Vanguard's Report on Climate-related Impacts 2021

In alignment with the Task Force on Climate-related Financial Disclosures (TCFD)
This report has been prepared by The Vanguard Group, Inc., in alignment with the guidelines of the Task Force on Climate-related Financial Disclosures. The data used for this report is as of December 31, 2021, unless otherwise specified.
I’m pleased to present Vanguard’s inaugural report in alignment with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), an effort by organizations across the globe to create consistent and comparable disclosure of climate-related risks and opportunities. Sharing a common approach to climate disclosure will be increasingly important as societies, governments, companies, and investors transition to a lower-carbon future.

As an investment manager and a fiduciary with respect to our clients’ interests and assets, Vanguard has a duty to maximize total return for investors and to ensure portfolio companies are taking appropriate steps to mitigate material risks to those returns. We consider climate change to be one such material risk affecting many companies and their shareholders’ long-term financial success. We assess climate risk as an investment manager, as a steward of assets on behalf of the investors in our funds, and as a company that employs more than 18,000 mission-driven crew members in 20 locations globally. We take a long-term view on investing, and our singular focus is the investment success of the 30 million individuals around the world who have entrusted us with their savings.

We are publishing our first TCFD report with a mix of confidence and humility. We are confident in our people, our approach, and our motivation to safeguard the assets of the investors we serve. Yet science leaves no doubt about the seriousness and complexity of climate risk for society, the economy, and, in turn, investors. We recognize that Vanguard, like all stakeholders, is in the early stages of a decades-long journey that simultaneously requires near-term action.

Vanguard is committed to mitigating climate-related risks that can erode our clients’ long-term investment returns and the achievement of their financial goals. We look forward to reporting on our progress in the years ahead.
Introduction
Introduction

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.

About Vanguard

Vanguard was founded in 1975 on the basis of a simple but revolutionary idea: An investment company should manage its funds solely in the 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 is our unique mutual ownership structure. Vanguard is owned by our U.S.-domiciled funds, which in turn are owned by their investors. This framework has inspired our client-first culture—our clients are at the heart of every decision—and 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 have a responsibility to monitor and, when necessary, take steps to address all risks, including climate risks, that could affect the value of our clients’ investments over the long term. We view our stewardship responsibilities as a natural extension of Vanguard’s core purpose.

A focus on the individual investor

One thing all our investors have in common is that they have entrusted us with their money in the expectation that we will safeguard it and help it grow, whether to help them achieve a secure retirement, afford higher education for their children, pursue the dream of owning a home or a small business, or build a legacy to leave
Introduction

Vanguard’s clients...

30 million

individual investors served through retirement plans, financial advisors, and Vanguard’s direct retail businesses around the world

for family or the causes they hold dear. As a fiduciary, we are required to manage our funds in the best interests of our clients and are obligated to maximize returns to help them meet these financial goals. These are responsibilities we take extremely seriously.

Our investors expect their mutual funds and ETFs to meet the specific objectives set forth for those vehicles. Each portfolio is managed to meet a specific objective, follows well-defined strategies, and adheres to clear policies.

On behalf of our clients and their financial goals, we have an important role to play to safeguard investors from material financial risks such as climate change. Our firm’s leadership, as well as the many teams that develop, manage, steward, and oversee our investment products, are committed to carrying out this important responsibility.

...and their investments

Management style

21% Active
79% Index

Asset classes

71% Equity
22% Fixed income
4% Balanced
3% Money market

Source: Vanguard, as of December 31, 2021. Percentages may not add up to 100% because of rounding.
Introduction

Vanguard’s approach to climate change

In keeping with our focus on our clients and material risks to their long-term investment returns, we seek to inform our investors and safeguard their assets in several ways with respect to climate change:

- Direct engagement with the boards and management of companies held in our funds regarding climate risk oversight, mitigation, and disclosure of progress toward stated strategies.
- Investment products that can help investors manage certain climate-related risks and opportunities.
- Selective participation in efforts that seek to facilitate an effective transition to a low-carbon economy and mitigate risk to investors.
- A commitment to working with global policymakers and regulators in this arena on behalf of long-term investors.
- Research by Vanguard economists to quantify the potential impact of climate change on global economic activity. Their recent paper, The Economics of Climate Change, is discussed in the “Strategy and risk management” section of this report.
- A set of corporate goals and actions to make progress toward reducing Vanguard’s own carbon emissions and reaching carbon neutrality as a company by 2025.
Introduction

Ways in which Vanguard is working to mitigate climate risk

Engaging with companies in our funds

As a fiduciary, Vanguard views climate risk, like other risks, through the lens of financial materiality for long-term investors. Our Investment Stewardship program has ongoing engagements about climate risks and opportunities with the companies our funds invest in.

Through these engagements with company boards and management—and through proxy voting on behalf of Vanguard's internally managed equity funds—Investment Stewardship encourages companies to have sound risk management practices, including with respect to climate risk. For companies where climate risk is a material risk, Investment Stewardship presses for effective oversight at the board level, mitigation targets that are aligned with the Paris Agreement,¹ and disclosure of progress against those targets.

On behalf of investors in our index equity funds, we have a mandate to stay invested in constituent companies. (By design, an index fund holds the shares of a company for as long as it is included in the benchmark index.) We believe that encouraging these companies to take positive action on material climate risks can deliver long-term sustainable value and have a real economic impact. In our view, this approach can be more effective than (1) divesting from these companies by selling them to other owners who may be less interested in sustainable, long-term value creation or (2) investing solely in green start-ups.

Our approach boils down to a belief that responding to risk, including climate risk, requires a responsible, long-term perspective—and we do not believe wholesale divestment is a productive way to safeguard the long-term investment returns of our clients.

Providing information and choices for our investors

We aim to provide investors with the insights they need to make well-informed investment decisions and understand material climate risks and opportunities.²

As a matter of investment philosophy, we believe most investors are best served by diversified portfolios that include appropriate allocations to the broad global stock and bond markets.

Some investors, however, do not wish to own certain companies that are not consistent with their values or preferences. This is true in the context of climate

¹ The Paris Agreement is a legally binding international treaty negotiated and signed in 2015 that set long-term goals to reduce greenhouse gas emissions and limit global temperature increases; 192 nations and the European Union have joined the agreement.
² For example, The Economics of Climate Change. See summary on page 19.
change, which is one reason we offer passively managed environmental, social, and governance (ESG) funds that provide investors the choice to avoid companies in many carbon-intensive industries.

There are also investors who prefer not only to avoid certain companies but also to invest proactively in companies with leading ESG practices. For them, we offer actively managed funds that choose to invest in companies deemed to be sustainability leaders.

**Participating in industry efforts**

Over the years, we have worked with a number of organizations that encourage collaborative and constructive dialogue across our industry to help safeguard long-term investor returns and respond to climate change. (See details in the Appendix, which begins on page 41.)

TCFD, an organization we’ve supported since 2017, advocates for constructive climate-change disclosure practices to help investors understand the material financial impacts of climate-related risks and opportunities associated with the companies in which they invest.

In 2021, we joined the Net Zero Asset Managers initiative (NZAM). It consists of more than 200 global asset managers committed to supporting policymakers’ stated goal of achieving net zero greenhouse gas emissions by 2050 or sooner. As part of our commitment, Vanguard, on behalf of certain of our funds, has pledged to engage with companies, policymakers, and other investment industry participants about the transition to net zero; publish annual TCFD disclosures to report on our progress; and provide Vanguard investors with information on net zero investing so they can make informed asset allocation decisions. See the “Metrics and targets” section of this report, beginning on page 31, for more on these efforts.

