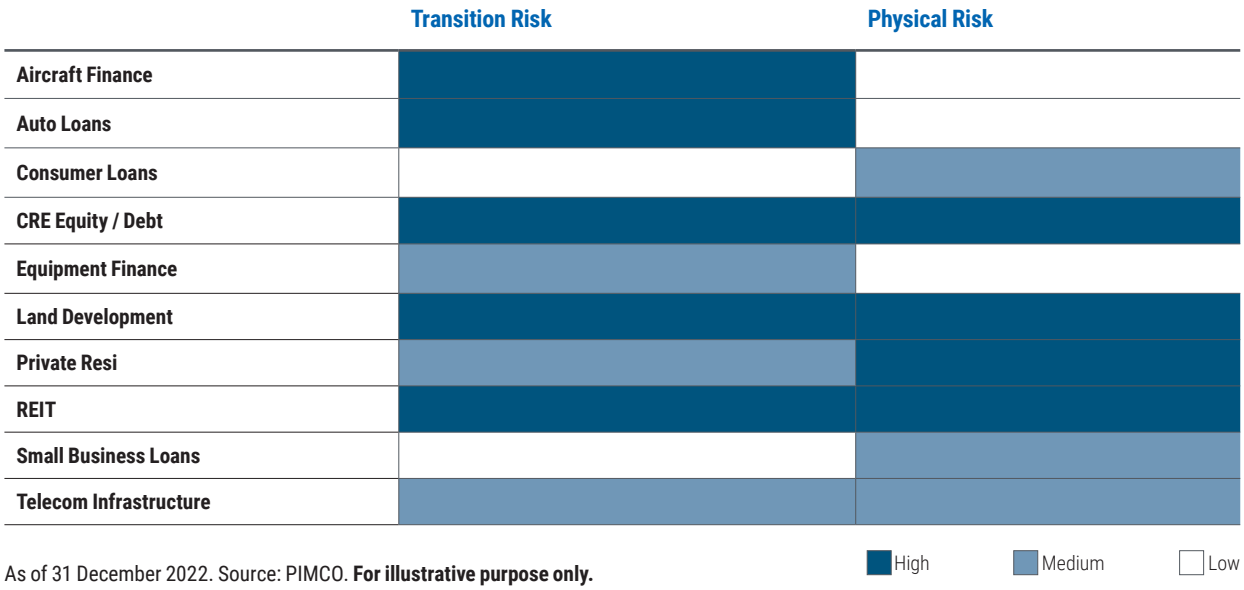
Issuer	Solar Loans / Leases Asset-Backed Security (ABS)	Non-Agency Commercial Mortgage-Backed Securities (CMBS)
Asset Class/Sector	**Securitized**	**Securitized**
Climate risk type	Transition risk	Transition risk
Issuer profile	Residential solar installer and financier	Single-asset / single-borrower fixed-rate deal secured a newly constructed certified building
Material climate factors affecting analyst overall view	Extension of solar Investment Tax Credit given recent passage of Inflation Reduction Act will continue to provide economic incentives to residential customers Secular trend of electrification and de-carbonization, spearhead by major metropolitan cities where residential solar has been serving traditionally, further supports sector growth.	Attractive from an ESG perspective (environmental impact credentials, including energy efficiency), as well as desirable from a tenant perspective The CMBS financing framework reflects industry best practice, aligned to ICMA Green Bond Principles
PIMCO Credit research and investment implication	Supportive. PIMCO participated in the new issue	Supportive. PIMCO participated in the new issue

As of 31 December 2022. Source: PIMCO. **For illustrative purpose only.**

CASE STUDY: ALTERNATIVE INVESTMENTS

Alternative investments are subject to potential transition and physical risks which, similar to other financial assets, can be material and partly depend on the segment in scope.

Select Alternative Investment Potential Materiality Exposure



As of 31 December 2022. Source: PIMCO. **For illustrative purpose only.**

Note: High/Medium/Low refer to the perceived materiality (potential exposure) in scenarios that may be deemed extreme relative to the current situation and unfold over several decades from now (e.g., disorderly transition to net zero, or limited climate action resulting in a significant increase in the intensity and frequency of extreme weather events). 'Low' includes areas where there is a particularly low visibility given data availability and quality.

Physical risks: Alternative assets with physical underlying collateral have the greatest exposure to physical risks. Natural hazards and perils are taken into consideration during the pre-investment due diligence process, particularly when underwriting commercial real estate deals, as asset performance can be severely impacted in extreme weather events.

Transition risks: Alternative assets are exposed to potential transition risk with the built environment and transportation-related collateral having the greatest potential exposure.

CASE STUDY: MUNICIPAL CREDIT CLIMATE-RELATED RISKS AND OPPORTUNITIES

Physical risks: Municipalities face both short-term and long-term physical risks, including acute events like flooding and wildfires, as well as long-term changes from sea level rise and temperature change. These risks can impair a community's tax and employment base.

Transition risks: While physical risk is a more immediate consideration, transition risks are considered for communities with significant ties to the fossil fuel industry. The impact of the transition away from fossil fuels varies across different communities, with some communities poised to benefit from the energy transition while others may see negative impacts on their tax and employment base.

Climate risks and impact embedded into PIMCO's sustainability strategies

In PIMCO's portfolios that follow sustainability guidelines and strategies[3], we embed climate change into our three-step approach of exclusion (e.g. fossil fuels[4]), evaluation (e.g. climate performance), and engagement to assess both the portfolio's contribution to climate change, and the impact of climate change from a credit risk perspective. Sustainability strategies aim to be better positioned than their respective benchmarks with respect to their exposure and management of climate risks, given their relative focus on issuers with stronger climate characteristics overall (e.g., issuers with lower carbon intensity than peers, and companies with science-based carbon emission reduction targets and robust transition plans).

PIMCO's process to evaluate these risks includes both the incorporation of this analysis into our credit and ESG research as well as the implementation of climate scenario analysis and stress tests.

Climate scenario analysis models: assessing the resilience of assets from top-down to bottom-up

PIMCO has developed models taking both top-down and bottom-up approaches to climate scenario analysis in order to assess our portfolio's potential resilience to relevant climate risks. PIMCO's Climate Risk Working Group conducts scenario analysis based on emerging methodologies and guidelines, such as those seeking to model the potential impact an extreme and sudden climate transition would have on bond prices (value at risk). Existing climate models could also examine the potential impact on bond prices in the event where no action is taken on climate change.

The following section expands further on these models and demonstrates how considering different climate scenarios enables PIMCO to have a more holistic assessment of the resilience of its investment strategies in relation to climate-related risks.

3 With respect to comingled funds with sustainability strategies and guidelines ("funds that follow sustainability strategies and guidelines"), we have built on PIMCO's over 50-year core investment processes, while actively incorporating sustainability principles. Through these guiding principles – excluding issuers fundamentally misaligned with sustainability factors, evaluating issuers using proprietary and independent ESG scoring (in addition to externally sourced and internally developed criteria), and engaging with issuers on ESG-related topics with the objective of improving investment outcomes – funds that follow sustainability strategies and guidelines seek to deliver attractive returns while also pursuing to provide a vehicle through which investors can meet their sustainability preferences. Please see each fund that follows sustainability strategies and guidelines prospectus for more detailed information related to its investment objectives, investment strategies and approach to ESG.

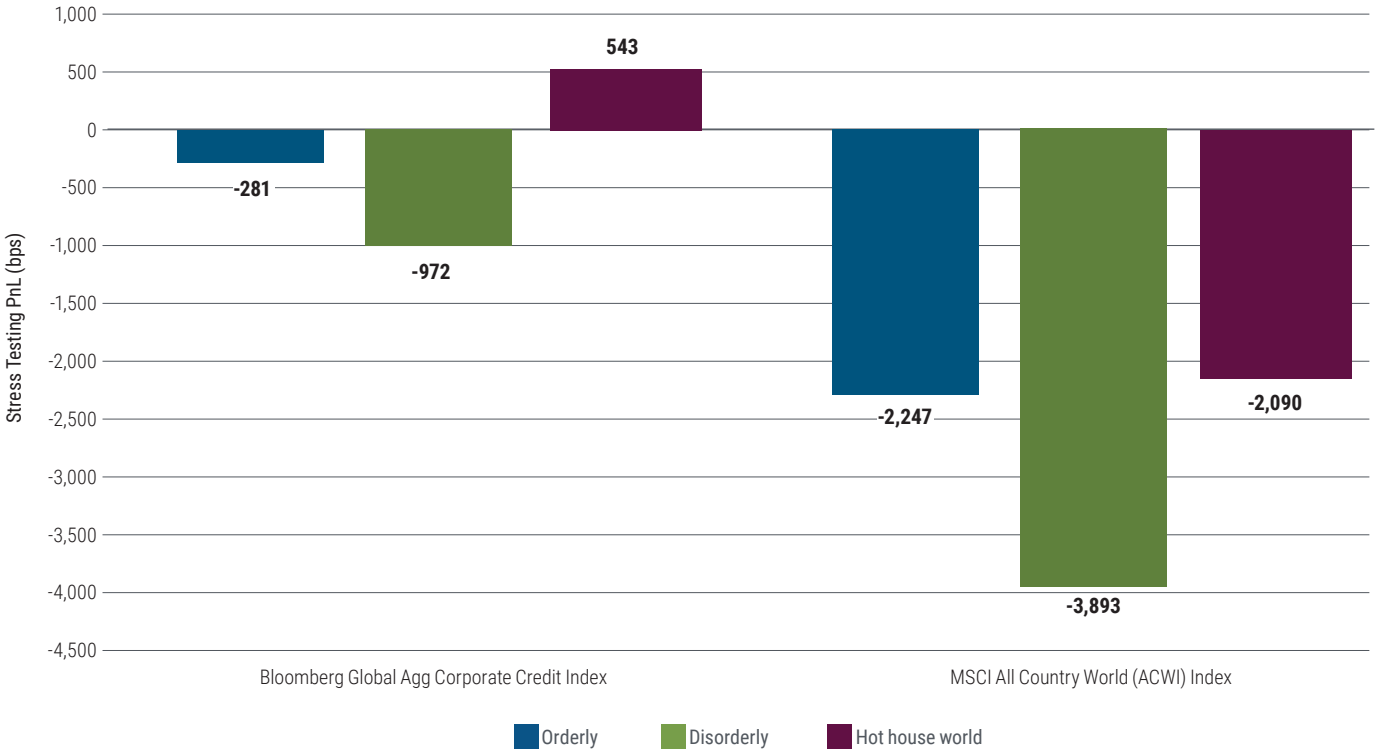
4 Defined as issuers principally engaged in the oil industry, including extraction, production, refining, transportation, or the production, sale of coal and coal-fired generation.

TOP-DOWN MODEL

We have created a PIMCO model which uses empirical data to capture the main mechanisms linking climate change to the global economy, such as changes in environmental taxes, impacts of rising temperatures, etc. With this model we can simulate the cumulative impact climate change could have on real GDP for the world, the U.S., and Europe over the years 2020-2050 under the three different scenarios designed by the Network for Greening the Financial System (NGFS) (More information on the top-down model and the NGFS Scenarios can be found in the Appendix).

To determine the impact of climate scenarios on asset prices, we map the loss in real GDP onto real equity returns and real rates. Detailed below are the PIMCO model results ('climate value-at-risk [VaR]') for a global fixed income index (Bloomberg Global Aggregate Corporate Credit Index) and a global equity index (MSCI All Country World (ACWI) Index).

PIMCO top-down model implied impact on benchmark returns by scenario



[5] As of 31 December 2022. Source: Burke and Tanutama (2019), Bloomberg, BP, IMF, OECD, Our World in Data, PIMCO. **For illustrative purposes only**

In the orderly and disorderly scenarios, the implementation of a carbon tax causes lower real GDP and higher inflation. Based on our mapping to asset prices, this implies that equities fall and rates rise. For the Bloomberg Global Aggregate Corporate index, we find the negative return on equity also means credit spreads widen.

