

# Task Force on Climate-related Financial Disclosures

Implementing the Recommendations  
of the Task Force on Climate-related  
Financial Disclosures

October 2021

**TCFD**

TASK FORCE ON  
CLIMATE-RELATED  
FINANCIAL  
DISCLOSURES

*This document updates and supersedes the 2017 Annex "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures"*

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A.

# Introduction

# A. Introduction

## 1. Background

In December 2015, the Financial Stability Board (FSB) established the industry-led Task Force on Climate-related Financial Disclosures (TCFD or Task Force) to develop climate-related disclosures that “could promote more informed investment, credit [or lending], and insurance underwriting decisions” and, in turn, “would enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system’s exposures to climate-related risks.”<sup>1, 2</sup>

To fulfill its remit, the Task Force developed a framework with four widely adoptable recommendations on climate-related financial disclosures applicable to organizations across sectors and industries, as described in the Task Force’s report—*Recommendations of the Task Force on Climate-related Financial Disclosures* (2017 report). The Task Force’s 2017 report reflects its consideration of public feedback received throughout 2016 and 2017. The Task Force solicited this feedback in several ways, including two public consultations, resulting in over 500 responses, hundreds of industry interviews, several focus groups, and multiple webinars.

An important aspect of the Task Force’s recommendations is their inclusion in organizations’ mainstream (i.e., public) annual financial filings. In most G20 jurisdictions, public companies have a legal obligation to disclose material information in their financial filings—including material climate-related information. The Task Force believes climate-related risks and opportunities are or could be material for many organizations; and its report and this Annex should be useful to organizations in complying with existing disclosure obligations more effectively. Furthermore, the Task Force encourages organizations for which climate-related risks and opportunities could be material in the future to begin disclosing climate-related financial information outside financial filings to facilitate the incorporation of such information into financial filings once climate-related issues are determined to be material.

This Annex contains the following information:

- directions on the application of the recommendations, including materiality assessments and location of disclosures;
- information on assessing financial impacts of climate-related risks and opportunities (collectively referred to as climate-related issues);
- recommendations and supporting recommended disclosures that describe information investors, lenders, and insurance underwriters need to make economic decisions;
- guidance that provides context and suggestions for implementing the recommendations;
- *supplemental* guidance that highlights important considerations for the financial sector and non-financial industries potentially most affected by climate change; and
- seven principles for effective disclosure developed by the Task Force to help guide current and future developments in climate-related financial reporting.<sup>3</sup>

<sup>1</sup> FSB, “[Proposal for a Disclosure Task Force on Climate-Related Risks](#),” November 9, 2015.

<sup>2</sup> The term “carbon-related assets” is not well defined, but is generally considered to refer to assets or organizations with relatively high direct or indirect GHG emissions.

<sup>3</sup> When used by organizations in preparing their climate-related financial disclosures, these principles can help achieve high-quality and decision-useful disclosures that enable users to understand the impact of climate-related risks and opportunities on organizations. The Task Force encourages organizations adopting its recommendations to consider these principles as they develop their climate-related financial disclosures.

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Since the Task Force issued its recommendations on climate-related financial disclosures in 2017, it has monitored and promoted organizations' adoption of the recommendations. As part of those efforts, it has issued annual status reports describing disclosure practices related to core elements of the TCFD recommendations along with additional information on specific topics to support organizations in implementing the recommendations and disclosing decision-useful climate-related financial information.<sup>4</sup>

In addition, the Task Force has issued other materials on specific topics intended to support implementation, as described in [Section A.5. Summary of Additional Supporting Materials](#). The Task Force updated this Annex to incorporate content from and references to these additional publications to reflect the evolution of disclosure practices and better support organizations' implementation efforts. The substantive updates to the Annex are summarized in [Table 1](#). The Task Force has not modified its four overarching recommendations on Governance, Strategy, Risk Management, and Metrics and Targets or the 11 associated recommended disclosures; however, it has updated the guidance for all sectors and now asks organizations to disclose their GHG emissions independent of a materiality assessment. Importantly, the Task Force recognizes organizations may need time to implement some of these changes, especially in areas where methodologies are being developed or refined and data availability is limited.

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Table 1		
Summary of Changes to Guidance, October 2021		
Recommendation	Location	Summary of Change
<b>Governance: no changes</b>		
<b>Strategy</b>		
a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	Supplemental Guidance for Banks	For purposes of reporting on exposure to carbon-related assets, expanded the suggested definition of such assets to include all non-financial groups identified by the TCFD in its <a href="#">2017 report</a> . <sup>5</sup>
b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	Guidance for All Sectors	Revised to more explicitly address disclosure of actual financial impacts on organizations as well as key information from organizations' plans for transitioning to a low-carbon economy (transition plans).
c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	Guidance for All Sectors	Revised to more explicitly address disclosure of potential financial impacts on organizations.
<b>Risk Management: no changes</b>		
<b>Metrics and Targets</b>		
a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	Guidance for All Sectors	Revised to more explicitly address disclosure of metrics consistent with cross-industry, climate-related metric categories ( <a href="#">Appendix 2</a> ) for current, historical, and future periods, where appropriate.

<sup>4</sup> For more information, see the Task Force's annual status reports ([2021 Status Report](#), [2020 Status Report](#), [2019 Status Report](#), and [2018 Status Report](#)).

<sup>5</sup> In its 2017 report and annex, the Task Force did not specifically define the term carbon-related assets. Instead, in the supplemental guidance for banks, the Task Force suggested that for purposes of disclosing information on significant concentrations of credit exposure to carbon-related assets under the TCFD framework, banks should use a consistent definition to support comparability. The Task Force suggested using assets tied to the energy and utilities sectors.

Table 1

**Summary of Changes to Guidance, October 2021** *(continued)*

Recommendation	Location	Summary of Change
<b>Metrics and Targets</b>		
a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	Supplemental Guidance for Banks	Added disclosure of the extent to which lending and other financial intermediary business activities are aligned with a well below 2°C scenario.
	Supplemental Guidance for Insurance Companies	Added disclosure of the extent to which insurance underwriting activities are aligned with a well below 2°C scenario.
	Supplemental Guidance for Asset Owners	Added disclosure of the extent to which assets they own and funds and investment strategies, where relevant, are aligned with a well below 2°C scenario. <sup>6</sup>
	Supplemental Guidance for Asset Managers	Added disclosure of the extent to which assets under management and products and investment strategies, where relevant, are aligned with a well below 2°C scenario. <sup>7</sup>
b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	Guidance for All Sectors	<ul style="list-style-type: none"> <li>▪ Revised disclosure of Scope 1 and Scope 2 GHG emissions to be independent of a materiality assessment.</li> <li>▪ Revised to encourage disclosure of Scope 3 GHG emissions.</li> </ul>
	Supplemental Guidance for Banks	Added disclosure of GHG emissions for lending and other financial intermediary business activities, where data and methodologies allow.
	Supplemental Guidance for Insurance Companies	Added disclosure of weighted average carbon intensity or GHG emissions associated with commercial property and specialty lines of business, where data and methodologies allow.
	Supplemental Guidance for Asset Owners	Added disclosure of GHG emissions for assets they own, where data and methodologies allow.
	Supplemental Guidance for Asset Managers	Added disclosure of GHG emissions for assets under management, where data and methodologies allow.
c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	Guidance for All Sectors	<ul style="list-style-type: none"> <li>▪ Added disclosure of targets consistent with cross-industry, climate-related metric categories (see <a href="#">Appendix 2</a>), where relevant.</li> <li>▪ Added disclosure of interim targets, where available, for organizations disclosing medium-term or long-term targets.</li> </ul>

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<sup>6</sup> While the Task Force's supplemental guidance for asset owners addresses considerations when reporting to beneficiaries, the Task Force believes an asset owners' disclosure of the extent to which the assets they own are aligned with a well below 2°C scenario may also be of interest to a wider range of stakeholders. As such, the Task Force encourages asset owners to disclose this information publicly, where appropriate.

<sup>7</sup> While the Task Force's supplemental guidance for asset managers addresses considerations when reporting to clients, the Task Force believes an asset managers' disclosure of the extent to which their assets under management are aligned with a well below 2°C scenario may also be of interest to a wider range of stakeholders. As such, the Task Force encourages asset managers to disclose this information publicly, where appropriate.

In addition to changes to the guidance, the Task Force made a few additional changes throughout this document including the following:

- Updated [Section A.3. Application of Recommendations](#) to encourage all organizations to disclose Scope 1 and Scope 2 GHG emissions independent of an assessment of materiality.<sup>8</sup> The disclosure of Scope 3 GHG emissions is subject to materiality; however, the Task Force encourages organizations to disclose such emissions.
- Removed tables on alignment of the recommendations with other frameworks, as they were originally included primarily to demonstrate the Task Force’s use of existing disclosure frameworks in developing its recommendations.<sup>9</sup> Since 2017, many climate-related disclosure regimes have aligned with the TCFD recommendations and generally indicate within their frameworks where such alignment exists.
- Removed the illustrative examples of metrics for the four non-financial groups, as work by other frameworks and standard setters provide more detailed guidance on sector-specific metrics and are updated on a regular basis.

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## 2. Structure of Recommendations

The Task Force developed four widely adoptable recommendations that are supported by key climate-related financial disclosures—referred to as recommended disclosures. In addition, there is guidance to support all organizations in developing disclosures consistent with the recommendations as well as *supplemental* guidance for specific sectors and industries. This structure is depicted in [Figure 1](#).



<sup>8</sup> While the Task Force agreed that organizations should disclose Scope 1 and 2 GHG emissions independent of a materiality assessment, a few Task Force members preferred keeping such disclosures as subject to materiality.

<sup>9</sup> When the FSB created the Task Force, it indicated the Task Force “should not add to the already well developed body of existing disclosure schemes” (FSB, “[Proposal for a Disclosure Task Force on Climate-Related Risks](#),” November 9, 2015). In response, the Task Force drew from existing climate-related disclosure and other frameworks where possible and appropriate, including ones developed by the Asset Owner Disclosure Project, CDP, Climate Disclosure Standards Board, ClimateWise, Enhanced Disclosures Task Force, G20/Organisation for Economic Co-operation and Development, Global Reporting Initiative, International Integrated Reporting Council, Principles for Responsible Investment, Sustainability Accounting Standards Board, and United Nations Environment Programme Finance Initiative.

The Task Force developed supplemental guidance to assist preparers in the financial sector and non-financial industries potentially most affected by climate change and the transition to a low-carbon economy (referred to as non-financial groups). Figure 2 shows the recommendations (Governance, Strategy, Risk Management, and Metrics and Targets) and recommended disclosures (a, b, c) for which supplemental guidance was developed for the financial sector and four non-financial groups. In addition, the Task Force developed additional supporting materials to help preparers implement key components of the TCFD recommendations. Section A.5. Summary of Additional Supporting Materials provides more details.

