Task Force on Climate-related Financial Disclosures

2021 Status Report

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

October 2021

Mr. Randal K. Quarles
Chair
Financial Stability Board
Bank for International Settlements
Centralbahnplatz 2
CH-4002 Basel
Switzerland

September 15, 2021

Dear Chair Quarles,

The Task Force on Climate-related Financial Disclosures (Task Force or TCFD) has had an exceptional year rallying global support for consistent and transparent climate risk reporting. The Task Force's recommendations are leading the way for companies around the world to disclose the risks and opportunities they face due to climate change — and for governments to address the issue. To summarize our latest progress, it is my pleasure to share our fourth annual status report with you.

Since our last report in September 2020, public- and private-sector support for the TCFD recommendations has accelerated rapidly. When the recommendations were released in 2017, few organizations accepted climate change as a major financial risk. Since then, the Task Force has raised the profile of climate disclosures as a pressing issue, both for businesses and for the planet. And the TCFD recommendations have become the global standard that guides private sector disclosures, informing new laws and regulations and garnering notable endorsements from the G7 and G20. Today, organizations are integrating climate risk into their financial risk frameworks, and governing bodies are incorporating our recommendations into official disclosure requirements — including the European Union, the United Kingdom, Switzerland, New Zealand, and Hong Kong. To date, 12 governments and dozens of central banks, supervisors, and regulators have formally expressed support for the TCFD recommendations, and more than 2,600 organizations have now endorsed them, an increase of over 70% since last year.

The momentum we have built is helping to ensure that organizations throughout the global economy understand and appreciate the role of climate change as a financial risk around the world. Our recent review of more than 1,600 companies found the greatest-ever growth in disclosures aligned with the TCFD recommendations. At the same time, companies continue to struggle to quantify the impacts of climate change, and to source the data they need to fully assess the threats of a changing climate.

Our efforts to increase and improve these disclosures are only growing more important. Markets are increasingly looking to channel funds to sustainable and resilient investments, and it is critical that climate reporting requirements are standardized across jurisdictions to help investors and consumers make decisions. To that end, the Task Force is supporting efforts to develop global baseline sustainability reporting standards built on our original recommendations.

Fighting climate change requires an all-hands-on-deck approach — and the Task Force's work is vital to securing a more sustainable and resilient future. Thank you for your continued support.

Sincerely,

Michael R. Bloomberg

Executive Summary

In June 2017, the Financial Stability Board's Task Force on Climate-related Financial Disclosures (Task Force or TCFD) released its final recommendations, providing a global framework for companies and other organizations to develop more effective climate-related financial disclosures through their existing reporting processes (Figure ES1).[1] In its report, the Task Force emphasized the importance of transparency in pricing of risk — including risk related to climate change — to support informed, efficient capital allocation decisions.

Figure ES1
The Task Force's Remit

In April 2015, the G20 Finance Ministers and Central Bank Governors asked the Financial Stability Board (FSB) to convene public- and private-sector participants to review how the financial sector can take account of climate-related issues. As part of its review, the FSB identified the need for better information to support informed investment, lending, and insurance underwriting decisions and improve understanding of climate-related risks.

To help identify the information needed to assess and price climate-related risks, the FSB established an industry-led task force — the TCFD. The FSB asked the TCFD to develop voluntary climate-related financial disclosures that would be useful to investors and others in understanding material risks.

Global momentum behind the Task Force's work has grown significantly over the past year (Figure ES2). Multiple jurisdictions have proposed or finalized laws and regulations to require disclosure aligned with the TCFD recommendations — some coming into effect as early as 2022. The TCFD recommendations are also the basis upon which international accounting standard setters are building global standards for climate risk disclosure.

These developments have taken place within a broader international focus on climate-related risk as impacts of climate change have continued to result in tangible and severe physical harm. Simultaneously, a range of governments and private sector organizations are working to operationalize public commitments to transition to a low- or zero-carbon economy. In a rapidly evolving climate risk landscape, transparency on climate-related issues is increasingly critical for investors, lenders, and insurance underwriters to make informed economic decisions.

At the request of the FSB, the Task Force has issued four annual status reports describing the alignment of companies' reporting with the TCFD recommendations. This fourth report provides an update on key TCFD-related developments and initiatives supporting the TCFD as well as the results of the Task Force's annual review of climate-related reporting. The report also describes key findings from an analysis of disclosures on the financial impact of climate-related risks and opportunities on companies' businesses and strategies. Overall, the Task Force is pleased to see increased maturity in climate-related disclosure efforts but believes significant work remains to "mainstream" consideration of climate-related issues within financial decision-making.

INITIATIVES SUPPORTING TCFD

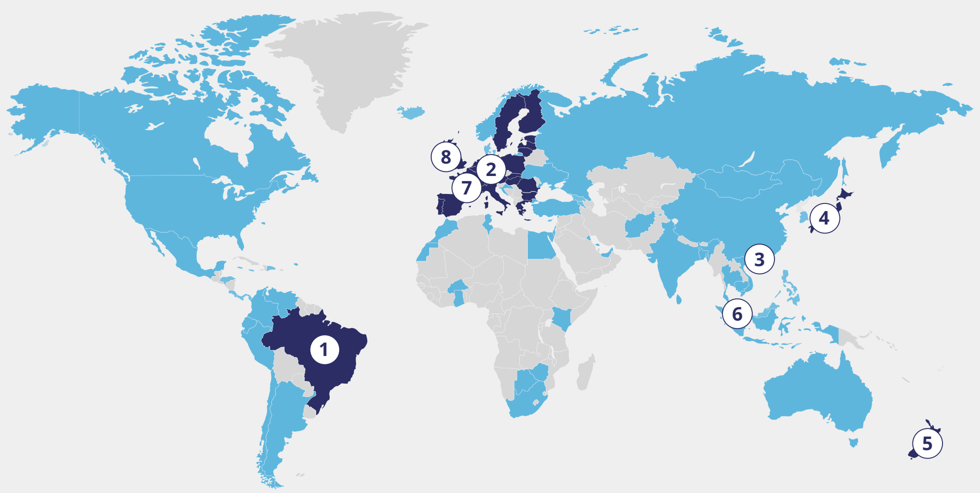
Since the release of the 2020 TCFD status report, over 1,000 additional organizations have pledged support for the TCFD recommendations. As of October 6, 2021, the Task Force had over 2,600 supporters globally, including 1,069 financial institutions, responsible for assets of $194 trillion. TCFD supporters now span 89 countries and jurisdictions and nearly all sectors of the economy, with a combined market capitalization of over $25 trillion — a 99% increase since last year, as shown in Box ES1 (p. 4).

[1] In this report, the Task Force uses the term "companies" to refer to entities with public debt or equity as well as asset managers and asset owners, including public- and private-sector pension plans, endowments, and foundations.

Box ES1

TCFD 2021 Year in Review

Continued Growth in Support



Countries/jurisdictions with TCFD supporters

Jurisdictions with announcements of TCFD-aligned reporting requirements

2,600+
TCFD Supporters Globally

8
TCFD-Aligned Official Reporting Requirements

1. Brazil
2. European Union
3. Hong Kong
4. Japan
5. New Zealand
6. Singapore
7. Switzerland
8. United Kingdom

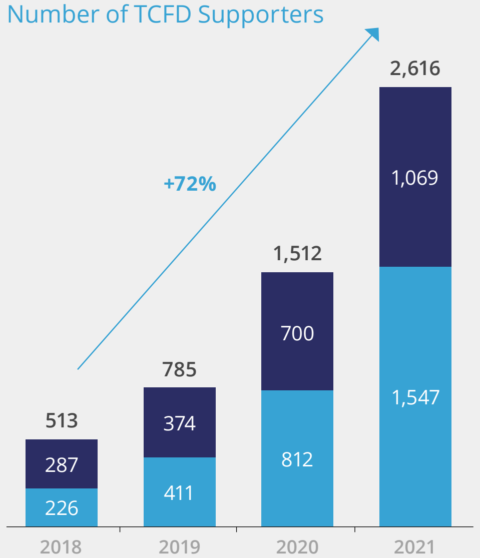
120+
Regulators and Governmental Entities

89
Countries and Jurisdictions Represented

$194 tn
Assets

$25 tn
Combined Company Market Capitalization

Number of TCFD Supporters

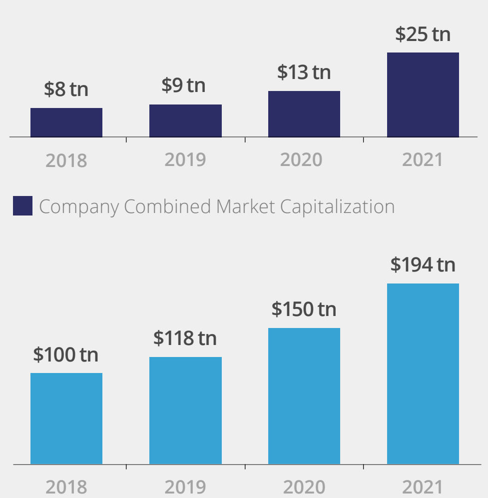


Financial Institutions

Other Supporters

TCFD Supporter Market Coverage

USD trillions



Financial Company Assets

Making Headlines

"We support moving towards mandatory climate-related financial disclosures that provide consistent and decision-useful information for market participants and that are based on the Task Force on Climate-related Financial Disclosures (TCFD) framework, in line with domestic regulatory frameworks."

– G7 Finance Ministers & Central Bank Governors Communiqué

"The commission supports initiatives by the G20, the G7, the Financial Stability Board and others to generate international commitment to develop a baseline of global sustainability reporting standards that would build on the work of the Task Force on Climate-related Financial Disclosures."

– European Commission Corporate Sustainability Reporting Directive

"(Mandatory) reporting will be based on the Task Force on Climate-related Financial Disclosures (TCFD) framework, which is widely acknowledged as international best practice."

– Hon. Dr. David Clark and Hon. James Shaw, New Zealand Parliament

Research and Engagement

26
User and Preparer interviews on challenges and uses of climate-related financial impact disclosures

1,651
Companies' disclosures reviewed with AI

220+
Responses to Consultation on Forward-Looking Metrics

240+
Responses to Consultation on Proposed Guidance on Climate-Related Metrics, Targets, and Transition Plans

Publications

2021 Status Report

2021 Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures (2021 annex)

Guidance on Metrics, Targets, and Transition Plans

Consultation Responses

Forward-Looking Financial Metrics Consultation: Summary of Responses

Metrics, Targets, and Transition Plans Consultation: Summary of Responses

As support from the private sector has grown, governments around the world have begun to codify aspects of the TCFD recommendations into policy and regulation, using the Task Force's work as a foundation for climate-related reporting requirements. In addition to the support of dozens of regulators and supervisors, Brazil, the European Union, Hong Kong, Japan, New Zealand, Singapore, Switzerland, and the United Kingdom have announced requirements for domestic organizations to report in alignment with the TCFD recommendations, as summarized in Figure ES2.

Figure ES2

Announcements of Official TCFD-Aligned Reporting Requirements

Brazil: In April 2021, the Central Bank of Brazil (BCB) issued a public consultation on rules for disclosure of social, environmental, and climate-related risk management by institutions of the National Financial System (SFN). In September 2021, BCB announced mandatory TCFD-aligned disclosure requirements, which will initially focus on qualitative aspects related to governance, strategy, and climate-related risk management for regulated institutions, with a second phase incorporating quantitative aspects.

European Union: In April 2021, the European Commission issued a proposed Corporate Sustainability Reporting Directive (CSRD) that would amend existing reporting requirements. The EC noted that the reporting standards should take into account existing standards and frameworks, including the TCFD framework, which would lead to TCFD-aligned reporting for nearly 50,000 large companies with a presence in the European Union.

Hong Kong: In December 2020, Hong Kong's Green and Sustainable Finance Cross-Agency Steering Group published a new Strategic Plan, announcing that TCFD-aligned disclosures "will be mandatory" across relevant financial sectors by 2025.[2] The Steering Group pledged to "increase the coverage of mandatory disclosure as soon as practicable."

Japan: In June 2021, the Tokyo Stock Exchange published a revised Corporate Governance Code (the Code) based on the proposals made by Japan's Council of Experts Concerning the Follow-up of Japan's Stewardship Code and Japan's Corporate Governance Code. Under revised Securities Listing Regulations, the Code requires certain listed companies to enhance the quality and quantity of climate-related financial disclosures based on the TCFD recommendations, with effect from June 11, 2021.

New Zealand: In September 2020, New Zealand announced plans to mandate climate-related financial disclosures aligned with the TCFD recommendations for approximately 200 organizations, including most licensed insurers, listed issuers, large registered banks, and managers of investment schemes. In April 2021, New Zealand introduced the Financial Sector (Climate-related Disclosure and Other Matters) Amendment Bill. If passed, legislation would enter into force within 12 months after receiving Royal assent.

Singapore: In August 2021, the Singapore Exchange Regulation proposed a road map for mandatory TCFD-aligned disclosure. Starting in 2022, all issuers would be required to adopt TCFD-aligned reporting on a comply or explain basis. Disclosure would become mandatory in 2023 for companies in key industries including finance and transportation, and in most industries in 2024. Public consultation on the proposed road map ended on September 27, 2021.

Switzerland: In December 2020, Switzerland's Federal Council indicated the authorities should prepare the binding implementation of the recommendations of the TCFD for Swiss companies across all sectors of the economy. In July 2021, the Swiss Financial Market Supervisory Authority (FINMA) amended its circulars to include the disclosure of climate-related financial risks based on the TCFD recommendations.

In August 2021, the Swiss Federal Council instructed the Federal Department of Finance to prepare a consultation draft for mandatory climate reporting based on the TCFD by summer 2022.

United Kingdom: In November 2020, the UK's Chancellor of the Exchequer announced the UK's intention to mandate climate disclosures by large companies and financial institutions by 2025. In December 2020, the Financial Conduct Authority introduced new rules for companies with a UK premium listing to disclose climate-related risks and opportunities in line with the TCFD recommendations on a comply or explain basis.

In June 2021, the FCA published further proposals to extend TCFD-aligned disclosure requirements to issuers of standard listed equity shares and introduce TCFD-aligned disclosure requirements for asset managers, life insurers, and FCA-regulated pension providers.

[2] Hong Kong's Green and Sustainable Finance Cross-Agency Steering Group was established in May 2020 and is co-chaired by the Hong Kong Monetary Authority and the Securities and Futures Commission. Additional members comprise the Environment Bureau, Financial Services and the Treasury Bureau, Hong Kong Exchanges and Clearing Limited, the Insurance Authority, and the Mandatory Provident Fund Schemes Authority. The group aims to coordinate the management of climate and environmental risks to the financial sector, among other sustainable finance activities.

International standard setters are also building upon the TCFD recommendations to incorporate climate-related issues within their disclosure standards. Earlier this year the Trustees of the International Financial Reporting Standards (IFRS) Foundation signaled their intentions to establish an International Sustainability Standards Board (ISSB) under the IFRS reporting framework. Based on public feedback and encouragement from the International Organization of Securities Commissions (IOSCO), the IFRS Foundation pledged to "build upon the well-established work" of the TCFD as a basis for its international climate-related disclosure standards. Many organizations have issued official statements in support of the TCFD recommendations as the basis for international climate-related disclosure efforts, either within the IFRS Foundation's work or more broadly. Several of these statements are referenced in Table ES1.

Table ES1

Support from International Standard Setters and Regulators for TCFD

	Organization (source hyperlinked)	**Statement of Support**
	G7 Finance Ministers and Central Bank Governors	"We support moving towards mandatory climate-related financial disclosures that provide consistent and decision-useful information for market participants and that are based on the Task Force on Climate-related Financial Disclosures (TCFD) framework, in line with domestic regulatory frameworks."
	G20 Finance Ministers and Central Bank Governors	"We will work to promote implementation of disclosure requirements or guidance, building on the FSB's Task Force on Climate-related Financial Disclosures (TCFD) framework, in line with domestic regulatory frameworks, to pave the way for future global coordination efforts."
	Financial Stability Board	"The TCFD framework provides a basis for initiatives that jurisdictions may wish to take, based on domestic regulatory frameworks, while work towards a global baseline corporate reporting standard progresses. FSB and other bodies will promote consistent approaches among national and regional climate disclosure initiatives, using frameworks based on the TCFD Recommendations."
	International Financial Reporting Standards Foundation	"The new (International Sustainability Standards Board) would build upon the well-established work of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD)."
	International Organization of Securities Commissions	"IOSCO has strongly encouraged the ISSB to leverage the content of existing sustainability related reporting principles, frameworks and guidance, including the TCFD's recommendations, as it develops investor-oriented standards focused on enterprise value, beginning with climate change."
	"The alliance"[3]	"Given that the market is embracing the TCFD Recommendations to help investors and others understand how reporting organizations assess climate-related risks and opportunities, development of such a (global sustainability reporting) standard would be timely."
	European Commission	"The Commission supports initiatives by the G20, the G7, the Financial Stability Board and others to develop a baseline of global sustainability reporting standards that would build on the work of the Task Force on Climate-related Financial Disclosures."

[3] "The alliance" was previously known as the Group of Five and comprises the CDP, the Climate Disclosure Standards Board (CDSB), the Global Reporting Initiative (GRI), and the Value Reporting Foundation (previously the IIRC and SASB).

STATE OF CLIMATE-RELATED FINANCIAL DISCLOSURES

In welcoming the 2020 TCFD status report, the FSB asked the Task Force to publish a fourth annual status report in 2021.[4] Consistent with previous years, this status report provides an overview of the growth and current state of climate-related financial disclosures by public companies. The Task Force reviewed the reports of 1,651 public companies over three years, as described in Section B1. TCFD-Aligned Reporting by Public Companies, and assessed whether the reports included information that appeared to align with one or more of the Task Force's 11 recommended disclosures (Table ES2).

Table ES2

TCFD Recommendations and Supporting Recommended Disclosures

Governance	Strategy	Risk Management	Metrics and Targets
Disclose the company's governance around climate-related risks and opportunities.	**Disclose the actual and potential impacts of climate-related risks and opportunities on the company's businesses, strategy, and financial planning where such information is material.**	**Disclose how the company identifies, assesses, and manages climate-related risks.**	**Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.**
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the company has identified over the short, medium, and long term.	a) Describe the company's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the company to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	b) Describe the impact of climate-related risks and opportunities on the company's businesses, strategy, and financial planning.	b) Describe the company's processes for managing climate-related risks.	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	c) Describe the resilience of the company's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the company's overall risk management.	c) Describe the targets used by the company to manage climate-related risks and opportunities and performance against targets.

[4] TCFD, *2020 Status Report: The Task Force on Climate-related Financial Disclosures*, October 29, 2020.

Table ES3 summarizes the key takeaways and findings from the Task Force's review of the state of climate-related financial disclosures. The Task Force also reviewed the aggregate reporting of signatories to the Principles for Responsible Investment for the years 2018–2020, as described in Section B2. TCFD-Aligned Reporting by Asset Managers and Asset Owners.

Table ES3

Overview: State of Climate-Related Financial Disclosures

	Disclosure increased more between 2019 and 2020 than in any previous year assessed, consistent with global momentum around climate-related reporting. However, progress is still needed, with only 50% of companies reviewed disclosing in alignment with at least three recommended disclosures.
	Companies remain more likely to disclose information on their climate-related risks and opportunities (*Strategy a*) than on any other recommended disclosure, with over half of the companies reviewed including such information in their 2020 reports.
	Disclosure of the resilience of companies' strategies under different climate-related scenarios (*Strategy c*), although still the least reported recommended disclosure, encouragingly increased from 5% of companies in 2018 to 13% in 2020.
	Although the Task Force recommends disclosure of governance regardless of materiality, the Governance recommendation remains the least disclosed recommendation with the two Governance recommended disclosures the second and third least disclosed.
	Materials and buildings companies now lead on disclosure. The average level of disclosure across the 11 recommended disclosures for fiscal year 2020 was 38% for materials and buildings companies.
	The insurance industry significantly increased its average level of disclosure by 11 percentage points between 2019 and 2020, and now leads all groups by at least 15 percentage points in disclosure of risk management processes (*Risk Management b*).
	Europe remains the leading region for disclosures, with average level of reporting across the 11 recommended disclosures from fiscal year 2020 now at half of European companies assessed. European companies have increased their average disclosure by 15 percentage points since 2019, and now disclose 16 percentage points more than the next closest region.

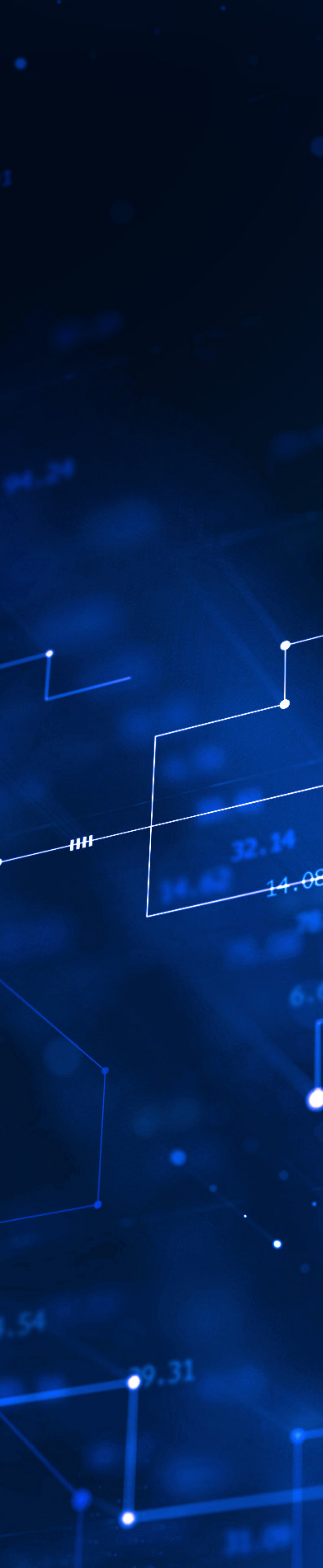
INSIGHTS INTO DISCLOSURE OF CLIMATE-RELATED FINANCIAL IMPACT

As part of the concept for the creation of a climate-related disclosure task force, the FSB noted that investors, lenders, and insurance underwriters could use climate-related disclosures to "analyse the potential changes in value of their assets and liabilities" due to climate-related developments.[5] The Task Force's recommendations solicit a range of decision-useful climate-related information that can inform such assessments. However, past reviews of the state of TCFD-aligned reporting have found few descriptions of the potential impacts of climate change.[6] In this context, the FSB requested that the TCFD "undertake further analysis on the extent to which organizations describe the financial impact of climate-related risks and opportunities on their businesses and strategies."[7]

[5] FSB, "Proposal for a disclosure task force on climate-related risks," 2015.

[6] The 2020 status report noted that "disclosure of TCFD-aligned information increased by six percentage points, on average, between 2017 and 2019. However, companies' disclosure of the potential financial impact of climate change on their businesses and strategies remains low" (p. 4). Also see *2018 Status Report*, p. 13; *2019 Status Report*, pp. iv and 51; and *2020 Status Report*, pp. 4, 8, and 12.

[7] FSB, "FSB welcomes TCFD status report," October 29, 2020.



The Task Force used a range of sources to better understand reporting on financial impact, including interviews with users and preparers of climate-related financial disclosure, manual reviews of public reports, the results of the Task Force's public consultation on its proposed guidance on disclosure of climate-related metrics, targets, and transition plans, and solicitation of input from rating agencies to provide insights on how the financial implications of climate-related risks and opportunities factor into their rating processes.[8] Key findings of the analysis are summarized in Table ES4.

Table ES4

Key Findings

Preparer Perspective

At least one in five preparers that responded to the Task Force's consultation disclose financial impact, with disclosure of impact on *financial performance* more common than impact on *financial position.*

Preparers interviewed reported disclosing potential financial impacts more often than actual impacts.

The process of estimating financial impacts can lead to improved internal and external communication.

Lessons learned from interviews with preparers offer a path forward for organizations earlier on in their journey:

- Enhanced data-gathering strategies are critical to enable effective assessment of financial impact.
- Allocating sufficient resources to assessing financial impact helps timely development of decision-useful information.
- Overcoming institutional siloes enables more effective collaboration and alignment on assumptions and methodologies used for estimating financial impact.
- Once financial impact has been estimated, approval from relevant internal stakeholders, including legal teams, is generally required when making public disclosures.

User Perspective

Over nine out of ten consultation respondents identified as users find disclosure of financial impacts useful.

Rating agencies stated that climate-related information is an increasingly important input into their financial impact assessments, informing the rating process.

Users have highlighted several areas that would improve the usefulness of information disclosed on financial impact to support decision-making, including:

- amount of expenditure or capital investment currently deployed toward climate-related risks and opportunities;
- amount of expenditure or capital investment to be deployed to meet targets for addressing climate risks and opportunities, often disclosed in transition plans; and
- interconnected reporting linking qualitative disclosures with their actual and potential financial impact.

[8] Throughout this report, the term "preparer" refers to any organization that discloses climate-related financial information. The term "user" refers primarily to investors, lenders, or insurance underwriters, though other market participants such as credit rating agencies and regulatory authorities are also important users of such information. Many users are also preparers of their own disclosures.

FURTHER WORK TO ADDRESS IMPLEMENTATION ISSUES

Each year, the Task Force undertakes work to assist companies with implementing its recommendations. Two of the most challenging areas of implementation, according to TCFD survey respondents, relate to the Task Force's recommendations on strategy and metrics and targets.[9] Historically, companies expressed a need for assistance with climate-related scenario analysis, and in response the Task Force provided guidance and tools to support organizations in this area in 2020. Over the last year, companies, investors, data and methodology providers, and others have continued to progress the disclosure of their strategies, taking climate-related scenarios into account.

To help address challenges related to disclosure of financial impacts, metrics, and targets, and to incorporate new guidance on transition plans, the Task Force released two supplemental documents simultaneously with this report. First, the Task Force updated its *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures* (2021 annex), which was originally released in 2017. The revised 2021 annex updates the implementing guidance for all sectors and supplemental guidance for the financial sector for certain recommended disclosures within the Strategy and Metrics and Targets recommendations. The Task Force also developed guidance to assist companies with disclosure of climate-related metrics, targets, and transition plans. In addition, the Task Force requested that external organizations conduct further work in two areas: portfolio alignment metrics for the financial sector and business-relevant climate-related reference scenarios (Figure ES3).[10]

Significant public consultation informed the two new TCFD documents. In October 2020, the Task Force held a consultation on Forward-Looking Financial Sector Metrics to gather feedback on potential climate-related metrics for financial organizations. Over 240 respondents provided their input on the usefulness and challenges of forward-looking metrics to inform the Task Force's work.

Following the 2020 consultation, in June 2021, the Task Force proposed guidance on disclosure of climate-related metrics, targets, and transition plans to help clarify the link between metrics and financial impacts, describe principles for setting targets, provide guidance for organizations disclosing transition plans, and propose potential changes to the 2021 annex. A summary of the over 240 consultation responses received, the updated 2021 annex, and the updated guidance on climate-related metrics, targets, and transition plans were released in October 2021.

Figure ES3
External Work on Scenarios and Portfolio Alignment

The Portfolio Alignment Team (PAT), an independent group of expert analysts from the financial sector, was asked to develop a report on portfolio alignment to help clarify methodologies and assumptions. An initial version of the PAT's report was released for public consultation in June 2021, and the final report was released in October 2021.

The World Business Council on Sustainable Development (WBCSD) has convened a group of preparers to develop climate reference scenario approaches for companies from the energy system. The approaches will draw on existing public scenarios.

NEXT STEPS

Over the next several months, the Task Force will continue to promote and monitor adoption of its recommendations, along with any further work necessary to support preparers' efforts to implement TCFD recommendations, and will prepare a status report for the Financial Stability Board in September 2022. The TCFD Secretariat is also supporting the efforts of the IFRS to develop a global baseline sustainability reporting standard, based on the TCFD recommendations, and will continue to provide technical advice to jurisdictional efforts. The Task Force continues to believe the success of its recommendations in informing capital allocation decision-making depends on continued, widespread implementation by companies in the non-financial and financial sectors and views its guidance as a means of helping improve the quality and consistency of climate-related financial disclosures.

[9] See TCFD, *2020 TCFD Status Report*, 2020, p. 31.

[10] The PAT consisted of technical representatives of seven major investment firms and other organizations. The PAT report provided important technical context for the TCFD consultation.

Contents

A. Initiatives Supporting TCFD

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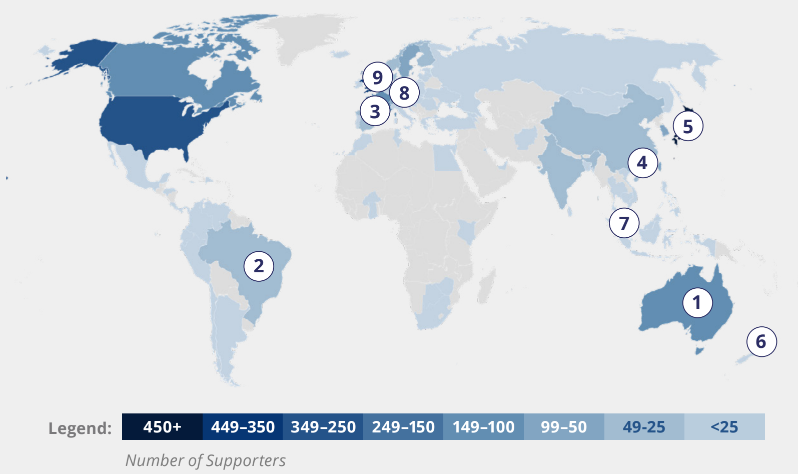
In 2017, the industry-led Task Force on Climate-related Financial Disclosures released recommendations for more effective, voluntary disclosure of climate-related risks and opportunities. Global support for the TCFD in the private sector, including consistently increasing investor demand for TCFD-aligned reporting, has driven steady progress on the disclosure of climate-related information since 2017.

Over the past few years, the Task Force has seen significant momentum by governments and regulators to embed its recommendations into policy and guidance and move toward requiring TCFD or TCFD-aligned disclosures through legislation and regulation. A summary of selected recent public sector announcements is shown in Figure A1. The Task Force believes the increased focus on its recommendations by governments and regulators around the world has accelerated TCFD-aligned disclosure at international, national, and regional levels.

This section provides an overview of public- and private-sector developments supporting the TCFD framework since the Task Force issued its previous status report in October 2020.

Figure A1

Geographic Distribution of TCFD Supporters



Top Five Countries by Number of Supporters

Japan	527
United Kingdom	384
United States	345
Australia	125
France	117

Developments in Various Jurisdictions

1 **Australia**
April 2021: The Australian Prudential Regulatory Authority published TCFD-aligned draft guidance on managing climate risks

2 **Brazil**
September 2021: The Central Bank of Brazil issued TCFD-aligned disclosure rules for regulated institutions

3 **European Union**
April 2021: The European Commission issued a proposal that included the development of sustainability reporting standards based on existing frameworks, including the TCFD

4 **Hong Kong**
July 2021: The Hong Kong Monetary Authority issued draft guidance indicating authorized institutions should make TCFD-aligned disclosures

5 **Japan**
June 2021: The Tokyo Stock Exchange issued a revised Corporate Governance Code, indicating certain companies should enhance disclosure based on TCFD recommendations

6 **New Zealand**
April 2021: New Zealand introduced a bill that would require mandatory TCFD-aligned disclosure for the financial sector

7 **Singapore**
August 2021: The Singapore Exchange Regulation proposed a road map for mandatory TCFD-aligned disclosure

8 **Switzerland**
June 2021: Switzerland's Financial Market Supervisory Authority amended disclosure rules for banks and insurers to include climate-related financial risks, based on TCFD

9 **United Kingdom**
2020–2021: Several UK regulators issued rules and proposals for TCFD-aligned disclosure

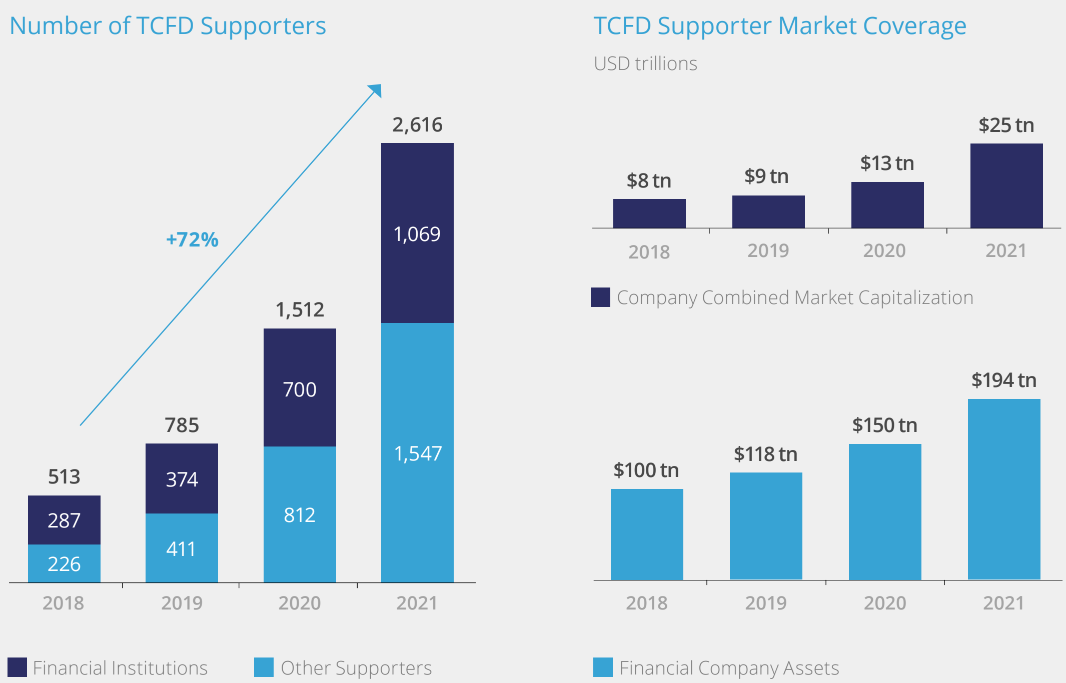
SUPPORT FOR TCFD RECOMMENDATIONS CONTINUES TO GROW

Support for the TCFD recommendations has accelerated over the past year.[11] Since October 2020, over 1,000 additional organizations have become TCFD supporters, bringing the supporter count to over 2,600 globally.[12] TCFD supporters now represent 89 countries and jurisdictions.

Organizations supporting the TCFD span nearly all sectors of the global economy with a combined market capitalization of over \$25 trillion — a 99% increase since last year. This includes 1,069 financial institutions, responsible for assets of \$194 trillion, as shown in Figure A2.