The disorderly scenario features a delayed transition and larger losses in real GDP due to transitioning later, and also larger inflation causing a more negative return for the fixed income benchmark compared to the orderly scenario.

In the hot house world scenario, there is no inflation to offset the large losses in real GDP due to physical risk. As a result, equities and rates fall, leading to losses in the equity benchmark and gains in the fixed income benchmark due to duration. While this simplified modelling inherently does not capture the specific impacts on fixed income sectors and securities given their characteristics and respective vulnerability to climate risks, it is useful as a first step to shed light on the connections between climate-induced GDP shocks and portfolio returns, all else equal.

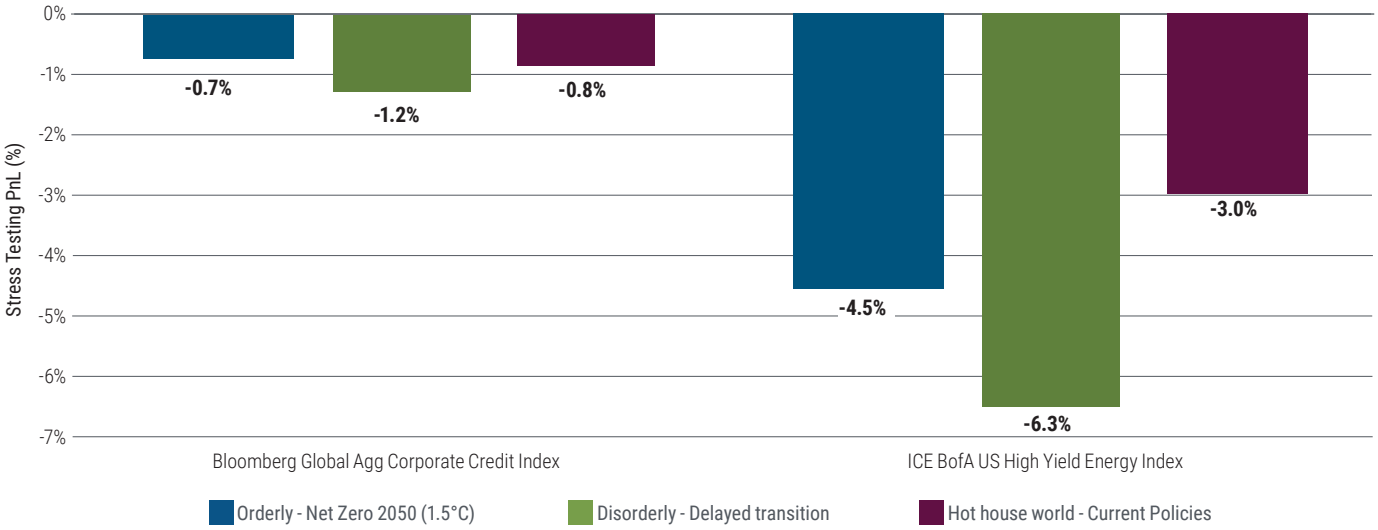
5 Source: PIMCO Proteus model output as of 31 December 2022 for the MSCI ACWI Net Total Return USD Index. **For illustrative purposes only.** The top-down macro model maps a NGFS climate scenario to two types of outputs: macroeconomic and risk factor. The outputs are a panel with country and time dimensions. The time series dimension is annual over the same horizon as the input scenario. We assume the climate scenario affects the macroeconomic outputs through two channels: 1) Physical risks: Loss in productivity due to human-driven increase in global temperature; 2) Transition risks: Increased inflation and loss in growth from taxing carbon and subsidizing renewable investment. These macroeconomic shocks flow through to asset prices which we capture using a set of risk factors. The risk factor outputs are then plugged into PIMCO's risk model (Proteus) and then applied to the desired account, index or security to generate the final return impact of the climate scenario. Given the uncertainties linked to climate models and data, this work inherently includes a host of assumptions and is exploratory and iterative. Scenarios are not forecasts or predictions. Sources: NGFS, IMF, OECD, BloombergNEF, World Bank, FRED, Our World in Data, Burke and Tanutama (2019).

BOTTOM-UP MODEL

PIMCO has developed a bottom-up sector stress-testing model using a distinct set of assumptions separate from those of the top-down approach. This model builds upon internal research and central bank stress testing exercises to determine equity price shocks for material sectors.[6] These shocks incorporate both physical and transition risks across the Network for Greening the Financial System's (NGFS's) six scenarios.[7] PIMCO then translates these equity shocks into fixed income shocks and can apply them to corporate bonds in a portfolio.[8]

The charts below illustrate the impact climate change could have on two different corporate credit benchmarks, the Bloomberg Global Aggregate Corporate Index and the ICE BofAML US High Yield Energy Index. Portfolios with a higher allocation to materially exposed sectors (e.g. energy), can increase the severity of losses across scenarios. The disorderly scenario can produce the most severe outcomes, as the world's abrupt transition materially affects the equity valuations of high carbon-emitting sectors.

PIMCO bottom-up model's impact on benchmark returns per scenario



[9]As of 31 December 2022. Source: Bank of England, NGFS, PIMCO. **For illustrative purposes only**

While the model does not account for a company's specific dynamics, which we address via a complementary bottom-up research approach[10], it provides insights into sector selection that can help structure more climate-resilient portfolios.

6 https://www.bankofengland.co.uk/stress-testing

7 https://www.ngfs.net/ngfs-scenarios-portal/

8 Source: PIMCO Bottom-up model output as of 12/31/2021 for the Bloomberg Global Aggregate Corporate unhedged USD index. Output represents the impact on corporate bonds for both transition and physical risk. For illustrative purposes only. This model draws on a simplified method suggested by the Bank of England to assess the potential corporate sector shocks (equity and bond prices change under each climate scenario), for climate-relevant sectors, including both transition and physical risk. These sectors are then mapped to their equivalent subsectors. The Bank of England's three climate scenarios (Orderly, Disorderly, and Hot House) are expanded to include the three new NGFS scenarios released in 2021. Each new scenario is calculated as a change compared to the original three scenarios. Expansion from three to six scenarios is accomplished by using multipliers for transition and physical risk. The transition risk multiplier is based on the NGFS carbon price for a given base and new scenario. The physical risk multiplier is based on temperature differences under each scenario. Bond price impact is estimated to be 15% of equity impact. Given the uncertainties linked to climate models and data, this work inherently includes a host of assumptions and is exploratory and iterative. Sources: NGFS, Bank of England, Merrill Lynch.

9 Source: PIMCO bottom-up model output as of 31 December 2022 for the ICE BofAML US High Yield Energy index. Output represents the impact on corporate bonds for both transition and physical risk. **For illustrative purposes only.**

10 Source: PIMCO bottom-up model output as of 31 December 2022. Output represents the impact on corporate bonds for both transition and physical risk. **For illustrative purposes only.** This model draws on a simplified method suggested by the Bank of England to assess the potential corporate sector shocks (equity and bond prices change under each climate scenario), for climate-relevant sectors, including both transition and physical risk. These sectors are then mapped to their equivalent subsectors. The Bank of England's three climate scenarios (Orderly, Disorderly, and Hot House) are expanded to include the three new NGFS scenarios released in 2021. Each new scenario is calculated as a change compared to the original three scenarios. Expansion from three to six scenarios is accomplished by using multipliers for transition and physical risk. The transition risk multiplier is based on the NGFS carbon price for a given base and new scenario. The physical risk multiplier is based on temperature differences under each scenario. Bond price impact is estimated to be 15% of equity impact. Given the uncertainties linked to climate models and data, this work inherently includes a host of assumptions and is exploratory and iterative. Sources: NGFS, Bank of England, Merrill Lynch.

Climate resilience of PIMCO

In general, preliminary data produced by these models suggest a moderate impact of climate scenarios on broad-based fixed income markets. However, limitations of stress testing methodologies and data described in the appendix, alongside the areas for improvement we focus on, warrant great caution.

To help address these risks, we focus on two types of risk mitigation levers:

1. PIMCO's business model and investments diversification in terms of asset classes, credit quality, sectors and geographies.

Climate-related risks have the potential to impact the value of our assets under management (AuM), which would affect our future profitability. PIMCO's exposure to climate related risks is predominantly via the financial assets we manage on behalf of our clients; our business model offers us a certain degree of flexibility and agility to adapt our exposure depending on the realized climate scenario, in order to effectively mitigate such risks.

Moreover, our portfolios are broadly diversified across a number of asset classes and geographies; a large portion of our assets is invested in high-quality, highly liquid instruments of the fixed income market including investment grade corporate credit, government and government-related securities, and cash equivalents. Climate risk-driven expected losses for bonds are typically smaller in magnitude compared to other asset classes (such as equities); diversification helps avoid unwanted concentrations towards economies that are geographically and/or structurally more vulnerable to climate change.

2. Our climate risk integration and management process as described in other sections, most notable in Risk Management.

Plans for transitioning to a low-carbon economy

As an organization that operates in jurisdictions with greenhouse gas (GHG) emissions reduction commitments, our firm is closely monitoring the implications for its clients and portfolios but has not set GHG emissions targets as an organization. However, as detailed throughout this report and in the next section, we are taking various actions to have leading capabilities to support the transition, for example, as it relates to investment solutions for clients with decarbonization objectives or our engagement with issuers and various organizations on best practices.

Collaboration to advance climate risk measurement and management

As a leading global asset manager, PIMCO helps define global climate metrics for investment purposes, and encourages greater climate-related disclosure from issuers. Below is a select list of our industry leadership with third-party sponsored partnerships that are involved with improving global climate-related practices with regards to investment analysis and diligence. This includes a range of industry initiatives that are linked to the implementations of the TCFD, such as the Bank of England's Climate Financial Risk Forum's ('CFRF') scenario analysis working group. In recent years, the CFRF published a series of guides to climate-related financial risk management. These guides aim to help financial firms understand the risks and opportunities that arise from climate change and provides support for how to integrate them into their risk, strategy, and decision-making processes. Here, a PIMCO case study is provided in the Climate Solutions Chapter of the latest session (released in December 2022), demonstrating PIMCO's leadership and commitment to engaging with issuers on addressing and managing relevant climate risks and opportunities to their businesses.

CDP NON-DISCLOSURE CAMPAIGN

Formerly the Carbon Disclosure Project (CDP), CDP is the world's largest, most comprehensive dataset on environmental action. PIMCO uses data aggregated by CDP to make more informed investment decisions. Each year CDP supports thousands of companies and state entities to measure and manage their ESG risks and opportunities.

PIMCO'S INVOLVEMENT

PIMCO supports the development of enhanced corporate disclosure regarding alignment with the Paris Agreement and the UN's Sustainable Development Goals (SDGs). We see CDP as a key source of data on opportunities for ESG investment and how corporates respond to ESG trends.

PROGRESS TO DATE

Following participation in CDP's pilot fixed income investor campaign in 2020 (an investor-backed pilot program focused on a small group of unlisted bond-issuing companies), PIMCO joined the CDP's Non-Disclosure Campaign in 2021 and 2022. PIMCO's engagement efforts have included issuers that have not yet provided a response to CDP's data request. CDP's 2022 Results report stated the disclosure rate for companies targeted by this initiative increased from 19% in 2020 to 27.9% in 2022 for the climate change section. Specifically, 32% of the companies at which we supported engagement via this campaign submitted their response to CDP in 2022 (30% in 2021).

INTERNATIONAL CAPITAL MARKETS ASSOCIATION (ICMA)

The International Capital Market Association (ICMA) sets out guiding principles that shape and enhance the market for green, social, sustainability, and sustainability-linked bonds.

PIMCO'S INVOLVEMENT

PIMCO is a member of ICMA's executive committee, which is responsible for addressing all matters related to the ICMA's Principles: the Green Bond Principles (GBP), Social Bond Principles (SBP), Sustainability Bond Guidelines (SBG), and Sustainability-Linked Bond Principles (SLBP).

