Vanguard®

Vanguard's Report on Climate-related Impacts 2023

In alignment with the Task Force on
Climate-related Financial Disclosures (TCFD)

VANGUARD'S CORE PURPOSE

To take a stand for all investors, to treat them fairly, and to give them the best chance for investment success.

Contents

This report has been prepared by The Vanguard Group, Inc., in alignment with the guidelines of the Task Force on Climate-related Financial Disclosures. Unless otherwise specified, the data used for this report are as of December 31, 2023.

CEO letter

I'm pleased to present Vanguard's third annual report in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). This report highlights our global efforts—as investment manager, investment steward, and corporate actor—in response to climate-related risks and opportunities.

We believe that disclosure is critical to the fair and efficient function of our capital markets. We are proponents of disclosure by companies on the material risks that climate change—and the ongoing global response—can pose to their businesses so that investors can make fully informed decisions. Our TCFD reporting is one important way we demonstrate our own commitment to disclosure. We also remain committed to providing investors with the information and products they need to make sound investment choices considering climate-related risks and opportunities.

Vanguard serves individual investors who have entrusted us to manage and steward their investments. Our actions and our reporting will always be grounded in our deep commitment to investors and their financial well-being.

Tim Buckley

Vanguard Chairman and Chief Executive Officer

Introduction

About Vanguard

Vanguard was founded in 1975 on the basis of a simple but revolutionary idea: An investment company should manage its funds in the best interests of its clients. Today, we are one of the world's leading asset management companies, offering investment products, advice, and retirement services to individuals, financial professionals, and institutions.

What sets Vanguard apart in the industry is our unique mutual ownership structure. Vanguard is owned by our U.S.-domiciled funds, which in turn are owned by their investors. Our owners are at the heart of every decision we make, which is reflected in our core purpose: **To take a stand for all investors, to treat them fairly, and to give them the best chance for investment success**.

As a steward of our clients' assets, we engage with portfolio companies to better understand how material risks, including material climate risks that could affect the value of our clients' investments over the long term, are evaluated by their boards and reflected in their disclosures to the market. We view such stewardship activities as a natural extension of Vanguard's core purpose.

A focus on the individual investor

Vanguard serves more than 50 million individual investors who have chosen to entrust us with their hard-earned savings to invest for important goals, such as education, the purchase of a home, or retirement.

We manage our funds in the best interests of our clients to help them meet these financial objectives.

Our investors expect the mutual funds and exchange-traded funds (ETFs) we offer to meet the specific objectives set forth for those vehicles. Each portfolio is managed to meet a specific objective, follow well-defined strategies, and adhere to clear policies.

On behalf of our clients, we have an important role to play in understanding and advocating for appropriate disclosures of material financial risks, such as climate change. Our firm's leadership, as well as the teams that develop, manage, steward, and oversee our investment products, are committed to doing so.

Vanguard's approach to climate risk

Climate change—and the ongoing global response—will have far-reaching economic consequences for companies, financial markets, and investors. Vanguard is committed to understanding and attending to material risks that can erode our investors' long-term returns, including climate-related risks. Our approach spans several key areas of focus.

Research on the market and economic implications of climate change

Vanguard has been conducting research to understand how climate change could affect the global economy. In a 2022 Vanguard Megatrends research paper, *The Economics of Climate Change*, Vanguard economists used consensus scientific data to assess the impact of climate change on economic activity under four scenarios for greenhouse gas emissions and resulting temperature increases. They found that the net impact on global GDP is negative in all scenarios.

Product choices for our investors

Our global investment product lineup includes more than 280 index mutual funds and ETFs and more than 120 actively managed funds and ETFs. For clients who seek them, we offer more than 30 investment products globally that have specific environmental, social, and governance (ESG) objectives. For investors who specifically want to limit exposure to carbon-intensive industries, we offer ESG index funds that avoid or reduce exposure to such industries while seeking to achieve a broad market-like return.

Vanguard also offers actively managed ESG funds that seek to generate excess return by allocating capital toward companies that the fund managers deem as demonstrating leading ESG practices consistent with each fund's mandate. Although the investment methodology may vary by product and manager, assessing ESG-related risks and opportunities is central to the investment strategy of each of these actively managed ESG portfolios.

Investment stewardship

Vanguard's Investment Stewardship program is responsible for voting proxies and engaging with company boards and management teams on behalf of Vanguard-advised funds.[1] As part of its work, the Investment Stewardship team seeks to understand how boards of directors oversee material risks, including material climate-related risks, to safeguard long-term investor returns. For portfolio companies where climate risk is a material risk, the Investment Stewardship team may engage with them to understand how they disclose, oversee, and mitigate these risks.

Companies' disclosure of material financial risks is central to the accurate pricing of securities and the fair and efficient functioning of the capital markets. Efficient market functioning is particularly important for the index funds favored by many Vanguard investors since these funds buy and hold the many securities included in the benchmark index.

Proxy voting and related portfolio company engagement for funds that are managed externally by third party investment advisors, including Vanguard's actively managed equity funds, are handled by these external investment advisors.

Engagement with policymakers

Vanguard works with global policymakers to support the interests of long-term investors. Government leaders are specifically empowered and charged with considering the competing interests inherent in issues—including climate change—and crafting public policy responses that will address the complex societal impacts and trade-offs. Given the potential impact of climate change on the global economy and investor returns, it is important that policymakers provide clarity to individuals, companies, and the financial markets about government plans and targets to address climate risks.

Corporate sustainability goals and initiatives

Vanguard has a set of corporate sustainability goals and initiatives to make progress toward reducing carbon emissions and reaching carbon neutrality in our global operations by 2025.

1 Vanguard's Investment Stewardship program is responsible for proxy voting and portfolio company engagement on behalf of the quantitative and index equity portfolios advised by Vanguard (together, "Vanguard-advised funds"). Vanguard's externally managed portfolios are managed by unaffiliated third-party investment advisors, and proxy voting and engagement for those portfolios are conducted by their respective advisors.

Governance

In this section, we discuss Vanguard's approach to governance of climate-related risks and opportunities.

Vanguard addresses climate-related impacts and clients' best interests through an integrated structure of boards, committees, and functions.

Board oversight of climate-related risks and opportunities

The Vanguard Group, Inc. (VGI), is owned by our U.S.-domiciled funds, which in turn are owned by their investors. As of December 31, 2023, the VGI Board of Directors (VGI board) comprised 12 directors, 11 of whom were independent. Members of the board also serve as the U.S.-domiciled funds' Boards of Trustees (fund boards). The directors bring to each of these boards a wealth of executive leadership experience derived from their service as senior executives, board members, and leaders of diverse public operating companies, academic institutions, government agencies, and other organizations. The VGI board and fund boards meet regularly throughout the year to fulfill their functions and obligations.

The VGI board is responsible for, among other matters, setting broad policies for the company as well as overseeing risk management relating to Vanguard's corporate operations. Where applicable, the execution of these responsibilities includes consideration of material ESG-related risks, such as climate-related risks and opportunities. In addition, the VGI audit committee reviews management's risk governance frameworks and discusses policies with respect to risk assessment and management, including any relevant framework or policy relating to ESG risks.

The VGI board also oversees Vanguard's corporate sustainability goals and initiatives aimed at reducing our carbon emissions and reaching carbon neutrality in our global operations by 2025.

The fund boards engage on ESG and sustainability matters and communicate with management to help inform an effective course of action, as appropriate. The fund boards also oversee the funds' risk management, including consideration of material climate-related risks, where appropriate. The level of ESG risk evaluation varies by investment style and fund objective.

The VGI board and fund boards oversee the various Vanguard functions that conduct day-to-day risk management as applicable, including compliance, fund services and oversight, enterprise investment services, investment management, investment stewardship, legal, product, and risk management. In addition, the VGI board and fund boards have regular interactions with internal and external auditors.

Outside the U.S., the boards of our international businesses and fund entities exercise similar oversight responsibilities in their respective regions. The management teams of our international businesses share relevant ESG developments through Vanguard's global management committees. For a regional example, see "In focus: European ESG governance framework" on page 14.

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Board engagement on climate matters affecting our product lineup

The U.S. fund boards retain proxy voting authority for the U.S. Vanguard-advised funds and receive regular updates on investment stewardship activities, including voting and portfolio company engagement. The U.S. fund boards discuss key themes and emerging areas of risk identified through stewardship activities (for example, risks related to climate change) and provide guidance to the stewardship team on how to address those risks consistent with the funds' proxy voting policies and guidelines. The U.S. fund boards consider updates to those policies and guidelines annually to address new or evolving issues.

We believe that boards of portfolio companies are responsible for determining risk-mitigation approaches to maximize shareholder value and plan for an uncertain future. To the extent that legally binding or government-specified limits related to the Paris Agreement on Climate Change have been established, we believe that companies should disclose how their targets and strategies are appropriate in the context of those factors.[2] For example, many companies have set targets aligned with the goals of the Paris Agreement. As shareholders, the Vanguard-advised funds seek to understand the implications of those commitments.

As part of the oversight process for our global investment product lineup, the boards meet directly with the managers of our actively managed funds as appropriate and receive reporting on their consideration of material climate-related issues as part of their ESG integration practices.

The U.S. fund boards also receive an annual report on the external advisors' proxy voting and approve their proxy voting policies and procedures. The 2023 proxy voting report for the externally managed funds included a discussion of key themes and material votes in 2023, including significant shareholder proposals regarding climate-related topics, and highlighted certain external advisors' proxy voting on those proposals.

2 The Paris Agreement sets a goal of holding the increase in global average temperature to well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels.

