NORTHERN TRUST
ASSET MANAGEMENT

TCFD Report
2023

Table of Contents

A message to our stakeholders

This report describes Northern Trust Asset Management's (NTAM) approach to assessing and managing climate-related risks and opportunities and leverages the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). The report represents another step in our journey towards providing more transparency and disclosure, and aligns with our stewardship expectations for the companies we invest in on behalf of our clients.

We believe investors should be compensated for the risks they take — in all market environments and any investment strategy. A careful assessment of climate-related risks and opportunities is one component of an overall strategy for investors to achieve better risk-adjusted returns over the long term. We are advocates for TCFD and International Sustainability Standards Board (ISSB) S2 climate-related disclosure guidance and encourage companies to share key information that may be useful for investment decisions. Over the past few years, we made substantial progress in identifying and managing climate-related risks and opportunities.

And more specifically, in the last year we:

- Expanded our stewardship efforts on climate change by encouraging companies to increase transparency in matters material to their long-term sustainability.
- Expanded our Capital Market Assumptions outlook from five to 10 years, allowing us to better identify trends we see affecting markets and the economy; and in line with the change in forecast horizon, a sustainable green transition remains one of the six key themes driving our outlook and informing asset allocation.
- Gained further insight of the valuation impact of future climate-related risks and opportunities by performing climate stress assessments under multiple Network for Greening the Financial System (NGFS)[1] scenarios, across our in-scope assets under management (AUM).
- Increased our industry advocacy efforts through engagement in climate-related policy and regulatory initiatives to promote effective disclosures and standards.
- Submitted and secured approval of our net zero targets from the Net Zero Asset Management Initiative (NZAMI).[2]

We will continue to work closely with clients who view climate concerns as an important consideration in achieving their long-term investment objectives. We recognize climate-related investment solutions and regulations are evolving quickly and we are committed to ensuring continued enhancement of our climate-related practices. We will also continue to make investments in our climate-related investment capabilities and enhance efforts to help clients consider the material implications of climate change within their portfolios.

Daniel Gamba
President
Northern Trust Asset Management

Our commitments:

- Founding signatory to Climate Action 100+
- Signatory to NZAMI
- Member of Institutional Investors Group on Climate Change's (IIGCC) Net Zero Engagement Initiative (NZEI)[3]

[1] The NGFS is a consortium of central banks and financial supervisors aiming to enhance climate risk management in the financial sector and support mobilization of capital for the green transition.

[2] NZAMI is an international group of asset managers committed to supporting the goal of net zero greenhouse gas emissions by 2050 or sooner.

[3] The IIGCC formally launched a new collaborative engagement initiative in 2023, the NZEI, which seeks enhanced disclosure of climate transition plans.

Introduction

Northern Trust Asset Management (NTAM) is a global investment manager entrusted by investors around the globe to help them navigate changing market environments, so they can confidently realize their long-term objectives.

We are committed to designing innovative and efficient strategies that seek to compensate investors for risk and deliver positive outcomes in all market environments, including the risks and opportunities associated with climate change. We believe investors should be compensated for the risks they take in any investment strategy. At the heart of this philosophy is how we think about, view, and analyze risk. This deep understanding and respect for employing risk purposefully serves as the foundation for every investment solution and perspective we provide to our clients.

Research indicates that climate change poses a potential systematic risk that, if not managed properly, may have material impacts on our economy and society. We believe we have a responsibility to act in the best interest of our clients by serving as an active steward and to protect and grow capital over the long term.

Building on commitments in our inaugural 2022 TCFD Report, we achieved the following milestones:

Climate-focused direct engagements

↑86%

In alignment with our engagement priority to reduce climate risk, we managed more than 90 climate-focused direct engagements in 2023, an increase of 86% compared to last year. These engagements expand upon our stewardship goal of encouraging companies to increase transparency in matters material to their long-term sustainability, such as publishing their climate transition plans, setting emissions reduction goals, and increasing participation in climate-focused collaborative engagements in both developed and emerging markets.

70%

Support of submitted environmental proposals

We supported 70% of the environmental shareholder proposals submitted to our investee companies in 2023. We continue to pursue our goal of encouraging companies to further disclose financially relevant climate-related information.

CMA expanded to

10 yrs

We expanded our Capital Market Assumptions from five to 10 years, allowing us to better identify trends we see affecting markets and the economy. This includes navigating decarbonization on a global scale, catalyzed by the steep drop in the price of renewable energy production — often referred to as levelized cost of electricity (LCOE) — and understanding macroeconomic impacts of decarbonization in countries and economies dependent on importing fossil fuels for energy security.

Net Zero

in-scope AUM by 2050 commitment

NTAM net zero targets were approved by NZAMI, thus reinforcing our commitment as a signatory to align our in-scope AUM with a net zero by 2050 or sooner. More details can be found in the Metrics and Targets section.

EXHIBIT 1:

Summary of Disclosures Aligned With TCFD Recommendations

Including guidance for all sectors and asset managers

Governance

Describe the board's oversight of climate-related risks and opportunities.

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

REVIEW NTAM'S RESPONSES →

Strategy

Describe the climate-related risks and opportunities the organization identified over the short-, medium-, and long-term.

Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

Describe how climate-related risks and opportunities are factored into relevant products or investment strategies.*

Describe how each product or investment strategy might be affected by the transition to a low-carbon economy.*

Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

REVIEW NTAM'S RESPONSES →

Risk Management

Describe the organization's processes for identifying and assessing climate-related risks.

Describe how you 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.*

Describe engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks in order to improve data availability and asset managers' ability to assess climate-related risks.*

Describe the organization's processes for managing climate-related risks.

Describe how you manage material climate-related risks for each product or investment strategy.*

Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.

REVIEW NTAM'S RESPONSES →

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.

Describe metrics used to assess climate-related risks and opportunities in each product or investment strategy.*

Asset managers should describe the extent to which their AUM and products and investment strategies, where relevant, are aligned with a well-below 2°C scenario.*

Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.

Disclose GHG emissions for their AUM.*

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

REVIEW NTAM'S RESPONSES →

*Supplemental Guidance for Asset Managers.

About Northern Trust Asset Management

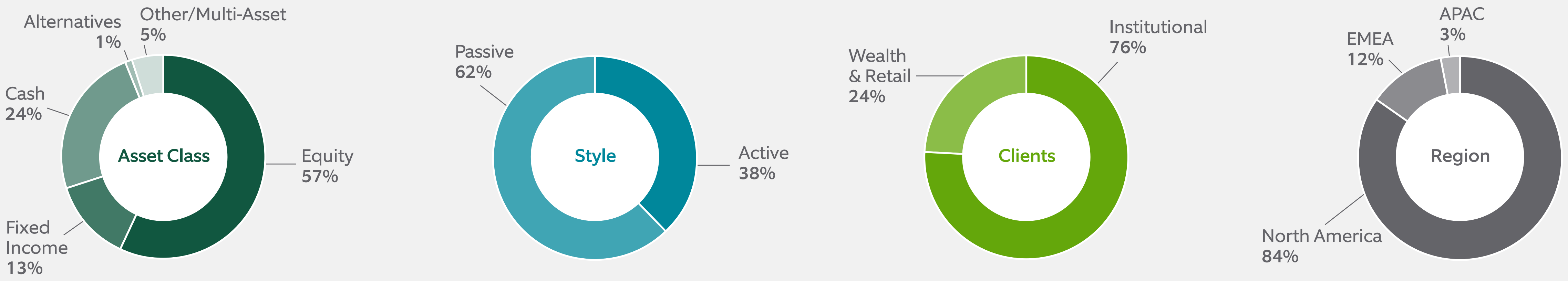
NTAM is the asset management business of Northern Trust Corporation (NTC), a leading provider of wealth management, asset servicing, asset management, and banking solutions.

NTAM is entrusted by investors around the globe to help them navigate changing market environments so they can confidently realize their long-term objectives. We are among the world's largest asset managers, with US$1.1 trillion in AUM, including US$162 billion in sustainable investment strategies,[4] and over 900 employees in 12 countries as of December 31, 2023. A more detailed breakdown of our AUM can be seen in Exhibit 2, below.

As regulations, data, and company-level actions continue to progress, we remain diligent in our evolving role with companies, industry associations, policymakers, and other stakeholders to help analyze climate change impacts. This report demonstrates NTAM's commitment to transparently manage climate-related risks and opportunities across the legal entities listed in Appendix 1. Also, an entity-level addendum for Northern Trust Global Investments Limited (NTGIL) is available at the end of this report, which is to be read in conjunction with this report. This addendum is prepared to highlight relevant disclosures in line with Chapter 2 of the UK's Financial Conduct Authority's (FCA) environmental, social and governance (ESG) sourcebook and cross references multiple sections of this report where relevant.

EXHIBIT 2:

NTAM Assets Under Management[5]

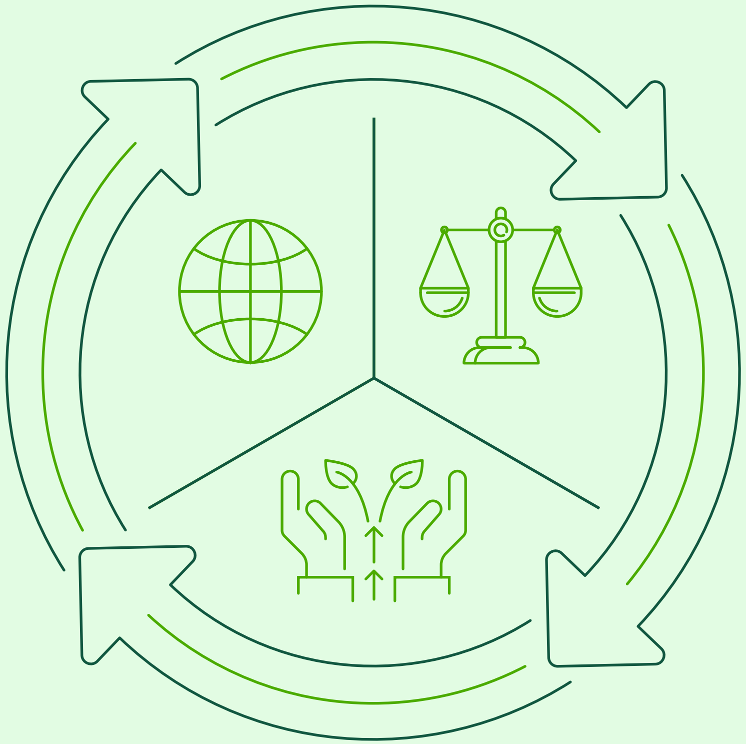


[4] At NTAM, we define Sustainable Investing as encompassing all of NTAM's investment strategies and accounts that utilize values-based and norms-based screens, best-in-class and ESG integration, or thematic investing that may focus on a specific ESG issue, such as climate-related risks. NTAM's Sustainable Investing includes portfolios designed by NTAM as well as those portfolios managed to client-defined methodologies or screens. As the data, analytical models and aforementioned portfolio construction tools available in the marketplace evolve over time, so too is NTAM. NTAM's Sustainable Investing encompasses strategies and client assets managed in accordance with client-specified responsible investing terms (historically referred to as Socially Responsible), as well as portfolios that leverage contemporary approaches and datasets, including ESG analytics and ESG thematic investing.

[5] Breakdown of products classified as active are as follows: Multi-Asset Class = 14%; Cash = 64%; Alternatives = 2%; Active Fixed = 14%; Quantitative Active Equity = 6%.

03 Governance

NTAM's governance provides a framework for identifying and managing the impact of climate change while strengthening accountability to our stakeholders.



Board Oversight

NTC's Board and its committees engage in active oversight of sustainability and ESG matters of significance — including climate-related risks and opportunities — to the Corporation and its subsidiaries.

NTAM's Sustainable Investing Council (SIC), chaired by the Global Head of Sustainable Investing, provides multidisciplinary oversight across sustainable investing practices, including climate change.

Across NTAM, each legal entity board provides oversight of senior management who are responsible for setting and executing the business strategy, including climate objectives where appropriate.

The NTAM Asset Management Risk Committee (AMRC) is the senior risk committee providing oversight and governance for risks, including climate change, within NTAM and its legal entities.

Please refer to Exhibits 3 and 4 for our governance structure and responsibilities of the committees.

EXHIBIT 3:
NTAM's Sustainability Governance Structure

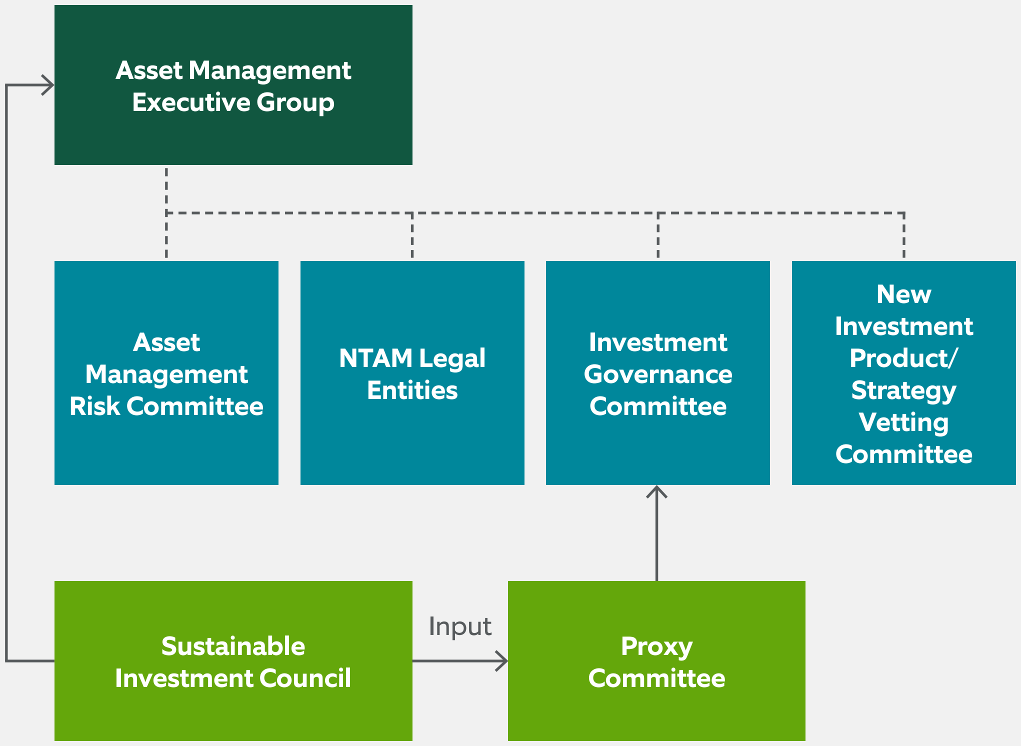


EXHIBIT 4:
Our Governance Bodies

Name	Responsibilities	Meeting Frequency
NTAM Legal Entity Boards	Oversight of each legal entity's business and execution	Quarterly/Ad hoc as needed
Asset Management Risk Committee (AMRC)	The primary purpose of the AMRC is to oversee the management of risks, including climate change risks, within NTAM globally, and for each legal entity. The AMRC is chaired by NTAM's Chief Risk Officer (CRO).	Monthly
New Investment Product/Strategy Vetting (NIPSV) Committee	NIPSV Committee reviews and approves new investment capabilities, strategies, or products for potential development, launch, and distribution by NTAM, including strategies with climate considerations.	Ad hoc as needed
Investment Governance Committee (IGC)	IGC promotes effective governance related to investment strategy decisions, portfolio performance, and related matters. This committee is responsible for escalation of significant investment governance and performance matters to the AMRC.	Quarterly
Sustainable Investing Council (SIC)	SIC provides multi-disciplinary oversight of NTAM's sustainable investing practices, including climate considerations within portfolio construction. The SIC purview includes oversight of the ESG integration process and the review and approval of memberships, such as NZAMI. The NTAM Global Head of Sustainable Investing serves as the chair. Membership includes representation of senior leaders from relevant business units and functions such as corporate sustainability, product development and management, investments, portfolio management, risk, compliance, business development, proxy voting, and engagement who meet to review and approve various sustainable investing agendas. Climate change considerations are included in NTAM's broader sustainable investing agenda and covered separately, in detail, on an as-needed basis.	Bi-monthly
Proxy Committee	This committee is responsible for the content, interpretation, and application of the Northern Trust Proxy Voting Policies, Procedures and Guidelines, and the Northern Trust Asset Management Engagement Policy. These policies outline how NTAM engages with companies on climate-related matters, and votes on climate proposals across the companies in which we invest.	Quarterly

Management Oversight

NTAM's governance structure provides oversight and accountability of climate-related risks. Within NTAM, each functional group is responsible for overseeing its own sustainability and climate-related objectives.