Figure 2

### Supplemental Guidance for Financial Sector and Non-Financial Groups

Industries and Groups		Governance		Strategy			Risk Management			Metrics and Targets		
		a)	b)	a)	b)	c)	a)	b)	c)	a)	b)	c)
Financial	Banks			■			■			■	■	
	Insurance Companies				■	■	■	■		■	■	
	Asset Owners				■	■	■	■		■	■	
	Asset Managers				■		■	■		■	■	
Non-Financial	Energy			■	■					■		
	Transportation				■	■				■		
	Materials and Buildings				■	■				■		
	Ag, Food, and Forest Products				■	■				■		

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## 3. Application of Recommendations

### a. Who should disclose?

To promote more informed investing, lending, and insurance underwriting decisions, the Task Force recommends all financial and non-financial organizations with public debt or equity implement its recommendations. Because climate-related risks and opportunities are relevant for organizations across *all* sectors, the Task Force encourages all organizations to implement these recommendations. In addition, the Task Force believes that asset managers and asset owners, including public- and private-sector pension plans, endowments, and foundations, should implement its recommendations.

### b. Which recommendations involve an assessment of materiality?

The disclosures related to the Strategy and Metrics and Targets recommendations involve an assessment of materiality, with the exception of Scope 1 and Scope 2 GHG emissions under the Metrics and Targets recommendation. The Task Force believes all organizations should disclose absolute Scope 1 and Scope 2 GHG emissions independent of a materiality assessment. The disclosure of Scope 3 GHG emissions is subject to materiality; however, the Task Force encourages organizations to disclose such emissions.

### c. Where should preparers disclose?

Preparers of climate-related financial disclosures should provide such disclosures in their mainstream (i.e., public) annual financial filings.<sup>10</sup> Certain organizations—those in the four non-financial groups that

<sup>10</sup> Financial filings refer to the annual reporting packages in which organizations are required to deliver their audited financial results under the corporate, compliance, or securities laws of the jurisdictions in which they operate.



have more than one billion U.S. dollar equivalent (USDE) in annual revenue—should consider disclosing information related to the Strategy and Metrics and Targets recommendations in other reports when the information is not deemed material and not included in financial filings.<sup>11</sup> Other reports include 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.

Asset owners and asset managers should report to their beneficiaries and clients, respectively, through existing means of financial reporting, when relevant and feasible. Asset owners and asset managers are also encouraged to disclose publicly via their websites or other public avenues of disclosure.

**d. How should material information be determined?**

Organizations should determine materiality for climate-related issues consistent with how they determine the materiality of other information included in their annual financial filings. The Task Force cautions organizations against prematurely concluding that climate-related risks and opportunities are not material based on perceptions of the longer-term nature of some climate-related risks.

When providing disclosures outside mainstream financial filings, asset managers and asset owners should consider materiality in the context of their respective mandates and investment performance for clients and beneficiaries.

**e. Who should review climate-related financial disclosures prior to release?**

Because these disclosures should be included in mainstream financial filings, the governance processes should be as rigorous as those used for existing public financial disclosures, including review by the chief financial officer, audit committee, and Board of Directors, as appropriate. Organizations that provide climate-related financial disclosures in reports other than financial filings should follow internal governance processes that are the same or similar to those used for financial reporting.

**f. What should preparers do if they choose to omit a recommended disclosure?**

If a recommended disclosure is not made, preparers should provide their rationale for omitting the disclosure.

**g. What reporting period should preparers use?**

Preparers should report information for the same period covered by their mainstream financial filings.

**h. How should preparers define short, medium, and long term?**

The Task Force is not specifying time frames for short, medium, and long term given that the timing of climate-related impacts on businesses will vary. Instead, the Task Force recommends preparers define time frames according to the life of their assets, the profile of the climate-related risks they face, and the sectors and geographies in which they operate.<sup>12</sup>

**i. What if certain disclosures are incompatible with national disclosure requirements?**

Organizations need 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, organizations are encouraged to disclose those elements through other reports.

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<sup>11</sup> The Task Force chose a one billion USDE annual revenue threshold because it captures organizations responsible for over 90 percent of Scope 1 and 2 GHG emissions in the industries represented by the four non-financial groups (about 2,250 organizations out of roughly 15,000).

<sup>12</sup> 2030 and 2050 have become key target dates for addressing climate change following the publication of the [Special Report on Global Warming of 1.5°C](#) by the Intergovernmental Panel on Climate Change (IPCC). This report noted that to limit global warming to 1.5°C “global net human-caused emissions of carbon dioxide (CO<sub>2</sub>) would need to fall by about 45 percent from 2010 levels by 2030, reaching ‘net zero’ around 2050.”

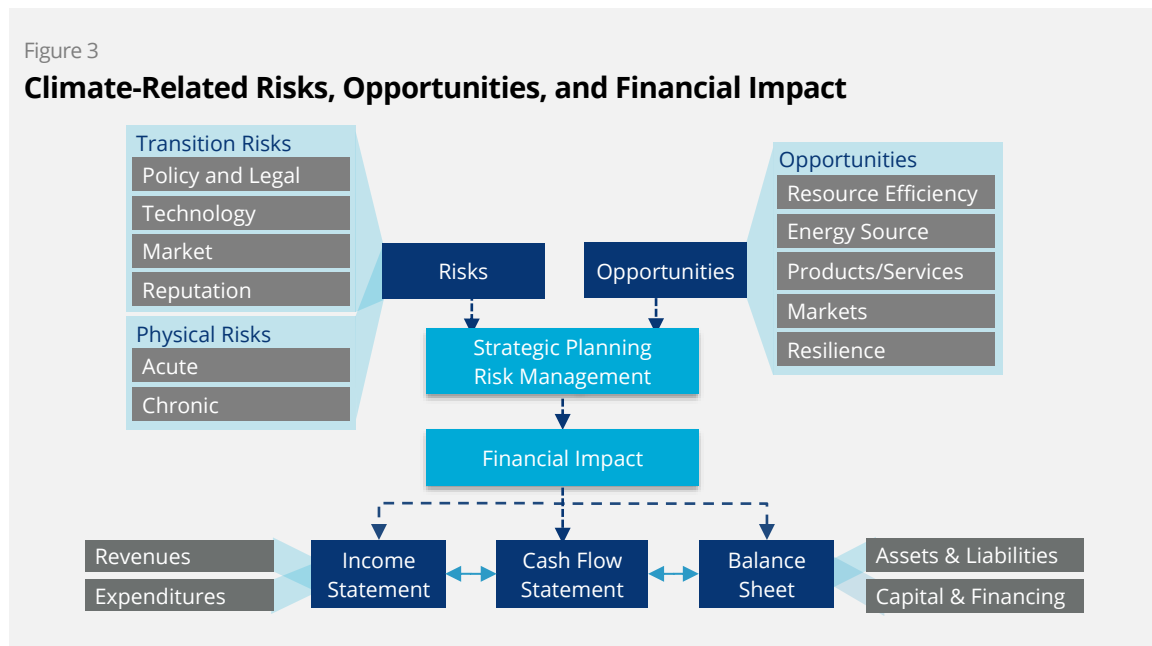
## 4. Assessing Financial Impacts of Climate-Related Risks and Opportunities

While climate change affects nearly all economic sectors, the level of exposure and the impact of climate-related risks differ by sector, industry, geography, and organization. Furthermore, the financial impacts of climate-related issues on organizations are not always clear or direct, and, for many organizations, identifying the issues, assessing potential impacts, and ensuring the material issues are reflected in financial filings may be challenging. Key reasons for this are likely because of (1) limited knowledge of climate-related issues within organizations, which may inhibit the identification of such risks; (2) the tendency to focus mainly on near-term risks without paying adequate attention to risks that may arise in the longer term; and (3) the difficulty in quantifying climate-related risks.<sup>13</sup>

Better disclosure of the financial impacts of climate-related risks and opportunities on an organization is a key goal of the Task Force’s work. In order to make more informed financial decisions, investors, lenders, and insurance underwriters need to understand how climate-related issues affect and are likely to affect an organization’s future financial performance and position as reflected in its income statement, cash flow statement, and balance sheet.

Fundamentally, 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., accept, avoid, pursue, reduce, or share/transfer).<sup>14</sup> Once an organization assesses its climate-related issues and determines its response to those issues, it can then consider actual and potential financial impacts on revenues, expenditures, assets and liabilities, and capital and financing. Figure 3 outlines the main climate-related risks (transition and physical) and opportunities organizations should consider as part of their strategic planning or risk management to determine potential financial implications. In addition, Appendix 1 provides tables with examples of (1) climate-related risks and their potential financial impacts and (2) climate-related opportunities and their potential financial impacts.

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Climate-related issues can affect several important aspects of an organization’s financial performance and position, both now and in the future. For example, climate-related issues may have implications for an organization’s businesses and capital expenditures. In turn, capital expenditures will determine the nature and amount of long-lived assets and the proportion of debt and equity to be funded on an

<sup>13</sup> World Business Council for Sustainable Development, *Sustainability and enterprise risk management: The first step towards integration*, January 18, 2017.

<sup>14</sup> For more information see TCFD, *Guidance on Risk Management Integration and Disclosure*, October 2020.

organization's balance sheet. Climate-related issues may also carry implications for future cash flows (operating, investing, and financing activities). An organization, therefore, should consider how climate-related issues affect its current financial position and may potentially affect its future financial positions in terms of four major categories of financial impact, as described in Figure 4.