**Working with policymakers**

Vanguard is committed to working with policymakers to represent the interests of long-term investors. Although companies, asset managers, and individual investors can all play a role in mitigating climate risk, governments must lead the way. Government leaders are specifically empowered to consider competing interests and craft public policy that will address complex societal impacts and make the appropriate trade-offs.

Government action on climate may also have the added benefit of applying equally to relevant entities such as private companies and state-owned enterprises. We encourage policymakers to set long-term plans and targets that provide clarity to individuals, companies, and the financial markets.

The Paris Agreement remains the most referenced example of an intergovernmental climate change agreement that has resulted in commitments and targets for countries and companies to meet. Vanguard expects the companies in which our funds invest to follow applicable climate rules and commitments set forth by policymakers in their respective jurisdictions, and to plan appropriately for emerging climate and transition risks and regulation.
Introduction

Still, significant opportunities remain for policymakers to develop the frameworks and mechanisms that will enable markets to function effectively in the coming years. For example, despite a number of domestic and regional initiatives, the global capital markets still lack specific policy direction and clarity from policymakers about the best way forward on climate.

Options abound, each with its own trade-offs and challenges. These range from a standardized mechanism for pricing carbon, to consistent taxonomies for “sustainable” investing, to specific pathways for aligning with the agreed-upon goals of the Paris Agreement.

Governments, companies, and financial market participants also lack a single global standard for climate risk reporting, which could provide stakeholders with information that is consistent, comparable, and therefore more useful for decision-making. We have been encouraged by recent efforts of the International Sustainability Standards Board to develop global climate disclosure standards based on the recommendations of TCFD. Given the global impact of climate risk, we are hopeful that governments will act individually and collectively with these long-term realities in mind.

Doing our part as a company

Vanguard has embraced our own climate-related goals regarding our company operations. They include using 100% renewable energy, a milestone we first achieved in 2021, and reaching carbon neutrality throughout our global operations in 2025.

To pursue carbon neutrality, we use a combination of tactics—operational enhancements to reduce our carbon emissions, investment in the sustainability of our global real estate portfolio, and the purchase of renewable energy certificates and carbon offsets.

We discuss these goals more fully in the “Vanguard as a company” section of this report, which begins on page 35.
Governance

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

Vanguard fulfills its fiduciary duty to investors through an integrated structure of boards, committees, and functions that oversee climate-related impacts and clients’ best interests.

Board oversight of climate-related risks and opportunities

The Vanguard Group, Inc., is a private company owned jointly by the U.S.-domiciled Vanguard funds and thus by the investors in those funds. The Vanguard Board of Directors is responsible for setting broad policies for the company. Where applicable, these policies include consideration of climate-related risks and opportunities.

As of April 30, 2022, Vanguard’s board includes 11 directors, 10 of whom are independent. Mark Loughridge serves as lead independent director, and Vanguard CEO Tim Buckley serves as board chair. Members of Vanguard’s board of directors also serve as the funds’ boards of trustees. The trustees bring to each fund’s board a wealth of executive leadership experience derived from their service as senior executives, board members, and leaders of diverse public operating companies, academic institutions, and other organizations.

The board of directors plays an active role in overseeing risk management, including climate-related risks. The board delegates day-to-day risk management to various groups, including compliance, fund accounting, fund financial services, investment management, legal, portfolio review, and risk management. The board also oversees risk management through regular interactions with internal and external auditors.

The board typically meets seven times per year. It engages in climate-related issues affecting our broader evaluation of ESG and sustainability matters and communicates with Vanguard’s management to help determine a logical and effective course of action with respect to climate-related and sustainability matters. The board has established an ESG advisory subcommittee that meets several times a year to
Governance

advise management specifically on ESG issues, including product development and corporate actions. On an as-needed basis, management provides relevant training to the board on ESG matters.

The board of each fund monitors and evaluates matters pertaining to the fund, including climate-related matters as appropriate.

The board of directors is actively engaged in climate-related issues affecting our product lineup as part of a broader evaluation of ESG and sustainability matters. The boards of our non-U.S. businesses provide similar oversight in global regions.

Ongoing board engagement on climate matters affecting our product lineup

As part of the oversight process for our investment products, Vanguard’s board of directors meets directly with the managers of our funds and receives reporting from the managers on their consideration of climate-related issues as part of their ESG integration practices.

The board also receives reporting and updates on the investment stewardship activities of our funds. In a recent update to the board, Vanguard Investment Stewardship leaders discussed key themes on voting and engagement activities. They provided the board with an extensive overview on “Say on Climate” proposals, a review of the meaningful increase in the number of both shareholder and management-submitted climate proposals, and an update on climate-change-related proposals focused on corporate lobbying efforts.

In the case of our active funds managed by external advisors, the board receives an annual proxy voting report on those funds. This report includes the information required for the board to approve the external advisors’ proxy voting policies and procedures. In the 2021 report to the board, significant votes related to climate change were an area of focus, with our external managers noting an increase in meaningful proposals on climate-related topics, such as alignment to the Paris Agreement and adoption of greenhouse gas emission targets.
This diagram highlights portions of our global ESG governance structure that have a specific connection to climate-related risks and opportunities.
Governance

Management’s role regarding climate-related risks and opportunities

ESG CEO Council

In recognition of the importance of ESG-related matters, including climate-related risks and opportunities, Vanguard established an ESG CEO Council to oversee and coordinate Vanguard’s ESG strategy globally. The CEO serves as council chair, and its members include a subset of Vanguard’s executive leadership team. The council meets at least quarterly and reports to the board at least once annually and at other times as appropriate.

The council provides ESG guidance, oversight, consistency, and coordination in service of client interests. It reviews and assesses long-term goals and key initiatives and holds teams accountable for progress throughout the company. For example, the council determined the approach to aligning fund assets to the Net Zero Asset Managers initiative (NZAM). The framework underlying the council is organized around three pillars: Investment Products and Services, Stewardship of Portfolio Securities, and Vanguard as a Corporate Actor. Functions across Vanguard’s global operations align to the pillars and provide reports to members of the council.

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 all ESG risks and opportunities, including those that are climate related. As an integral part of this process, Vanguard’s Portfolio Review Department develops Vanguard’s 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 Vanguard’s investment philosophy. To support this, the Portfolio Review Department convenes the Global Investment Committee 11 times per year to engage on key issues relevant to the oversight of our products. Included in the committee’s work is the approval of recommendations that go to the boards of the Vanguard funds, including those for new products, risk guidelines, and manager selection. The CEO serves as chair of the committee, and members
include senior leaders from Vanguard’s investment, product, business, legal, risk, and finance functions.

In addition, the Portfolio Review Department regularly meets with the ESG Product Strategy Committee and the Manager Oversight Committee, both of which have significant overlap in membership with the Global Investment Committee. The ESG Product Strategy Committee advances ESG investment product development activities, while the Manager Oversight Committee 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 Vanguard’s board of directors and the Vanguard funds’ boards of trustees for review and approval as appropriate.

**Stewardship of portfolio securities**

Our Investment Stewardship Oversight Committee, at the direction of the Vanguard funds’ boards, oversees the proxy voting and stewardship function for the shares of equity securities held in portfolios advised by Vanguard. The committee meets at least quarterly and regularly reviews stewardship practices and proxy voting policies, including those concerning material climate risks. Those reviews include topics such as changes to proxy voting policies, proxy season engagement and voting activities, and risk control processes. The committee includes fund officers and senior executives from relevant functions. The committee provides reports to Vanguard’s board of directors and the Vanguard funds’ boards of trustees.