Figure A2

Continued Growth in Support for the TCFD



[11] Importantly, not all organizations that support the TCFD recommendations implement them. Some organizations express support by convening their members and facilitating consistency in implementation, while others — such as governments and regulators — express support by encouraging or requiring companies and other organizations to implement the recommendations.

[12] Figures based on TCFD supporter data since October 2020, with data correct as of October 6, 2021.

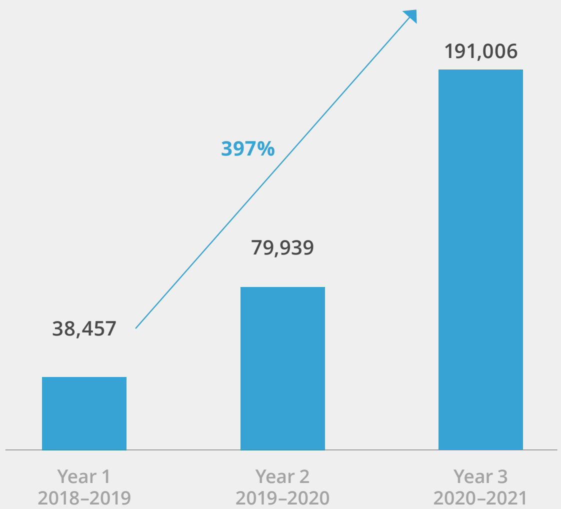
Reflecting the momentum behind the TCFD, online visits to the Climate Disclosure Standards Board's (CDSB's) TCFD Knowledge Hub have increased by nearly 400% since the Hub was launched in 2018 (Figure A3). The Knowledge Hub provides online resources useful to organizations in understanding and implementing the TCFD recommendations.

Figure A3

TCFD Knowledge Hub

The TCFD Knowledge Hub has received nearly 200,000 unique visitors over the last year. Visits originated in over 180 countries and jurisdictions, although nearly 40% of all visits were from the United Kingdom and the United States. Additionally, TCFD Knowledge Hub online course completions reached nearly 10,000 completions in only two years since the course was released in 2019.

Annual Visitors to the TCFD Knowledge Hub



Country/Jurisdiction	Users	% Users
United Kingdom	62,699	20.36%
United States	58,033	18.84%
Canada	16,356	5.31%
Australia	13,937	4.52%
Germany	11,847	3.85%
Ireland	11,164	3.62%
Japan	10,393	3.37%
India	10,161	3.30%
France	8,290	2.69%
Hong Kong	8,078	2.62%

CDSB, TCFD Knowledge Hub

1. GOVERNMENT AND REGULATORY EFFORTS

Over the past year, a range of public sector entities in various jurisdictions have announced intentions to require climate-related reporting through policy, guidance, legislation, or regulation. This section summarizes government announcements and regulatory developments that are driving disclosure of information in line with the Task Force's recommendations.

Brazil: In April 2021, the Central Bank of Brazil (BCB) issued a public consultation on rules for the disclosure of social, environmental, and climate-related risk management by institutions of the National Financial System (SFN). The BCB indicated the proposed rules were "inspired" by the TCFD recommendations and would be implemented in two phases. In September 2021, the BCB issued final disclosure rules for regulated institutions addressing aspects of governance, strategy, and risk management (first phase). The second phase will include quantitative aspects, such as metrics and targets, to be disclosed in a defined and consistent manner to better allow for comparability.

[13] The main types of financial institutions included in the SFN are banks, credit unions, investment promotion agencies, finance and investment companies, and leasing companies. See BankTrack, *An Introduction to the Brazilian Banking Sector and its Sustainability Practices*, pp. 6–8.

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European Union: In April 2021, the European Commission (EC) issued a proposed Corporate Sustainability Reporting Directive that would amend existing reporting requirements to include a broader range of companies and require sustainability reporting according to standards to be developed by the European Financial Reporting Advisory Group.[14] The EC noted that the reporting standards should take into account existing standards and frameworks, including the TCFD framework.

"The Commission supports initiatives by the G20, the G7, the Financial Stability Board and others to develop a baseline of global sustainability reporting standards that would build on the work of the Task Force on Climate-related Financial Disclosures."

– European Commission, April 21, 2021

Hong Kong: In December 2020, Hong Kong's Green and Sustainable Finance Cross-Agency Steering Group (Steering Group), established and co-chaired by the Hong Kong Monetary Authority and Securities and Futures Commission (SFC), announced that TCFD-aligned disclosures "will be mandatory" across relevant sectors by 2025. The regulators announced that they will "increase the coverage of mandatory disclosure as soon as practicable."[16]

In July 2021, the Hong Kong Monetary Authority issued draft guidance indicating authorized institutions (i.e., banks, restricted license banks, and deposit-taking companies) should make climate-related disclosures aligned with the TCFD recommendations.

New Zealand: In September 2020, New Zealand's Minister for Climate Change announced government plans to make climate-related financial disclosures mandatory for certain publicly listed companies and large insurers, banks, and investment managers and that reporting would be against a standard developed in line with the TCFD recommendations. In April 2021, the Financial Sector (Climate-related Disclosure and Other Matters) Amendment Bill (bill) was introduced to Parliament. One of the bill's main elements is requiring large listed issuers, large registered banks and other deposit takers, large licensed issuers, and large managers of managed investment schemes to make climate-related disclosures. If passed, the legislation would enter into force within 12 months after receiving Royal assent.

"Reporting will be based on the Task Force on Climate-related Financial Disclosures (TCFD) framework, which is widely acknowledged as international best practice."

– Hon. Dr. David Clark and Hon. James Shaw, New Zealand Parliament, April 13, 2021

Switzerland: In December 2020, Switzerland's Federal Council indicated the authorities should "prepare the binding implementation of the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) by Swiss companies in all sectors of the economy." The Federal Council also advised Swiss companies to apply the TCFD recommendations immediately. In January 2021, Switzerland became an official supporter of the TCFD.

In August 2021, the Federal Council instructed the Federal Department of Finance and other federal units to prepare a consultation on mandatory climate reporting by large Swiss companies by summer 2022. The Federal Council noted several parameters of such a consultation, including the binding implementation of the TCFD recommendations.

- **Swiss Financial Market Supervisory Authority (FINMA):** In June 2021, FINMA amended its "Disclosure – banks" and "Disclosure – insurers" circulars to include the disclosure of climate-related financial risks. FINMA noted that it based its disclosure rules on the recommendations of the TCFD and that the amended circulars would enter into force on July 1, 2021, for large banks and insurance companies.

United Kingdom (UK): In November 2020, the UK's Chancellor of the Exchequer announced the UK's intention to mandate climate disclosures by large companies and financial institutions by 2025, "[g]oing further than recommended

[14] On June 25, 2020, the European Commission issued a request for technical advice mandating EFRAG to undertake preparatory work on possible EU non-financial reporting standards under a revised NFRD. In March 2021, EFRAG published two documents guiding the development of a comprehensive set of EU sustainability reporting standards, including integration of the TCFD recommendations.

[15] In December 2019, Hong Kong Exchanges and Clearing Limited published *Updated Environmental, Social and Governance Reporting Guide and Related Listing Rules*, requiring listed companies to disclose ESG information, effective on July 1, 2020.

[16] See "Cross-Agency Steering Group Launches its Strategic Plan to Strengthen Hong Kong's Financial Ecosystem to Support a Greener and More Sustainable Future."

by the Taskforce on Climate-related Financial Disclosures." As part of the Chancellor's announcement, HM Treasury released an *Interim Report* from the UK's Joint Government-Regulator TCFD Task Force and a *Roadmap towards mandatory climate-related disclosures*. The Roadmap set out an indicative pathway for making TCFD disclosures mandatory, as summarized in Figure A4.

- **UK Financial Conduct Authority (FCA):** In December 2020, the FCA introduced new rules for companies with a UK premium listing to disclose climate-related risks and opportunities in line with the TCFD recommendations on a comply or explain basis. In June 2021, the FCA published further proposals to extend TCFD-aligned disclosure requirements to issuers of standard listed equity shares and introduce TCFD-aligned disclosure requirements for asset managers, life insurers, and FCA-regulated pension providers. The latter proposed regulation would be introduced via a "phased implementation approach" and cover 98% of assets under management in both the UK asset management market and held by UK asset owners.

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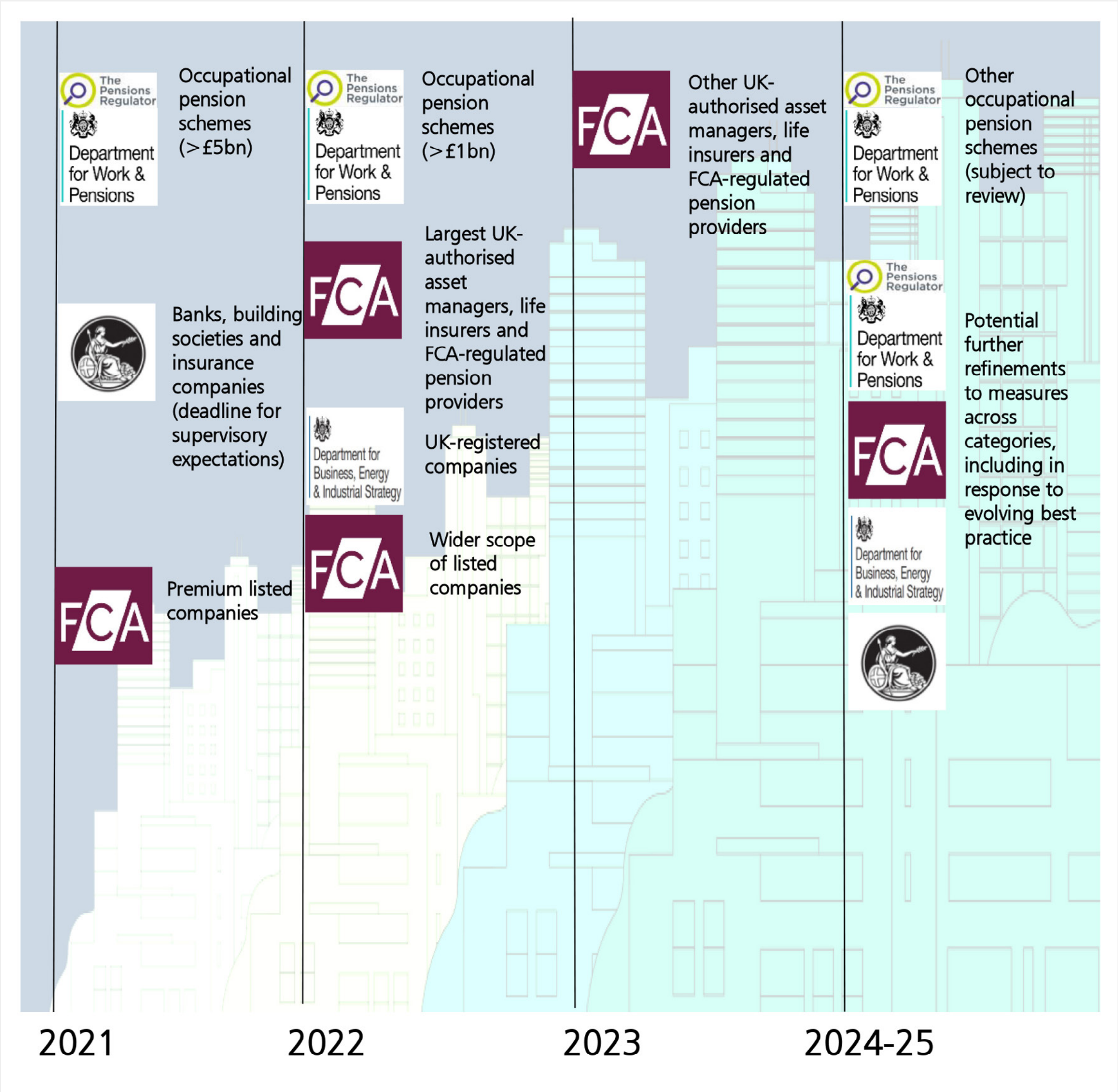
Figure A4

UK Roadmap Towards Mandatory Climate-Related Disclosures



HM Treasury, A roadmap towards mandatory climate-related disclosures, November 2020, p. 5

- **UK Department for Business, Energy, and Industrial Strategy (BEIS):** In March 2021, BEIS launched a public consultation on proposals to require mandatory TCFD-aligned disclosures from publicly quoted companies, large private companies, and Limited Liability Partnerships (LLPs).

- **UK Department for Works and Pensions (DWP):** In June 2021, DWP proposed legislation to Parliament that would require UK occupational pension scheme trustees to assess and publicly disclose climate-related risks in line with the TCFD recommendations. The regulations would affect trustees of schemes with at least £5 billion ($7.1 billion) in assets from October 1, 2021, and be extended to a £1 billion ($1.2 billion) threshold from October 1, 2022. The proposed regulations are subject to Parliamentary debate.

"Come 2023, the vast majority of (UK) assets will be invested with pension scheme trustees, asset managers, and insurers who are disclosing climate-related financial risks and opportunities in line with the recommendations by the Task Force on Climate-related Financial Disclosures (TCFD)."

– Guy Opperman MP, July 2, 2021

Australia: In April 2021, the Australian Prudential Regulatory Authority published a consultation on draft guidance for banks, insurers, and superannuation trustees on managing the financial risks of climate change. The draft *Prudential Practice Guide CPG 229 Climate Change Financial Risks* (CPG 229) is aligned with the TCFD recommendations and is expected to be finalized before the end of 2021.

Canada: In April 2021, Canada published its *2021 Federal Budget* and included multiple stipulations related to TCFD alignment, particularly related to its Crown Corporations.[17] Canada further pledged to "engage with provinces and territories, with the objective of making climate disclosures, consistent with the Task Force on Climate-related Financial Disclosures, part of regular disclosure practices for a broad spectrum of the Canadian economy."[18]

Denmark: In October 2020, Denmark declared its support for the TCFD, urging companies to commit to TCFD-aligned climate disclosure as a means to building a more resilient financial system. Following the declaration, Minister for Industry, Business, and Financial Affairs Simon Kollerup expressed: "I am very pleased that so many Danish companies have already implemented the recommendations from The Task Force on Climate-related Disclosures (TCFD) because it will contribute to more transparent and consistent reporting on climate-related risks and opportunities."

France: In December 2020, following the five-year anniversary of the Paris Agreement, the 40 largest French companies listed on the CAC40 index declared their support for the TCFD. An official statement of support was signed by multiple government officials and demonstrated French commitment to building a more climate-resilient financial system through enhanced, TCFD-aligned disclosures.

"The official support of the big French companies for the recommendations of the Task Force on Climate-related Disclosures bears witness to the fact that they consider climate as vital for the sustainability of their business. They must continue to promote the use of good practices and to onboard the entire supply chain towards the goal of carbon neutrality set by the President of the Republic."

– Bruno Le Maire, French Minister of Economy, Finance, and the Recovery, December 12, 2021

Germany: In May 2021, the German Finance Ministry published a sustainable finance strategy. Within the publication, the federal government states that "the recommendations of the TCFD are an important element of uniform global standards for sustainability reporting," pledging to "promote (the TCFD) at the G7 and G20 level."

Ireland: In November 2020, Irish Finance Minister Paschal Donahue publicly endorsed the TCFD recommendations, stating that the government is "actively encouraging greater

[17] Crown corporations are defined as wholly owned federal or provincial organizations that are structured like private or independent companies. See the *Canadian Encyclopedia* for more details. The "Treasury Board Secretariat List of Crown corporations" includes 47 Crown corporations, accessed July 2021.

[18] Government of Canada, *Budget 2021: A Recovery Plan for Jobs, Growth and Resilience*, April 19, 2021, p. 175.

take-up" among Irish firms. To support government efforts, Sustainable Finance Ireland has initiated a campaign modeled off the Japan TCFD Consortium platform to accelerate Irish firms' commitment to the TCFD framework.

Italy: In March 2021, the Commissione Nazionale per la Societa' e la Borsa (Consob), Italy's public authority responsible for regulating the Italian securities market, announced formal support for the TCFD recommendations. As part of the institute's strategy aimed at developing a more sustainable economy in line with the EU commitments, "Consob encourages companies to voluntarily adopt the recommendations of the TCFD," among other activities.

Japan: In May 2021, Japan's Financial Services Agency, Ministry of Economy, Trade, and Industry, and Ministry of the Environment released their final *Basic Guidelines on Climate Transition Finance*. The guidelines include several references to the TCFD framework; for example, "[i]t is possible to disclose transition strategies and elements concerning the governance guaranteeing that the execution of transition strategies is in alignment with the reporting frameworks such as the Recommendations of the Task Force on Climate-Related Financial Disclosures."

Malaysia: In February 2021, Malaysia's Joint Committee on Climate Change announced its intention to support "the voluntary implementation of climate-related disclosures that are aligned with the TCFD Recommendations" and proposed various work streams focused on industry take-up, resource development, stakeholder engagement, and building technical capacity.

Norway: In May 2021, the Norwegian Finance Ministry announced Norway's official support for the TCFD. In a joint press release with the Nordic CEOs for a Sustainable Future and the Oslo Stock Exchange, Jan Tore Sanner, Norway's Minister of Finance, reflected that "in 2019, the Norwegian Government endorsed the TCFD recommendations and communicated an expectation that large companies disclose climate-related information in line with the TCFD framework. Today, we reiterate our endorsement by becoming an official supporter of the TCFD."

Russia: In July 2021, the Bank of Russia published recommendations for public joint-stock companies to disclose ESG-related information, recognizing that "an assessment of ESG risks is necessary, since over time they can be transformed with a high degree of probability into financial risks." The recommendations were developed based on both the TCFD framework and GRI standards.

Singapore: In December 2020, the Monetary Authority of Singapore (MAS) issued final *Guidelines on Environmental Risk Management for Banks*, *Guidelines on Environmental Risk Management for Asset Managers*, and *Guidelines on Environmental Risk Management for Insurers*. The guidelines outline that financial institutions' disclosure should be in accordance with well-regarded international reporting frameworks, such as recommendations by TCFD. In June 2021, MAS released its inaugural sustainability report and announced that all banks, insurers, and asset managers in the city-state are expected to make TCFD-aligned climate disclosures from June 2022.

- **Green Finance Industry Taskforce (GFIT):** In May 2021, Singapore's GFIT, convened by the MAS, published *Financial Institutions Climate-related Disclosure Document (FCDD)*, an implementation guide for climate-related disclosures for financial institutions. The document adopts the TCFD's recommendations as "the guiding framework for disclosure."

South Korea: In May 2021, South Korea's Financial Services Commission (FSC), along with 13 other relevant institutions, declared official support for the TCFD. Vice Chairman of the FSC Doh Kyu-sang stated that "[f]ollowing the TCFD recommendations, we hope that corporate disclosures of climate-related financial data will help transform our society into a sustainable and low carbon economy and help us build a more stable financial system."

"Following the TCFD recommendations, we hope that corporate disclosures of climate-related financial data will help transform our society into a sustainable and low carbon economy and help us build a more stable financial system. To this end, we declare our support for the TCFD and its recommendations and pledge that each institution will work to take the following measures."

– **Korean Financial Services Commission,**
May 24, 2021

United States of America: Several federal and state initiatives are underway in support of the TCFD in the United States, as outlined here.

- **U.S. Commodity Futures Trading Commission (CFTC):** In September 2020, the CFTC's Climate-Related Market Risk Subcommittee released a report titled *Managing Climate Risk in the U.S. Financial System*, issuing 53 recommendations to mitigate the risks to financial markets. The report urges regulators to "build from existing standards that provide industry-specific climate disclosure recommendations, for example, those developed by the TCFD," among other frameworks, and to "consider the TCFD recommendations" for governance and risk management disclosure rulemaking.

- **U.S. Securities Exchange Commission (SEC):** In March 2021, the SEC launched a public consultation regarding potential regulation of climate risk disclosure, highlighting the TCFD as an international reporting framework for regulatory consideration. In April 2021, during a speech to the International Institute of Finance, U.S. Treasury Secretary Yellen committed to working with the SEC to promote consistent climate-related financial disclosures and noted that the TCFD framework provides a strong foundation for climate risk reporting. In July 2021, the results of the SEC's public consultation revealed strong support for mandatory climate-related disclosure and the TCFD framework as the recommended basis for such disclosure.

- **New York State Department of Financial Services (NYDFS):** In September 2020, the Superintendent of Financial Services announced several actions by New York State Department of Financial Services to bolster commitment to addressing financial risks from climate change. DFS expects New York insurers to start developing their approach to climate-related financial disclosure and consider engaging with TCFD and other initiatives when doing so. The department will begin an examination process in 2021 to develop this strategy.

- **State of California:** In April 2021, California State Senator Stern (later joined by Senator Wiener) introduced legislation, bill SB 449, that would require California-based business entities with over $500 million in annual revenue to annually disclose their climate-related financial risks in accordance with the TCFD recommendations. Since then, E2, a coalition of 2,600 California business leaders, and a coalition of institutional investors with more than $88 billion in assets under management have sent letters in support of SB 449 to the California State Legislature.

2. INTERNATIONAL STANDARD SETTING

Several international standard setters working to develop sustainability standards have stated intentions to draw from the TCFD recommendations to promote harmonization across global climate-related reporting practices.

"The alliance": In December 2020, a group of five leading sustainability reporting organizations, comprising the Carbon Disclosure Project (CDP), Climate Disclosure Standards Board (CDSB), Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and International Integrated Reporting Council (IIRC), published a prototype for a global comprehensive reporting system for climate-related financial disclosure.[19] The prototype outlines a shared vision that integrates both financial accounting and sustainability disclosure and builds on the TCFD recommendations. The use of the TCFD recommendations as a starting foundation is supported by the IFRS Foundation, FSB, and IOSCO, as outlined in Figure A5.

The International Financial Reporting Standards (IFRS) Foundation: In early February 2021, the Trustees of the IFRS Foundation announced their intention to establish an international sustainability standards board within the existing governance structure of the IFRS Foundation, serving to clarify sustainability-related financial standards.

In March 2021, the Trustees published their strategic direction and declared that the proposed board will "build upon the well-established work" of the TCFD and "the alliance" reporting prototype.

Later in March 2021, the Trustees announced a new technical readiness working group to provide recommendations for prototype standards, built on the TCFD recommendations, for its proposed international sustainability

Figure A5

Excerpts of International Organizations' Support for Convergence Around the TCFD

IFRS	The Trustees' proposed sustainability standards board "would **build upon the well-established work of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD).**"
FSB Financial Stability Board	**"The FSB strongly encourages national or regional authorities that are developing requirements or guidance for climate-related disclosures to consider using the TCFD recommendations as the basis."**
CDSB, SASB, GRI, CDP, Integrated Reporting <IR>	"**We have used the four pillars of the TCFD as the basis for the wider set of sustainability-related financial risks and opportunities and to be the foundation** of a Prototype Sustainability-related Financial Disclosure Presentation Standard."
OICU-IOSCO	"IOSCO welcomes a prototype for an **approach to climate-related disclosures that builds on the recommendations of the Task Force of Climate-related Financial Disclosures (TCFD).**"

IFRS Foundation, "Trustees announce strategic direction based on feedback to sustainability reporting consultation"; FSB, "FSB encourages the IFRS foundation and authorities to use TCFD's recommendations as the basis for climate-related financial risk disclosures"; IMP, Reporting on enterprise value climate prototype, p. 17; IOSCO, "IOSCO sees an urgent need for globally consistent, comparable, and reliable sustainability disclosure standards," p. 1

[19] In June 2021, the Sustainability Accounting Standards Board (SASB) and International Integrated Reporting Council (IIRC) merged to form the Value Reporting Foundation.

standards board. The working group is chaired by the IFRS Foundation, overseen by the International Organization for Securities Commissions (IOSCO), and includes participation by the International Accounting Standards Board (IASB), the TCFD, "the alliance" members, and the World Economic Forum's International Business Council (WEF-IBC).

In April 2021, the IFRS published institutional arrangements for the proposed International Sustainability Standards Board (ISSB).

Financial Stability Board: In December 2020, the FSB welcomed the IFRS Foundation's approach to focus on standards for climate-related financial disclosures. It further encouraged the IFRS Foundation to build on the work of its Task Force on Climate-related Financial Disclosures and to use the TCFD's recommendations as the basis for climate-related financial disclosures.

In July 2021, the FSB published a *Roadmap for Addressing Climate-Related Financial Risks*, laying out a comprehensive plan to address climate-related financial risks and promote international coordination on climate-related policy. The Roadmap highlights the TCFD framework as a foundational baseline standard for promoting globally consistent, comparable, and decision-useful climate-related disclosures. Within the document, the FSB and "other bodies" commit to promoting consistency in national and regional climate disclosure policy using frameworks built on the TCFD recommendations. In addition, the FSB released a report on promoting climate-related disclosures (Figure A6).

"FSB and other bodies will promote consistent approaches among national and regional climate disclosure initiatives, using frameworks based on the TCFD Recommendations for climate-related financial disclosures, in line with domestic legal and regulatory frameworks, as work on the issuance of ISSB standards progresses."

– Financial Stability Board, July 2021

Figure A6

FSB Report on Jurisdictions' Implementation of Climate-Related Disclosure Frameworks

In July 2021, the FSB published a *Report on Promoting Climate-Related Disclosures*, a document outlining high-level guidance to support financial authorities in their development of climate-related disclosure frameworks. Aiming to promote greater consistency in approaches and accelerate progress, the FSB report encourages authorities to use a framework based on the TCFD recommendations across all sectors (non-financial corporates and financial institutions) for climate-related disclosures. It examines current and planned climate-related disclosure practices across all 25 FSB member jurisdictions and provides case studies with examples of jurisdictions' approaches to implementing climate-related disclosure frameworks. The case studies examine strategies, mechanisms, and tools used by financial authorities to implement both mandatory and voluntary disclosure regimes in the United Kingdom, European Union, Japan, Hong Kong, and Brazil.

International Organization for Securities Commissions (IOSCO): In late February 2021, IOSCO publicly endorsed the IFRS Foundation's proposed international sustainability standards board and welcomed "the alliance" prototype "as a potential basis for the ISSB to develop climate-related reporting standards." The statement explicitly approved of the use of the TCFD recommendations within the prototype.

In June 2021, IOSCO released a *Report on Sustainability-related Issuer Disclosures*, outlining the work of its Sustainable Finance Taskforce (STF) on improving corporate issuers' sustainability-related disclosures. Among other topics, the STF engaged with asset managers and corporate reports to determine how effectively TCFD-aligned disclosure standards would meet investors' needs.[20] The report

[20] In support of its *Report on Sustainability-related Issuer Disclosures*, IOSCO's Sustainable Finance Taskforce engaged with a sample of approximately 60 asset managers across 19 jurisdictions to determine how asset managers use sustainability-related information provided by corporate issuers. See p. 13 for more details.

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supported the TCFD framework and climate-related disclosure standards based on the TCFD recommendations, including the IFRS ISSB.[21]

Finance Ministers and Central Bank Governors of the G7: In June 2021, the Finance Ministers and Central Bank Governors of the G7 released a communiqué announcing their support of "moving toward mandatory climate-related financial disclosures that provide consistent and decision-useful information for market participants and that are based on the recommendations of the TCFD, in line with domestic regulatory frameworks."

Finance Ministers and Central Bank Governors of the G20: In July 2021, the Finance Ministers and Central Bank Governors of the G20 released a communiqué committing to "work to promote implementation of disclosure requirements or guidance, building on the FSB's Task Force on Climate-related Financial Disclosures (TCFD) framework, in line with domestic regulatory frameworks, to pave the way for future global coordination efforts." The statement further welcomed the TCFD-aligned IFRS ISSB work program and FSB Roadmap.

3. STOCK EXCHANGE DEVELOPMENTS

The TCFD recommendations have seen traction among stock exchanges globally, with some entities incorporating TCFD-aligned disclosure into their listing requirements or guidance.

Singapore Stock Exchange (SGX): In August 2021, the Singapore Exchange Regulation proposed a road map for mandatory TCFD-aligned disclosure. Starting in 2022, all issuers would be required to adopt TCFD-aligned reporting on a comply or explain basis. Disclosure would become mandatory in 2023 for companies in key industries including finance and transportation, and in most industries in 2024. Public consultation on the proposed road map ended on September 27, 2021.

Tokyo Stock Exchange (TSE): In June 2021, TSE published a revised Corporate Governance Code (the Code) based on the proposals made by Japan's Council of Experts Concerning the Follow-up of Japan's Stewardship Code and Japan's Corporate Governance Code. Under revised Securities Listing Regulations, the Code requires certain listed companies to enhance the quality and quantity of climate-related financial disclosures based on the TCFD recommendations, with effect from June 11, 2021.[22]

United Nations Sustainable Stock Exchanges (SSE) Initiative: In July 2020, the SSE Initiative created a Climate Disclosure Advisory Group and launched a new workstream to develop guidance to assist stock exchanges in developing TCFD-aligned reporting guidance for issuers. The project was conducted under the direction of the UN Special Envoy for Climate Action and Finance, Mark Carney, in collaboration with Advisory Group Co-Chairs, London Stock Exchange Group (LSEG), and Johannesburg Stock Exchange. In June 2021, the SSE Initiative published its final *Model Guidance on Climate Disclosure: A template for stock exchanges to guide issuers on TCFD implementation*, citing the TCFD as "current best practice for climate-related disclosure."

London Stock Exchange (LSEG): In February 2021, LSEG pledged to embed the TCFD recommendations within its new *Environmental, Social and Governance guide*, mandating that all listed companies commit to TCFD-aligned financial reporting. The LSEG has officially supported the TCFD and encouraged issuers to report against the recommendations since 2017.

Oslo Stock Exchange (Oslo Børs): In May 2021, Oslo Børs declared official support for the TCFD recommendations. Øivind Amundsen, CEO of Oslo Børs and member of the Managing Board at Euronext, stated that Oslo Børs "encourages our listed companies to implement the recommendations of the TCFD. Transparent and consistent climate-related disclosure is critical in order to effectively mobilize private capital towards a greener and more climate-resilient economy."

[21] IOSCO reports that "most of the asset managers conveyed that the TCFD's recommendations are the framework they would like to see universally applied for climate-related disclosures. In several cases, asset managers have called for mandatory reporting based on the TCFD Recommendations." See p. 13 of the *Report on Sustainability-related Issuer Disclosures* for more details supporting asset managers' endorsement of mandatory TCFD-aligned disclosure.

[22] The "Prime Market" will be a newly introduced market for companies that have higher standards of governance and are committed to sustainable growth and medium-to-long-term enhancement of corporate value, with a focus on constructive dialogue with investors. Prime Market–listed companies are estimated to account for over 90% of Japan's listed companies on a market capitalization basis.

4. INVESTOR AND INDUSTRY-LED INITIATIVES

Numerous industry-led initiatives have driven support for and implementation of the TCFD recommendations over the past year, several of which are summarized below.

Climate Action 100+: The CA100+ Net-Zero Company Benchmark assesses the performance of the world's largest corporate greenhouse gas emitters against 11 sustainability-related indicators, including measuring TCFD alignment.[23] Despite a rise in net-zero commitments, the inaugural 2020 CA100+ Net-Zero Company Benchmark revealed limited progress on climate transition.

Group of Thirty: In October 2020, the Group of Thirty, a group of economic, financial, and academic leaders, released a report calling for businesses, governments, and the financial community to mandate climate risk disclosure in line with the TCFD recommendations by 2030.

Institute of International Finance (IIF) and United Nations Environment Programme Finance Initiative (UNEP FI): In September 2020, the IIF and UNEP FI, together with EY, jointly published a *TCFD Report Playbook* to serve as a resource for organizations throughout the various stages of developing TCFD-aligned climate disclosure.

Investment Association (IA): In May 2021, the IA, a coalition of UK-based investment managers with over £7.7 trillion AUM, published an open letter outlining key measures they believe G7 nations should adopt, including a commitment to "implementing mandatory economy-wide reporting on international Task Force on Climate-related Financial Disclosures (TCFD) reporting agreed by national regulators."

Maple 8: In November 2020, the CEOs of Canada's eight largest pension plan investment managers, informally known as "Maple 8," issued a joint public statement calling for SASB- and TCFD-aligned disclosure from all listed companies. Specifically, Maple 8 cited an "obligation to disclose material climate-related risks and opportunities to financial markets to provide financially relevant, comparable, and decision-useful information" in line with the TCFD framework.

Nordic CEOs for a Sustainable Future: In May 2021, Nordic CEOs for a Sustainable Future declared support for the recommendations of the TCFD. In accordance with this declaration, group members pledged to report aligned to the TCFD recommendations starting from the reporting year of 2021 — and committed to urging other Nordic companies to follow suit. The group further developed a guide, *Climate Risk Management, a Guide to Getting Started*, to support other Nordic countries throughout the TCFD implementation journey.

"As the first regional group to mobilize behind the TCFD, the Nordic CEOs for a Sustainable Future are further catalyzing (TCFD) adoption in Europe and globally. I look forward to discussing Nordic companies' leadership in this space and what we have left to accomplish."

– **Mark Carney, Finance Advisor for COP26 and UN Special Envoy for Climate Action and Finance,** May 21, 2021

The Investor Agenda: In June 2021, the seven Founding Partners of The Investor Agenda released the "2021 Global Investor Statement to Governments on the Climate Crisis," calling on all world governments to accelerate and strengthen climate-related policy action in support of a net-zero transition by 2050. The statement specifically urges governments to "commit to implementing mandatory TCFD-aligned climate disclosure" and was signed by 457 investors representing $41 trillion in assets.[24]

"We, therefore, call on all governments in 2021 to [c]ommit to implementing mandatory climate risk disclosure requirements aligned with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations, ensuring comprehensive disclosures that are consistent, comparable, and decision-useful."

– **2021 Global Investor Statement to Governments on the Climate Crisis,** 2021

[23] This is shown through Disclosure Indicator 10.

[24] According to IIGCC, the 2021 Global Investor Statement to Governments on the Climate Crisis represents the largest collective assets under management to sign on to a global investor statement to governments on climate change since the first statement in 2009.

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UNEP FI TCFD Banking Programme: In January 2021, Phase III of the UNEP FI TCFD banking pilot commenced. The pilot will "more fully explore climate stress testing, the integration of physical and transition risk assessments, and sector-specific risks and opportunities." In February 2021, the programme released three papers relating to (1) understanding the financial risks of a disorderly transition using climate scenarios, (2) climate transition scenarios for financial professionals, and (3) mapping climate-related financial risk assessment methodologies.

WBCSD: In May 2021, WBCSD concluded its series of sector-specific TCFD Preparer Forums, having worked since 2017 with companies from six sectors — oil and gas, construction, chemicals, electric utilities, automobiles, and food, agriculture, and forest products — to explore their TCFD implementation practices. Implementation reports for each of the six sectors are now published on the WBCSD website. Each report contains examples of good disclosure practice across all the TCFD's recommendations, together with commentary on the challenges associated with disclosure, the opportunities for developing disclosure practice over time, and comments based on informal interactions with small, self-selected groups of investors.