HOW PIMCO HELPED ADVANCE ICMA'S GOALS

Supported by the release of ICMA's Sustainability-Linked Bond Principles in June 2020, the sustainability-linked bonds (SLBs) market took off and experienced strong growth in recent years ($194.8 billion of total issuance in 2021 and 2022 according to Bloomberg New Energy Finance). As additional guidance, ICMA updated in 2022 its Q&A for SLBs as well as illustrative examples for the selection of key performance indicators (KPIs) for sustainability-linked bond issuers. PIMCO is one of the coordinators of the SLB working group and contributed to both documents.

RISK MANAGEMENT

Framework to Identify, Assess and Manage Climate Risks.

Processes for identifying, assessing, and managing climate-related risks

Risk management is a major focus at PIMCO and has been a cornerstone of the firm's investment philosophy since inception. PIMCO measures and manages portfolio risk by focusing on a series of factor-based risk measures, which aim to capture each portfolio's positioning. PIMCO believes that successful risk management demands constant reassessment of the investment landscape in order to anticipate future market events and evolutions in potential risk frameworks.

The Portfolio Risk Management team is integrated into the broader Portfolio Management group at PIMCO with members of the team located in each of the regions with major trading centres: Asia, Europe, and North America. This enables 24-hour portfolio coverage and greater continuity of information flow from each region. Additionally, integration into the portfolio management organization helps to ensure the timely escalation of any potential concerns.

The identification and assessment of relevant climate-related risks in our portfolios starts with our in-house investment research team. PIMCO's climate research is led by credit analysts – experts in their market sectors – who build on the structure of our broader ESG specialist desk for coordination and consistency. Where applicable, climate risk features in our credit recommendations and our proprietary ESG scores for the issuers we evaluate. In this way, PIMCO leverages the expertise of our analyst teams, while harmonizing climate risk analysis across asset classes and sectors. Importantly, our ESG scores inform the risk analysis applied to broad PIMCO portfolios, not only portfolios with specific sustainability objectives. Material ESG factors may include but are not limited to: climate change risks (both transition and physical risks), nature-related risks, shifting consumer preferences, and other factors associated with the concept of a Just Transition[11] or human rights (e.g. supply chain risks). PIMCO's ESG scores have been developed based on proprietary frameworks and methodologies relevant to various fixed income sectors such as: CLOs; corporate credit; covered bonds and Danish mortgages; municipal debt; and sovereign- or government-related debt, such as local authorities, supranational issuers and development banks.

11 According to the International Labour Organisation (ILO), a Just Transition, "involves maximizing the social and economic opportunities of climate action, while minimizing and carefully managing any challenges – including through effective social dialogue among all groups impacted, and respect for fundamental labor principles and rights".

Please see below an illustration of select ESG indicators and examples of sector-specific metrics used by PIMCO's analysts to assess corporate issuers' exposure to ESG risks as well as practices to mitigate those risks.

	Theme	Issue	Key Performance Indicators & Topics
Environmental	Climate Change	Greenhouse Gas Emissions	• Carbon and GHG Emissions • Energy Management, mix and reserves • Transition risks (market, policy, technology) • Climate strategy, for risk mitigation
		Physical Risks and Resilience	• Extreme weather impacts • Adaptation and mitigation
	Resource efficiency and Natural Capital	Water	• Water security & scarcity • Water use, recycling & efficiency
		Land use and Biodiversity	• Agriculture, Forestry, Land use change • Soft commodities sourcing and production, including restoration costs
		Waste	• Materials efficiency & process mass intensity • Waste recycling, hazardous waste management • Critical incidents, environmental remediation & fines
		Air Pollution	• Air quality
Social	Human Capital	Human Capital Management	• Employee training, development, & engagement • Attraction and retention & pay equity • Diversity, equity & inclusion
		Human & Labor Rights and Health & Safety	• Occupational health and safety incident rates • Organized labor policies and relationships • Supplier policies on worker rights, health, safety and compulsory labor
		Community & Stakeholder Relationships	• Community engagement & relationship management • Conflict minerals sourcing • Involvement in controversial projects
	Product Health, Quality, Safety & Innovation	Product Safety & Quality	• Product safety & lifecycle management, Recall track record • Product liabilities, controversies and fines • User data policies, data security
		Product Innovation & Wellness	• Products & services tied to secular sustainability trends • Innovation and intellectual capital, dedicated R&D • Social/Inclusive business models ("triple bottom line")
Governance	Corporate Governance	Board, Management & Ownership	• Qualifications, characteristics and oversight & effectiveness, remuneration & succession • Shareholder profiles (majority, family, government, activist), voting rights & proxy access • Conflicts of interest and/or related party transactions
		Business Ethics, Conduct & Culture	• Bribery & corruption, litigation, anti-competitive practices & tax transparency • Regulatory capture and political influence • Code of ethics, corporate behavior & conflicts of interest • Treatment of customers and key stakeholders, reputation
		Delivery on Business & Balance Sheet Strategy	• Track record in achieving guidance and targets • Controls over capital allocation, share buybacks and distributions • Acquisitions, asset sales, divestitures or other transactions
	Risk Management & Transparency	Risk Management	• Climate / critical Incident / systemic / cyber enterprise risk management • Susceptibility to headline risks
		Transparency & Reporting	• ESG data disclosure, Accounting practices & Audit quality • Internal controls and reporting (timeliness and accuracy) • Communication with key stakeholders (customers, employees, clients, investors)

As of 31 December 2022; Source: PIMCO. **For illustrative purposes only**

To help analysts evaluate climate risk, PIMCO's ESG specialists designed various proprietary tools (see full list in graphic below), drawing on our decades of experience in fixed income analysis. The insights these tools provide are intended to help portfolio managers with managing and mitigating climate-related credit risks – as always, working within specific portfolio objectives and guidelines.

Insights from PIMCO's climate tools along with general ESG-related analysis are incorporated into PIMCO's proprietary ESG scores, as well as asset class and sector views where applicable. These assessments are subsequently made available to portfolio managers firm-wide in order to account for and manage relevant ESG risks and opportunities within investment strategies. For portfolios that do not follow any sustainability strategy, the management of climate risks involves evaluating if we are sufficiently compensated for such risks over the investment horizon.

Further, for our portfolios that follow sustainability strategies, management of climate risks involves actively optimizing portfolios in order to avoid positions most exposed to climate risks and tilting to issuers best suited to take advantage of the identified climate opportunities. Our ESG Analyst team provides relevant portfolio managers with ESG reports on a weekly basis to actively monitor and manage these risks. Quarterly fund reviews also take place for our funds with sustainable investment guidelines and restrictions to update Portfolio Managers regarding various trends, including engagement progress or issuers' climate-related performance and controversies. In addition, ESG risk reports have been made available to our Portfolio Management team to provide additional details on a portfolio's exposure to carbon-sensitive sectors, climate solutions, and issuers' alignment with the Paris Agreement or our proprietary climate risk score.

PIMCO's seven climate tools for risk analysis and management

Integrating material climate risk into broad investment decisions

Objective	Tool #	Focus	PIMCO Tool Name	Key Question
Lower Credit Risk	1	Economic Impacts (Top-down)	Climate Macro Tracker	How to assess and decrease portfolio exposure to financial risks brought about by climate change
	2	Credit Risk Impacts (Bottom-up)	Portfolio Climate Risk Heat Map	
	3		Issuer Climate Risk Score	
Reduce Carbon Emissions	4	Brown Bonds	Energy and Technology mix compared with the Paris Agreement (IEA Scenarios)	How to reduce portfolio exposure to activities contributing to global warming
	5	Carbon Intensity	Portfolio Carbon Intensity Analysis	How to reduce portfolio's carbon footprint
	6	Green Bonds	Green Bonds Score	How to increase portfolio exposure to activities that help mitigate global warming
Both	7	Engagement	Expectations toward issuers on climate change	How to influence companies' strategy

Tools / Analytics to support construction of sustainability portfolios

As of 31 December 2022. Source: PIMCO. **For illustrative purposes only**

The first three tools, the Climate Macro Tracker, Climate Risk Heat Map, and Issuer Climate Risk Score (Tools 1-3), seek to assess and reduce portfolio exposure to material financial risks due to climate change. The Climate Macro Tracker monitors broad momentum in climate change across key themes and scenarios, and measures the gap between the real-world metrics and global climate goals. Our climate risk heat map seeks to provide a high-level overview of exposure to climate risk among relevant sectors and assets. Finally, our issuer climate risk score assesses climate change risks for a wide range of relevant sectors and issuers drawing on metrics such as the issuer's current and future carbon emissions.

Alongside the tools that are integrated into broad investment decisions, PIMCO's subsequent three climate tools (Tools 4-6) aim to reduce carbon emissions in sustainable investment portfolios. The Energy and Technology Mix looks to reduce portfolio exposure to activities contributing to global warming. Carbon Intensity Analysis seeks to provide insight on how to improve a portfolio's carbon profile. Finally, PIMCO's Green Bond Score assesses ESG-labeled debt both prior to and after issuance, mapping them across a spectrum based on strategic fit, potential impact, red flags and reporting.

Finally, engagement is a significant tool for PIMCO as we seek to engage with relevant issuers to – among others – bolster their Paris Agreement alignment and to help them improve their management of the underlying credit risks, moving from awareness to readiness and ultimately alignment.

Encouraging better disclosure and practices related to climate risks

We engage with issuers for enhanced corporate disclosure on climate change and transition plans.

We evaluate the evidence of issuers' activities in relation to the points highlighted in the table further below (illustrative), acknowledging issuers are at various stages, and the importance of the direction of travel and momentum. These expectations build on several frameworks, including the TCFD, Science-Based Targets initiative, or International Sustainability Standards Board.[12]

1	**Climate Awareness**	Recognition	I	• Recognize climate change as a significant issue • Develop a policy
2	**Climate Readiness**	Reporting	I	• Report absolute and relative carbon emissions across entire value chain • Report carbon intensity based on relevant metrics
		Target	II	• Set a greenhouse gas (GHG) emissions reductions target
3	**Climate Alignment**	Scenarios	I	• Implement comprehensive qualitative scenario analysis
			II	• Factor an internal price of carbon into business decisions
			III	• Address potential financial impacts of transition and physical risks
		Strategy	I	• Set a Paris Agreement-aligned (science based) GHG emissions reductions target
			II	• Report business alignment with Paris Agreement and potential climate adaptation needs
			III	• Set a net zero commitment detailing interim targets, emissions covered, and any absorption or offset mechanisms

As of 31 December 2022. Source: PIMCO. **For illustrative purposes only**

PIMCO continues to view stewardship and engagement as a long-term and dynamic process that evolves over several years. While changes may take time to materialize (e.g. issuers' implementation of the TCFD recommendations or development of science-based targets often take at least two to three years), PIMCO analysts reinforce and follow up on ESG engagement objectives as part of their regular interactions with issuers.[13]

12 Exposure draft named 'IFRS S2 Climate-related Disclosures'.

13 For more details on our ESG engagement and escalation approach, including how this may affect investment decisions (e.g. purchasing hold or divestment consideration), see PIMCO's UK Stewardship Report (e.g. page 72)

ENGAGEMENT ESCALATION EXAMPLE

U.S. BASED REIT

Background: The company issued a sustainability bond in 2020 with some disclosure practices falling short of market best practices, such as second party opinion and indication of impact reporting post issuance. It did not provide any impact report two years after the issuance, which misaligns with the standard market practice as per ICMA to publish it annually, starting one year after the issuance.

Engagement: Given the slightly weaker disclosure at issuance, PIMCO engaged with the company to share our expectations on impact reporting and best practices for ESG bonds more broadly. When it failed to publish any impact reports two years into the three-year maturity, PIMCO reached out to the company about the timeline for the impact report publication and had not received any expected timeline for the disclosure. We escalated to the company that we would assume the bond program misaligned with ICMA principles in the absence of an update and highlighted the lack of plan to align its overall environmental disclosure with industry standards such as TCFD, CDP, Global Reporting Initiative (GRI) or Sustainability Accounting Standards Board (SASB). PIMCO spoke with its Treasury team several times to reinforce our recommendations and potential impacts on ESG assessment for the program.