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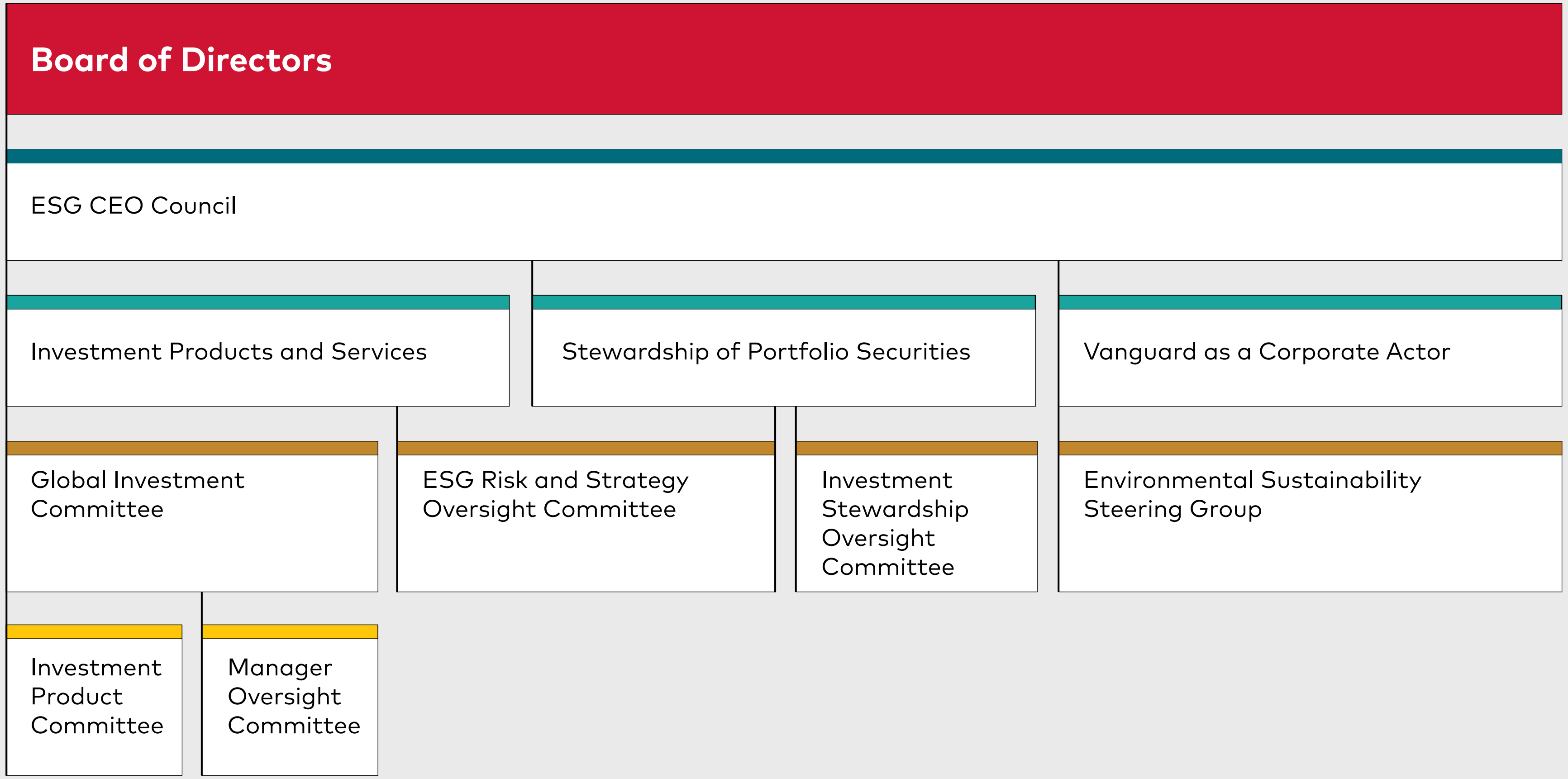
Vanguard's ESG governance structure

This diagram highlights elements of our current global ESG governance structure that have a specific connection to climate-related risks and opportunities.



Management's role regarding climate-related risks and opportunities

ESG CEO Council

Vanguard's ESG CEO Council oversees and coordinates our global strategy on ESG-related matters, including climate-related risks and opportunities, at both the corporate and product levels. Members include a subset of Vanguard's executive team, and Vanguard's chief executive officer serves as council chair. The council meets as needed and reports to the VGI board and the fund boards as appropriate.

The council provides guidance, oversight, and coordination on ESG matters in service of client interests. The framework underlying the council is organized around three pillars: Investment Products and Services, Stewardship of Portfolio Securities, and Vanguard as a Corporate Actor.

ESG Risk and Strategy Oversight Committee

The ESG Risk and Strategy Oversight Committee, composed of senior leaders across our product, communications, risk, and legal functions, is a subcommittee of the ESG CEO Council that facilitates the council's oversight of global ESG matters by:

- Sharing awareness of global ESG risks, strategic opportunities, and investment perspectives.
- Deciding how to address such risks and opportunities or aligning department resources to do so.

The committee supports two of the three ESG CEO Council pillars: Investment Products and Services and Stewardship of Portfolio Securities. By bridging both pillars, the committee aims to facilitate enterprise strategic alignment and enhance accountability. In the course of carrying out its responsibilities, the committee may escalate risks, issues, or other matters to the ESG CEO Council. In 2023, the committee discussed emerging regulatory trends, our ESG data strategy, and enterprise sustainability-related reporting—including TCFD—among other topics.

Investment Products and Services

Vanguard takes a disciplined, long-term approach to product development and strategy, and our product governance structure is intended to cover material ESG risks and opportunities, including those that are climate-related. As an integral part of this process, Vanguard's Portfolio Review Department develops our global product strategy, monitors the performance of each Vanguard fund, and oversees the funds and their investment advisors to ensure that they follow defined investment objectives and collectively offer diverse investment exposures consistent with our investment philosophy.

The Portfolio Review Department has regional teams that conduct product research and product management to evaluate local market conditions and assess local client preferences. The department typically convenes Vanguard's Global Investment Committee 11 times a year to engage on key issues relevant to product oversight. The committee's work includes making recommendations to the respective fund boards regarding such matters as new products, risk guidelines, and manager selection. Vanguard's chief executive officer serves as the committee chair, and members include senior leaders from Vanguard's investment, product, business, legal, compliance, and risk functions.

In addition, the Portfolio Review Department convenes the Investment Product Committee and the Manager Oversight Committee, both of which have significant overlap in membership with the Global Investment Committee. The Investment Product Committee periodically provides input and guidance on ESG and non-ESG product topics that are in the early stages of strategic evaluation, while the Manager Oversight Committee regularly meets with current and prospective managers as part of the oversight and selection process. The work of these committees supports the product-related recommendations made to the Global Investment Committee and, ultimately, to the VGI board and the fund boards for review and approval as appropriate.

Stewardship of Portfolio Securities

On behalf of Vanguard-advised funds, including both ESG and non-ESG index funds, Vanguard's Investment Stewardship team engages with portfolio companies about material risks, including material ESG risks. This dedicated team of experienced professionals operates globally while employing a regionally focused model. The team engages directly with company executives and boards, votes proxies, and advocates for market-wide adoption of governance best practices.

At the direction of the fund boards, our Investment Stewardship Oversight Committee oversees the proxy voting and stewardship activity with respect to the equity securities held in portfolios advised by Vanguard. The committee typically meets at least quarterly and regularly reviews stewardship practices and proxy voting policies, including those concerning material climate risks. Those reviews encompass such topics as changes to proxy voting policies, proxy season engagement and voting activities, and risk control processes. The committee recommends any appropriate proxy voting policy changes to the fund boards, which review and assess those changes. The committee includes fund officers and senior executives from relevant functions. The Investment Stewardship team provides regular reports to the VGI board, fund boards, and boards of our international entities, as appropriate.

Since 2019, the proxy voting responsibilities for externally managed Vanguard funds have been delegated to the investment advisors for those funds, creating greater alignment of investment management and investment stewardship. A Proxy Oversight team, which includes members of Vanguard's legal team and the Portfolio Review Department, conducts ongoing oversight to ensure that external advisors are consistently exercising their obligation to vote proxies. The Proxy Oversight team also provides annual updates to the fund boards. The fund boards are required to review and approve each external advisor's proxy voting policies and procedures at least annually.

Vanguard as a Corporate Actor

Vanguard has established goals and targets for operational sustainability to help responsibly manage and reduce our own environmental footprint. Our corporate sustainability efforts are led by the Global Workplace Experience (GWx) department, which reports to Vanguard's chief financial officer. GWx's Environmental Sustainability Steering Group sets both short- and long-term goals and priorities, incorporates sustainability activities into business planning, and monitors and tracks progress toward targets. Oversight of Vanguard's own sustainability goals and progress on the corporate level resides with the VGI board. See "Vanguard as a company" on page 37 for more information.

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European ESG governance framework

In addition to our global governance structure, we have regional structures in place to navigate the market and regulatory environments of each of the jurisdictions in which we operate. The Vanguard companies in Europe include our U.K. entities, Vanguard Asset Management, Limited (VAM), and Vanguard Investments UK, Limited (VIUK), as well as other affiliates, including Vanguard Group (Ireland), Limited, and Vanguard Group Europe GmbH (collectively, Vanguard Europe).

The Vanguard Europe boards oversee risk management in their respective jurisdictions, including ESG-related risks, within Vanguard Europe's overall business strategy, regulatory and governance frameworks, and risk appetite. The Vanguard Europe boards oversee risk management of various functions, including compliance, fund accounting, financial reporting, fund administration, investment management, investment stewardship, legal, product, and regional risk management. The boards typically meet at least five times per year. They consider issues affecting Vanguard Europe's evaluation of ESG risk and strategy matters and engage with Vanguard's management to help determine an effective course of action. Management arranges for periodic relevant training to the boards on ESG matters.

The following climate and other ESG-related subjects have been considered by the VAM board, the VIUK board, or both, during 2023:

- Training on ESG regulatory developments, including the U.K. ESG policy environment.
- Training on climate-related financial risks.
- Overview of the key decisions made by the European ESG Management Oversight Council, including the approval of the Sustainability Risk Policy and the establishment of the European ESG Program Steering Committee.
- Updates to the TCFD report and the approach to compliance with the FCA's ESG Sourcebook requirements applicable to the TCFD report.
- Updates on the progress of the implementation of Vanguard Europe's ESG governance framework.

European ESG Management Oversight Council

The European ESG Management Oversight Council (ESG MOC) provides oversight of ESG risks and strategy in relation to Vanguard Europe that may impact the broader Vanguard enterprise and its investment products and services. The ESG MOC reports to Vanguard's European Leadership Team and the managing director of Europe.

The European head of the Portfolio Review Department chairs the ESG MOC, and the council's voting members include European management representatives from investment management, risk management, finance, and legal. Its remaining members are ESG subject matter experts from across our European business. The council meets or considers matters at least monthly and reports quarterly to the European Leadership Team and the European boards as necessary. Members of the council meet periodically with Vanguard Europe boards and other Vanguard European councils and forums, as appropriate.

The ESG MOC has the following responsibilities:

- Acting as the designated forum for oversight, harmonization, and direction-setting on ESG risk and strategy matters related to Vanguard's European business.
- Overseeing the integration of ESG considerations into Vanguard Europe functions and processes within the context of Vanguard's global approach to ESG investing and risk appetite.
- Reviewing U.K. and European Union sustainability regulations and the implementation of applicable requirements by Vanguard's European business.

Strategy

In this section, we discuss how Vanguard considers climate-related risks and opportunities across our business.

We manage our business with the goal of creating long-term value for our clients.

Our client-centric strategy

Vanguard's strategy as a corporate actor and asset manager is grounded in our investor-owned structure.

In support of our strategy, we have an important role to play in understanding and responding to risks and opportunities that impact our ability to serve clients and help them meet their financial goals.

At Vanguard, climate risk is not considered a discrete risk. Instead, climate change and the resulting global response is viewed as a potential root cause or driver of the principal near-term and long-term risks facing the organization, namely financial, operational, regulatory, reputational, extended enterprise, strategic, technology, and investment management risks.