Several TCFD Consortiums have also been initiated or developed over the course of the last year, as outlined in Figure A7.

Figure A7

Spotlight on TCFD Consortiums

Japan:
Throughout 2020–2021, the Japan TCFD Consortium developed *Guidance on Climate-related Financial Disclosures 2.0*, promoted dialogue between users and preparers of climate-related disclosures via the Green Investment Guidance (GIG) Supporters platform, and supported the second annual TCFD Summit.[25]

The Japan TCFD Consortium has achieved measurable success, serving as a model to promote adoption of the TCFD recommendations at the national level.[26] Accordingly, some jurisdictions have initiated development of their own TCFD Consortiums.

Ireland:
In January 2021, following the Irish Government's public statement of support for the TCFD, Sustainable Finance Ireland initiated a campaign to accelerate Irish firms' commitments to addressing the risks of climate change by reporting in line with the TCFD framework.[27] The campaign "will be using the model of the Japan TCFD Consortium as a template" to drive support for the TCFD.

[25] In May 2019, Japan's Ministry for Economy, Trade, and Industry (METI), Ministry of the Environment (MOE), and Financial Services Agency (JFSA) arranged an industry-led Japan TCFD Consortium — a public-private partnership designed to facilitate dialogues between financial institutions, business corporations, and institutional investors around climate-related financial disclosures recommended by the TCFD.

[26] As of July 2021, the Japan TCFD Consortium comprises 350 companies and has produced three TCFD-specific implementation guides, supported two national TCFD Summits, and driven national support for the TCFD recommendations. Japan has the largest number of TCFD supporters of any country.

[27] Sustainable Finance Ireland is a network of public- and private-sector actors working to advance Ireland's sustainable finance agenda.

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B. State of Climate-Related Financial Disclosures

Since 2018, the Task Force has assessed the evolution and current state of climate-related financial disclosures using artificial intelligence (AI) technology to review public companies' reports. These AI reviews provide helpful insight into the current state and practices of climate-related reporting. For this status report, the Task Force reviewed the reports of 1,651 public companies for the 2018, 2019, and 2020 fiscal year reporting periods.[28] The AI assessed whether the reports included information that appeared to align with one or more of the Task Force's 11 recommended disclosures (Table B1).

The Task Force also reviewed the aggregate reporting of signatories to the Principles for Responsible Investment for the years 2018–2020 to assess disclosures by asset managers and owners (Section B2. TCFD-Aligned Reporting by Asset Managers and Asset Owners).

Table B1

TCFD Recommendations and Supporting Recommended Disclosures

Governance	Strategy	Risk Management	Metrics and Targets
Disclose the company's governance around climate-related risks and opportunities.	**Disclose the actual and potential impacts of climate-related risks and opportunities on the company's businesses, strategy, and financial planning where such information is material.**	**Disclose how the company identifies, assesses, and manages climate-related risks.**	**Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.**
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the company has identified over the short, medium, and long term.	a) Describe the company's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the company to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	b) Describe the impact of climate-related risks and opportunities on the company's businesses, strategy, and financial planning.	b) Describe the company's processes for managing climate-related risks.	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	c) Describe the resilience of the company's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the company's overall risk management.	c) Describe the targets used by the company to manage climate-related risks and opportunities and performance against targets.

[28] The Task Force gratefully acknowledges the work of Richard Cantor, Burcu Guner, Ashit Talukder, Sankalp Gaur, and Diya Sawhny from Moody's Corporation on the AI technology review. Moody's contributed to the contents of this report by developing the artificial intelligence component and providing its results as described in Appendix 2: AI Review Methodology. Moody's contribution has been prepared only for the TCFD. Moody's accepts no liability (including for negligence) to anyone else in connection with the Moody's contents of this report.

1. TCFD-ALIGNED REPORTING BY PUBLIC COMPANIES

This sub-section summarizes the results and key findings from the AI review, as shown in Table B2, as well as the scope and approach used to review the alignment of public companies' reporting for fiscal years 2018, 2019, and 2020 with the Task Force's 11 recommended disclosures. All quoted percentages refer to the sample population, unless otherwise stated.

Table B2

Overview: State of Climate-Related Financial Disclosures

Disclosure increased more between 2019 and 2020 than in any previous year assessed, consistent with global momentum around climate-related reporting. However, progress is still needed, with only 50% of companies reviewed disclosing in alignment with at least three recommended disclosures.

- Growth has accelerated over the past year from growth of four percentage points between 2018 and 2019 to growth of nine percentage points between 2019 and 2020.
- Reporting in 2020 was at 32% across companies analyzed, based on the average score across the 11 recommended disclosures.

Companies remain more likely to disclose information on their climate-related risks and opportunities (*Strategy a*), than on any other recommended disclosure, with over half of the companies reviewed including such information in their 2020 reports.

Disclosure of the resilience of companies' strategies under different climate-related scenarios (*Strategy c*), although still the least reported recommended disclosure, encouragingly increased from 5% percent of companies in 2018 to 13% in 2020.

Although the Task Force recommends disclosure of governance regardless of materiality, The Governance recommendation remains the least disclosed recommendation with the two Governance recommended disclosures the second and third least disclosed.

Materials and Buildings companies now lead on disclosure. The average level of disclosure across the 11 recommended disclosures for fiscal year 2020 was 38% for Materials and Buildings companies.

The Insurance industry significantly increased its average level of disclosure by 11 percentage points between 2019 and 2020, and now leads all groups by at least 15 percentage points in disclosure of risk management processes (*Risk Management b*).

Europe remains the leading region for disclosures, with average level of reporting across the 11 recommended disclosures from fiscal year 2020 now at half of European companies assessed. European companies have increased their average disclosure by 15 percentage points since 2019, and now disclose 16 percentage points more than the next closest region.

Scope and Approach

The Task Force reviewed financial filings, annual reports, integrated reports, and sustainability reports of 1,651 public companies from 69 countries across eight industries. Six of the eight industries align with groups highlighted in the Task Force's 2017 report: Banking, Insurance, Energy, Materials and Buildings, Transportation, and Agriculture, Food, and Forest Products.[29] To incorporate other types of companies that may be exposed to climate-related risks, two additional industries were added to the review in 2019 and retained for this year — Technology and Media and Consumer Goods.

For the 2020 status report, the Task Force identified an initial review population of nearly 4,500 public companies across the eight industries based on company size thresholds. Banks and insurance companies were selected for the initial population if their assets totaled $10 billion or more or $1 billion or more, respectively, for the 2019 fiscal year. Companies in all other groups were selected if their annual revenue totaled $1 billion or more for the 2019 fiscal year. Once the initial population was identified, companies that did not have annual reports available for review in all three years were removed from the population to ensure a consistent population of companies and their reporting could be reviewed across all three years. Companies were also removed from the initial population if they did not have annual reports available in English in all three years. This approach resulted in a final review population of 1,701 companies.[30]

For this year's status report, the Task Force started with the 1,701 companies used in the 2020 status report. However, 50 companies from the 2020 review population no longer exist as individual entities or did not have reports available in English for fiscal year 2020. Removing those 50 companies from the review population resulted in a final population of 1,651 public companies for the Task Force's 2021 AI review (Figure B1).

Figure B1
AI Review Population Size

Industry	Number
Banking	282
Insurance	132
Energy	267
Materials and Buildings	404
Transportation	158
Ag., Food, and Forest Products	142
Technology and Media	106
Consumer Goods	160
Total	**1,651**

It is important to note that there were several methodological changes between the 2020 AI review and 2021 AI review. These changes may limit the comparability of the 2021 results to those conducted in 2018–2020. The methodology used to conduct this year's AI review employs deep learning–based natural language models that have been shown to understand meaning and semantic context in text documents.[31, 32] More details about the methodology are provided in Appendix 2: AI Review Methodology.

Findings from Analysis

This section summarizes the results from the Task Force's AI review of companies' 2018, 2019, and 2020 reports for alignment with the Task Force's 11 recommended disclosures.

TCFD-Aligned Reporting Overview

Figure B2 (p. 30) shows the AI review results by year for each of the Task Force's recommended disclosures. Due to the change in the AI technology, the results are not directly comparable to those in the 2020 status report, although they are broadly consistent. Notably, the 2021 AI employed a more stringent methodology for identifying climate-specific language related to governance, resulting in lower percentages for the Governance recommended disclosures than would have resulted from a less targeted approach.

[29] TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures*, June 29, 2017.
[30] TCFD, *2020 Status Report*, September 22, 2020.
[31] Devlin, et al., "Bert: Pre-training of deep bidirectional transformers for language understanding," October 13, 2018 (Revised May 24, 2019).
[32] Wang, et al., "GLUE: A multi-task benchmark and analysis platform for natural language understanding," 2018.

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The level of disclosure varies significantly across the Task Force's 11 recommended disclosures, as does growth rate of disclosure, which ranged from four percentage points to 12 percentage points across the recommended disclosures. The AI review found that disclosure of TCFD-aligned information in 2020 was at 32% across the companies analyzed, based on the average score across the 11 recommended disclosures. Overall, the average level of disclosure increased by 13 percentage points from 2018 to 2020.

Figure B2

TCFD-Aligned Disclosures by Year

Recommendation	Recommended Disclosure	Pt. Change 2018–2020	Percent of Companies That Disclose Information Aligned with TCFD Recommended Disclosures: 2018	2019	2020
Governance	a) Board Oversight	16	9%	13%	25%
	b) Management's Role	9	9%	11%	18%
Strategy	a) Risks and Opportunities	14	38%	42%	52%
	b) Impact on Organization	13	26%	30%	39%
	c) Resilience of Strategy	8	5%	7%	13%
Risk Management	a) Risk ID and Assessment Processes	14	16%	20%	30%
	b) Risk Management Processes	15	14%	17%	29%
	c) Integration into Overall Risk Management	17	10%	17%	27%
Metrics and Targets	a) Climate-Related Metrics	10	34%	40%	44%
	b) Scope 1, 2, 3 GHG Emissions	10	27%	31%	37%
	c) Climate-Related Targets	13	21%	24%	34%

Legend: 2018 2019 2020

Disclosure increased more between 2019 and 2020 than in any previous year assessed, consistent with global momentum around climate-related reporting. This momentum is discussed in further detail in Section A. Initiatives Supporting TCFD. However, progress is still needed, with only 50% of companies reviewed disclosing in alignment with at least three recommended disclosures.

Companies remain more likely to disclose information on their climate-related risks and opportunities (*Strategy a*) than on any other recommended disclosure, with over half of the companies reviewed including such information in their 2020 reports. However, disclosures on companies' processes for identifying, assessing, and managing climate-related risks, and whether those processes are integrated into the company's overall risk management, remain below average. While companies are increasingly disclosing their risks, the processes through which they manage those risks is currently less transparent — although between 2018 and 2020 disclosure increased notably for the three Risk Management recommended disclosures.

Disclosure of the resilience of companies' strategies under different climate-related scenarios (*Strategy c*), although still the least reported recommended disclosure, encouragingly increased from 5% of companies in 2018 to 13% in 2020. While this 8% growth represents a growth rate below the average, given the relatively low starting point of this recommended disclosure, this represents a significant increase of disclosure rates. The percentage of companies disclosing the resilience of their strategies continues to be the lowest of all recommended disclosures. Section C. Disclosure of Financial Impact describes several challenges noted by preparers that relate to implementing elements of this recommended disclosure.

Although the Task Force recommends disclosure of governance regardless of materiality, the Governance recommendation remains the least disclosed recommendation. The two Governance recommended disclosures were the second and third least disclosed of the Task Force's 11 recommendations, with 25% disclosing information on board oversight (*Governance a*), and 18% disclosing information on the role of management (*Governance b*). Disclosure aligned with all three Risk Management recommended disclosures was also below average, despite those recommended disclosures not being subject to a materiality threshold. However, the Risk Management recommended disclosures saw greater increases from 2019 to 2020 than many other areas. Information aligned with five of the six Strategy and Metrics and Targets recommended disclosures was reported at a higher rate than the overall average of 32%, despite being subject to a materiality threshold.

While disclosure of metrics and targets is strong, growth has slowed. Disclosure of *Metrics and Targets a), b)*, and *c)* are all above the overall average. There has also been strong growth in disclosure of *Metrics and Targets c)*, which has increased by ten percentage points since 2019, from 24% to 34%. However, the growth rate of disclosure of climate-related metrics (*Metrics and Targets a*) has slowed, dropping from six percentage point growth from 2018 to 2019 to four percentage point growth from 2019 to 2020. This represents the slowest growth of any of the recommended disclosures over the last year, closely followed by disclosure of Scope 1, Scope 2, and Scope 3 GHG emissions (*Metrics and Targets b*), which increased by six percentage points to 37% disclosure.[33] To support companies in their efforts to disclose in line with the Metrics and Targets recommendation, TCFD this year developed guidance to assist companies with disclosure of climate-related metrics, targets, and transition plans.

[33] Disclosure of *Strategy c)* also increased by six percentage points.

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TCFD-Aligned Reporting in Select Industries

This section summarizes the results of the AI review of 2018, 2019, and 2020 disclosures for the eight industries reviewed. To provide a simple comparison of reporting across the eight industries, Figure B3 shows the average percentage of disclosure across the 11 recommended disclosures by industry for all three years reviewed. Figure B4 (p. 33) shows the breakdown of disclosure percentage for each of the 11 recommended disclosures by industry for fiscal year 2020 reporting, and Appendix 3: AI Review Results by Industry includes the breakdown of results by industry and recommended disclosure for all three years reviewed.

Materials and Buildings companies now lead on disclosure. The average level of disclosure across the 11 recommended disclosures for fiscal year 2020 was 38% for Materials and Buildings companies. This group principally leads in disclosure of metrics and targets information, with GHG emissions (*Metrics and Targets b*) being reported at a rate 13 percentage points higher than the next closest group (Agriculture, Food, and Forest Products). Materials and Buildings companies also showed the fastest growth rate in disclosures of any group, with a 17-percentage-point increase in disclosure since 2018.

Different industries prioritize different recommended disclosures. The Insurance industry significantly increased its average level of disclosure by 11 percentage points between 2019 and 2020. The Insurance industry now leads all groups by at least 15 percentage points in disclosure of risk management processes (*Risk Management b*). This is consistent with feedback given to the Task Force on the criticality of climate-related impact assessments to many insurance companies.

While Energy companies disclose second most on average with 36% disclosure, they have the highest disclosure of risks and opportunities (*Strategy a*) at 67%. However, some other industries lead Energy companies in disclosure of metrics and targets, particularly disclosure of GHG emissions (*Metrics and Targets b*), which are disclosed at 36%.

Figure B3
Overview of Disclosure by Industry

Industry	Average % by disclosure year			Pt. change ('18–'20)
	2018	2019	2020	
Materials and Buildings	21	26	38	17
Energy	24	31	36	12
Insurance	22	23	34	12
Ag., Food, and Forest Products	20	21	30	10
Banking	15	20	28	13
Transportation	17	20	26	9
Consumer Goods	15	18	26	11
Technology and Media	11	12	16	5

Groups seen to be less carbon intensive disclose less. Technology and Media companies have made the smallest improvements in disclosures, increasing by five percentage points since 2018. This group now has 16% disclosure on average across the recommended disclosures. As Technology and Media is generally seen as a less carbon-intensive industry than most of the other industries assessed, there is likely less investor pressure on Technology and Media companies to increase their disclosure.

Figure B4

Disclosure by Sector: 2020 Reporting

Recommendation	Recommended Disclosure	Banking (282)	Insurance (132)	Energy (267)	Materials & Buildings (404)
Governance	a) Board Oversight	22%	35%	34%	27%
	b) Management's Role	17%	23%	20%	23%
Strategy	a) Risks and Opportunities	45%	52%	67%	61%
	b) Impact on Organization	35%	36%	47%	49%
	c) Resilience of Strategy	15%	18%	18%	14%
Risk Management	a) Risk ID and Assessment Processes	33%	37%	30%	33%
	b) Risk Management Processes	32%	47%	32%	31%
	c) Integration into Overall Risk Management	29%	39%	31%	29%
Metrics and Targets	a) Climate-Related Metrics	35%	32%	44%	58%
	b) Scope 1, 2, 3 GHG Emissions	27%	30%	36%	52%
	c) Climate-Related Targets	22%	27%	41%	43%

Recommendation	Recommended Disclosure	Trans-portation (158)	Ag., Food & Forest (142)	Technology & Media (106)	Consumer Goods (160)
Governance	a) Board Oversight	23%	17%	6%	20%
	b) Management's Role	15%	13%	8%	16%
Strategy	a) Risks and Opportunities	49%	50%	25%	41%
	b) Impact on Organization	36%	31%	28%	26%
	c) Resilience of Strategy	6%	11%	7%	8%
Risk Management	a) Risk ID and Assessment Processes	25%	28%	12%	23%
	b) Risk Management Processes	22%	25%	8%	21%
	c) Integration into Overall Risk Management	18%	23%	11%	18%
Metrics and Targets	a) Climate-Related Metrics	41%	48%	26%	42%
	b) Scope 1, 2, 3 GHG Emissions	28%	39%	24%	37%
	c) Climate-Related Targets	28%	41%	25%	35%

The numbers in parentheses represent the size of the review population.

Legend: Low to high percentage of disclosure

TCFD-Aligned Reporting by Region

Companies in the AI review population were categorized into five regions based on the location of their headquarters to consider potential regional differences. Similar to the approach taken toward industries, Figure B5 shows average percentage of disclosure across the 11 recommended disclosures by region for all three years reviewed. Figure B6 (p. 35) shows the breakdown of disclosure percentage for each of the 11 recommended disclosures by region for fiscal year 2020 reporting.

Europe remains the leading region for disclosures, with average level of reporting across the 11 recommended disclosures from fiscal year 2020 now at half of European companies assessed.[34] European companies analyzed now disclose 16 percentage points more than the next closest region (Asia Pacific). Europe is particularly prominent in disclosure of metrics and targets information, with disclosure of climate-related targets (*Metrics and Targets c*) being reported at 61%, 36 percentage points higher than the next closest region. Furthermore, 75% of European companies reviewed disclose climate-related metrics (*Metrics and Targets a*). Europe's leadership is likely driven by increasing governmental pressure and requirements, as outlined in Section A. Initiatives Supporting TCFD.

There has been encouraging growth across multiple other regions. Asia Pacific has recorded 15 percentage point growth in disclosure since 2018, now disclosing the second most of any region assessed at 34%. While relatively strong in disclosure of the role of management (*Governance b*) at 23%, ten percentage points higher than the third-strongest region, Asia Pacific companies disclose climate-related targets (*Metrics and Targets c*) at similar levels to other regions, with 25% disclosure.

Figure B5
Overview of Disclosure by Region

Region	Average % by disclosure year			Pt. change ('18–'20)
	2018	2019	2020	
Europe	28	35	50	22
Asia Pacific	19	25	34	15
Latin America	11	18	26	15
Middle East and Africa	10	16	22	12
North America	15	16	20	5

Reporting in Latin America, and the Middle East and Africa, has continued to progress over the past year, with reporting at 26% and 22%, respectively, up from 11% and 10% in 2018. Progress in Latin America has been largely driven by disclosure of risks and opportunities (*Strategy a*), with disclosure at 54%. Potential drivers of increased reporting in Latin America are highlighted in Figure B7 (p. 36).

[34] "Europe" refers to all European countries assessed, not just members of the European Union.

Figure B6

Disclosure by Region: 2020 Reporting

Recommendation	Recommended Disclosure	Asia Pacific (333)	Europe (424)	Middle East and Africa (80)	North America (762)	Latin America (52)
Governance	a) Board Oversight	26%	36%	14%	20%	21%
	b) Management's Role	23%	31%	8%	11%	13%
Strategy	a) Risks and Opportunities	48%	67%	32%	48%	54%
	b) Impact on Organization	39%	50%	26%	35%	31%
	c) Resilience of Strategy	15%	24%	6%	7%	10%
Risk Management	a) Risk ID and Assessment Processes	35%	50%	20%	17%	29%
	b) Risk Management Processes	32%	47%	15%	19%	27%
	c) Integration into Overall Risk Management	32%	41%	11%	18%	21%
Metrics and Targets	a) Climate-Related Metrics	54%	75%	36%	23%	37%
	b) Scope 1, 2, 3 GHG Emissions	42%	64%	26%	21%	25%
	c) Climate-Related Targets	25%	61%	24%	25%	21%

The numbers in parentheses represent the size of the review population.

Legend: Low to high percentage of disclosure

Figure B7

Spotlight: Potential Drivers of TCFD-Aligned Disclosure in Latin America

The Task Force's 2021 AI review demonstrated a rise in TCFD-aligned disclosure throughout Latin America for the 2020–2021 reporting cycle. The following list provides illustrative examples of initiatives that may have contributed to this increase in disclosure.

Mexican Banking Association (ABM):
In 2019, ABM launched a Climate Risk Capacity Building Program, including a "TCFD readiness tool" and other TCFD modules, to support Mexican banks.

Brazilian Federation of Banks (FEBRABAN):
In 2019, FEBRABAN published *Implementing the TCFD recommendations: a roadmap for the Brazilian banking sector* to support banks' TCFD efforts.

Ministry of Finance of Chile:
In 2020, with support from the Inter-American Development Bank (IDB), UNEP FI, UK Embassy, and the Public-Private Working Group on Green Finance of Chile, the Ministry held a series of webinars to educate financial market participants on the TCFD and climate.

Mexican Green Finance Advisory Council (CCFV):
In 2020, Mexico's CCFV issued a request to public issuers to disclose climate-related risks, recommending alignment to the TCFD.

Bank of Mexico (BdeM):
In 2020, BdeM issued recommendations for financial companies to enhance their sustainable finance and ESG-related risk strategies. The recommendations focus on the TCFD as the main framework to manage and report climate-related risks and opportunities.

Central Bank of Brazil (BCB):
In 2020, the BCB announced a new sustainability agenda, including a framework for more transparent climate-related disclosure based on the TCFD recommendations. It will be implemented over two phases, with both phases to be launched by the end of 2022.

Peruvian Securities Commission (SMV):
In 2020, SMV declared support for the TCFD, in line with a commitment to promoting best business practices in the Peruvian securities market.

North American companies' disclosure is at 20% across all companies assessed; however, this is skewed by the large sample of companies included in the analysis (762, versus 52 in Latin America). The sample of North American companies reviewed incorporated a range of company sizes, and had a heavier skew toward Media and Technology companies than in some other regions. When considering all North American companies analyzed, despite 48% disclosure of risks and opportunities (*Strategy a*), metrics and targets in particular are disclosed less than in other regions.

Figure B8 shows the top 50 companies by 2020 revenue of the population analyzed for each region. This view shows North America disclosing second most, at 42% (versus Europe's 68%).

Figure B8
Disclosure by Region: 2018–2020 Reporting for Top 50 Companies by 2020 Revenue by Region

Region	Average % disclosure in 2020
Europe	68
North America	42
Asia Pacific	36
Latin America	27
Middle East and Africa	27

TCFD-Aligned Reporting by Company Size

The Task Force divided the AI review population into thirds to assess results by company size: those with a market capitalization of less than $3.4 billion, those with a market capitalization of $3.4 billion to $12.2 billion, and those with a market capitalization of more than $12.2 billion. Figure B9 shows average percentage of disclosure across the 11 recommended disclosures by company size for all three years reviewed. Figure B10 shows the breakdown of disclosure percentage for each of the 11 recommended disclosures by company size for fiscal year 2020 reporting.

While reporting by the largest companies remained stronger than reporting by smaller companies, fewer than half of the largest companies reviewed are reporting climate-related information in line with the TCFD recommendations. Forty-four percent of companies assessed with a market capitalization in the top third (greater than $12.2B) disclosed information aligned with the TCFD recommendations in 2020. Meanwhile, 20% of companies with a market capitalization in the bottom third (less than $3.4B) disclosed in line with the TCFD recommendations.

Figure B9
Overview of Disclosure by Company Size

Company size	Average % by disclosure year 2018	2019	2020	Pt. change ('18–'20)
>$12.2B Market Cap	29	33	44	15
$3.4B–$12.2B Market Cap	18	22	31	13
<$3.4B Market Cap	10	14	20	10

Disclosure from the largest companies continues to grow the fastest, with a 15 percentage point increase in disclosure since 2018. However, there has been encouraging growth in reporting by companies in the bottom two thirds since 2018 (less than $3.4B and $3.4B–$12.2B market capitalizations), with 13 and ten percentage point growth, respectively.

Figure B10
Disclosure by Market Cap: 2020 Reporting

Recommendation	Recommended Disclosure	<$3.4B Market Cap (540)	$3.4B–$12.2B Market Cap (541)	>$12.2B Market Cap (542)
Governance	a) Board Oversight	12%	24%	39%
	b) Management's Role	10%	18%	27%
Strategy	a) Risks and Opportunities	38%	52%	67%
	b) Impact on Organization	30%	36%	51%
	c) Resilience of Strategy	5%	13%	20%
Risk Management	a) Risk ID and Assessment Processes	16%	31%	42%
	b) Risk Management Processes	17%	30%	41%
	c) Integration into Overall Risk Management	12%	26%	41%
Metrics and Targets	a) Climate-Related Metrics	31%	43%	57%
	b) Scope 1, 2, 3 GHG Emissions	26%	36%	50%
	c) Climate-Related Targets	19%	30%	54%

The numbers in parentheses represent the size of the review population.

Legend: Low to high percentage of disclosure

Examples of Climate-Related Disclosures

This section provides recent examples of reporting aligned with the Task Force's 11 recommended disclosures. These examples were primarily sourced from reports covering the fiscal year 2020 reporting period. The following sub-headings reflect each of the TCFD's 11 recommended disclosures, within the TCFD's recommendations. The examples may not be applicable to all sectors and should be considered within the framework of the sector in which the company operates.

Governance

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

Figure B11 describes the information disclosed by Legal and General Group, regarding how its Board prioritizes, identifies, and reviews climate-related risks and opportunities, as well as its climate-related governing bodies, individual Board roles and responsibilities, and feedback mechanisms.

Figure B11

Example Disclosure: Legal and General Group

Industry: **Asset Managers and Asset Owners**

Board oversight

The Board is ultimately accountable for the long-term stewardship of the Group. Responding to climate change and the risks associated with it are of importance to the Board.

In early 2020 the Group added 'addressing climate change' as one of our six strategic growth drivers, emphasising the importance of climate risk and the opportunities arising from the necessary energy transition.

Throughout the year, the Group CEO Report, divisional CEO Reports and Chief Risk Officer (CRO) Report to the Group Board detailed the challenge of climate change and the new opportunities presented by it, including continued focus on investing in clean energy technologies that support zero-carbon homes and climate-committed cities.

Nigel Wilson, Group CEO, has spearheaded the Group's engagement on a range of climate change and environmental initiatives. Nigel is actively engaged and takes responsibility for the Group's strategic direction and progress on this important topic.

The Group Chief Financial Officer (CFO), who is also a Board member, is responsible for how market risks connected to our investments (including risks arising from climate change) are identified, considered and managed.

The CRO is responsible for ensuring that an appropriate strategy is in place to understand, identify, measure, monitor, control and report risks from climate change in line with the risk strategy and risk appetite parameters set by the Group Board. The CRO also supports business managers in the development of appropriate processes to monitor and report exposures to the risks from climate change.

The Group Board, through the Group Risk Committee (GRC) and Executive Risk Committee (ERC), has delegated oversight of the management of the risks associated with climate change to the Group Environment Committee (GEC).

Legal and General Group Plc, 2020 Climate Report in line with recommendations from the Task Force on Climate-related Financial Disclosures, p. 8
Note: Some content was reformatted in order to fit the page.

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

Figure B12 describes ArcelorMittal management's role in identifying, assessing, and managing climate-related risks and opportunities. It describes specific roles and responsibilities, personnel involved, relevant feedback mechanisms, and how managerial oversight informs group-level and climate change strategy.

Figure B12

Example Disclosure: ArcelorMittal

Industry: **Materials and Buildings**

Section 3 Our opportunities, risks and governance of climate change

3.3 Governance

Appointments, Remuneration, Corporate Governance and Sustainability (ARCGS) committee
Chaired by lead independent director Mr. Bruno Lafont

The ARCGS oversees the implications of sustainable development issues for the company under five sustainability themes, of which one is climate change. Members of the ARCGS are independent and receive regular training on climate change-related issues. Their experience of sustainability has been gained through their leadership roles in the cement, mining and global consulting sectors. The committee is chaired by the lead independent director on the Board, Mr. Bruno Lafont, who has been a board member of the World Business Council for Sustainable Development for three years.

The Committee considers the implications of climate change for the business and oversees the company's strategic planning of resources and investments in response to the risks and opportunities that arise, as well as having oversight of policy and stakeholder trends. It receives regular reports from senior management on stakeholder expectations, the company's low-emissions technology strategy, climate-related policy engagement and carbon performance.

Each year the ARCGS Committee spends time undertaking a deep dive on climate change to ensure they remain updated with the latest science, technology and stakeholder developments. The chair of the ARCGS liaises closely with the chair of the Audit & Risk Committee, and provides a summary of its work on climate change to the full Board.

Audit & Risk Committee
Chaired by non-executive independent director Ms. Karyn Ovelmen

The Audit & Risk Committee ensures that the interests of the company's shareholders are properly protected in relation to risk management, internal control and financial reporting. It oversees both the identification of risks to which the ArcelorMittal group is exposed, via regular senior management reports, and the management response to these risks.

Executive Office
Executive Chairman Mr. Lakshmi N. Mittal, and CEO Mr. Aditya Mittal

The Executive Office works closely with executive officers and members of the Management Committee on key strategic issues.

Group Management Committee
Chaired by Group CEO Mr. Aditya Mittal

The Group Management Committee regularly considers climate-related risks and group-level strategy. Members includes the leaders of all segments and major corporate functions.

Corporate Finance and Tax Committee
Chaired by Mr. Genuino Christino, CFO

The CFTC meets regularly to review the financial performance, tax planning and treasury analysis of the business. It is responsible for introducing policies and controls and implementation of strict policies and procedures to manage and monitor financial market risks. The CFTC approves all corporate finance/funding/treasury files including for example the Revolving Credit ESG facility.

Group Climate Council
Chaired by Mr. Brad Davey, EVP business optimisation

Group Climate Council is responsible for informing and shaping the company's climate change strategy, considering both technology and stakeholder relations. Members of the group include VP government affairs, VP corporate communications and corporate responsibility; VP head of corporate strategy; VP technology strategy; CTO Europe, VP climate action Europe, GM, head of sustainability; CMO Global Automotive.

Investment Allocations Committee
Chaired by CEO Mr Aditya Mittal and Mr. Brad Davey, EVP business optimisation

The Investment Allocations Committee authorises large capex projects, including those designed to deliver carbon and environmental improvements, and reviews CO_2 impact of all proposals. Committee members include EVP and chief financial officer, Mr. Genuino Cristino, chief technical officer, Mr. Pinakin Chaubal, and VP head of corporate strategy, Mr. David Clarke. The IAC reviews the CO_2 impact of all projects as part of the evaluation process.

For decarbonisation projects in particular, investment project concepts are given the green light at executive level as part of the investment strategy discussed at the Climate Investment Strategy Committee. These are then scrutinised at the IAC which, after the launch of our new global targets, will also ensure that no approved project that is not specifically aimed at decarbonisation, will reduce the company's chances of achieving our CO_2 reduction targets.

Group CTO Council
Chaired by Chief Technical Officer Mr. Pinakin Chaubal

The technical council coordinates and oversees progress on the global technology roadmap via regional and project-based committees involving CTO and R&D.

Sustainable Development Council
Chaired by EVP business optimisation Mr. Brad Davey

The Sustainable Development Council ensures that material sustainability issues and progress reports are brought to the attention of the ARCGS, and that guidance from the ARCGS is duly followed up in action plans.

XCarb™ Technical Panel
Chaired by EVP business optimisation Mr. Brad Davey

The purpose of the panel is to review requests from the network to have their products or projects appearing beneath the XCarb™ brand.

ArcelorMittal, Climate Action Report 2, p. 48

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Strategy

a) Describe the climate-related risks and opportunities the company has identified over the short, medium, and long term.

Figure B13 describes Orbia's climate-related risks and opportunities identified over the short, medium, and long term, including details of time horizon, risk type, risk classification, and magnitude of financial impact. It also provides additional details on the scope of time horizon used and quantifies levels of financial impact in terms of EBITDA.

Figure B13

Example Disclosure: Orbia

Industry: **Agriculture, Food, and Forest Products; Materials and Buildings**

2.a Climate-related risks and opportunities identified in the short, medium and long term.

Climate change is a core challenge as Orbia transforms into a future-fit and resilient set of businesses. Each business group regularly develops and adapts their strategy to ensure Orbia's products and solutions address risks and opportunities of climate change.

Risks
As part of our business processes, we continually identify physical and transition risks, quantifying their potential financial impacts and time horizon. Those risks with higher financial impact are prioritized for action. See Table 1 for details.

Opportunities
Further detail of identified opportunities can be seen in Table 2.

Financial impact ranges
NOTE: impact range labels are aligned with categories used in Carbon Disclosure Project reporting and reflect Orbia's reviewed risk management processes

We have 5 levels to define substantive financial impact:

1. High: $50MM or greater USD
2. Medium-High: $37.5MM USD – $50MM USD
3. Medium: $22.5MM - $37.5MM USD
4. Medium-Low: $7.5MM - $22.5MM USD
5. Low: Less than $7.5MM USD

Time Horizons

•Short term: Up to 1 year
•Medium term: 1-4 years
•Long term: 5 years and above

CDP response section C2.1, C2.2, C2.3 and C2.4

Orbia Climate Risk Assessment

Orbia 2020 Sustainability Report:

Risk Management p. 7
Sustainability Approach p. 22
Sustainable Solutions in Practice p. 35

Orbia 2020 Annual Report p. 22, 26, 27, 35, 36, 74, 115

Table 1: Key Climate-Related Risks Identified

TIME HORIZON	RISK TYPE	CLASSIFICATION	RISK DESCRIPTION	MAGNITUDE OF FINANCIAL IMPACT	REFERENCE/ FURTHER DETAILS
Short term	Physical	Chronic	Increased water stress and drought leading to reduced capacity, resulting in decreased revenues.	Low	CDP response section 2.3 Orbia 2020 Annual Report p. 22, 26, 27, 35, 36, 74, 115
	Transition	Policy and Legal	Carbon pricing mechanisms leading to increased direct costs.	Low	
	Transition	Policy and Legal	Mandates on and regulation of existing products and services (e.g. The AIM Act, which was signed into law in Dec. 2020, and directs EPA to establish limits to production and consumption of HFCs in line with the Kigali amendment), leading to reduced demand for products and services and decreased revenues from HFCs.	Medium - Low	
Medium term	Physical	Acute	Increased severity and frequency of cyclones and floods, leading to reduced capacity and decreased production and revenues.	Medium - Low	

Orbia, TCFD Report 2020, pp. 2–3

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

Figure B14 describes the impact of climate-related opportunities on Ford's strategy around use of alternative fuels, electrification, and supply chain. It quantifies relevant commitments and provides specific details related to its strategic planning and partnerships.