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 Review Team, which includes members of Vanguard’s legal and portfolio review teams, conducts ongoing oversight to ensure that external advisors are consistently exercising their fiduciary obligation to vote proxies and provide annual updates to the funds’ boards of trustees. The funds’ boards are required to review and approve each external advisor’s proxy voting procedures at least annually.

**Vanguard as a corporate actor**

Vanguard has established targets for operational sustainability to help responsibly manage and reduce our own environmental footprint. Oversight of these efforts resides with several departments reporting to Vanguard’s chief financial officer, including Global Workplace Experience (GWx), the department responsible for buildings, transportation, energy and waste management, and other operational functions. GWx’s Environmental Sustainability Steering Group sets both short- and long-term goals and priorities, incorporates sustainability activities into the overall business plan, and monitors and tracks progress toward targets. Oversight of Vanguard’s own sustainability goals and progress on the corporate level resides with Vanguard’s board of directors.

For more details, see the “Vanguard as a company” section of this report, beginning on page 35.
Strategy and risk management

In this section, we discuss how Vanguard identifies, evaluates, and manages climate-related risks and opportunities on behalf of our investors.
Vanguard’s views on climate change are grounded in our conviction that it will have far-reaching consequences for the economy, financial markets, public policy, and society. As we look at climate risk through the lenses of strategy and risk management, we ensure that:

- Vanguard and the investors we serve have the information needed to make good decisions.
- We work to mitigate material risks through investment stewardship.
- We manage climate risk effectively through our investment management processes.
- We offer investment products that account for climate-related impacts and investor preferences.

Research and analysis

Vanguard believes rigorous research and analysis on climate matters helps inform our investors and should underpin the decisions we make on behalf of our investors. The quality, consistency, and comparability of data on climate risks and opportunities continue to evolve, and we are actively engaged in efforts to advance data maturity. Moreover, Vanguard will continually explore ways to further integrate climate risk data into our overall risk framework.

From an investment perspective, climate change represents a risk to the economy, with varying potential impacts on countries, industries, and companies. To help inform investors and to further inform the thinking of our investment teams on climate, we recently completed a macroeconomic analysis on the effects of climate change on the global economy over the next three decades. (See a summary of the research on page 19.)
Research in focus: The Economics of Climate Change

In the recent research paper *The Economics of Climate Change*, Vanguard economists used consensus scientific data and forecasts to assess economic activity under four scenarios for greenhouse gas emissions and temperature increases.

In all four scenarios, economic costs associated with the direct physical impact of climate change and stricter environmental policies are, to some extent, offset by more “green” investment. The net impact on global GDP, however, is negative in all scenarios.

In the best-case scenario, if countries and companies meet the target of 1.5 degrees Celsius versus pre-industrial levels set by global policymakers in the Paris Agreement, our research forecasts a net drag of around 2% to 4% of global GDP by 2050. In the worst-case scenario, where policymakers make no additional progress to reduce emissions and temperatures rise by more than 3 degrees Celsius, the global economy could see a net drag closer to 10% of GDP. (See figure at right.)

The effects of climate change will not follow a straight line. We expect significant regional disparities and the possibility of climate-related economic shocks. Investors may experience periods of heightened volatility in the financial markets as climate change becomes more evident through events such as storms, droughts, flooding, heat waves, and wildfires. Policy measures aimed at combating climate change—such as tighter regulatory standards, emission trading permits, emission taxes, and shifting subsidies away from fossil fuel energy sources to renewable ones—also can hamper economic growth, particularly if those measures are late, abrupt, or reactive rather than early, transitioned, and thoughtful.

Of course, efforts by consumers, businesses, and policymakers to address climate risk offer investors opportunities as well. As our economic analysis indicates, to achieve policymakers’ goals, significant investments will be required in the decades ahead to change how power is generated, buildings are constructed, food is grown, and goods are shipped. Although transition effects, market changes, and regulations may provide headwinds for some, this transformation will spur new technologies, markets, and growth opportunities for others.

We will continue to pursue research efforts such as these to educate both our clients and our investment teams about the ways climate change may affect economic growth and investment returns.

The net impact of climate change on global GDP by 2050

<table>
<thead>
<tr>
<th>Warming of...</th>
<th>Net effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1.5 degrees Celsius</td>
<td>2%</td>
</tr>
<tr>
<td>1.5–2.0 degrees Celsius</td>
<td>4%</td>
</tr>
<tr>
<td>2.0–3.0 degrees Celsius</td>
<td>8%</td>
</tr>
<tr>
<td>Greater than 3.0 degrees Celsius</td>
<td>10%</td>
</tr>
</tbody>
</table>

Source: Vanguard, April 2022.
Strategy and risk management

Investment stewardship

Vanguard’s internally managed equity funds can provide broadly diversified access to the global markets at a very low cost, which is why so many people have chosen to invest in them. But broad market diversification by necessity means exposure to climate risk. Vanguard’s investment stewardship activities are a primary way in which we monitor, oversee, and work to mitigate climate risks and other material risks on behalf of these funds’ investors.

Our Investment Stewardship program engages directly with portfolio company executives and board members to better understand how companies are addressing climate and other material risks. In 2021, the program engaged with 1,074 companies representing $3.5 trillion in equity assets under management.

Investment Stewardship takes a case-by-case approach to evaluating portfolio companies and executing proxy voting. Decisions on how to vote all proxy ballot items, including climate-related proposals, are grounded in our duty to safeguard our clients’ assets.

On behalf of our internally managed equity funds, the Investment Stewardship program believes portfolio company boards should effectively oversee material climate-related risks and disclose those risks using widely recognized investor-oriented reporting frameworks. We support the framework created by TCFD for disclosing governance, strategy, risk management, and metrics and targets. Where climate change is a material risk for companies, we expect boards to disclose those risks, along with the company’s climate strategy and progress on climate-related goals. We also look for companies to make progress in response to shareholder feedback.

The company’s board should be fully engaged, monitoring progress and ensuring action. Although we want companies to mitigate material risks, we do not dictate strategy or specify company actions. When boards fail to address material risks like climate, we seek to reengage with company management and directors to advocate for a different outcome. We may also vote against directors if we believe they have failed to effectively identify, monitor, and manage material risks, inclusive of climate.
Strategy and risk management

In focus

Companies with significant coal exposure

Certain companies and sectors face greater risk from climate change than others. And because of the material risks to shareholder value in highly carbon-intensive industries, Investment Stewardship has focused on a subset of utilities and mining companies significantly exposed to thermal coal. The scientific consensus is that coal is a major contributor of greenhouse gas emissions and that its consumption at current levels is incompatible with the Paris Agreement goals. It is now well-established scientifically that coal-related emissions must decline rapidly in the coming years to achieve those goals.

As a result, companies with a business model that relies on uninterrupted or unconstrained thermal coal production and use (primarily mining and utility companies) face a disproportionately high risk of climate-related actions by governments, customers, and counterparties. As companies and countries around the world work to reduce their carbon footprint or become carbon neutral, coal-exposed companies will face increased financial, regulatory, legal, and reputational risk. As discussed in a recent Investment Stewardship Insight, companies with significant exposure to coal should disclose that, as well as the steps they are taking to mitigate risks to long-term investment returns.
**Case study**

**Director accountability at Australia’s AGL Energy**

AGL, Australia’s largest utility, is also the country’s largest single carbon emitter, primarily because the bulk of its electricity generation comes from coal-fired power plants. Market expectations for companies to plan for an energy transition have become increasingly clear over the last several years, as has the materiality of the related risks to shareholder value.