Updates: The company published an allocation report and obtained a second-party opinion for the program, including impact metrics, showing some progress in improving disclosure. PIMCO will continue to engage the issuer on best practices such as more ambitious eligibility criteria and impact metrics.

The examples above are presented for illustrative purposes only, as a general example of PIMCO's ESG research and engagement capability and is not intended to represent any specific portfolio's performance or how a portfolio will be invested or allocated at any particular time. PIMCO's ESG processes may yield different results than other investment managers' and a company's ESG rankings and factors may change over time. All data is as of 31 December 2022, unless otherwise stated.

Besides cross-sector recommendations, our bilateral and collaborative engagement also focuses on specific themes, sectors and initiatives, such as methane emissions[14] or CDP's non-disclosure and science-based target campaigns. As it relates to our engagement with policy makers, we have provided responses either directly or via industry affiliations to a number of consultations.

The CDP non-disclosure campaign offers investors the opportunity to engage companies that have received a CDP disclosure request but have not provided a response, while the Science-Based Targets Campaign allows investors to contribute to the adoption of science-based emission reduction climate targets (a proxy of issuer's commitment that we report in the TCFD Metrics and Targets section of this report).

14 For more details, see PIMCO's viewpoint "Engaging With Stakeholders to Reduce Methane Emissions From Oil and Gas Production"

ENGAGEMENT CASE STUDY

The below is a select case study from engagements PIMCO conducted in 2022 with issuers where topics of engagement included disclosure and practices related to climate risks.

TARGET SETTING – MULTINATIONAL BANK

- **Background:** PIMCO had a 1x1 call with the investor relations team, with an emphasis on climate change.
- **Engagement:** Discussed progress on sectoral target setting, financed emissions, client engagement on transition, clarifications on sector policy. We also discussed the issuer's gaps in its lending policies on natural capital, the issuer's alignment with net zero, and that the issuer is reviewing the policy though it is unlikely to be updated in 2022. We encouraged the issuer to clarify its approach to assess and engage clients on transition progress. Furthermore, PIMCO recommended the issuer set clear criteria for assessing client transition progress, defining engagement strategy, outcomes and escalation process.
- **Looking Forward:** The issuer is reviewing the lending policies with updates expected through 2022. The issuer's efforts to enhance its climate strategy should advance its capabilities to manage climate transition risks.

The examples above are presented for illustrative purposes only, as a general example of PIMCO's ESG research and engagement capability and is not intended to represent any specific portfolio's performance or how a portfolio will be invested or allocated at any particular time. PIMCO's ESG processes may yield different results than other investment managers' and a company's ESG rankings and factors may change over time. All data is as of 31 December 2022, unless otherwise stated.

TAKING A HOLISTIC APPROACH TO CLIMATE RISKS

We explore and engage on climate change in the context of broader sustainability risk and are supportive of the Sustainable Development Goals (SDGs) as the reference framework to assess these wide-ranging risks, e.g. biodiversity, water scarcity, Just Transition, human and labor rights. For example, PIMCO is a member of the UN Global Investors for Sustainable Development Alliance, and co-chairs the UN Global Compact's CFO Coalition for the SDGs.

Further, deforestation – an important topic from both a biodiversity and Just Transition perspective – has been a particular area of thematic focus for our engagement, as halting and reversing land degradation is crucial to limiting global warming and mitigating a wide variety of risks, such as biodiversity loss and human rights violations. On this front, while our direct exposure to forest-risk commodities was limited, we engaged companies across sectors, including food manufacturers, retailers, and banks, on their commitment to eliminating deforestation in their value chain.

In terms of portfolio screener and issuer-level evaluation, we have explored the use of tools that help evaluate the impact and dependence of our portfolio holdings on nature using publicly available data such as ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure).

METRICS AND TARGETS

Climate Focused Investment Exposure of Sample PIMCO Portfolios

Metrics and targets used to assess and manage relevant climate-related risks and opportunities

At PIMCO, we are keenly aware of the planetary, market, and societal trends that are reshaping what it means to manage a global sustainable business in the 21st century. In our view, running a company, sustainably, entails incorporating critical environmental and social commitments into strategy, operations and culture, as well as ensuring that the necessary governance, business continuity, technology, and supply chain capabilities and processes are in place. PIMCO recognizes the need to continuously examine our own operations, resource use, and impacts in an effort to minimize negative environmental impacts and find ways to contribute positively to environmental challenges and solutions.

As it relates to the firm's corporate operations' impact on the climate, we are taking a scientific approach in relation to measuring and reducing our carbon footprint by assessing the current sustainability practices of our global offices and taking appropriate action. We are in the process of evaluating strategies to further promote environmental responsibility in PIMCO's operations including enhancements to the firm's corporate policies. Our priority areas for the upcoming years may include looking at ways of aligning with global standards like the Greenhouse Gas Protocol; identifying additional opportunities in terms of greenhouse gas emission reduction levels, where applicable, such as further leveraging low-carbon energy (e.g., increasing renewable electricity usage), and reducing the negative environmental externalities associated with business travel, and reducing waste, water usage, and paper use.

Climate-focused investment exposure of sample PIMCO portfolios

Investments within the sample PIMCO portfolios are exposed to a share of the carbon emissions within the broader global bond market.

This section shows for sample PIMCO portfolios, representative of the assets that fall under PIMCO, and benchmarks selected metrics linked to the recommendations of the Task Force on Climate-Related Financial Disclosures and similar disclosure frameworks. This is a shortlist as there is a broader range of metrics we monitor and report in selected contexts. We have continued to refine and expand our carbon measurement, data reporting and portfolio optimization capabilities based on guidance from ESG-focused financial institutions, such as the Partnership for Carbon Accounting Financials (PCAF), and the Science-Based Target initiative (SBTi). Our reporting tools cover an ever-broader range of perspectives (e.g., financed emissions, portfolio alignment, climate solutions, or the exposure to both transition and physical risks), assets classes (e.g. we updated the methodology for sovereign debt) and instrument types (e.g., green and sustainability bonds). This helps our clients better understand key climate and carbon metrics, in their portfolios.

Importantly, these figures consist of ESG-optimized portfolios as well as those that do not follow a sustainability strategy. Therefore, although these metrics may be optimized in portfolio construction for mandates that follow sustainability strategies and guidelines, they are not optimized on aggregate across all of our portfolios. Our obligation as an asset manager and fiduciary is seeking to deliver on our clients' investment objectives, which vary across portfolios depending on investor preference.

Summary table for PIMCO portfolios

This illustrative table includes the aggregated value for PIMCO portfolios for selected climate-related metrics based on the recommendations of the TCFD and other initiatives providing guidance on carbon measurement and reporting from financial institutions (e.g. Partnership for Carbon Accounting Financials or PCAF, Science-Based Targets initiative or SBTi).

This includes:

- Both data for the latest reporting year and 2021, which suggests several trends, e.g. slight increase in the coverage of carbon data for corporate credit, relative stability of certain carbon emissions metrics such as weighted average carbon emissions or total carbon emissions for scope 1 and 2, material increase in the carbon footprint or the share of issuers with science-based greenhouse gas emission reduction targets.
- Data on the coverage per indicator for asset classes in scope: as only corporates and governments are included a material share of assets are not covered by carbon metrics listed here.

Corporate Credit

Metric type	Metric	Asset class covered[15]	Units	Value PIMCO[16]	Value Benchmark[17]	Diff Over Index	2021 Value PIMCO[18]	2021 Value Benchmark[19]	PIMCO Coverage[20]	2021 Coverage[20]
Financed emissions	Weighted Average Carbon Intensity (Scope 1 and 2 emissions)	Corporates	tCO2e / $M USD Sales	274	248	10.8%	279	288	89.8%	89.6%
	Definition: Portfolios' exposure to carbon-intensive companies (Scope 1 absolute emissions + Scope 2 absolute greenhouse gas emissions)/issuer's revenues in $M USD (weighted based on Market Value)									
	Total Carbon Emissions (Scope 1 and 2 emissions)	Corporates	tCO2e	54,925,825	54,788,756	0.3%	56,589,565	63,450,043	88.7%	88.1%
	Definition: Proxy for the carbon emissions that the position in the security is responsible for. Total GHG emissions for portfolios (scope 1 and 2 emissions). Based on enterprise value including cash									
	Carbon Footprint (Scope 1 and 2 emissions)	Corporates	tCO2e / $M USD invested	102	97	5.0%	78	85	88.7%	88.1%
	Definition: Total GHG emissions for a portfolio normalized by the market value of the corporates in the portfolio with Scope 1+2 GHG emissions data, expressed in tons CO2e/$M invested. Based on enterprise value including cash.									
	Weighted Average Carbon Intensity (Scope 1, 2 and 3 emissions)	Corporates	tCO2e / $M USD Sales	1,263	1,188	6.3%	1,533	1,465	63.2%	60.6%
	Definition: Portfolios' exposure to carbon-intensive companies (Scope 1 absolute emissions + Scope 2 absolute + Scope 3 absolute greenhouse gas emissions)/issuer's revenues in $M USD (weighted based on Market Value)									
	Total Carbon Emissions (Scope 1, 2 and 3 emissions)	Corporates	tCO2e	245,982,329	273,935,037	-10.2%	264,071,197	278,199,630	62.8%	59.9%
	Definition: Proxy for the carbon emissions that the position in the security is responsible for. Total GHG emissions for portfolios (scope 1, 2 and 3 emissions). Based on enterprise value including cash									
	Carbon Footprint (Scope 1, 2 and 3 emissions)	Corporates	tCO2e / $M USD invested	644	665	-3.2%	535	507	62.8%	59.9%
	Definition: Total GHG emissions for a portfolio normalized by the market value of the corporates in the portfolio with Scope 1+2+3 GHG emissions data, expressed in tons CO2e/$M invested. Based on enterprise value including cash.									

15 Corporates refer to Corporate Bonds, Commercial Paper, Certificate of Deposit, Time Deposit, Bankers' Acceptance. This is repeated across all the charts and tables in this section.

16 PIMCO's aggregate value is based on PIMCO accounts as of 31 December 2022, subject to data availability.

17 Benchmark value is based on Bloomberg Global Agg Corporate Index as of 31 December 2022, subject to data availability. The Bloomberg Global Agg Corporate Index serves as a proxy for the corporate credit market.

18 PIMCO's aggregate value based on PIMCO accounts as of 31 December 2021, subject to data availability.

19 Benchmark value is based on Bloomberg Global Agg Corporate Index as of 31 December 2021, subject to data availability. The Bloomberg Global Agg Corporate Index serves as a proxy for the corporate credit market.

20 Coverage metrics represent the share of securities with data as a % of the corporate market value of assets under management.

Metric type	Metric	Asset class covered[15]	Units	Value PIMCO[16]	Value Benchmark[17]	Diff Over Index	2021 Value PIMCO[18]	2021 Value Benchmark[19]	PIMCO Coverage[20]	2021 Coverage[20]
Portfolio Alignment Metrics	Share of issuers with a Science Based Target set	Corporates	%	20.1%	24.6%	-4.5 p.p.	15.3%	20.2%	-	-
	Definition: % of Corporate Market Value of portfolios invested in issuers with a Science Based Target set									
Exposure to carbon-related assets	Share of Carbon Sensitive Sectors	Corporates	%	27.6%	28.6%	-1.0 p.p.	27.2%	30.3%	-	-
	Definition: % of Corporate Market Value of portfolios invested in sectors deemed particularly sensitive to risks brought about by the energy transition (Energy; Materials and Buildings; Transportation; Food and Agriculture; Forest products).									