Figure 4

### Major Categories of Financial Impact

Financial Performance <sup>15</sup>	Financial Position <sup>16</sup>
<p><b>Revenues.</b> Transition and physical risks may affect demand for products and services. Organizations should consider the potential impact on revenues and identify potential opportunities for enhancing or developing new revenues. In particular, given the emergence and likely growth of carbon pricing as a mechanism to regulate emissions, it is important for affected industries to consider the potential impacts of such pricing on business revenues.</p> <p><b>Expenditures.</b> An organization's response to climate-related risks and opportunities may depend, in part, on the organization's cost structure. Lower-cost suppliers may be more resilient to changes in cost resulting from climate-related issues and more flexible in their ability to address such issues. By providing an indication of their cost structure and flexibility to adapt, organizations can better inform investors about their investment potential.</p> <p>It is also helpful for investors to understand capital expenditure plans and the level of debt or equity needed to fund these plans. The resilience of such plans should be considered bearing in mind organizations' flexibility to shift capital and the willingness of capital markets to fund organizations exposed to significant levels of climate-related risks. Transparency of these plans may provide greater access to capital markets or improved financing terms.</p>	<p><b>Assets and Liabilities.</b> Supply and demand changes from changes in policies, technology, and market dynamics related to climate change could affect the valuation of organizations' assets and liabilities. Use of long-lived assets and, where relevant, reserves may be affected by climate-related issues. It is important for organizations to provide an indication of the potential impact on their assets and liabilities, especially long-lived assets. This should focus on existing and committed future activities and decisions requiring new investment, restructuring, write-downs, or impairment.</p> <p><b>Capital and Financing.</b> Climate-related risks and opportunities may change the profile of an organization's debt and equity structure, either by increasing debt levels to compensate for reduced operating cash flows or for new capital expenditures or research and development (R&amp;D). It may also affect the ability to raise new debt or refinance existing debt, or reduce the tenor of borrowing available to the organization. There could also be changes to capital and reserves from operating losses, asset write-downs, or the need to raise new equity to meet investment.</p>

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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., accept, avoid, pursue, reduce, or share/transfer) its risks or seize opportunities; and
- the implications of the organization's planned responses on its income statement, cash flow statement, and balance sheet.

#### a. Exposure to Climate-Related Risks and Opportunities

Exposure, in this context, refers to an organization's vulnerability to negative impacts or capability of realizing positive impacts from the transition to a low-carbon economy and/or the physical aspects of

<sup>15</sup> Financial performance refers to an organization's income and expenses as reflected on its income and cashflow statements (actual) or potential income and expenses under different climate-related scenarios.

<sup>16</sup> Financial position refers to an organization's assets, liabilities, and equity as reflected on its balance sheet (actual) or potential assets, liabilities, and equity under different climate-related scenarios.

climate change. When considering its exposure to climate-related risks and opportunities, an organization should consider the exposure of its value chain as well.

The complexity and uncertainty associated with climate change make it difficult to identify the specific touchpoints and time frames in which climate change may affect an organization. As a starting point, an organization should assess its value chain over a reasonable time frame as it relates to the following:<sup>17</sup>

- climate-related risks including (1) transition risks such as policy constraints on emissions, imposition of carbon tax, water restrictions, land use restrictions or incentives, and market demand and supply shifts and (2) physical risks such as the disruption of operations or destruction of property and
- climate-related opportunities such as access to new markets and new technology (e.g., carbon capture and storage technology).

Importantly, an organization should assess its climate-related risks and opportunities within the context of its businesses, operations, and physical locations in order to determine potential financial implications. In making such an assessment, an organization should consider (1) current and anticipated policy constraints and incentives in relevant jurisdictions, technology changes and availability, and market changes and (2) whether an organization's physical locations or suppliers are particularly vulnerable to physical impacts from climate change. For example, an organization may have high emissions, but if anticipated policy in the organization's jurisdiction fails to constrain emissions in a binding manner, the organization may determine financial impacts are minimal over its planning horizon.

### **b. Responses to Climate-Related Risks and Opportunities**

After assessing its exposure to climate-related risks and opportunities, an organization needs to choose how to respond to the identified risks and opportunities, including the following:

- the risk management actions it plans to undertake (i.e., accept, avoid, pursue, reduce, or share/transfer);
- capital expenditures (CapEx) on or financing towards new technology or facilities that may be warranted; and
- R&D expenditures that may be necessary.

These are largely strategic and financial planning decisions around the operating and capital expenditures or financing the organization plans to undertake in response to climate-related risks and opportunities. In some cases, these responses may be directly motivated by specific climate-related issues, and in other cases, climate-related issues may be an additional, but not exclusive, motivational factor around other business drivers. It is important for an organization to recognize that accepting climate-related risks (i.e., "no response") may also carry potential financial implications, such as a loss in revenue, reduced asset valuations or write-offs, or increased costs.

### **c. Effectiveness of Responses**

Financial impacts associated with climate-related risks and opportunities depend on not only an organization's level of exposure and planned responses, but also on how effective its responses are in realizing opportunities and mitigating or otherwise managing risks. An organization, therefore, should monitor implementation of its responses against both internal targets and external factors to assess their effectiveness. For example, an organization that has made investments in new products to take

<sup>17</sup> An important aspect for organizations to consider is the time horizon for assessing exposures. While the common perception is that climate-related risks are "long term," arising in 10, 20, or 30 years, this may not be the case. Policies, technology innovation, and markets are likely to adjust and shift in advance of many foreseeable climate trends. Likewise, more frequent and severe storms, floods, and droughts are occurring today. Organizations, therefore, should carefully consider the time horizon they use to evaluate their exposures and possibly assess them over a range of time horizons to capture potential exposures arising in the short, medium, and longer term.

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advantage of climate-related opportunities may establish an internal target for revenues associated with sales of the new products to gauge effectiveness.

#### d. Linking It All Together

Determining the financial impacts of climate-related risks and opportunities generally involves an organization assessing (1) its exposures, (2) its planned responses, and (3) its response effectiveness. Analyses should focus on the following:

- the exposure and potential financial impact if no action is undertaken and
- the financial implications of managing risks and maximizing opportunities in the context of an organization's overall business strategy and environment.

Forward-looking analyses are especially important, but challenging. Efforts to mitigate and adapt to climate change are without historical precedent, and many aspects about the timing and magnitude of climate change in specific contexts are uncertain. For these reasons, the Task Force believes scenario analysis is an important tool for organizations to use in their strategic planning processes. Scenario analysis and other strategic planning tools can help organizations consider a broader range of assumptions, uncertainties, and potential future states when assessing financial implications of climate change.

## 5. Summary of Additional Supporting Materials

Since the Task Force issued its final recommendations in June 2017, it has monitored climate-related financial disclosure practices and sought to identify and address implementation challenges raised by preparers. In this regard, the Task Force has published guidance on specific topics intended to help address identified challenges and better support implementation, as described below.

**[The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities](#)** (2017) provides information on types of climate-related scenarios, the application of scenario analysis, and the key challenges in implementing scenario analysis to support an organization's disclosure of the resilience of its strategy, taking into consideration different climate-related scenarios.<sup>18</sup>

**[Guidance on Scenario Analysis for Non-Financial Companies](#)** (2020) provides practical, process-oriented ways for organizations to use climate-related scenario analysis and ideas for disclosing the resilience of their strategies under different climate-related scenarios.<sup>19</sup>

**[Guidance on Risk Management Integration and Disclosure](#)** (2020) describes considerations for organizations interested in integrating climate-related risks into their existing risk management processes and disclosing information on their risk management processes in alignment with the Task Force's recommendations.<sup>20</sup>

**[Guidance on Metrics, Targets, and Transition Plans](#)** (2021) describes recent developments around climate-related metrics and users' increasing focus on information describing organizations' plans for transitioning to a low-carbon economy. The guidance also describes a set of cross-industry, climate-related metric categories (described in [Appendix 2: Cross-Industry, Climate-Related Metric Categories](#)) that the Task Force believes are applicable to all organizations.<sup>21</sup>

<sup>18</sup> TCFD, [The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities](#), June 29, 2017.

<sup>19</sup> TCFD, [Guidance on Scenario Analysis for Non-Financial Companies](#), October 29, 2020.

<sup>20</sup> TCFD, [Guidance on Risk Management Integration and Disclosure](#), October 29, 2020.

<sup>21</sup> TCFD, [Guidance on Metrics, Targets, and Transition Plans](#), October 14, 2021.

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B.

# Recommendations

## B. Recommendations

The Task Force's recommendations are structured around four thematic areas that are core elements of how organizations operate—governance, strategy, risk management, and metrics and targets (Figure 5). The four overarching recommendations are supported by key climate-related financial disclosures—referred to as recommended disclosures—that build out the framework with information that will help investors and others understand how reporting organizations assess climate-related issues (Figure 6, p. 15).

Figure 5

### Core Elements of Recommended Climate-Related Financial Disclosures



#### **Governance**

The organization's governance around climate-related risks and opportunities

#### **Strategy**

The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

#### **Risk Management**

The processes used by the organization to identify, assess, and manage climate-related risks

#### **Metrics and Targets**

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

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The Task Force recommends that organizations provide climate-related financial disclosures in their mainstream (i.e., public) annual financial filings and recognizes that most information included in financial filings is subject to a materiality assessment. However, because climate-related risk is a non-diversifiable risk that affects nearly all industries, many investors believe it requires special attention. For example, in assessing organizations' financial and operating results, many investors want insight into the governance and risk management context in which such results are achieved. The Task Force believes disclosures related to its Governance and Risk Management recommendations directly address this need for context and should be included in financial filings.

For disclosures related to the Strategy and Metrics and Targets recommendations, the Task Force believes organizations should provide such information in annual financial filings when the information is deemed material. Certain organizations—those in the four non-financial groups that have more than one billion U.S. dollar equivalent (USDE) in annual revenue—should consider disclosing such information in other reports when the information is not deemed material and not included in financial filings.<sup>22</sup> Because these organizations are more likely than others to be financially impacted over time, investors are interested in monitoring how these organizations' strategies evolve.

Importantly, the recommendations were developed to apply broadly across sectors and jurisdictions and should not be seen as superseding national disclosure requirements. Organizations should make financial disclosures in accordance with their national disclosure requirements for financial filings.

<sup>22</sup> The Task Force chose a one billion USDE annual revenue threshold because it captures organizations responsible for over 90% of Scope 1 and 2 GHG emissions in the industries represented by the four non-financial groups (about 2,250 organizations out of roughly 15,000).

Figure 6

## Recommendations and Supporting Recommended Disclosures

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



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## C. Guidance for All Sectors

The Task Force developed guidance to support all organizations in developing climate-related financial disclosures consistent with its recommendations and recommended disclosures. The guidance assists preparers by providing context and suggestions for implementing the recommended disclosures.

### 1. Governance

Investors, lenders, insurance underwriters, and other users of climate-related financial disclosures (collectively referred to as “investors and other stakeholders”) are interested in understanding the role an organization’s board plays in overseeing climate-related issues as well as management’s role in assessing and managing those issues. Such information supports evaluations of whether material climate-related issues receive appropriate board and management attention.

#### Governance

Disclose the organization’s governance around climate-related risks and opportunities.

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**Recommended Disclosure a)**  
Describe the board’s oversight of climate-related risks and opportunities.

#### Guidance for All Sectors

In describing the board’s oversight of climate-related issues, organizations should consider including a discussion of the following:

- processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues;
- whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well as setting the organization’s performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures; and
- how the board monitors and oversees progress against goals and targets for addressing climate-related issues.

**Recommended Disclosure b)**  
Describe management’s role in assessing and managing climate-related risks and opportunities.