We identify and seek to mitigate short- and medium-term top risks to the enterprise while conducting longer-term horizon scanning to evaluate and prioritize action planning for future risks.

Climate-related risks and opportunities

Consensus market expectations—as well as Vanguard's own economic analysis—indicate that changes to the climate and the resulting global response will have far-reaching economic consequences for companies and financial markets, and therefore for investors.

In general, organizations face both physical and transition risks from climate change. Physical risk involves the tangible impacts of climate change, including extreme weather events such as flooding, wildfires, and droughts. Transition risk involves the move to a low-carbon economy through policy, preferences, technology, and market changes.

Vanguard seeks to understand and monitor physical and transition risk drivers that may present material risks to our ability to serve our investors. We conduct ongoing investment, expense management, and operational oversight to modernize and maintain the resiliency of core infrastructure (such as computer systems and buildings) and to implement evolving regulatory and reporting requirements.

Figure 1 highlights examples of climate-related risks that Vanguard could face. We actively monitor these potential risks and remain confident in our time-tested approach for effectively managing risks that could affect our clients' long-term investments.

FIGURE 1

Summary of climate-related risks

	Risk category	Risk description	Illustrative risk impacts	Driver type
Investment product and management	Investment management risk	Market, credit, and liquidity risks that impact returns or impede our ability to manage assets on behalf of clients	Mass market movements and decreased liquidity driven either by transitioning too suddenly and rapidly or too slowly	Transition and physical
			Market repricing for climate risks as well as volatility may be seen in certain companies, sectors, and geographies	Transition and physical
			Investors overallocate capital to climate-focused companies too quickly, leading to valuation anomalies that could increase volatility and impact long-term returns	Transition
	Operational risk	The risk to operations due to human error, or inadequate or failed processes, systems, or service providers	Reputational damage related to holding securities that are not aligned to the ESG objectives of an ESG product because of data errors	Transition
			Business interruptions to Vanguard and third parties stemming from climate-related physical impacts	Physical
	Regulatory risk	The risk of noncompliance with new or existing laws and regulations	Regulatory breach and legal costs associated with inaccurate disclosures related to climate objectives	Transition
	Strategic risk	Risks related to management's ability to make appropriate business decisions to prepare for and react to the broader economic or regulatory environment	Investment product range fails to align with changing investor sentiment	Transition
			Government and political views on climate change and sustainable investing impact Vanguard's ability to attract investors and the success of products	Transition
Business operations and financial health	Financial risk	Risks related to the organization's ability to manage its financial resources efficiently and responsibly	Loss of revenue from fund drawdowns as clients shift away from investment approaches lacking clear climate risk-mitigation strategies	Transition and physical
	Regulatory risk	The risk of noncompliance with new or existing laws and regulations	Increased financial costs because of complex global regulatory requirements	Transition
	Strategic risk	Risks related to management's ability to make appropriate business decisions to prepare for and react to the broader economic or regulatory environment	Employee skill sets prove inadequate to address climate-related challenges (e.g., failing to meet requirements or misinterpreting data and client needs)	Transition
			Regulations on climate change and sustainable investing interfere with Vanguard's ability to conduct business	Transition

While such risks are possible, efforts to adapt to climate change and encourage innovation may also present Vanguard with opportunities, such as those outlined in **Figure 2**.

Transition-related corporate and investment risks

In the near term, Vanguard considers transition risks to be a greater driver of enterprise risk than physical risks, as climate-related regulations and reporting requirements are evolving at different paces—and with varying degrees of complexity—in markets around the world.

We also consider transition risks to be a more pressing driver of risk in the short-term and medium-term for companies held in our products, with physical risks generally acting as a driver of longer-term risk. As governments and sectors diverge in climate policy approaches, and global markets approach key dates outlined in the Central Banks and Supervisors Network for Greening the Financial System (NGFS) scenarios, there is greater potential for transition risks driven by the emergence of disorderly transition scenarios.

FIGURE 2

Summary of climate-related opportunities

	Opportunity	Opportunity description	Illustrative opportunity impact	Driver type
Investment product and management	Operational	Innovations that stem from addressing climate change foster increased efficiency	Availability of improved data sets leads to enhanced oversight and client reporting	Transition
	Strategic	Investor demand for investment products and advice focused on climate change, ESG, or both	Meet client needs through a selection of ESG products that we believe have enduring investment merit and are consistent with our time-tested product design principles	Transition and physical
Business operations and financial health	Financial	Greater understanding of operational resiliency	Enhancing risk identification, mitigation, and operational resilience associated with climate-related challenges will allow for greater capital efficiencies and cost savings from right-sized risk management and risk transfer (e.g., insurance) activities	Transition and physical

Meeting investment needs of clients

Vanguard has an opportunity to meet the evolving investment needs of our clients, including through products that consider climate-related risks and opportunities.

Our product lineup includes both index and active funds. Our index funds enable investors to construct broadly diversified portfolios and frequently serve as the core building blocks underlying our extensive array of multi-asset products. Our non-ESG equity index funds seek to track the performance of broad market indexes. Material ESG risks, including material climate-related risks, are considered when our Investment Stewardship team evaluates proxy proposals and engages with portfolio company boards and management. See “Investment stewardship” on page 25 for more information.

Some of our investment products are designed to pursue specific ESG goals and objectives for investors who prefer such an approach. Our exclusionary ESG index products, for example, avoid or reduce exposure to specific business practices and industries, including many that are carbon-intensive, while still seeking to achieve market-like returns.

Our actively managed funds include several ESG-focused funds that aim to generate excess return by allocating capital to companies with leading or improving ESG practices. In each instance, these actively managed ESG funds account for climate considerations and also have specific net zero objectives.

We also offer many actively managed products that do not have ESG-specific mandates. The managers of these products have their own approaches to integrating material ESG risks, including material climate risks, into their investment processes.

Resilience of our strategy

Our U.S. mutual fund ownership structure enables us to continually invest in people and technology to ensure that we can serve our clients and remain operationally resilient at all times.

We are confident in our approach to managing risks that could affect our clients' long-term investments, including material risks resulting from climate change. Our engagement with portfolio companies as part of our Investment Stewardship program, our rigorous processes for selection and oversight of the managers of our actively managed funds, and our thoughtful approach to product development remain core components of our approach.

Vanguard's focus on long-term returns, rather than quarterly results, keeps our business resilient, even during challenging macroeconomic environments. We have captured positive net cash flows into our funds for 45 consecutive years, and our asset base is diversified across product type, asset class, and management style. We maintain a strong balance sheet and liquidity position, which are regularly monitored through stress testing to ensure that we can withstand the financial implications of significant, unexpected events, including those resulting from climate change.

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Vanguard U.K. stress and scenario testing

A key component of Vanguard U.K. (VAM and VIUK) risk processes is a material risk assessment of harms.

The assessment's objectives are to:

- Identify material harms that could result from the ongoing operation and winding down of Vanguard's U.K. business.
- Determine the material risks facing Vanguard's U.K. business, clients, and financial markets over varying time horizons.
- Assess the probability and potential impact of identified risks, including stress testing where appropriate, to inform strategic and financial planning.
- Assess and identify mitigating management actions and internal controls.
- Provide assurance to stakeholders as to the effectiveness of management actions relating to the level and nature of risks faced.

The material risk assessment of harms supports Vanguard U.K.'s overall risk life cycle and provides assurance that:

- Vanguard U.K. is able to remain financially viable throughout the economic cycle, with the ability to address any material potential harm that may result from its ongoing activities.
- Vanguard U.K.'s business could be wound down in an orderly manner, minimizing harm to customers and other market participants.

Vanguard U.K. has identified a series of severe but plausible risk scenarios, including ESG risk exposures, with which to stress test our business. Stress testing involves adjusting specific parameters that affect the financial position of Vanguard U.K., including capital and liquid resources, income, and profit.

Our ESG stress test considers "greenwashing" risks, U.K. client demand for ESG products, and how resilient Vanguard U.K.'s strategies are in terms of climate-related risks and opportunities.[3] We take into consideration different climate-related scenarios, including a temperature rise of 2 degrees Celsius above pre-industrial levels (consistent with a transition to a low-carbon economy). We refine our stress tests every year along with our scenario analysis best practices, both of which enhance our ability to assess associated ESG risks.

3 Greenwashing is the making of false or misleading claims about the environmental benefits of a product or service.

Risk management

In this section, we discuss how Vanguard identifies, evaluates, and manages climate-related risks and opportunities on behalf of our investors.

Vanguard has a long history of thoughtfully managing risk to safeguard our clients' assets and best interests.

Identifying and assessing climate-related risks

As a matter of course, we seek to identify, assess, and mitigate risks from both a corporate and investment product management perspective, taking impact, probability, and urgency into account. In our experience, it is critical to continually evolve and refine the way each risk is considered.

Vanguard's risk-management life cycle has four key components: identification of risk, assessment of risk, management of risk, and monitoring and reporting of the risk environment. We see risk management as an ongoing process and mindset moving continuously through each stage.

Vanguard embeds relevant ESG considerations into existing functions to ensure that ESG factors are considered alongside, not separately from, other matters important to serving our clients. Within our investment processes, we integrate material climate and broader ESG considerations where appropriate.

Our overall risk-mitigation approach is founded on three core lines of defense:

- **Vanguard's business units**, which include areas ranging from client-facing teams to shared service functions, such as technology and finance. We assess risks within the respective purview of each area and develop processes and control frameworks to mitigate potential impacts on our clients.
- **Vanguard's corporate risk functions**, which include Global Risk and Security and the Office of the General Counsel. We incorporate risk prevention across areas of our operations and businesses.
- **Vanguard Internal Audit**, an independent and objective team directly accountable to the VGI board, assesses the adequacy of internal controls to enhance the governance and oversight of enterprise risks and risk management.

Business continuity

As a company dedicated to helping clients build and preserve wealth, Vanguard plans carefully and methodically to ensure a quick and smooth recovery from a potential emergency or disruptive event, including climate-related events.

Vanguard's Enterprise Resiliency and Business Continuity Management group, within Global Risk and Security, oversees enterprise resilience and partners with business continuity teams in every division at Vanguard sites globally. The group independently assesses and monitors business continuity to ensure that we can continue operations and serve our clients during natural disasters, weather-related events, and other potential disruptions.

Our integrated business continuity program oversees enterprise resilience and provides crisis management, governance, and oversight to ensure employee, supplier, technology, and workspace resilience. The process has three major components:

- Identifying and mitigating risks.
- Documenting detailed business contingency plans.
- Executing comprehensive contingency tests.

In addition to regular planning, maintenance, and testing, we use several routine business strategies to ensure flexibility and resilience in our operations. For example, Vanguard runs key business functions from multiple geographic locations, which in turn reduces the risk of regional climate-related events and other disruptions.