Figure B14

Example Disclosure: Ford

Industry: **Transportation**

Sustainability Aspirations	Topic Area	Goals	Progress
Climate Change Achieve carbon neutrality by 2050	Reducing Our Vehicle Footprint	Improve fuel economy across our global vehicle lineup, consistent with regulatory requirements and climate stabilization	• We have committed to science-based emissions targets for our operations and vehicles: – Reduce Scope 1 and 2 greenhouse gas (GHG) emissions by 76 percent by 2035 from a 2017 baseline – Reduce Scope 3 GHG emissions from use of sold products by 50 percent per vehicle km by 2035 from a 2019 baseline • Combined U.S. car and truck fleet corporate average fuel economy improved • We have used our EcoBlue technology and award-winning EcoBoost® technology in millions of engines worldwide • CDP Climate Change questionnaire
		Offer alternative fuel vehicles	• We offer several models powered by ethanol and biodiesel • A wide range of our commercial vehicles run on compressed natural gas (CNG) and liquefied petroleum gas (LPG)
	Electrification	Pursue our electrification strategy	• We are increasing our planned investment in electrification to more than $22 billion through 2025 • We have committed that by mid-2026, 100 percent of our passenger vehicles in Europe will be zero-emissions capable, all-electric or plug-in hybrid, moving to all-electric by 2030. Similarly, our European commercial vehicles will be zero-emissions capable, all-electric or plug-in hybrid by 2024, with two-thirds of Ford's commercial vehicle sales expected to be all-electric or plug-in hybrid by 2030 • Our new electrified models include the all-electric Mustang Mach-E and F-150 PowerBoost Hybrid on sale today, plus the all-electric E-Transit coming late this year and the all-electric F-150 arriving by mid-2022
	Sustainable Operations	Reduce global facility CO_2 emissions by 18 percent (2019–2023)	• We achieved a 40 percent absolute reduction in our global manufacturing carbon footprint since 2011
	Minimizing our Supply Chain Impact	Engage with our supply chain to understand its carbon footprint	• We have surveyed 233 production suppliers (85 percent) using CDP Supply Chain program's Climate Change questionnaire
		Work with selected suppliers to reduce our collective environmental footprint through PACE	• We have shared best practice examples with more than 50 key Tier 1 suppliers through PACE • We have introduced a streamlined version of our supply chain sustainability program, *Fast*PACE, to reach select suppliers in China, India, Thailand and South Africa
Air Attain zero emissions from our vehicles and facilities	Sustainable Operations	Air emissions reductions other than CO2	• We are working to reduce emissions of non-CO2 pollutants, in accordance with increasingly stringent standards around the world • We are working to reduce volatile organic compound (VOC) emissions during the vehicle painting process, using a combination of approaches including abatement, color blocking and improved purge recovery
Energy Use 100 percent local, renewable electricity in all manufacturing by 2035	Sustainable Operations	Achieve 32 percent renewable electricity by 2023 and 100 percent locally sourced renewable electricity by 2035	• Over the past decade, we have achieved a 40 percent reduction in our carbon footprint through improved energy efficiency and conservation at our facilities and in our manufacturing processes • Our Dearborn Truck Plant, Michigan Assembly Plant and several new buildings on our Research and Engineering and Corktown campuses will be powered by 100 percent locally sourced renewable electricity by January 2022 • Our global amount of renewable electricity for 2020 was 29%

Ford, Integrated Sustainability and Financial Report 2021, p. 12

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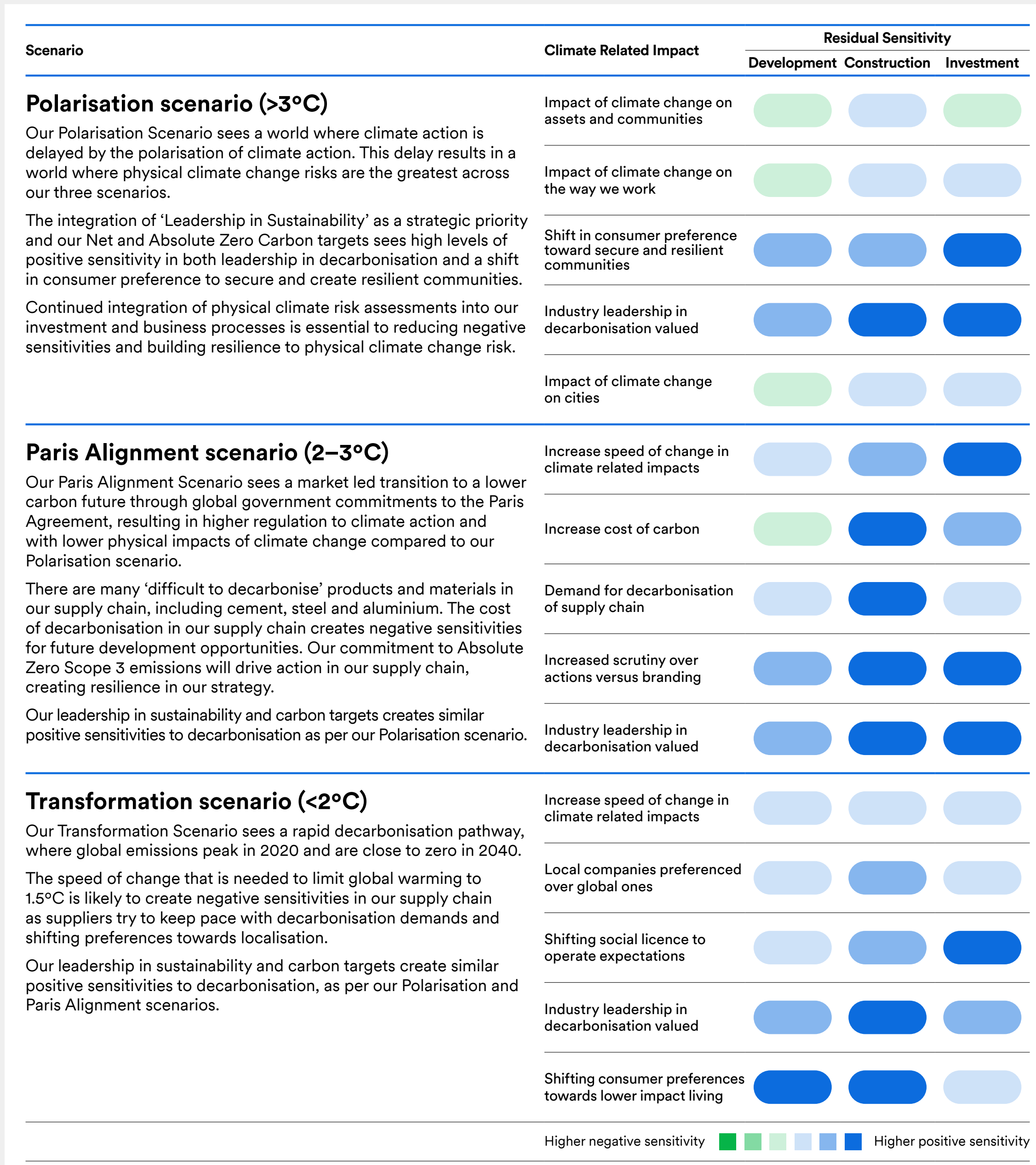
c) Describe the resilience of the company's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

Figure B15 describes Lendlease's planning for potential climate-related scenarios, including sensitivity and types of impact of risks and opportunities. It details various scenarios considered, including a lower than 2°C scenario.

Figure B15

Example Disclosure: Lendlease

Industry: **Materials and Buildings**



Lendlease, Lendlease Annual Report 2021, p. 53

In another example, Figure B16 highlights the impact of two transition risk scenarios — both 2°C or lower — on the risk exposure (i.e., resilience) of Allianz's strategy. It shows various time horizons, asset types, risk levels, and factors that may enhance or mitigate potential risk exposures in order to increase resilience (e.g., policy, technology substitutions, and other market forces).

Figure B16

Example Disclosure: Allianz

Industry: **Insurance Companies, Asset Managers**

Assets and business impact under transition scenarios (source: Allianz, excerpt)

Global		2°C					1.5°C				
		2020	2025	2030	2035	2040	2020	2025	2030	2035	2040
Energy	Integrated oil and gas	(M)	(M)				(M)				T
Energy	Oil and gas storage and transportation										
Energy	Coal and consumable fuels				T, P	T, P				T, P	T, P
Materials	Fertilizers and agricultural chemicals	(T)	(T)	(T)	(T)	(T)	(T)	(T)	(T)	P	
Materials	Aluminium										
Materials	Steel										
Industrials	Industrial conglomerates										
Industrials	Airlines	(T)	P				(T)	P			
Consumer discretionary	Auto components										
Consumer discretionary	Automobiles			P	P, T	T		P	P	P, T	P, T
Utilities	Electric utilities	P	(M)		P	P	P	(M)		P	P
Utilities	Renewable electricity				T	T				T	T

Risk enhancer:
P = policy
T = substitution technology
M = related market forces

Risk mitigator:
(P) = policy
(T) = little substitution technology
(M) = countering market forces

Risk:
Low
Medium
High
Very high

Allianz Group, Sustainability Report 2020, p. 86

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Risk Management

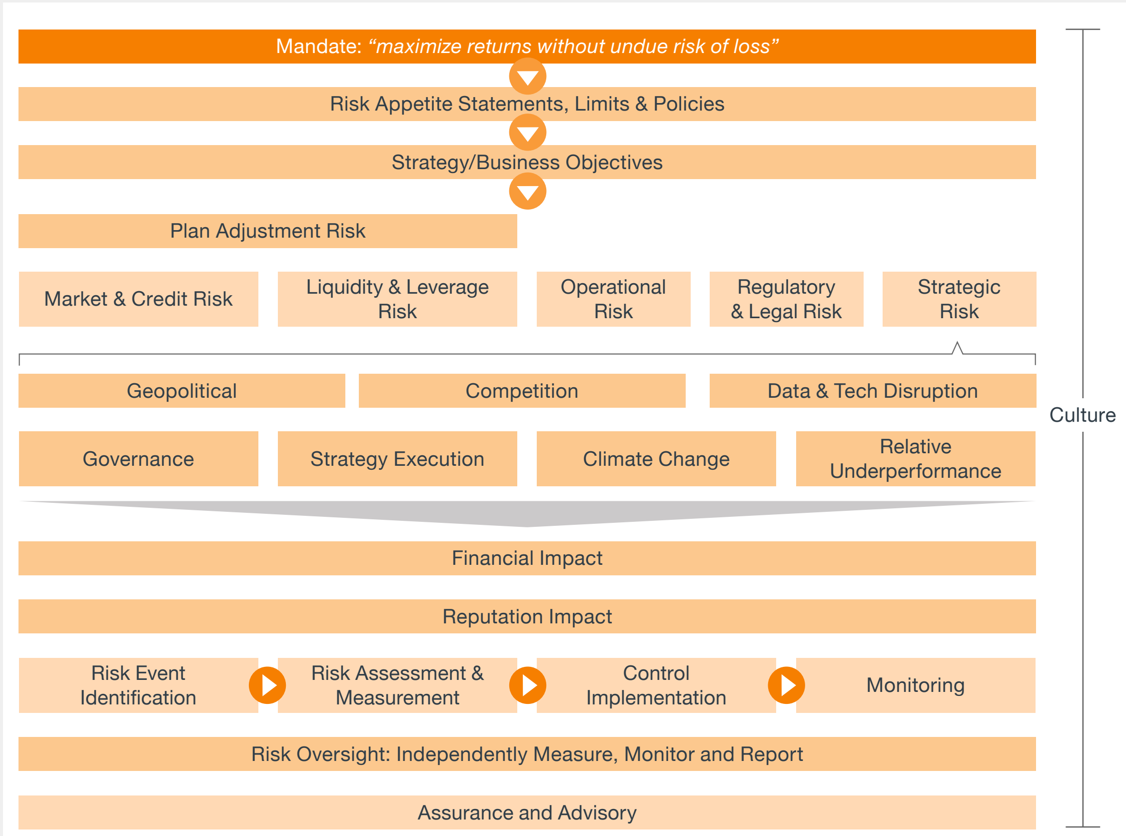
a) Describe the company's processes for identifying and assessing climate-related risks.

Figure B17 describes CPP Investments' processes for assessing climate-related risks, including the relationship between climate risks and other risk types. The framework enables assessment of climate risk in relation to financial and reputational impact.

Figure B17

Example Disclosure: CPP Investments

Industry: **Asset Managers**



CPP Investments, Report on Sustainable Investing 2020, p. 52

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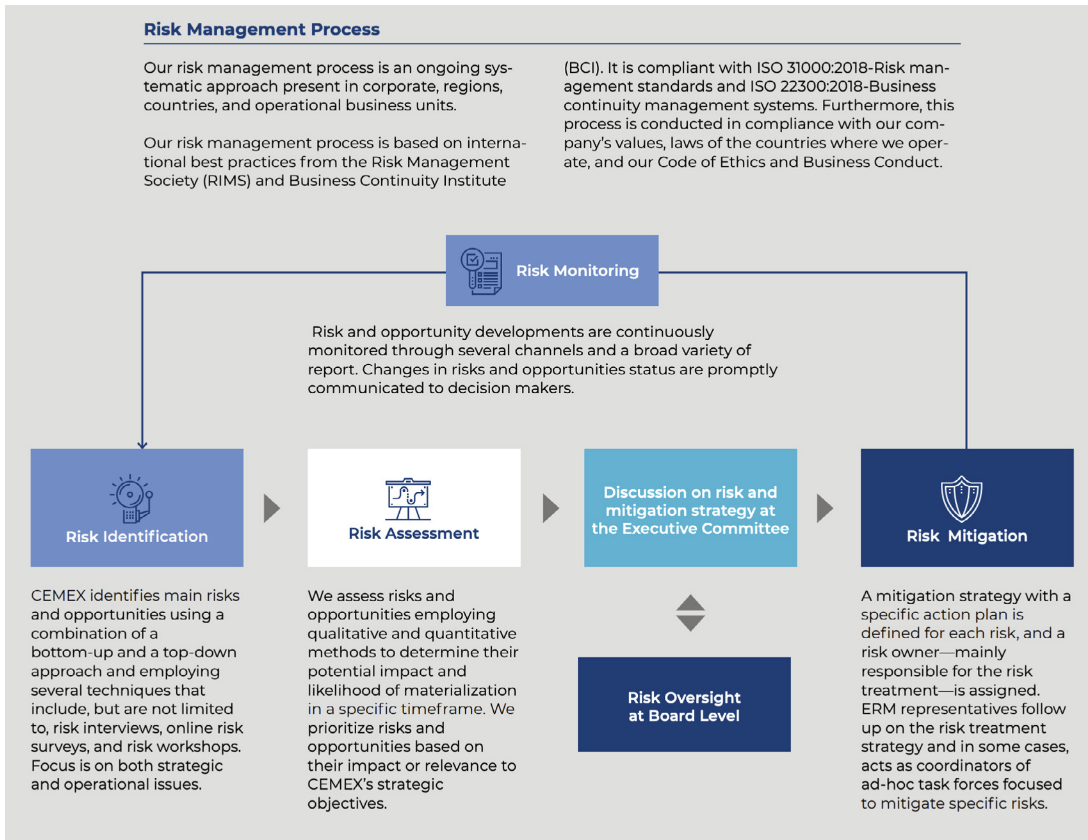
b) Describe the company's processes for managing climate-related risks.

Figure B18 describes Cemex management's role in identifying, assessing, monitoring, and mitigating climate-related risks and opportunities within an overarching Risk Management Process framework.

Figure B18

Example Disclosure: Cemex

Industry: Materials and Buildings



Cemex, 2020 Integrated Report, p. 87

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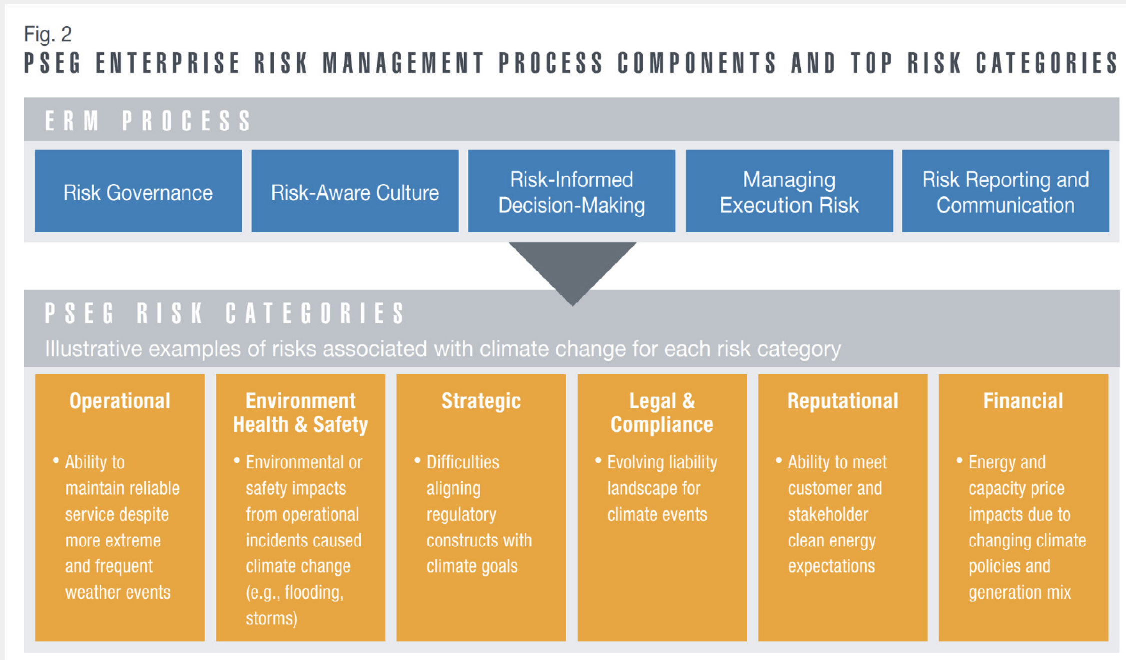
c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the company's overall risk management.

Figure B19 describes how PSEG's processes for identifying, assessing, and managing climate-related risks are integrated into the company's overall enterprise risk management process. It provides illustrative examples of risks associated with climate change for each risk category.

Figure B19

Example Disclosure: PSEG

Industry: **Energy**



PSEG, 2020 Climate Report, p. 16

Metrics and Targets

a) Disclose the metrics used by the company to assess climate-related risks and opportunities in line with its strategy and risk management process.

Figure B20 describes Standard Bank Group's metrics for portfolio segments with elevated climate-related risks. These risks are quantified and divided by risk type, and are shown as a percentage of the company's loan exposure.

Figure B20

Example Disclosure: Standard Bank Group

Industry: **Banks**

Portfolio segments with elevated climate-related risk (as at 31 December 2019)

ZARm As at 31 December 2019	On Balance Sheet Loans and Advances at Amortised Cost [4]	Off Balance Sheet Loan Commitments[5]	Total	% of Total Group Loans and Advances & Loan Commitments[6]
SECTORS WITH ELEVATED TRANSITION RISK				
Coal fired power generation [a]	3191	885	**4076**	0.27%
Coal mining (extractors) [b]	3575	1823	**5398**	0.35%
Oil & Gas (Exploration and Production)	8602	3007	**11609**	0.76%
Oil & Gas (Integrated)	3348	8644	**11992**	0.78%
Oil & Gas (Midstream, Services)	3036	7842	**10877**	0.71%
Oil & Gas (Trading & Retail)	13712	9718	**23430**	1.53%
SECTORS WITH ELEVATED PHYSICAL RISK				
Agriculture [c]	75 062	35 817	**110 879**	7.24%
RENEWABLES SECTOR WHICH REPRESENTS CLIMATE MITIGATION				

Standard Bank Group, TCFD Interim Report 2020, p. 11 (excerpt)

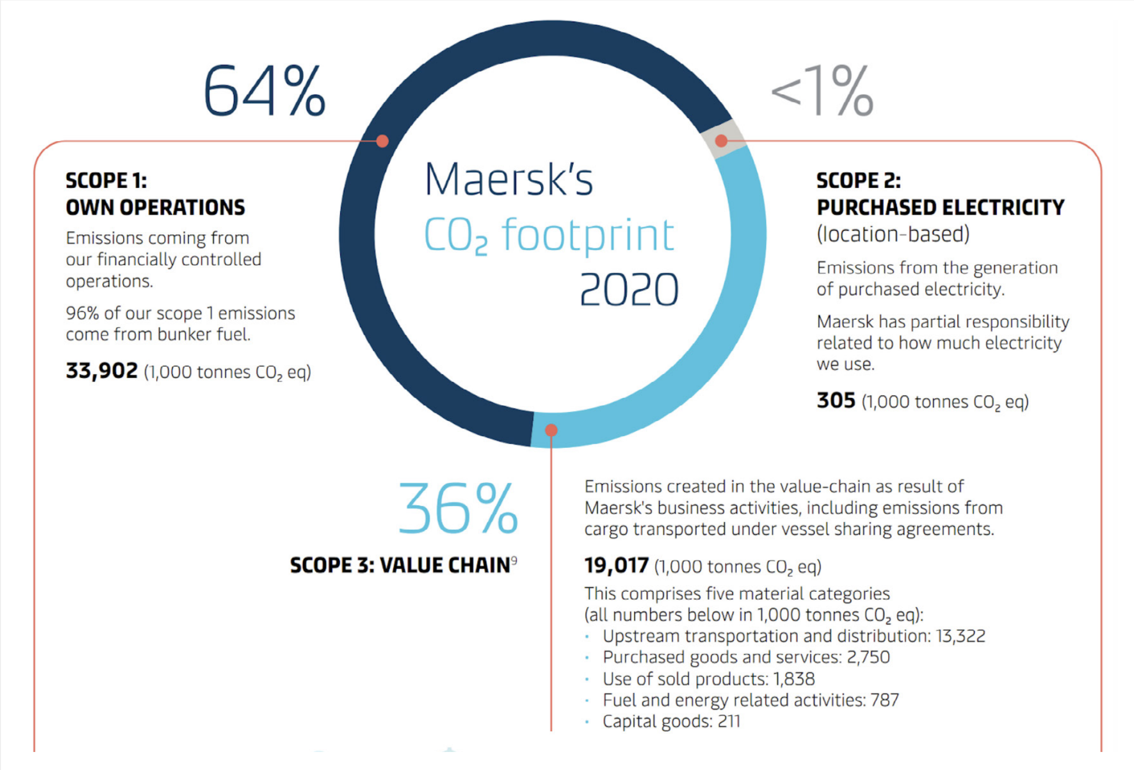
b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.

Figure B21 describes Maersk's Scope 1, Scope 2, and Scope 3 greenhouse gas emissions, represented as carbon dioxide equivalents, as well as sources of primary emissions and estimates of material Scope 3 emissions categories.[35]

Figure B21

Example Disclosure: Maersk

Industry: **Transportation**



Maersk, 2020 Sustainability Report, 2020

[35] Maersk measures CO_2 eq, or "carbon dioxide equivalent," which is defined by the GHG Protocol Corporate Standard as "the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis."

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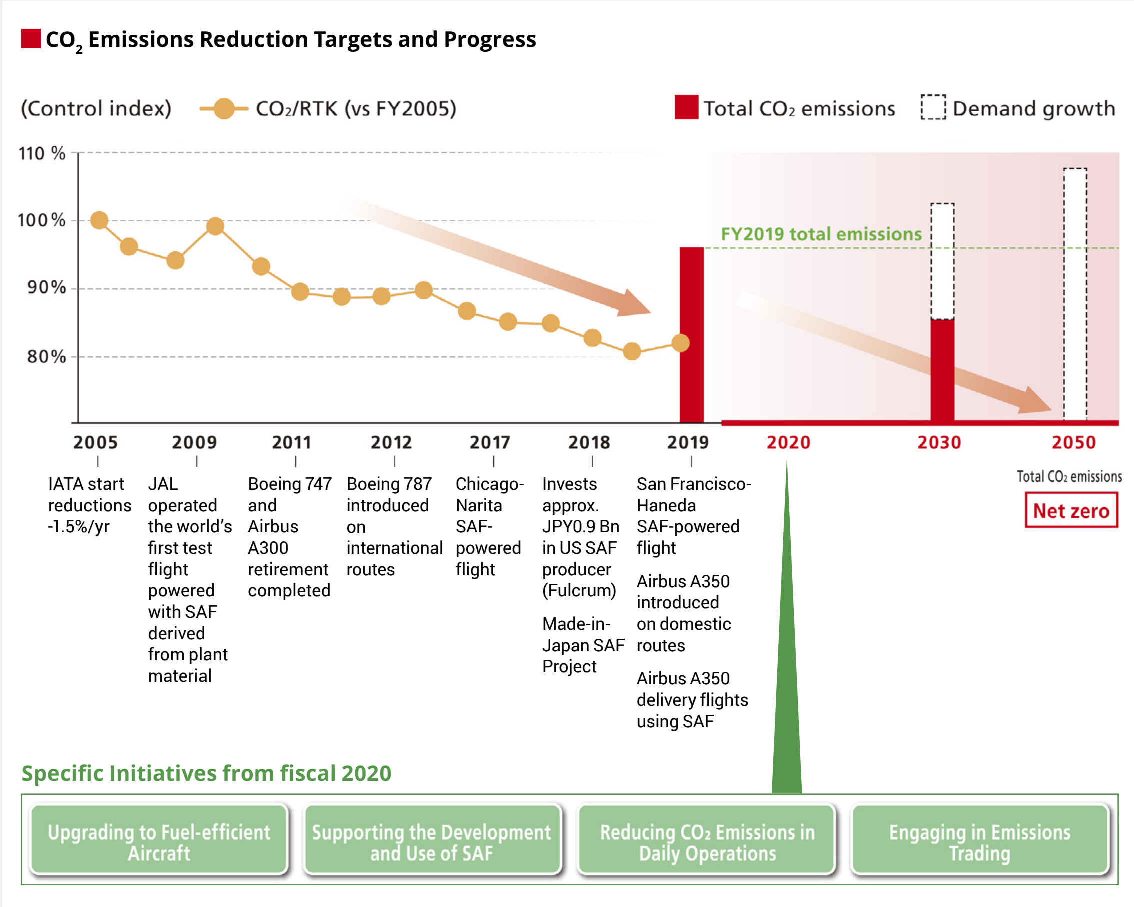
c) Describe the targets used by the company to manage climate-related risks and opportunities and performance against targets.

Figure B22 describes Japan Airlines' CO_2 historical emissions and forward-looking reduction targets. Japan Airlines' disclosure in Figure B23 (p. 51) also includes interim targets and specific initiatives supporting these targets, as well as quantified expenditure deployed toward climate-related risks and opportunities (investment in SAF).[36]

Figure B22

Example Disclosure: Japan Airlines (JAL) Group

Industry: **Transportation**



Japan Airlines (JAL) Group, 2020 Sustainability Report, p. 45

Note: Some content was reformatted in order to fit the page.

[36] Sustainable aviation fuel (SAF) is a common term used by the aviation industry to describe a nonconventional (fossil-derived) aviation fuel. See the International Air Transport Association's *What is SAF?* for more information.

2. TCFD-ALIGNED REPORTING BY ASSET MANAGERS AND ASSET OWNERS

In its 2017 report, the Task Force recommended that companies provide climate-related financial disclosures in their public annual financial filings (or other publicly available corporate reporting). However, the Task Force recognized comparable reporting by asset managers and asset owners to their clients and beneficiaries, respectively, would usually occur in other types of financial reporting. For purposes of adopting the recommendations, the Task Force recommended asset managers and asset owners use their existing channels of financial reporting to their clients and beneficiaries, respectively, and recognized such reporting may not be public.

Given the wide range of reporting channels used by asset managers and asset owners and the lack of a consistent set of public reports in the two industries, the Task Force excluded asset managers and asset owners from the AI review.[37] As a result, the Task Force explored other means of gaining insight on climate-related financial reporting by asset managers and asset owners and ultimately identified their reporting to the Principles for Responsible Investment (PRI) as a possible means for gaining such insight. The Task Force reviewed aggregated reporting results of asset manager and asset owner signatories to the PRI for the 2021 reporting period.[38] PRI signatories are required to report on their responsible investment activities on an annual basis by responding to "indicators" in the PRI reporting framework; a subset of those indicators is aligned with the Task Force's recommendations. Importantly, PRI signatories' responses to the indicators are self-reported and a PRI signatory's responses to indicators aligned with the TCFD recommendations do not imply the signatory meets the recommendations or that the signatory provides TCFD-aligned reporting to its clients or beneficiaries.

Background and Approach

Shortly after the Task Force issued its final recommendations in June 2017, the PRI integrated several climate-related indicators based on the TCFD recommendations and the supplemental guidance for asset managers and asset owners into its 2018 reporting framework. The PRI has made adjustments to its climate-related indicators over the years, including in its 2021 reporting framework.[39]

To use signatories reporting to PRI as a proxy for asset managers' and asset owners' TCFD-aligned reporting, the Task Force mapped specific PRI climate-related indicators to its 11 recommended disclosures for 2021 — where possible — as shown in Appendix 4: PRI Indicators Mapped to TCFD Recommended Disclosures. In mapping the PRI's climate-related indicators to the Task Force's recommended disclosures, we attempted to maintain consistency in the definitions of the PRI indicators mapped to the recommended disclosures between this year and last year. We were able to map one or more PRI indicators to each recommended disclosure with the exception of *Strategy c)*.

For the 2020 reporting period, the PRI made its governance and strategy climate-related indicators mandatory for signatories to report to PRI, but voluntary to disclose publicly. For the 2021 reporting period, the PRI required signatories to report *and* disclose publicly its governance and most of its strategy climate-related indicators.[40] In the following figures on TCFD-aligned reporting, the Task Force distinguishes between indicators that are mandatory for asset managers and asset owners to report and disclose and those that are voluntary.

[37] Based on an assessment of publicly available information by EY, a smaller percentage of asset managers and asset owners disclose TCFD-aligned information compared to companies in other industries. The *2021 EY Global Climate Risk Disclosure Barometer* report found the level of disclosure for asset managers and asset owners to be the lowest of the 11 industries they reviewed.

[38] In an August 2021 article, PRI informed signatories of certain issues related to its new pilot reporting framework used for the 2021 reporting period, including that some signatories' submissions contained data gaps or errors (see PRI's August 2, 2021, "An important update for all signatories on reporting"). The PRI data used in the analysis in this section was not affected.

[39] Adjustments refer to changes to the indicator name, its description, or the associated explanatory notes.

[40] Of its six climate-related indicators mapped to the Strategy recommendation, four are mandatory to report and disclose publicly.

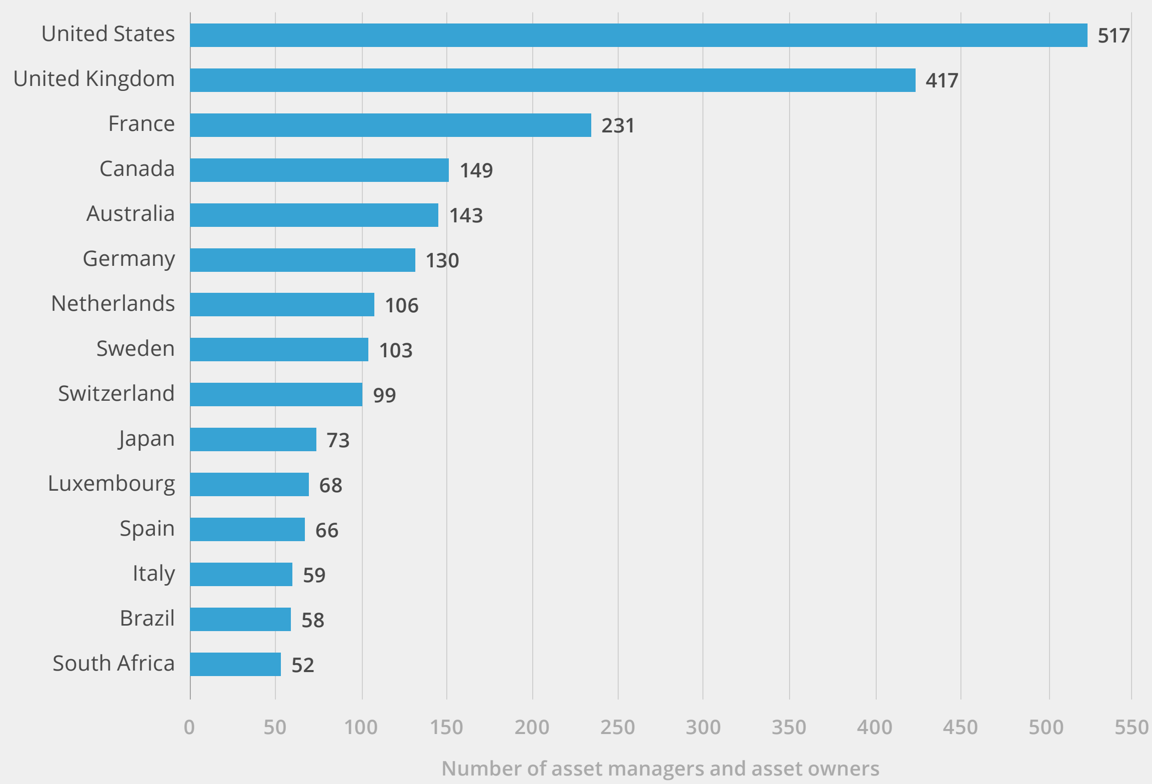
Demographics of PRI Signatories

In the first quarter of 2021, there were 2,720 asset managers and asset owners with $134 trillion in assets under management reporting to PRI on climate-related indicators. This includes 2,182 asset managers and 538 asset owners.[41] In terms of PRI signatories' market coverage, asset manager signatories cover almost 75% of global assets under management by asset managers, and asset owner signatories cover around 24% of global assets under management by corporate and noncorporate pensions, insurance companies, and reserve/sovereign wealth funds.[42]

Geographically, these 2,720 asset managers and asset owners were headquartered in over 60 countries. The geographical spread of the 15 largest countries — based on the number of asset managers and asset owners reporting on PRI climate-related indicators — is shown in Figure B23. The United States has the largest number of asset managers and asset owners reporting to PRI on climate-related indicators, followed by the United Kingdom and France, where the introduction of Article 173 climate and ESG reporting initiative in 2015 may be one of the drivers for the high number of asset managers and asset owners reporting to PRI.[43] These results are broadly in line with the global distribution of asset managers and asset owners, with the largest number of asset managers and asset owners present in the United States with 5,058 as of 2021. In Europe, the largest distribution of asset managers and asset owners is in the United Kingdom with 720 as of 2021.[44] Canada and Australia have 382 and 262 asset managers and asset owners, respectively, as of 2021.