#### Guidance for All Sectors

In describing management’s role related to the assessment and management of climate-related issues, organizations should consider including the following information:

- whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues;
- a description of the associated organizational structure(s);
- processes by which management is informed about climate-related issues; and
- how management (through specific positions and/or management committees) monitors climate-related issues.

## 2. Strategy<sup>23</sup>

Investors and other stakeholders need to understand how climate-related issues may affect an organization's businesses, strategy, and financial planning over the short, medium, and long term. Such information is used to inform expectations about the future performance of an organization.

### Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

#### Recommended Disclosure a)

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

#### Guidance for All Sectors

Organizations should provide the following information:

- a description of what they consider to be the relevant short-, medium-, and long-term time horizons, taking into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms;
- a description of the specific climate-related issues potentially arising in each time horizon (short, medium, and long term) that could have a material financial impact on the organization; and
- a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization.

Organizations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate. In describing climate-related issues, organizations should refer to [Tables A1.1](#) and [A1.2](#) (pp. 75–76).

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#### Recommended Disclosure b)

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

#### Guidance for All Sectors

Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning.

Organizations should consider including the impact on their businesses, strategy, and financial planning in the following areas:

- Products and services
- Supply chain and/or value chain
- Adaptation and mitigation activities
- Investment in research and development
- Operations (including types of operations and location of facilities)
- Acquisitions or divestments
- Access to capital

Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time.

Organizations should describe the impact of climate-related issues on their financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities).<sup>24</sup> If climate-related scenarios were used to inform the organization's strategy and financial planning, such scenarios should be described.

<sup>23</sup> The Task Force's *Guidance on Scenario Analysis for Non-Financial Companies*, *The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities*, and *Guidance on Metrics, Targets, and Transition Plans* may be useful to organizations in disclosing information under this recommendation.

<sup>24</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

## Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

Organizations that have made GHG emissions reduction commitments, operate in jurisdictions that have made such commitments, or have agreed to meet investor expectations regarding GHG emissions reductions should describe their plans for transitioning to a low-carbon economy, which could include GHG emissions targets and specific activities intended to reduce GHG emissions in their operations and value chain or to otherwise support the transition.<sup>25</sup>

### Recommended Disclosure c)

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

### Guidance for All Sectors

Organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a low-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.<sup>26</sup>

Organizations should consider discussing:

- where they believe their strategies may be affected by climate-related risks and opportunities;
- how their strategies might change to address such potential risks and opportunities;
- the potential impact of climate-related issues on financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities);<sup>27</sup> and
- the climate-related scenarios and associated time horizon(s) considered.

Refer to Section D in the [Task Force's report](#) for information on applying scenarios to forward-looking analysis.

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<sup>25</sup> Organizations may agree to meet investor expectations regarding GHG emissions reductions for various reasons, including concerns about access to or the cost of capital if they fail to do so.

<sup>26</sup> In interpreting the phrase "2°C or lower," organizations should consider aligning their scenario analysis with Article Two of the 2015 [Paris Agreement](#) which commits parties to "holding the increasing in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

<sup>27</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

### 3. Risk Management<sup>28</sup>

Investors and other stakeholders need to understand how an organization’s climate-related risks are identified, assessed, and managed and whether those processes are integrated in existing risk management processes. Such information supports users of climate-related financial disclosures in evaluating the organization’s overall risk profile and risk management activities.

## Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

### Recommended Disclosure a)

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

### Guidance for All Sectors

Organizations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organizations determine the relative significance of climate-related risks in relation to other risks.

Organizations should describe whether they consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) as well as other relevant factors considered.

Organizations should also consider disclosing the following:

- processes for assessing the potential size and scope of identified climate-related risks and
- definitions of risk terminology used or references to existing risk classification frameworks used.

### Recommended Disclosure b)

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

### Guidance for All Sectors

Organizations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organizations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations.

In describing their processes for managing climate-related risks, organizations should address the risks included in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as appropriate.

### Recommended Disclosure c)

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

### Guidance for All Sectors

Organizations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.

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<sup>28</sup> The Task Force’s [Guidance on Risk Management Integration and Disclosure](#) may be useful to organizations in disclosing information under this recommendation.

## 4. Metrics and Targets<sup>29</sup>

Investors and other stakeholders need to understand how an organization measures and monitors its climate-related risks and opportunities. Access to the metrics and targets used by an organization allows investors and other stakeholders to better assess the organization’s potential risk-adjusted returns, ability to meet financial obligations, general exposure to climate-related issues, and progress in managing or adapting to those issues.

### Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

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

#### Guidance for All Sectors

Organizations should provide the key metrics used to measure and manage climate-related risks and opportunities, as described in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as well as metrics consistent with the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79).<sup>30</sup> Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable.

Where climate-related issues are material, organizations should consider describing whether and how related performance metrics are incorporated into remuneration policies.

Where relevant, organizations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a low-carbon economy.

Metrics should be provided for historical periods to allow for trend analysis. Where appropriate, organizations should consider providing forward-looking metrics for the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79), consistent with their business or strategic planning time horizons. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.

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

#### Guidance for All Sectors

Organizations should provide their Scope 1 and Scope 2 GHG emissions independent of a materiality assessment, and, if appropriate, Scope 3 GHG emissions and the related risks.<sup>31</sup> All organizations should consider disclosing Scope 3 GHG emissions.<sup>32, 33</sup>

GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.<sup>34</sup> As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.<sup>35</sup>

<sup>29</sup> The Task Force’s [Guidance on Metrics, Targets, and Transition Plans](#) should be reviewed by organizations disclosing information under this recommendation.

<sup>30</sup> Financial organizations may find it more difficult to quantify exposure to climate-related risks because of challenges related to portfolio aggregation and data availability. The Task Force suggests financial organizations provide qualitative and quantitative information, where data and methodologies allow.

<sup>31</sup> Emissions are a prime driver of rising global temperatures and, as such, are a key focal point of policy, regulatory, market, and technology responses to limit climate change. As a result, organizations with significant emissions are likely to be impacted more significantly by transition risk than other organizations. In addition, current or future constraints on emissions, either directly by emission restrictions or indirectly through carbon budgets, may impact organizations financially.

<sup>32</sup> The Task Force strongly encourages all organizations to disclose Scope 3 GHG emissions. While the Task Force recognizes the data and methodological challenges associated with calculating Scope 3 GHG emissions, it believes such emissions are an important metric reflecting an organization’s exposure to climate-related risks and opportunities. For guidance on reporting Scope 3 GHG emissions, see the GHG Protocol’s [The Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#).

<sup>33</sup> When considering whether to disclose Scope 3 GHG emissions, organizations should consider whether such emissions are a significant portion of their total GHG emissions. For example, see discussion of 40% threshold in the Science Based Targets initiative’s (SBTi’s) paper [SBTi Criteria and Recommendations](#), Version 4.2, April 2021, Section V, p. 10.

<sup>34</sup> While challenges remain, the GHG Protocol methodology is the most widely recognized and used international standard for calculating GHG emissions. Organizations may use national reporting methodologies if they are consistent with the GHG Protocol methodology.

<sup>35</sup> For industries with high energy consumption, metrics related to emission intensity are important to provide. For example, emissions per unit of economic output (e.g., unit of production, number of employees, or value-added) is widely used.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

GHG emissions and associated metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics.

### **Recommended Disclosure c)**

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

### **Guidance for All Sectors**

Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., in line with the cross-industry, climate-related metric categories in [Table A2.1](#) (p. 79), where relevant, and in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a low-carbon economy.

In describing their targets, organizations should consider including the following:

- whether the target is absolute or intensity based;
- time frames over which the target applies;
- base year from which progress is measured; and
- key performance indicators used to assess progress against targets.

Organizations disclosing medium-term or long-term targets should also disclose associated interim targets in aggregate or by business line, where available.

Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.

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# D. Supplemental Guidance for the Financial Sector

A key element of the FSB’s proposal for the Task Force was the development of climate-related disclosures that “would enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system’s exposures to climate-related risks.”<sup>36</sup> The FSB’s proposal also noted that disclosures by the financial sector would:

- “foster an early assessment of [climate-related] risks” and “facilitate market discipline” and
- “provide a source of data that can be analyzed at a systemic level, to facilitate authorities’ assessments of the materiality of any risks posed by climate change to the financial sector, and the channels through which this is most likely to be transmitted.”

The Task Force organized the financial sector into four major industries, largely based on activities performed, as follows: banks (lending), insurance companies (underwriting), asset managers (asset management), and asset owners, which include public- and private-sector pension plans, endowments, and foundations (investing). Given the important role of the financial sector as preparers of climate-related financial disclosures described in the FSB’s proposal, the Task Force identified certain areas where supplemental guidance was warranted, as shown in Figure 7. This supplemental guidance is intended to provide additional context for the financial sector when preparing disclosures consistent with the Task Force’s recommendations.

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Figure 7

## Supplemental Guidance for the Financial Sector

Industries	Governance		Strategy			Risk Management			Metrics and Targets		
	a)	b)	a)	b)	c)	a)	b)	c)	a)	b)	c)
<b>Banks</b>			■			■			■	■	
<b>Insurance Companies</b>				■	■	■	■		■	■	
<b>Asset Owners</b>				■	■	■	■		■	■	
<b>Asset Managers</b>				■		■	■		■	■	

<sup>36</sup> FSB, “Proposal for a Disclosure Task Force on Climate-Related Risks,” November 9, 2015.

## 1. Banks

Banks are exposed to climate-related risks and opportunities through their lending and other financial intermediary activities as well as through their own operations. As financial intermediaries, banks may assume exposure to material climate-related risks through their borrowers, customers, or counterparties. Banks that provide loans or trade the securities of companies with direct exposure to climate-related risks (e.g., fossil fuel producers, intensive fossil fuel consumers, real property owners, or agricultural/food companies) may accumulate climate-related risks via their credit and equity holdings. In particular, asset-specific credit or equity exposure to large fossil fuel producers or users could present risks that merit disclosure or discussion in a bank's financial filings. In addition, as the markets for lower-carbon and energy-efficient alternatives grow, banks may assume material exposures in their lending and investment businesses. Banks could also become subject to litigation related to their financing activities or via parties seeking damages or other legal recourse. Investors, lenders, insurance underwriters, and other stakeholders need to be able to distinguish among banks' exposures and risk profiles so that they can make informed financial decisions.

### Governance

Disclose the organization's governance around climate-related risks and opportunities.

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

#### Guidance for All Sectors

In describing the board's oversight of climate-related issues, organizations should consider including a discussion of the following:

- processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues;
- whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well as setting the organization's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures; and
- how the board monitors and oversees progress against goals and targets for addressing climate-related issues.