The following are the role summaries of the groups responsible for the oversight and execution of NTAM's sustainability and climate-related objectives.

Asset Management Executive Group (AM EG)

AM EG is comprised of senior-level executives within NTAM and is responsible for setting priorities, communicating, coordinating, and implementing strategic objectives. This group also oversees business activities, monitors performance against strategic, financial, and risk management parameters, and manages significant issues that may impact the business. The executive sponsor of the sustainable investing practice is a member of AM EG and sets the strategic priorities and implementation of NTAM's sustainable investing and climate-related objectives.

Global Sustainable Investing (SI Team) and Stewardship Team

The SI and Stewardship Teams are comprised of dedicated specialists serving as centers of excellence across NTAM, ensuring we understand and continuously improve best practices in ESG integration and stewardship. The SI Team provides analysis and insights on emerging ESG themes and monitors critical issues, industry trends, and regulatory developments. In order to deliver specialist knowledge, the two teams are divided into three areas with dedicated sustainability responsibilities, including:

1

CLIENT ENGAGEMENT

- Consult with clients to understand their sustainable investment objectives and advise them of solutions that may help them achieve those objectives, both financially and in ways that align with their values.
- Partner with the ESG research and integration specialists to develop innovative sustainable investing solutions based on client input.
- Provide education programs for employees and clients.

2

ESG RESEARCH AND INTEGRATION

- Partner with our investment teams to plan and implement ESG integration appropriate for various asset classes, investment strategies and time horizons.
- Develop research insights and proprietary data tools, such as the Northern Trust ESG Vector Score™.
- Keep abreast of developments related to ESG data tools and technology, to improve the ESG investment process and gain research insights.

3

STEWARDSHIP

- Engage with companies to improve their policies and strategies related to ESG.
- Ensure proxy voting aligns with our policies.
- Manage and participate in engagement campaigns in collaboration with other shareholders.

ESG Champions Across Other Functions

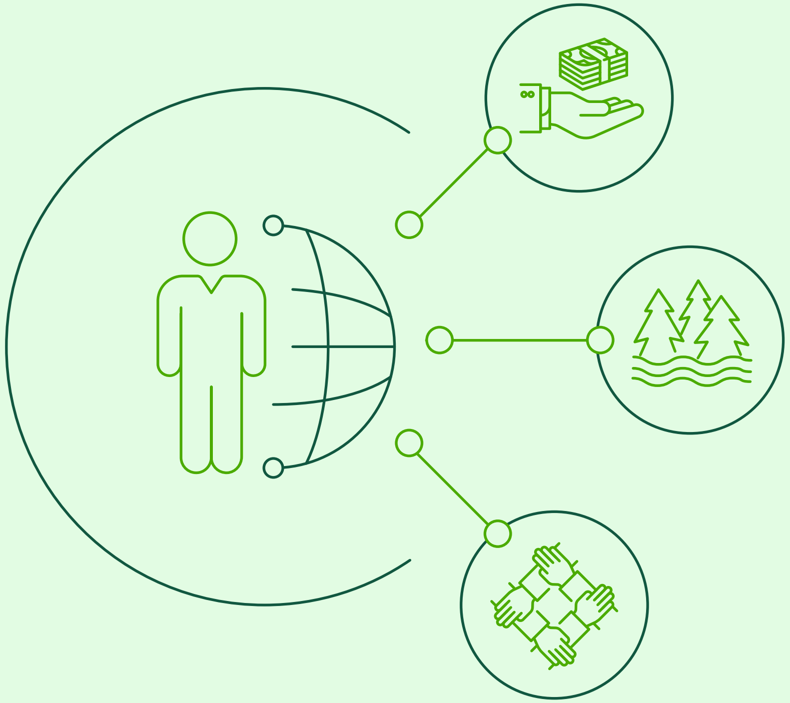
As one of the largest global asset managers, we have an extended ESG champion network of NTAM employees with expertise in client servicing, distribution, product, portfolio management, compliance, risk, and research, who also serve as sustainable investing champions within their respective teams. This cohort work in collaboration with the Global SI and Stewardship Teams to explore emerging ESG themes, industry trends, and regulatory developments which may impact our firm, clients, and investment strategies. ESG champions can leverage the resources of our SI Team and participate in various committees and regional ESG working groups, with oversight and accountability provided by the SIC.

Within NTAM, each functional group is responsible for overseeing its own sustainability and climate-related objectives supported by the dedicated specialists in SI and Stewardship teams.

04

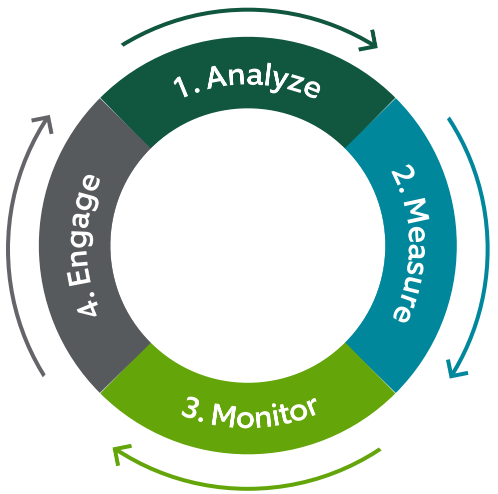
Strategy

NTAM's perspective on climate change is embedded in our sustainable investing philosophy, which is consistent with our view that investors should be compensated for the risks they take. We believe understanding and evaluating companies' performance using ESG criteria enhances our forward-looking view of risks and opportunities.



NTAM's Sustainable Investing Approach

Research indicates climate-related risks pose a potential systemic risk to financial markets, which may affect the economy and risk-adjusted returns for investors in global markets.



Our investment solutions purposefully employ a robust four-step investment approach to consider these risks:

1. Analyze

We leverage leading industry-standard frameworks, such as Sustainability Accounting Standards Board (SASB) Standards and the TCFD recommendations, along with our proprietary frameworks to analyze climate-related risks and opportunities. These resources help us identify material climate change factors and their impact over different time horizons.

2. Measure

We utilize multiple tools, including external best-in-class ESG data sets, proprietary research and analytics, custom exclusionary screens, and measurements to evaluate how companies perform against various climate factors. Understanding historic and future climate-related risks and opportunities helps us make informed decisions.

3. Monitor

We regularly assess the securities in our sustainable investment portfolios for relevant and material climate-related risks. Our monitoring process helps us proactively identify the climate-related risks exposure and take appropriate actions.

4. Engage

Stewardship is an integral part of our investment process, through which we identify long-term risks that have a potential to pose challenges to shareholder value, and then engage with those companies on specific issues.

Sustainable investing is a strategic priority for NTAM, with climate change and its associated risks and opportunities assessed and considered when developing our firm-wide strategies and goals. Our sustainable investing philosophy guides us as we seek to align with our clients' investment and climate objectives, while addressing the growing need for integration of climate considerations in portfolios. This is achieved through the implementation of our climate-focused strategic pillars to the right:

ESG integration

We focus on sustainable value creation and effective risk mitigation.

Innovation across our climate-focused investment solutions

NTAM does not take a one-size-fits-all approach to climate investment solutions. Our approach varies between asset classes to reflect the integration philosophies of each team, client preferences and objectives, and the specific nuances of each investment strategy.

Stewardship focus on:

a. Engagement with investee companies

b. Proxy voting in line with long-term value creation

Industry advocacy and participation in industry associations

NTAM understands regulatory risk is a key aspect of managing climate-related risks and opportunities. We participate in various industry associations to better understand these risks, which in turn informs the integration of climate considerations in the portfolios we manage.

Investing in resources, tools, and technology

We continue to strengthen our team by adding new roles and enhancing our ESG data hub.

Our ESG Integration Approach

We believe material ESG factors are pre-financial indicators that may affect a company's future financial viability and clients' long-term risk-adjusted investment returns. NTAM defines ESG integration as: **the systematic inclusion of material ESG factors as additional inputs into investment analysis and decision-making.**

ESG factors encompass a wide range of issues, including climate change. Our approach represents a refined perspective on ESG materiality, and leverages our quantitative and fundamental research expertise. We believe our distinct ability to hone in on these critically important and financially material ESG issues will help further align sustainable investments and stewardship.

E	S	G
ENVIRONMENTAL	**SOCIAL**	**GOVERNANCE**
Climate change; resource depletion, including water; waste; pollution; energy efficiency; and, green revenue	Working conditions including child labor, health and safety, employee relations and diversity, human capital	Board diversity and structure, executive pay, bribery and corruption, shareholders rights

Integrating Climate Change Into Capital Market Assumptions

Each year, our Capital Market Assumptions (CMA) working group, a subset of NTAM's Investment Policy Committee, develops long-term investment themes that take into account, among other factors, systemic market risks. *A Sustainable Green Transition* is among the six key themes. These forward-looking investment themes and return forecasts, combined with our research on historic asset class volatility and correlations, are used to build the strategic asset allocation that sets the foundation for positioning multi-asset portfolio products.

In 2023, our CMA time horizon expanded from five to 10 years, allowing us to better identify trends we see affecting markets and the economy. Navigating *A Sustainable Green Transition* requires balancing environmental and economic priorities. We think that balancing act will be hard and all but guarantees the transition won't evenly accelerate over the next 10 years — though technology may improve this trajectory. All said, policy persistence is lining up with the economics, allowing the transition to continue, even if some policy goals may be hard to reach. For more details, see the CMA website.

A SUSTAINABLE GREEN TRANSITION

Countries want to cut emissions and improve energy security, so the green energy transition is still a go. But it requires vast amounts of financing and natural resources. Investors must navigate environmental and economic priorities.

Identifying Impacts of Climate-related Risks and Opportunities

Climate-related risks have the potential to impact future revenues and expenses of NTAM's investee companies, which ultimately can affect client returns.

The materiality and impact of climate change factors in NTAM's investment strategies depend on many variables, including: investment style; regulatory impact; client guidelines and objectives; region; asset class; and, holding period of the investments. When analyzing the climate-related risks and opportunities to client accounts and products, these factors are considered in the portfolio design process.

NTAM is committed to understanding how climate factors may contribute to risk in client portfolios as well as across our broader range of investments. The risks of climate change can be divided into two categories:

- Climate-related **transition risks** may arise as the world moves from a reliance on carbon-based energy toward lower-carbon alternatives. These risks include the potential for additional regulation and reporting requirements, legal exposure, reduction in the value of investments, and costs associated with developing low-carbon technology. Depending on the nature and extent of these changes, the global climate transition may catalyze meaningful shifts across the economy, and impact the companies in which we invest. Our current view is that identifying and managing transition risks and opportunities are particularly important in the short- (0 to 5 years) and medium-term (5 to 10 years), and continues to be our area of focus.
- Climate-related **physical risks** arise from the direct impacts of a changing climate. Physical risks are both acute and chronic. Acute physical impacts include extreme weather or climate events, like flooding. Chronic impacts include longer-term shifts, such as increased temperatures and rising sea levels. Such risks can lead to extreme weather events impacting operations and leading to impairment of infrastructure and facilities or the disruption of supply chains. We foresee physical risks becoming increasingly frequent over longer time horizons (10 to 30 years), although extreme weather events could have near-term impacts.

Exhibits 5 and 6 on the following page summarize the specific climate-related transition risks and opportunities potentially arising in each time horizon (short-, medium-, and long-term) and the anticipated financial impact to NTAM.

EXHIBIT 5:
Key Climate-related Transition Opportunities

Opportunities	Description	Anticipated Financial Impact*	Time Horizon
Products and Services	Increasing demand from clients for climate-focused investment solutions may help NTAM generate new business through product offerings.	Increased Revenue	Short- to medium-term (0–10 years)
Markets	Increasing decarbonization efforts in the market may increase the demand for net zero focused investment solutions. NTAM's net zero commitment may resonate well with client needs.	Increased Revenue	Short- to long-term (0–30 years)

EXHIBIT 6:
Key Climate-related Transition Risks

Risks	Description	Anticipated Financial Impact*	Time Horizon
Policy and Legal	Increased climate-related disclosure regulations may continue to evolve, potentially resulting in higher compliance costs to manage climate-focused investment strategies.	Increased expenses	Short-term (0–5 years)
	New regulations could impact client investment strategies or allocation decisions in a manner that may not be favorable to NTAM.	Reduced revenues	Short- to medium-term (0–10 years)
	New policies could result in stranded assets for some of our investee companies, which might result in unfavorable short-term impacts.	Reduced revenues	Short-term (0–5 years)
Market	Climate-related risks could cause asset value fluctuations, which may result in a decline in NTAM AUM.	Reduced revenues	Medium- to long-term (5–30 years)
Reputation	Increasing scrutiny around climate-related activities and a potential lack of sufficient action from NTAM could create reputational risks impacting our AUM.	Reduced revenues	Short- to medium-term (0–10 years)
Physical	NTAM offices could be impacted by adverse climate impacts. However, the financial impacts are limited as NTAM leases most of its facilities. Climate adaptation would also affect the expenses due to impact of physical risks.	Increased expenses	Medium- to long-term (5–30 years)

*Anticipated financial impact cannot be guaranteed as impacts are driven by multiple factors not in our control.

Scenario Analysis and Portfolio Resilience

In 2023, NTAM conducted an inaugural climate scenario analysis, assessing the resilience of NTAM's portfolio against a range of NGFS climate scenarios. The analysis applied to equity, corporate bond and sovereign bond holdings, as of December 31, 2023. This section details the scenarios assessed, methodology used, and results.

To capture the impact of the complex interaction of the economy, energy system and physical climate risk on NTAM's portfolio, Planetrics,[6] a third-party data provider, supported the climate scenario analysis and modeling. The analysis focuses on investments for which comprehensive financial and environmental data were available.

Overall, this analysis focused on US$839 billion of NTAM's equity, corporate bond and sovereign bond AUM, which is about 75% of the overall NTAM AUM (hereafter referred to as, "Total aggregated portfolio").[7] At the asset class level, nearly all global listed equities, over half of corporate bonds, and over three-quarters of sovereign bonds were included in the exercise, as shown in Exhibit 7. The balance of fixed income securities not covered includes short-duration bonds, some of which reached maturity.

EXHIBIT 7:

Climate Scenario Analysis 2023 Asset Coverage

Asset Class	AUM (US$B)	Scenario Analysis Coverage (US$B)	Scenario Analysis Coverage (%)
Equity	647.9	643.1	99.3
Corporate Bonds	81.7	41.9	51.3
Corporates (Equity + Bonds)	*729.6*	*685.0*	*93.8*
Sovereign Bonds	109.4	86.2	78.8
Overall	**839**	**771.2**	**91.9**

Source: Planetics, NTAM holdings as of December 31, 2023.

Where results are presented at an asset class level, the portfolio is compared against the following publicly available indices:

- For aggregated equities, MSCI All Country World Index.
- For aggregated corporate bonds, Bloomberg Global Aggregate Corporate Total Return Index.
- For aggregated sovereign bonds, Bloomberg Global Aggregate Treasuries Total Return Index.
- For total aggregated portfolio, a weighted combination of above indices (hereafter referred to as, "Total aggregated index").

[6] This report has been created by Northern Trust Asset Management drawing on selected data provided by Planetrics, a McKinsey & Company solution (which does not include investment advice). This report represents Northern Trust Asset Management's own selection of applicable scenarios selection and/or its own portfolio data. Northern Trust Asset Management is solely responsible for, and this report represents, such scenario selection, all assumptions underlying such selection, and all resulting findings, and conclusions and decisions. McKinsey & Company is not an investment adviser and has not provided any investment advice.

[7] This excludes cash, repurchase agreement (repo) transactions, securitized credit, agency credit, municipal credit, asset-backed credit and derivatives in the corporate and sovereign bond portfolios as of December 31, 2023.

Climate Scenarios

Climate change presents a unique risk with no historical precedence, posing a challenge for models calibrated on past data. Scenario analysis helps identify opportunities and attempts to mitigate future risks. Climate scenario analysis models the potential impacts of climate change and the low carbon transition by depicting plausible future climate, energy system and economic pathways with a clear and credible narrative and strong internal logic. Assessing the resilience of the NTAM portfolio to a range of uncertainties can help bound the range of potential future outcomes and challenge "business as usual" assumptions by exploring a spectrum of possible outcomes across key risk and opportunity drivers, including changes in temperature and technology, policy stringency, timing and coordination.