Our portfolio managers and investment analysts in different regions work as one team. This approach enables us to collaborate across multiple time zones to extend the number of hours in a trading day and ensure business continuity. We have trading desks in two of our U.S. locations (Pennsylvania and Arizona), as well as in the U.K. and Australia.

Managing climate-related risks within our investments

Relevant teams monitor material climate-related risks across our funds through our investment stewardship activities, ESG integration within the Vanguard-advised active strategies, and oversight of our external managers' ESG integration and engagement practices.

Investment stewardship

Vanguard-advised equity funds provide broadly diversified access to the global markets at a very low cost. Broad market diversification can include exposure to material risks, including climate risk. On behalf of the Vanguard-advised equity funds and their investors, Vanguard's Investment Stewardship team monitors and promotes disclosure of material risks, including material climate-related risks.

All aspects of Vanguard's Investment Stewardship program are focused on safeguarding and promoting long-term shareholder returns at the companies in which the Vanguard-advised funds invest.

The team engages with portfolio company directors and executives to learn about each company's corporate governance practices and to share our perspectives on corporate governance practices associated with long-term shareholder returns. In 2023, the global Investment Stewardship team engaged with 1,334 companies representing 69% of the Vanguard-advised funds' total assets under management.

Each fund's proxy voting policies and procedures are designed to promote long-term shareholder returns by supporting effective corporate governance practices. The proxy voting policies for each of the Vanguard-advised funds detail the general positions of the Vanguard-advised funds on proxy proposals that appear frequently at public companies (for example, proposals to approve executive pay plans). The Vanguard-advised funds have also developed country- or region-specific policies for markets where the funds have significant portfolio company holdings. These regional policies reflect local market nuances on regulatory requirements and governance practices. When we encounter a ballot item for which specific policies are not defined in the funds' proxy voting policies, the vote is determined on a case-by-case basis consistent with the principles articulated in the funds' proxy voting policies and each fund's investment objective.

On behalf of the Vanguard-advised equity funds, the Investment Stewardship team looks for portfolio company boards to effectively oversee material climate-related risks and disclose those risks using widely recognized investor-oriented reporting frameworks. The team supports the framework created by TCFD for disclosing governance, strategy, risk management, and metrics and targets. Where climate change is a material risk for a company, the team looks for a company's board to disclose the specific risks and the strategies in place to oversee and mitigate those risks. Vanguard views such disclosure as central to the healthy and efficient functioning of capital markets. The team also evaluates the company's reporting on any climate-related goals they have set and disclosed.

The funds will support proposals whose provisions, in our assessment and on balance, serve the long-term financial interests of the funds and their investors. The funds will not support proposals that include elements we view as dictating company strategy or operating decisions that, in our view, should be the purview of the company's board of directors and management teams.

CASE STUDY

Shareholder proposal regarding disclosure of methane emissions at Coterra Energy Inc.

At the annual meeting of Coterra Energy Inc. (Coterra), a U.S.-based oil and gas producer, the Vanguard-advised funds voted in support of a shareholder proposal requesting that the board produce a report analyzing the reliability of its methane emission disclosures.

At the 2023 annual meeting, Coterra received a shareholder proposal requesting that the board analyze the reliability of the company's methane emission disclosures, explain whether there is likely to be a material difference between direct measurement results and the company's reported methane emissions, and assess the degree to which any differences would alter estimates of the company's Scope 1 emissions.[4] We assessed the proposal as reasonable and relevant to a material risk for the company given its operations as an oil and gas producer, the financial materiality of methane emissions to the company, and the company's settlement of criminal charges last year related to water contamination resulting from methane leakages by Coterra's corporate predecessor.

The proposal further requested that the company conduct the direct measurement using a recognized framework and suggested Oil and Gas Methane Partnership (OGMP) as a possible framework. However, the proposal was not prescriptive as to which framework should be used. Coterra's disclosures described methane emissions as a percentage of natural gas produced using an interpretation of Environmental Protection Agency (EPA) methodology that some critics consider outdated. We also observed that the company provides less disclosure of its emissions than its peers.

During our engagement with Coterra leaders, they acknowledged the importance of disclosure and described issues with the company's testing of direct measurements of methane emissions. Coterra leaders acknowledged gaps in the current EPA methodology and expressed that they perceived value in projects such as OGMP. They explained that their direct-measurement sampling results showed inconsistencies that they perceived to be the result of limitations in the available direct measurement technologies. Coterra leaders described their desire to see consistency in the company's testing results before disclosing an updated emissions inventory and would not commit to a timeline for disclosure.

In our assessment, the proposal granted the board sufficient flexibility to disclose the company's methane impacts through multiple calculation methodologies. The example framework suggested by the proponent provided guidance and flexibility (on both timing and calculation methods).

Risks associated with climate change are material for energy companies, and we observed that climate-related risks had materialized at Coterra as evidenced by its recent legal settlement. A misalignment between company and peer disclosure practices hinders the market's ability to accurately price the risks (and opportunities) associated with the company's strategy.

As a result, the Vanguard-advised funds voted in support of the proposal, which passed with majority support. The funds did not support a separate shareholder proposal asking for a report on whether and how Coterra's lobbying activities and political influence aligned with the goals of the Paris Agreement. We found the proposal to be overly prescriptive and not germane to the company considering that Coterra had not expressed any position on the Paris Agreement. The proposal failed to receive majority support.

4 Scope 1 refers to all direct greenhouse gas (GHG) emissions. Scope 2 refers to indirect GHG emissions from consumption of purchased electricity, heat, or steam. Scope 3 refers to other indirect emissions not covered in Scope 2 that occur in a company's value chain, including both upstream and downstream emissions.

CASE STUDY

Say on Climate proposal at Woodside Energy Group Ltd.

Woodside Energy Group Ltd. (Woodside), an Australian-listed global energy company, put forward a Say on Climate proposal at its 2022 annual meeting.[5] The Vanguard-advised funds did not support the proposal. We engaged with Woodside leaders ahead of the 2023 annual meeting to discuss the company's approach to managing material climate risks, how the board oversees those risks, and the enhancements made to the company's climate disclosures following high levels of shareholder dissent on the company's 2022 Say on Climate proposal.

During the engagement, Woodside leaders shared details about the process for improving the company's reporting—including hosting an investor roadshow to better understand investor feedback—and outlined the changes made. We provided feedback on the importance of decision-useful disclosure and the difficulties we had in identifying and understanding the main changes to Woodside's report. We suggested that a summary of changes may be helpful to shareholders. Woodside leaders also provided additional examples of areas where steps were being taken to address material climate risks that were not included in the report; we explained that this information would be helpful to disclose in order to give shareholders a more complete picture of enhancements made to Woodside's most recent climate report.

Woodside's initial Say on Climate proposal at its 2022 annual meeting was as an advisory vote; the plan was to allow shareholders to vote every three years on the report unless material changes were made. Although a vote was not required, given the high level of shareholders that did not support the report, we questioned why Woodside had elected not to put a Say on Climate proposal forward at the 2023 annual meeting, which would allow shareholders an opportunity to express their views on the updated report. We explained our view that such an action would demonstrate that shareholder input was being appropriately considered.

Following the engagement, and in advance of Woodside's 2023 annual meeting, we received communication from Woodside that provided a clear summary of the changes made to its most recent report; it highlighted the improvements made by directly comparing the 2022 disclosures with those published in the 2023 climate report. Woodside also announced that the next iteration of the climate report would be put up for shareholder vote at the 2024 annual meeting.

We were encouraged to see the board and management's responsiveness to shareholder feedback.

5 Say on Climate management proposals seek an advisory vote from shareholders on a company's approach to climate strategy.

CASE STUDY

Board oversight of climate risk at Thungela Resources Ltd.

We first engaged with Thungela Resources Ltd. (Thungela), a South African thermal coal company, in 2022, and noted its stated confidence in the fundamentals of coal demand and recognition of the long-term implications of climate risk on its business. We encouraged the company to continue developing effective disclosures of board-level oversight of climate risks and opportunities and risk mitigation plans. Thungela committed to publishing its first TCFD report in early 2023.

In 2023, we engaged with board directors and company leaders to discuss the board's oversight of climate-related risks. In our conversation, we explored oversight of Thungela's climate change goals—greenhouse gas targets in particular—and strategy of pursuing geographic diversification of its coal assets. Thungela leaders were able to provide helpful context for changes made to board composition that served to further strengthen the board's capabilities with respect to oversight of risk and strategy at the company.

Additionally, we discussed Thungela's response to an environmental incident in 2022. In part due to illegal mining activities, toxic water from a mine in the Mpumalanga province of South Africa spilled into nearby rivers, negatively impacting aquatic life in the region. Thungela leaders shared the company's remediation approach, which included efforts to restore the biodiversity of affected rivers at a cost to the business.

We observed that Thungela provided effective disclosures in its annual report and was able to clearly articulate the board's role in overseeing the mitigation of this incident. We will continue to monitor the board's oversight and disclosures of climate-related risks and opportunities.

2023 Investment Stewardship activity at a glance

1,334	1,659	13,490	182,641
companies engaged	total company engagements	companies where a proposal was voted on	proposals voted on

Additional resources on investment stewardship at Vanguard

- Investment Stewardship 2023 Annual Report
- Global proxy voting policy
- Vanguard's approach to climate risk governance
- Proxy voting disclosures for Vanguard funds

Piloting investor choice for an expanded set of investors

In 2023, Vanguard launched a voluntary pilot program to give investors in certain equity index funds the ability to select from a menu of policy options that direct how shares associated with their fund holdings should be voted. Vanguard has expanded this investor choice program by introducing proxy voting choices to investors in additional funds and to additional investors in early 2024. Expanding proxy voting choices is a continuation of Vanguard's effort to give investors the information and options they need to help ensure that their investment portfolios reflect their investment goals and preferences.

Investment management

Integration of climate risks and opportunities by our external advisors

The majority of Vanguard's active equity funds and active multi-asset funds are managed by external firms. In fact, 24 external asset management firms serve as investment managers and investment stewards for Vanguard's externally managed active funds. Vanguard recognizes that each firm brings a different perspective to the way it assesses and oversees climate risk, including in funds that do not pursue explicit ESG objectives.

We work closely with each of our active managers to understand how they integrate ESG considerations into their investment processes. This approach has enabled us to observe how much the ESG landscape has changed over time and how much the reliability of ESG data has improved.

More broadly, we are responsible for assessing how each manager's approach aligns with its investment process, which is designed to deliver strong investment outcomes for our clients. Our approach to fund manager selection centers on what we believe to be the key drivers of investment success—firm, people, philosophy, and process. This approach provides our investors with diversity of thought and broader access to top investment talent. It also provides us with a unique perspective on the ways in which different active managers approach the investment process.