Vanguard Investment Stewardship has maintained an open dialogue with AGL’s board members over multiple years. In 2021, those discussions focused on the AGL board’s oversight of the company’s energy transition plan.

At AGL’s 2021 annual meeting, the Vanguard funds voted against reelection of a director because of concerns that the board had failed to appropriately oversee material climate-related risks. Our funds also supported an advisory shareholder resolution asking AGL to set emissions reduction targets aligned with the Paris Agreement goals as part of its demerger plans. (AGL had previously announced its intention to split into two companies in 2022.)

The company has stated that it intends to have a greater focus on its energy transition, provide further details of its decarbonization plans and targets as part of the demerger documents, and introduce a Say on Climate vote. Investment Stewardship welcomed these commitments and will remain engaged with the company to monitor its efforts to mitigate risks to shareholder value.

**Climate-related proposal at Union Pacific**

Vanguard Investment Stewardship has engaged regularly over many years with board directors and company leaders of Union Pacific, the large U.S. railroad. Based on its research, Investment Stewardship assessed climate change as a material risk to Union Pacific’s business as a transportation company.

At its 2021 annual meeting, a shareholder proposal requested that the company report annually on its greenhouse gas emissions and emissions reduction plan and that it produce the first such report within 60 days of the annual meeting.

In analyzing the proposal, Investment Stewardship learned that the Science Based Targets initiative (SBTi) had recently approved Union Pacific’s science-based emissions reduction targets. Given that Union Pacific had only recently received the SBTi approval and had yet to develop a full emissions reduction plan aligned with TCFD guidelines, Investment Stewardship concluded that the proposal’s 60-day deadline for its first report was unreasonable. The Vanguard funds voted against the proposal because we viewed it as overly prescriptive. We remain engaged and, through our Investment Stewardship program, will continue to monitor the company’s progress.
Strategy and risk management

Case study

A call for greater disclosure at UPS

At the 2021 annual meeting for United Parcel Service (UPS), the U.S.-based global shipping and logistics company, the Vanguard funds supported a proposal that requested a report on whether, and how, the company plans to reduce its total contribution to climate change and align its operations with Paris Agreement goals. Vanguard Investment Stewardship assessed climate change as a material risk for UPS as a company that relies on multiple modes of transportation.

The team’s review of UPS’s climate reporting had identified a gap in disclosure of its overarching climate strategy. The company’s disclosures did not provide insight into its holistic approach to mitigating climate risks across all of its emissions-heavy business lines, including aviation. Although we were encouraged by the company’s disclosure of its emissions-reduction targets for global ground operations and its reporting aligned with the Sustainability Accounting Standards Board framework, we determined that it was in the interest of long-term shareholder value to support the request that UPS improve its disclosures by reporting alignment of its climate strategy—inclusive of all its emissions-heavy business lines—with Paris Agreement goals.

Vanguard Investment Stewardship in 2021

1,074
Number of companies engaged

42%
Support for environmental proposals

426
Number of engagements on environmental topics, including climate risk

47%
Support for climate-related proposals, including 27 Say on Climate proposals

Note: We define “climate-related proposals” as those that focus largely on climate-related matters, including climate-risk disclosures and climate-risk mitigation. “Environmental proposals” is a broader category that includes proposals on climate risk as well as matters such as biodiversity, water, and plastics. Vanguard funds may support proposals that are determined to address material risks or be in the best long-term interests of shareholders. The funds may not support proposals that, for example, dictate strategy and operations, are overly prescriptive, or request action when sufficient action or change has been implemented.

Additional resources on investment stewardship at Vanguard:

- Investment Stewardship 2021 Annual Report
- Voting insights: Climate-related proposals, January–June 2021
- Vanguard’s expectations for companies with significant coal exposure
- Interview with Vanguard’s global head of Investment Stewardship: Our approach to climate risk
- Proxy voting disclosures for Vanguard funds
Investment stewardship in Vanguard’s externally managed products

For Vanguard’s externally managed active funds, investment stewardship activities are carried out by the funds’ respective managers. By voting their own proxies and directly engaging with companies on climate, our outside active managers can fully integrate their stewardship principles with their unique investment processes. Each fund’s board has oversight of those activities.
Strategy and risk management

Climate scenario analysis

One of the recommendations of the TCFD is to “consider how climate-related risks and opportunities may evolve and their potential business implications under different conditions.” Climate scenario analysis can help an organization evaluate the potential resilience of its strategic plans across a range of scenarios and generate useful discussion on the risks and opportunities of climate change.

We recognize that scenario analysis and the data underpinning it are not yet widely available or understood. We also recognize it is one tool intended to help organizations consider a range of possible future outcomes that could impact the investment outcomes of our investors. Accordingly, we believe it is important for Vanguard to consider a scenario-based approach, and we have begun considering how to do so.

Vanguard recently conducted our first climate change scenario analysis in partnership with Baringa, an external consulting firm. We analyzed four funds, representing thousands of individual issuers and about 5% of our global assets under management as of December 31, 2021. These funds, which hold a broad array of equity and fixed income securities, were selected to help us obtain a deeper understanding of climate impact in different sectors of the capital markets.

Scenario analysis, though imperfect, can provide insight on the impacts of both transition risk and physical risk. Transition risk involves the move to a low-carbon economy through policy, preferences, technology, and market changes. Physical risk involves the tangible impacts of climate change, including extreme weather events such as flooding, wildfires, and droughts.

The analysis examined three scenarios:

Orderly: This scenario assumes that policy is enacted early on and increases over time. Greenhouse gas emissions reach net zero by 2050. Physical and transition risks are both relatively low.

Disorderly: Action is delayed until 2030, resulting in a more abrupt transition, especially as technologies are less developed. This means the pace and investment required to make the transition are much greater. The result is higher transition risk.

Hot house world: No policy changes are made. Greenhouse gas emissions increase until 2080, translating into a temperature rise of 3 degrees Celsius or more and severe physical risk, including permanent impacts such as rising sea levels.

We are reviewing the early results of this scenario analysis to assess the implications for our business and investment strategies and how they may add value for our clients. As part of this review, we will further consider how climate change may impact our business strategy over the short, medium, and long term, and will remain guided by the objective to deliver outstanding investment performance for our investors.
Integration of climate risks and opportunities by our external advisors

The majority of Vanguard’s active equity funds and some multi-asset funds are managed by external firms. In fact, more than 25 different asset management firms serve as investment managers and investment stewards for Vanguard’s actively managed funds. Vanguard recognizes that each firm brings a different perspective to the way it assesses and oversees climate risk, even in funds that do not pursue explicit ESG objectives.

We work closely with each of our active managers to understand their process, and we encourage continued refinement as data availability improves and the ESG landscape continues to evolve. Ultimately, 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—and the resulting outcomes of portfolio and performance. This approach provides our investors with diversity of thought and broader access to top talent. It also provides us with a unique perspective on the ways in which different active managers approach the investment process.

Vanguard Portfolio Review Department’s global Oversight and Manager Search team of more than 20 investment professionals regularly engages with current and prospective external fund managers. As part of these engagements, the team examines how managers incorporate financially material ESG 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 ESG and climate considerations, the extent to which they consider both quantitative and qualitative factors in their analysis, and how they vote proxies. For more information about the oversight of proxy voting, see “Stewardship of portfolio securities” on page 16. The team regularly reports on its findings and discussions to Vanguard’s Global Investment Committee and the funds’ boards of trustees.