For the inaugural NTAM climate scenario analysis exercise, three scenarios developed by NGFS were selected — Current Policies (referred to as "Hot House World" throughout this document), Delayed Transition, and Net Zero 2050.[8] Each scenario draws from the Phase 4 NGFS scenarios released in November 2023. These scenarios are based on outputs from the REMIND-MAgPIE Integrated Assessment Model (IAM),[9] which is widely adopted by regulators, the broader financial sector, and is also included in the Intergovernmental Panel on Climate Change's Sixth Assessment Report (IPCC AR6).[10] The selected scenarios span a range of narratives and varying levels of transition and physical risk, summarized in Exhibit 8 on the following page.

NGFS scenario variables provide the pace and the pathway of physical and transition risks and opportunities for the selected scenario narrative, also seen in Exhibit 8. Physical risks are driven by emissions levels and their associated impacts on global mean temperature. The Hot House World scenario, where current policies are maintained (also referred to as "business as usual"), results in the highest level of physical risk as temperatures rise above 2°C by 2050.

Assessing the resilience of the NTAM portfolio to a range of uncertainties can help bound the range of potential future outcomes and challenge "business as usual" assumptions.

[8] There are seven NGFS scenarios, falling into four quadrants: Hot House World, which includes the Current Policies scenario; Disorderly, which includes Delayed Transition; Orderly, which includes Net Zero 2050; and Too Little Too Late.

[9] REMIND (Regional Model of Investment and Development) is a numerical model that represents the future evolution of the world economies with a special focus on the development of the energy sector and the implications for our world climate. MAgPIE (Model of Agricultural Production and its Impacts on the Environment) is a global land use allocation model. Both models are run out of the Postdam Institute for Climate Impact Research.

[10] The IPCC is the United Nations' body for assessing the science related to climate change.

EXHIBIT 8:

Selected NGFS Scenarios at a Glance

All scenarios are based on outputs from the REMIND-MAgPIE model.

Scenario	Description	Median 2100 Warming (Unless Otherwise Stated)	Net Zero (CO_2) Year	Technology Change	CO_2 Reduction Assumption	Regional Policy Variation
Hot House World	Existing climate policies remain in place, but there is no strengthening of ambition level. Thus, there is no transition risk. Heightened physical risks are assumed through high climate sensitivity, specifically 90th percentile temperature increase (3.8°C by 2100), high levels of ice sheet melt, and higher responsiveness of tropical and windstorm frequency and intensity to changing temperatures.[11]	3.8°C (90th percentile)	N/A	Slow change	Low use	Low variation
Delayed Transition	Imposes the 2°C target in 2100 and allows for temporary overshoot. Annual emissions do not decrease until 2030. Strong policies are then needed to limit warming to below 2°C. This scenario includes regional carbon price variation. Regional net zero targets for countries with clear commitments (China, EU, Japan, and U.S.) are applied from 2030 onwards, but for other countries ambition equivalent to the overall temperature target of below 2°C in 2100 is assumed leading to strong regional differentiation.	1.6°C	N/A	Slow until 2030; fast thereafter	Low/medium use	High variation
Net Zero 2050	Limits global warming to below 1.5°C (the median temperature returns to 1.3°C in 2100, after a limited temporary overshoot) through stringent climate policies and innovation, reaching global net zero CO_2 emissions around 2060. Some jurisdictions such as the U.S., EU and Japan reach net zero for all GHGs by 2050.	1.3°C	2050	Fast change	Medium/high use	Medium variation

Source: NGFS Technical Documentation, 2023.

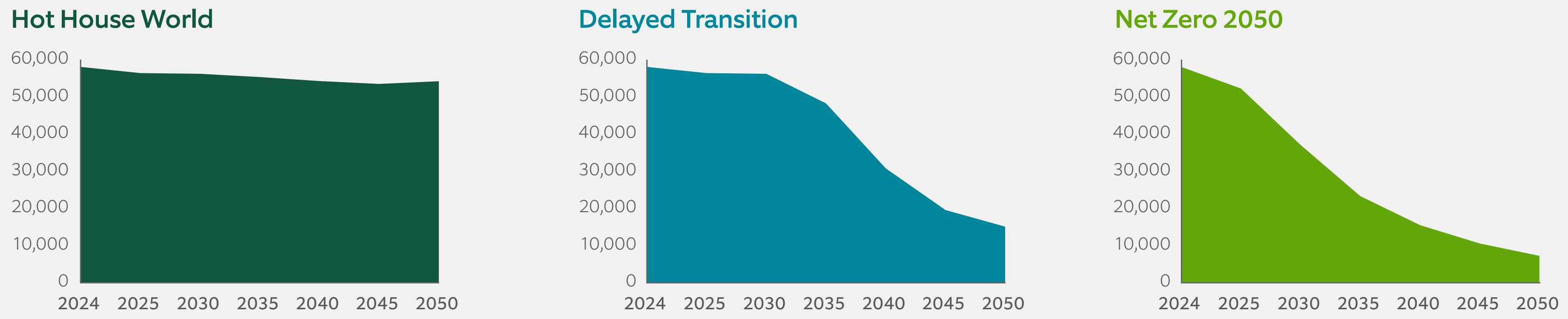
[11] The impact of scenario emissions on temperature is probabilistic. The Hot House World scenario assumes a 90th percentile warming outcome for the scenario level of emissions.

Transition risks are driven by increasing carbon prices and changes in the energy system. Rising carbon prices increase costs for emissions-intensive industries, while changes in demand for oil, gas and coal negatively impact revenues in the energy sector and demand for fossil fuel intensive products, such as internal combustion vehicles (ICEs). However, the low-carbon transition also results in opportunities as the transition away from fossil fuels increases demand for low-carbon generation technologies and low-carbon products, such as electric vehicles (EVs) and biofuels. The Net Zero 2050 scenario, where policies are enacted immediately to reach net zero emissions around mid-century, results in the most transition risk and transition opportunity as temperatures are limited to 1.5°C. Exhibit 9 shows the scenario variables of projected GHG emissions and carbon price for NGFS scenarios. More details on projected temperature anomaly and energy mix are available in [Appendix 2](#).

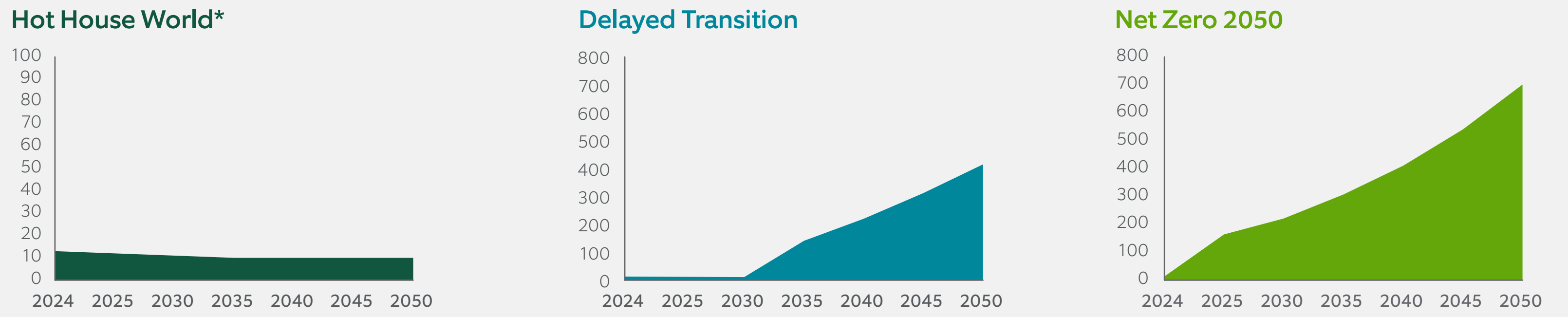
EXHIBIT 9:

Key Variables for Selected NGFS Scenarios

a) Projected GHG Emissions (Mt CO_2e/year)[12]



b) Projected Carbon Price (Based on 2020 US$/$tCO_2$ Baseline)[13]



Source: NGFS Technical Documentation. As of November 2023. * Note change in scale when comparing charts.

[12] CO_2e is used throughout this document and includes GHGs, such as methane, nitrous oxide and fluorinated gases in calculations. Therefore, CO_2e is a more accurate measure of an assets true carbon footprint.

[13] NGFS 'implicit' carbon prices encompass carbon taxes, market-based carbon prices, and the cost of complying with other climate change regulations. The NGFS provides regional carbon prices. For illustration, the chart displays global carbon prices, representing a weighted average of regional carbon prices.

Modeling Approach

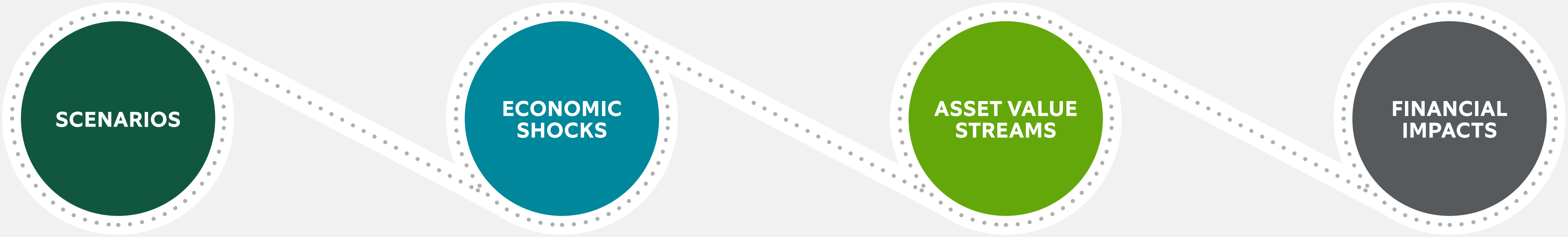
Our data provider's modeling quantifies the impact of a range of physical and transition risks on security values under a range of possible future climate scenarios. For equities and corporate bonds, a four-step framework is deployed, also seen in Exhibit 10, below.

For sovereign bonds, value impacts are estimated by drawing on macroeconomic modeling of changes in debt-to-gross domestic product (GDP) and resulting default risk premia adjustments for each NGFS scenario.

The model accounts for company-specific characteristics — such as the markets in which the company operates, revenue segmentation and emissions intensity — and security-specific characteristics, including duration and issuer credit rating for bonds. It also simulates company responses to shocks, including the adoption of economically optimal abatement opportunities, and captures the effects of competition dynamics, such as changes in market share and cost pass-through to consumers.

The output from the model includes changes in the current value of financial assets from each climate scenario, disaggregated by source of transition and physical risk as shown in Exhibit 11 on the following page. This supports the identification of climate risk and opportunity drivers at portfolio, sector, region and security level.

EXHIBIT 10:
Four-step Modeling Framework



Identify plausible climate narratives that include economic, energy system, and climate variables.

Translate scenario variables into economic shocks affecting corporate revenues and costs. For example, carbon prices can increase production costs, and changes in the frequency and intensity of extreme weather can raise insurance costs.

Apply economic shocks to companies to estimate changes in annual earnings to 2050.

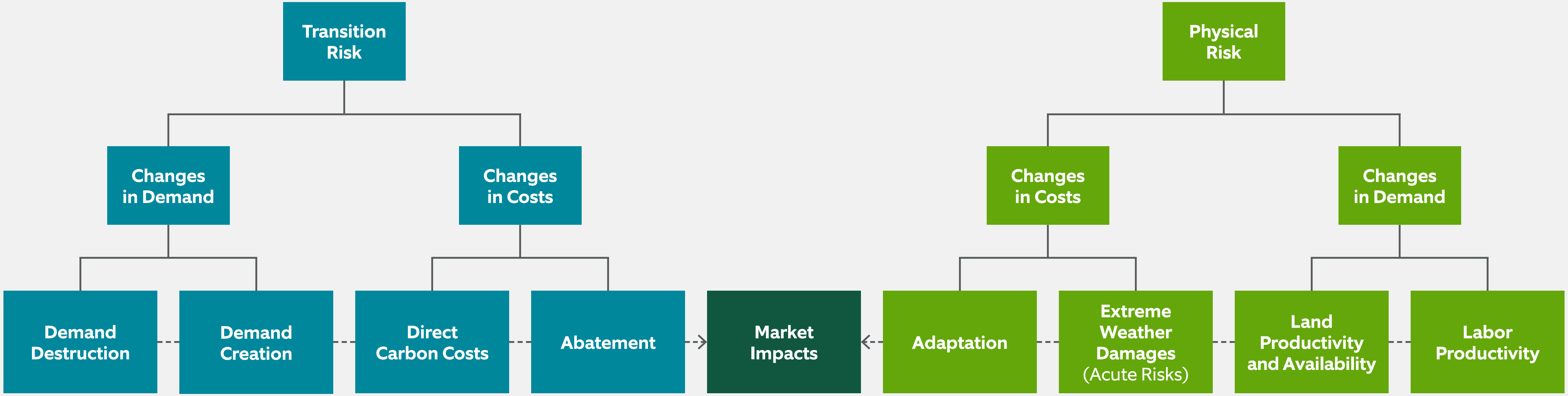
Consolidate and translate changes in earnings into changes in security values. For example, equity impacts are estimated using discounted cash flow modeling, and corporate bond impacts are estimated by assessing changes in issuer credit quality.

Source: Planetrics.

EXHIBIT 11:

Climate Risk's Impact Channels

Climate impacts are disaggregated into seven impact channels, related to either physical or transition risk.



Reduced demand for fossil fuels pushes down prices for producers and results in lower profit margins and stranded assets

Increasing demand for low-carbon products and materials (such as lithium) pushes up profits for companies involved

Increase in cost from emissions-intensive companies which face a cost burden from carbon pricing (for the emissions not abated)

Decrease in cost from emissions-intensive companies which can reduce emissions through abatement

Changes in profit from companies' ability to pass through costs to consumers and take market share from more emissions-intensive competitors

Decrease in costs or increase in revenue due to actions to reduce the physical impacts of climate change (such as coastal flood defenses)

Increase in insurance costs due to increased likelihood of extreme weather events, including coastal, river and surface water flooding, tropical cyclones, windstorms and wildfire

Decrease in revenue from chronic physical impacts due to land and changes in agricultural productivity caused by higher precipitation and temperature

Decrease in revenue from chronic physical impacts due to changes in labor productivity caused by heat stress

Source: Planetrics.

Scenario Analysis Results and Insights

The NTAM portfolio remains resilient to climate-driven value impacts under each of the three climate scenarios relative to the broader market indices. Across scenarios, the stringency of climate policies drives value impacts. Here are four key findings from the exercise:

1

Within each asset class of the NTAM Total portfolio, the net present value (NPV) impact is about the same or better than broad market indices, across each of the climate scenarios.

2

The most material NPV impact occurs in Net Zero 2050, the scenario with the highest stringent climate policies.

3

For equities, under the Net Zero 2050 scenario, the main drivers of risk are direct carbon costs and demand destruction.

4

Longer-duration bonds, which have higher cashflows in later years, face more pronounced climate impacts than shorter-duration bonds.

Impacts to NPV

The most material NPV impact occurs in Net Zero 2050, the scenario with the most stringent climate policies, followed by the Delayed Transition scenario and Hot House World, and as seen in Exhibit 12 on the following page. The difference in NPV impacts across scenarios is driven by the varying time horizons over which transition and physical risks materialize.