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

#### Guidance for All Sectors

In describing management's role related to the assessment and management of climate-related issues, organizations should consider including the following information:

- whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues;
- a description of the associated organizational structure(s);
- processes by which management is informed about climate-related issues; and
- how management (through specific positions and/or management committees) monitors climate-related issues.

# Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

**Recommended Disclosure a)**  
Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.

**Guidance for All Sectors**

Organizations should provide the following information:

- a description of what they consider to be the relevant short-, medium-, and long-term time horizons, taking into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms;
- a description of the specific climate-related issues potentially arising in each time horizon (short, medium, and long term) that could have a material financial impact on the organization; and
- a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization.

Organizations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate. In describing climate-related issues, organizations should refer to [Tables A1.1](#) and [A1.2](#) (pp. 75–76).

**Supplemental Guidance for Banks**

Banks should describe significant concentrations of credit exposure to carbon-related assets.<sup>37</sup> Additionally, banks should consider disclosing their climate-related risks (transition and physical) in their lending and other financial intermediary business activities.

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

**Guidance for All Sectors**

Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning.

Organizations should consider including the impact on their businesses, strategy, and financial planning in the following areas:

- Products and services
- Supply chain and/or value chain
- Adaptation and mitigation activities
- Investment in research and development
- Operations (including types of operations and location of facilities)
- Acquisitions or divestments
- Access to capital

Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time.

Organizations should describe the impact of climate-related issues on their financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities).<sup>38</sup>

If climate-related scenarios were used to inform the organization's strategy and financial planning, such scenarios should be described.

<sup>37</sup> Recognizing that the term "carbon-related assets" is not well defined, the Task Force encourages banks to use a consistent definition to support comparability. For purposes of disclosing information on significant concentrations of credit exposure to carbon-related assets under this framework, the Task Force suggests banks define carbon-related assets as those assets tied to the four non-financial groups identified by the Task Force in its 2017 report (see [Table 4](#), p. 56). There may be industries or sub-industries that are appropriate to exclude, such as water utilities and independent power and renewable electricity producer industries. Banks should describe which industries they include.

<sup>38</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

## Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

Organizations that have made GHG emissions reduction commitments, operate in jurisdictions that have made such commitments, or have agreed to meet investor expectations regarding GHG emissions reductions should describe their plans for transitioning to a low-carbon economy, which could include GHG emissions targets and specific activities intended to reduce GHG emissions in their operations and value chain or to otherwise support the transition.<sup>39</sup>

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

### Guidance for All Sectors

Organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a low-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.<sup>40</sup>

Organizations should consider discussing:

- where they believe their strategies may be affected by climate-related risks and opportunities;
- how their strategies might change to address such potential risks and opportunities;
- the potential impact of climate-related issues on financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities);<sup>41</sup> and
- the climate-related scenarios and associated time horizon(s) considered.

Refer to Section D in the [Task Force's report](#) for information on applying scenarios to forward-looking analysis.

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## Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

**Recommended Disclosure a)**  
Describe the organization's processes for identifying and assessing climate-related risks.

### Guidance for All Sectors

Organizations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organizations determine the relative significance of climate-related risks in relation to other risks.

Organizations should describe whether they consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) as well as other relevant factors considered.

Organizations should also consider disclosing the following:

- processes for assessing the potential size and scope of identified climate-related risks and
- definitions of risk terminology used or references to existing risk classification frameworks used.

### Supplemental Guidance for Banks

Banks should consider characterizing their climate-related risks in the context of traditional banking industry risk categories such as credit risk, market risk, liquidity risk, and operational risk.

<sup>39</sup> Organizations may agree to meet investor expectations regarding GHG emissions reductions for various reasons, including concerns about access to or the cost of capital if they fail to do so.

<sup>40</sup> In interpreting the phrase "2°C or lower," organizations should consider aligning their scenario analysis with Article Two of the 2015 [Paris Agreement](#) which commits parties to "holding the increasing in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

<sup>41</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

## Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

Banks should also consider describing any risk classification frameworks used (e.g., the Enhanced Disclosure Task Force’s framework for defining “Top and Emerging Risks”).<sup>42</sup>

**Recommended Disclosure b)**  
Describe the organization’s processes for managing climate-related risks.

**Guidance for All Sectors**  
Organizations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organizations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations.  
  
In describing their processes for managing climate-related risks, organizations should address the risks included in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as appropriate.

**Recommended Disclosure c)**  
Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management.

**Guidance for All Sectors**  
Organizations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.

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## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

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

**Guidance for All Sectors**  
Organizations should provide the key metrics used to measure and manage climate-related risks and opportunities, as described in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as well as metrics consistent with the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79).<sup>43</sup>  
  
Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable.  
  
Where climate-related issues are material, organizations should consider describing whether and how related performance metrics are incorporated into remuneration policies.  
  
Where relevant, organizations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a low-carbon economy.  
  
Metrics should be provided for historical periods to allow for trend analysis. Where appropriate, organizations should consider providing forward-looking metrics for the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79), consistent with their business or strategic planning time horizons. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.

<sup>42</sup> The Enhanced Disclosure Task Force was established by the FSB in to make recommendations on financial risk disclosures for banks. It defined a top risk as “a current, emerged risk which has, across a risk category, business area or geographical area, the potential to have a material impact on the financial results, reputation or sustainability or the business and which may crystallise within a short, perhaps one year, time horizon.” An emerging risk was defined as “one which has large uncertain outcomes which may become certain in the longer term (perhaps beyond one year) and which could have a material effect on the business strategy if it were to occur.”

<sup>43</sup> Financial organizations may find it more difficult to quantify exposure to climate-related risks because of challenges related to portfolio aggregation and data availability. The Task Force suggests financial organizations provide qualitative and quantitative information, where data and methodologies allow.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

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### Supplemental Guidance for Banks

Banks should provide the metrics used to assess the impact of (transition and physical) climate-related risks on their lending and other financial intermediary business activities in the short, medium, and long term. Metrics provided may relate to credit exposure, equity and debt holdings, or trading positions, broken down by:

- Industry<sup>44</sup>
- Geography
- Credit quality (e.g., investment grade or non-investment grade, internal rating system)
- Average tenor

Banks should also provide the amount and percentage of carbon-related assets relative to total assets as well as the amount of lending and other financing connected with climate-related opportunities.<sup>45</sup>

Banks should describe the extent to which their lending and other financial intermediary business activities, where relevant, are aligned with a well below 2°C scenario, using whichever approach or metrics best suit their organizational context or capabilities.<sup>46</sup>

Banks should also indicate which financial intermediary business activities (e.g., loans to specific sectors or industries) are included.

### Recommended Disclosure b)

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

### Guidance for All Sectors

Organizations should provide their Scope 1 and Scope 2 GHG emissions independent of a materiality assessment, and, if appropriate, Scope 3 GHG emissions and the related risks.<sup>47</sup> All organizations should consider disclosing Scope 3 GHG emissions.<sup>48, 49</sup>

GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.<sup>50</sup> As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.<sup>51</sup>

GHG emissions and associated metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics.

### Supplemental Guidance for Banks

Banks should disclose GHG emissions for their lending and other financial intermediary business activities where data and methodologies allow. These emissions should be calculated in line with the *Global GHG Accounting and Reporting Standard for the Financial Industry* developed by the Partnership for Carbon Accounting Financials (PCAF Standard) or a comparable methodology (See [Table 2](#), p. 50).<sup>52</sup>

<sup>44</sup> Industry should be based on the Global Industry Classification Standard or national classification systems aligned with financial filing requirements.

<sup>45</sup> Recognizing that the term “carbon-related assets” is not well defined, the Task Force encourages banks to use a consistent definition to support comparability. For purposes of disclosing information on significant concentrations of credit exposure to carbon-related assets under this framework, the Task Force suggests banks define carbon-related assets as those assets tied to four non-financial groups identified by the Task Force in its 2017 report (see [Table 4](#), p. 56). There may be industries or sub-industries that are appropriate to exclude, such as water utilities and independent power and renewable electricity producer industries. Banks should describe which industries they include.

<sup>46</sup> This could include forward-looking metrics, GHG emissions targets and progress against them, reducing emissions in their operations and value chains, and working with customers to support their transition to a low-carbon economy. The Task Force acknowledges that there are challenges to implementing portfolio alignment methodologies, including the resources involved, and encourages organizations to disclose qualitative and quantitative information given existing data and methodologies. The Portfolio Alignment Team’s, *Measuring Portfolio Alignment*, October 2021 outlines potential approaches and associated design decisions for portfolio alignment tools.

<sup>47</sup> Emissions are a prime driver of rising global temperatures and, as such, are a key focal point of policy, regulatory, market, and technology responses to limit climate change. As a result, organizations with significant emissions are likely to be impacted more significantly by transition risk than other organizations. In addition, current or future constraints on emissions, either directly by emission restrictions or indirectly through carbon budgets, may impact organizations financially.

<sup>48</sup> The Task Force strongly encourages all organizations to disclose Scope 3 GHG emissions. While the Task Force recognizes the data and methodological challenges associated with calculating Scope 3 GHG emissions, it believes such emissions are an important metric reflecting

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

### **Recommended Disclosure c)**

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

### **Guidance for All Sectors**

Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., consistent with the cross-industry, climate-related metric categories in [Table A2.1](#) (p. 79), where relevant, and in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a low-carbon economy.

In describing their targets, organizations should consider including the following:

- whether the target is absolute or intensity based;
- time frames over which the target applies;
- base year from which progress is measured; and
- key performance indicators used to assess progress against targets.

Organizations disclosing medium-term or long-term targets should also disclose associated interim targets in aggregate or by business line, where available.

Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.

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an organization's exposure to climate-related risks and opportunities. For guidance on reporting Scope 3 GHG emissions, see the GHG Protocol's [The Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#).

<sup>49</sup> When considering whether to disclose Scope 3 GHG emissions, organizations should consider whether such emissions are a significant portion of their total GHG emissions. For example, see discussion of 40% threshold in the Science Based Targets initiative's (SBTi's) paper [SBTi Criteria and Recommendations](#), Version 4.2, April 2021, Section V, p. 10.

<sup>50</sup> While challenges remain, the GHG Protocol methodology is the most widely recognized and used international standard for calculating GHG emissions. Organizations may use national reporting methodologies if they are consistent with the GHG Protocol methodology.

<sup>51</sup> For industries with high energy consumption, metrics related to emission intensity are important to provide. For example, emissions per unit of economic output (e.g., unit of production, number of employees, or value-added) is widely used.