We hold these external investment managers to the highest of standards to ensure that they remain singularly 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.
Integration of climate risks at Wellington Management

Wellington Management Company LLP, Vanguard’s largest subadvisory partner, manages $470 billion in Vanguard investor assets across 36 products globally. We consider Wellington to be a leader in ESG integration, and its approach to managing climate-related impacts is one key reason. Wellington believes the transition to a low-carbon economy is underway and is unlikely to reverse. Importantly, the firm believes the transition will create greater return dispersion between companies that are climate leaders and those that are climate laggards. As a result, Wellington devotes significant resources to assessing the impact of both physical and transition risks resulting from climate change so that these risks do not undermine its ability to maximize total return for our investors. For example, Wellington’s Climate Research Team has developed proprietary dashboards that track metrics such as weighted average carbon intensity (WACI) and top contributors to portfolio emissions. These tools and data sets facilitate company and portfolio-level monitoring and are available to all Wellington investment and product management teams. This rigorous climate analysis also enables Wellington to capitalize on opportunities with companies best-positioned to lead in the future. Wellington continues to invest in its fundamental climate research capabilities and is a founding member of the Net Zero Asset Managers initiative (NZAM). Wellington demonstrates rigor in its approach, which helps it better manage climate-related risks and opportunities on behalf of the investors in the funds it manages.

Integration of climate risks in fixed income

Vanguard’s Fixed Income Group (FIG) continues to refine its approach to evaluating climate-related impacts. This approach features a formal integration process to regularly identify and incorporate ESG risk factors—from macroeconomic factors to issuer-specific considerations—into investment decisions, for both internally managed active funds and index funds. FIG systematically assesses the financial materiality of ESG risks, including climate risks, to complement standard credit assessment. Our fixed income credit research analysts regularly meet with issuers to discuss key credit risk topics and, where applicable, raise climate and ESG concerns. When appropriate, our fixed income team shares input with Investment Stewardship and holds joint engagements with portfolio companies.
Case study
Integration of climate impacts in municipal bond evaluation

Vanguard’s municipal bond team has created frameworks to assess potential impacts of climate change when examining an issuer’s ability and willingness to repay financial obligations. The team recently analyzed a bond for a Florida-based airport in a region vulnerable to severe weather events, including hurricanes. The team determined that the financial impact of past storms has been manageable because of strong cash reserves, insurance policies, and assistance from the Federal Emergency Management Agency. In considering these risks and mitigants, along with factors such as yield and credit risk, the team decided to invest in this security on behalf of Vanguard investors.

Case study
Greenhouse gas emissions at BMW

Vanguard credit research and investment stewardship analysts held a joint engagement with BMW, the German automaker. The focus was on board-level governance and progress toward the company’s greenhouse gas emissions reduction targets. Through this constructive discussion, our analysts were encouraged by BMW’s progress in meeting its stated targets. From an investment perspective, this progress helps reduce the risk that BMW will be subject to material fines or penalties from regulators, and our fixed income and stewardship analysts gained a better understanding of the company’s risk oversight and strategy. Vanguard’s analysts will continue to meet with the company to monitor its progress against the targets it has set.
Strategy and risk management

Investment products for a range of investor preferences

As noted, our product lineup includes both index and actively managed funds. Our index funds frequently serve as the core building blocks underlying our extensive array of multi-asset products and help investors construct broadly diversified portfolios. As discussed throughout this report, climate-related impacts are considered in the management of our funds through engagement and integration practices, or specifically as part of the product design.

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

Our actively managed funds include ESG-focused funds that aim to generate excess return by allocating capital toward companies with leading or improving ESG practices. In each instance, these actively managed ESG funds account for climate considerations through their inclusion of specific net zero objectives. We also offer many actively managed funds that do not have ESG mandates. The managers of these funds typically integrate material ESG risks, such as climate risk, into their investment process.

As client interest in ESG investing has grown, we have taken steps to provide a greater selection of index and active ESG products that we believe have enduring investment merit and are consistent with our time-tested product design principles. For example, we launched four new ESG products in December 2021 that were designed with explicit net zero objectives.
Strategy and risk management

Resilience of our strategy

Our strategy has always followed our structure—one that allows us to manage our funds and business solely in the interests of our clients and with a long-term perspective not driven by the next quarterly earnings cycle. This gives us confidence in the resilience of our strategy because it ensures that we remain inextricably aligned to our clients. It also ensures that we remain appropriately long term in our approach to addressing climate-related impacts on behalf of our clients.

We are confident we have a sound approach to managing the risks and opportunities resulting from climate change. Our engagement with portfolio companies as part of our Investment Stewardship program, rigorous selection and oversight of the managers of our actively managed funds, and thoughtful approach to product development have served our investors well.

That said, we will not stand still. Science leaves no doubt about the seriousness and complexity of climate risk. We recognize this, and we expect that addressing the resulting challenges it presents will require continued evolution. Vanguard is committed to evolving in ways that support our investors’ ability to achieve their financial goals.
In this section, we discuss the metrics and targets we use to assess climate-related risks and opportunities.
Metrics and targets

The ability to quantify the financial implications of climate change across asset classes, business sectors, and geographic regions will be a critical part of investment management in the years to come.

Measuring 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. Our in-house investment and risk management teams are working with external climate research and data providers to deepen our understanding of climate-related risks and determine how to convey those risks to investors most effectively.

Our methodologies for assessing the climate impact of the holdings in our funds are still in the early stages. The key metrics we are considering, which are aligned with the Task Force on Climate-related Financial Disclosures: Guidance on Metrics, Targets, and Transition Plans (October 2021), include:

- **Weighted average carbon intensity (WACI):** A portfolio’s exposure to carbon-intensive companies, expressed in metric tons of carbon dioxide equivalent (tCO₂e) per $1 million in revenue, reflects the carbon intensity of a portfolio across asset classes.

- **Total carbon emissions (financed emissions):** Greenhouse gas emissions (Scope 1 and Scope 2) times the current value of investment divided by the issuer’s market capitalization. The absolute greenhouse gas emissions associated with a portfolio, expressed in tCO₂e.

- **Carbon footprint:** Total carbon emissions for a portfolio normalized by the market value of the portfolio in tCO₂e per $1 million invested.

Vanguard also has a set of environmental sustainability metrics and targets for the way we manage our global operations. See the “Vanguard as a company” section of this report, beginning on page 35, for more information.

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3 The formula for measuring weighted average carbon intensity for investments provided by the Task Force for Climate-related Financial Disclosures allocates Scope 1 and Scope 2 greenhouse gas emissions based on portfolio weights (the current value of the investment relative to the current portfolio value).
Vanguard assets aligned to net zero goals

In April 2022, we submitted our initial disclosure of the alignment of Vanguard fund assets to the goals of the Net Zero Asset Managers initiative (NZAM), covering a number of actively managed funds.

Of the products included in the disclosure, representing $1.7 trillion in actively managed assets under management, we identified $290 billion, or 17% of the total, that are investing in a net zero-aligned manner. A portion of these assets is in actively managed ESG products with net zero commitments as part of the product design.

The assets also include actively managed funds without explicit ESG mandates that nonetheless align to net zero objectives because of the existing philosophy and process used by the investment managers to maximize total returns for investors. These managers account for and consider climate risk in their process and believe that robust science-based strategies for managing climate risk will be critical for companies to deliver long-term shareholder value.