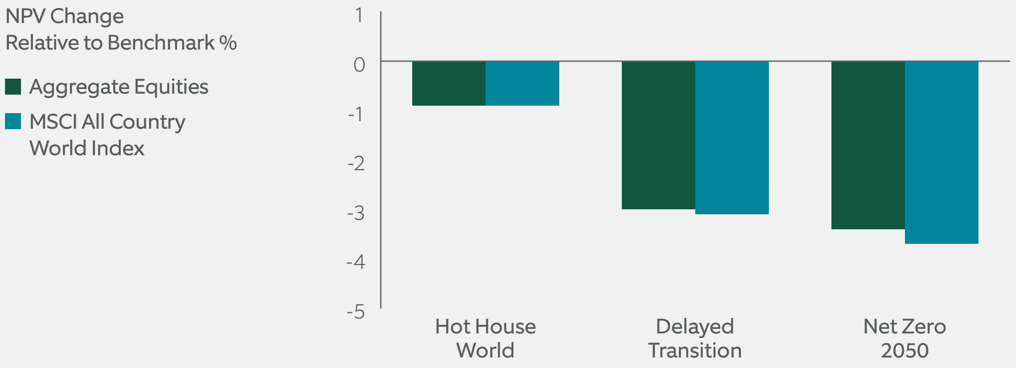
Transition risks materialize first under Net Zero 2050, as climate policies are immediately introduced to limit warming to below 1.5°C by 2100. In the Delayed Transition scenario, transition risks do not materialize until the introduction of stringent climate policies in 2030, resulting in a more disorderly transition to limit temperatures to below 2°C. Physical risks materialize over longer time horizons in the Hot House World scenario and continue to increase beyond the modeling horizon of 2080.[14]

Equities face the most material climate impacts, followed by corporate and sovereign bonds, also seen in Exhibit 12. Equities are more exposed to climate risks and opportunities than corporate bonds because bondholders receive fixed payments and have a higher claim on assets. Each asset class within the NTAM total aggregated portfolio performs about the same or better than the broad market indices, across all the climate scenarios.

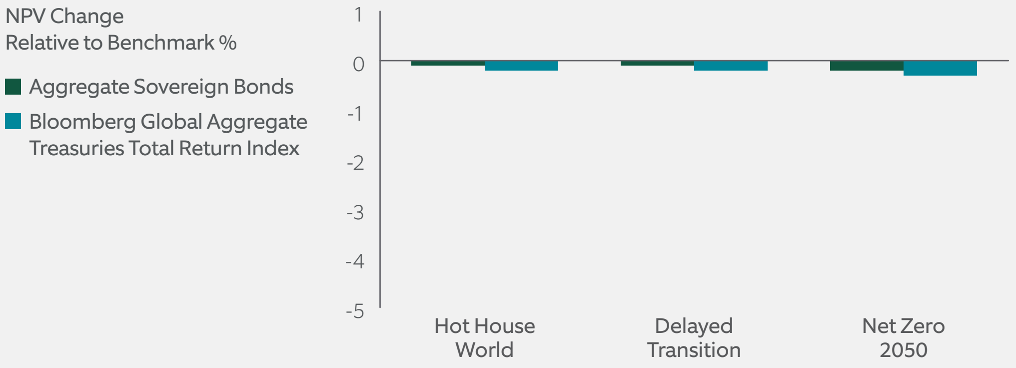
[14] In the model, risks are discounted to their present-day values, making near-term transition risks more prominent than longer-term physical risks. The impacts of transition risk are modelled to 2050 and physical risks to 2080.

EXHIBIT 12:
Asset Class Level NPV Impacts vs. Broader Market Index Impacts

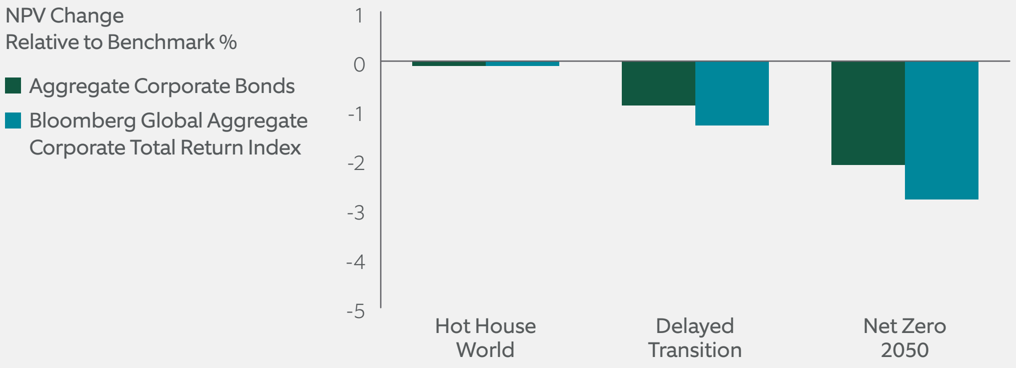
Aggregate Equities vs. MSCI All Country World Index



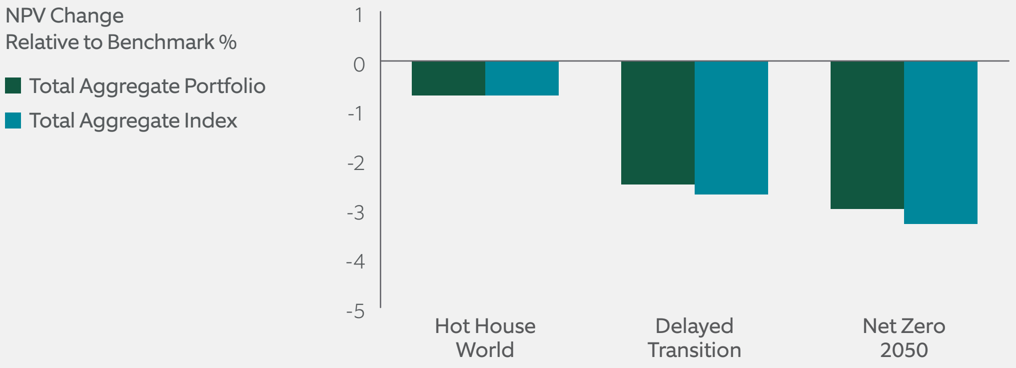
Aggregate Sovereign Bonds vs. Bloomberg Global Aggregate Treasuries Total Return Index



Aggregate Corporate Bonds vs. Bloomberg Global Aggregate Corporate Total Return Index



Total Aggregate Portfolio vs. Total Aggregate Index



The most material NPV impact occurs in Net Zero 2050.

Source: Planetrics, NTAM holdings as of December 31, 2023.

Equity Impacts Under Net Zero 2050 Scenario

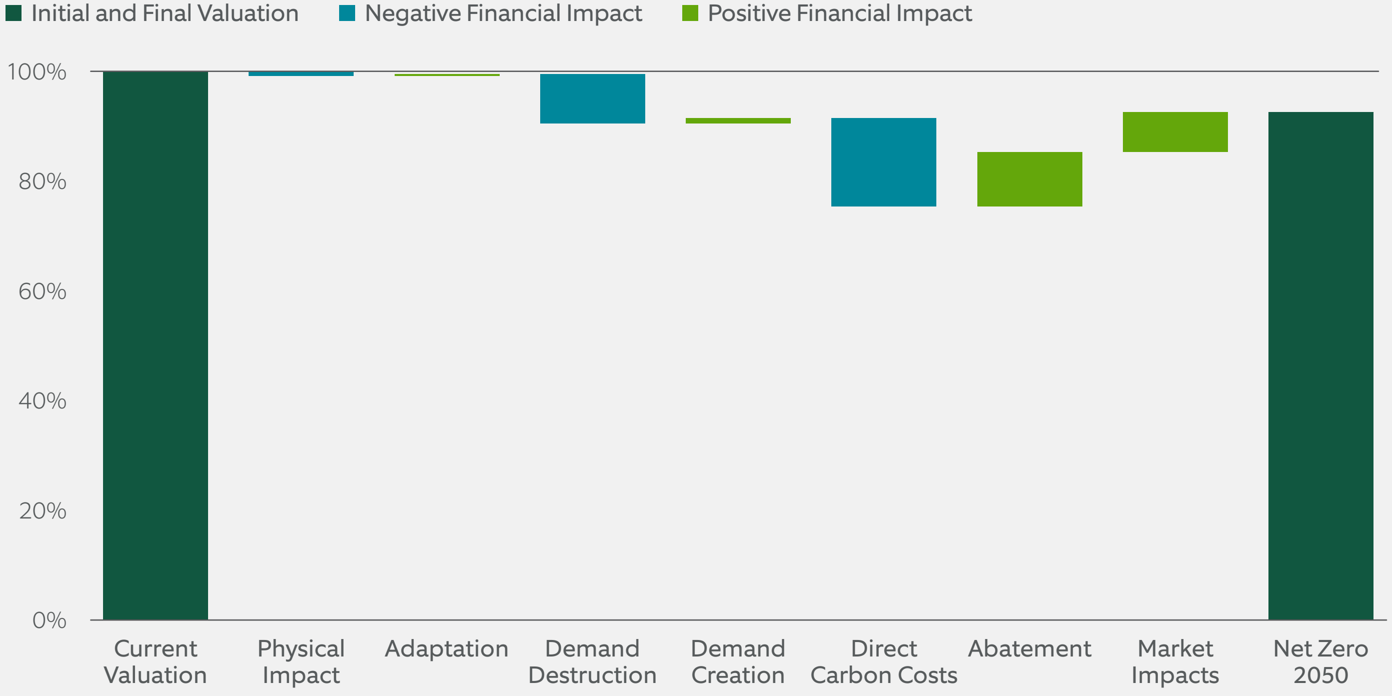
Under the Net Zero 2050 scenario, the main drivers of risk for equities are the direct carbon costs and demand destruction, as shown in Exhibit 13. However, modeling estimates companies will react to rising carbon prices by adopting economically optimal levels of abatement, weighing the carbon price against abatement costs for each ton of emissions. In addition, modeling finds that companies are able to pass some costs on to consumers. The combination of emissions abatement and cost pass-through reduces the impact of direct carbon costs. As a result, the overall impact on equity value is primarily due to demand destruction, which is only partially offset by demand creation.

In the Net Zero 2050 scenario, physical risk has a relatively smaller impact on equity value, which is also partially offset by adaptation measures, reflecting the benefit of policy limiting warming to below 1.5°C.

EXHIBIT 13:

Equity Portfolio Value Impacts, Disaggregated by Risk Channel

(Based on Net Zero 2050)



The overall impact on equity value is primarily due to demand destruction, which is only partially offset by demand creation.

Source: Planetrics, NTAM holdings as of December 31, 2023.

Transition-exposed Sectors

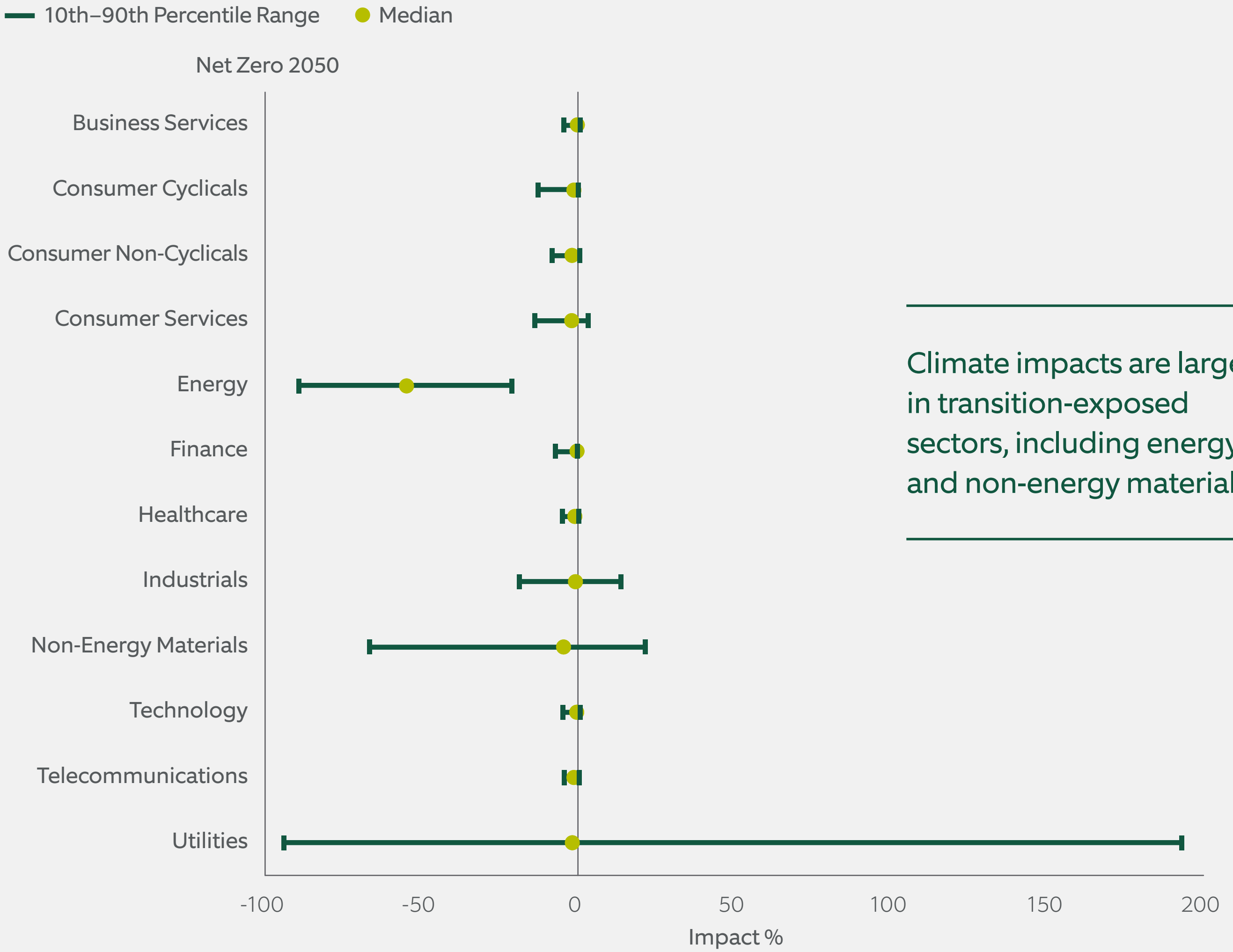
Climate risks and opportunities are concentrated across and within sectors. Under Net Zero 2050, climate impacts are largest in transition-exposed sectors, including energy and non-energy materials. In this scenario, impacts are driven by declining revenues from failing demand for fossil fuels. Rising carbon prices result in material cost increases for non-energy materials companies with highly emissions-intensive manufacturing processes, such as chemical and cement production.

Within the utilities sector, the 10% of companies with the largest climate exposure could see negative NPV impacts of 90% or more, while the 10% of companies with the lowest exposure could more than double in equity value, as seen in Exhibit 14. This variation is driven by differences in emissions intensity. For example, utilities with high emissions from fossil fuel generation face substantial direct carbon cost impacts, while those with low emissions from renewable generation stand to benefit from increasing competitiveness. Modeling climate risk at the individual equity level allows NTAM to conduct more granular assessments of climate risks and opportunities.

EXHIBIT 14:

Distribution of Equity Impacts by Sector

(Median and 10th–90th Percentile Range, Under Net Zero 2050)



Source: Planetrics, NTAM holdings as of December 31, 2023.

Climate impacts are largest in transition-exposed sectors, including energy and non-energy materials.