<sup>52</sup> The Task Force recognizes the PCAF Standard currently does not provide explicit guidance on calculating GHG emissions for certain financial products including private equity that refers to investment funds, green bonds, sovereign bonds, loans for securitization, exchange traded funds, derivatives, and initial public offering (IPO) underwriting. The PCAF notes "guidance on such financial products will be considered and published in later editions of the Standard" ([PCAF Standard](#), p. 44). The Task Force encourages banks to disclose GHG emissions for additional financial products, where data are available or can be reasonably estimated, as methodologies are published.

## 2. Insurance Companies<sup>53</sup>

For insurance companies, climate-related risks and opportunities constitute a key topic affecting the industry's core business (e.g., weather-related risk transfer business). The scientific consensus is that a continued rise in average global temperatures will have a significant effect on weather-related natural catastrophes and will account for an increasingly large share of natural catastrophe losses.<sup>54</sup>

Users of climate-related financial disclosures are specifically interested in how insurance companies are evaluating and managing climate-related risks and opportunities in their underwriting and investment activities. Such disclosure will support users in understanding how insurance companies are incorporating climate-related risks into their strategy, risk management, underwriting processes, and investment decisions. This guidance applies to the liability (underwriting) side of insurance activities. For insurance companies' investment activities, refer to the supplemental guidance for asset owners.

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### Governance

Disclose the organization's governance around climate-related risks and opportunities.

#### Recommended Disclosure a)

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

#### Guidance for All Sectors

In describing the board's oversight of climate-related issues, organizations should consider including a discussion of the following:

- processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues;
- whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well as setting the organization's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures; and
- how the board monitors and oversees progress against goals and targets for addressing climate-related issues.

#### Recommended Disclosure b)

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

#### Guidance for All Sectors

In describing management's role related to the assessment and management of climate-related issues, organizations should consider including the following information:

- whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues;
- a description of the associated organizational structure(s);
- processes by which management is informed about climate-related issues; and
- how management (through specific positions and/or management committees) monitors climate-related issues.

<sup>53</sup> Insurance companies include both insurers and re-insurers.

<sup>54</sup> Intergovernmental Panel on Climate Change, *Fifth Assessment Report (AR5)*, Cambridge University Press, 2014.



# Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

## Recommended Disclosure a)

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

## Guidance for All Sectors

Organizations should provide the following information:

- a description of what they consider to be the relevant short-, medium-, and long-term horizons, taking into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms;
- a description of the specific climate-related issues potentially arising in each time horizon (short, medium, and long term) that could have a material financial impact on the organization; and
- a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization.

Organizations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate. In describing climate-related issues, organizations should refer to [Tables A1.1](#) and [A1.2](#) (pp. 75–76).

## Recommended Disclosure b)

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

## Guidance for All Sectors

Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning.

Organizations should consider including the impact on their businesses, strategy, and financial planning in the following areas:

- Products and services
- Supply chain and/or value chain
- Adaptation and mitigation activities
- Investment in research and development
- Operations (including types of operations and location of facilities)
- Acquisitions or divestments
- Access to capital

Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time.

Organizations should describe the impact of climate-related issues on their financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities).<sup>55</sup>

If climate-related scenarios were used to inform the organization's strategy and financial planning, such scenarios should be described.

Organizations that have made GHG emissions reduction commitments, operate in jurisdictions that have made such commitments, or have agreed to meet investor expectations regarding GHG emissions reductions should describe their plans for transitioning to a low-carbon economy, which could include GHG emissions targets and specific activities intended to reduce GHG emissions in their operations and value chain or to otherwise support the transition.<sup>56</sup>

## Supplemental Guidance for Insurance Companies

Insurance companies should describe the potential impacts of climate-related risks and opportunities as well as provide supporting quantitative information where available, on their core businesses, products, and services, including:

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<sup>55</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

<sup>56</sup> Organizations may agree to meet investor expectations regarding GHG emissions reductions for various reasons, including concerns about access to or the cost of capital if they fail to do so.

## Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

- information at the business division, sector, or geography levels;
- how the potential impacts influence client or broker selection; and
- whether specific climate-related products or competencies are under development, such as insurance of green infrastructure, specialty climate-related risk advisory services, and climate-related client engagement.

### Recommended Disclosure c)

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

### Guidance for All Sectors

Organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a low-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.<sup>57</sup>

Organizations should consider discussing:

- where they believe their strategies may be affected by climate-related risks and opportunities;
- how their strategies might change to address such potential risks and opportunities;
- the potential impact of climate-related issues on financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities);<sup>58</sup> and
- the climate-related scenarios and associated time horizon(s) considered.

Refer to Section D in the [Task Force's report](#) for information on applying scenarios to forward-looking analysis.

### Supplemental Guidance for Insurance Companies

Insurance companies that perform climate-related scenario analysis on their underwriting activities should provide the following information:

- description of the climate-related scenarios used, including the critical input parameters, assumptions and considerations, and analytical choices. In addition to a 2°C scenario, insurance companies with substantial exposure to weather-related perils should consider using a greater than 2°C scenario to account for physical effects of climate change and
- time frames used for the climate-related scenarios, including short-, medium-, and long-term milestones.

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## Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

### Recommended Disclosure a)

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

### Guidance for All Sectors

Organizations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organizations determine the relative significance of climate-related risks in relation to other risks.

Organizations should describe whether they consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) as well as other relevant factors considered.

<sup>57</sup> In interpreting the phrase "2°C or lower," organizations should consider aligning their scenario analysis with Article Two of the 2015 [Paris Agreement](#) which commits parties to "holding the increasing in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

<sup>58</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

## Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

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Organizations should also consider disclosing the following:

- processes for assessing the potential size and scope of identified climate-related risks and
- definitions of risk terminology used or references to existing risk classification frameworks used.

### Supplemental Guidance for Insurance Companies

Insurance companies should describe the processes for identifying and assessing climate-related risks on re-/insurance portfolios by geography, business division, or product segments, including the following risks:

- physical risks from changing frequencies and intensities of weather-related perils;
- transition risks resulting from a reduction in insurable interest due to a decline in value, changing energy costs, or implementation of carbon regulation; and
- liability risks that could intensify due to a possible increase in litigation.

**Recommended Disclosure b)**  
Describe the organization's processes for managing climate-related risks.

### Guidance for All Sectors

Organizations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organizations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations.

In describing their processes for managing climate-related risks, organizations should address the risks included in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as appropriate.

### Supplemental Guidance for Insurance Companies

Insurance companies should describe key tools or instruments, such as risk models, used to manage climate-related risks in relation to product development and pricing.

Insurance companies should also describe the range of climate-related events considered and how the risks generated by the rising propensity and severity of such events are managed.

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

### Guidance for All Sectors

Organizations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

**Recommended Disclosure a)**  
Disclose the metrics used by the organization to assess climate-

### Guidance for All Sectors

Organizations should provide the key metrics used to measure and manage climate-related risks and opportunities, as described in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as well as metrics consistent with the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79).<sup>59</sup> Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management

<sup>59</sup> Financial organizations may find it more difficult to quantify exposure to climate-related risks because of challenges related to portfolio aggregation and data availability. The Task Force suggests financial organizations provide qualitative and quantitative information, where data and methodologies allow.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

<p>related risks and opportunities in line with its strategy and risk management process.</p>	<p>where relevant and applicable.</p> <p>Where climate-related issues are material, organizations should consider describing whether and how related performance metrics are incorporated into remuneration policies.</p> <p>Where relevant, organizations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a low-carbon economy.</p> <p>Metrics should be provided for historical periods to allow for trend analysis. Where appropriate, organizations should consider providing forward-looking metrics for the cross-industry, climate-related metric categories described in <a href="#">Table A2.1</a> (p. 79), consistent with their business or strategic planning time horizons. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.</p> <hr/> <p><b>Supplemental Guidance for Insurance Companies</b></p> <p>Insurance companies should provide aggregated risk exposure to weather-related catastrophes of their property business (i.e., annual aggregated expected losses from weather-related catastrophes) by relevant jurisdiction.</p> <p>Insurance companies should describe the extent to which their insurance underwriting activities, where relevant, are aligned with a well below 2°C scenario, using whichever approach or metrics best suit their organizational context or capabilities.<sup>60</sup> Insurance companies should also indicate which insurance underwriting activities (e.g., lines of business) are included.</p>
<p><b>Recommended Disclosure b)</b> Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.</p>	<p><b>Guidance for All Sectors</b></p> <p>Organizations should provide their Scope 1 and Scope 2 GHG emissions independent of a materiality assessment, and, if appropriate, Scope 3 GHG emissions and the related risks.<sup>61</sup> All organizations should consider disclosing Scope 3 GHG emissions.<sup>62, 63</sup></p> <p>GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.<sup>64</sup> As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.<sup>65</sup></p> <p>GHG emissions and associated metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics.</p>

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<sup>60</sup> This could include forward-looking metrics, GHG emissions targets and progress against them, reducing emissions in their operations and value chains, or working with clients and brokers to support their transition to a low-carbon economy. The Task Force acknowledges that there are challenges to implementing portfolio alignment methodologies, including the resources involved, and encourages organizations to disclose qualitative and quantitative information given existing data and methodologies. The Portfolio Alignment Team's, [Measuring Portfolio Alignment](#), October 2021 outlines potential approaches and associated design decisions for portfolio alignment tools.

<sup>61</sup> Emissions are a prime driver of rising global temperatures and, as such, are a key focal point of policy, regulatory, market, and technology responses to limit climate change. As a result, organizations with significant emissions are likely to be impacted more significantly by transition risk than other organizations. In addition, current or future constraints on emissions, either directly by emission restrictions or indirectly through carbon budgets, may impact organizations financially.

<sup>62</sup> The Task Force strongly encourages all organizations to disclose Scope 3 GHG emissions. While the Task Force recognizes the data and methodological challenges associated with calculating Scope 3 GHG emissions, it believes such emissions are an important metric reflecting an organization's exposure to climate-related risks and opportunities. For guidance on reporting Scope 3 GHG emissions, see the GHG Protocol's [The Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#).

<sup>63</sup> When considering whether to disclose Scope 3 GHG emissions, organizations should consider whether such emissions are a significant portion of their total GHG emissions. For example, see discussion of 40% threshold in the Science Based Targets initiative's (SBTi's) paper [SBTi Criteria and Recommendations](#), Version 4.2, April 2021, Section V, p. 10.

<sup>64</sup> While challenges remain, the GHG Protocol methodology is the most widely recognized and used international standard for calculating GHG emissions. Organizations may use national reporting methodologies if they are consistent with the GHG Protocol methodology.