All data as of 31 December 2022. Sources: MSCI, PIMCO, TCFD, PCAF, SBTi. **For illustrative purposes only.** Calculations for carbon metrics are based on the guidance developed by the TCFD and the Partnership for Carbon Accounting Financials (PCAF). Carbon data reflects the last level of emissions reported by the company, although in some instances it can reflect emissions data that had been disclosed before 2022 (e.g. 2021 and 2020), subject to availability.

15 Corporates refer to Corporate Bonds, Commercial Paper, Certificate of Deposit, Time Deposit, Bankers' Acceptance. This is repeated across all the charts and tables in this section.

16 PIMCO's aggregate value is based on PIMCO accounts as of 31 December 2022, subject to data availability.

17 Benchmark value is based on Bloomberg Global Agg Corporate Index as of 31 December 2022, subject to data availability. The Bloomberg Global Agg Corporate Index serves as a proxy for the corporate credit market.

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19 Benchmark value is based on Bloomberg Global Agg Corporate Index as of 31 December 2021, subject to data availability. The Bloomberg Global Agg Corporate Index serves as a proxy for the corporate credit market.

20 Coverage metrics represent the share of securities with data as a % of the corporate market value of assets under management.

Sovereigns

Metric type	Metric	Asset class covered	Units	Value PIMCO 2022	Value Benchmark 2022	Diff Over Index	Definition
Financed emissions	Production Emissions (Scope 1 emissions) – excl. LULUCF	Sovereigns	tCO2e	133,727,040	127,488,769	4.9%	Territorial emissions of a country, excluding land use, land-use change and forestry (LULUCF), based on the PRIMAP dataset.
Financed emissions	Production Emissions (Scope 1 emissions) – excluding LULUCF	Sovereigns	tCO2e	135,024,597	136,245,681	-0.9%	Territorial emissions of a country, including land use, land-use change and forestry (LULUCF), based on the PRIMAP dataset.
Financed emissions	Weighted Average Production emission (Excl. LULUCF) intensity	Sovereigns	tCO2e/$M of GDP-PPP adjusted	258	286	-9.8%	Weighted average of production emissions (defined as Scope 1 emissions excl. LULUCF) normalized by $M of PPP-adjusted GDP.
Financed emissions	Weighted Average Production emission (incl. LULUCF) intensity	Sovereigns	tCO2e/$M of GDP-PPP adjusted	260	311	-16%	Weighted average of production emissions (defined as Scope 1 emissions incl. LULUCF) normalized by $M of PPP-adjusted GDP.

As of 31 December 2022. Source: S&P (Trucost) 2021 sovereign emissions data. The asset class named Sovereign covers here bonds classified as Treasury (i.e. excluding government-related securities such as quasi-sovereign, agencies and supranational). Scope 1 refers to Production Emissions which are Territorial emissions of a country, excluding/including land use, land use change and forestry (including direct exports). Under the territorial approach (used in this report and by PCAF), a sovereign is seen primarily as a national territory, and direct (scope 1) GHG emissions are attributable to emissions generated within its boundaries and are equivalent to production emissions which are emissions produced domestically and inclusive of domestic consumption and direct exports (this definition follows the approach adopted by UNFCCC for annual national inventories and is typically referenced by sovereigns in their Nationally Determined Contributions (NDCs)). Note: Given a divergence of views among emissions data providers and climate experts regarding the accounting of land use, land-use change, and forestry (LULUCF) emissions, PCAF states that investors have to report Scope 1 twice, including and excluding LULUCF as separate metrics.

Note: Sovereigns' emissions and socio-economic data is based on the Trucost dataset from August 2022 which uses PRIMAP v2.3.1. Trucost extrapolated the 2021 data by calculating the Compound Annual Growth Rate (CAGR) over a period of four years. Therefore, for each country the 2021 data was estimated using CAGR for 2017-2020. The CAGR was then used to extrapolate the data forwards so that modelled data remained consistent with the most recent years.

*Emissions from ABU Dhabi, Dubai and SHARJAH are mapped to the United Arab Emirates.

Targets used by the organization to manage climate-related risks and opportunities and performance against targets

PIMCO does not employ any broad targets on the assets managed on behalf of our clients. Our obligation as an asset manager is seeking to deliver on investment objectives driven by our clients, the asset owners. Currently, the extent to which we employ carbon-related targets in portfolios on behalf of clients consists of relative targets, where portfolios seek to have a better carbon intensity compared to relevant benchmarks, or targets related to a reduction in portfolio's financed emissions over time.

APPENDIX

Scope of this report

Data refer to assets under management (AuM) for PIMCO.

Climate data

GENERAL NOTE

Metrics included in this report or similar instances are based on recommendations from the TCFD and similar voluntary frameworks, recommendations or proposals developed by various initiatives (e.g. CDP, ISSB, PCAF, CFRF, UK Transition Plan Taskforce (TPT)). This inherently involves methodologies and data that are at various degrees of development, quality and acceptance, notably as it relates to greenhouse gas emissions accounting, asset classes beyond corporate credit, and forward-looking assumptions. For example, certain metrics such as portfolio's climate at risk, implied temperature rise[21], or greenhouse gas emissions for sovereign when including land-use change and consumptions, are subject to particularly significant limitations. In the future, regulators, investors' own constituents, academics, and non-governmental organizations could have different interpretations and expectations for GHG accounting and climate risk disclosure in portfolios. There is no representation that data presented in this report will suffice to draw conclusions linked to investment decisions or make a positive or negative environmental impact claim. Past environmental performance and available proxies for the potential future performance is no guarantee of future results

In this section, we share details on methodology considerations (including uncertainties and broader limitations) and the room for improvement identified as we continuously look at ways of enhancing our ESG evaluation and disclosure, while increasing our transparency.

21 'In addition to a baseline of core metrics, we proposed that firms make 'best efforts' to disclose additional, mostly forward-looking, metrics (climate value-at-risk (VaR), portfolio alignment metrics, and any other metrics that they would consider decision-useful to disclose). We recognized that methodologies are still developing but considered that these metrics represent the direction of travel of the industry and are likely to be decision-useful to clients and consumers.' (source: FCA, Enhancing climate-related disclosures by asset managers, life insurers and FCA-regulated pension providers).

Methodology

Category	Use case	Metric type	Metric	TCFD Reference	Definition	Use case	Strengths	Weaknesses
Impact of the firm on climate change	Portfolio decarbonization	Financed emissions	Weighted Average Carbon Intensity	TCFD Implementation Guidance: Cross-Industry, Climate-Related Metric Categories (page 80), and others.	Portfolios' exposure to carbon-intensive companies (Scope 1 absolute emissions + Scope 2 absolute greenhouse gas emissions)/ issuer's revenues in $M USD (weighted based on Market Value).	Proxy for the portfolio's efficiency in terms of emitting less carbon considering a certain level of activity.	Factors in company's size. Enables some comparison over time and between portfolios. Easier to manage than absolute carbon emissions Helps assess carbon (transition) risks but is far from equating it.	Coverage of Carbon Emissions of issuers (especially for Scope 3) remains the biggest challenge when calculating carbon performance metrics such as Weighted Average Carbon Intensity, Total Carbon Emissions or Carbon Footprint. Carbon metrics including Scope 3 data are considering only issuers that have all the Scopes populated (Scope 1, 2 and 3). It is worth noting that even when Scope 3 emissions are reported, sometimes they only include a few categories (emissions from use of sold products often lacking). To cover this gap, we are using estimated Scope 3 emissions provided by MSCI when the issuer is not reporting Scope 3 data. For the sake of a fair comparison in Total Carbon Emissions, the market value of the benchmark has been rescaled to match the market value of PIMCO. Total Carbon Emissions and Carbon Footprint are linked to volatility, notably due to biases linked to EVIC changes and changes in the equity/debt structure. Difficult to determine appropriate capital structure of private issuers. Weighted Average Carbon Intensity use revenues as a denominator, which introduces bias. Not a proxy for the portfolio's contribution to global warming. The quality gap between the highest and lowest Data Quality Scores is significant. Lacks additional buckets to further differentiate company data that is estimated.
Impact of the firm on climate change	Portfolio decarbonization	Financed emissions	Total Carbon Emissions	TCFD Implementation Guidance: Cross-Industry, Climate-Related Metric Categories (page 80), and others.	Proxy for the carbon emissions that the position in the security is responsible for. Total GHG emissions for portfolios (scope 1 and 2 emissions). Based on enterprise value including cash.	Proxy for the portfolio's contribution to global warming.	Can be linked to the absolute impact and a portfolio's total contribution to GHG emissions.	
Impact of the firm on climate change	Portfolio decarbonization	Financed emissions	Carbon Footprint	TCFD Implementation Guidance: Cross-Industry, Climate-Related Metric Categories (page 80), and others.	Total GHG emissions for a portfolio normalized by the market value of the corporates in the portfolio with Scope 1+2 GHG emissions data, expressed in tons CO2e/$M invested. Based on enterprise value including cash.	Proxy for the portfolio's efficiency in terms of emitting less carbon considering a certain level of investment.	Can be linked to the absolute impact and a portfolio's total contribution to GHG emissions.	
Impact of the firm on climate change	Portfolio decarbonization	Financed emissions	Data Quality Score	PCAF – Global GHG Standard for Financed Emissions (page 57), and others.	Data Quality score (1 to 3 – 1: best, 3: worst) that takes into account if the emissions are reported or estimated and if there is existence of assurance audits for the emissions data.	Proxy for the portfolio's carbon data quality.	Directly comparable across companies regardless of size. Provides a general indication of the degree of advancement in company's carbon reporting.	

Category	Use case	Metric type	Metric	TCFD Reference	Definition	Use case	Strengths	Weaknesses
Impact of the firm on climate change	Portfolio decarbonization	Portfolio alignment metrics	Share of issuers with a Science Based Target set	Summary of Changes to Guidance, October 2021 (page 6, 47, 48), and others.	% of Corporate Market Value of portfolios invested in issuers with a Science Based Target set.	Proxy for the exposure to issuers with more advanced decarbonization strategies Proxy to map alignment of the Portfolio with the objectives of the Paris Agreement.	Forward looking. only publicly available initiative that verifies decarbonization targets based on a transparent process and methodologies.	Limitations to SBTi's coverage and methods, e.g., sectors are covered to varying degrees.
Impact of the firm on climate change	Portfolio decarbonization	Portfolio alignment metrics	Share of issuers aligned with the Paris Agreement	Summary of Changes to Guidance, October 2021 (page 6, 47, 48), and others.	% of Corporate Market Value of portfolios invested in issuers aligned with the Paris Agreement climate targets.	Proxy for the exposure to issuers with more advanced decarbonization strategies Proxy to map alignment of the Portfolio with the objectives of the Paris Agreement.	Forward looking. Uses a waterfall logic leveraging sources such as SBTi, TPI, Trucost and MSCI to address data gaps.	It is not a standardized metric (e.g. no standard methodology to calculate it). The use of a waterfall logic means that the value might be driven by different data sources which carry different assumptions.
Impact of the firm on climate change	Portfolio decarbonization	Portfolio alignment metrics	Implied Temperature Rise	TCFD Implementation Guidance (page 48, page 5 – footnote 7), and others.	% of Corporate Market Value of portfolios invested in issuers with an Implied Temperature Rise aligned with the objectives of the Paris Agreement.	Proxy for the exposure to issuers with more advanced decarbonization strategies Proxy to map alignment of the Portfolio with the objectives of the Paris Agreement.	Forward looking. Granular, as it is calculated at company level and later aggregated at portfolio level.	High dispersion in the results depending on the methodology to evaluate the warming potential of an entity and how to aggregate those at portfolio level.
Impact of climate change on a firm	Transition Risks	Exposure to carbon-related assets	Share of Carbon Sensitive Sectors	Common Carbon Footprinting and Exposure Metrics (page 55), and others.	% of Corporate Market Value of portfolios invested in sectors deemed particularly sensitive to risks brought about by the energy transition (Energy; Materials and Buildings; Transportation; Food and Agriculture; Forest products).	Proxy for the exposure to carbon risks.	Get an order of magnitude regarding the exposure of the portfolio to securities from sectors that are carbon-intensive and sometimes hard to decarbonize.	The list of carbon sensitive sectors is created by PIMCO based on the evidence regarding the materiality of the energy transition and industry best practice, leaning on several external sources (TCFD, IPCC, TPI). Does not reflect idiosyncratic factors and the dispersion within sectors.
Opportunities derived from Climate Change	Climate Solutions	Exposure to climate solutions	Exposure to ESG-labelled bonds (Green, Sustainability and Sustainability-linked bonds)	TCFD Implementation Guidance: Cross-Industry, Climate-Related Metric Categories (page 80), and others.	% Market Value of portfolios invested in Green, Sustainability or Sustainability-linked Bonds.	Proxy for the exposure to climate solutions in portfolio.	Guarantee on which are the projects funded and how can they help mitigate and/or adapt to climate change. Generally audited by third parties.	Partial visibility on the projects being funded by the proceeds and capital raised through the bonds. Full allocation to the project categories described by the framework in case of Use of Proceeds bonds can only be achieved some months or years after the bond has been issued.