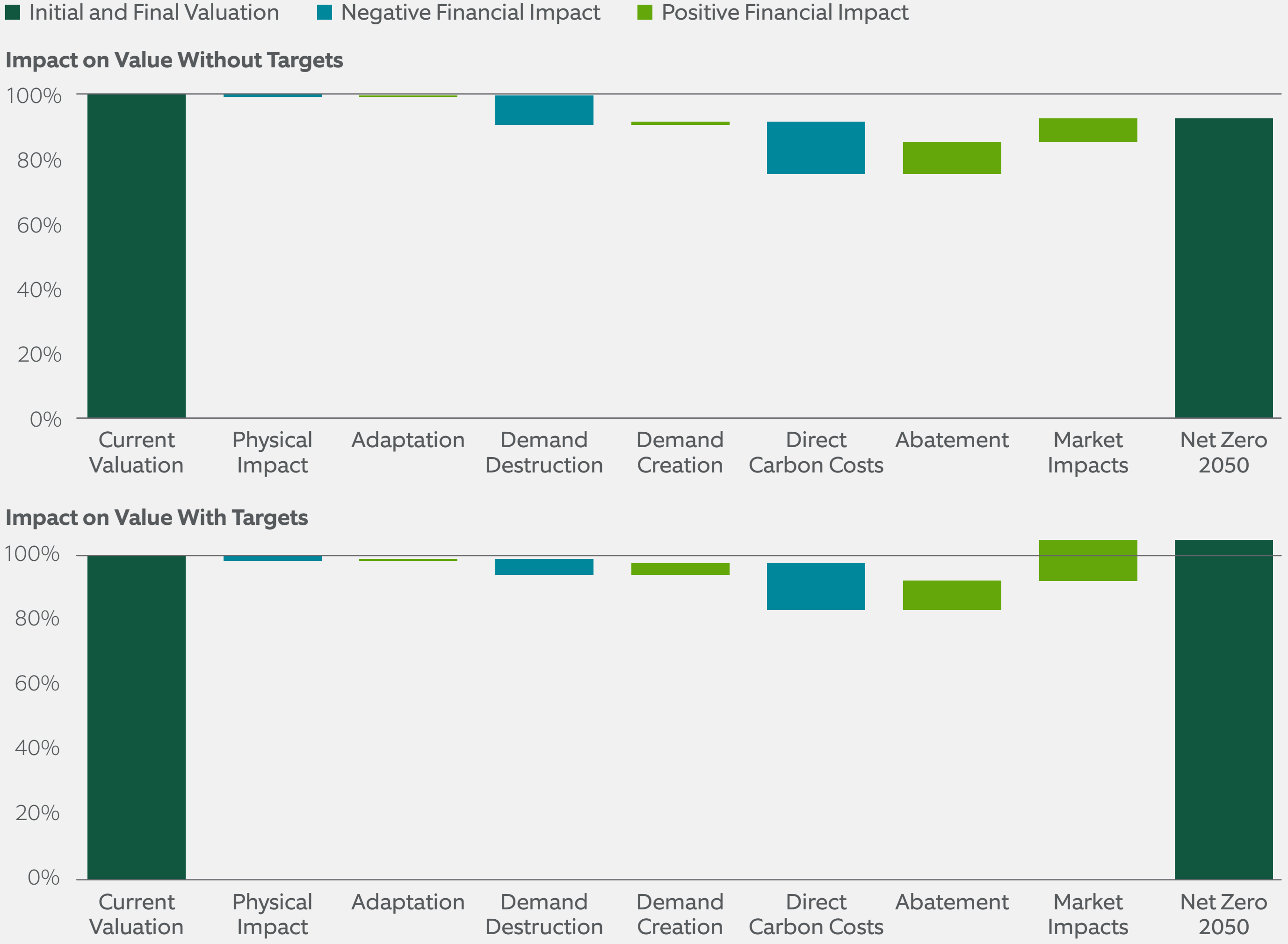
Impacts on an Automotive OEM Company Equity Valuation

To understand how companies are positioned for the low-carbon transition, NTAM also analyzed the impact of companies achieving their publicly announced climate targets, which often results in a material reduction in climate risk. For example, an automotive original equipment manufacturer (OEM) may target a specific share of electric vehicle (EV) sales by 2030. This approach supports assessing company-level results both with and without revenue-share targets. Exhibit 15 shows value impacts by risk channel for a selected OEM under Net Zero 2050, with and without targets applied in the analysis. Without targets, this auto OEM risks NPV impacts of 8%, driven by demand destruction for ICE vehicles. However, if the company meets its targets, demand creation for EVs outweighs demand destruction for ICEs, leading to a 5% NPV increase in the scenario.

EXHIBIT 15:

Value Impact for Auto OEM With and Without EV Sales by 2030 Targets Applied

(Based On Net Zero 2050)

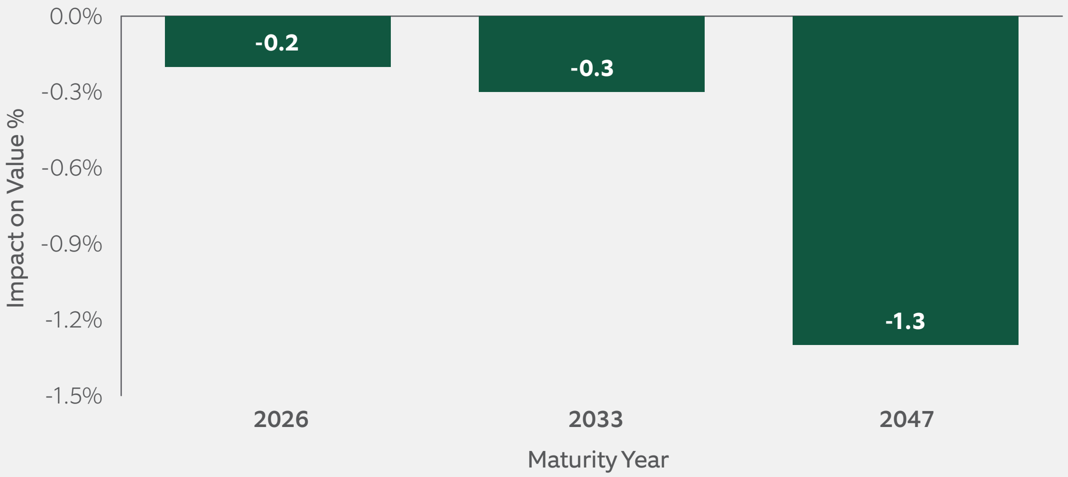


Source: Planetrics, NTAM holdings as of December 31, 2023.

EXHIBIT 16:

Corporate Bond Impacts by Maturity on Auto OEM

(Based on Net Zero 2050)



Source: Planetrics, NTAM holdings as of December 31, 2023.

Impacts on an Automotive OEM Company Bonds

For the corporate bonds issued by the same automotive company used in the equity model, the approach considers how different maturities face different exposure to climate risks. As physical and transition risks intensify through 2050, impacts on company earnings increase, resulting in associated changes in credit quality, which could increase the probability of default. Consequently, as Exhibit 16 shows, longer-duration bonds, which have additional cashflows in later years, face more pronounced climate impacts than shorter-duration bonds.

Limitations

Climate scenario analysis and climate analytics continue to evolve and improve. For the inaugural NTAM scenario analysis exercise, there are several important limitations, including:

- **Uncertainty in physical risk modeling:** There are considerable uncertainties related to first- and second-order impacts of physical climate change. The analysis does not explicitly account for second-order non-linearities in the climate system, such as tipping points.[15] Nor does the analysis capture potential second-order social impacts from climate change, such as conflict and migration. As a result, the analysis likely underestimates physical impacts in high warming scenarios.
- **Average damages vs. tail risks:** The analysis captures the change in average expected damage from acute hazards. However, this average may be materially lower than the damages resulting from tail risks that could materialize during extreme weather events.
- **Data quality and company disclosure:** The quality of data and the extent of company disclosures vary materially. When company-reported data is unavailable, proxies such as sector averages are used to fill in the gaps.
- **Cleantech "unknown unknowns":** The analysis captures potential growth in demand for mature cleantech products that are already in commercial production or proven at scale. However, it does not account for emerging technologies that have not yet been widely deployed as these cannot be easily attributed to companies based on current financials.

In future exercises, we will continue to evaluate and, as appropriate, adopt enhanced data and methodologies to mitigate such limitations.

[15] The IPCC defines "tipping points" as critical thresholds in a system that, when exceeded, can lead to a significant change in the state of the system, often with an understanding that the change is irreversible.

Climate-focused Investment Solutions

NTAM offers a broad range of investment solutions across the sustainable investing spectrum.

With NTAM's decades of experience working with clients across the globe to integrate sustainable elements into portfolio construction, we understand not only the desire to consider climate change in investment strategies, but also the need to implement an actionable strategy.

NTAM does not take a one-size-fits-all approach to climate investment solutions. Our approach varies between asset classes to reflect the integration philosophies of each team, client preferences and objectives, and the specific nuances of each investment strategy. Most of our climate strategies use a combination of approaches including, but not limited to:

- Proprietary ESG screens to minimize climate-related risks, including stranded assets
- Reduction in carbon emissions and potential carbon emissions relative to the investable universe
- Climate-related stewardship to encourage companies to develop and disclose climate goals by using engagement and voting as a tool
- Efficiently managing forward-looking risks and opportunities by favoring companies well-positioned for the low carbon transition

In order to cater to different client objectives, our products include a wide range of climate-based strategies, such as World Natural Capital Paris Aligned Index, Global Bond ESG Climate Index and Global Green Bond Index.

EXHIBIT 17:
The Spectrum of Our ESG Capabilities

EXCLUSIONS	ESG INTEGRATION	BEST-IN-CLASS	THEMATIC
Strategy excluding from a fund or portfolio certain sectors, companies or practices based on specific ESG criteria and/or minimum standards of business practice based on international norms such as United Nations Global Compact Principles	Strategy incorporating ESG considerations across business activities and investment valuation	Strategy investing in a defined percentage of companies/issuers that lead in their peer groups in implementing ESG	Strategy investing in targeted ESG themes and often seeks an environmental or social outcome, such as clean technologies

NTAM Stewardship

NTAM Approach to Engagement

Climate-related stewardship plays a key role in meeting climate objectives across our strategies over the medium- to long-term. When delegated, NTAM incorporates climate considerations into its proxy voting and engagement policies across its portfolio of companies. More specifically, NTAM expects investee companies to incorporate climate-related issues into their business models, where relevant, and encourages them to provide transparency and disclosure around these actions.

NTAM takes a risk-based approach to prioritizing our engagements. We identify areas representing the most significant risks to a company's valuation, the sustainability of its business model, and, ultimately, the durability of its business to sustain free cash flow. Climate change is one such risk, and is one of the key areas of priority in our engagement strategy. When a company is identified for engagement, NTAM takes the following steps:

- NTAM contacts the company with our concerns and requests dialogue with the representatives responsible to address the concern.
- If a company fails to make sufficient progress during the time period agreed to by the company and NTAM during an engagement, we may escalate the matter by voting in support of a related shareholder resolution, voting against the re-election of certain directors, or taking some other investment action.

We are a founding member of Climate Action 100+, which brings together more than 700 participating investment firms who engage with the largest publicly held corporate emitters of climate-damaging GHGs.[16] When engaging with companies' boards on climate-related matters, Climate Action 100+ encourages companies to adopt climate-related reporting that aligns with the framework recommended by the TCFD, using metrics that meet SASB Standards.

We consistently seek ways to build on our 30-year legacy of creating long-term investment value for our clients through purposeful management of ESG risks, effective engagement and proxy voting that aligns with our clients' values.

On the following page is a case study on how NTAM engaged with Reliance Industries to reduce climate risk and encourage reporting on Scope 3 emissions.

2023 Engagement Highlights

NTAM conducted more than 90 climate-related engagements with 79 companies, focusing on TCFD-based disclosures, strategic alignment to 1.5°C or below and other climate-related topics.

EOS at Federated Hermes (EOS)[17] engaged on 3,895 themes[18] with 905 companies on NTAM's behalf. This includes more than 850 engagements on climate change.

NTAM participated as a collaborating investor on engagements with six companies through our Climate Action 100+ membership. We co-led engagements with CEZ AS and National Grid, and acted as contributors to engagements with Valero Energy, Bayer AG, UltraTech Cement, and South32 Ltd. We also joined the working groups for Coal India, Dangote Cement and KEPCO as a collaborating investor.

[16] As of January 31, 2023.

[17] We appointed EOS to act as agent of our Undertakings for the Collective Investment in Transferable Securities (UCITS) pooled funds in EMEA.

[18] As part of our engagement approach, NTAM identified more than 30 themes focusing on environmental, social and governance issues. Climate change is one of the key themes in our engagement approach.

Reduce climate risk

NTAM CASE STUDY

Reliance Industries

Reporting on Scope 3 Emissions

THE CHALLENGE

Oil and gas production and refining is carbon intensive. Integrated oil and gas companies are, therefore, under pressure to adopt net zero carbon commitments. Reliance Industries has announced net zero targets but only for direct operations: it does not include indirect (Scope 3) emissions, which contribute a substantial portion of overall emissions.

WHAT WE DID

In 2023, we engaged on behalf of our equity and fixed income holdings with management to discuss Reliance's decarbonization strategy, recommending that it be more transparent about its roadmap for achieving its targets, and report on short-term and medium-term carbon reduction targets. We highlighted that the company lacks transparency on Scope 3 emissions reporting, especially category 11 (use of sold products). To achieve its net zero targets, Reliance needs to include these indirect emissions.

THE OUTCOME

The company accepted the feedback and agreed to measure and report on Scope 3 emissions in the future. Further, the company responded that it would be more transparent about its carbon reduction targets, including the operations which are under its influence. Reliance will also evaluate and report on the role of offsets for achieving its decarbonization-related targets. NTAM will monitor for progress against these goals.

Proxy Voting Approach on Climate Change

As a large asset manager representing permanent capital in more than 10,000 companies globally, NTAM's voting is performed in a manner consistent with the best interests of our clients and to optimize the value of the investment. In 2023, we voted in favor of shareholder resolutions when companies did not progress sufficiently on priority issues. In our experience, executives are more likely to take our concerns seriously when we vote against directors who lead board committees, such as those responsible for ESG risks, climate change, or compensation.

In 2023, we:

- **Supported 70% of environmental shareholder resolutions** submitted to our investee companies.
- **Scored 77% overall in ShareAction's 2023 survey,**[19] and our support for climate-related shareholder proposals calling for increased climate disclosure remained very high, at 92% (65 of 71 proposals).
- **Supported shareholder climate-related resolutions,** where deemed appropriate, to create sustainable value in the long term. There were multiple resolutions with climate agendas, including: adopting a policy consistent with net zero emissions by 2050; and, setting emission reduction targets aligned with Paris Agreement goals. More details on our climate-related voting record can be found in Appendix 2 of our 2023 Stewardship Report.

Additionally, we formalized new proxy voting policies, procedures, and guidelines to support a thoughtful approach to proxy voting. For more information on impacts of our engagements and proxy voting, please refer to our 2023 Stewardship Report.

We consistently seek ways to build on our 30-year legacy of creating long-term investment value for our clients through purposeful management of ESG risks, effective engagement and proxy voting that aligns with our clients' values.

[19] More information can be found at https://shareaction.org/reports/voting-matters-2023.

EXHIBIT 18:

A Year of Stewardship

146,715

Number of votable items proposed by management and shareholders[20]

27,672

Resolutions voted against management

4,505

Total engagement themes covered[21,22]

16,010

Shareholder meetings in which we voted

63%

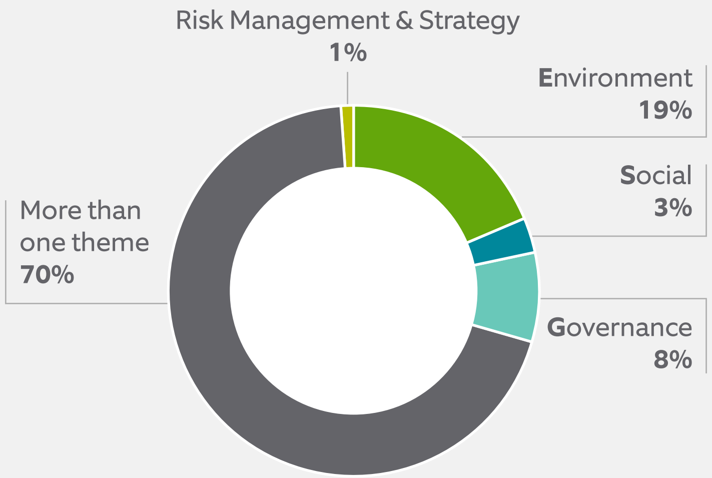
Shareholder meetings in which we voted against management on at least one resolution

Supported

70%

of environmental shareholder resolutions submitted to our investee companies in 2023

NTAM Direct Engagements by Theme



Based on 183 direct engagements by NTAM

[20] Aggregate votes represent those cast by NTAM in line with our custom set of guidelines — the Northern Trust proxy voting policies and procedures — and alternative voting policies applied to select funds. In cases of different votes submitted for an individual agenda item, votes cast are discretely counted by vote cast (for, against, etc.) per proposal. This may result in voting totals exceeding the number of votable items.

[21] Sources: Northern Trust Asset Management and EOS at Federated Hermes (EOS). An engagement is defined as a meeting or call with an investee company. Individual engagements may have covered one or more themes and multiple engagements may occur with the same company. In 2023, NTAM engaged on 610 themes and EOS engaged on 3,895 themes on NTAM's behalf, leading to a total of 4,505 themes discussed. NTAM-led engagements capture those performed individually or in collaboration with other investors. NTAM engaged with 160 companies in 2023; EOS engaged with 905 companies.

[22] We appointed EOS to act as agent of our UCITS pooled funds in EMEA.

Industry Advocacy

NTAM engages with various industry organizations to better understand and support climate initiatives. These include a range of industry initiatives aimed at reducing systemic risks linked to long-term sustainability, including climate change.