Figure B23

Countries with the Largest Number of Asset Managers and Asset Owners Reporting on PRI Climate-Related Indicators in 2021[45]



[41] Preliminary number, of asset manager and asset owner signatories who reported in 2021, may be subject to change.

[42] Boston Consulting Group, *Global Asset Management 2020: Protect, Adapt, and Innovate*, May 2020; Organisation for Economic Co-operation and Development (OECD), *Global Pension Statistics*; OECD, *OECD Insurance Statistics 2019*, 2020; and IE Foundation, *Sovereign Wealth Funds 2018*, 2019.

[43] Assemblée Nationale, *Session Extraordinaire de 2014-2015*, July 2015.

[44] Custom Search Using *Preqin's Investor Advanced Search*, July 2021.

[45] Preliminary numbers, may be subject to change.

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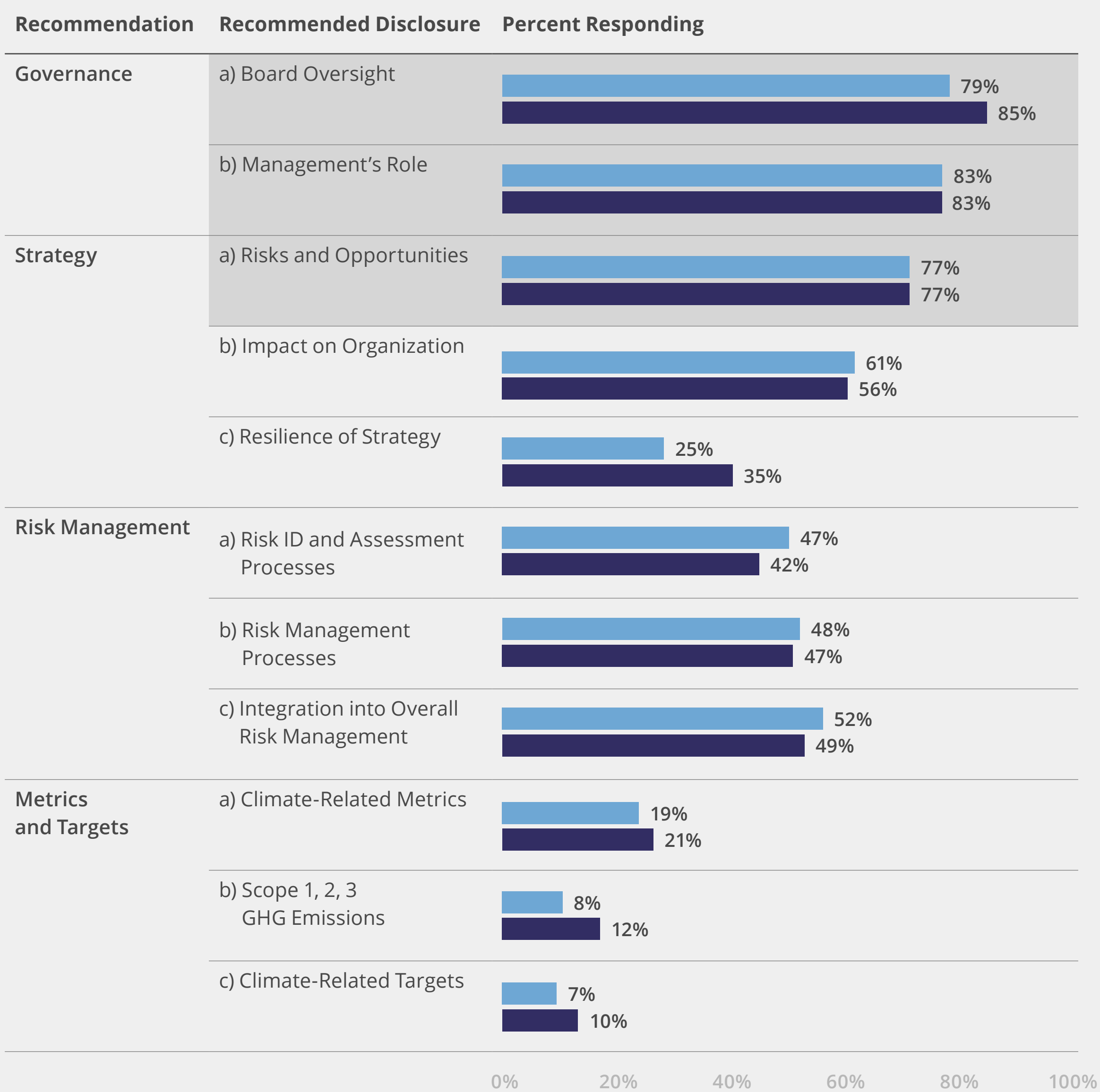
Review of Asset Manager and Asset Owner Reporting to the PRI

Figure B24 shows the response rates by asset manager and asset owner PRI signatories to the indicators mapped to the TCFD recommended disclosures. The percentages shown in Figure B24 are based on the number of asset managers and asset owners that reported on each mapped indicator and the total number of asset managers and asset owners that reported in 2021. For both asset managers and asset owners, the reporting against the PRI indicators for *Governance a)* and *b), Strategy a)* and *b)* and *Risk Management a), b),* and *c)* is considerably higher than for *Metrics and Targets a), b),* and *c)*. According to PRI, the number of asset managers and asset owners who indicated they were using climate-related metrics was three to four times higher (45% of asset managers responding, 52% of asset owners responding) than those who provided additional details on those metrics, such as the assets under management covered, or the methodology used to calculate the metric. In addition, PRI indicated quantitative information

Figure B24

Asset Manager and Asset Owner TCFD-Aligned Reporting to PRI



Base size: 2,182 asset managers, 538 asset owners

Asset manager · Asset owner · Mandatory PRI indicator

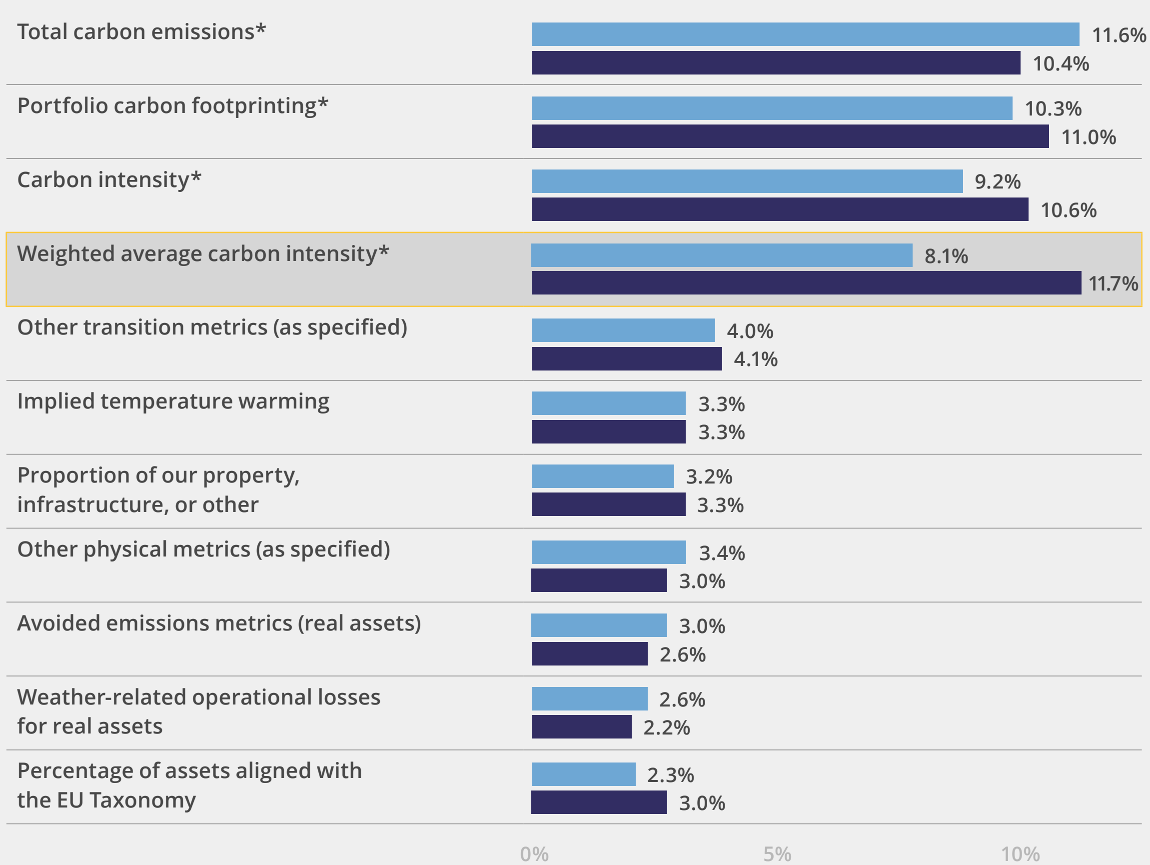
— such as metrics and targets — is more challenging to report and is generally disclosed less than narrative reporting.

In its 2020 status report, the Task Force described the low levels of reporting of the metric it recommended asset managers and asset owners disclose for *Metrics and Targets* recommended disclosure *b)* — the weighted average carbon intensity (WACI).[46] In fact, the Task Force highlighted that the WACI metric had the lowest percentage of responses across four different carbon footprinting metrics for each of the three reporting periods reviewed (2018–2020). Interestingly, for the 2021 reporting period, the WACI metric had the highest percentage of responses across the same four carbon footprinting metrics for asset owners, as shown in Figure B25. For asset managers, however, the WACI metric continued to have the lowest percentage of responses across the carbon footprinting metrics.

This year, PRI included some of the emerging alignment metrics ("implied temperature warming" and "proportion of assets aligned with the EU Taxonomy") in its answer options providing an indication of the number of asset managers and asset owners that have started to report using these metrics to PRI.[47]

Figure B25

Percentage of Asset Managers and Asset Owners Indicating Use of Metrics to Manage Climate-Related Issues



Base size: 2,182 asset managers, 538 asset owners
*Carbon footprinting metrics

Asset manager Asset owner

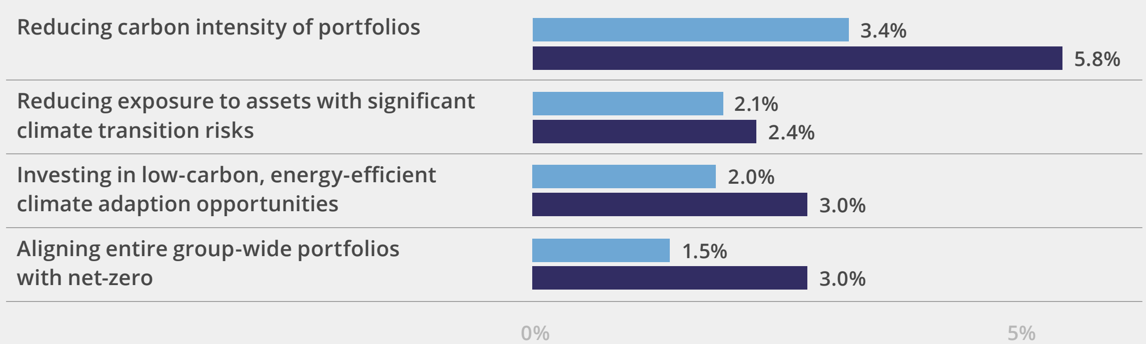
[46] TCFD, *2020 TCFD Status Report*, 2020, p. 23, and *2017 TCFD Annex*, pp. 37 and 41–42, Supplemental Guidance on the Financial Sector, for *Metrics and Targets* recommended disclosure *b)* for Asset Owners and Asset Managers.

[47] "Implied temperature warming" refers to estimates of global temperature rise associated with the greenhouse gas emissions of a single entity or a selection of entities (See *TCFD Forward-Looking Financial Sector Metrics Consultation*, p. 18), and "Proportions of assets aligned with the EU Taxonomy" measures the degree to which an issuer is performing taxonomy-aligned asset management activities (See "Testing the taxonomy: insights from the PRI Taxonomy Practioners Group").

With respect to climate-related targets, Figure B26 shows that the number of asset managers and asset owners reporting different types of climate-related targets to PRI is fairly low, with most climate-related targets having response rates of only 2%–3% of PRI signatories. “Aligning entire group-wide portfolios with net-zero” is the lowest target for asset managers; while “reducing exposure to assets with significant climate transition risks” is the lowest for asset owners.

Figure B26

Percentage of Asset Managers and Asset Owners Indicating Use of Climate-Related Targets



Base size: 2,182 asset managers, 538 asset owners
*Carbon footprinting metrics

Asset manager   Asset owner

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C. Disclosure of Financial Impact

While climate change affects nearly all economic sectors, the level of exposure and the impact of climate-related risks differ by industry, geography, and organization.[48] Furthermore, the financial impacts of climate-related risks and opportunities on organizations are not always clear or direct, and, for many organizations, identifying the issues, assessing their financial impacts, and ensuring that these are appropriately reflected in organization reporting may be challenging.

Despite challenges, the financial impact of climate-related risks and opportunities on an organization is critical decision-useful information that investors, lenders, and insurance underwriters seek to understand. The Task Force's recommendations solicit a range of disclosures that can inform users' assessments of an organization's financial performance over time. Better disclosure of climate-related financial implications—which enables effective pricing of climate-related risks and opportunities and efficient allocation of capital — is a key goal of the Task Force's work.

Fundamental to pricing risks, including climate-related risks, is the accurate and timely disclosure of actual impacts on organizations' financial performance and position. In addition, given the unprecedented nature of climate change, organizations' disclosure of potential impacts is equally important in assessing an organization's exposure to climate-related risks and opportunities. The Task Force's Strategy recommendation addresses disclosure of both actual and potential impacts associated with climate change, including financial impacts.

However, the Task Force's annual assessments of reporting have found few descriptions of the *potential* impacts of climate change. The Task Force's AI analysis (Section B. State of Climate-Related Financial Disclosures) showed that *Strategy c)* is disclosed the least out of the 11 recommended disclosures with only 13% of organizations analyzed disclosing. Given the importance of such disclosure, the FSB requested that the TCFD "undertake further analysis on the extent to which companies describe the financial impact of climate-related risks and opportunities."

To better understand current disclosure of financial impacts of climate-related risks and opportunities, the Task Force solicited preparer perspectives on reporting financial impact, including associated challenges and lessons learned, and user perspectives on current uses of financial impact disclosures and ways to improve their usefulness. In addition, the Task Force analyzed the results of the Task Force's consultation on the proposed guidance on disclosure of climate-related metrics, targets, and transition plans. Key findings from the analysis are described in Table C1 (p. 57). In addition, several examples of disclosures are included to demonstrate some approaches in current reporting.

The Task Force hopes that these insights will help to identify key areas requiring further work, and will drive progress in the development of methodologies and processes for assessing and disclosing financial impact.

[48] The Task Force uses the term "organizations" when referring to a broad range of entity types.

Table C1

Key Findings

Preparer Perspectives on Financial Impact of Climate-Related Risks and Opportunities

At least one in five preparers that responded to the Task Force's consultation disclose financial impact, with disclosure of impact on *financial performance* more common than impact on *financial position.*

- Twenty percent of preparers currently disclose impact on financial performance, while 14% disclose impact on financial position, according to the consultation.
- Disclosures vary from qualitative, directional information for potential longer-term financial impacts to more specific, quantitative financial plans and project budgets in the shorter term and actual financial values booked in the current period.
- More than 40% of organizations are currently estimating, but not yet disclosing, or planning to estimate financial impacts.

Preparers interviewed reported disclosing potential financial impacts more often than actual impacts.

- Organizations most commonly disclose potential financial impacts of transition risks based on their strategy and supporting financial plans, supported by the use of scenario analysis.
- Disclosure of actual impacts is rarer; organizations interviewed highlighted that the main challenge of estimating actual financial impact is effective attribution to climate-related events, as financial effects may have multiple drivers beyond climate.
- Potential financial impacts are most often disclosed in sustainability reports, while actual impacts are often disclosed in annual reports or captured within notes of financial statements.

The process of estimating financial impacts can lead to improved internal and external communication, according to findings from preparer interviews.

- Preparers disclosing financial impact often observe improved engagement with investors, lenders, and insurance underwriters.
- The process of conducting financial impact analysis can improve communication among business and financial decision-makers, and sustainability teams.

Lessons learned from interviews with preparers offer a path forward for organizations earlier on in their journey:

- Enhanced data gathering strategies are critical to enable effective assessment of financial impact.
- Allocating sufficient resources to assessing financial impact helps timely development of decision-useful information.
- Overcoming institutional siloes enables more effective collaboration and alignment on assumptions and methodologies used for estimating financial impact.
- Once financial impact has been estimated, approval from relevant internal stakeholders, including legal teams, is generally required when making public disclosures.

User Perspectives on Financial Impact of Climate-Related Risks and Opportunities

Over nine out of ten consultation respondents identified as users find disclosure of financial impacts useful.

- Active investors in particular leverage disclosure of actual and potential financial impacts for financial impact assessments.
- Some users conduct their own “outside-in” financial impact analysis and compare the outcomes with that disclosed by preparers, frequently furthering stewardship interactions.

Rating agencies stated that climate-related information is an increasingly important input into their financial impact assessments, informing the rating process.

- For example, credit rating agencies may consider rising costs of the climate-related transition or exposure to mortgage-backed securities with high concentration in areas of heightened natural disaster risk as a part of their credit rating process.
- These users find value in preparers disclosing financial impact information in order to not be solely subject to an “outside-in” view of the impact of climate-related risks and opportunities on their financial performance and position.

Users have highlighted several areas that would improve the usefulness of information disclosed on financial impact to support decision-making, including:

- amount of expenditure or capital investment currently deployed toward climate-related risks and opportunities;
- amount of expenditure or capital investment to be deployed to meet targets for addressing climate risks and opportunities, often disclosed in transition plans; and
- interconnected reporting linking qualitative disclosures with their actual and potential financial impact.

1. APPROACH

The Task Force drew from a range of sources to better understand disclosure of financial impact as well as associated challenges and uses. As described in Table C2 (p. 59), the primary sources of information were manual disclosure reviews, interviews with users and preparers of disclosures, and a consultation conducted by the Task Force. The Task Force reviewed the public disclosures of 25 organizations in various industries and jurisdictions that had experience with assessing financial impact associated with climate-related risks and opportunities (Figure C1, p. 59). The Task Force then interviewed representatives from the 25 organizations, including individuals who could provide perspective on challenges related to preparing climate-related disclosures and how to address those challenges, and individuals who could provide insight on how disclosures are used in financial decision-making and the usefulness and quality of current reporting.[49]

In addition, the Task Force interviewed three organizations that work closely with users and preparers and reviewed several other available assessments of climate-related disclosures that address financial impact. Finally, the Task Force solicited input from several credit and insurance rating agencies on how climate-related information is taken into account within their ratings, which serve as important inputs for a variety of economic decisions.

The Task Force also held a public consultation from June 7 to July 18, 2021, on its proposed guidance on disclosure of climate-related metrics, targets, and transition plans. The consultation included questions for preparers about their disclosure of financial impact, including impacts on their financial performance and financial position, and questions for users about the usefulness of financial impact disclosures. In total, the consultation received over 240 survey responses and letters, with 205 respondents identifying as users or preparers of disclosure. The survey was publicly available, and also distributed to TCFD supporters, representatives of NGOs, and business association partners, as well as being shared through TCFD’s social media pages, so it is important to note that most survey respondents were familiar with the Task Force’s work.

[49] The Task Force interviewed two individuals from one organization to obtain both a user and a preparer perspective. Therefore, while 25 disclosures were reviewed, 26 user and preparer interviews were conducted.

Table C2

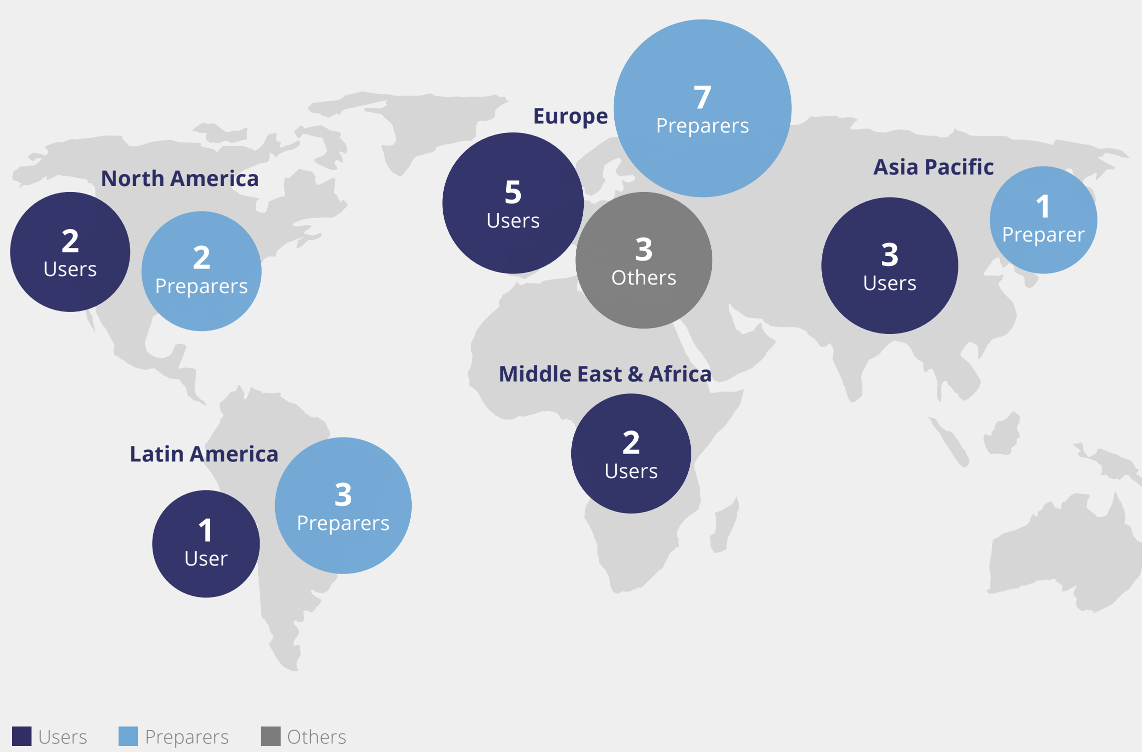
Primary Sources for Perspectives on Financial impact

Perspective	Sources
Preparers of disclosure	• Task Force manual review of publicly available disclosures from 25 organizations • Interviews with 14 preparers in the following industries: Asset Managers, Energy, Materials and Buildings, Technology and Media, and Transportation • 100 preparer responses to the Task Force's consultation on its proposed guidance on disclosure of climate-related metrics, targets, and transition plans
Users of disclosure	• Interviews with 12 users in the following industries: Asset Managers, Asset Owners, Banking, and Insurance • Insights from credit rating agencies • 105 user responses to the Task Force's consultation on its proposed guidance on disclosure of climate-related metrics, targets, and transition plans
General	• Interviews with representatives from three organizations that assist companies with preparing and using climate-related disclosures

These primary sources provided the basis for the Task Force's findings on disclosure of climate-related impact. However, the Task Force also reviewed a range of data and analysis from additional sources, which are noted as appropriate.

Figure C1

Distribution of Interviewees on Financial Impact



2. OVERVIEW OF FINANCIAL IMPACT

The financial impacts of climate-related issues on an organization are driven by the specific climate-related risks and opportunities to which the organization is exposed, and its strategic and risk management decisions on seizing those opportunities and managing those risks (i.e., through mitigation, transfer, acceptance, adaptation, or control). Whether an individual organization is or may be affected financially by climate-related issues usually depends on:

- the organization's exposure to, and anticipated effects of, specific climate-related risks and opportunities;
- the organization's planned responses to manage (i.e., mitigate, transfer, accept, adapt, or control) its risks or seize opportunities; and
- the implications of the organization's planned responses on its income statement, cash flow statement, and balance sheet.

Climate-related risks and opportunities can affect an organization's **financial performance** or **financial position**. An organization's **performance** typically shows changes over time; that is, what happened in the reporting period and how results compare with metrics reported in previous reporting periods and with targets set by management in previous periods. An organization's **position** reflects a point in time stocktaking; for example, the position at the end of the reporting period of the organization's assets, liabilities, resources, contracts, and relationships, and how they position the organization to execute its strategy to address climate-related risks and opportunities.[50]

Organizations can then assess (1) **actual financial impacts** that have already occurred as a result of climate-related risks or opportunities, and (2) **potential financial impacts** that may occur in the future due to climate-related risks or opportunities.[51] Organizations use scenario analysis to supplement their understanding of potential financial impacts of any climate-related risks and opportunities, and to help inform their strategy. The Task Force recognizes disclosing the potential financial impact of climate change may not be consistent with national financial filing requirements and encourages organizations to make financial disclosures in accordance with their national disclosure requirements. If certain elements of the recommendations are incompatible with national disclosure requirements for financial filings, the Task Force encourages organizations to disclose those elements in other official company reports that are issued at least annually, widely distributed and available to investors and others, and subject to internal governance processes that are the same or substantially similar to those used for financial reporting.[52]

[50] Definitions from IFRS, *Conceptual Framework*, 2021.

[51] While financial impacts may take the form of actual or potential monetary changes to an organization's income statement, cash flow statement, or balance sheet, financial impacts may also have intangible effects on an organization's enterprise value; for example, through changes in the value of an organization's reputation.

[52] TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures*, June 29, 2017.

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Organizations may choose to describe financial impact **qualitatively** or present **quantitative** figures, ranges, and estimates. Qualitative descriptions often include summaries of analysis conducted and directional outcomes. For instance, an organization might report that revenue of a particular service is expected to be negatively impacted under the tested scenario. Meanwhile, quantitative figures tend to provide more specificity. For instance, an organization might disclose the percentage increase of operating costs due to a climate-related event, or the capital allocated toward a particular adaptation project. Figure C2 shows a range of reporting styles from qualitative descriptions of the types of risk exposures and expected direction of impacts to more detailed analysis by business line, product, asset, or counterparty.

Figure C2

Example Range of Quantification

More qualitative → More quantitative

VW	PIMCO	Hannon Armstrong	Meridian
			
High-level descriptions of qualitative impacts	**Qualitative impacts broken down by business line or asset**	**High-level quantification**	**Quantitative impacts broken down by business line or asset**
Explanation of: • Risk exposures • Expected impacts • Management actions to mitigate risks	Assessments of risk exposures and materiality, often by climate risk across sectors/portfolios	Range or quantity of impacts and estimates at organization level	Provides specific quantity, or quantities, including underpinning assumptions for potential financial impacts

VW, 2020 Sustainability report, p. 15; PIMCO, "ESG in Action: Evaluating Global Financials"; Hannon Armstrong, 2020 Form 10-K, p. 62; Meridian Energy, Climate Change Disclosures Meridian Energy Limited FY20, p. 11

3. KEY THEMES OF THE TASK FORCE'S REVIEW

Based on the Task Force's manual review of disclosures, consultation outcomes, interviews, and other sources, several key themes emerged around preparers' current reporting practices of financial impact. The key themes are summarized here.

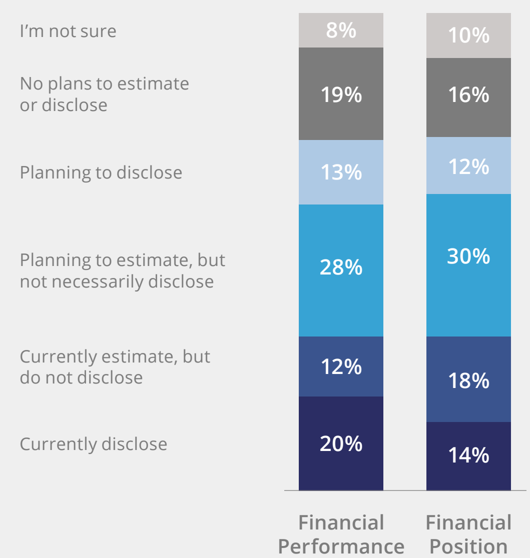
Disclosure of financial impacts remain limited. According to the results of the consultation shown in Figure C3, disclosure of each of financial performance and financial position was at or below one in five companies. Around the same number of companies responded that they do not plan to estimate or disclose information on financial impact. More than 40% of respondents identifying as preparers estimate or plan to estimate impact on financial position, but do not necessarily plan to disclose those estimates. Similarly, among the 25 organizations reviewed by the Task Force, which had experience with assessing financial impact associated with climate-related risks and opportunities, only 20 (80%) disclosed qualitative information on the actual or potential impacts of climate-related risks or opportunities, while 13 (52%) disclosed quantified actual or potential impacts of climate-related risks and opportunities. Additionally, the Sustainability Accounting Standards Board (SASB) shared insights from their manual review of 159 organizations' public disclosures with the Task Force. For the review SASB intentionally selected organizations that they determined are further along in financial impact disclosure. SASB found that only 18 (11%) of the 159 organizations reviewed reference financial impacts.[53]

Figure C3

Extent of Financial Impact Disclosure

The Task Force's consultation on its proposed guidance on disclosure of climate-related metrics, targets, and transition plans asked preparers about the extent to which they were disclosing financial impacts on their financial performance and financial position as well as challenges associated with these disclosures. A total of 100 preparers, from both financial and non-financial organizations, responded to the consultation.

A majority of respondents (64%) estimate, but do not disclose, or do not plan to disclose impact on financial position. Only one in eight respondents plan to disclose information on financial performance and financial position in the future. Explanations from consultation respondents that do not plan to disclose financial impact were consistent with the challenges summarized in the section.



Q8. Which of the following climate-related information does your organization disclose? (n = 100) Base: Preparers

Impact on financial performance is estimated and disclosed more commonly than impact on financial position. As seen in Figure C3, 20% of preparers that responded to the consultation currently disclose impact on financial performance, while even fewer (14%) disclose impact on financial position. Of the reports reviewed by the Task Force, disclosures of financial impact tended to focus on the amount of investment or financing deployed toward addressing climate-related risks and opportunities. Sixteen of the 25 organizations reviewed disclosed an amount of expenditure or capital investment deployed toward climate-related risks or opportunities, though primarily in the form of case studies or examples rather than as an aggregated view of the organization's total climate-related expenditure or capital investment. Seven of the 25 organizations disclosed revenues from climate-related opportunities and one in five disclosed cost savings.

[53] SASB used keyword and proximity searches of sustainability reports, annual reports, and financial filings to identify disclosures that seemed likely to contain information on financial impact. SASB primarily reviewed documents issued between 2019 and 2021. Based on the results of this search, SASB performed a manual review to identify whether the documents included disclosure of climate-related financial impact.

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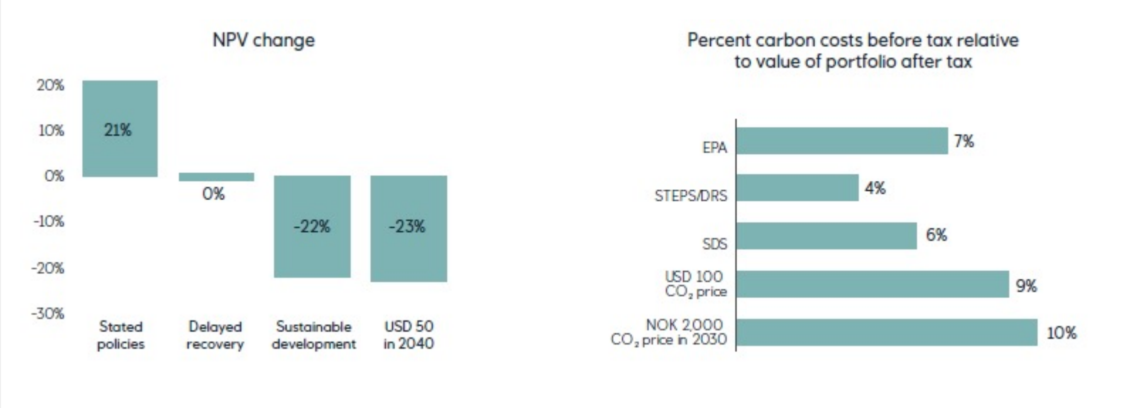
Organizations also reported financial impacts in various other forms, such as potential impairment values, return volatility, enterprise value, profit and loss (P&L), fair value of assets, and net present value (NPV), as seen in Figure C4.

Figure C4

Example Disclosure: Equinor



Equinor, 2020 Sustainability Report, p. 17

The disclosures reviewed primarily focused on potential financial impacts rather than actual financial impacts. Several preparers interviewed by the Task Force stated that actual financial impact is challenging to identify and disaggregate from other non-climate events. Meanwhile, determining potential financial impact can be more accessible, often assessed through leveraging scenario analysis. A report by CDP found that 60% of financial companies in the CDP 2020 dataset use scenario analysis to inform their strategy, including potential financial impact. Forty-seven percent of these companies assess exposure to climate-related risks and opportunities covering the majority of their portfolio, while 29% consider climate change when reviewing and guiding their annual budget.[54] Interviewees noted that their organizations were more likely to conduct scenario analyses than publicly disclose the output of such analyses.

Financial impact can be disclosed in a variety of forms, most commonly through qualitative descriptions. From the small sample of the 25 organizations reviewed, the Task Force observed that the extent of disclosure can vary across type of risk (physical versus transition risks) and opportunity, nature of disclosure (qualitative or quantitative), and time horizon. Twenty of the 25 organizations reviewed disclosed financial impact in a qualitative, directional, and aggregated form. Quantitative disclosure of potential impacts was less common, and most often found for forward-looking transition risks than forward-looking physical risks. Discussion of physical impacts was typically in the form of qualitative descriptions rather than quantitative information.

Financial impacts can be disclosed in various locations. Consistent with the findings of the Task Force's broader annual reviews of climate-related reporting (Section B1. TCFD-Aligned Reporting by Public Companies), the organizations reviewed disclosed financial impacts in a variety of locations, including annual reports, sustainability reports, TCFD reports, and financial filings.[55] However, the type of information reported varied based on the type of disclosure. Interviews and research suggest that quantified reporting of potential financial impact is primarily found in sustainability reports, while quantified reporting of actual financial impact and qualitative reporting is more often found in annual reports. Some organizations include qualitative information in the notes within their financial statements attributing certain impacts to weather or climate.