As governments continue to act on climate policy, we expect that more companies will address climate risks through the increased adoption of science-based targets. This will accordingly increase the universe of net zero-aligned securities for active managers to consider for investment (as well as the proportion of assets represented in the indexes that index funds track).

As Vanguard considers how our approach may evolve to include a greater portion of our actively managed assets, several considerations will be important:

- **Evolving net zero methodologies:** Many of our actively managed products have significant holdings in asset classes in which net zero methodologies either do not exist or are evolving. For example, assessment methodologies for municipal bonds are not widely available. As a result, we have not included our actively managed municipal bond funds in our interim NZAM commitment even though the investment team that manages these funds incorporates the consideration of climate risks in its evaluation of material risks. We will continue to assess how methodologies for aligning such assets to net zero evolve.
• **Varying approaches to managing climate risks:** As we have noted, more than 25 different investment firms, including Vanguard, manage assets on behalf of Vanguard investors, and each, to some degree, considers climate-related impacts as part of its integrated approach to assessing investment risks. As part of our oversight of these investment managers, we engage with them on their practices for evaluating and mitigating ESG and climate risks. We do not dictate an explicit approach for addressing climate risk to our investment managers. We will continue to engage with our investment managers as their approaches evolve.

• **Multi-manager funds:** Many of Vanguard’s actively managed funds are structured to be managed by more than one investment firm. Currently, portions of certain products are managed in a net zero-aligned manner, but under the guidelines of NZAM there is no methodology that allows for the alignment of portions of products. We will engage with NZAM to consider how a methodology could be developed to account for this product structure.

### Index funds and net zero goals

Approximately 80% of Vanguard investors’ assets are held in index funds, the majority of which, by mandate, track broad equity and fixed income market indexes. These assets cannot be committed to net zero targets without substantial action by the underlying companies or clarity on government actions related to climate risks.

While we have excluded our index funds in our initial NZAM commitment, this report details how Vanguard’s investment stewardship and credit research teams engage with portfolio companies held in our index funds to better understand how they are addressing material risks, including climate risks. As we have described, we expect proper board oversight, appropriate risk mitigation, and effective disclosure. This is done to ensure that these risks do not undermine the long-term investment outcomes of our investors.

Through the course of our ongoing discussions with the boards and management teams of the index funds’ portfolio companies, we have advocated for increased disclosures on climate risk mitigation and have witnessed progress on climate risk oversight in recent years. More boards are gaining expertise on climate-related matters, and more companies are performing scenario analysis and setting risk mitigation targets aligned to global efforts to limit warming to 1.5 degrees Celsius.

### More than $1 trillion of our index equity assets are invested in companies with net zero targets

Vanguard manages more than $5 trillion in index equity assets. According to data from MSCI, over $1 trillion of those assets are invested in companies that have committed to net zero targets, and an additional $2.8 trillion in assets are invested in companies that have some other form of emission reduction targets. In total, more than 70% of Vanguard’s index equity assets are invested in companies with publicly stated emission reduction goals. Our Investment Stewardship program will continue to engage with companies about their commitments.
Vanguard as a company

In this section, we discuss our goals to improve environmental sustainability, our progress, and how we manage climate risk in our business operations.
Vanguard as a company

With more than 18,000 mission-driven crew members around the world, Vanguard is committed to reducing our global carbon footprint and managing climate-related risks to our operations.

Measuring organizational progress on climate risks

Vanguard’s own organizational climate strategy seeks to reduce carbon emissions, increase renewable energy use, and invest in sustainable technology and equipment. Our sustainability goals and operational targets are outlined in the adjacent table.

In 2021, we achieved our goal to use 100% renewable energy globally within Vanguard’s operational control.4 Where possible, our buildings are powered by renewable energy provided directly from the utility supplier. Where direct renewable energy from the utility supplier is unavailable, our approach includes purchasing renewable energy certificates.

Our 2021 emissions fell in part because many employees were working remotely during the COVID-19 pandemic.

Climate-related goals and targets for our global operations

<table>
<thead>
<tr>
<th>Goal</th>
<th>Date established</th>
<th>Target completion</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieve 100% renewable energy in our global operations.</td>
<td>January 2020</td>
<td>2021</td>
<td>Achieved 100% renewable energy in 2021. Goal shifts to maintaining 100% use of renewable energy moving forward.</td>
</tr>
<tr>
<td>Reach carbon neutrality throughout our global operations.</td>
<td>January 2020</td>
<td>2025</td>
<td>76% year-over-year progress toward carbon neutrality by year-end 2021.</td>
</tr>
</tbody>
</table>

New reduction targets for 2025*

- Reduce emissions by 20% per full-time employee.
- Reduce electricity usage by 5% per square foot.
- Reduce water usage by 20% per square foot.
- Divert 80% of waste from landfills.

* Established in September 2021 based on 2019 baseline levels.

4 Does not include leased facilities.
Vanguard as a company

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

2021 carbon footprint
Total emissions before any purchased renewable energy certificates and carbon offsets. (tCO₂e = metric tons of carbon dioxide (CO₂) equivalent)

<table>
<thead>
<tr>
<th>2021 Carbon Footprint</th>
<th>57,205 tCO₂e</th>
</tr>
</thead>
</table>

Greenhouse gas emissions (tCO₂e)

<table>
<thead>
<tr>
<th>Scope</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1 emissions</td>
<td>3,187</td>
<td>3,240</td>
<td>3,683</td>
</tr>
<tr>
<td>Scope 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity emissions—location-based</td>
<td>44,510</td>
<td>39,707</td>
<td>37,271</td>
</tr>
<tr>
<td>Total electricity emissions—market-based</td>
<td>45,610</td>
<td>20,431</td>
<td>0</td>
</tr>
<tr>
<td>Scope 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scope 3 emissions</td>
<td>62,125</td>
<td>21,894</td>
<td>16,251</td>
</tr>
</tbody>
</table>

Total carbon emissions

| Total emissions Scope 1, 2, and 3 (location-based) | 111,822 | 64,841 | 57,205 |
| Total reported emissions | 111,822 | 45,565 | 13,934 |

*Notes: Vanguard’s operational carbon emissions have been assured by ERM CVS, a third-party sustainability analysis provider. Assurance is based on International Standard on Assurance Engagements (ISAE 3000).

5 Emissions from electricity before we purchased renewable energy certificates.
6 Emissions from electricity after we purchased renewable energy certificates.
7 Total emissions before any purchased renewable energy certificates and carbon offsets.
8 Total reported emissions = (Scope 1 + Scope 2 market-based + Scope 3) – purchased carbon offsets.

We intend to avoid, reduce, or offset all Scope 1 and Scope 2 emissions, as well as emissions from Scope 3 categories, including purchased goods and services, fuel- and energy-related activities, waste generated in operations, business travel, employee commuting, and upstream leased assets.

9 Categories are those as defined by the Greenhouse Gas Protocol. The Greenhouse Gas Protocol builds on a 20-year partnership between the World Resources Institute and the World Business Council for Sustainable Development to work with governments, industry associations, nongovernmental organizations, businesses, and other organizations to develop emissions reduction programs.
10 Includes only shuttle, security, and other service vehicles.
11 Scope 3 data do not include Vanguard fund investments.
Vanguard as a company

Implementing operational changes

We offer programs to encourage the use of low-carbon transportation, including 60 free electric vehicle charging stations adjacent to our buildings, shuttles between campuses and to and from public transit, and pretax deductions for public transit costs. In 2022, we introduced a program offering active U.S. employees an incentive toward the lease or purchase of a hybrid or electric vehicle. Our employees also participate in various educational events such as our speaker series, Earth Day activities, and our employee-led Green Teams events throughout the year.