One example is our membership in the ISSB Investor Advisory Group, which promotes consistent, comparable and decision-useful corporate disclosure of material sustainable business practices. Such efforts underscore our commitment to engage in policy and regulatory initiatives to promote high standards. We believe it is important to partner with industry organizations to enhance our understanding of market developments and support information sharing, as well as the development of industry standards on climate-related matters. Some 2023 highlights include:

- NTAM participated in a feedback dialogue regarding the future of Principles for Responsible Investment (PRI) reporting, sharing our perspective on the topic of reciprocal reporting (e.g., where we report on similar content areas across different reports, such as the TCFD report and the PRI report); on the use of the PRI reporting results for benchmarking; and, the functionality of the reporting database and processes.
- NTAM joined NZEI, a new collaborative engagement initiative launched by the IIGCC that seeks enhanced disclosure of corporate net zero transition plans. NZEI focuses on heavy users of fossil fuels, broadening the scope of investor collaborations to increase focus on the demand side. NTAM co-signed letters to 72 companies requesting alignment with the IIGCC's Net Zero Investor Framework (NZIF),[23] including:
  - A comprehensive net zero commitment.
  - Robust GHG targets over the short-, medium- and long-term.
  - Emissions tracking, enabling investors to track companies' progress.
  - A credible strategy on how a company will reach its emissions targets, including planned capital expenditures to support the strategy.

[23] The Net Zero Investment Framework provides a common set of recommended actions, metrics and methodologies through which investors can maximize their contribution to achieving global net zero global emissions by 2050 or sooner.

[24] The complete list of our participation in industry organizations can be found in Appendix 4 of our 2023 Stewardship Report.

Below is a list of various climate initiatives in which we participate[24]

Founding signatory of Climate Action 100+

Signatory of Farm Animal Investment Risk and Return Initiative

Signatory of Net Zero Asset Manager Initiative

Signatory of One Planet Asset Managers Initiative

Signatory of the Principles for Responsible Investing

Member of ISSB Investor Advisory Group

Member of Institutional Investors Group on Climate Change

Supporter of Task Force for Climate-related Financial Disclosures

Member of the UK Investment Associations Sustainable and Responsible Investment Committee

Investing in Resources, Tools, and Technologies

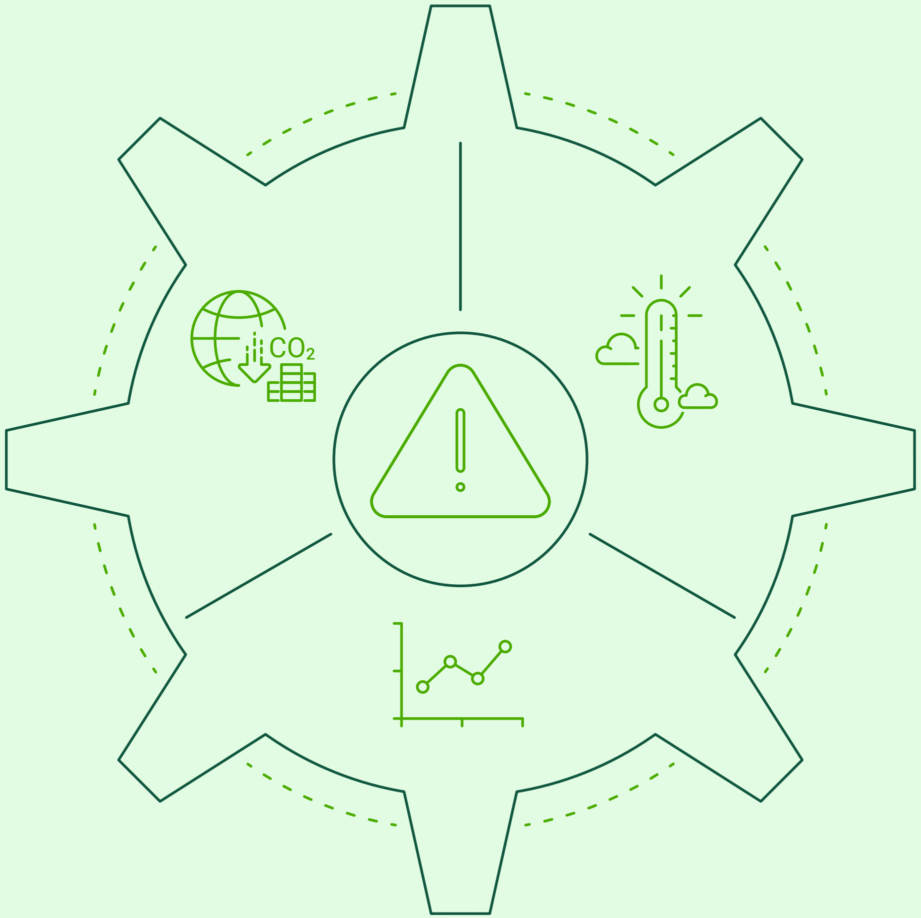
NTAM continues to invest in various resources to support sustainable investing, including growing the Sustainable Investing and the Stewardship Teams and investing in our ESG data, analytical resources, and infrastructure to enhance the accessibility of ESG-related information.

In 2023, we strengthened our team by adding the new role of Director of Business Enablement to optimize our Sustainable Investing Integration and Stewardship services. We also expanded our Stewardship Team in EMEA with an additional senior stewardship analyst and an additional research analyst to the SI Team in the U.S. In 2024, we plan to continue to grow our team and sustainable investing capabilities.

Also in 2023, we continued to enhance our ESG data hub, which centralizes sustainability metrics across our investible universe, to further the ESG integration, research and stewardship efforts across the organization. This platform enables enterprise wide access to high quality and governed ESG data, including many climate-related metrics critical for meeting our long-term climate commitments, such as: net zero; regulatory and client reporting (Sustainable Finance Disclosure Regulation and others); and facilitating integration of climate factors into our investment and risk process.

05 Risk Management

Potential systemic risks, such as climate change, threaten to destabilize increasingly interconnected financial markets.



Identifying and Assessing Risks

NTAM employs an integrated risk management framework, enabling a risk-informed profile to support business decisions, and execution of corporate strategies. The framework provides a methodology to identify, manage, report, and govern both internal and external risks to NTAM, and promote a culture of risk awareness and good conduct across the organization.

The risk management framework consists of three inter-related elements designed to support consistent risk identification, management, and reporting:

1 **A comprehensive risk inventory**

2 **A static taxonomy of risk categories**

3 **A dynamic taxonomy of risk themes**

The risk inventory is a detailed register of the risks inherently faced by NTC and its subsidiaries. The risk categories and risk themes are classification systems used for classifying and managing the risk inventory and enabling different risk profile views.

All identified risks inherent in NTAM business activities are cataloged into the following risk categories: credit, operational, fiduciary, compliance, liquidity, market, and strategic risk. All material risks are also dynamically cataloged into various risk themes, which are defined groupings that share common characteristics, focus on business outcomes, and span across risk categories.

Climate-specific Risk

Climate risk continues to be an evolving strategic risk for NTAM. Climate risk refers to the risk of loss arising from climate change and is made up of two important risk categories:

- **Physical risk** refers to risks emanating from the increased severity of extreme weather events (e.g., cyclones, droughts, floods, and fires). It can also refer to longer-term shifts in precipitation and temperature and increased variability in weather patterns (e.g., sea level rise).
- **Transition risk** reflects the risks associated with transitioning to a lower-carbon economy that may entail extensive policy, legal, technological, and market changes. Depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of financial and reputational risk.

NTAM also leverages NTC's climate risk management efforts, overseen by NTC's Chief Climate and Sustainability Risk Officer. NTC's Risk Management function created a dedicated climate and sustainability risk unit to monitor, oversee and take account of the increasing impacts climate change has, or may have in the future, on financial risk, non-financial risk, and regulatory compliance. The climate and sustainability risk unit works to evolve the risk management framework to ensure NTC, including NTAM, meets the expectations of all stakeholders as well as all climate-related commitments made to our clients, suppliers, counterparties and external agencies.

Apart from the integrated risk management framework, our Stewardship Team proactively reviews the climate change risk exposure across our investee companies. We engage with companies where we have material holdings and climate risk exposure with the goal of addressing the key risks. Please refer to the Strategy section for more details on our climate stewardship approach.

Climate risk continues to be an evolving strategic risk for NTAM. We continue to monitor, oversee and take account of the increasing impacts climate change has, or may have in the future, on financial risk, non-financial risk, and regulatory compliance.

Managing Climate-related Risks

At NTAM, global and regional business risk committees are responsible for reviewing the management of portfolio-level climate risks and implementing the risk management framework through a “three lines of defense” operating model.

Within this operating model, our investment teams are the first line of defense, responsible for evaluating the material environmental and climate-related risks across the investments’ strategy. Access to climate-related data is essential for our investment teams, who choose to consider climate risks as part of their investment process. To identify and assess material ESG and climate-related risks, we leverage our investment expertise in fundamental, quantitative, and passive spaces, along with multiple third-party ESG data providers.

We also factor in our proprietary ESG ratings, Northern Trust ESG Vector Score™, which covers more than 10,000+ companies and uses an industry-first approach, marrying two leading sustainability disclosure standards and frameworks. First, the SASB Standards, which are industry-specific sustainability disclosure standards focused on financial materiality. And second, the thematic structure of the TCFD recommendations, which focus on management of material ESG issues facing the operating industry. Please refer to our website for more details on our proprietary ESG Northern Trust Vector Score™.

To identify and assess material ESG and climate-related risks, we leverage our investment expertise in the fundamental, the quantitative, and the passive spaces, along with multiple third-party ESG data providers.

Teams across NTAM have the flexibility and tools to incorporate climate data from multiple sources (see Exhibit 19 for details) for investment research, portfolio management, risk and compliance functions. When managing products on behalf of certain clients who require climate-related guidelines on their portfolios, investment teams can leverage the data to integrate management of climate risks further into their investment processes to meet our clients' specific needs.

NTAM's risk management function, the second line of defense, sets the direction for risk management activities, and provides aggregate risk oversight and reporting in support of risk governance. The risk management function is also responsible for the design, delivery, and ongoing enhancement of climate-related investment risk monitoring in client portfolios. In EMEA and APAC regions, the results of portfolio-level monitoring of fund-specific metrics and targets for NTAM collective investment schemes are subject to review by respective regional business risk committees and, as required, by the investment committees of relevant funds' boards. The nature of monitoring performed in each region in which NTAM operates, including the specification of metrics used, depends upon a range of factors, such as: the investment guidelines to which the portfolio is managed; specific product features; applicable regulations; and individual client requirements.

Audit Services, the third line of defense, provides independent assurance as to the effectiveness of the Corporate Risk Management Framework of NTC.

Regulatory Risks

In 2023, NTC implemented the Regulatory Change Framework (RCF), which provides a consistent approach to how we monitor, manage, and deliver regulatory change across the firm, including NTAM. Centralized monitoring allows NTAM to identify jurisdictional developments across various areas, including climate change, which provides early-stage identification of impacts across entities, businesses, and regions as regulations develop. Appropriate governance structures are in place to challenge and oversee regulatory change throughout the organization.

EXHIBIT 19:

Our ESG Data Providers, Tools and Technology

ESG Research and Screening

- Equileap
- GRESB
- ICE Data Services
- ISS Climate Solutions
- ISS SDG
- MSCI ESG Research
- Planetrics
- Sell-side research
- S&P TruCost Environmental
- Sustainalytics
- TruValue Labs
- World Bank Worldwide Governance Indicators

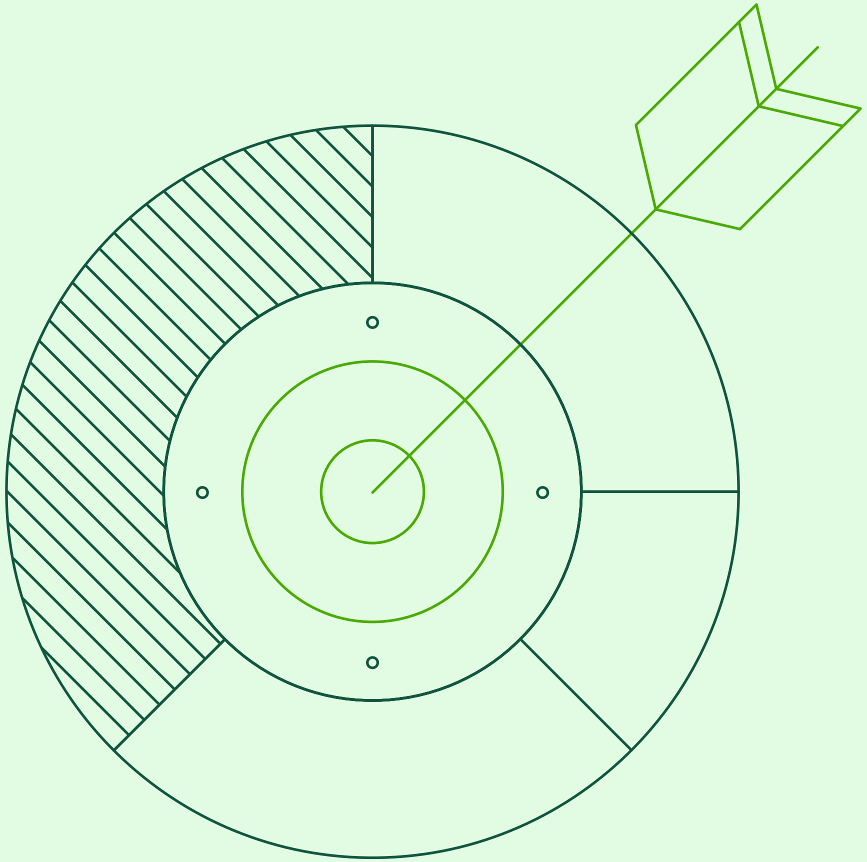
Technology Enablers

- Aladdin
- Bloomberg
- FactSet
- Microsoft Azure
- Snowflake

06

Metrics and Targets

Metrics and targets are critical in facilitating NTAM's management of climate and environmental risks and to measure progress towards our goal of net zero by 2050.



Climate Metrics

NTAM uses a range of metrics to assess the environmental footprint of our global equities and fixed income strategies, enabling investment strategies to align with our clients' objectives.

These metrics include the following and definitions of these metrics are available in Appendix 4:

- **Total carbon emissions (also known as financed emissions) in line with Partnership for Carbon Accounting Financials (PCAF) recommendations[25]**
- **Weighted Average Carbon Intensity (WACI)**
- **Carbon footprint**
- **Fossil fuel reserves**
- **Potential future emissions**

NTAM values transparency with clients to raise awareness of portfolio-level exposure to climate-related risks. This is achieved through disclosing climate metrics in our standard ESG reports and fund fact sheets. An example of a fund fact sheet with selected carbon metrics is available here.

In this second edition of our TCFD report, we are expanding our reporting of carbon exposure metrics to include sovereign bonds. NTAM's aggregated corporate issuers and sovereign bonds exposure is about US$846 billion or roughly 76% of our overall AUM. Other asset classes such as cash, repurchase agreement (repo) transactions, securitized credit, agency credit, municipal credit, asset-backed credit, and derivatives are currently out of scope due to a lack of reliable frameworks and data challenges. This expansion aligns with commitments made in our inaugural TCFD report (2022), to continue to improve and enhance our climate measurement capabilities with the goal of aligning with evolving industry standards.

To calculate the carbon metrics, we have used our climate analytics data provider, Planetrics, to analyze two aggregated NTAM portfolios as explained in the following:

1 NTAM's aggregated corporate holdings portfolio, consisting of equities and corporate bonds, constitutes about US$737 billion, or roughly 66% of NTAM's overall AUM, as of December 31, 2023. Carbon metrics for NTAM's aggregated corporate holdings portfolio are disclosed in Exhibit 20. These metrics are calculated in alignment with PCAF recommendations based on the securities data available from the third party data provider. The portfolio has roughly 97% coverage which is about US$717 billion of portfolio AUM.

EXHIBIT 20:

NTAM Carbon Metrics for Corporates[26]

Metric^	Unit	Emissions Scope*	2022	2023
Weighted Average Carbon Intensity (WACI)	tCO_2e per US$ million revenue	Scope 1	116	84
		Scope 2	24	21
		Scope 3	996	1,112
Total Carbon Emissions (Financed Emissions)	tCO_2e	Scope 1	32,492,074	24,165,352
		Scope 2	6,695,219	5,319,943
		Scope 3	325,236,539	334,002,235
Carbon Footprint	tCO_2e/ US$ million AUM	Scope 1	51	34
		Scope 2	11	7
		Scope 3	510	466
Exposure to Carbon-Related Assets	US$ million invested		71,408	67,835
	% of AUM		11	10

Sources: Planetrics and NTAM holdings as of December 31, 2022, and 2023.