[54] CDP, *Running Hot — Accelerating Europe's Path to Paris*, 2021.

[55] TCFD, *2019 Status Report*, 2019, p. 54: "To better understand whether more companies are including climate-related information in their financial filings, the Task Force asked survey respondents that identified as preparers where they disclosed this information for fiscal years 2016, 2017, and 2018. Sustainability reports continue to be the dominant location of climate-related financial disclosures; however, preparers increasingly include such information in their financial filings, annual reports, and integrated reports."

4. PREPARER PERSPECTIVES: CHALLENGES AND LESSONS LEARNED

The Task Force focused its interviews with preparers on the challenges related to assessing and disclosing the financial impacts of climate-related risks and opportunities. In response to the consultation, preparers noted several challenges related to conducting and disclosing financial impact analysis, as highlighted in Figure C5.

Challenges of Conducting Financial Impact Analysis

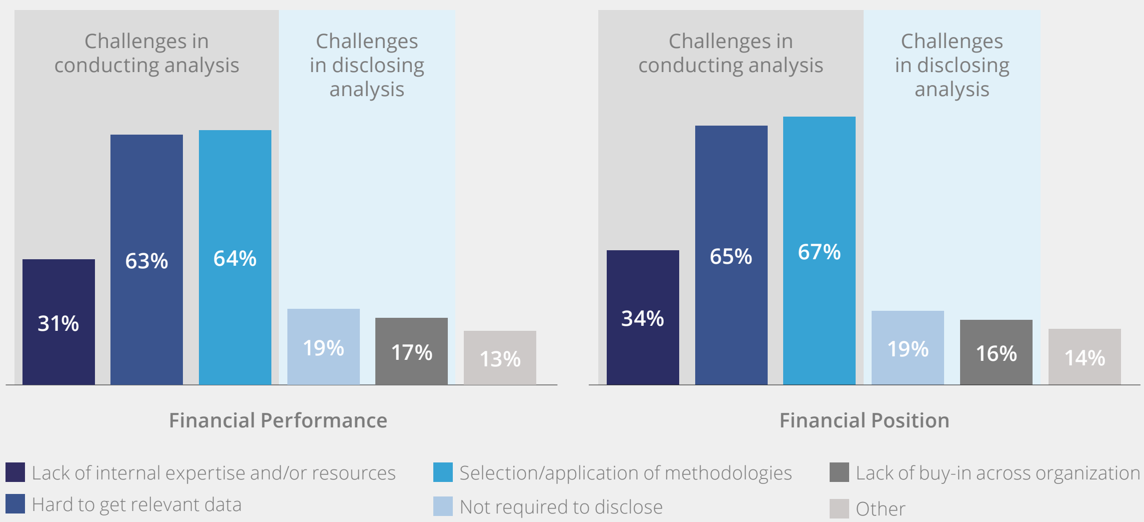
Consistent with findings from the consultation, preparers interviewed by the Task Force noted numerous challenges around effectively assessing the financial implications of their climate-related risks and opportunities. These challenges occur throughout the process of conducting financial impact analysis, starting

Figure C5

Key Challenges of Financial Impact Disclosure

The consultation asked preparers that found disclosure difficult to identify the key challenges of disclosing impacts on financial position and financial performance. The two main challenges preparers identified were both challenges in conducting analysis, namely difficulties with obtaining relevant data and selecting and applying assessment methodologies.

Challenges in disclosing analysis was secondary, with fewer respondents identifying lack of requirements to disclose or lack of buy-in in their organization as key challenges.[56]



Q16 & Q18. In general, what are the key challenges your organization is facing (or may face) in disclosing the proposed cross-industry, climate-related metrics and climate-related financial impacts? Select all that apply.

Note: Percentages are based on total respondents for each category. Base totals vary across metrics, as respondents were prompted to select all key challenges that apply only for metrics ranked "not very difficult," "somewhat difficult," or "very difficult" to disclose in Question 12 or 14.

from organizational alignment and support through data acquirement, attribution of risks and opportunities, and estimation of potential financial impacts.

Coordinating organizational support and resources. Conducting a financial impact analysis is a multidisciplinary process and requires access to, and coordination among, the requisite resources and experts due to the range of ways in which climate-related impacts can affect an organization financially. A lack of collaboration can make it difficult to identify and assess planning assumptions and potential business changes in response to climate-related risks and opportunities. Coordination of efforts to conduct this analysis can improve communication between teams and improve the output of the analysis. One interviewee stated that "moving the climate conversation into financial language has helped bridge the gap between finance and sustainability teams by creating common language between departments." Another said that "new integration between climate and financial teams has directly influenced planning on how carbon offsets feed into valuations."

[56] Lack of buy-in across an organization can result in challenges in both conducting and disclosing financial impact analysis.

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Obtaining and using relevant data. Due to the complexity of estimating financial impacts, preparers interviewed reported often using a combination of internal performance data, forecasts, organization-specific climate scenarios, and external data in their analysis. In addition, preparers can also depend on disclosures from organizations in their supply chains or portfolios as inputs to their financial impact analysis. Interviewees noted that external data, particularly from small, private suppliers or counterparties can be difficult to obtain, with one interviewee stating that "sourcing data from private markets is a black box." Granular, asset-level data can also be hard to source, which interviewees noted as one reason analysis of physical risks and opportunities is less common than that of transition risks and opportunities. Meanwhile, governments, investors, and other stakeholders may require disclosure of different financial information across various regions, while the relevance of various data varies with sector. Variability in metrics and financial impact data reported, and time horizons considered (even within sectors), can make data aggregation and comparability challenging.

Determining actual financial impacts. Organizations have noted challenges with attribution of specific monetary amounts affecting financial accounts to climate events. This is especially difficult when a monetary effect has multiple drivers in addition to climate (e.g., technology trends, political instability). Financial impacts can be attributed to a broad set of factors, and preparers interviewed noted a subjective element in organizations' decisions of how to attribute the impact of climate-related risks and opportunities to financial accounts.[57]

Many jurisdictions require organizations to disclose material risks in their financial filings, including material climate-related risks. However, some organizations interviewed described challenges around communicating the financial accounting implications of climate-related risks under financial reporting standards. For instance, incorporating climate considerations into impairment analysis can be challenging due to divergent time horizons between accounting and climate reporting frameworks.

Estimating potential financial impacts. One aspect of estimating forward-looking financial impacts is selecting which methodologies to use (e.g., scenario analysis, forecasting, sensitivity analysis, trend analysis). Interviewees noted that climate-related scenario analysis can be a useful tool to assess potential financial impacts. Scenarios help organizations understand the potential consequences of a range of climate-related risks and opportunities and, in turn, help to identify the specific and relevant factors that can impact financial results.

Nearly all interviewees reported using recognized third-party scenarios — such as those developed by the International Energy Agency (IEA) or Network for Greening the Financial System (NGFS) — to evaluate financial impact. These recognized scenarios were selected largely due to the simplicity of using predetermined methodologies and promoting comparability of results. Use of third-party scenarios also reduces the amount of scenario building expertise required within an organization and enables resources to be directed toward other areas. However, some interviewees felt that this increased standardization decreased granularity and customization of analyses.

An additional challenge in assessing potential financial impacts is misaligned scenario and business planning timeframes. Organizations often view the climate-related risks and opportunities as occurring years beyond typical business planning time horizons, making it difficult to determine a baseline from which to attribute quantified financial impact. Organizations can assess a range of financial implications across multiple scenarios and compare the results to their baseline forecasts. However, baseline forecasts rarely extend long term, as opposed to climate-related scenarios, which often extend to 2050 and beyond.[58] This creates challenges for organizations looking to estimate scenario impacts out to 2050 relative to their baseline forecasts. Figure C6 (p. 66) outlines the Task Force's view that organizations can disclose near-term financial impacts with more specificity and quantification than potential impacts farther in the future.

[57] As outlined in Section A. Initiatives Supporting TCFD, a coalition of leading sustainability reporting organizations ("the alliance") has developed a proposal for a prototype climate-related financial disclosure standard to help connect sustainability and accounting standards. This work supports the IFRS's proposal to create an International Sustainability Standards Board and IASB's work on clarifying application of financial accounting standards to climate-related matters. Accounting firms are also issuing guidance on how climate-related risks can affect financial accounts and statements.

[58] Intergovernmental Panel on Climate Change, *Special Report on Global Warming of 1.5°C Summary for Policymakers*, January 2019.

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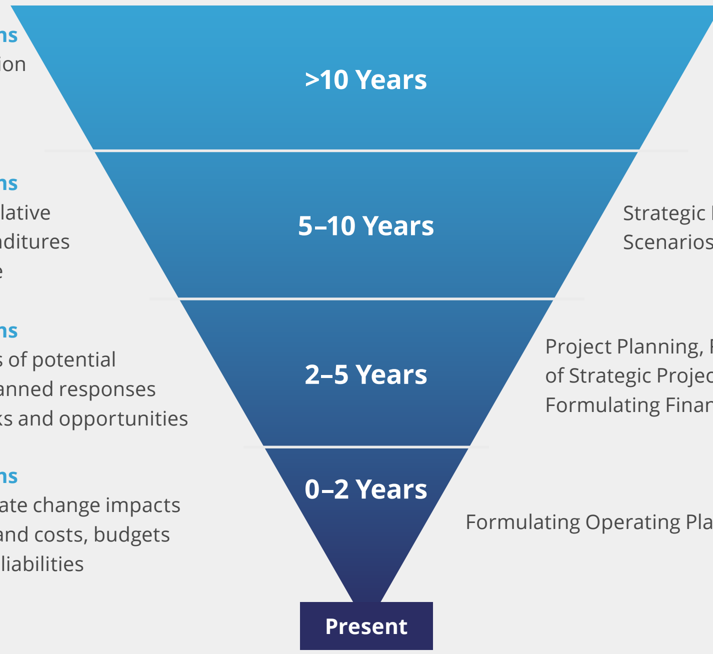
Figure C6

Assessing Potential Financial Impacts

As noted in the *2020 TCFD Scenario Analysis Guidance*, "Translating forward-looking scenarios into meaningful financial implications is difficult, but not impossible."[59] That report stated that "the financial effects of a company's strategy in a longer time horizon might be characterized in terms of broad financial pathways or broad directional shifts in capital expenditures; as the strategy is implemented over time, capital budgets, project plans, and operational plans provide progressively more concrete estimates of financial effects."



TCFD, TCFD Guidance on Scenario Analysis for Non-Financial Companies, Figure E2, 2020

Climate models are often designed for policy or research purposes or cannot scale to the granularity needed for business purposes. Interviewees noted that the use of models built to serve alternate purposes and functions raised concerns about the accuracy and validity of estimated impacts. A recent report on the emergence of climate-related analytics found that "many of the emerging demands for financially meaningful information cannot be met by current climate models that were designed for other purposes."[60] However, another report claimed that newer models, such as Integrated Assessment Models, offer a potential solution as they group together multiple models and impact chains and assume more complex and non-linear relationships between climate variables. The paper claimed that "the next generation of models is well placed to help rationalize the complexities of climate science."[61]

Preparers in the financial sector noted an extra level of complexity as they make assumptions on how organizations within their portfolio will adapt their product mix or business models under various scenarios. According to one financial sector preparer, it is difficult to define assumptions for organizations within their portfolio because this "requires understanding of proprietary positioning and preparations on transition risks."

Potential business changes were seen as crucial inputs in determining potential impacts from a transition to a low-carbon economy — but can be difficult to source or aggregate.

[59] Rogelj, McCollum, and Reisinger, *Probabilistic cost estimates for climate change mitigation*, 2013.
[60] Nature, "Business risk and the emergence of climate-related analytics," February 8, 2021, p. 91.
[61] S&P Global, *Model Behavior: How Enhanced Climate Risk Analytics Can Better Serve Financial Market Participants*, June 24, 2021.

Challenges of Disclosing Financial Impact

Beyond the complexity of determining financial impacts, the consultation highlighted that it can be challenging to secure buy-in to disclose the results of financial impact analyses, particularly where disclosure is not mandated. Preparers interviewed stated that in order to disclose financial impacts, approval is often required from a range of business functions such as legal, corporate reporting, finance, sustainability, and strategy teams that review the organization's public statements. Each function may have concerns with disclosure for a variety of reasons, such as reliability of data, litigation of risk, and competitive disadvantage.

Articulating the uncertainty of assumptions and the quality and reliability of disclosures. A lack of confidence in data, methodology, and assumptions is often the main driver behind decisions not to disclose quantitative financial impacts. Several interviewees highlighted that even though they quantified financial impacts internally, their organization felt more comfortable disclosing qualitative, directional impacts. Preparers expressed hesitancy around quantitative disclosure of potential financial impacts because of the many assumptions involved, the resulting uncertainty of potential estimates, and difficulties in clearly and effectively articulating uncertainties.

Historical challenges in auditing the effects of financial impacts on financial accounts and reports have also hindered disclosure.[62] However, auditors are increasingly considering climate-related issues when reviewing financial statements (Box C1, p. 68). An analysis conducted by the Center for Audit Quality found that organizations in the S&P 100 are beginning to hire public company audit firms to independently evaluate aspects of their ESG disclosures. Eleven percent of S&P 100 companies "provided independent assurance on some aspect of company-prepared ESG information," while 6% of S&P 500 companies received assurance from a public company auditing firm over some of their ESG information.[63, 64]

[62] See Thomas, "Auditing climate impact," March 2021.

[63] Center for Audit Quality (CAQ), *The Role of ESG Reporting in Building a Sustainable World*, April 22, 2021.

[64] CAQ, *S&P 500 and ESG Reporting*, August 9, 2021.

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Box C1
Insights on Auditors' Work on Current Climate-Related Financial Impacts

In September 2020, investor groups representing $103 trillion in global assets under management published an Open Letter requesting that companies, and their auditors, ensure that material climate-related risks are incorporated into IFRS financial statements (and considered in the audits thereof). Reinforcing this call, in November 2020, the Institutional Investors Group on Climate Change (IIGCC) wrote to audit committees and lead audit partners for 36 of the EU and UK's largest energy, materials, and transportation companies, asking that they ensure "material climate risks associated with the transition onto a 2050 net zero pathway are fully incorporated into the financial statements."

To assess consideration of climate in both financial statements and audit reports, the Carbon Tracker Initiative reviewed the 2019 and 2020 annual reports of 55 investor-selected carbon-exposed companies, including the 36 IIGCC companies. The Climate Accounting Project (CAP), a team of accounting and finance experts drawn from the investor community and sponsored by the PRI, reviewed the 2020 annual reports of an additional 52 companies.[65] Select findings derived from the report are summarized here.[66]

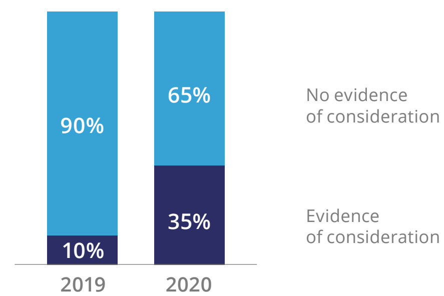
Auditors are increasingly considering climate-related issues in their audits. In their assessments of audit reports, Carbon Tracker found a notable 25 percentage point increase between 2019 and 2020 in the percent of auditors that appeared to consider climate-related issues, either as separate key audit matters or as considerations for assessing a key audit matter.[67, 68] However, none of the audit reports for the 19 U.S. energy companies indicated consideration of climate-related issues in either year.[69]

The International Federation of Accountants defines key audit matters as "those matters that, in the auditor's professional judgment, were of most significance in the audit of the financial statements of the current period. Key audit matters are selected from matters communicated with those charged with governance."[70]

Auditors are incorporating climate-related issues into assessments of company impairment tests. Of the 107 companies reviewed for 2020, 77% of the auditors included impairment as a key or critical audit matter in their audit reports. Of these, Carbon Tracker and CAP found that only 25% noted consideration of climate change–related matters when discussing their assessments of impairment in their audit reports. It is important to note that some of these companies may have considered climate-related issues in their impairment calculations.

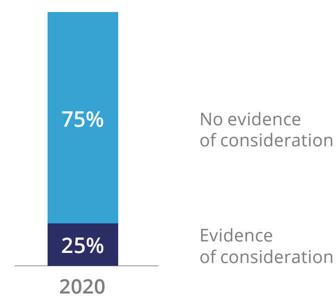
Consideration of Climate-Related Risks and/or Company Commitments in Audit Reports

% of Audit Reports assessed



Inclusion of Climate-Related Issues in Impairment Assessments in Audit Reports

% of Audit Reports assessed



Carbon Tracker, "Flying blind: The glaring absence of climate risks in financial reporting"

[65] The full report describes the review's population selection methodology, scope and approach, and review criteria.

[66] Assessments with "significant concerns" were mapped to "no evidence of consideration," while assessments with "some concerns" or "few concerns" were mapped to "evidence of consideration."

[67] For example, Carbon Tracker looked for discussions of how the auditor assessed the effects of material climate-related matters on the assumptions and estimates that the company used and that would be affected by such issues.

[68] This finding and the associated chart is based solely off the Carbon Tracker analysis, and so has a different review population to the subsequent chart.

[69] For audits in the United States this would relate to critical audit matters or CAMs, which the Public Company Accounting Oversight Board defines as "any matter arising from the audit of the financial statements that was communicated or required to be communicated to the audit committee and that: Relates to accounts or disclosures that are material to the financial statements; and Involved especially challenging, subjective, or complex auditor judgment." Implementation of Critical Audit Matters: The Basics, 2019.

[70] IFAC, *Auditor Reporting Standards Implementation: Key Audit Matters*, 2017.

Potential litigation risk. Interviewees noted that legal departments can be hesitant to approve disclosure of the results of quantitative, forward-looking financial impact assessments due to concerns of litigation risk if such disclosures ultimately vary from actual future results. As a result, organizations that release potential financial impact data tend to emphasize that the disclosures are illustrative or represent only initial or "pilot" results. However, many jurisdictions provide "safe harbor" provisions for forward-looking information when "accompanied by meaningful cautionary statements identifying important factors that could cause actual results to differ materially from those in the forward-looking statement."[71]

Concerns related to competitive disadvantage. Some organizations expressed concern over disclosing detailed financial impact information that might put them at a competitive disadvantage. Organizations indicated a willingness to disclose information at the same level as competitors but noted that potential competitive disadvantages could arise both from investors accessing different levels of information from different organizations as well as from competitors gaining a detailed understanding of the disclosing organization's operations. One interviewee reported receiving negative media attention when they reported more extensive coverage of Scope 3 GHG emissions data as it created an appearance of higher impact on financial performance relative to competitors.

In contrast to the concerns around competitive disadvantage, several organizations interviewed noted benefits from leading on disclosure (Figure C7). Increased reporting on financial impacts, as encouraged by new guidance in the Task Force's updated 2021 annex, should also help organizations feel more confident in their reporting.

Figure C7

Potential Advantages of Leading on Disclosure

In regions where climate reporting is more mainstream, interviewees expressed that they had experienced **advantages in being an early mover on disclosure**. While some organizations were initially concerned about weakening their competitive positioning by disclosing more than peers, once users began to expect more disclosures, those who had historically included more disclosure on financial impact saw themselves at a **competitive advantage**.

In part, some preparers felt that proactively disclosing allowed them to **control the conversation around their organization and avoid speculation**. This was seen as particularly valuable in carbon-intensive sectors, where investors have been concerned by speculation regarding potential stranded assets. As one interviewee stated, "[Our company] has a lot more opportunities to gain by moving quickly and efficiently. By being a first mover with the TCFD, it shows that we have something substantial to say here. We can earn a seat at the table in determining requirements for our future, and hopefully harmonize this space of climate disclosure to mitigate transition risks."

5. USER PERSPECTIVES: THE USEFULNESS OF FINANCIAL IMPACT DISCLOSURE

Climate-related information is critical for users of climate-related information to price the risks and opportunities of climate change within economic decisions. Although many types of stakeholders use information on financial impacts, this section focuses on the perspectives of the investors and rating agencies who provided their insights to the Task Force.

Investor Assessments of Financial Impact

Users incorporate a broad range of data sources to evaluate the actual and potential impacts of organizations' climate-related risks and opportunities. In addition to public disclosures, many investors use third-party aggregated data, proxy disclosures, estimates built on industry averages, media coverage, NGO analysis, and ratings from rating agencies. Financial organizations generally assess climate-related risks in their portfolios in one of two ways: assigning risks at the sector or portfolio level using indices (a "top-down"

[71] Wasim, *Corporate (Non)Disclosure of Climate Change Information*, 2019. In the United States, for example, the Private Securities Litigation Reform Act of 1995 shields companies from liability for certain written and oral forward-looking statements.

approach) or assessing the risks of major individual holdings and aggregating those risks up to a portfolio- or sector-wide level (a "bottom-up" approach). Investors often use a top-down approach to assess climate-related risks in the absence of detailed data at the organization level, particularly because application of a top-down approach is seen as easier than application of a bottom-up approach.

Usefulness of financial impact disclosures. Almost all users participating in the consultation noted that disclosure of financial impacts is useful. More than 90% of users responded that disclosure of impact on financial performance and financial position is very useful or somewhat useful as shown in Figure C8. Users interviewed by the Task Force reported that their organizations are increasingly seeking preparers' financial impact disclosures to inform their financial decisions. For example, users may incorporate considerations of the cost of decarbonization into the potential return on short-term investments. Several users reported integrating financial impacts into scoring tools, such as credit risk scoring tools, to support effective financial decision-making, including investment and credit risk processes. To improve the use of financial impacts in decision-making, many interviewees are also building capacity around data comparability, business assumptions, and scenario analysis.

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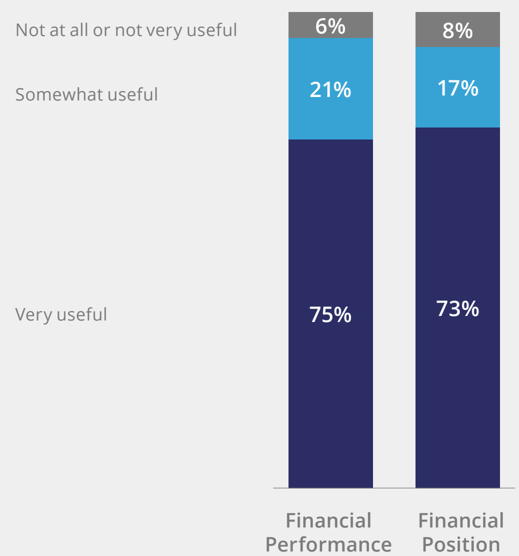
Figure C8

How Useful Is Disclosure of Financial Impact?

As part of the 2021 consultation on its proposed guidance on disclosure of climate-related metrics, targets, and transition plans, the Task Force asked users how useful it would be for preparers to disclose climate-related impact on financial performance and financial position. Over 90% of the 105 respondents rated disclosure in both areas as very useful or somewhat useful.

Disclosure of financial performance and financial position were seen to be similarly useful, with users indicating analogous desire to see each.



Q20. Which of the proposed cross-industry, climate-related metrics and financial impacts would your organization find useful for preparers to disclose? (n = 105) Base: Users

Sourcing financial impact information. Users generally access financial impact information either directly from organizations' disclosures or through third-party aggregated data that incorporates disclosures, proxy estimates, and other information.

Passive investors are likely to leverage third-party aggregated data to inform their financial impact assessments. Although some users noted that information sourced from third-party aggregators can lack granularity, it was often seen as the best available option and provided useful directional indicators for passive investors. Despite continued challenges in sourcing high-quality data, data aggregators are identifying new pathways to quantify impact of climate-related risks and opportunities. Interviews with users suggest that aggregators are providing more comprehensive tools for organizations to measure and manage risk, an important input as investors and regulators shift toward alignment with a net-zero economy.

Active investors are more likely to go beyond third-party aggregated data to independently evaluate disclosures and conduct more thorough financial impact assessments. Users who supplement third-party analyses with disclosures reported that this practice enhances data coverage, enables organizations to develop a more comprehensive view of risk profiles of organizations in their portfolios, and improves overall verifiability, promoting internal confidence and usage of the data to drive business decisions.

When users do not have access to relevant climate-related disclosure for a particular preparer, they tend to conduct an outside-in assessment using sector-level assumptions or leveraging data of a comparable organization. Users highlighted it is challenging to make assumptions based on limited data exposing outside-in assessment to significant uncertainty. Additionally, preparers may be exposed to less favorable assumptions and outcomes compared to the actual information that would be used if disclosure were available.

Ultimately, users noted that more data transparency would facilitate better integration of preparer data into users' financial impact assessments and increase confidence in decision-making processes.

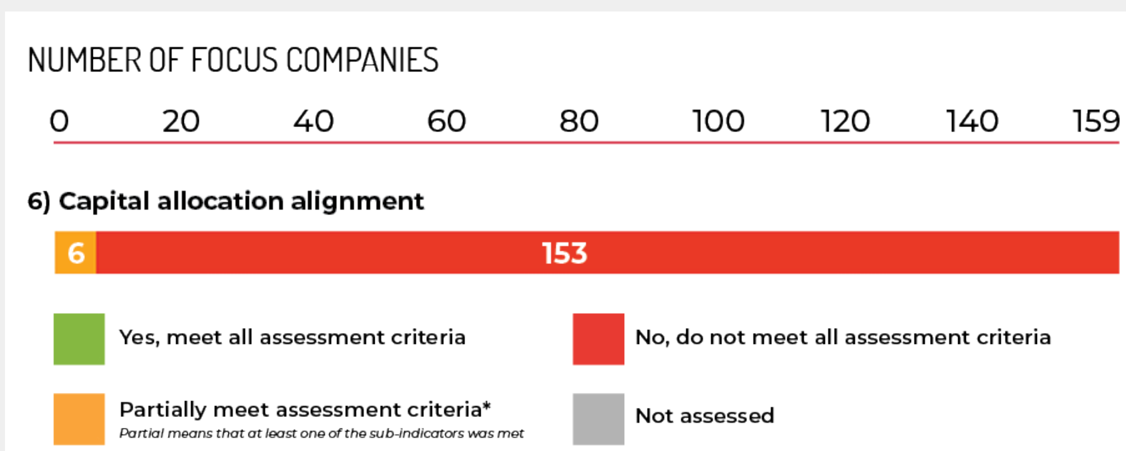
Desired Improvements to Financial Impact Disclosures

As noted in a recent IOSCO report, "There is often a disconnect between the information that investee companies produce, and the information that asset managers consider most decision useful. [F]urther maturity in companies' disclosures is needed to better capture the tangible implications of climate governance, strategy and risk management for business planning, operations and financial outcomes."[72] Users interviewed by the Task Force provided additional detail on specific aspects of disclosure that they would find most valuable if disclosed.

Interviewees felt that transition-related expenditure or capital investment can serve as a key input to users' financial decision-making and portfolio steering. However, users expressed that it is currently difficult to gauge how committed organizations are to addressing climate risks and opportunities, and anticipate evolving regulations. A recent Climate Action 100+ (CA100+) report highlighted this information gap, showing that only six out of 159 organizations surveyed met partial assessment criteria for capital allocation alignment, as shown in Figure C9.[73] Given concerns about achievability of commitments, many users interviewed said that more visibility on organizations' planned actions, through expenditure and capital investment, would allow them to judge the credibility of these commitments and evaluate the benefits of the targeted initiatives.

Figure C9

CA100+ Net-Zero Company Benchmark (excerpt)



CA100+, "Net-Zero Company Benchmark"

[72] IOSCO, *Report on Sustainability-related Issuer Disclosures*, 2021.

[73] CA100+, *Net-Zero Company Benchmark*, 2021.

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In addition to expenditure or capital investment, users would like to see more information on actual and potential impacts of climate-related risks and opportunities on an organization's financial performance and position. Users noted that information on these financial impacts may provide insight as to how preparers are thinking about climate change from a reporting perspective, helping inform user decisions and portfolio planning. Some users cited a desire to see revenue data split by product. Users interviewed stated that disclosure of these metrics would allow them to base decisions on preparer-disclosed data rather than analysis conducted by users, handing preparers greater control of their own narrative and increasing ease of data sourcing for users. One interviewee enforced this message by stating, "I would like an organization to say, 'Here is our balance sheet split by sector, subsector, and within those, these are the pockets of high risk. Here are our emissions from each bucket based on a transition perspective.'"

Users and preparers both identified additional engagement as an opportunity for improved financial impact disclosure. For example, users and preparers may engage with each other to better understand disparities between disclosures and analyses conducted by users. Increased collaboration, for example, by leveraging investor calls, could strengthen the understanding of developments for both users and preparers. This process would enable a more comprehensive and accurate estimation of financial impact.

Financial Impact in Credit and Insurance Ratings

Many investors, lenders, and insurance underwriters rely on credit ratings as key inputs in their financial decision-making. Therefore, the Task Force asked four large credit rating agencies to provide details on how they incorporate climate-related risks, opportunities, and financial impacts into their rating processes.

All four rating agencies responded that they include assessments of financial impacts in their rating process, such as rising costs of energy transition and impacts on cash flow ratios. Box C2 provides a summary of the rating agencies' responses, particularly input related to (1) sourcing information and (2) impact on ratings. Full responses can be found in Appendix 5: Rating Agency Incorporations of Climate-Related Information.

Box C2
Summaries of Rating Agency Responses

In alphabetical order; see Appendix for full responses.

AM BEST

AM Best's approach to assessing climate risks and opportunities includes consideration of an (re)insurer's climate exposures, their strategic business plans, and how these exposures can positively or negatively affect their creditworthiness over the short-to-medium term. For climate risks, AM Best explicitly considers the impact from physical, transition, and liability climate-related risks. AM Best's evaluation considers the financial impact of climate risks and opportunities across the building block assessments, namely balance sheet strength, operating performance, business profile, and enterprise risk management.

AM Best assesses the financial impact of climate risks and opportunities for all (re)insurers, emphasizing a forward-looking approach based on an understanding of how (re)insurers adapt their profile to manage climate risks and capitalize on opportunities.

Sourcing Information
Financial disclosure on climate risks are becoming a mainstay in many insurance markets with an increasing number of (re)insurers using the TCFD framework. AM Best uses both public and nonpublic relevant information gathered through engagement with management, company sustainability reports, regulatory reporting submissions, and other sources as part of the credit rating analysis.

Impact on Ratings
Approximately 9% of AM Best's global rating movements have been as a result of ESG factors, of which climate risks have been a key driver. Negative rating actions have mainly affected companies that have concentrated exposures to weather-related events, whereby exposures have fallen outside of risk appetite, and affected capital positions and earnings profiles. Conversely, some (re)insurers have demonstrated positive rating actions mainly through strengthened governance practices, driven by enhanced modeling techniques, exposure management, and protection against peak risks.

FitchRatings

Fitch provides a comprehensive, systematic approach to communicating how climate-related risks and opportunities influence ratings at a sector, issuer, and transaction level. Analysts incorporate climate-related risks, which could affect credit profiles, into their forecasts, including increased focus on carbon-transition policies and lower long-term oil price assumptions, partially due to increasing transition risk.

Sourcing Information
Over 150,000 ESG Relevance Scores (ESG.RS) have been applied by Fitch's 1,500 global credit analysts to over 11,000 issuers or transactions since their launch in 2019. ESG.RS track the credit relevance of environmental factors including GHG emissions, energy management, and exposure to environmental impacts, firmly embedding the transparent display of climate risk impacts within ratings reports and research.

Impact on Ratings
Fitch has noted examples of ratings pressures driven by rising costs of energy transition (for example, electric vehicles in the auto sector) and physical risks of climate change (for example, mortgage-backed securities with high concentration in areas of heightened natural disaster risk and underinsurance). Conversely, the ESG.RS include issuers that received positive ratings uplift from supply of renewable energy in markets with supportive regulatory environments (climate-related opportunities).

Fitch recognizes the emerging, latent nature of many climate-related risks, as well as widespread gaps in disclosure. Fitch's global ESG research team undertakes detailed thematic research on climate and ESG themes at macro, sector, and entity/transaction levels to better understand the credit implications of these emerging risks across diverse areas such as industrial decarbonization, deforestation, and sustainability-linked debt.

Moody's
INVESTORS SERVICE

Assessment of Climate Risk
Moody's Investor Services assesses the credit considerations of ESG risks including climate change, alongside all other relevant credit drivers and mitigating factors, in the determination of its credit ratings. Moody's has introduced ESG issuer profile scores and ESG credit impact scores as well as Carbon Transition Assessment scores to assist in the assessment of these risks and their impact on credit ratings. Moody's observes that the credit impact of physical climate risk is generally negative, to varying degrees. The credit impact of carbon transition can be positive or negative, depending upon whether the entity's risk profile is improved or weakened by its operating environment's transition to a low-carbon economy.

Quantitative & Qualitative Analysis
Moody's Investor Services' transition and physical risk scores are informed by quantitative metrics, including some forward-looking data and projections. The final scores are determined by analysts who also qualitatively consider the materiality of transition and physical risk for an entity and information about that entity's business strategy and operating environment. This augmentation of data and exercise of judgment is necessary because, at present, TCFD-inspired and similar disclosures are generally not sufficiently detailed, forward-looking, and consistent on a global — or even on an industry — basis to support a mechanistic, quantitative scoring approach.

Impact on Ratings
Thirteen percent of Moody's private sector ratings actions in 2020 cited environmental issues, up from 5% in 2019. Carbon transition risk was the most frequently cited environmental consideration in these rating actions. Most rating actions citing carbon transition came from sectors Moody's had previously identified in their environmental heat map as facing high or very high exposure to that risk, such as oil and gas and steel.

S&P Global
Ratings

S&P Global Ratings incorporates environmental, social, and governance (ESG) credit factors, including climate-related credit factors, into its credit analysis across all sectors if S&P believes the factors are material and relevant to S&P's opinions of creditworthiness. As one of the key ESG credit factors, the potential effect of climate-related issues depends on S&P's opinion of how much they affect the capacity and willingness of an obligor to meet its financial commitments.

Continued on next page

Impact on Ratings
Climate-related disclosure information may affect credit rating analysis in many ways. S&P's credit analysis may incorporate climate-related short-, medium-, and long-term information — both qualitative and financial. Qualitative information predominantly influences S&P's country and industry assessments as well as S&P's evaluation of management and governance in case of non-financial corporates.

Forward-looking financial information provided by issuers that is material to S&P's analysis may not only affect an entity's key metrics, such as the cash flow/leverage ratios of a non-financial corporate, but also S&P's assessment of an entity's competitive position among its peers.

Sourcing Information
S&P Global Ratings incorporates climate-related credit factors into its credit analysis if S&P believes the factors are material and relevant to S&P's opinions of creditworthiness.