Green building criteria and certifications have been incorporated into our corporate building design standards. As of December 31, 2021, seven buildings across our global locations were either LEED- or BREEAM-certified.12 The exterior lighting for our Malvern, Pennsylvania, corporate headquarters campus was upgraded to LED in 2021, requiring the replacement of over 2,300 lamps and resulting in estimated savings of more than 726 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.

12 LEED and BREEAM are systems that rate buildings on a range of sustainability and environmental criteria. 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.
Vanguard as a company

Renewable energy and carbon offsets

In 2021 Vanguard purchased over 109,000 MWh of renewable energy, which resulted in a reduction of more than 37,000 tCO₂e.

Additionally, we invested in three carbon-offset projects in 2021 that offset 6,000 tCO₂e:

**Uruguay: Guanaré Forest Plantations on Degraded Grasslands**
Registry: Verra Verified Carbon Standard
Project type: Afforestation

Establishing forest plantations in a degraded grasslands region to promote high-value, long-lived timber products, sequester an average of 127,000 tCO₂e per year, create nearly 1,000 jobs, promote small family businesses, and increase exports.

**Uganda: BioLite Improved Stove Programme**
Registry: Gold Standard
Project type: Clean cook stoves

Distributing fuel-efficient cook stoves to replace wood and charcoal stoves, which will cut toxic pollution emissions by 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.

**United States: Greenville County Landfill Gas Project**
Registry: Climate Action Reserve
Project type: Landfill gas

Supporting a landfill gas collection and utilization project at the Enoree landfill in Greer, South Carolina. The project includes methane capture and destruction with an open flare and a modular electricity generation plant. As a direct result, the surrounding community benefits from improved air quality and reduced odor.
Vanguard as a company

Managing climate-related risks to our operations

Vanguard’s Global Risk & Security (GR&S) team oversees the resilience of our business operations and must consider potential risk factors such as weather volatility, rising sea levels, and legal or regulatory changes. GR&S partners with business continuity teams in each of Vanguard’s sites around the world. These functions are augmented by many other Vanguard teams, including our compliance, legal, and internal audit teams.

Business continuity

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

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 maintains geographic diversity by running key business functions from multiple locations to reduce the risk of regional climate-induced or other events.

Managing financial risk

Vanguard is financially strong, with healthy cash flows, fund and business diversification, and asset growth. We regularly assess our balance sheet and monitor the market environment to ensure a sound financial position. Our diligent expense management and prudent operating practices help us mitigate business and operational risk. This includes maintaining sufficient liquidity to withstand the financial implications of significant, unexpected events, such as those that result from climate change.
Appendix
## Alignment with external organizations and initiatives

Vanguard carefully assesses external organizations and initiatives to determine which alignments would serve the best interest of our investors and support Vanguard’s core purpose. Our primary current alignments are listed in the adjacent table.

<table>
<thead>
<tr>
<th>Initiative/organization</th>
<th>Year joined</th>
<th>Description</th>
<th>Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Nations (UN) Principles for Responsible Investment (PRI)</td>
<td>2014</td>
<td>An organization that encourages investors to use responsible investment to enhance returns and better manage risks.</td>
<td>Signatory. Vanguard is committed to adopting and implementing the six principles and reporting our progress in an annual transparency report.</td>
</tr>
<tr>
<td>Value Reporting Foundation (previously SASB)</td>
<td>2016</td>
<td>A global nonprofit organization, formed through the merger of the International Integrated Reporting Council (IIRC) and the Sustainability Accounting Standards Boards (SASB), that helps businesses and investors develop a shared understanding of enterprise value.</td>
<td>Member. Vanguard serves on the SASB Standards Investor Advisory Group and is a member of the Standards Advisory Group for the infrastructure sector.</td>
</tr>
<tr>
<td>Task Force on Climate-related Financial Disclosures</td>
<td>2017</td>
<td>An organization that developed guidelines for voluntary climate-centered financial disclosures for all industries.</td>
<td>Supporter. Vanguard publicly supports the TCFD and encourages portfolio companies to disclose climate-related risks in line with the framework.</td>
</tr>
<tr>
<td>CDP</td>
<td>2018</td>
<td>A not-for-profit charity that runs the global disclosure system for investors, companies, cities, states, and regions to manage their environmental impacts.</td>
<td>Signatory. Vanguard is a signatory to CDP Climate Change, CDP Forests, and CDP Water.</td>
</tr>
<tr>
<td>Net Zero Asset Managers Initiative</td>
<td>2021</td>
<td>A group of global asset managers committed to supporting the goal of net zero greenhouse gas emissions, in line with efforts to limit global warming to 1.5 degrees Celsius, and to supporting investing aligned with net zero emissions, both by 2050 or sooner.</td>
<td>Signatory.</td>
</tr>
<tr>
<td>Ceres</td>
<td>2021</td>
<td>A nonprofit organization with a mission to transform the economy to build a just and sustainable future for people and the planet.</td>
<td>Member. Vanguard is a member of the Ceres Investor Network on Climate Risk and Sustainability.</td>
</tr>
<tr>
<td>Institutional Investors Group on Climate Change (IIGCC)</td>
<td>2021</td>
<td>A global investor membership body for investor collaboration on climate change with a mission to support and enable the investment community in driving significant progress by 2030 toward a net zero and resilient future.</td>
<td>Member.</td>
</tr>
<tr>
<td>Investor Group on Climate Change (IGCC)</td>
<td>2021</td>
<td>A collaboration of Australian and New Zealand institutional investors focused on the impact of climate change on investments.</td>
<td>Member.</td>
</tr>
<tr>
<td>Asia Investor Group on Climate Change (AIGCC)</td>
<td>2021</td>
<td>An initiative to create awareness and encourage action among Asia’s asset owners and financial institutions about the risks and opportunities associated with climate change and low-carbon investing.</td>
<td>Member.</td>
</tr>
</tbody>
</table>
### 2021 TCFD disclosure status