A team from Vanguard's Portfolio Review Department regularly engages with current and prospective external fund managers. As part of these engagements, the team examines how managers incorporate financially material considerations, including climate change, into their security selection processes. The team considers how managers gather information, how their research efforts are structured to account for climate considerations, the extent to which they consider both quantitative and qualitative factors in their analysis, and how they engage with portfolio companies. The team regularly reports on its findings and discussions to the Manager Oversight Committee and the fund boards.

The Portfolio Review Department holds these external investment managers to the highest standards to ensure that they remain focused on maximizing investment performance for our investors. Included in our ongoing assessment is the appropriate consideration and management of material financial risks, such as those posed by climate change.

CASE STUDY

Wellington Management

Driver type: Transition risk

Wellington Management Company LLP oversees the largest amount of Vanguard assets among our external investment advisors, managing more than $400 billion globally on behalf of Vanguard clients.

Wellington hosted a series of engagements with companies in the rail industry during the fourth quarter of 2023 to assess the transition and decarbonization strategies in place in the industry.

In November, Wellington met with Union Pacific, the second-largest railroad operator in the U.S., to better understand the material climate transition risks to the company and discuss its transition strategy. The company is targeting a 26% reduction in Scopes 1 and 2 emissions by 2030 and has set a low-carbon fuel target of 20% by 2030.

Union Pacific generally expects policy and regulation to become more stringent over time, and the company may face increased operational costs due to increasing carbon prices, which can be mitigated by reducing company emissions. Wellington was encouraged to learn that Union Pacific has committed to spend more than $1 billion on modernizing locomotives to reduce Scope 1 emissions by an additional 2%. The company believes these investments will improve reliability and operational efficiency, which should provide financial benefits. Furthermore, reducing emissions may represent an opportunity for the company to become a supply chain partner of choice for potential customers who seek to reduce value chain emissions.

Wellington also met with Westinghouse Air Brake Technologies (Wabtec), a locomotive, freight car, and passenger transit-vehicle manufacturer, to discuss its decarbonization strategy. Emissions, regulation, and the cost of carbon are key components of the company's ongoing strategy and budget-planning dialogue. Wabtec's products and technologies enable rail customers to improve reliability and operational efficiency and reduce emissions, which enable its customers to achieve operational goals and mitigate regulatory and policy risk. Wellington believes this positions the company to capture both replacement demand and modernization growth spurred by rail operators' decarbonization efforts.

These engagements provided Wellington greater clarity on the steps the companies are taking to reduce risk and take advantage of opportunities. Wellington will continue to engage with these companies and monitor their future transition plans.

CASE STUDY

Ninety One: Waste Management

Driver type: Physical and transition risk

Ninety One is an active, global investment manager managing more than $150 billion in assets. Ninety One manages the Vanguard Global Environmental Opportunities Fund, which aims to achieve long-term total returns by investing in the equities of companies expected to contribute to the transition to a lower-carbon global economy.

Waste Management is the largest waste-collection and processing company in the United States. By improving resource efficiency, Waste Management is helping to deliver real world decarbonization. A key component of this is the permanent sequestration of carbon and other greenhouse gases through its extensive landfill network. The company employs methane capture technology on an increasing portion of its landfill sites, using the gas to make automotive fuel and generate electricity. In addition, Waste Management is a significant player in the recycling industry, which reduces the requirement for raw materials. Overall, Waste Management's innovative model results in significant carbon reduction.

As part of its Ninety One Sustainable Equity team's investment process for the Global Environment Strategy, the team identified annual engagement goals for Waste Management regarding the company's management of material ESG risks and opportunities. For example, in 2023, the team engaged with Waste Management on carbon risk management through science-based targets.

Waste Management's decarbonization goals are now validated by the Science Based Targets initiative (SBTi).[6] A continuation—and increase—of its landfill site gas collection efforts will be the primary driver of achieving its emissions reduction target. This decarbonization goal is strongly linked to the company's strategy and directly supports the expansion of its renewable energy businesses, as there is a revenue opportunity from the collection of more landfill gas that can be converted into renewable energy and sold.

6 SBTi is a corporate climate action organization that develops standards, tools and guidance which allow companies to set greenhouse gas (GHG) emissions reductions targets.

Integration of climate risks in fixed income

All of Vanguard's fixed income index funds and the majority of its actively managed fixed income funds are managed by Vanguard Fixed Income Group (FIG).

Where appropriate, and in accordance with a fund's mandate, FIG integrates ESG considerations into its investment process by assessing the financial materiality of ESG risk factors along with investment risks to complement standard credit assessment. FIG tailors its approach within applicable sub-asset classes to address nuances in material ESG risk factors across fixed income.

FIG's ESG integration process applies to most fixed income mandates, excluding money market mutual funds. FIG continually refines its ESG integration process to consider financial markets' adaptation to societal and environmental risk factors, regulatory requirements, and the availability of ESG data.

Engagements with issuers are among the many informational inputs that FIG may use to integrate risk considerations into its investment process. FIG credit research analysts regularly meet with issuers to discuss a range of topics that may pose a financial or reputational risk to an issuer, including material ESG risk.

CASE STUDY

Company: Aurizon Holdings Ltd.

Aurizon Holdings Ltd. is a leading Australian integrated rail operator and a top 100 company listed on the Australian Securities Exchange (ASX).

Aurizon provides large-scale, supply chain solutions to a diverse customer base, including the operation of one of the world's largest coal haulage networks in the state of Queensland. This network supports 90% of Australian metallurgical coal exports. Around 70% of the volume hauled across Aurizon's network is metallurgical; the remaining 30% is thermal coal. Our credit researchers' investment thesis on Aurizon takes into consideration the company's commitment to diversify and de-risk its earnings base.

Aurizon held an investor day in 2023 to articulate the company's earnings diversification and decarbonization strategy. At this meeting, Aurizon discussed its One Rail acquisition and the "land-bridging" strategy (which is intended to improve freight rail service between the northern port of Darwin and key Australian markets), both of which are aimed at increasing earnings diversity. Aurizon's rail network plays an important role in Australia's transition to a low-carbon economy, and the shift from road-to-rail transportation improves ESG credentials, with 95% less carbon emissions per metric ton transported by rail compared with roads.

A successful execution of the land-bridging strategy could reduce thermal coal contribution to company revenues from 33% in fiscal 2023 to 20% in 2030. This would support the company's decarbonization plan to achieve net zero operational emissions (Scopes 1 and 2) by 2050.

Engagements with Aurizon have enabled our credit research team to gain a better understanding of the company's level of risk related to climate and other ESG matters. The information gained provided our credit research analysts with a measure of comfort regarding key risk information being reported. The critical nationwide infrastructure network that Aurizon operates and the ongoing strong financial support from Aurizon's banking panel contributed to our assessment that the company has an improving ESG profile.

Metrics and targets

In this section, we discuss the metrics and targets we use to assess climate-related risks and opportunities.

One of our most important responsibilities to our clients is clear, accurate, and useful disclosure about risks in Vanguard funds.

Measuring climate-related risks and opportunities

Climate data and metrics remain a rapidly evolving area. We are exploring the benefits and limitations of various climate metrics for our investors. We also acknowledge the growing global scrutiny and regulation of climate-related disclosures as well as the increasing demand for ESG data among a subset of our clients. Vanguard continues to build out its data and reporting capabilities to meet regulatory reporting obligations and evolving client requirements.

In terms of our investment processes and stewardship activities, we focus on material climate-related risks as they relate to the overall risk exposure of our underlying portfolio companies. Vanguard views corporate disclosures—including disclosures pertaining to climate matters—through the lens of materiality to the firm's long-term value. We focus on the risks that are most relevant to specific companies while acknowledging that those risks might evolve over time. Disclosure and assessment of material risks, including material climate-related risks, are important for price discovery and returns. As disclosure of material climate-related risks improves, we believe that security prices will more accurately reflect these risks and that all investors will benefit.

For our equity index products, our Investment Stewardship team uses climate metrics disclosed at the company level to inform its engagements and proxy votes on material climate risk matters. We undertake these activities with a long-term perspective and with the objective of safeguarding and enhancing shareholder returns over time. The Investment Stewardship team in some instances supplements disclosed company metrics with climate metrics provided by third parties.

For our actively managed funds, corporate disclosures about climate risks and opportunities can inform the investment decisions of portfolio managers. The managers incorporate such disclosures into their investment processes and engagement strategies. Each manager's approach to the use of climate metrics is part of our Portfolio Review Department's ongoing oversight of our investment advisors.

IN FOCUS

In response to the evolving regulatory environment in Europe, we continue to consider how to integrate sustainability risk data into our enterprise and investment risk-management frameworks. In our 2021 TCFD report, we described our first climate change scenario analysis exercise, which was designed to help us obtain a deeper understanding of climate impact in different sectors of the capital markets. Since then, we've employed scenario analysis in our climate-related research and in the ESG stress testing of our U.K. business, which is required by regulation (and highlighted on page 21 of this report). These use cases are sharpening our understanding of the various tools and methodologies and will inform our future approach to scenario analysis. Additionally, climate metrics are disclosed in our 2023 U.K. TCFD entity-level and product disclosures report.

Figure 3 illustrates climate-related metrics that are used in our U.K. TCFD disclosures or are being considered for integration into sustainability risk disclosures in Europe.

FIGURE 3

Summary of climate-related metrics reported in European disclosures

Metric	Helps to answer the question	Definition
Total carbon emissions	How many metric tons of carbon dioxide equivalent (tCO_2e) emissions is the portfolio responsible for?	Greenhouse gas (GHG) emissions (Scopes 1, 2, and 3) multiplied by the current value of investment divided by the issuer's enterprise value including cash (EVIC). The calculation is based on the absolute GHG emissions associated with a portfolio, expressed in tCO_2e.
Total carbon footprint	How much tCO_2e in emissions is the portfolio responsible for per $1 million invested?	Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tCO_2e per $1 million invested.
Weighted average carbon intensity (WACI)	What is the portfolio's exposure to carbon-intensive companies?	A portfolio's exposure to carbon-intensive companies, expressed in tCO_2e per $1 million in revenue; reflects the carbon intensity of a portfolio across asset classes.
Climate Value-at-Risk (Climate VaR)	How is the portfolio impacted in different climate scenarios?	A forward-looking climate risk metric that assesses how a company's valuation could be impacted by climate policy risks and physical climate risks and could benefit from a low-carbon technology transition.
Implied Temperature Rise (ITR)	How well do public companies align with global temperature goals?	The ITR estimates the global implied temperature rise (in the year 2100 or later) if the entire economy had the same carbon budget overshoot or undershoot as the portfolio in question. The portfolio-level ITR compares the sum of "owned" projected GHG emissions, including Scope 3, against the sum of "owned" carbon budgets for the underlying fund holdings.