*Notes: See Appendix 3 for definitions of Scope 1, 2, and 3. ^See Appendix 4 for carbon metrics definitions.

[25] PCAF is an industry-led initiative enabling financial institutions to measure and disclose GHG emissions of loans and investments.

[26] For consistency, we have recalculated NTAM's 2022 carbon metrics across corporates (listed equities and corporate bonds) portion of the AUM due to the change in the data source from ISS ESG to Planetrics. The 2022 AUM in scope is about US$673B, with a coverage of about 95%. The calculations and metrics disclosed are in alignment with PCAF recommendations. Exposure to carbon-related assets is calculated based on portfolio company revenue generation in industries identified in TCFD guidelines as carbon intensive. This includes Energy and Utilities.

2 NTAM's aggregated sovereign holdings portfolio, consisting of sovereign bonds only, constitutes about US$109 billion, or roughly 10% of NTAM's overall AUM, as of December 31, 2023. Carbon metrics for NTAM's aggregated sovereign holdings portfolio are disclosed in Exhibit 21.

These metrics are calculated in alignment with PCAF recommendations based on the securities data available from the third-party data provider. The portfolio has 100% coverage which is US$109 billion of portfolio AUM.

EXHIBIT 21:

2023 NTAM Carbon Metrics for Sovereigns

Metric^	Unit	Emissions Scope*	2023
Weighted Average Carbon Intensity (WACI)	tCO_2e per US$ million PPP-adjusted GDP	Scope 1 (excld. LULUCF)	233
		Scope 1 (incld. LULUCF)	226
		Scope 2	79
		Scope 3	142
Total Carbon Emissions (Financed Emissions)	tCO_2e	Scope 1 (excld. LULUCF)	24,486,387
		Scope 1 (incld. LULUCF)	23,701,840
		Scope 2	8,339,424
		Scope 3	14,919,036
Carbon Footprint	tCO_2e/ US$ million AUM	Scope 1 (excld. LULUCF)	224
		Scope 1 (incld. LULUCF)	217
		Scope 2	76
		Scope 3	136

Sources: Planetrics and NTAM holdings as of December 31, 2023.

*Notes: See Appendix 3 for definitions of Scope 1, 2, and 3. ^See Appendix 4 for carbon metrics definitions.

For sovereign WACI and financed emissions, we report two types of Scope 1 values: including and excluding Land Use, Land Use Change, and Forestry (LULUCF) emissions in Exhibit 21. In accordance with United Nations Framework Convention on Climate Change (UNFCCC) guidelines, adopted by PCAF, emissions should encompass key sectors and categories, including: energy, industrial processes and product use, agriculture, forestry, other land use, and waste. However, there is significant uncertainty in LULUCF emissions. In addition, countries vary in how they account for LULUCF emissions in their mitigation targets, and our clients may adopt different perspectives on the potentially offsetting role of LULUCF emissions. Therefore, we report Scope 1 emissions including and excluding LULUCF.[27]

[27] More details on PCAF recommendations can be found here.

Addressing Data Gaps and Challenges

While carbon emissions data, specifically Scope 1 and 2, are widely reported and have well-defined methodologies, other metrics such as Scope 3 emissions, temperature alignment, and climate NPV are still nascent, highly estimated, lack transparency, and require additional time to evolve. We believe the tools for climate-related measurement will improve in the future as increased focus on global standards of disclosure evolve. However, we are taking the following actions to address current data gaps:

1 We leverage multiple data providers, including MSCI, ISS, Planetrics and S&P Global Trucost for climate-related information. When companies do not report emissions, we utilize estimated emissions supplied by data providers. The data is stored in our centralized ESG data hub, which goes through several data quality checks to validate the readiness of the data before it is integrated into our stewardship, portfolio management, and investment risk management processes.

2 When companies are not covered by third-party data providers and exposed to material risks, we engage with investee companies to gain enhanced disclosure of emissions data and what actions they plan to take in the short- and medium-term.

3 We utilize proxies, wherever appropriate, to fill data gaps. For example, if the actions noted above do not result in meaningful outcomes, we could use the average emissions of the industry or sub-industry or peers to fill these gaps.

The approach outlined helps us to overcome data gaps and provide better coverage across our business. We understand that using proxies or estimations sometimes can result in values with varying data quality. However, we consider these approaches in a balanced and transparent way by providing measured inputs to differentiate companies across sectors.

Targets

In 2023, we disclosed our initial AUM commitment of US$112 billion (baselined for year 2022) to be managed in line with net zero and approved by NZAMI. Exhibit 22 details our targets in line with the Science Based Targets Initiative (SBTi), Sectoral Decarbonization Approach (SDA) and the IIGCC NZIF.

EXHIBIT 22:

Our Targets

AUM/Proportion of AUM in Scope	Methodology	Asset Classes	Baseline Year	GHG Scopes Included	Targets
US$112 billion/10.8 % of total AUM as of December 31, 2022, 3.5% of total AUM will be covered under the SDA, and 7.3% will be covered under the NZIF approach.	SBTi for financial institutions using SDA and NZIF for portfolio coverage approach.	We currently only consider portfolios invested in equities and corporate fixed income due to better established methodologies and more robust climate data availability in these two asset classes. As of December 31, 2022, these asset classes represent about 65% of our total AUM and are eligible for inclusion in scope for target-setting. We will reassess the coverage for other asset classes in the future, especially sovereigns as the Assessing Sovereign Climate-related Opportunities and Risks (ASCOR) Project matures over the next 12–24 months.	2022	Our emissions reduction target will currently include only Scope 1 and Scope 2 emissions; Scope 3 emissions will be phased in over time when disclosure and methodology improve.	We established the following targets for our in-scope AUM: **SDA:** In line with the SBTi recommendations, a 50% reduction in financed Scope 1 and 2 emissions per unit of owned EVIC in line with recommendations of the PCAF by 2030, relative to 2022 baseline. **NZIF:** The targeted list of companies that fall within scope of CA100+ and NZEI comes to 228, representing just 1.5% of the companies NTAM invests in, as of December 31, 2022. However, these 228 companies represent approximately 50% of the owned Scope 1 and Scope 2 emissions, and 44% when including Scope 3. By 2030 we expect these 228 companies will develop and communicate plans aligning to net zero.

07

Legal Entity Addendum

Northern Trust Global Investments Limited (NTGIL)

This entity-level addendum is designed to be read in conjunction with the Northern Trust Asset Management (NTAM) TCFD Report.

NTAM operates a global asset management business with global processes and approaches. NTGIL is the UK-regulated entity of this business and elected to utilize the global TCFD Strategy and Risk Management Frameworks outlined in the main content of this report. NTGIL also benefits from the global Governance and Metrics and Targets, and prepared this addendum to highlight the separate legal entity Governance and Metrics providing relevant disclosures in line with Chapter 2 of the UK's Financial Conduct Authority's (FCA) ESG sourcebook.

As of December 31, 2023, NTGIL had US$160 billion in assets under management (AUM).

Governance

Board Oversight

The NTGIL Board of Directors is responsible for governing and overseeing NTGIL's strategy and providing oversight of its operations and risks, including climate-related risks and sustainability themes. The Board is comprised of both Executive and Non-Executive Directors, each of whom perform a Senior Management Function (SMF) under the FCA's Senior Management and Certification Regime (SMCR). The Directors are subject to training and competence requirements to ensure requisite knowledge and skills remain in line with both the business and client needs.

A key component of the Board's remit is managing regulatory risk through staying abreast of future regulatory expectations, informed by horizon scanning, and oversight of the implementation of regulatory change. Horizon scanning facilitates and informs strategic discussions on financial and other potential material impacts, allowing NTGIL to keep pace with market developments and maintain a high standard of compliance. The Board meets on a quarterly basis and receives an update from the Global Head of Sustainable Investing.

In addition to the NTGIL Board , local oversight is provided as follows:

Board/Committee	Roles and Responsibilities	Meeting Frequency
NTGIL Risk and Audit Committee	The Risk and Audit Committee is responsible for the oversight of risk management (including climate risk management) on behalf of the NTGIL Board.	Quarterly
NTAM EMEA Business Risk Committee	Provides oversight and governance for risks within the EMEA region of the Asset Management Business Unit and legal entities and includes the responsibility for reviewing sustainability risks related to climate change at an organizational and a product level.	Quarterly

This local entity oversight is supported by the wider NTAM governance framework. NTGIL Executive Directors along with other senior managers participate in global governance committees and councils as described in the Governance section of the NTAM report.

Management Oversight

NTGIL benefits from the management oversight mechanisms described in the NTAM Report. In particular, the Sustainable Investing Council (SIC), Proxy Committee and regional ESG working groups. These are designed to capture the needs of all asset management entities within NTAM.

NTGIL also benefits from the NTAM EMEA Product Governance Forum (PGF), which considers ESG integration and implementation of ESG regulations in relevant products and services managed by NTGIL. The PGF considers the provision of portfolio management services to new and/or existing clients. This includes how to incorporate clients' increasing data and reporting needs, particularly in relation to ESG including climate-related metrics and targets.

Management Forum	Roles and Responsibilities	Meeting Frequency
EMEA Product Governance Forum	Provides oversight for all NTAM Products that are either manufactured or distributed in EMEA. The PGF oversees Product Approval and monitors Product Governance and meets monthly.	Monthly

Strategy

NTAM's perspective on climate change is presented in our Sustainable Investing Philosophy. This perspective is consistent with our view that investors should be compensated for the risks they take. We believe understanding and evaluating companies' performance using ESG criteria enhances our forward-looking view of risks and opportunities.

In 2023, NTAM conducted an inaugural climate scenario analysis exercise to assess the resilience of NTAM portfolio against a range of Network for Greening the Financial System (NGFS) climate scenarios. The analysis was applied to NTAM equity, corporate and sovereign bond holdings, as of December 31, 2023, which includes NTGIL holdings as well.

More details on scenario analysis outcomes can be found in the Scenario Analysis and Portfolio Resilience section.

NTGIL adopts the same approach to manage climate-related risks and opportunities from an asset management perspective as set out in more detail in the Strategy section of the NTAM Report.

Statement on Delegated Functions

NTGIL is responsible for the management sub-delegated to other NTAM entities. Delegate investment managers share the same investment processes, participation in the SIC, and are subject to the same Corporate Risk Management framework as NTGIL. No assets are sub-delegated to third parties outside of NTAM.

Risk Management

Potential systemic risks like climate change threaten to destabilize increasingly interconnected financial markets. We take our responsibility to identify and integrate these risks into our risk management seriously, as doing so enhances our ability to preserve investors' capital and, ultimately, enable them to achieve their long-term financial objectives.

The risk management framework is adopted across NTAM with no material deviations specific to NTGIL. Information on the identification, assessment and management of risks, including climate-related ones can be found in the Risk Management section of the NTAM report.

During 2023, NTGIL enhanced its investment risk oversight of pooled fund products and segregated mandates including monitoring of portfolio-level ESG targets and exclusions. Oversight processes include monitoring of ESG scoring of products versus parent benchmarks, ESG exclusions versus investment guidelines and progress against carbon intensity and fossil fuel reduction objectives, as applicable.

The EMEA Business Risk Committee receives climate metrics reporting from Risk Management and reviews sustainability risks related to climate change at an organizational and a product level as part of the Committee's responsibilities. The Committee's purpose is to raise awareness of tools and resources used in the process and promote understanding of the materiality of climate-related risks for different investment strategies. Reporting covers entity-level emissions exposures, sector and security level attribution and scenario analyses.

Metrics

NTGIL uses a range of climate metrics to develop an informed view of environmental footprint to ensure that the investment strategies align with the clients' objectives.

Currently, NTGIL utilizes total carbon emissions (also known as financed emissions) in line with PCAF recommendations; Weighted Average Carbon Intensity (WACI); carbon footprint; fossil fuel reserves; and, future potential emissions metrics from MSCI, ISS, Planetrics and S&P Global Trucost in the investment and risk analysis across the global equities and fixed income capabilities. For more information on carbon metrics definition, see Appendix 4.

In this second edition of the TCFD report, NTGIL is expanding the reporting of carbon exposure metrics to include sovereign bonds. NTGIL's aggregated corporate issuers and sovereign bonds exposure is about US$131 billion or roughly 82% of overall AUM. This expansion aligns with commitments made in the inaugural TCFD Report (2022) to continue to improve and enhance the climate measurement capabilities with the goal of aligning with evolving industry standards. Other asset classes such as cash, repurchase agreement (repo) transactions, securitized credit, agency credit, municipal credit, asset-backed credit, and derivatives are currently out of scope due to a lack of reliable frameworks and data challenges.

To calculate the carbon metrics, we have used our climate analytics data provider to analyze two aggregated portfolios as explained in the following exhibits:

1 NTGIL's aggregated corporate holdings portfolio (consists of equities and corporate bonds), which constitutes about US$126 billion or roughly 79% of NTGIL's overall AUM, as of December 31, 2023. Carbon metrics for the NTGIL's aggregated corporate holdings portfolio are disclosed in Exhibit 23. These metrics are calculated in alignment with PCAF recommendations based on the securities data available from the third party data provider. The portfolio has roughly 97% coverage, which is about US$122 billion of portfolio AUM.

EXHIBIT 23:

NTGIL Carbon Metrics For Corporates[28]

Metric^	Unit	Emissions Scope*	2022	2023
Weighted Average Carbon Intensity (WACI)	tCO_2e per US$ million revenue	Scope 1	103	75
		Scope 2	28	24
		Scope 3	918	1,029
Total Carbon Emissions (Financed Emissions)	tCO_2e	Scope 1	4,905,369	4,155,887
		Scope 2	1,134,144	1,111,926
		Scope 3	47,184,478	59,096,702
Carbon Footprint	tCO_2e/US$ million AUM	Scope 1	50	34
		Scope 2	12	9
		Scope 3	480	485
Exposure to carbon-related assets	US$ million invested		9,684	9,772
	% of AUM		10	8

Sources: Planetrics and NTGIL holdings as of December 31, 2022, and 2023.

*Notes: See Appendix 3 for definitions of Scope 1, 2, and 3. ^See Appendix 4 for carbon metrics definitions.

[28] For consistency, we have recalculated NTGIL's 2022 carbon metrics across corporates (listed equities and corporate bonds) portion of the AUM due to the change in the data source from ISS ESG to Planetrics. The 2022 AUM in scope is about US$98B with a coverage of about 98%. The calculations and metrics disclosed are in alignment with PCAF recommendations. Exposure to carbon-related assets is calculated based on portfolio company revenue generation in industries identified in TCFD guidelines as carbon intensive. This includes Energy and Utilities.

2 NTGIL's aggregated sovereign holdings portfolio (includes sovereign bonds only), which constitutes about US$5 billion or roughly 3% of NTGIL's overall AUM, as of December 31, 2023. Carbon metrics for the NTGIL's aggregated sovereign holdings portfolio are disclosed in Exhibit 24. These metrics are calculated in alignment with PCAF recommendations based on the securities data available from the third-party data provider. The portfolio has 100% coverage, which is US$5 billion of portfolio AUM.

EXHIBIT 24:

NTGIL Carbon Metrics For Sovereigns

Metric^	Unit	Emissions Scope*	2023
Weighted Average Carbon Intensity (WACI)	tCO_2e per US$ million revenue (or PPP-adjusted GDP)	Scope 1 (excld. LULUCF)	168
		Scope 1 (incld. LULUCF)	166
		Scope 2	47
		Scope 3	105
Total Carbon Emissions (Financed Emissions)	tCO_2e	Scope 1 (excld. LULUCF)	883,368
		Scope 1 (incld. LULUCF)	874,167
		Scope 2	248,616
		Scope 3	550,453
Carbon Footprint	tCO_2e/US$ million AUM	Scope 1 (excld. LULUCF)	168
		Scope 1 (incld. LULUCF)	166
		Scope 2	47
		Scope 3	105

Sources: Planetrics and NTGIL holdings as of December 31, 2023.

*Notes: See Appendix 3 for definitions of Scope 1, 2, and 3. ^See Appendix 4 for carbon metrics definitions.