Additional limitations and areas under development

Besides strengths and weaknesses mentioned in the previous table, we note that:

- **The coverage of carbon emissions of issuers** (especially for Scope 3) remains the biggest challenge when calculating carbon performance metrics such as Weighted Average Carbon Intensity, Total Carbon Emissions or Carbon Footprint. Carbon metrics including Scope 3 data consider only issuers that have all the Scopes populated (Scope 1, 2 and 3). We are using both reported and estimated Scope 3 emissions provided by MSCI. There are significant limitations associated with each approach (reported or estimated). It is worth noting that even when Scope 3 emissions are reported, sometimes they only include a few Greenhouse Gas Protocol categories (e.g. emissions from use of sold products often lacking) and may omit the most material ones. Issuers' disclosure on the types and sources of data as well as methodology to calculate these emissions may also be partial, while the heterogeneity of practices, together with uncertainties associated with these calculations, hamper the comparison over time or between issuers. Besides, MSCI's methodology uses various assumptions and proxies (e.g. estimating emissions based on sectoral revenues and intensities) that may make these values materially differing from actual emissions. There is also inherently some double counting issues associated with both scope 2 and scope 3 (the same ton of carbon is counted several times within a portfolio).

  For the sake of a fair comparison for Total Carbon Emissions, the market value of the benchmark has been rescaled to match the market value of PIMCO. As explained individually in the "Definition" column, metrics representing a share of market value have been adjusted for data coverage (e.g. calculating the share only within the corporate universe with data available). Metrics using weights (e.g. for Weighted Average Carbon Intensity) have used a weighting system which calculates the weight based on the market value universe of corporates with carbon data populated.

- **The list of carbon-sensitive sectors** is created based on PIMCO's classification system, as there is no guidance from the TCFD regarding the specific classification categories to use. This list can be both considered too broad (e.g. it doesn't exclude industries or sub-industries that are appropriate to exclude according to the TCFD, such as water utilities and independent power and renewable electricity) and too narrow (there may be issuers with potentially material exposure to carbon risks across their value chain that are not in scope).

- **Use of proceeds bonds:** All data on carbon emissions are in this report at issuer level, i.e. without applying any assumptions regarding green bonds that fund low-carbon projects such as renewable energy.

Scenario analysis covered in Strategy section

METHODOLOGY DETAILS

Below we show more illustrative results and background information from two different models taking a top down macroeconomic approach to climate scenario analysis, examining fixed income markets' resiliency to future climate risks. The first is an off-the-shelf model developed by the Network for Greening the Financial System (NGFS), a coalition of central banks dedicated to assessing the impact of climate change[22]. Their approach tries to capture all the major components of the global economy including government policy, labor and capital markets, and trade flows.

The second is the PIMCO model used in the scenario analysis of the strategic section, a reduced form approach using empirical data to capture the main mechanisms linking climate change to the global economy. This bespoke approach abstracts away from modeling all components of the economy and chooses instead to focus on the key mechanisms that are linked to climate change. The PIMCO top-down macro model maps the NGFS climate scenarios to two types of outputs: macroeconomic and risk factor. The outputs are a panel with country and time dimensions. The time series dimension is annual over the same horizon as the input scenario. We assume the climate scenario affects the macroeconomic outputs through two channels: 1) Physical risks: Loss in productivity due to human-driven increase in global temperature; 2) Transition risks: Increased inflation and loss in growth from taxing carbon and subsidizing renewable investment. These macroeconomic shocks flow through to asset prices which we capture using a set of risk factors. The risk factor outputs are then plugged into PIMCO's risk model (Proteus) and then applied to the desired account, index or security to generate the final return impact of the climate scenario.

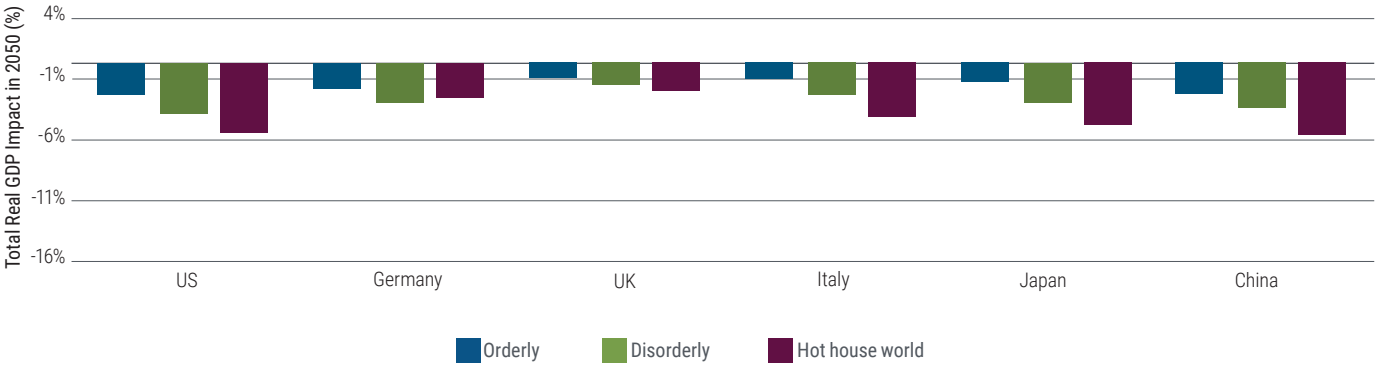
Using the two models, we can simulate the cumulative impact climate change could have on real GDP or equity for the world, the U.S., and Europe over the years 2020-2050 under three different scenarios (designed by the NGFS[23]):

1. Orderly transition: Net zero (medium transition risks, low physical risks)
2. Disorderly: Delayed transition (high transition risks, medium physical risks)
3. Hot house world: Continuation of current policies (low transition risks, very high physical risk)

22 The model combines "REMIND," an integrated assessment model, and "NIGEM," a large global macroeconomic model. NGFS home page is https://www.ngfs.net/en. MAGIC home page is http://www.magicc.org/ . NIGEM home page is https://www.niesr.ac.uk/nigem-macroeconomic-model

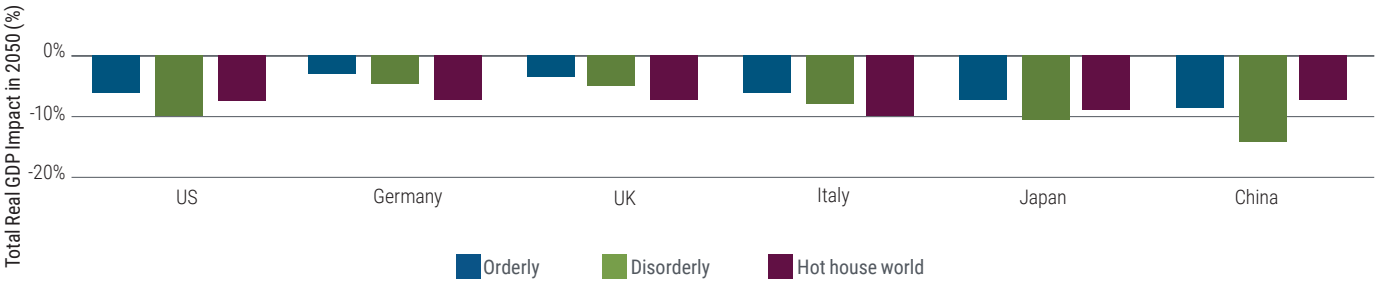
23 Orderly scenarios assume climate policies are introduced early and become gradually more stringent. Disorderly scenarios explore higher transition risk due to policies being delayed or divergent across countries and sectors. Hot house world scenarios assume that some climate policies are implemented in some jurisdictions, but globally efforts are insufficient to halt significant global warming. The scenarios result in severe physical risk including irreversible impacts, such as sea-level rise. https://www.ngfs.net/sites/default/files/medias/documents/ngfs_climate_scenarios_for_central_banks_and_supervisors_.pdf.pdf

NGFS model predictions for real GDP per region and scenario[24]



As of 31 December 2022. Source: NGFS, PIMCO. **For illustrative purposes only**

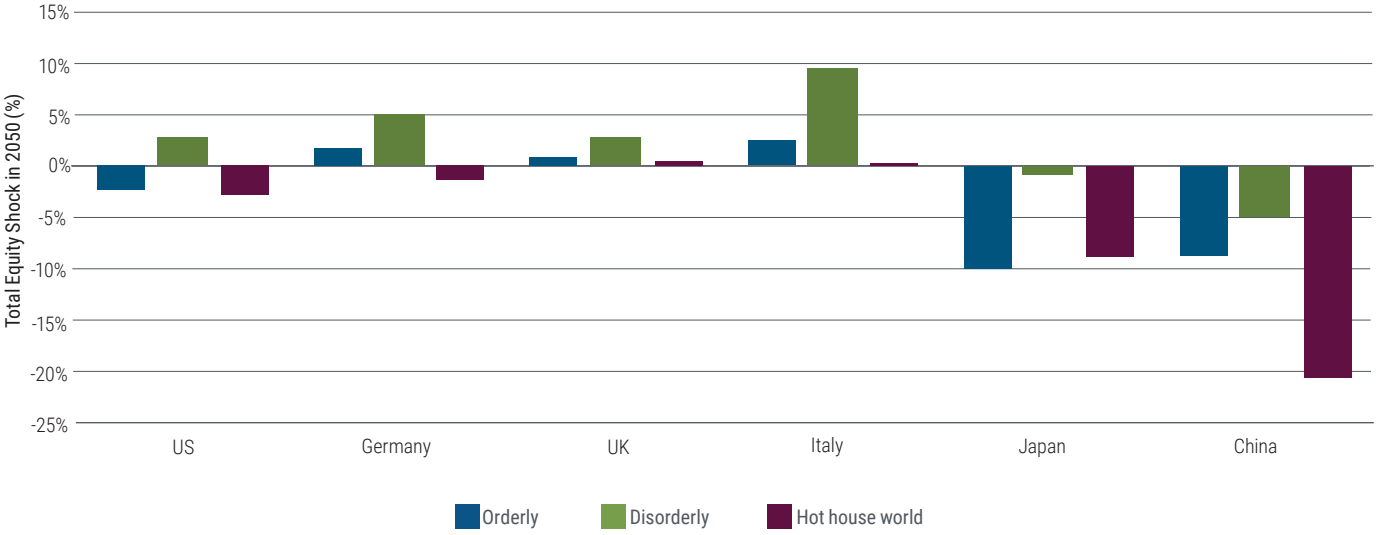
PIMCO model predictions for real GDP per region and scenario[24]



As of 31 December 2022. Source: Burke and Tanutama (2019), Bloomberg, BP, IMF, OECD, Our World in Data, PIMCO. **For illustrative purposes only**