Notes: For U.K. product-level disclosures, as mandated by the Financial Conduct Authority effective in 2022, we adopted the Climate VaR and ITR metrics given their wide adoption within the financial sector. At the same time, we acknowledge the limitations of both metrics, including the static nature of the assessment and the heavy reliance on multiple assumptions.

ESG products and net zero objectives

Vanguard has been thoughtful and deliberate in building out our ESG product lineup by ensuring that each new fund can address enduring needs for investors. Our product development approach relies on a rigorous set of design principles. These principles require assessment of each product proposal based on investment merit, client needs, any competitive advantage, and any legal, regulatory, or operational constraints. Only after a multi-tier approval process, as outlined in “Management’s role regarding climate-related risks and opportunities” on pages 12 and 13, do we proceed with the introduction of a new fund for investors.

The ESG funds we have launched in recent years include a number of actively managed equity products that are aligned with a temperature rise of less than 2 degrees Celsius above preindustrial levels, meaning that, as part of the fund design, they are constructed to meet net zero objectives. The external managers of these active funds each determine their own interim targets and methodology for alignment, consistent with the fund’s strategy. Their approach is disclosed in the fund’s prospectus, and the targets are monitored by both the manager and Vanguard.

IN FOCUS

Information on Vanguard ESG index funds

Vanguard reports information on certain Vanguard ESG index funds’ asset-weighted average of holdings with Scopes 1 and 2 emissions data from MSCI ESG Research LLC (MSCI). Vanguard also reports information on certain ESG index funds’ total carbon footprint and weighted average carbon intensity from MSCI.

MSCI collects publicly available emissions and intensity data from company-reported sources, government agencies, nongovernmental organizations, and media sources. To Vanguard’s knowledge, MSCI does not receive third-party assurances regarding the accuracy of the underlying information. Vanguard relies on the accuracy of the data provided by MSCI. Vanguard does not independently review the accuracy of MSCI’s data and does not retain independent third-party verification services to review that data.

Vanguard as a company

In this section, we discuss our goals and progress regarding corporate sustainability in our business operations.

With more than 20,000 crew members around the world, Vanguard is committed to reducing our global carbon footprint and managing climate-related risks in our business operations.

Measuring progress on operational climate risks

Vanguard's corporate climate strategy seeks to reduce our firm's own climate impact, pursue sustainable business operations, and engage our crew.

In early 2020, we established a pair of goals to curb emissions and reduce the global carbon footprint of our operations.

In 2023, we continued to use 100% renewable electricity globally in owned and leased properties where Vanguard has operational control, an outcome we first achieved in 2021.

Where possible, our buildings are powered by on-site renewable electricity, direct renewable electricity from the utility supplier, or purchasing Green-e certified renewable energy certificates (RECs) by a third-party provider.

We offset our remaining footprint with high-impact carbon offset projects that increase economic development.

Climate-related goals for our global operations

Goal	Date established	Target completion	Status
Achieve 100% renewable energy in our global operations	January 2020	2021	Achieved 100% renewable energy in 2021, 2022, and 2023.
Reach carbon neutrality throughout our global operations	January 2020	2025	84% carbon neutral by year-end 2023.

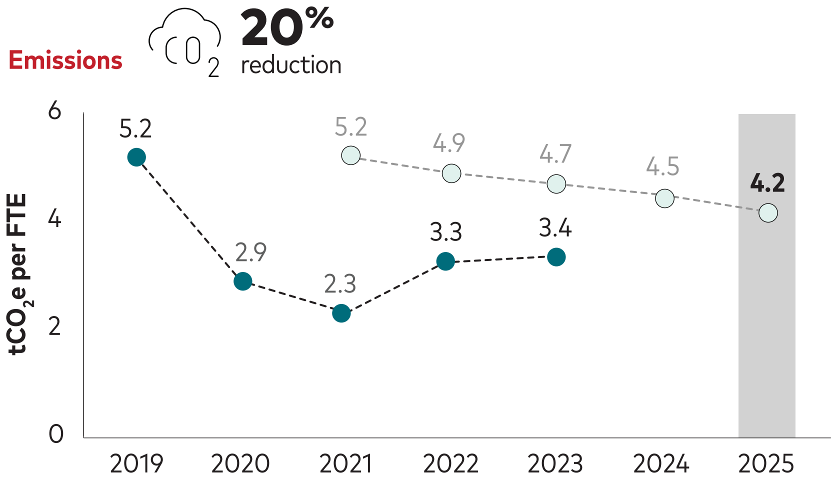
Notes: Vanguard's greenhouse gas (GHG) emissions reporting follows the Greenhouse Gas Protocol corporate standard. The company has a goal of reaching carbon neutrality throughout its global operations by 2025. We aim to achieve this goal by reducing Scopes 1, 2, and select Scope 3 GHG emissions (not including Vanguard Fund investments) at least 20% as compared to 2019 by assessing annual GHG emissions as well as offsetting remaining emissions in those categories through the use of REC and carbon offset purchases. Using this criteria, we determined that Vanguard reached 84% carbon neutrality in 2023. Vanguard's Scopes 1, 2, and 3 GHG emissions for 2021, 2022, and 2023 have been assured by a third-party provider. This limited assurance is based on the International Standard on Assurance Engagements ISAE 3000 (revised).

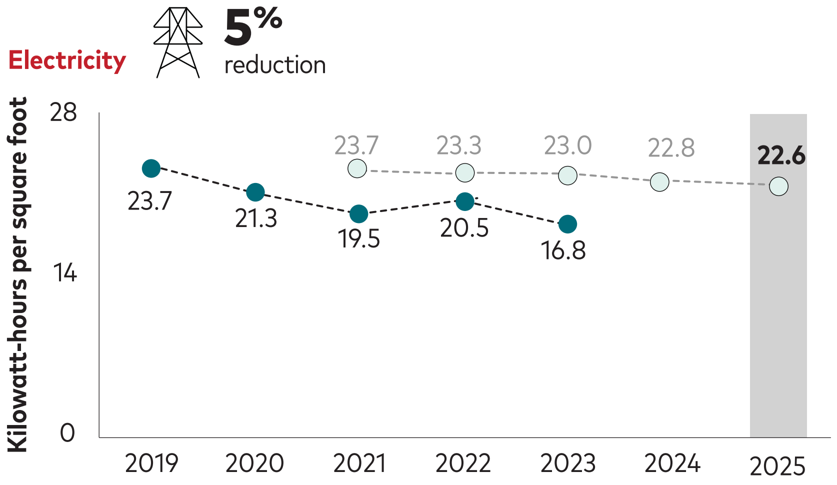
Update on 2025 reduction targets

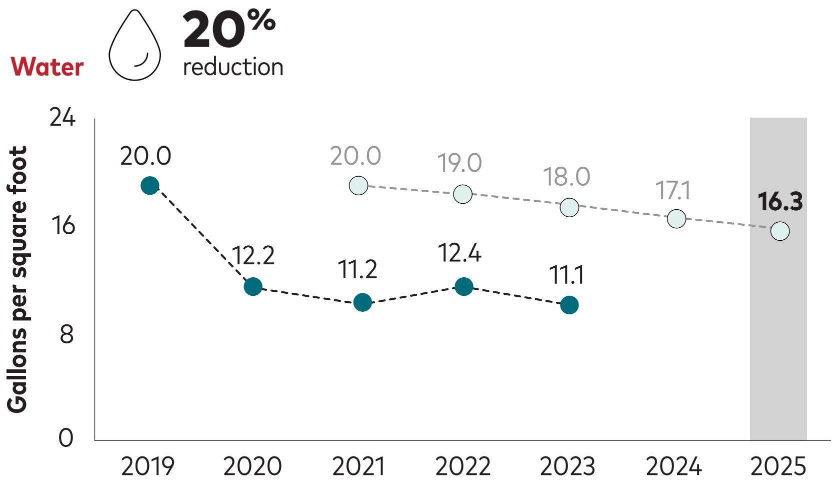
We have adopted four reduction targets for 2025, based on 2019 baseline levels:

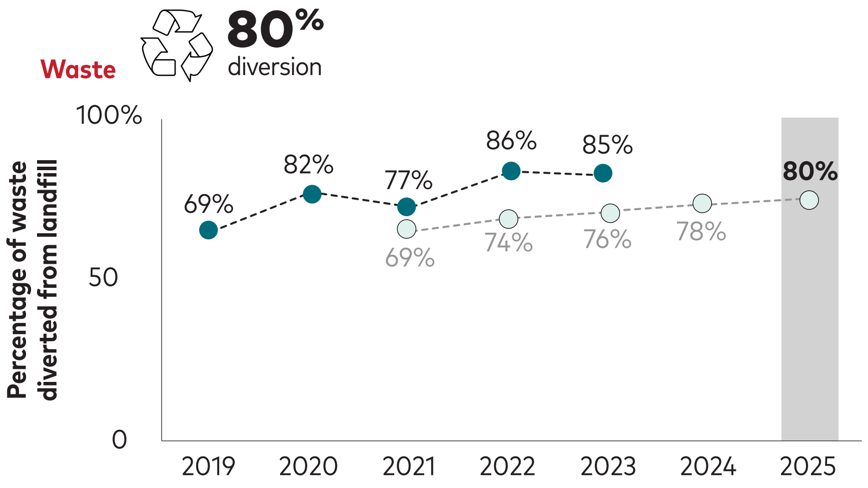
- Reduce carbon emissions by 20%, measured in tCO_2e per full-time equivalent (FTE).
- Reduce electricity usage by 5%, measured in kilowatt-hours per square foot of space under operational control.
- Reduce water usage by 20%, measured in gallons per square foot of space under operational control.
- Divert 80% of waste from landfills.

The adjacent charts show actual results through 2023 and targets through 2025.









Target Actual result

Sustainable business operations

Green building criteria and certifications are integral to our corporate building design standards. Twenty-two buildings (or 37%) of Vanguard's total square footage across our global locations were either LEED, BREEAM, or WELL certified.[7] Of the 22 buildings, four were new certifications for Vanguard in 2023. For example, our Manchester, U.K., leased office space is BREEAM 'Excellent' certified, with all electricity supplied from renewable sources, electric car charging ports, LG7-compliant LED lighting with automatic sensors, and photovoltaic panels that generate on-site electricity.

As part of a multi-year plan to update our lighting, we upgraded the exterior lighting for our Scottsdale, Arizona, campus to LED in 2023. This resulted in an estimated savings of more than 313 megawatt-hours (MWh) of electricity annually.

Additionally, we are a member of the U.S. Environmental Protection Agency's Green Power Partnership, which seeks to increase voluntary use of electricity produced from renewable energy resources.

Engaging our crew

We offer programs for our crew to encourage their use of low-carbon transportation, including 122 free electric vehicle charging ports adjacent to our U.S. buildings, shuttles between campuses and to and from public transit, and pre-tax deductions for public transit costs. Additionally, we have begun to add electric vehicles to our U.S. maintenance fleet.