For sovereign WACI and financed emissions, we report two types of Scope 1 values: including and excluding Land Use, Land Use Change, and Forestry (LULUCF) emissions in Exhibit 24. In accordance with UNFCCC guidelines, adopted by PCAF, emissions should encompass key sectors and categories, including energy, industrial processes and product use, agriculture, forestry, other land use, and waste. However, there is significant uncertainty in LULUCF emissions. In addition, countries vary in how they account for LULUCF emissions in their mitigation targets, and NTGIL clients may adopt different perspectives on the potentially offsetting role of LULUCF emissions. Therefore, we report Scope 1 emissions including and excluding LULUCF.[29]

Targets

As disclosed in the 2022 report, NTAM, which includes NTGIL, made the decision to join the Net Zero Asset Manager Initiative (NZAMI) and submitted interim targets. These interim targets were approved by NZAMI in 2023 and are detailed in Exhibit 22 in the Metrics and Targets section of the NTAM report.

[29] More details on PCAF recommendations can be found here.

Compliance Statement

This NTGIL addendum should be read in conjunction with the full Northern Trust Asset Management TCFD Report.

The disclosures for NTGIL, including those in the NTAM TCFD Report, comply with the requirements in line with Chapter 2 of the FCA's ESG sourcebook.

John McCareins

Chief Executive Officer and Director,
Northern Trust Global Investments Limited

08

Appendices

APPENDIX 1

NTAM Business Legal Entities in Scope for TCFD Report

Below are the details of the legal entities which are in scope of this TCFD report for the NTAM business:

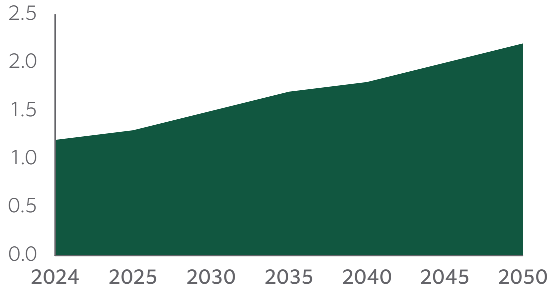
Entity Code	Legal Entity Name
NTI	Northern Trust Investments, Inc
NTFMIL	Northern Trust Fund Managers Ireland Limited
NTGIL	Northern Trust Global Investments Limited
NTAMA	Northern Trust Asset Management Australia Pvt Ltd
TNTCHK	Northern Trust Company of Hong Kong Limited
NTGIJ	Northern Trust Global Investment Japan, K.K.

APPENDIX 2

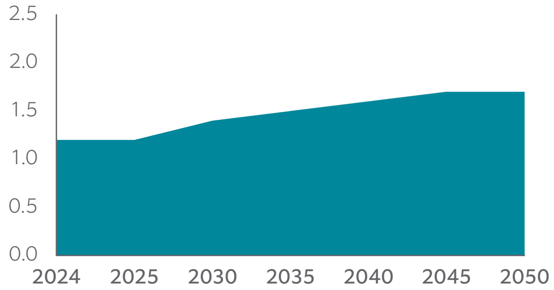
Key Variables for Selected NGFS Scenarios

a) Projected Temperature Anomaly (Global Mean Temperature Relative to Pre-industrial Levels, °C)[30]

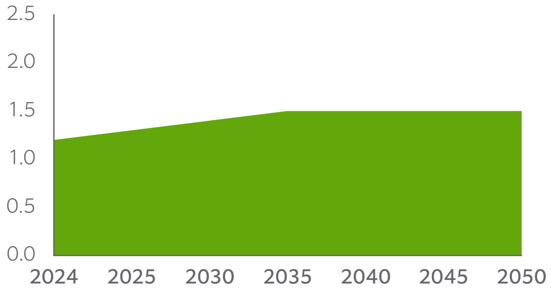
Hot House World



Delayed Transition



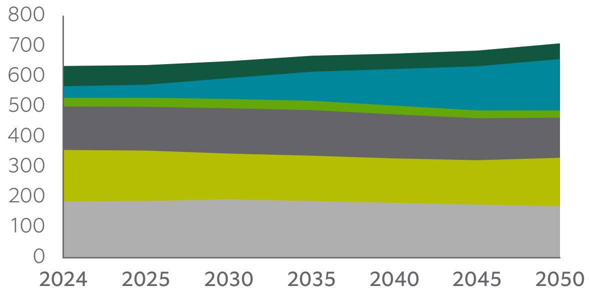
Net Zero 2050



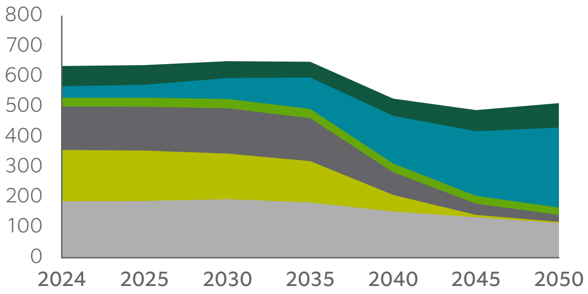
b) Projected Energy Mix (EJ[31]/year)

Oil Coal Gas Nuclear Non-Biomass Renewables Biomass

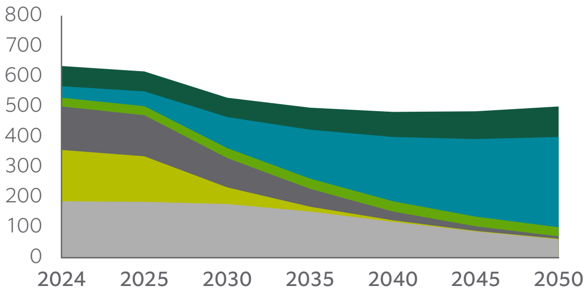
Hot House World



Delayed Transition



Net Zero 2050



Source: NGFS Technical Documentation. As of November 2023.

[30] The chart displays median warming impacts, with the exception of Hot House World, which shows 90th percentile temperature rise. NGFS scenarios (median warming) are aligned in 2020 at 1.2°C.

[31] An exajoule (EJ) is equal to 10^{18} (one quintillion) joules.

APPENDIX 3

Defining Scope 1, 2, and 3 Emissions

Scope Type	Asset Class	Description
Scope 1	Corporates	Direct GHG emissions from sources owned or controlled by the company, such as company-owned vehicles and facilities.
	Sovereigns	Domestic GHG emissions from sources located within the country territory.
Scope 2	Corporates	GHG emissions from energy generation purchased or otherwise brought into the company's organizational boundary.
	Sovereigns	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.
Scope 3	Corporates	Includes all indirect GHG emissions (not included in Scope 2) that are not produced by the company itself and are not the result of activities from assets owned or controlled by the company, but by those that it is indirectly responsible for upstream and downstream in the value chain.
	Sovereigns	Emissions attributable to non-energy imports as a result of activities taking place within the country territory.

APPENDIX 4

Carbon Metrics Definition

Metrics	Unit	Metric Description	Use Case
WACI for Corporates	tCO_2e per US$ million revenue	Calculates each portfolio company's emissions (tons of CO_2 equiv.) per unit of revenue (million US$), then aggregates each company's emissions using % weight of the holding within portfolio.	Allows best comparison between portfolios, and portfolio decomposition and attribution analysis.
WACI for Sovereign Bonds	tCO_2e per US$ million PPP-adjusted GDP	Calculates each issuer country's emissions (tons of CO_2 equiv.) per unit of Purchase Power Parity (PPP) adjusted GDP (million US$). Then aggregates figures using % weights of holdings within investment portfolio.	
Total Carbon Emissions (Also Called "Financed Emissions") for Corporates	tCO_2e	Apportions total GHG emissions of a portfolio based on the ownership of issuer by enterprise value including cash (EVIC).	Measures impact of investments through absolute measure and to set emissions baseline.
Total Carbon Emissions (Also Called "Financed Emissions") for Sovereign Bonds	tCO_2e	Allocates total GHG emissions of issuer country based on lender exposure to the total value of borrower (the sovereign), with latter proxied by PPP-GDP.	
Carbon Footprint	tCO_2e/US$ million AUM	Calculated by dividing total carbon emissions by market value of portfolio.	Compares portfolios and/or to benchmark. Enables understanding link between money invested and associated emissions.
Exposure to Carbon-Related Assets	Expressed in US$M or % of current portfolio value	Focuses portfolio's exposure to sectors and industries considered most GHG emissions-intensive.	Applied across asset classes. Does not rely on underlying companies' Scope 1 and Scope 2 emissions.

APPENDIX 5

Summary of Disclosures Aligned With TCFD Recommendations

Governance

Describe the board's oversight of climate-related risks and opportunities.

Legal entity boards provide oversight to senior management, who are responsible for setting and executing the business strategy, including sustainability and climate objectives. NTAM's Sustainable Investment Council (SIC) provides multi-disciplinary oversight of NTAM's sustainable investing practices with respect to climate change. Please refer to Exhibit 3 and 4 for more details.

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

At NTAM, each legal entity and functional group across the firm are responsible for overseeing the sustainability and climate-related objectives as part of their oversight responsibilities. Consideration of sustainability and climate-related matters are led by specialist groups, as well as incorporated throughout existing responsibilities of broader functions, with oversight from management.

Strategy

Describe the climate-related risks and opportunities the organization identified over the short-, medium-, and long-term.

Our current view is that transition risks (i.e., Policy and Legal, Market, Reputation, Product and Services) and opportunities are particularly important in the short- (0 to 5 years) and medium-term (5 to 10 years), while physical risks (acute and chronic) are increasingly important over medium- to long-term (10 to 30 years).

Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

The impact of climate-related risks and opportunities in the short- and medium-term might be elevated by the transition to a low carbon economy, while, over the long-term, it might be the physical risks from extreme weather events. More details are available in Exhibit 5 and 6.

Describe how climate-related risks and opportunities are factored into relevant products or investment strategies.*

Describe how each product or investment strategy might be affected by the transition to a low-carbon economy.*

NTAM does not take a one-size-fits-all approach to climate investing. Most of our climate strategies use a combination of approaches including, but not limited to: proprietary environmental, social and governance screens to minimize climate-related risks (including stranded assets); reduction in carbon emissions intensity and potential carbon emissions; climate stewardship to engage with companies to align with our climate goals and voting as a tool; and, efficiently managing the forward-looking risks and opportunities by favoring companies well-positioned for low carbon transition.

Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

In 2023, NTAM conducted an inaugural climate scenario analysis exercise assessing the resilience of the NTAM portfolio against a range of NGFS climate scenarios. The analysis was applied to equity, corporate and sovereign bond holdings, as of December 31, 2023. The Scenario Analysis section details the scenarios assessed, methodology used, and results.

Risk Management

Describe the organization's processes for identifying and assessing climate-related risks.

Our risk management framework contains three interrelated elements, designed to support consistent risk identification, management, and reporting: a comprehensive risk inventory, a static taxonomy of risk categories, and a dynamic taxonomy of risk themes.

Describe how you 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.*

All identified risks inherent in NTAM business activities are cataloged into the following risk categories: credit; market and liquidity; operational; fiduciary; compliance; and, strategic risk. Climate-related risks are a driver across all risk categories.

Describe engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks in order to improve data availability and asset managers' ability to assess climate-related risks.*

The NTAM stewardship team proactively reviews the climate change risk exposure across our investee companies. We engage with companies where we have material holdings and climate risk exposure with the goal of addressing the key risks. Please refer to the Strategy section for more details on our climate stewardship approach.

Describe the organization's processes for managing climate-related risks.

Describe how you manage material climate-related risks for each product or investment strategy.*

Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.

In NTAM, global and regional business risk committees are responsible for reviewing the management of portfolio level climate risks and implements its risk management framework through a "three lines of defense" operating model. The first line of defense sits with our investment teams, who manage all the material ESG and climate-related risks across the investment strategy. The Risk Management function is the second line of defense and sets the direction for risk management activities and provides aggregate risk oversight and reporting in support of risk governance. Audit Services, the third line of defense, provides independent assurance as to the effectiveness of the Corporate Risk Management Framework of Northern Trust Corporation.

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.

Describe metrics used to assess climate-related risks and opportunities in each product or investment strategy.*

Asset managers should describe the extent to which their AUM and products and investment strategies, where relevant, are aligned with a well-below 2°C scenario.*

NTAM utilizes a range of climate metrics to develop an informed view on climate-related risks and opportunities and to enable the investment strategies to align with clients' objectives. Currently, we use: total carbon emissions (also known as financed emissions) in line with Partnership for Carbon Accounting Financials recommendations; Weighted Average Carbon Intensity (WACI); carbon footprint; fossil fuel reserves; and, future potential emissions metrics.

For alignment to a well-below 2°C scenario, please refer to the Scenario Analysis section of this report.

Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.

Disclose GHG emissions for their AUM.*

Carbon exposure metrics for NTAM and Northern Trust Global Investments Limited in-scope AUM as of December 31, 2022, and 2023, are disclosed in the Metrics and Targets section.

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

NTAM is a NZAMI signatory with set interim targets in 2023 committing 10.8% of in-scope AUM to align with the goal of achieving net-zero GHG emissions by 2050.

*Supplemental Guidance for Asset Managers.

IMPORTANT INFORMATION

Northern Trust Asset Management (NTAM) is composed of Northern Trust Investments, Inc., Northern Trust Global Investments Limited, Northern Trust Fund Managers (Ireland) Limited, Northern Trust Global Investments Japan, K.K., NT Global Advisors, Inc., 50 South Capital Advisors, LLC, Northern Trust Asset Management Australia Pty Ltd, and investment personnel of The Northern Trust Company of Hong Kong Limited and The Northern Trust Company.

Issued in the United Kingdom by Northern Trust Global Investments Limited regulated by the Financial Conduct Authority (Licence Number 191916), issued in the European Economic Area ("EEA") by Northern Trust Fund Managers (Ireland) Limited regulated by the Central Bank of Ireland (Licence Number C21810) , issued in Australia by Northern Trust Asset Management (Australia) Limited (ACN 648 476 019) which holds an Australian Financial Services Licence (License Number: 529895) and is regulated by the Australian Securities and Investments Commission (ASIC), and issued in Hong Kong by The Northern Trust Company of Hong Kong Limited which is regulated by the Hong Kong Securities and Futures Commission.

This information is directed to institutional, professional and wholesale current or prospective clients or investors only and should not be relied upon by retail clients or investors. The information is not intended for distribution or use by any person in any jurisdiction where such distribution would be contrary to local law or regulation. NTAM may have positions in and may effect transactions in the markets, contracts and related investments different than described in this information. This information is obtained from sources believed to be reliable, its accuracy and completeness are not guaranteed, and is subject to change. Information does not constitute a recommendation of any investment strategy, is not intended as investment advice and does not take into account all the circumstances of each investor.

This report is provided for informational purposes only and is not intended to be, and should not be construed as, an offer, solicitation or recommendation with respect to any transaction and should not be treated as legal advice, investment advice or tax advice. Recipients should not rely upon this information as a substitute for obtaining specific legal or tax advice from their own professional legal or tax advisors. References to specific securities and their issuers are for illustrative purposes only and are not intended and should not be interpreted as recommendations to purchase or sell such securities. Indices and trademarks are the property of their respective owners. Information is subject to change based on market or other conditions.

All securities investing and trading activities risk the loss of capital. Each portfolio is subject to substantial risks including market risks, strategy risks, advisor risk, and risks with respect to its investment in other structures. There can be no assurance that any portfolio investment objectives will be achieved, or that any investment will achieve profits or avoid incurring substantial losses. No investment strategy or risk management technique can guarantee returns or eliminate risk in any market environment. Risk controls and models do not promise any level of performance or guarantee against loss of principal. Any discussion of risk management is intended to describe NTAM's efforts to monitor and manage risk but does not imply low risk.

Past performance is not a guarantee of future results. Performance returns and the principal value of an investment will fluctuate. Performance returns contained herein are subject to revision by NTAM. Comparative indices shown are provided as an indication of the performance of a particular segment of the capital markets and/or alternative strategies in general. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index. Net performance returns are reduced by investment management fees and other expenses relating to the management of the account. Gross performance returns contained herein include reinvestment of dividends and other earnings, transaction costs, and all fees and expenses other than investment management fees, unless indicated otherwise. For U.S. NTI prospects or clients, please refer to Part 2a of the Form ADV or consult an NTI representative for additional information on fees.

Forward-looking statements and assumptions are NTAM's current estimates or expectations of future events or future results based upon proprietary research and should not be construed as an estimate or promise of results that a portfolio may achieve. Actual results could differ materially from the results indicated by this information.

All data is as of December 31, 2023, unless otherwise stated.