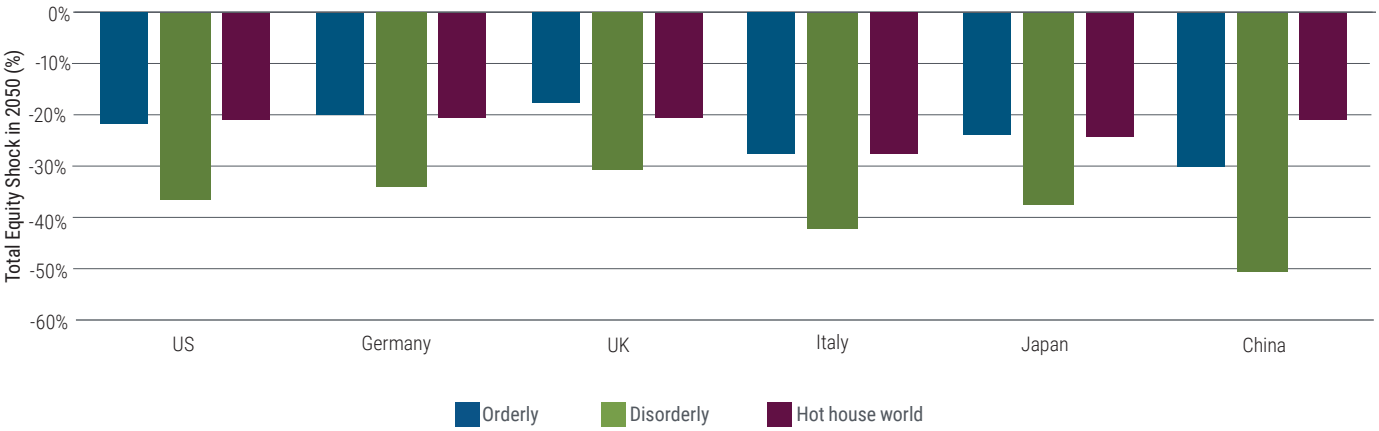
24 Represents NIGEM|Gross Domestic Product (GDP) figures for the NGFS's *REMIND-MAgPIE 2.1-4.2 inputs* model. Source: NGFS Phase 3 data set, V3.4, October 2022

NGFS model predictions for equity shocks per region and scenario



As of 31 December 2022. Source: NGFS, PIMCO. **For illustrative purposes only**

PIMCO model predictions for equity shocks per region and scenario



As of 31 December 2022. Source: Burke and Tanutama (2019), Bloomberg, BP, IMF, OECD, Our World in Data, PIMCO. **For illustrative purposes only**

Both the NGFS and PIMCO models predict a negative cumulative impact on real GDP across scenarios. For the orderly and disorderly scenarios, the negative impact is driven by transition risk. Carbon taxes help the world to transition to a greener economy, however they cause a negative impact on real GDP along the way. For the hot house world scenario, the loss in GDP comes from physical risk; increasing temperatures impact output through losses in productivity and increased disaster risk.

Both the NGFS and PIMCO model predict that early climate action is better than late climate action. This effect is driven by how a late transition in the disorderly scenario causes larger and more sudden increases in carbon policy. An orderly transition is less disruptive, causing less deadweight loss and less inflation. The models diverge in their predictions of magnitude and relative ordering.

It is important to note the worst of climate change will occur after 2050 if temperatures continue to rise and the effects of sustained carbon concentration begin to appear. The results suggest that between 2020-2050 the immediate effect of climate change may be moderate, which implies that it is crucial to pay attention to climate change now, before damages in the future become irreversible and much more severe.

LIMITATIONS AND AREAS UNDER DEVELOPMENT (ILLUSTRATIVE)

- **Asset class coverage:** Data and methods are at a very early stage besides corporate credit and sovereign credit.
- **Top-down versus bottom-up:** The illustrative scenarios addressed in this report evaluate separately the impact on macroeconomic parameters top-down model) from the impact on corporate credit (bottom-up mode).
- **Country-specific climate change-related macroeconomic effects** are difficult to quantify (whether in terms of transition risk or physical climate risk) and their time horizon is challenging to predict.
- **Physical risks:** Estimates used to model physical climate risks are based on historical data and chronic, not acute climate physical risks, and may thus underestimate future climate shocks.
- **Nature of the shock and complexity:**
  - Future climate pathways are inherently uncertain and non-linear and historical data cannot apply.
  - Second order effects, negative feedback loop and irreversible tipping points, migration, low probability high impact events together are not taken into account.
  - None of these models calculates the GDP endogenously by adding the activity in individual sectors. The effects of the mitigation policies on GDP are calculated at the macro level, by taking into account the overall changes in the costs of energy, not the increasing or decreasing activity in individual sectors.
  - The interplay between transition and physical risks is hard to model.
  - The nexus with broader environmental and social factors add to the complexity. For example, energy prices and economic disruptions associated with fossil fuels are not factored in.
- **Input macro variables:** the impact on other key macroeconomic variables (currency changes versus USD) is not addressed.
- **Time horizon:** Physical risks materialize far in time across scenarios. The scenarios deviate more in the 2nd half of the century.
- **Issuer, policy and market reactions:** There are no 'dynamic' assumptions regarding the actions taken by issuers, policy makers or the market (e.g. based on their commitments, policies or adaptive capacity).
- **Capital Market Assumptions (CMAs) and Strategic Asset Allocation (SAA):** the output of this climate scenario analysis can be connected to the existing models and infrastructure used for CMA.

GLOSSARY

Term	Description
Adaptation	Actions that minimize or remove the negative impacts of global warming or climate change. Adaptation takes different forms depending on how well the potential damage is understood, and the type of damage it is designed to prevent.
Avoided Emissions	Emission reductions that the financed project produces versus what would have been emitted in the absence of the project (the baseline emissions).
Bank of England Climate Financial Risk Forum (CFRF)	The CFRF is an initiative to build capacity and share best practice across industry and financial regulators to advance our sector's responses to the financial risks from climate change.
Biodiversity	The variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
Carbon Dioxide	A naturally occurring gas, CO2 is also a by-product of burning fossil fuels (such as oil, gas and coal), of burning biomass, of land-use changes (LUC) and of industrial processes (e.g., cement production).
Carbon Disclosure Project (CDP)	The CDP is an organization that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts.
Carbon Footprint	Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tCO2e/USDmm invested.
Carbon Price	The price for avoided or released carbon dioxide (CO2) or CO2-equivalent emissions. This may refer to the rate of a carbon tax, or the price of emission permits. In many models that are used to assess the economic costs of mitigation, carbon prices are used as a proxy to represent the level of effort in mitigation policies.
Climate Bonds Initiative (CBI)	CBI is a leading organization focused on fixed income and climate change solutions.
Climate Risk Score	Assesses climate change risks for a wide range of relevant sectors and issuers.
Ecosystem	A network of relationships between organisms, their environment, and other organisms. An ecosystem is usually defined by its primary environment (e.g. a desert ecosystem, or a freshwater ecosystem). Ecosystems include living components (e.g. plants and animals) and non-living components (e.g. weather, water, rocks).
Enterprise Value Including Cash (EVIC)	The sum of the market capitalization of ordinary shares at fiscal year end, the market capitalization of preferred shares at fiscal year-end, and the book values of total debt and minorities' interests.
Environmental Degradation	Reductions in the health and resilience of the environment (or an ecosystem) from human activity. Environmental degradation is also referred to as 'ecological degradation'. Environmental degradation includes the depletion and pollution of resources (e.g. soil, water, air), habitat destruction, and the extinction of species.
FAIRR	FAIRR is a global collaborative investor network that raises awareness of the environmental, social and governance (ESG) risks and opportunities brought about by intensive livestock production, with over $23 trillion in member AuM.

Term	Description
Global Warming	The estimated increase in global mean surface temperature (GMST) averaged over a 30-year period, or the 30-year period centered on a particular year or decade, expressed relative to pre-industrial levels unless otherwise specified.
Green Bonds	Portfolio exposure (%MV) to green bonds – bonds issued with use of proceeds devoted to environmental projects.
Green Bonds Score	We assess green bond instruments both prior to and after issuance, mapping them across a spectrum based on strategic fit, potential impact, red flags, and reporting, resulting in PIMCO's impact score for green, social, or SDG bonds.
Greenhouse Gas (GHG) Emissions	The seven gases mandated under the Kyoto Protocol and to be included in national inventories under the United Nations Framework Convention on Climate Change (UNFCCC)—carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF), and nitrogen trifluoride (NF3).
Greenhouse Gases	A naturally occurring gas, CO2 is also a by-product of burning fossil fuels (such as oil, gas and coal), of burning biomass, of land-use changes (LUC) and of industrial processes (e.g., cement production).
Greenium	Pricing differential between green bonds (issues where proceeds are used to finance or re-finance environmentally sustainable projects) and conventional non-green fixed income securities.
Institutional Investors Group on Climate Change (IIGCC)	The IIGCC is a leading investor coalition on climate change with more than 170 members across 13 countries, with over €23 trillion in assets.
Integrated Assessment Model (IAMs)	Integrated assessment models (IAMs) integrate knowledge from two or more domains into a single framework. They are one of the main tools for undertaking integrated assessments. One class of IAM used in respect of climate change mitigation may include representations of: multiple sectors of the economy, such as energy, land use and land-use change; interactions between sectors; the economy as a whole; associated GHG emissions and sinks; and reduced representations of the climate system. This class of model is used to assess linkages between economic, social and technological development and the evolution of the climate system. Another class of IAM additionally includes representations of the costs associated with climate change impacts, but includes less detailed representations of economic systems.
Interim Target	Refers to a short-term milestone between the organization's medium- or long-term target and current period.
International Capital Markets Association (ICMA)	ICMA is an association that promotes building internationally accepted standards of best practice in markets through the development of appropriate, broadly accepted guidelines, rules, recommendations, and standard documentation. In order to maintain and enhance the framework of cross-border issuing, trade, and investing in debt securities.
Issuers Engaged on Net Zero	Net zero engagement topics includes: environment, greenhouse gas emissions, transparency and reporting, land use and biodiversity, physical risks and resilience and ESG bonds.
Just Transition	Involves maximizing the social and economic opportunities of climate action, while minimizing and carefully managing any challenges – including through effective social dialogue among all groups impacted, and respect for fundamental labor principles and rights.
Mitigation	Actions that minimize or remove the processes that cause global warming or climate change. Mitigation involves minimizing greenhouse gas emissions and/or maximizing greenhouse gas sequestration.
Nationally Determined Contribution	A term used under the United Nations Framework Convention on Climate Change (UNFCCC) whereby a country that has joined the Paris Agreement outlines its plans for reducing its emissions. Some countries' NDCs also address how they will adapt to climate change impacts, and what support they need from, or will provide to, other countries to adopt low-carbon pathways and to build climate resilience.