<sup>65</sup> For industries with high energy consumption, metrics related to emission intensity are important to provide. For example, emissions per unit of economic output (e.g., unit of production, number of employees, or value-added) is widely used.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

### Supplemental Guidance for Insurance Companies

Insurance companies should disclose weighted average carbon intensity or GHG emissions associated with commercial property and specialty lines of business where data and methodologies allow.<sup>66</sup>

### Recommended Disclosure c)

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

### Guidance for All Sectors

Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., consistent with the cross-industry, climate-related metric categories in [Table A2.1](#) (p. 79), where relevant, and in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a low-carbon economy.

In describing their targets, organizations should consider including the following:

- whether the target is absolute or intensity based;
- time frames over which the target applies;
- base year from which progress is measured; and
- key performance indicators used to assess progress against targets.

Organizations disclosing medium-term or long-term targets should also disclose associated interim targets in aggregate or by business line, where available.

Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.

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<sup>66</sup> The CRO Forum's 2020 [Carbon Footprinting Methodology for Underwriting Portfolios](#) provides a methodology for adapting WACI for insurance underwriting activities (See [Table 3](#) (p. 52) for a description of the methodology). The Partnership for Carbon Accounting Financials (PCAF) is [working in collaboration](#) with members of the Net-Zero Insurance Alliance as well as other insurance companies to develop a methodology for measuring GHG emissions associated with underwriting activities. Insurance companies should follow these or other comparable industry guidance as they become available.

### 3. Asset Owners

Asset owners are a diverse group that include public- and private-sector pension plans, re-/insurance companies, endowments, and foundations and invest assets on their own behalf or on behalf of their beneficiaries. Asset owners invest according to a mandate or investment strategy set out by their oversight body or their beneficiaries. Asset owners have various investment horizons that influence their risk tolerance and investment strategies. Many asset owners have broadly diversified investment portfolios across investment strategies, asset classes, and regions and portfolios with thousands of underlying individual company and government exposures. Asset owners may hire asset managers to invest on their behalf.<sup>67</sup>

Whether asset owners invest directly or through asset managers, asset owners bear the potential transition and physical risks to which their investments are exposed. Similarly, asset owners can benefit from the potential returns on the investment opportunities associated with climate change.

Asset owners sit at the top of the investment chain and, therefore, have an important role to play in influencing the organizations in which they invest to provide better climate-related financial disclosures. Disclosure of climate-related risks and opportunities by asset owners—to the extent possible given existing data and methodology constraints—allows beneficiaries and other audiences to assess the asset owner's investment considerations and approach to climate change. This may include an assessment of the asset owner's integration of appropriate climate-related financial information into its investment activities in various ways, for example, in setting investment strategy, making new investment decisions, and managing its existing portfolio. By encouraging climate-related financial disclosures by asset owners, beneficiaries and other stakeholders will be in a position to better understand exposures to climate-related risks and opportunities. Further, climate-related financial disclosures by asset owners may encourage better disclosures across the investment chain—from asset owners to asset managers to underlying companies—thus enabling all organizations and individuals to make better-informed investment decisions.

Asset owners have contributed to the success of the TCFD in many ways, including by voluntarily publishing their own "TCFD reports." In these reports, asset owners have highlighted GHG emissions data from their respective portfolios and how their governance structures have developed to manage climate-related risk. Governance structures have developed to collect and analyze GHG emissions data as a proxy for climate-related risk from investee companies, either directly or via third party asset managers and data analytics specialists. The Task Force recognizes asset owners often issue reports, including ones containing climate-related information, directly to their beneficiaries or members rather than making them available publicly as would generally be the case with public companies. As a result, some of the cross-industry, climate-related metrics described in Appendix 2 may be less relevant for asset owners than for other organizations, particularly where flexibility is needed on the specific metrics and methodologies used.<sup>68</sup> Nevertheless, the Task Force believes the cross-industry, climate-related metrics have some applicability to asset owners because, by asking for this standardized information, asset owners encourage all organizations to publish TCFD-aligned information.

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<sup>67</sup> In this role, asset managers also act as fiduciaries. Asset managers invest within the guidelines specified by the asset owner for a given mandate set out in the investment management agreement or the product specification.

<sup>68</sup> The Task Force also understands asset owners may need several years to implement relevant cross-industry, climate-related metrics, particularly where assets are held through third party mandates such as pooled funds. The data and methodologies for some of these metrics, such as the impact of climate change on investment income or asset valuations, are very much in the early stages of development; and it may take time before methodologies have been developed and can be applied in practice. The Task Force also recognizes the methodological challenges of calculating GHG emissions associated with certain asset classes (e.g., sovereign bonds) and accepts research is ongoing. In determining whether a particular category of metric is relevant, asset owners should consider whether the information is used as part of the management of climate-related risks or investment decision-making processes.

## Governance

Disclose the organization's governance around climate-related risks and opportunities.

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

### Guidance for All Sectors

In describing the board's oversight of climate-related issues, organizations should consider including a discussion of the following:

- processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues;
- whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well as setting the organization's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures; and
- how the board monitors and oversees progress against goals and targets for addressing climate-related issues.

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

### Guidance for All Sectors

In describing management's role related to the assessment and management of climate-related issues, organizations should consider including the following information:

- whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues;
- a description of the associated organizational structure(s);
- processes by which management is informed about climate-related issues; and
- how management (through specific positions and/or management committees) monitors climate-related issues.

## Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

**Recommended Disclosure a)**  
Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.

### Guidance for All Sectors

Organizations should provide the following information:

- a description of what they consider to be the relevant short-, medium-, and long-term horizons, taking into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms;
- a description of the specific climate-related issues potentially arising in each time horizon (short, medium, and long term) that could have a material financial impact on the organization; and
- a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization.

Organizations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate. In describing climate-related issues, organizations should refer to [Tables A1.1](#) and [A1.2](#) (pp. 75–76).

**Recommended Disclosure b)**  
Describe the impact of climate-related risks and opportunities on the organization's businesses,

### Guidance for All Sectors

Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning.

Organizations should consider including the impact on their businesses, strategy, and financial planning in the following areas:

- Products and services
- Supply chain and/or value chain
- Adaptation and mitigation activities

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# Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

strategy, and financial planning.

- Investment in research and development
- Operations (including types of operations and location of facilities)
- Acquisitions or divestments
- Access to capital

Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time.

Organizations should describe the impact of climate-related issues on their financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities).<sup>69</sup>

If climate-related scenarios were used to inform the organization's strategy and financial planning, such scenarios should be described.

Organizations that have made GHG emissions reduction commitments, operate in jurisdictions that have made such commitments, or have agreed to meet investor expectations regarding GHG emissions reductions should describe their plans for transitioning to a low-carbon economy, which could include GHG emissions targets and specific activities intended to reduce GHG emissions in their operations and value chain or to otherwise support the transition.<sup>70</sup>

### Supplemental Guidance for Asset Owners

Asset owners should describe how climate-related risks and opportunities are factored into relevant investment strategies. This could be described from the perspective of the total fund or investment strategy or individual investment strategies for various asset classes.

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

### Guidance for All Sectors

Organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a low-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.<sup>71</sup>

Organizations should consider discussing:

- where they believe their strategies may be affected by climate-related risks and opportunities;
- how their strategies might change to address such potential risks and opportunities;
- the potential impact of climate-related issues on financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities);<sup>72</sup> and
- the climate-related scenarios and associated time horizon(s) considered.

Refer to Section D in the [Task Force's report](#) for information on applying scenarios to forward-looking analysis.

### Supplemental Guidance for Asset Owners

Asset owners that perform scenario analysis should consider providing a discussion of how climate-related scenarios are used, such as to inform investments in specific assets.

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<sup>69</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

<sup>70</sup> Organizations may agree to meet investor expectations regarding GHG emissions reductions for various reasons, including concerns about access to or the cost of capital if they fail to do so.

<sup>71</sup> In interpreting the phrase "2°C or lower," organizations should consider aligning their scenario analysis with Article Two of the 2015 [Paris Agreement](#) which commits parties to "holding the increasing in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

<sup>72</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.



# Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

**Recommended Disclosure a)**  
Describe the organization's processes for identifying and assessing climate-related risks.

## Guidance for All Sectors

Organizations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organizations determine the relative significance of climate-related risks in relation to other risks.

Organizations should describe whether they consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) as well as other relevant factors considered.

Organizations should also consider disclosing the following:

- processes for assessing the potential size and scope of identified climate-related risks and
- definitions of risk terminology used or references to existing risk classification frameworks used.

## Supplemental Guidance for Asset Owners

Asset owners should describe, where appropriate, engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks to improve data availability and asset owners' ability to assess climate-related risks.

**Recommended Disclosure b)**  
Describe the organization's processes for managing climate-related risks.

## Guidance for All Sectors

Organizations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organizations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations.

In describing their processes for managing climate-related risks, organizations should address the risks included in [Tables A.1](#) and [A.2](#) (pp. 75–76), as appropriate.

## Supplemental Guidance for Asset Owners

Asset owners should describe how they consider the positioning of their total portfolio with respect to the transition to a low-carbon energy supply, production, and use. This could include explaining how asset owners actively manage their portfolios' positioning in relation to this transition.

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

## Guidance for All Sectors

Organizations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.

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## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

### **Recommended Disclosure a)**

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

### **Guidance for All Sectors**

Organizations should provide the key metrics used to measure and manage climate-related risks and opportunities, as described in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as well as metrics consistent with the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79).<sup>73</sup> Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable.

Where climate-related issues are material, organizations should consider describing whether and how related performance metrics are incorporated into remuneration policies.

Where relevant, organizations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a low-carbon economy.

Metrics should be provided for historical periods to allow for trend analysis. Where appropriate, organizations should consider providing forward-looking metrics for the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79), consistent with their business or strategic planning time horizons. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.

### **Supplemental Guidance for Asset Owners**

Asset owners should describe metrics used to assess climate-related risks and opportunities in each fund or investment strategy. Where relevant, asset owners should also describe how these metrics have changed over time.

Where appropriate, asset owners should provide metrics considered in investment decisions and monitoring.

Asset owners should describe the extent to which assets they own and their funds and investment strategies, where relevant, are aligned with a well below 2°C scenario, using whichever approach or metrics best suit their organizational context or capabilities.<sup>74, 75</sup> Asset owners should also indicate which asset classes are included.

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<sup>73</sup> Financial organizations may find it more difficult to quantify exposure to climate-related risks because of challenges related to portfolio aggregation and data availability. The Task Force suggests financial organizations provide qualitative and quantitative information, where data and methodologies allow.