In 2022, we introduced a program offering U.S. crew an incentive toward the lease or purchase of a hybrid or electric vehicle. As of December 31, 2023, more than 1,180 crew had taken advantage of this incentive.

As a result of the adoption of electric vehicles, Vanguard reduced approximately 463 tCO_2e from commuting emissions and contributed to saving approximately 81,400 gallons of gasoline, as estimated using data provided by ChargePoint, a third-party electric vehicle charging provider.

Our U.S. dining services focuses on sustainable food purchasing practices and diverting waste from landfills. We implement waste and recycling programs, as well as cooking demonstrations for crew by Vanguard's community garden team. Established in 2012, the Malvern, Pennsylvania, campus community garden is maintained and harvested by crew volunteers. The community garden donated over 1,500 pounds of produce to local food banks, pantries, and centers in 2023.

Globally, crew participate in various educational events such as our speaker series, Earth Day activities, and crew-led Green Teams throughout the year.

IN FOCUS

A LEED project

The Victory building on our Malvern, Pennsylvania, campus is our second Vanguard-owned building to achieve LEED Interior Design and Construction Silver certification.

Its sustainable features include:

- Water-efficient faucets, toilets, and showers, which reduced water usage by approximately 46% compared to previous systems.
- Energy-efficient lighting, which is estimated to reduce electrical usage by 57%, saving approximately 212 MWh annually compared to previous fixtures.
- Diverted 78% of the demolition and construction waste from the landfill by sending 246 tons of waste to a recycling facility to be repurposed.
- Over 40 materials with reports or certifications that verify their impact on installer and occupant health were used in Victory.

The Victory project also used only low-emission paints, coatings, flooring, insulation, and ceiling products to ensure greater safety for construction workers and building occupants.

7 LEED (Leadership in Energy and Environmental Design) is administered by the U.S. Green Building Council. BREEAM (Building Research Establishment Environmental Assessment Methodology) is administered by BRE Global, a subsidiary of the U.K.-based BRE Group. WELL is administered by the International Well Building Institute (IWBI).

Renewable energy and carbon offsets

In 2023, Vanguard purchased over 94,000 MWh of renewable energy, which resulted in a reduction of more than 30,000 tCO_2e.

As a company, we supported three cost-efficient and diversified carbon-offset projects in 2023 that offset 41,472 tCO_2e. These projects represent both U.S. and global efforts with multiple benefits.

UNITED STATES

Clinton Landfill Gas Collection and Combustion Project

Registry: Verra Verified Carbon Standard

Project type: Landfill gas

The project supports a landfill gas collection and utilization project at the Clinton Landfill in DeWitt County, Illinois. The project includes methane capture and destruction with two generators to convert the methane to biofuel. As a direct result, the surrounding community benefits from improved air quality and reduced odor.

UNITED STATES

Greater Lebanon Refuse Authority Landfill Gas Collection

Registry: Verra Verified Carbon Standard

Project type: Landfill gas

The project supports a landfill gas collection and utilization project at the Greater Lebanon Refuse Authority Landfill in Lebanon, Pennsylvania. The project includes methane capture and destruction with two generators. As a direct result, the surrounding community benefits from improved air quality and reduced odor.

KENYA

BioLite Improved Cookstoves Programme

Registry: Gold Standard

Project type: Improved cookstoves

The project distributes fuel efficient cookstoves to replace wood and charcoal stoves, which will cut toxic pollution emissions by up to 90%, reduce fuel use by 50%, and generate electricity for mobile phone charging and home lighting. Other benefits include protecting forests, reducing indoor air pollutants, and improving home safety.

Vanguard's carbon offset projects, 2021-2023

These carbon offset projects were part of Vanguard's total carbon emissions reductions for 2021, 2022, and 2023.

We purchased carbon offsets exclusively from providers that require independent third-party verification of projects and corresponding emission reductions or removals achieved.

Inventory year	Name of project	Project ID number	Seller	Verification program*	Protocol	Type	Country	State
2021	Greenville County Landfill Gas Utilization Project	CAR495	3Degrees Group, Inc.	Climate Action Reserve	CAR Landfill Project Protocol, Version 3.0	Avoided Emissions - Landfill Gas	United States	South Carolina
2021	GS1247 VPA 164 EcoZoom Improved Stove Programme, Uganda	GS7153	3Degrees Group, Inc.	Gold Standard VER	Gold Standard Methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1	Avoided Emissions - Clean Cookstoves	Uganda	N/A
2021	Guanare Forest Plantations on Degraded Grasslands under Extensive Grazing	VCS959	3Degrees Group, Inc.	Verified Carbon Standard	AR-ACM0001 Version 5.2.0	Removals - Afforestation	Uruguay	N/A
2022	Clinton Landfill Gas Collection and Combustion Project	VCS318	3Degrees Group, Inc.	Verified Carbon Standard	ACM0001, "Flaring or use of landfill gas", Version 19	Avoided Emissions - Landfill Gas	United States	Illinois
2022	Davidson County Landfill Gas Destruction Project	VCS2414	3Degrees Group, Inc.	Verified Carbon Standard	CAR U.S. Landfill Project Protocol, Version 5.0	Avoided Emissions - Landfill Gas	United States	North Carolina
2022	Paradigm, Kenya Clean Cookstove Project	VCS1918	3Degrees Group, Inc.	Verified Carbon Standard	AMS-II.G., "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass", Version 10	Avoided Emissions - Energy Efficiency, Clean Cookstoves	Kenya	N/A
2023	Clinton Landfill Gas Collection and Combustion Project	VCS318	3Degrees Group, Inc.	Verified Carbon Standard	ACM0001, "Flaring or use of landfill gas", Version 19	Avoided Emissions - Landfill Gas	United States	Illinois
2023	BioLite Improved Cookstoves Programme, Kenya	GS11193	3Degrees Group, Inc.	Gold Standard VER	AMS-II.G., "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass", Version 3.0	Energy Efficiency, Avoided Emissions	Kenya	N/A
2023	Greater Lebanon Refuse Authority Landfill Gas Collection	VCS5	3Degrees Group, Inc.	Verified Carbon Standard	ACM0001, "Flaring or use of landfill gas", Version 18.1	Avoided Emissions - Landfill Gas	United States	Pennsylvania
2023	BioLite Improved Cookstoves Programme, Kenya	GS11194	3Degrees Group, Inc.	Gold Standard VER	AMS-II.G., "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass", Version 3.0	Energy Efficiency, Avoided Emissions	Kenya	N/A

* Vanguard does not have separate and additional third-party assurance for its carbon offset project verification programs for its 2025 carbon neutrality goal or for its statement as to interim progress of 84% carbon neutrality by year-end 2023.

Disclosure of Scopes 1, 2, and 3 greenhouse gas emissions

	Greenhouse gas emissions (tCO_2e)	2021	2022	2023
Scope 1	Emissions	3,683	4,375	2,699
Scope 2	Electricity emissions–location-based*	37,271	34,361	30,047
	Total electricity emissions–market-based**	0	0	0
Scope 3	Emissions	16,251	44,699	52,683
Total Carbon Emissions	Scopes 1, 2, and 3+	57,205	83,435	85,429
Renewable Energy Certificates		–37,271	–34,361	–30,047
Carbon Offsets		–6,000	–24,500	–41,472
Total reported emissions++		**13,934**	**24,573**	**13,910**

* Emissions from electricity before we purchased renewable energy certificates.

** Emissions from electricity after we purchased renewable energy certificates.

+ Total emissions before any purchased renewable energy certificates and carbon offsets.

++ Total reported emissions = (Scope 1 + Scope 2 location-based + Scope 3) – renewable energy certificates – carbon offsets.

Assurance

Vanguard's Scopes 1, 2, and 3 GHG emissions for 2021, 2022, and 2023 have been assured by a third-party provider. This limited assurance is based on the International Standard on Assurance Engagements ISAE 3000 (revised).

By 2025, we intend to avoid, reduce, or offset all Scopes 1 and 2 emissions, as well as emissions from a number of Scope 3 categories, which include:

- **3.3** Fuel and energy-related activities
- **3.4** Upstream transportation and distribution
- **3.5** Waste generated in operations
- **3.6** Business travel
- **3.7** Employee commuting
- **3.8** Upstream leased assets

Scopes 1, 2, and 3 are as defined by the Greenhouse Gas Protocol standard. Scope 1 refers to all direct greenhouse gas (GHG) emissions. Scope 2 refers to indirect GHG emissions from consumption of purchased electricity, heat, or steam. Scope 3 refers to other indirect emissions not covered in Scope 2 that occur in a company's value chain, including both upstream and downstream emissions.

Scope 3 data do not include Scope 3 categories 3.1: Purchased goods and services, and 3.2: Capital goods or Vanguard fund investments.

2023 TCFD disclosure status

2023 TCFD disclosure status

The TCFD recommends disclosure in four primary areas: governance, strategy, risk management, and metrics and targets. This table is a summary of our plans and progress in each of the relevant areas.

	Pillar/recommendation	Summary
Governance: Disclose the organization's governance around climate-related risks and opportunities.	(a) Describe the board's oversight of climate-related risks and opportunities.	The Vanguard Group, Inc., board of directors is responsible for broad company policies, including consideration of material climate-related risks and opportunities. The boards of trustees of our U.S. domiciled funds oversee fund-related matters, including environmental, social, and governance (ESG) considerations and material climate-related risks. Outside the U.S., the boards of our international businesses and fund entities provide similar oversight and have decision-making authority in their respective regions. See "Board oversight of climate-related risks and opportunities" on page 9. Our global ESG governance structure includes an integrated network of committees and functions with a specific connection to climate-related risks and opportunities. See "Vanguard's ESG governance structure" on page 11.
	(b) Describe management's role in assessing and managing the climate-related risks and opportunities.	Our ESG CEO Council, chaired by the chief executive officer, has global oversight of climate-related risks and opportunities. The council is structured around three pillars—Investment Products and Services, Stewardship of Portfolio Securities, and Vanguard as a Corporate Actor. The ESG Risk and Strategy Oversight Committee, a subcommittee of the council, facilitates its oversight of the Investment Products and Services and Stewardship of Portfolio Securities pillars. See "Management's role regarding climate-related risks and opportunities" on page 12. In Europe, Vanguard's European ESG Management Oversight Council oversees ESG risks and strategy for the company's European businesses. See "European ESG governance framework" on page 14.
Strategy: Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	(a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	In the near term, Vanguard expects transition risks to outweigh physical risks as a driver of risk both for our organization and the companies held in our product portfolios. With climate-related regulations and reporting requirements evolving at varying paces around the world, there is greater potential for impacts from transition risks driven by the emergence of disorderly transition scenarios. We anticipate that physical risks will act as a driver of longer-term risks. See "Climate-related risks and opportunities" on page 17.
	(b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	The potential impacts of climate-related risks include higher operational costs related to complying with complex global regulatory requirements. Potential opportunities include meeting client needs through a selection of ESG products that we believe have enduring investment merit and are consistent with our time-tested product design principles. See "Summary of climate-related risks" on page 18 and "Summary of climate-related opportunities" on page 19.
	* For asset managers: Describe how climate-related risks and opportunities are factored into relevant products or investment strategies.	Climate-related impacts are considered in the management of our funds through engagement with portfolio companies and integration of ESG risks as appropriate and in some instances specifically as part of the product design. See "Meeting investment needs of clients" on page 20.
	* For asset managers: Describe how each product or investment strategy might be affected by the transition to a low-carbon economy.	We consider transition risks to be a greater driver of enterprise risk than physical risks in the near term, as climate-related regulations and reporting requirements are evolving at different paces—and with varying degrees of complexity—in markets around the world. We also consider transition risks to be a more pressing driver of risk in the short-term and medium-term for companies held in our product portfolios, with physical risks acting as a driver of longer-term risk. See "Transition-related corporate and investment risks" on page 19.
	(c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2 degrees Celsius or lower scenario.	We manage our funds and business in the interests of our clients and with a long-term perspective. See "Resilience of our strategy" on page 21. In the U.K., we have conducted ESG stress testing to assess our ability to remain financially viable throughout the economic cycle. See "Vanguard U.K. stress and scenario testing" on page 21.