Term	Description
Net Zero	Achieving an equal balance between GHG emissions produced and GHG emissions removed from the atmosphere.
Network for Greening the Financial System (NGFS)	The NGFS is a coalition of central banks dedicated to assessing the impact of climate change. Their approach tries to capture all the major components of the global economy including government policy, labor and capital markets, and trade flows.
New Energy Vehicles (NEV)	NEV includes Battery Electric Vehicles or BEV and Plug-in hybrid electric vehicle (PHEV).
Paris Agreement	The Paris Agreement, adopted within the UNFCCC in December 2015, commits participating countries to limit global temperature rise to well-below 2°C above preindustrial levels and pursue efforts to limit warming to 1.5°C, adapt to changes already occurring, and regularly increase efforts over time.
Partnership for Carbon Accounting Financials (PCAF)	An industry-led initiative enabling financial institutions to measure and disclose greenhouse gas (GHG) emissions of loans and investments.
Physical Risk	Physical risks from climate change broadly include risk to facilities and infrastructure, impact on operations, water and raw material availability and supply chain disruptions. Physical risks affect the economy in two ways. • **Acute** impacts from extreme weather events can lead to business disruption and damages to property. Historically these impacts were considered transient but this will change with increased global warming. These events can increase underwriting risks for insurers and impair asset values. • **Chronic** impacts, particularly from increased temperatures, sea levels rise and precipitation, may affect labor, capital and agriculture productivity. These changes will require a significant level of investment and adaptation from companies, households and governments.
Portfolio Carbon Intensity Analysis	Consists of high-level portfolio screens that allow comparison of carbon intensity of different portfolios and benchmarks, for example based on the weighted average sum of both direct greenhouse gas emissions and greenhouse gas emissions due to purchases of electricity, heating, and cooling (i.e., scope 1 + scope 2 emissions in tonnes of carbon dioxide equivalent, or tCO2e / revenues in USD (weighted based on percentage of market value)).
Portfolio Climate Risk Heat Map	Gives a high-level overview of exposure to climate risk (both transition and physical) among relevant sectors and assets. It illustrates a "heat map" of select corporate sectors' exposure, from low risk (green) to high risk (red), along with examples of relevant climate risks within each sector.
Scenario Analysis	A plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces (e.g., rate of technological change, prices) and relationships.
Science Based Target initiative (SBTi)	The Science Based Targets initiative is a collaboration between the CDP, the United Nations Global Compact, World Resources Institute and the World Wide Fund for Nature.
Scope 1 Emissions	**Corporate:** Direct GHG emissions that occur from sources owned or controlled by the reporting company—i.e., emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc. **Sovereign:** Domestic GHG emissions from sources located within the country territory.
Scope 2 Emissions	**Corporate:** Indirect GHG emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company. Scope 2 emissions physically occur at the facility where the electricity, steam, heating, or cooling is generated. **Sovereign:** GHG emissions occurring as a consequence of the domestic use of grid-supplied electricity, heat, steam and/or cooling which is imported from another territory.

Term	Description
Scope 3 Emissions	**Corporate:** All other indirect GHG emissions (not included in Scope 1 and 2) that occur in the value chain of the reporting company. The 15 Scope 3 GHG Protocol categories consist of; • Purchased Goods and Services • Capital Goods • Fuel and Energy related Activities (Not included in Scope 1 and 2) • Upstream Transportation and Distribution • Waste Generated in Operations • Business Travel • Employee Commuting • Upstream Leased Assets • Downstream Transportation and Distribution • Processing of Sold Products • Use of Sold Products • End of Life Treatment of Sold Products • Downstream Leased Assets • Franchises • Investments **Sovereign:** Emissions attributable to non-energy imports as a result of activities taking place within the country territory.
Shared Socioeconomic Pathways (SSPs)	Based on five narratives, the SSPs describe alternative socio-economic futures in the absence of climate policy intervention, comprising sustainable development (SSP1), regional rivalry (SSP3), inequality (SSP4), fossil–fueled development (SSP5) and middle-of-the road development (SSP2).
Sovereign Consumption Emissions	Reflect the demand side of sovereign emissions and account for consumption patterns and trade effects. This metric provides a broader view of a sovereign's GHG emissions and tackles the issue of carbon leakage that arises due to production shifts from countries where goods and services are actually consumed later.
Sovereign Production Emissions	Emissions attributable to emissions produced domestically and include domestic consumption and exports. This definition follows the territorial emissions approach adopted by UNFCCC for annual national inventories and is typically referenced by sovereigns in their Nationally Determined Contributions (NDCs).
Stranded Assets	Assets that turn out to be worth less than expected as a result of changes associated with the energy transition.
Sustainable Development Goals (SDGs)	A collection of seventeen interlinked objectives designed to serve as a "shared blueprint for peace and prosperity for people and the planet, now and into the future".
Total Carbon Emissions	The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO2e.
Transition Pathway Initiative (TPI)	TPI is a global asset owner-led initiative (including clients and investment consultants) that assesses companies' preparedness for the transition to a low-carbon economy.
Transition Risks	Transitioning to a lower-carbon economy can entail extensive policy, legal, technology and market changes to address mitigation and adaptation requirements related to climate change. Transition risks will affect the profitability of businesses and wealth of households, creating financial risks for lenders and investors. They will also affect the broader macroeconomy through investment, productivity and relative price channels, particularly if the transition leads to stranded assets.
Unlabeled Green Bonds	Portfolio exposure (%MV) to unlabeled green bonds – issuers fundamentally aligned to low carbon products and services, including renewable energy pure plays.
Weighted Average Carbon Intensity	Portfolio's exposure to carbon-intensive companies, expressed in tCO2e/USDmm sales.

As of 31 December 2022; Source: PIMCO, IPCC, PCAF, NGFS, TCFD

The information contained herein is as of December 31, 2022 unless otherwise noted.

This report contains examples of the firm's internal ESG engagement and research capabilities. The data contained within the report may be stale and should not be relied upon as investment advice or a recommendation of any particular security, strategy or investment product. In selecting case studies, PIMCO considers multiple factors, including, but not limited to, whether the example illustrates the particular investment strategy being featured and processes applied by PIMCO to making investment decisions. Information contained herein has been obtained from sources believed to be reliable, but not guaranteed.

Environmental ("E") factors can include matters such as climate change, pollution, waste, and how an issuer protects and/or conserves natural resources. Social ("S") factors can include how an issuer manages its relationships with individuals, such as its employees, stakeholders, customers and its community. Governance ("G") factors can include how an issuer operates, such as its leadership, pay and incentive structures, internal controls, and the rights of equity and debt holders.

PIMCO is committed to the integration of Environmental, Social and Governance ("ESG") factors into our broad research process and engaging with issuers on sustainability factors and our climate change investment analysis. At PIMCO, we define ESG integration as the consistent consideration of material ESG factors into our investment research process with the goal of enhancing our clients' risk-adjusted returns. Relevant factors may include, but are not limited to: climate change risks, resource efficiency, natural capital, human capital management, human rights, regulatory risks, and reputation risk at an issuer. Further information is available in PIMCO's Sustainable Investment Policy Statement.

With respect to comingled funds with sustainability strategies and guidelines ("funds that follow sustainability strategies and guidelines"), we have built on PIMCO's over 50-year core investment processes, while actively incorporating sustainability principles. Through these guiding principles—excluding issuers fundamentally misaligned with sustainability factors, evaluating issuers using proprietary and independent ESG scoring (in addition to externally sourced and internally developed criteria), and engaging with issuers on ESG-related topics with the objective of improving investment outcomes - funds that follow sustainability strategies and guidelines seek to deliver attractive returns while also pursing to provide a vehicle through which investors can meet their sustainability preferences. Please see each fund that follows sustainability strategies and guidelines prospectus for more detailed information related to its investment objectives, investment strategies and approach to ESG.

Portfolios that invest in them may be subject to greater levels of credit and liquidity risk than portfolios that do not. **Equities** may decline in value due to both real and perceived general market, economic, and industry conditions. **Derivatives** may involve certain costs and risks such as liquidity, interest rate, market, credit, management and the risk that a position could not be closed when most advantageous. Investing in derivatives could lose more than the amount invested. **Diversification** does not ensure against loss. **Management risk** is the risk that the investment techniques and risk analyses applied by an investment manager will not produce the desired results, and that certain policies or developments may affect the investment techniques available to the manager in connection with managing the strategy.

ESG investing is qualitative and subjective by nature, and there is no guarantee that the factors utilized by PIMCO or any judgment exercised by PIMCO will reflect the opinions of any particular investor, and the factors utilized by PIMCO may differ from the factors that any particular investor considers relevant in evaluating an issuer's ESG practices. In evaluating an issuer, PIMCO is dependent upon information and data obtained through voluntary or third-party reporting that may be incomplete, inaccurate or unavailable, or present conflicting information and data with respect to an issuer, which in each case could cause PIMCO to incorrectly assess an issuer's business practices with respect to its ESG practices. Socially responsible norms differ by region, and an issuer's ESG practices or PIMCO's assessment of an issuer's ESG practices may change over time. There is no standardized industry definition or certification for certain ESG categories, for example "green bonds"; as such, the inclusion of securities in these statistics involves PIMCO's subjectivity and discretion. There is no assurance that the ESG investing strategy or techniques employed will be successful. **Past performance is not a guarantee or reliable indicator of future results.**

PIMCO's credit research analysts assess the Environmental, Social, and Governance ("ESG") profile of corporate, municipal, and sovereign issuers relative to peer issuers with a goal of separating leaders from laggards. Using industry-specific ESG frameworks, analysts review issuers' ESG performance based on information available in public filings, recent ESG news and controversies, as well as through engagement with company management teams. Analysts assign three separate numerical scores from 1 to 5 (with 5 being the highest) to their environmental, social and governance-based business practices. The score in each category is related to an issuer's rank relative to industry peers, and the relative weights of the E, S, and G scores in the composite score vary based on industries, as each industry is assigned a different factor weight. For example, the environmental category has the greatest weight for issuers in extractive industries (e.g., oil, gas, and mining), the social category has the greatest weight for pharmaceutical issuers, and the governance category has the greatest weight for financial issuers. Analysts also include a forward-looking ESG trend assessment, which recognizes companies whose ESG performance is significantly improving or deteriorating. These factors are combined to create a proprietary composite ESG issuer score.

PIMCO's credit research analysts also assess green, social, sustainability, and sustainability-linked bonds (collectively "ESG bonds") at an issuance level, including prior to and after issuance. Utilizing PIMCO's proprietary ESG Bond Framework assessment, credit analysts evaluate such instruments starting with the strategic fit, assessing the alignment of the issuers' ESG-related strategies with the bond's objectives and use of proceeds, key performance indicators (KPIs), and the evidence of significant positive impact of the activities compared to "business as usual". We continuously screen for "red flags" and controversies through this process and also assess the degree of reporting by the issuer to analyze misalignment with key market standards, such as the Green Bond Principles. These factors result in a proprietary ESG bond score ranging from 1 to 5 (with 5 being the highest). PIMCO does not score all ESG bonds. Unassessed ESG bonds receive a default score of 3. ESG bonds holdings in PIMCO portfolios are then assigned a score that combines the issuer's ESG score and the ESG bond score. Specifically, an ESG bond holding receives the ESG issuer score plus an adjustment ranging from 0 up to 1.0 point, depending on the type of ESG bond (use of proceeds or sustainability-linked) and the quality of the ESG bond according to PIMCO's proprietary assessment. Holdings of securitized ESG bond issuances (asset-backed securities, collateralized loan obligations, collateralized mortgage obligations, collateralized debt obligations, and mortgage pass through securities) receive the ESG issuer score and are not adjusted.

We use MSCI and other third-party ratings for reference but make our own assessment based on our own, independent analysis of the industry and relevant ESG factors. PIMCO's resulting assessments are proprietary and distinct from those provided by ESG rating providers. Inclusion of a proprietary PIMCO ESG rating creates a conflict of interest because PIMCO and its affiliates benefit when PIMCO assigns a particular security a high score, or assigns a benchmark index or security a low score.

Statements concerning financial market trends or portfolio strategies are based on current market conditions, which will fluctuate. There is no guarantee that these investment strategies will work under all market conditions or are appropriate for all investors and each investor should evaluate their ability to invest for the long term, especially during periods of downturn in the market. Outlook and strategies are subject to change without notice. Investors should consult their investment professional prior to making an investment decision.

The issuers referenced are examples of issuers PIMCO considers to be well known and that may fall into the stated sectors. References to specific issuers are not intended and should not be interpreted as recommendations to purchase, sell or hold securities of those issuers. PIMCO products and strategies may or may not include the securities of the issuers referenced and, if such securities are included, no representation is being made that such securities will continue to be included.

Stress testing involves asset or portfolio modeling techniques that attempt to simulate possible performance outcomes using historical data and/or hypothetical performance modeling events. These methodologies can include among other things, use of historical data modeling, various factor or market change assumptions, different valuation models and subjective judgments.

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