The main challenges when trying to evaluate climate-related credit factors can be insufficient disclosure generally and — where there is disclosure — inconsistent disclosure across peers. Furthermore, S&P's assessment could also be enhanced by an interconnected reporting on these matters, linking the qualitative disclosures with their historic and potential future financial impact. S&P believes that such a link would support telling a comprehensive story about the entity's exposure to climate-related risks and opportunities and management's actions in response to those.

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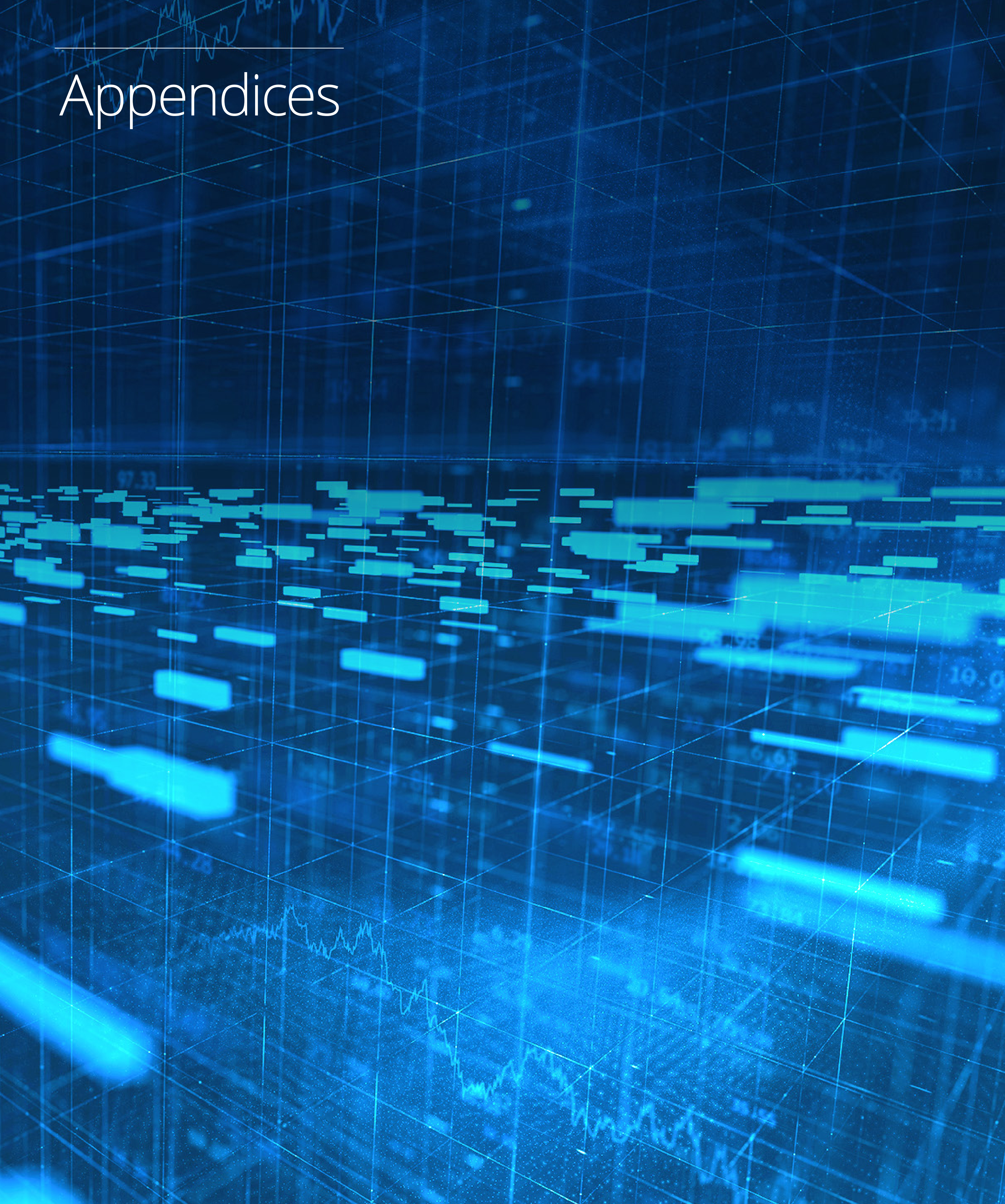

Appendix 1: Task Force Members

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Chair
Founder
Bloomberg LP and Bloomberg Philanthropies

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Vice Chair
Senior Advisor
Aggrego Consultores

Graeme Pitkethly
Vice Chair
Chief Financial Officer
Unilever

Yeo Lian Sim
Vice Chair
Special Adviser, Diversity
Singapore Exchange

Christian Thimann
Vice Chair
Former CEO and Chairman of the Management Board
Athora Germany (Until June 2021)

Members

Jane Ambachtsheer
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BNP Paribas Asset Management

Wim Bartels
Partner, Corporate Reporting
KPMG

Bruno Bertocci
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USB Asset Management

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Generation Investment Management

Marisa Buchanan
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Tata Steel Limited

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Russell Picot
Chair, Trustee Board
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Former Group Chief Accounting Officer,
HSBC
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Mary Schapiro
Vice Chair for Global Public Policy and Special Advisor to the Founder and Chair
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This report was developed with the support of Oliver Wyman's John Colas, Alban Pyanet, Ilya Khaykin, Kaja Pergar, Becky Swanson, Kais Ben Halim, and Megan Dombrowski.

Appendix 2: AI Review Methodology

As summarized in Section B1. TCFD-Aligned Reporting by Public Companies, the Task Force developed an approach using artificial intelligence (AI) technology to review the alignment of information in fiscal year 2018, 2019, and 2020 public reports with the TCFD recommendations. This appendix describes the Task Force's process for selecting the companies included in the review, the types of documents reviewed, and the AI review methodology.

1. COMPANIES INCLUDED IN THE REVIEW

The AI methodology was used to review financial filings, annual reports, integrated reports, and sustainability reports of 1,651 large companies from 69 countries in eight industries. Six of the eight industries align with groups highlighted in the Task Force's 2017 report — Banking; Insurance; Energy; Materials and Buildings; Transportation; and Agriculture, Food, and Forest Products. Two additional industries from the 2020 status report were also included — Technology and Media, and Consumer Goods.

In order to select the companies to include in the AI review, the Task Force started with the population of companies used in the 2020 status report AI review, which was selected using the following methodology:

- Identified universe of public companies — companies in the eight selected industries are further classified into 29 sub-industries, listed in Figure A2-1 (p. 79). The sub-industries are loosely based on the Global Industry Classification Standard sub-sectors and industries.
- Removed subsidiaries to avoid double counting of companies. Identified companies that shared the same industry and ultimate parent for capital structure purposes and retained the company with the largest annual revenue (for non-financial industries) or the largest total assets (for financial industries). We followed this approach to avoid, as much as possible, removing companies that published annual reports separate from their parent company.
- Removed smaller companies from the population to maintain focus on larger companies. We retained banks and insurance companies with total assets of at least \$10 billion and \$1 billion, respectively, and companies in the six non-financial industries with annual revenue of \$1 billion or more. This resulted in 4,446 total companies; and the breakdown by industry and sub-industry is shown in Figure A2-1 (p. 79).
- Removed companies that did not have reports available in English.
- Removed companies that did not have annual reports available for review in all three years. This was done to ensure a consistent population of companies and comparable reporting across all three years. Importantly, not all 2020 disclosures were available by the date that documents were extracted for review (June 16, 2021).

This methodology resulted in a review population of 1,701 companies for the 2020 status report.[74]

For this year's status report, the Task Force started with the 1,701 companies used in the 2020 status report. However, 50 companies from the 2020 review population no longer exist as individual entities or did not have reports available in English for fiscal year 2020. Removing those 50 companies from the review population resulted in a final population of 1,651 public companies for the Task Force's 2021 AI review.

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[74] TCFD, *2020 Status Report*, September 22, 2020.

Figure A2-1

Industry and Sub-Industry of Companies Selected for Review

Industries	Sub-Industries	
Banking 608 Companies	• Regional Banks • Large, Diversified Banks	• Investment and Asset Management Firms
Insurance 246 Companies	• Multiline Insurance • Property and Casualty Insurance	• Life and Health Insurance • Reinsurance
Energy 483 Companies	• Oil and Gas • Coal	• Utilities
Transportation 456 Companies	• Air Freight • Passenger Air Transportation • Maritime Transportation	• Rail Transportation • Trucking Services • Automobiles
Materials and Buildings 1,580 Companies	• Chemicals • Construction Materials • Capital Goods	• Metals and Mining • Real Estate Management and Development
Agriculture, Food, and Forest 325 Companies	• Beverages • Agriculture	• Packaged Foods and Meats • Paper and Forest Products
Technology and Media 292 Companies	• Technology Hardware and Equipment	• Interactive Media and Services
Consumer Goods 456 Companies	• Consumer Retailing	• Textiles and Apparel
Total: 4,446 Companies		

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2. DOCUMENTS REVIEWED

The Task Force focused primarily on companies' fiscal year 2018, 2019, and 2020 financial filings, annual reports, integrated reports, and sustainability reports. These documents were identified using the Bloomberg Terminal, and other relevant documents provided in the Terminal were reviewed as available. The Task Force only selected documents available in English and documents were categorized by the year of reporting.

- **Financial Filings** (including 10-Ks, 20-Fs, annual report and accounts, and registration documents): Reports that describe companies' audited financial results under the corporate, compliance, or securities laws of the jurisdictions where they operate. While reporting requirements differ internationally, financial filings generally contain financial statements and other information such as governance statements and management commentary.
- **Annual or Integrated Reports:** Reports that describe companies' activities for the preceding year (annual reports) or the broader range of measures that contribute to companies' long-term value and the role they play in society (integrated reports).
- **Sustainability Reports** (including corporate social responsibility and environmental, social, and governance reports): Reports that describe companies' impact on society, often addressing environmental, social, and governance issues.
- **Other Relevant Documents:** Documents available in the Bloomberg Terminal that are associated with companies' annual reporting or sustainability.

3. AI-BASED REVIEW METHODOLOGY

The Task Force relied on a different AI technology approach to review company reports for the 2021 status report than the AI used in previous years, as another AI provider offered to undertake the review of climate-related disclosures for the Task Force in 2021.[75]

The goal of the AI-based review was to automatically identify TCFD-aligned disclosures in financial filings and other company reports. Designing an automated AI system to review TCFD alignment entailed several challenges and novel solutions to address these challenges. In particular, the language aligning with different TCFD recommended disclosures could be found anywhere in multiple documents of significant length. Another challenge was that the language and semantics used to describe a particular disclosure could differ across countries, sectors, and even between companies in the same sector. To help address these challenges, the AI system utilized language models that can mathematically represent whole sentences and paragraphs and are able to capture and understand meaning in context.[76]

To begin the review process, text passages were first extracted from the various documents available for review in PDF format. An AI model incorporating computer vision techniques was used in this step to properly identify paragraph boundaries. Correct paragraph segmentation was important in order to allow the language models used in subsequent steps to correctly capture the context of sentences.

The paragraph segmentation technique identified thousands of paragraph passages across the various available documents for each company. To filter these passages down to only the ones relevant to climate-related disclosures, a language model–based information retrieval technique was then used to retrieve, score, and rank the passages in order of their relevance to a particular disclosure. The top ranked relevant passages were then selected as relevant to a particular disclosure. Finally, a language model fine-tuned for climate disclosure classification was used to determine if an entity's report aligned with each of the 11 TCFD disclosures.

These language models used for classification were based on the Bidirectional Encoder Representations from Transformers (BERT) architecture.[77] BERT is a deep learning–based natural language processing model trained on a massive text document corpus that encodes text into mathematical representations while taking into account the context for a given word. For example, while other techniques might have encoded the word "running" in the two sentences, "The car is running great," and "The car is running out of gas," in the same way, BERT would take the context into account and provide different representations for "running" in the two sentences. This means that BERT (and other similar architectures) based models can utilize the contextual meaning of words while making the classification decision.

The AI models discussed were trained and fine-tuned using text examples that subject matter experts from V.E., part of Moody's ESG Solutions, had labeled as being aligned to the recommended disclosures. To review the reports, the team used a common standard that involved narrowing down each recommended disclosure to a single yes-no question (Figure A2-2, p. 81). To increase the efficiency of the labeling effort, Active Learning (AL) techniques were utilized.[78] AL is an iterative machine-driven annotation cycle for data labeling, where the AI model identifies ambiguous unlabeled samples that are most informative and provides the most useful information for improving its model performance. This is very useful in resource-constrained environments where labeled data is limited, and sufficient number of human experts are not available to provide labels on large data volumes (which the AI deep learning models need to improve performance). A batch-based AL process in which the AI models iteratively identified relevant batches of unlabeled informative data samples for human annotation from large document collections was used. This resulted in more efficient use of annotator effort and enabled the AI models to perform successfully on a limited number of annotated examples.

[75] The Task Force is grateful for the previous years of review provided by PwC as well as for the review in 2021 provided by Moody's.

[76] Devlin, et al., "Bert: Pre-training of deep bidirectional transformers for language understanding," 2018.

[77] Liu, et al., "Roberta: A robustly optimized bert pretraining approach," 2019.

[78] Settles, "Active learning literature survey," 2009.

Figure A2-2
AI Review Questions

#	Question	Recommended Disclosure
1	Does the company describe the board's or a board committee's oversight of climate-related risks or opportunities?	*Governance a)*
2	Does the company describe management's or a management committee's role in assessing and managing climate-related risks or opportunities?	*Governance b)*
3	Does the company describe the climate-related risks or opportunities it has identified?	*Strategy a)*
4	Does the company describe the impact of climate-related risks and opportunities on its businesses, strategy, or financial planning?	*Strategy b)*
5	Does the company describe the resilience of its strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario?	*Strategy c)*
6	Does the company describe its processes for identifying and/or assessing climate-related risks?	*Risk Management a)*
7	Does the company describe its processes for managing climate-related risks?	*Risk Management b)*
8	Does the company describe how processes for identifying, assessing, and managing climate-related risks are integrated into overall risk management?	*Risk Management c)*
9	Does the company disclose the metrics it uses to assess climate-related risks or opportunities?	*Metrics and Targets a)*
10	Does the company disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas emissions?	*Metrics and Targets b)*
11	Does the company describe the targets it uses to manage climate-related risks or opportunities?	*Metrics and Targets c)*

The AI pipeline was implemented and run on mlfabric™, a custom-designed modular, reusable, cloud-based platform developed at Moody's that operationalizes deep learning and machine learning models, allowing users to deploy and reuse AI models and AI workflows at scale. The disclosure leveraged the mlfabric™ models-as-a-service platform to scale the processing of greater than 10,000 documents (financial filings and other documents) for the selected population of companies to produce the final results.

Performance Validation

The performance of the AI pipeline was assessed at a company level. A company was marked as having a TCFD-aligned disclosure if at least one passage was categorized as a positive result for the questions in Figure A2-2 (p. 81) across any of its documents. If a company was predicted to be complying with a particular disclosure and human annotators were also in agreement (based on annotated data) with that judgment, then that particular example was marked as correctly classified. The metric used to assess the final performance of the AI pipeline was the F1 Score.[79]

F1 Scores for the 11 recommended disclosures are presented in Figure A2-3.

Outcome

The AI pipeline was applied to the excerpts from the reports of the 1,651 companies, and the results were aggregated for analysis by the 11 recommended disclosures, the eight industries, the size of the companies, and the regions in which the companies were located.

Figure A2-3
Paragraph-level model performance

Recommended Disclosure	F1-Score
Governance a)	0.958
Governance b)	0.815
Strategy a)	0.857
Strategy b)	0.906
Strategy c)	0.820
Risk Management a)	0.900
Risk Management b)	0.882
Risk Management c)	0.897
Metrics and Targets a)	0.955
Metrics and Targets b)	0.957
Metrics and Targets c)	0.857

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[79] In binary classification, precision measures the number of correct positive predictions out of the total number of positive predictions while recall measures the number of correct positive predictions out of the actual number of examples that were correct. The F1 Score is the harmonic mean of precision and recall. It is an indicator of the classification accuracy of a model and is commonly used in machine learning applications to judge performance.

Appendix 3: AI Review Results by Industry

As summarized in Section B.1. TCFD-Aligned Reporting by Public Companies, the Task Force developed an approach using artificial intelligence (AI) technology to review the alignment of information included in fiscal year 2018, 2019, and 2020 public reports with the TCFD recommendations. This appendix provides the results of the AI review for each of the eight industries included in the review — Banking; Insurance; Energy; Materials and Buildings; Transportation; Agriculture, Food, and Forest Products; Technology and Media; and Consumer Goods.

Banking

The AI technology reviewed reports from 282 banks in three sub-industries: investment and asset management banks, large and diversified banks, and regional banks. The 282 banks had a median asset size of nearly $66 billion in assets and a maximum size of $5.1 trillion in assets. The AI review results for banks are shown in Figure A3-1.

For seven of the 11 recommended disclosures, the percentage of banks disclosing relevant information was lower than the average across all companies reviewed. However, banks' disclosure of information in alignment with the TCFD recommendations increased from 2018 to 2020 for all the recommended disclosures, and banks, along with materials and buildings companies, had the largest increase in disclosure of *Strategy a)* — climate-related risks and opportunities — between 2018 and 2020 at 20 percentage points. The most significant increases in disclosure for this industry over the three-year period were for *Strategy a)* as mentioned, and *Risk Management c)* at 19 percentage points, showing that banks are increasingly disclosing their analysis of climate-related risks and opportunities as well as integrating processes for identifying, assessing, and managing climate-related risks into their overall risk management activities. However, in 2020, banks had the lowest percentage of disclosure of any industry for the *Metrics and Targets c)* recommended disclosure, climate-related targets.

Figure A3-1

Banking Review Results

Recommendation	Recommended Disclosure	Pt. Change 2018–2020	Percent of Companies That Disclose Information Aligned with TCFD Recommended Disclosures: 2018	2019	2020
Governance	a) Board Oversight	16	6%	14%	22%
	b) Management's Role	8	9%	10%	17%
Strategy	a) Risks and Opportunities	20	25%	33%	45%
	b) Impact on Organization	15	20%	26%	35%
	c) Resilience of Strategy	10	5%	8%	15%
Risk Management	a) Risk ID and Assessment Processes	15	18%	22%	33%
	b) Risk Management Processes	18	14%	19%	32%
	c) Integration into Overall Risk Management	19	10%	17%	29%
Metrics and Targets	a) Climate-Related Metrics	12	23%	32%	35%
	b) Scope 1, 2, 3 GHG Emissions	16	21%	25%	27%
	c) Climate-Related Targets	7	15%	15%	22%

0% 20% 40% 60% 80% 100%

Legend: Percentage of companies that disclosed information aligned with TCFD recommended disclosures in 2020

Insurance

The AI technology reviewed reports from 132 insurance companies in four categories: multiline insurance, property and casualty insurance, reinsurance, and life and health insurance. The insurance companies reviewed had a median size of around $29 billion in assets and a maximum size of $1.3 trillion in assets. The AI review results for these companies are shown in Figure A3-2.

Based on 2020 reporting, the 132 insurance companies most often disclosed information aligned with the TCFD recommended disclosure *Strategy a)*, climate-related risks and opportunities. The percentage of disclosure in 2020 was greater than or equal to the 2020 average across all companies for seven of the 11 recommended disclosures. Insurance companies also exceeded the 2020 average by ten or more percentage points for *Governance a)*, *Risk Management b)*, and *Risk Management c)*. In addition, the insurance companies had higher than average percentage point increases for seven of the 11 recommended disclosures between 2018 and 2020. In 2020, the reviewed insurance companies also had the highest disclosure percentage for four of the 11 recommended disclosures: *Governance a)*, *Risk Management a)*, *Risk Management b)*, and *Risk Management c)*.

Figure A3-2

Insurance Review Results

Recommendation	Recommended Disclosure	Pt. Change 2018–2020	Percent of Companies That Disclose Information Aligned with TCFD Recommended Disclosures: 2018	2019	2020
Governance	a) Board Oversight	22	13%	17%	35%
	b) Management's Role	10	13%	13%	23%
Strategy	a) Risks and Opportunities	17	35%	39%	52%
	b) Impact on Organization	8	28%	32%	36%
	c) Resilience of Strategy	10	8%	9%	18%
Risk Management	a) Risk ID and Assessment Processes	10	27%	26%	37%
	b) Risk Management Processes	16	31%	30%	47%
	c) Integration into Overall Risk Management	17	22%	25%	39%
Metrics and Targets	a) Climate-Related Metrics	6	26%	27%	32%
	b) Scope 1, 2, 3 GHG Emissions	10	20%	20%	30%
	c) Climate-Related Targets	9	18%	18%	27%

0% 20% 40% 60% 80% 100%

Legend: Percentage of companies that disclosed information aligned with TCFD recommended disclosures in 2020

Energy

The AI technology reviewed reports from 267 energy companies in three categories: oil and gas, coal, and utilities. The energy companies had a median revenue of $4.6 billion and a maximum of $181 billion in annual revenue.

The AI review results for these companies are shown in Figure A3-3. In 2020, energy companies had the highest percentage of disclosure for any industry for two recommended disclosures: *Strategy a)*, describing the climate-related risks and opportunities the company has identified over the short, medium, and long term, and *Strategy c)*, describing the resilience of the company's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario. Energy companies also disclosed TCFD-aligned information at a rate greater than or equal to the 2020 average across all companies for ten of the 11 recommended disclosures. The percentage of energy companies reporting information aligned with *Metrics and Targets c)*, describing the targets used by the company to manage climate-related risks and opportunities and performance against targets, more than doubled between 2018 and 2020.

Figure A3-3

Energy Review Results

Recommendation	Recommended Disclosure	Pt. Change 2018–2020	Percent of Companies That Disclose Information Aligned with TCFD Recommended Disclosures
Governance	a) Board Oversight	14	2018 20% 2019 26% 2020 34%
	b) Management's Role	9	2018 11% 2019 15% 2020 20%
Strategy	a) Risks and Opportunities	13	2018 54% 2019 61% 2020 67%
	b) Impact on Organization	14	2018 33% 2019 42% 2020 47%
	c) Resilience of Strategy	17	2018 11% 2019 14% 2020 18%
Risk Management	a) Risk ID and Assessment Processes	8	2018 22% 2019 29% 2020 30%
	b) Risk Management Processes	14	2018 18% 2019 25% 2020 32%
	c) Integration into Overall Risk Management	11	2018 20% 2019 28% 2020 31%
Metrics and Targets	a) Climate-Related Metrics	8	2018 36% 2019 45% 2020 44%
	b) Scope 1, 2, 3 GHG Emissions	14	2018 22% 2019 33% 2020 36%
	c) Climate-Related Targets	21	2018 20% 2019 27% 2020 41%

0% 20% 40% 60% 80% 100%

Legend: Percentage of companies that disclosed information aligned with TCFD recommended disclosures in 2020

Transportation

The AI technology reviewed reports from 158 transportation companies in six categories: air freight, automobiles, maritime transportation, passenger air transportation, rail transportation, and trucking services. The transportation companies had a median size of $4.3 billion in annual revenue and a maximum of $254 billion in annual revenue.

The AI review results are shown in Figure A3-4. In 2020, the 158 transportation companies most often disclosed information aligned with *Strategy a)* and *Metrics and Targets a)* at 49% and 41%, respectively, while the lowest percentage of disclosure related to *Strategy c)* at 6%. Between 2018 and 2020, the largest increase in disclosure (17 percentage points) was for *Governance a)*, the board's oversight of climate-related risks and opportunities. For the same period, the smallest increase in disclosure percentage (three percentage points) was in *Strategy c)* and *Metrics and Targets b)*. Overall, transportation companies disclosed TCFD-aligned information below the 2020 average across all companies for all of the 11 recommended disclosures.

Figure A3-4

Transportation Review Results

Recommendation	Recommended Disclosure	Pt. Change 2018–2020	Percent of Companies That Disclose Information Aligned with TCFD Recommended Disclosures: 2018	2019	2020
Governance	a) Board Oversight	17	6%	11%	23%
	b) Management's Role	11	4%	9%	15%
Strategy	a) Risks and Opportunities	10	39%	37%	49%
	b) Impact on Organization	13	23%	27%	36%
	c) Resilience of Strategy	3	3%	2%	6%
Risk Management	a) Risk ID and Assessment Processes	14	11%	15%	25%
	b) Risk Management Processes	11	11%	13%	22%
	c) Integration into Overall Risk Management	11	7%	13%	18%
Metrics and Targets	a) Climate-Related Metrics	7	34%	38%	41%
	b) Scope 1, 2, 3 GHG Emissions	3	25%	30%	28%
	c) Climate-Related Targets	8	20%	27%	28%

0% 20% 40% 60% 80% 100%

Legend: Percentage of companies that disclosed information aligned with TCFD recommended disclosures in 2020

Materials and Buildings

The AI technology reviewed reports from 404 materials and buildings companies in five categories: capital goods, chemicals, construction materials, metals and mining, and real estate management and development. The materials and buildings companies had a median size of $5.7 billion in annual revenue with a maximum size of $142 billion in annual revenue.

The AI review results for these companies are shown in Figure A3-5. In 2020 reporting, the materials and buildings companies most often disclosed information aligned with the TCFD recommended disclosures *Strategy a)* and *Metrics and Targets a)*. The percentage of materials and buildings companies disclosing information was greater than that for companies in any other industry for four of the 11 recommended disclosures in 2020. In addition, the materials and buildings companies disclosed at the highest rate among all other companies for all three years, for the *Metrics and Targets a)* disclosure, metrics used to assess climate-related risks and opportunities. The materials and buildings companies also disclosed at a percentage that was three times higher for 2020 as for 2018 for three of the recommended disclosures — *Governance a), Strategy c)*, and *Risk Management c)*.

Figure A3-5

Materials and Buildings Review Results

Recommendation	Recommended Disclosure	Pt. Change 2018–2020	Percent of Companies That Disclose Information Aligned with TCFD Recommended Disclosures		
			2018	2019	2020
Governance	a) Board Oversight	18	9%	13%	27%
	b) Management's Role	14	9%	13%	23%
Strategy	a) Risks and Opportunities	20	41%	45%	61%
	b) Impact on Organization	21	28%	33%	49%
	c) Resilience of Strategy	11	3%	4%	14%
Risk Management	a) Risk ID and Assessment Processes	17	16%	20%	33%
	b) Risk Management Processes	19	12%	15%	31%
	c) Integration into Overall Risk Management	20	9%	16%	29%
Metrics and Targets	a) Climate-Related Metrics	4	44%	51%	58%
	b) Scope 1, 2, 3 GHG Emissions	18	34%	42%	52%
	c) Climate-Related Targets	18	25%	31%	43%

0% 20% 40% 60% 80% 100%

Legend: Percentage of companies that disclosed information aligned with TCFD recommended disclosures in 2020

Agriculture, Food, and Forest Products

The AI technology reviewed reports from 142 agriculture, food, and forest products companies in four categories: beverages, packaged foods and meats, agriculture, and paper and forest products. The agriculture, food, and forest products companies had a median size of $3.9 billion in annual revenue and a maximum size of $90 billion in annual revenue.

The AI review results for these companies are shown in Figure A3-6. In 2020, agriculture, food, and forest products companies most frequently disclosed information on *Strategy a)*, climate-related risks and opportunities, and *Metrics and Targets a)*, the metrics used by companies to assess climate-related risks and opportunities. The percentage of agriculture, food, and forest products companies disclosing in 2020 was lower than 2020 average across all companies for eight of the 11 recommended disclosures. However, in 2020 the companies in this group also disclosed at a rate that was at least 10 percentage points higher than the rate in 2018, for six of the 11 recommended disclosures.

Figure A3-6

Agriculture, Food, and Forest Products Review Results

Recommendation	Recommended Disclosure	Pt. Change 2018–2020	Percent of Companies That Disclose Information Aligned with TCFD Recommended Disclosures: 2018	2019	2020
Governance	a) Board Oversight	13	4%	7%	17%
	b) Management's Role	4	9%	8%	13%
Strategy	a) Risks and Opportunities	6	44%	42%	50%
	b) Impact on Organization	4	27%	23%	31%
	c) Resilience of Strategy	10	1%	5%	11%
Risk Management	a) Risk ID and Assessment Processes	15	13%	20%	28%
	b) Risk Management Processes	15	10%	15%	25%
	c) Integration into Overall Risk Management	19	4%	12%	23%
Metrics and Targets	a) Climate-Related Metrics	7	41%	42%	48%
	b) Scope 1, 2, 3 GHG Emissions	4	35%	33%	39%
	c) Climate-Related Targets	11	30%	29%	41%

0% 20% 40% 60% 80% 100%

Legend: Percentage of companies that disclosed information aligned with TCFD recommended disclosures in 2020

Technology and Media

The AI technology reviewed reports from 106 technology and media companies in two categories: interactive media and services and technology hardware and equipment. The technology and media companies had a median annual revenue of $3.0 billion and a maximum annual revenue of $275 billion.

The AI review results for these companies are shown in Figure A3-7. In 2020, technology and media companies had the lowest levels of disclosure of the industries reviewed for eight out of the 11 recommended disclosures. The percentages of disclosure for these companies was lower than the average percentages of disclosure, across all the companies in the industries reviewed, for all of the 11 recommended disclosures. For two of the recommended disclosures — *Risk Management b)* and *Metrics and Targets a)* — there was an increase of only one percentage point between 2018 and 2020. However, in 2020, over a quarter of technology and media companies disclosed for four out of the 11 recommended disclosures.

Figure A3-7

Technology and Media Review Results

Recommendation	Recommended Disclosure	Pt. Change 2018–2020	Percent of Companies That Disclose Information Aligned with TCFD Recommended Disclosures		
			2018	2019	2020
Governance	a) Board Oversight	6	0%	1%	6%
	b) Management's Role	5	3%	5%	8%
Strategy	a) Risks and Opportunities	3	22%	28%	25%
	b) Impact on Organization	13	15%	22%	28%
	c) Resilience of Strategy	4	3%	5%	7%
Risk Management	a) Risk ID and Assessment Processes	4	8%	6%	12%
	b) Risk Management Processes	1	7%	4%	8%
	c) Integration into Overall Risk Management	9	2%	6%	11%
Metrics and Targets	a) Climate-Related Metrics	1	25%	22%	26%
	b) Scope 1, 2, 3 GHG Emissions	2	22%	19%	24%
	c) Climate-Related Targets	12	13%	9%	25%

0% 20% 40% 60% 80% 100%

Legend: Percentage of companies that disclosed information aligned with TCFD recommended disclosures in 2020

Consumer Goods

The AI technology reviewed reports from 160 consumer goods companies in two categories: consumer retailing and textiles and apparel. The consumer goods companies had a median annual revenue of more than $6 billion and a maximum annual revenue of $518 billion.

The AI review results for these companies are shown in Figure A3-8. Overall, the percentages of disclosure for the consumer goods companies was lower than the 2020 average across all companies for nine of the 11 recommended disclosures. The highest percentage of disclosure for companies in the consumer goods group was for climate-related metrics (*Metrics and Targets a*), which was 42% in 2020. The percentage of the 160 consumer goods companies disclosing TCFD-aligned information increased between 2018 and 2020 by greater than five percentage points for all recommended disclosures.

Figure A3-8

Consumer Goods Review Results

Recommendation	Recommended Disclosure	Pt. Change 2018–2020	Percent of Companies That Disclose Information Aligned with TCFD Recommended Disclosures: 2018	2019	2020
Governance	a) Board Oversight	16	4%	6%	20%
	b) Management's Role	10	6%	9%	16%
Strategy	a) Risks and Opportunities	7	34%	36%	41%
	b) Impact on Organization	15	21%	20%	26%
	c) Resilience of Strategy	7	1%	5%	8%
Risk Management	a) Risk ID and Assessment Processes	11	12%	13%	23%
	b) Risk Management Processes	15	6%	9%	21%
	c) Integration into Overall Risk Management	16	2%	9%	18%
Metrics and Targets	a) Climate-Related Metrics	11	31%	38%	42%
	b) Scope 1, 2, 3 GHG Emissions	9	28%	30%	37%
	c) Climate-Related Targets	16	19%	25%	35%

0% 20% 40% 60% 80% 100%

Legend: Percentage of companies that disclosed information aligned with TCFD recommended disclosures in 2020

Appendix 4: PRI Indicators Mapped to TCFD Recommended Disclosures

A s described in Section B2. TCFD-Aligned Reporting by Asset Managers and Owners, the Task Force used PRI's climate-related indicators to gain insight on asset managers' and asset owners' TCFD-aligned reporting. This appendix provides the Task Force's mapping of PRI indicators to its 11 recommended disclosures where possible as shown in Figure A4-1.

Figure A4-1

2021 PRI Indicators Mapped to TCFD Recommended Disclosures

TCFD Recommendation	TCFD Recommended Disclosure	PRI Indicator(s)
Governance	a) Describe the board's oversight of climate-related risks and opportunities.	ISP 28A-G
	b) Describe management's role in assessing and managing climate-related risks and opportunities.[80]	ISP 29A-D
Strategy	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	ISP 30A-G ISP 31A-G
	b) Describe the impact of climate-related risks and opportunities on the organization's business, strategy, and financial planning.	ISP 32
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.[81]	ISP 33.1
Risk Management	a) Describe the organization's processes for identifying and assessing climate-related risks.	ISP 34A-E
	b) Describe the organization's processes for managing climate-related risks.	ISP 36A-G
	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	ISP 36A-G
Metrics and Targets	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management processes.	ISP 38.1 ISP 39.1
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	ISP 38.1
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	ISP 37.1

[80] PRI excluded certain "free text" responses in the aggregate data provided for the indicators mapped to *Governance b)* and *Risk Management a)*, which may understate the level of TCFD-aligned reporting to the PRI.

[81] For *Strategy c)*, the Task Force reviewed PRI indicators relative to its supplemental guidance for asset owners, which asks these organizations to consider providing a discussion of how climate-related scenarios are used, such as to inform investments in specific assets. The PRI indicator most closely aligned with *Strategy c)* asks signatories to "[d]escribe how climate scenario analysis is used to test the resilience of your organization's investment strategy and inform investments in specific asset classes." The Task Force notes the PRI indicator could be interpreted as requesting information beyond that described in the supplemental guidance.

Appendix 5: Rating Agency Incorporations of Climate-Related Information

As part of its work on the usefulness of climate-related financial impact information, the Task Force asked several credit rating agencies to provide a short submission on how climate risks and opportunities factor into their credit rating processes. These submissions are provided in full, in alphabetical order.