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

<table>
<thead>
<tr>
<th>Pillar/recommendation</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance: Describe the board’s oversight of climate-related risks and opportunities.</td>
<td>Vanguard’s board of directors is responsible for broad company policies, including those on climate. See “Board oversight of climate-related risks and opportunities” on page 12.</td>
</tr>
<tr>
<td>(b) Describe management’s role in assessing and managing the climate-related risks and opportunities.</td>
<td>Our ESG CEO Council, chaired by the chief executive officer, has global oversight of climate risk and opportunities structured around three pillars—Investment Products and Services, Stewardship of Portfolio Securities, and Vanguard as a Corporate Actor. See “Management’s role regarding climate-related risks and opportunities” on page 15.</td>
</tr>
<tr>
<td>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.</td>
<td>Our framework for assessing the macroeconomic implications of climate change identifies physical risks, stricter environmental policies, and the boost from greater “green investment” as key categories. See a summary of our research, <em>The Economics of Climate Change</em>, on page 19. For a broader discussion of our approach to climate-related risks and opportunities, see “Vanguard as a company” on page 35.</td>
</tr>
<tr>
<td>(a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.</td>
<td>As a company, we continue to assess how climate change may impact our business strategy over the short, medium, and long term, and we will remain guided by the objective to deliver long-term value for our investors. See “Resilience of our strategy” on page 30. For a broader discussion of our approach to climate-related risks and opportunities, see &quot;Vanguard as a company” on page 35.</td>
</tr>
<tr>
<td>(b) Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning.</td>
<td>As a company, we have conducted our first climate change scenario analysis across three different temperature-rise scenarios. We are reviewing the results to assess the implications for our business and investment strategies and how the results may add value for our clients. See “Climate scenario analysis” on page 25.</td>
</tr>
<tr>
<td>(c) Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</td>
<td>More than 25 different asset management firms serve as investment managers and investment stewards for Vanguard’s actively managed funds. Vanguard values the different perspectives that each firm brings in assessing and overseeing climate risk—even in funds that do not pursue explicit ESG objectives.</td>
</tr>
<tr>
<td></td>
<td>Vanguard’s Fixed Income Group has a formal integration process to regularly identify and incorporate climate-related risk impacts into investment decisions, both for internally managed active funds and index funds.</td>
</tr>
<tr>
<td></td>
<td>On behalf of investors in our index equity funds, we have a mandate to stay invested in constituent companies. Vanguard Investment Stewardship has ongoing engagements about climate risk with the companies our funds invest in. See &quot;Strategy and risk management&quot; on page 17.</td>
</tr>
<tr>
<td>* For asset managers: Describe how climate-related risks and opportunities are factored into relevant products or investment strategies.</td>
<td>The complexity of climate change will require rigorous and ongoing assessment of climate-related impacts across Vanguard’s product offerings. See “Investment management” on page 26.</td>
</tr>
</tbody>
</table>
| * For asset managers: Describe how each product or investment strategy might be affected by the transition to a low-carbon economy. | }
### Appendix

#### Risk management: Disclose how the organization identifies, assesses, and manages climate-related risks.

<table>
<thead>
<tr>
<th>Pillar/recommendation</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(a) Describe the organization’s processes for identifying and assessing climate-related risks.</em></td>
<td>In our operations, our business continuity program plans carefully and methodically to ensure a quick and smooth recovery in the event of an emergency or disruptive event, including climate-related events. See “Managing climate-related risks to our operations” on page 40.</td>
</tr>
<tr>
<td>* 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.*</td>
<td>Vanguard’s Investment Stewardship program monitors climate-related risks as part of its engagement efforts related to internally managed equity funds. In 2021, the program engaged with 1,074 companies and conducted 426 engagements on climate or environmental matters. For Vanguard’s externally managed active funds, investment stewardship activities are carried out by the funds’ respective managers. By voting their own proxies and directly engaging with companies on climate, our outside active managers can fully integrate their stewardship principles with their unique investment processes. See “Investment stewardship” on page 20.</td>
</tr>
<tr>
<td>* For asset managers: Describe how material climate-related risks are identified, assessed, and managed for each product or investment strategy.*</td>
<td>More than 25 different asset management firms serve as investment managers and investment stewards for Vanguard’s actively managed funds. Vanguard values the different perspectives that each firm brings in assessing and overseeing climate risk—even in funds that do not pursue explicit ESG objectives. Vanguard’s Fixed Income Group has a formal integration process to regularly identify and incorporate climate-related risk impacts into investment decisions, both for internally managed active funds and index funds. On behalf of investors in our index equity funds, we have a mandate to stay invested in constituent companies. Vanguard Investment Stewardship has ongoing engagements about climate risk with the companies our funds invest in. See “Strategy and risk management” on page 17.</td>
</tr>
<tr>
<td><em>(b) Describe the organization’s processes for managing climate-related risks.</em></td>
<td>Vanguard’s Global Risk &amp; Security (GR&amp;S) team oversees the resilience of our business operations and must consider potential risk factors such as weather volatility, rising sea levels, and legal or regulatory changes. GR&amp;S partners with business continuity teams in each of Vanguard’s sites around the world. These functions are augmented by many other Vanguard teams, including our compliance, legal, and internal audit teams. See “Managing climate-related risks to our operations” on page 40.</td>
</tr>
<tr>
<td>* For asset managers: Describe how the organization manages climate-related risks for each product or investment strategy.*</td>
<td>More than 25 different asset management firms serve as investment managers and investment stewards for Vanguard’s actively managed funds. Vanguard values the different perspectives that each firm brings in assessing and overseeing climate risk—even in funds that do not pursue explicit ESG objectives. Vanguard’s Fixed Income Group has a formal integration process to regularly identify and incorporate climate-related risk impacts into investment decisions, both for internally managed active funds and index funds. On behalf of investors in our index equity funds, we have a mandate to stay invested in constituent companies. Vanguard Investment Stewardship has ongoing engagements about climate risk with the companies our funds invest in. See “Strategy and risk management” on page 17.</td>
</tr>
<tr>
<td><em>(c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management.</em></td>
<td>As a company, we have aligned with a number of sustainability and collaborative initiatives to help us better evaluate and implement strategies to manage climate-related risks. See “Alignment with external organizations and initiatives” on page 42. Vanguard’s board and ESG CEO Council oversee climate-related risks and opportunities. See “Governance” on page 11.</td>
</tr>
</tbody>
</table>
Appendix

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.

As a company, Vanguard has established targets and metrics for operational sustainability to help responsibly manage and reduce our own environmental footprint. See "Disclosure of Scope 1, Scope 2, and Scope 3 greenhouse gas emissions" on page 37.

* 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.

The more than two dozen investment firms that manage assets on behalf of Vanguard investors have varying approaches to managing climate risks, including through net zero-aligned strategies. We do not dictate an explicit approach for addressing climate risk to our investment managers. See "Vanguard assets aligned to net zero goals" on page 33.

* For asset managers: Where appropriate, provide metrics considered in investment decisions and monitoring.

Our in-house investment and risk management teams are working with external climate research and data providers to deepen our understanding of climate-related risks. See "Measuring climate-related risks and opportunities" on page 32.

* 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°C scenario. Also indicate which asset classes are included.

Vanguard is a signatory to the Net Zero Asset Managers initiative. As part of our commitment, we have identified $290 billion of actively managed products that are investing in a net zero-aligned manner, representing 17% of Vanguard’s actively managed assets. Separately, more than 70% of Vanguard’s index equity assets are invested in companies with emission reduction goals. See "Vanguard assets aligned to net zero goals" on page 33.

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

As a company, we report on Vanguard’s operational GHG emissions for 2019–2021. Our operational carbon footprint in 2021 was 57,205 metric tons of CO₂ equivalent. See "Disclosure of Scope 1, Scope 2, and Scope 3 greenhouse gas emissions" on page 37.

* 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.

Our methodologies for assessing the climate impact of the holdings in our funds are still in early stages, but the metrics we are using include carbon intensity, weighted average carbon intensity, total carbon emissions, and carbon footprint. See "Measuring climate-related risks and opportunities" on page 32.

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

In our global operations, Vanguard is committed to reaching carbon neutrality by 2025. In addition, we have a 20% reduction target of emissions per full-time employee by 2025, compared with 2019. See "Measuring organizational progress on climate risks" 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, 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.

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.

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.

ESG portfolios are subject to ESG investment risk, which is the chance that the stocks or bonds screened by the data provider 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 data provider’s assessment of a company, based on the company’s level of involvement in a particular industry or the data provider’s own ESG criteria, may differ from that of other portfolios or of the advisor’s or an investor’s assessment of such company. As a result, the companies deemed eligible by the data provider 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 weight given to ESG factors for active non-ESG funds may vary across types of investments, industries, regions and issuers and 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.

To learn more about Vanguard, visit vanguard.com.

Vanguard

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