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	Pillar/recommendation	Summary
Risk management: Disclose how the organization identifies, assesses, and manages climate-related risks.	(a) Describe the organization's processes for identifying and assessing climate-related risks.	As a matter of course, we seek to identify, assess, and mitigate risks from both a corporate and investment product management perspective, taking impact, probability, and urgency into account. Vanguard's risk-management life cycle has four key components: identification of risk, assessment of risk, management of risk, and monitoring and reporting of the risk environment. We see risk management as an ongoing process and mindset moving continuously through each stage. See "Identifying and assessing climate-related risks" on page 23.
	* For asset managers: Describe, where appropriate, engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks in order to improve data availability and asset managers' ability to assess climate-related risks.	On behalf of the Vanguard-advised equity funds, the Investment Stewardship program looks for portfolio company boards to effectively oversee material climate-related risks and disclose those risks using widely recognized investor-oriented reporting frameworks. For Vanguard's externally managed funds, investment stewardship activities are carried out by the funds' respective managers. We support the disclosure framework created by the TCFD. See "Investment stewardship" on page 25.
	* For asset managers: Describe how material climate-related risks are identified and assessed for each product or investment strategy. This might include a description of the resources and tools used in the process.	Vanguard's Investment Stewardship team engages with portfolio companies and oversees proxy voting and stewardship activity on behalf of Vanguard-advised funds, including Vanguard equity index funds and ETFs. See "Investment stewardship" on page 25. Our external advisors serve as investment managers and investment stewards for the majority of our actively managed equity funds, each bringing a different perspective to assessing and overseeing climate risk, including in funds that do not pursue explicit ESG objectives. See "Integration of climate risks and opportunities by our external advisors" on page 29. Vanguard Fixed Income Group (FIG), which manages most of our fixed income funds, integrates ESG considerations into its investment process by assessing the financial materiality of ESG risk factors alongside, and in the context of, other investment risks to complement standard credit assessment. See "Integration of climate risks in fixed income" on page 32.
	(b) Describe the organization's processes for managing climate-related risks.	Across the enterprise, Vanguard incorporates relevant ESG considerations into existing functions to ensure that ESG factors are considered alongside, not separately from, other matters important to serving our clients. Across our funds, relevant teams monitor material climate-related risks through our investment stewardship activities, ESG integration within the Vanguard-advised active strategies, and oversight of our external managers' ESG integration and engagement practices. See "Managing climate-related risks within our investments" on page 24.
	* For asset managers: Describe how the organization manages climate-related risks for each product or investment strategy.	The majority of Vanguard's active equity funds and active multi-asset funds are managed by 24 external asset management firms. We hold these managers to the highest standards to ensure that they remain singularly focused on maximizing investment performance for our investors. The appropriate consideration and management of material financial risks, such as those posed by climate change, are part of our ongoing assessment of these firms. See "Identifying and assessing climate-related risks" on page 23.
	(c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	Vanguard's overall risk-mitigation approach is founded on three core lines of defense: our business units, our corporate risk functions, and our independent Internal Audit team. See "Identifying and assessing climate-related risks" on page 23.

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2023 TCFD disclosure status

	Pillar/recommendation	Summary
Metrics and targets: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	(a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk-management process.	For our equity index products, our Investment Stewardship team uses climate metrics disclosed at the company level to assess potential material risks to long-term investments and to inform its engagements and proxy votes. The team undertakes these activities with the objective of safeguarding and enhancing long-term investor returns. In some instances, the team supplements disclosed company metrics with climate metrics provided by third parties. For the Vanguard-advised active funds, corporate disclosures about climate risks and opportunities inform the investment decisions of portfolio managers. The managers incorporate such disclosures into their investment processes and engagement strategies, including their use of scenario analysis. See "Measuring climate-related risks and opportunities" on page 34.
	* For asset managers: Describe metrics used to assess climate-related risks and opportunities in each product or investment strategy. Where relevant, also describe how these metrics have changed over time. Where appropriate, provide metrics considered in investment decisions and monitoring.	In Europe, we've employed scenario analysis in our climate-related research and in U.K. ESG stress testing as required by regulation. These use cases are sharpening our understanding of the various tools and methodologies and will inform our future approach to scenario analysis. Additionally, climate metrics are disclosed in our 2023 U.K. TCFD entity-level and product reports. See "Summary of climate-related metrics reported in European disclosures" on page 35.
	* For asset managers: Where appropriate, provide metrics considered in investment decisions and monitoring.	Climate data and metrics remain a rapidly evolving area. We are exploring the benefits and limitations of various climate metrics for our investors. We also acknowledge the growing global scrutiny and regulation of climate-related disclosures as well as the increasing demand for ESG data among a subset of our clients. Vanguard continues to build out its data and reporting capabilities to meet regulatory reporting obligations and evolving client requirements. See "Measuring climate-related risks and opportunities" on page 34.
	* For asset managers: Describe the extent to which the organization's assets under management and products and investment strategies, where relevant, are aligned with a well-below 2 degrees Celsius scenario. Also indicate which asset classes are included.	Vanguard has been thoughtful and deliberate in building out our ESG product lineup by ensuring that each new fund can address enduring needs for investors. This includes actively managed equity ESG products that are aligned with a temperature rise of less than 2 degrees Celsius above preindustrial levels, meaning that as part of the fund design, they are intended to meet net zero objectives. The external managers of these active funds each determine their own targets and methodology for alignment, consistent with the fund's strategy. Their approach is disclosed in the fund's prospectus, and the targets are monitored by both the manager and Vanguard. See "ESG products and net zero objectives" on page 36.
	(b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	As a company, we disclose Scopes 1 and 2 GHG emissions and several Scope 3 emissions. Our operational carbon footprint in 2023 was 85,429 metric tons of carbon dioxide equivalent (tCO_2e), which was reduced to 13,910 tCO_2e through the purchase of carbon offsets. See "Disclosure of Scopes 1, 2, and 3 greenhouse gas emissions" on page 43.
	* For asset managers: Disclose GHG emissions for assets under management and the weighted average carbon intensity (WACI) for each product or investment strategy, where data and methodologies allow. Also consider providing other carbon footprinting metrics the organization believes are useful for decision-making.	Vanguard continues to build out its data and reporting capabilities to meet regulatory reporting obligations and evolving client requirements. In the U.K., we are disclosing GHG emissions and WACI for funds meeting specified data coverage thresholds, as mandated by the Financial Conduct Authority. See "Measuring climate-related risks and opportunities" on page 34.
	(c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	Vanguard seeks to reach carbon neutrality in our global operations by 2025. We also have four reduction targets for 2025, based on 2019 baseline levels. We have made progress on each of those targets: • Reduce carbon emissions by 20%, measured in tCO_2e per full-time equivalent. • Reduce electricity usage by 5%, measured in kilowatt-hours per square foot of space under operational control. • Reduce water usage by 20%, measured in gallons per square foot of space under operational control. • Divert 80% of waste from landfills. See "Update on 2025 reduction targets" on page 39. We also have a number of actively managed ESG funds constructed to meet net zero targets. See "ESG products and net zero objectives" on page 36.

* Supplemental guidance for asset managers, from Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures, published October 2021.

Important information

For more information about Vanguard funds and ETFs, visit vanguard.com to obtain a prospectus or, if available, a summary prospectus. Investment objectives, risks, charges, expenses, and other important information about a fund are contained in the prospectus; read and consider it carefully before investing.

Vanguard ETF shares are not redeemable with the issuing fund other than in very large aggregations worth millions of dollars. Instead, investors must buy and sell Vanguard ETF shares in the secondary market and hold those shares in a brokerage account. In doing so, the investor may incur brokerage commissions and may pay more than net asset value when buying and receive less than net asset value when selling.

All investing is subject to risk, including the possible loss of the money you invest. Diversification does not ensure a profit or protect against a loss.

Be aware that fluctuations in the financial markets and other factors may cause declines in the value of your account. There is no guarantee that any particular asset allocation or mix of funds will meet your investment objectives or provide you with a given level of income.

Investments in bonds are subject to interest rate, credit, and inflation risk.

ESG portfolios are subject to ESG investment risk, which is the chance that the stocks or bonds screened by the index provider or advisor, as applicable, for ESG criteria generally will underperform the market as a whole or, in the aggregate, will trail returns of other portfolios screened for ESG criteria. The index provider or advisor assessment of a company, based on the company's level of involvement in a particular industry or their own ESG criteria, may differ from that of other portfolios or an investor's assessment of such company. As a result, the companies deemed eligible by the index provider or advisor may not reflect the beliefs and values of any particular investor and certain screens may not exhibit positive or favorable ESG characteristics. The evaluation of companies for ESG screening or integration is dependent on the timely and accurate reporting of ESG data by the companies. The advisor may not be successful in assessing and identifying companies that have or will have a positive impact or support a given position. In some circumstances, companies could ultimately have a negative or no impact or support of a given position. The weight given to ESG factors for active non-ESG funds may vary across types of investments, industries, regions and issuers; may change over time; and not every ESG factor may be identified or evaluated. Where ESG risk factor analysis is used as one part of an overall investment process (as is the case for actively managed equity and fixed income non-ESG Funds), such Funds may still invest in securities of issuers that all market participants may not view as ESG-focused or that may be viewed as having a high ESG risk profile.

Vanguard is owned by its funds, which are owned by Vanguard's fund shareholder clients.

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P.O. Box 2600
Valley Forge, PA 19482-2600

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