AM BEST

The physical hazards caused by climate risks can drive significant socioeconomic disruptions. Rising average temperatures are contributing to a higher frequency and severity of weather-related losses across the world. While many (re)insurers focus on protection against climate risks, there are also opportunities as a material protection gap exists, new insurance opportunities emerge in the transition to a low-carbon economy, and changes in customer preferences and lifestyles create new product prospects. The (re)insurance sector serves to naturally identify and manage the financial consequences of climate risks and enhance the resilience of affected communities.

AM Best's approach to assessing climate risks and opportunities includes consideration of an (re)insurer's climate exposures, their strategic business plans, and how these exposures can positively or negatively affect their creditworthiness over the short-to-medium term. For climate risks, AM Best explicitly considers the impact from physical, transition, and liability climate-related risks. AM Best's evaluation considers the financial impact of climate risks and opportunities across the building block assessments, namely balance sheet strength, operating performance, business profile, and enterprise risk management.

AM Best assesses the financial impact of climate risks and opportunities for all (re)insurers, emphasizing a forward-looking approach based on an understanding of how (re)insurers adapt their profile to manage climate risks and capitalize on opportunities.

Weather-related events are considered a severe threat to the balance sheet strength of insurers because of the often significant, rapid, and unexpected impact of such losses. AM Best expects (re)insurers accepting climate-related risks to be able to demonstrate that they can effectively manage these risks, including consideration for climate trends and for the increased severity and frequency of weather-related events — and have the financial wherewithal to withstand potential losses.

The asset profile of (re)insurance is also important. Any asset held by (re)insurers that may be affected by climate risk, such as coastal properties at risk of flooding due to rising sea levels, or assets exposed to weather-related catastrophe events, may need to be assessed to understand the value of these assets, or if any write-downs are applicable. Any mitigating measures that protect the asset value would also need to be considered.

The financial impact of climate risks will vary between companies depending on their mix of business and geographic exposures. Their business profile and the level of reinsurance protection will dictate underlying volatility in financial metrics and their ability to produce profitable returns. These elements are bound together based on the company's risk appetite and risk practices adopted to manage climate risk.

Risk management plays an important role in the company's ability to effectively model weather-related events and factor climate risk into the pricing and modeling of risks. A key area for consideration is the availability of appropriate data and analytical tools to accurately model weather-related events. Overexposure, inadequate modeling, or insufficient protection arising from an event are concerns if losses fall outside of AM Best, or company expectations. For life insurers, climate risk can change the pattern and resistance to infectious disease, which could affect future mortality and morbidity rates. In underwriting such risks, it is important to understand changes to the operating environment stemming from climate risks.

Financial disclosure on climate risks are becoming a mainstay in many insurance markets with an increasing number of (re)insurers using the TCFD framework. AM Best uses both public and nonpublic relevant information gathered through engagement with management, company sustainability reports, regulatory reporting submissions, and other sources as part of the credit rating analysis.

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Since March 2020, AM Best has been disclosing whether environmental, social, and governance (ESG) factors have been key to any positive or negative change in ratings (Figure A5-1). Approximately 9% of AM Best's global rating movements have been as a result of ESG factors, of which climate risk has been a key driver. Negative rating actions have been mainly on companies that have concentrated exposures to weather-related events, whereby exposures have fallen outside of risk appetite, and affected capital positions and earnings profiles. These losses have highlighted weaknesses in managing climate risks, and their inability to model and mitigate these risks. Conversely, some (re)insurers have demonstrated positive rating actions mainly through strengthened governance practices, driven by enhanced modeling techniques, exposure management, and protection against peak risks. AM Best's expectation is that the risk management of climate risk is important and that (re)insurers need to step up engagement on climate risks and opportunities, according to a framework, such as that shown in Figure A5-2.

Figure A5-1
Key Drivers of Global Rating Movements

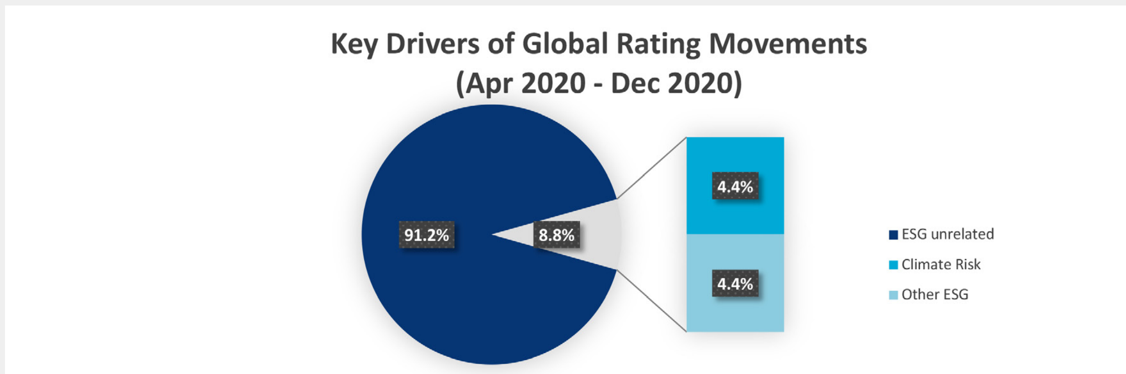

Figure A5-2
Assessing Climate Risks Through the Rating Process

	Balance Sheet Strength	Operating Performance	Business Profile	Enterprise Risk Management	
Climate Risks (positive)	• Capital position withstand shocks • Protection against peak exposures and aggregation of losses • Low volatility / sensitivity to climate risk • Diversification in investment portfolio	• Stability of earnings • Limited impact of stranded assets • Adequate modelling and pricing • New climate products earnings accretive	• Underwriting profile diversified and insulated against climate risks • Development of new products • Clearly defined policy wording and contracts	• Climate risks factored into ERM approach • Ability to absorb climate stress tests • Ability to model weather-related risks • High visibility of climate reporting, (financial disclosures, regulatory reporting) • Board oversight	→ **Issuer Credit Rating**
Climate Risks (negative)	• Rapid decline in capital position – over-exposure, unexpected losses • Inadequate protection against peak exposures • High volatility / sensitivity to climate risks • Exposure to stranded assets	• Volatile earnings • Issues with stranded assets • Climate risks not considered in underwriting model • Unexpected losses • Adverse mortality and morbidity rates from resistant disease	• Underwriting or investment profile concentrated and exposed to climate risk • Uncertain or indirect exposures to climate risks	• Breaches of appetite and tolerance • Stress test failures • Inadequate risk modelling – poor data quality • Non-disclosure in financial reporting • Inadequate protection against peak exposure, or aggregation of risks	

Note: Some content was reformatted in order to fit the page.

FitchRatings

Incorporation of climate risks and opportunities into rating process

Fitch provides a comprehensive, systematic approach to communicating how climate risks and opportunities influence ratings at a sector, issuer, and transaction level. Analysts incorporate climate-related risks that could affect credit profiles into their forecasts, including increased focus on carbon-transition policies and lower long-term oil price assumptions, partially due to increasing transition risk.

Over 150,000 ESG Relevance Scores (ESG.RS) have been applied by Fitch's 1,500 global credit analysts to over 11,000 issuers or transactions since their launch in 2019. ESG.RS tracks the credit relevance of environmental factors including GHG emissions, energy management, and exposure to environmental impacts, firmly embedding the transparent display of climate risk impacts within ratings reports and research (as shown in Figure A5-3). Fitch Ratings' ESG.RS provide a tool to prioritize research and engagement around the most financially material factors for rated entities or transactions, which is of heightened importance under the new EU Sustainable Finance Disclosure Regulation. Financial materiality of climate issues can be compared across a peer group, distinguishing entities who are actively managing climate risks from those whose exposure affects their credit rating, in line with the *"strategic planning risk management"* at the core of the TCFD. Changes to ESG.RS over time capture the dynamic nature of climate risks.

Fitch has seen several notable examples of ratings pressures driven by rising costs of energy transition (for example, electric vehicles in the auto sector) and physical risks of climate change (for example, mortgage-backed securities with high concentration in areas of heightened natural disaster risk and underinsurance). Currently, 38% of Fitch's Autos sector and 20% of its EMEA Utilities sector issuers for instance have an ESG score of 4 or 5 for GHG emissions, reflecting the factor as a key rating driver of the credit rating. Conversely, the ESG.RS also include issuers who have seen a positive ratings uplift from supply of renewable energy in markets with supportive regulatory environments, in line with the "opportunities" metric of the TCFD.

Figure A5-3

ESG Scoring Definitions

ESG Scoring Definitions

LOWEST RELEVANCE		NEUTRAL	CREDIT-RELEVANT TO ISSUER	
1	**2**	**3**	**4**	**5**
Irrelevant to the entity rating and irrelevant to the sector.	Irrelevant to the entity rating but relevant to the sector.	Minimally relevant to rating, either very low impact or actively managed in a way that results in no impact on the entity rating.	Relevant to rating, not a key rating driver but has an impact on the rating in combination with other factors.	Highly relevant, a key rating driver that has a significant impact on the rating on an individual basis.

Note: Some content was reformatted in order to fit the page.

Filling information gaps:

Fitch recognizes the emerging, latent nature of many climate risks, as well as widespread gaps in disclosure. Its global ESG research team undertakes detailed thematic research on climate and ESG themes at macro, sector, and entity/transaction levels to better understand the credit implications of these emerging risks across diverse areas such as industrial decarbonization, deforestation, and sustainability-linked debt (Figure A5-4). Targeted use of third-party, asset-level data sources such as CRU[82] deepens issuer commentary and benchmark climate risk management. In addition, analysts' interaction with management boards as part of the ratings process enables an ongoing discussion and understanding of how different entities are impacted and are managing climate risks, which better inform ESG.RS for each issuer.

Figure A5-4

Understanding ESG Credit Implications

SHORT TO MEDIUM-TERM — MEDIUM TO LONG-TERM

ESG Relevance Scores

- ESG Relevance Scores articulate the level of influence an environmental, social or governance issue has had on a credit rating decision.
- ESG Relevance Scores are forward looking and based on the base case forecasts for the credit ratings of entities and transactions.
- Fitch Ratings' credit analysts systematically evaluate ESG credit considerations incorporated in its ratings methodologies.
- The scores cover Environmental, Social, and Governance (E, S and G, respectively) risks under a transparent sector based, cross-asset, global framework.
- Sector based templates provide clear articulation of credit relevant ESG risks.

Sector / Entity / Transaction

ESG Research

- Dedicated global ESG Research team based across three continents who cover thematic and cross-sector ESG credit risk, as well as supporting credit analysts with themed issuer and transaction specific research.
- Thematic reports analysing ESG themes at a macro-level, a sector level, and an entity / transaction level with an emphasis on how they are likely to affect sectors and entities from a credit perspective.
- The ESG Research team prioritize emerging ESG themes that are most material and likely to disrupt industries and business models.

Sector / Thematic

ESG Vulnerability Scores

- Credit risk analysis based on a credible downside credit risk scenario whereby climate change is limited to 2 degrees of warming by 2050.
- Vulnerability scores provide a time series comparative risk score of credit risk vulnerability for sectors, entities within a sector, and debt instruments.
- Time profiled scores at regular intervals from 2025 to 2050. Unique granular view for investors looking to manage longer term ESG credit risks.
- Based on the UN-backed Principles for Responsible Investment's Inevitable Policy Response scenario, refined and adjusted for the in-depth sector knowledge of Fitch's rating analysts.

Sector / Entity / Transaction

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Regulatory landscape

In line with the TCFD recommendations, Fitch uses scenario analysis and stress testing methodologies to explore the implications of a changing regulatory landscape. Its ESG Vulnerability Scores (ESG.VS) use a plausible policy stress scenario (the UN PRI's Inevitable Policy Response) as a starting point to test exposure to long-term regulatory tightening in response to climate change. Fitch then overlays this with analysts' detailed knowledge of sectoral and regional drivers of supply and demand, as well as issuer-specific fundamentals such as cost recovery mechanisms, local policy environments, cost competitiveness and asset age, as well as climate risk strategy. This enables Fitch to form a long-term view (2025–2050) of the relative exposure of issuers to changing regulation and financial materiality of the changes, in line with the TCFD recommendations. This view is expounded in its ESG Vulnerability Score sector reports.

[2] CRU refers to CRU Group, a strategic partner of Fitch.

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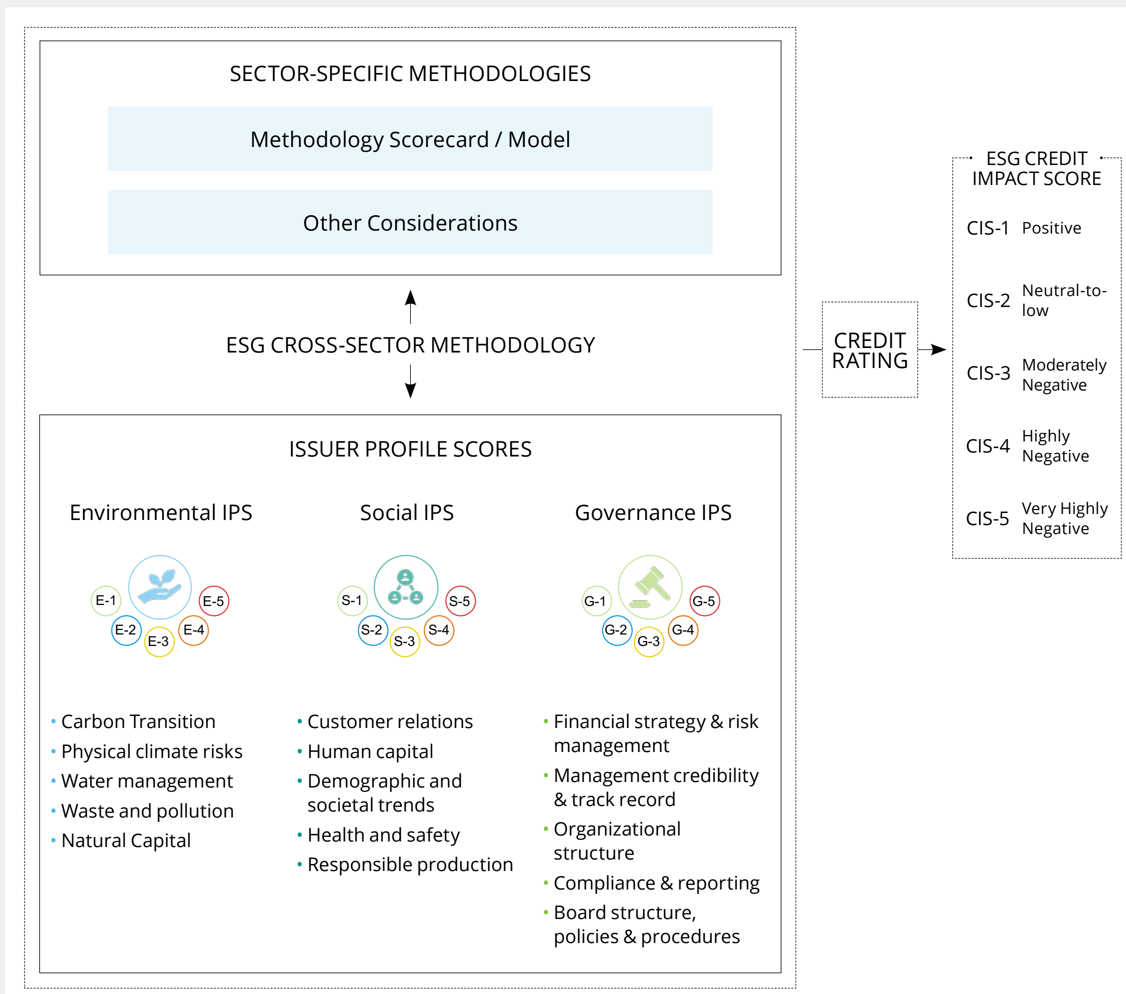
Assessment of climate risk

Moody's Investors Service assesses the credit considerations of ESG risks including climate change, alongside all other relevant credit drivers and mitigating factors, in the determination of its credit ratings — see Figure A5-5. It has introduced ESG issuer profile scores and ESG credit impact scores as well as Carbon Transition Assessment scores to assist in the assessment of these risks and their impact on credit ratings.

Categories of environmental risk scored include exposure to climate risk, including transition and physical risks. In assessing transition risk for issuers in the most impacted sectors, Moody's also produces Carbon Transition Assessments to further inform their assessment of the transition risk facing that entity. They observe that the credit impact of physical climate risk is generally negative, to varying degrees. The credit impact of carbon transition can be positive or negative, depending upon whether the entity's risk profile is improved or weakened by its operating environment's transition to a low-carbon economy.

Figure A5-5

Summary of How Climate Risk Scores Contribute to Credit Ratings



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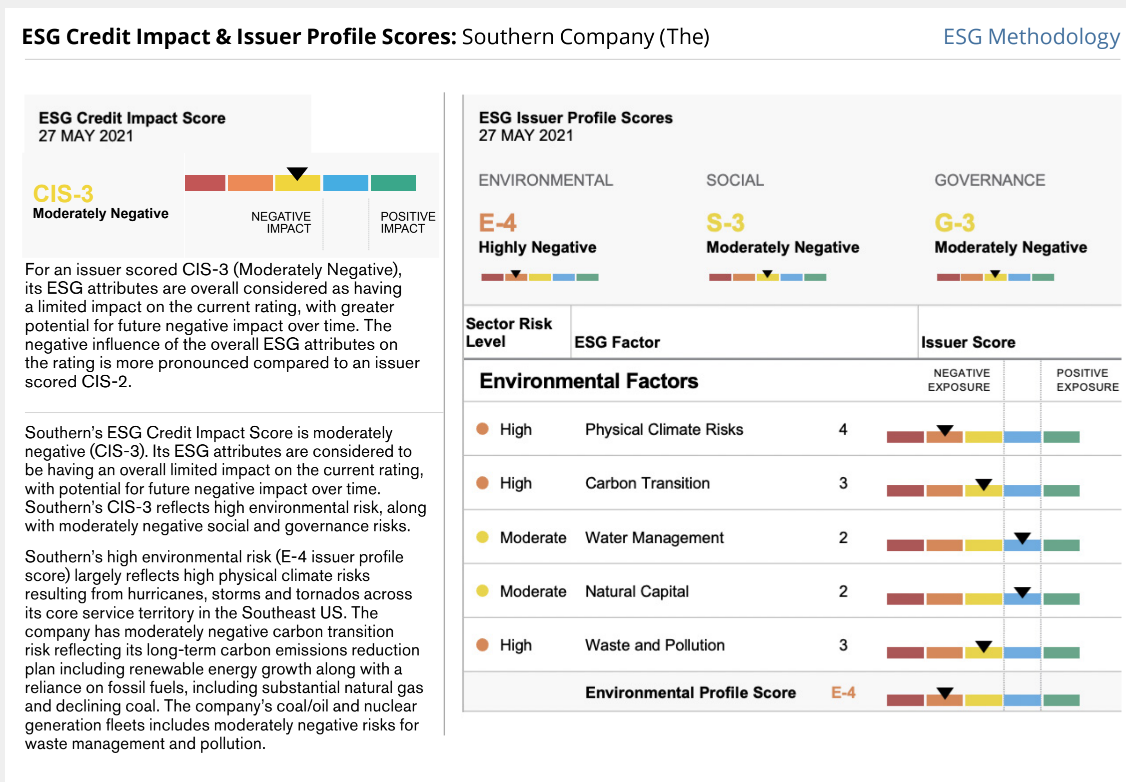
Quantitative and qualitative analysis

Moody's Investors Service's transition and physical risk scores are informed by quantitative metrics, including some forward-looking data and projections. The final scores are determined by analysts who also qualitatively consider the materiality of transition and physical risk for an entity and information about that entity's business strategy and operating environment. This augmentation of data and exercise of judgment is necessary because, at present, TCFD-inspired and similar disclosures are generally not sufficiently detailed, forward-looking, or consistent on a global — or even on an industry — basis to support a mechanistic, quantitative scoring approach.

An example of the ESG scores for a U.S. utility is shown in Figure A5-6 along with the narrative explaining the positioning. While the sector has high exposure to transition risk, the strategy of the company is mitigating the risk to moderate exposure for this particular issuer. The geographic location of this utility's operations results in the physical risk exposure being high. Environmental risk is the most significant of the three ESG areas for the company resulting in the E-4 IPS; however, in the context of the overall credit analysis, ESG issues are only having a limited negative impact on the current credit rating outcome, as indicated by the CIS-3 score.

Figure A5-6

Example of Moody's Investors Service ESG Scores Covering Climate Risk



ESG Credit Impact & Issuer Profile Scores: Southern Company (The) ESG Methodology

ESG Credit Impact Score
27 MAY 2021

CIS-3
Moderately Negative

NEGATIVE IMPACT POSITIVE IMPACT

For an issuer scored CIS-3 (Moderately Negative), its ESG attributes are overall considered as having a limited impact on the current rating, with greater potential for future negative impact over time. The negative influence of the overall ESG attributes on the rating is more pronounced compared to an issuer scored CIS-2.

Southern's ESG Credit Impact Score is moderately negative (CIS-3). Its ESG attributes are considered to be having an overall limited impact on the current rating, with potential for future negative impact over time. Southern's CIS-3 reflects high environmental risk, along with moderately negative social and governance risks.

Southern's high environmental risk (E-4 issuer profile score) largely reflects high physical climate risks resulting from hurricanes, storms and tornados across its core service territory in the Southeast US. The company has moderately negative carbon transition risk reflecting its long-term carbon emissions reduction plan including renewable energy growth along with a reliance on fossil fuels, including substantial natural gas and declining coal. The company's coal/oil and nuclear generation fleets includes moderately negative risks for waste management and pollution.

ESG Issuer Profile Scores
27 MAY 2021

ENVIRONMENTAL	SOCIAL	GOVERNANCE
E-4 Highly Negative	**S-3** Moderately Negative	**G-3** Moderately Negative

Sector Risk Level	ESG Factor		Issuer Score
Environmental Factors			NEGATIVE EXPOSURE / POSITIVE EXPOSURE
High	Physical Climate Risks	4	
High	Carbon Transition	3	
Moderate	Water Management	2	
Moderate	Natural Capital	2	
High	Waste and Pollution	3	
	Environmental Profile Score	E-4	

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Impact on ratings

Thirteen percent of private sector ratings actions in 2020 cited environmental issues, up from 5% in 2019. Carbon transition risk was the most frequently cited environmental consideration in these ratings actions. Most ratings actions citing carbon transition came from sectors Moody's had previously identified in its environmental heat map as facing high or very high exposure to that risk, such as oil and gas and steel.

S&P Global
Ratings

How does climate-related financial information affect S&P Global's issuer credit ratings?

S&P Global Ratings incorporates environmental, social, and governance (ESG) credit factors, including climate-related credit factors, into its credit analysis across all sectors if it believes the factors are material and relevant to its opinions of creditworthiness. As one of the key ESG credit factors, the potential effect of climate-related issues depends on how much they affect the capacity and willingness of an obligor to meet its financial commitments.

Climate-related disclosure information may affect credit rating analysis in many ways.[83]

S&P Global's credit analysis may incorporate climate-related short-, medium-, and long-term information — both qualitative and financial. Qualitative information predominantly influences its country and industry assessments as well as its evaluation of management and governance in case of non-financial corporates.

Forward-looking financial information provided by issuers that is material to S&P Global's analysis may not only affect an entity's key metrics such as the cash flow/leverage ratios of a non-financial corporate, but also its assessment of an entity's competitive position among its peers.

- Transition and physical risks may materially increase operating costs — such as greenhouse gas and other pollution emissions compliance costs and health and safety costs — or reduce asset values and revenues through decreased capacity or changing consumer preferences. These risks and the mitigation of the risks may also significantly affect the entities expenditure or capital investment plans and thereby its future cash flow generation capability. Investing to avail of climate-related opportunities may weaken cash flow during the investment phase but boost the entity's forecast earnings and cash flow generation once the investment breaks even.
- S&P Global would factor in such climate-related forecast information provided by companies into cash flow/leverage assessments for non-financial corporates, if there is sufficient certainty and visibility, and if the information is sufficiently material to the analysis of creditworthiness, which, in turn, can directly affect the assessment of financial risk profile. The revenue strength and its diversification, cost structures, and volatility of profitability are also key factors in competitive position assessments for non-financial corporates.

For banks and insurance companies, S&P Global analyzes capital and earnings as well as risk exposures and considers financial data such as expected loan losses or annual catastrophe losses. Similarly, structural characteristics such as revenue diversification and any strategic changes to these characteristics are incorporated into assessments of their business risk profiles.

S&P Global incorporates in its analysis forward-looking financial information for periods over which it considers it has a sufficiently clear view of an entity's potential financial performance. Nevertheless, it considers whether the creditworthiness is sustainable beyond such forecast period. If S&P Global has a high degree of visibility about factors that may crystallize beyond the typical forecast period, even if less certain, it could factor those into its ratings in its qualitative considerations.

Furthermore, comparable, standardized, non-financial data, such as historical scope 1, 2, and 3 GHG emissions metrics, and an entity's strategic targets as regards factors such as future emissions and emissions intensity, as well as physical risk mitigation goals, are also beneficial in improving the information that is used to undertake credit analysis. However, for such data to facilitate deeper dialogue and analysis of both transition and physical risks, it needs to be prepared on a consistent basis, globally comparable, widespread in use, and reliable.

Information gap

S&P Global Ratings incorporates climate-related credit factors into its credit analysis if it believes the factors are material and relevant to its opinions of creditworthiness.

The main challenges when trying to evaluate climate-related credit factors can be insufficient disclosure generally and — where there is disclosure — inconsistent disclosure across peers. Furthermore, this assessment could also be enhanced by interconnected reporting on these matters, linking the qualitative disclosures

[83] S&P Global, *S&P Global Ratings Proposes Additional Transparency On ESG Factors As Drivers Of Credit Ratings*, 2021.

with their historic and potential future financial impact. Such links would support telling a comprehensive story about the entity's exposure to climate-related risks and opportunities and management's actions in response to those.

Regulatory landscape

S&P Global continues to monitor the changes in climate-related policy landscape and evaluate any potential impact on all obligor's creditworthiness. As new information emerges, S&P Global captures and incorporates risks and opportunities through the surveillance and review of existing and future information that is relevant to the issuer. Future rating actions may be influenced by climate-related policy changes that impose new costs or create opportunities for rated entities, such as greenhouse gas emissions pricing or taxes, natural condition adaptation requirements, or regulated safety management costs.

A rating can reflect the potential effects of a given policy action once there is high certainty that a policy will be implemented (for example, if a related law or regulatory requirement has been, or is close to being, adopted). This makes its potential credit implications more predictable. In some cases, S&P Global could also consider the potential credit implications of such actions, and possibly incorporate these into its ratings analysis, where a future policy change is agreed and highly certain to be implemented but with a delay.

Regulatory changes do not always have to alter underlying economics; they may simply provide additional insights into an entity's existing climate-related risks or opportunities. The introduction of mandatory disclosure frameworks — such as the TCFD by the UK from 2022 — may improve how credit analysis incorporates climate-related information by offering comparable and consistent disclosures by companies.

With the evolving policy and legal framework on climate-related disclosures, a risk may become more visible or more certain, or the obligor may take action to mitigate the risk that reduces or eliminates its risk exposure. Insignificant risks or strengths that are not currently considered material to the obligor's creditworthiness can later become material.

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Appendix 6: Glossary and Abbreviations

ANNUAL OR INTEGRATED REPORTS refer to reports that describe companies' activities for the preceding year (annual reports) or the broader range of measures that contribute to companies' long-term value and the role they play in society (integrated reports).

BOARD OF DIRECTORS (OR BOARD) refers to a body of elected or appointed members who jointly oversee the activities of a company or organization. Some countries use a two-tiered system where "board" refers to the "supervisory board" while "key executives" refers to the "management board."[84]

CARBON FOOTPRINTING is the calculation of the total greenhouse gas emissions caused by an individual, event, organization, service, or product, expressed as carbon dioxide equivalent.

CARBON INTENSITY relates to a company's physical carbon performance and describes the extent to which its business activities are based on carbon usage for a defined Scope and fiscal year.

FINANCIAL FILINGS refer to the annual reporting packages in which companies are required to deliver their audited financial results under the corporate, compliance, or securities laws of the jurisdictions in which they operate. While reporting requirements differ internationally, financial filings generally contain financial statements and other information such as governance statements and management commentary.[85]

FINANCIAL PERFORMANCE refers to income and expenses as reflected on its income and cashflow statements (actual) or potential income and expenses under different climate-related scenarios.

FINANCIAL PLANNING refers to a company's consideration of how it will achieve and fund its objectives and strategic goals. The process of financial planning allows companies to assess future financial positions and determine how resources can be utilized in pursuit of short- and long-term objectives. As part of financial planning, companies often create "financial plans" that outline the specific actions, assets, and resources (including capital) necessary to achieve these objectives over a one-to-five-year period. However, financial planning is broader than the development of a financial plan as it includes long-term capital allocation and other considerations that may extend beyond the typical three-to-five-year financial plan (e.g., investment, research and development, manufacturing, and markets).

FINANCIAL POSITION refers to assets, liabilities, and equity as reflected on its balance sheet (actual) or potential assets, liabilities, and equity under different climate-related scenarios.

GOVERNANCE refers to "the system by which an organization is directed and controlled in the interests of shareholders and other stakeholders."[86] "Governance involves a set of relationships between an organization's management, its board, its shareholders, and other stakeholders. Governance provides the structure and processes through which the objectives of the organization are set, progress against performance is monitored, and results are evaluated."[87]

GREENHOUSE GAS (GHG) EMISSIONS SCOPE LEVELS[88]

- Scope 1 refers to all direct 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 the value chain of the reporting company, including both upstream and downstream emissions. Scope 3 emissions could include: the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g., transmission and distribution losses), outsourced activities, and waste disposal.[89]

IMPLIED TEMPERATURE RISE refers to an estimate of a global temperature rise associated with the greenhouse gas emissions of a single entity (e.g., a company) or a selection of entities (e.g., those in a given investment portfolio, fund, or investment strategy). Expressed as a numeric degree rating, ITR metrics incorporate current

[84] OECD, *G20/OECD Principles of Corporate Governance*, 2015.

[85] Based on Climate Disclosure Standards Board, *CDSB Framework for Reporting Environmental and Climate Change Information*, December 2019.

[86] Cadbury, *Report of the Committee on the Financial Aspects of Corporate Governance*, 1992.

[87] OECD, *G20/OECD Principles of Corporate Governance*, 2015.

[88] World Resources Institute and World Business Council for Sustainable Development, *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)*, March 2004.

[89] World Resources Institute and World Business Council for Sustainable Development, *The Corporate Value Chain (Scope 3) Accounting and Reporting Standard*, April 16, 2014.

GHG emissions or other data and assumptions to estimate expected future emissions associated with the selected entity or entities. Then, the estimate is translated into a projected increase in global average temperature (in °C) above pre-industrial levels that would occur if all companies in corresponding sectors had the same carbon intensity as the selected asset(s).

MANAGEMENT refers to those positions a company or organization views as executive or senior management positions.

NET-ZERO refers to achieving an equal balance between GHG emissions produced and GHG emissions removed from the atmosphere.

RISK is defined in many ways. For purposes of this guidance, risk is defined as the possibility or likelihood that actual results (operational or financial) deviate from expected results in a manner that has an effect on objectives at different levels (such as strategic, organization-wide, project, product, and process). Risk is often characterized by reference to potential events and consequences, or a combination of these, and expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood of occurrence. Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of, an event, its consequence, or likelihood. Risk conceptually equals the probability or likelihood of hazardous events occurring multiplied by the company's exposure and vulnerability to the event.

RISK ASSESSMENT consists of risks identification, risk analysis, and risk evaluation. The essential building blocks for comprehensively assessing risk (and establishing metrics) are hazards, exposure, vulnerability, risk, and impacts.

RISK MANAGEMENT refers to a set of processes that are carried out by a company or organization's board and management to support the achievement of its objectives by addressing its risks and managing the combined potential impact of those risks.

RISK PROFILE refers to each company's **risk attitude**, which may be described as risk-averse, risk-neutral, or risk-seeking, a **risk tolerance**, which looks at acceptable/unacceptable deviations from what is expected, and a risk appetite, which looks at how much risk one is willing to accept.

SCENARIO ANALYSIS is a process for identifying and assessing a potential range of outcomes of future events under conditions of uncertainty. In the case of climate change, for example, scenarios allow an organization to explore and develop an understanding of how the physical and transition risks of climate change may impact its businesses, strategies, and financial performance over time.

SECTOR refers to a segment of companies performing similar business activities in an economy. A sector generally refers to a large segment of the economy or grouping of business types, while "industry" is used to describe more specific groupings of companies within a sector.

STRATEGY refers to an organization's desired future state. An organization's strategy establishes a foundation against which it can monitor and measure its progress in reaching that desired state. Strategy formulation generally involves establishing the purpose and scope of the organization's activities and the nature of its businesses, taking into account the risks and opportunities it faces and the environment where it operates.

SUSTAINABILITY REPORT is a report that describes a company's or organization's impact on society, often addressing environmental, social, and governance issues.

TRANSITION PLAN refers to an aspect of an organization's overall business strategy that lays out a set of targets and actions supporting its transition toward a low-carbon economy, including actions such as reducing its GHG emissions.

USER, or **PRIMARY USER**, refers to investors, lenders, and insurance underwriters. The Task Force recognizes that many other organizations, including credit rating agencies, equity analysts, stock exchanges, investment consultants, and proxy advisors also use climate-related financial disclosures, allowing them to push information through the credit and investment chain and contribute to the better pricing of risks by investors, lenders, and insurance underwriters. These organizations, in principle, depend on the same types of information as primary users.[90]

[90] TCFD, *Final Report*, 2017, pp. 2–3.

Abbreviations

1.5°C	1.5° Celsius
2°C	2° Celsius
AUM	Assets under management
CA100+	Climate Action 100+
CDP	Carbon Disclosure Project
CDSB	Climate Disclosure Standards Board
CSRD	Corporate Sustainability Reporting Directive
ESG	Environmental, social, and governance
FSB	Financial Stability Board
G20	Group of 20
GHG	Greenhouse gas
GRI	Global Reporting Initiative
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
IIF	Institute of International Finance
IIGCC	Institutional Investors Group on Climate Change
IIRC	International Integrated Reporting Council
IOSCO	International Organization of Securities Commissions
IPCC	Intergovernmental Panel on Climate Change
ISSB	International Sustainability Standards Board
NGFS	Network for Greening the Financial System
PRI	Principles for Responsible Investment
SASB	Sustainability Accounting Standards Board
TCFD	Task Force on Climate-related Financial Disclosures
UN	United Nations
UNEP FI	United Nations Environment Programme Finance Initiative
WACI	Weighted average carbon intensity
WBCSD	World Business Council for Sustainable Development

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B.
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C.
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