<sup>74</sup> This could include forward-looking metrics, GHG emissions targets and progress against them, reducing emissions in their operations and value chains, oversight of asset managers, and engagement with investee companies on their transition to a low-carbon economy. The Task Force acknowledges that there are challenges to implementing portfolio alignment methodologies, including the resources involved, and encourages organizations to disclose qualitative and quantitative information given existing data and methodologies. The Portfolio Alignment Team's, [Measuring Portfolio Alignment](#), October 2021 outlines potential approaches and associated design decisions for portfolio alignment tools.

<sup>75</sup> While the Task Force's supplemental guidance for asset owners addresses considerations when reporting to beneficiaries, the Task Force believes an asset owners' disclosure of the extent to which their assets are aligned with a well below 2°C scenario may also be of interest to a wider range of stakeholders. As such, the Task Force encourages asset owners to disclose this information publicly, where appropriate.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

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### Recommended Disclosure b)

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

### Guidance for All Sectors

Organizations should provide their Scope 1 and Scope 2 GHG emissions independent of a materiality assessment, and, if appropriate, Scope 3 GHG emissions and the related risks.<sup>76</sup> All organizations should consider disclosing Scope 3 GHG emissions.<sup>77, 78</sup>

GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.<sup>79</sup> As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.<sup>80</sup>

GHG emissions and associated metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics.

### Supplemental Guidance for Asset Owners

Asset owners should disclose GHG emissions for assets they own and the weighted average carbon intensity (WACI) for each fund or investment strategy, where data and methodologies allow. These emissions should be calculated in line with the *Global GHG Accounting and Reporting Standard* for the Financial Industry developed by the Partnership for Carbon Accounting Financials (PCAF Standard) or a comparable methodology (See [Table 2](#), p. 50).<sup>81</sup>

In addition to WACI, asset owners should consider providing other carbon footprinting metrics they believe are useful for decision-making. See [Table 3](#) (p. 52) for additional common carbon footprinting and exposure metrics.<sup>82</sup>

### Recommended Disclosure c)

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

### Guidance for All Sectors

Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., consistent with the cross-industry, climate-related metric categories in [Table A2.1](#) (p. 79), where relevant, and in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a low-carbon economy.

<sup>76</sup> Emissions are a prime driver of rising global temperatures and, as such, are a key focal point of policy, regulatory, market, and technology responses to limit climate change. As a result, organizations with significant emissions are likely to be impacted more significantly by transition risk than other organizations. In addition, current or future constraints on emissions, either directly by emission restrictions or indirectly through carbon budgets, may impact organizations financially.

<sup>77</sup> The Task Force strongly encourages all organizations to disclose Scope 3 GHG emissions. While the Task Force recognizes the data and methodological challenges associated with calculating Scope 3 GHG emissions, it believes such emissions are an important metric reflecting an organization's exposure to climate-related risks and opportunities. For guidance on reporting Scope 3 GHG emissions, see the GHG Protocol's *The Corporate Value Chain (Scope 3) Accounting and Reporting Standard*.

<sup>78</sup> When considering whether to disclose Scope 3 GHG emissions, organizations should consider whether such emissions are a significant portion of their total GHG emissions. For example, see discussion of 40% threshold in the Science Based Targets initiative's (SBTi's) paper *SBTi Criteria and Recommendations*, Version 4.2, April 2021, Section V, p. 10.

<sup>79</sup> While challenges remain, the GHG Protocol methodology is the most widely recognized and used international standard for calculating GHG emissions. Organizations may use national reporting methodologies if they are consistent with the GHG Protocol methodology.

<sup>80</sup> For industries with high energy consumption, metrics related to emission intensity are important to provide. For example, emissions per unit of economic output (e.g., unit of production, number of employees, or value-added) is widely used.

<sup>81</sup> The Task Force recognizes the PCAF Standard currently does not provide explicit guidance on calculating GHG emissions for certain financial products including private equity that refers to investment funds, green bonds, sovereign bonds, loans for securitization, exchange traded funds, derivatives, and initial public offering (IPO) underwriting. The PCAF notes "guidance on such financial products will be considered and published in later editions of the Standard" (*PCAF Standard*, p. 44). The Task Force encourages asset owners to disclose GHG emissions for additional financial products, where data are available or can be reasonably estimated, as methodologies are published.

<sup>82</sup> The Task Force acknowledges the challenges and limitations of current carbon footprinting metrics, including that such metrics should not necessarily be interpreted as risk metrics. The Task Force recognizes that some asset owners may be able to report weighted average carbon intensity or GHG emissions for only a portion of their investments given data availability and methodological issues.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

In describing their targets, organizations should consider including the following:

- whether the target is absolute or intensity based;
- time frames over which the target applies;
- base year from which progress is measured; and
- key performance indicators used to assess progress against targets.

Organizations disclosing medium-term or long-term targets should also disclose associated interim targets in aggregate or by business line, where available.

Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.

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## 4. Asset Managers

Asset managers, also known as investment managers, are hired by clients to invest assets on their behalf. In this role, asset managers act as fiduciaries. Asset managers invest within the guidelines specified by their clients for a given mandate set out in an investment management agreement or product specification. Importantly, the investment results, whether positive or negative, belong to the client.<sup>83</sup>

Asset managers' clients, as owners of the underlying assets, bear the major portion of the potential transition and physical risks to which their investments are exposed. Similarly, asset managers' clients will benefit from the potential returns on the investment opportunities associated with the transition to a low-carbon economy. The relevance of climate-related risks and opportunities to an asset manager and its asset owner clients will depend on a number of variables, including its investment styles and objectives, the asset classes in which it invests, the investment mandates, as well as other factors.

In the case where an asset manager is a public company, it has two distinct audiences for its climate-related financial disclosures. The first audience is its shareholders, who need to understand enterprise-level risks and opportunities and how these are managed. The second is its clients, for whom product-, investment strategy-, or client-specific disclosures are more relevant.

Asset managers' clients rely on reporting from asset managers to understand how climate-related risks and opportunities are managed within each of their portfolios. The guidance provided below addresses considerations for asset managers when reporting to their clients.

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### Governance

Disclose the organization's governance around climate-related risks and opportunities.

#### Recommended Disclosure a)

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

#### Guidance for All Sectors

In describing the board's oversight of climate-related issues, organizations should consider including a discussion of the following:

- processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues;
- whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well as setting the organization's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures; and
- how the board monitors and oversees progress against goals and targets for addressing climate-related issues.

#### Recommended Disclosure b)

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

#### Guidance for All Sectors

In describing management's role related to the assessment and management of climate-related issues, organizations should consider including the following information:

- whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues;
- a description of the associated organizational structure(s);
- processes by which management is informed about climate-related issues, and
- how management (through specific positions and/or management committees) monitors climate-related issues.

<sup>83</sup> Introductory language sourced from Blackrock, "BlackRock Worldwide Leader in Asset and Risk Management," February 2019.

# Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

## Recommended Disclosure a)

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

## Guidance for All Sectors

Organizations should provide the following information:

- a description of what they consider to be the relevant short-, medium-, and long-term horizons, taking into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms;
- a description of the specific climate-related issues potentially arising in each time horizon (short, medium, and long term) that could have a material financial impact on the organization; and
- a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization.

Organizations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate. In describing climate-related issues, organizations should refer to [Tables A1.1](#) and [A1.2](#) (pp. 75–76).

## Recommended Disclosure b)

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

## Guidance for All Sectors

Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning.

Organizations should consider including the impact on their businesses, strategy, and financial planning in the following areas:

- Products and services
- Supply chain and/or value chain
- Adaptation and mitigation activities
- Investment in research and development
- Operations (including types of operations and location of facilities)
- Acquisitions or divestments
- Access to capital

Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time.

Organizations should describe the impact of climate-related issues on their financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities).<sup>84</sup>

If climate-related scenarios were used to inform the organization's strategy and financial planning, such scenarios should be described.

Organizations that have made GHG emissions reduction commitments, operate in jurisdictions that have made such commitments, or have agreed to meet investor expectations regarding GHG emissions reductions should describe their plans for transitioning to a low-carbon economy, which could include GHG emissions targets and specific activities intended to reduce GHG emissions in their operations and value chain or to otherwise support the transition.<sup>85</sup>

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<sup>84</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

<sup>85</sup> Organizations may agree to meet investor expectations regarding GHG emissions reductions for various reasons, including concerns about access to or the cost of capital if they fail to do so.

## Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

### Supplemental Guidance for Asset Managers

Asset managers should describe how climate-related risks and opportunities are factored into relevant products or investment strategies.

Asset managers should also describe how each product or investment strategy might be affected by the transition to a low-carbon economy.

### Recommended Disclosure c)

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

### Guidance for All Sectors

Organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a low-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.<sup>86</sup>

Organizations should consider discussing:

- where they believe their strategies may be affected by climate-related risks and opportunities;
- how their strategies might change to address such potential risks and opportunities;
- the potential impact of climate-related issues on financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities);<sup>87</sup> and
- the climate-related scenarios and associated time horizon(s) considered.

Refer to Section D in the [Task Force's report](#) for information on applying scenarios to forward-looking analysis.

## Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

### Recommended Disclosure a)

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

### Guidance for All Sectors

Organizations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organizations determine the relative significance of climate-related risks in relation to other risks.

Organizations should describe whether they consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) as well as other relevant factors considered.

Organizations should also consider disclosing the following:

- processes for assessing the potential size and scope of identified climate-related risks and
- definitions of risk terminology used or references to existing risk classification frameworks used.

### Supplemental Guidance for Asset Managers

Asset managers should describe, where appropriate, engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks in order to improve data availability and asset managers' ability to assess climate-related risks.

Asset managers should also describe how they identify and assess material climate-related risks for each product or investment strategy. This might include a description of the resources and tools used in the process.

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<sup>86</sup> In interpreting the phrase "2°C or lower," organizations should consider aligning their scenario analysis with Article Two of the 2015 [Paris Agreement](#) which commits parties to "holding the increasing in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

<sup>87</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

## Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

**Recommended Disclosure b)**  
Describe the organization's processes for managing climate-related risks.

### Guidance for All Sectors

Organizations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organizations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations.

In describing their processes for managing climate-related risks, organizations should address the risks included in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as appropriate.

### Supplemental Guidance for Asset Managers

Asset managers should describe how they manage material climate-related risks for each product or investment strategy.

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

### Guidance for All Sectors

Organizations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.

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## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

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

### Guidance for All Sectors

Organizations should provide the key metrics used to measure and manage climate-related risks and opportunities, as described in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as well as metrics consistent with the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79).<sup>88</sup> Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable.

Where climate-related issues are material, organizations should consider describing whether and how related performance metrics are incorporated into remuneration policies.

Where relevant, organizations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a low-carbon economy.

Metrics should be provided for historical periods to allow for trend analysis. Where appropriate, organizations should consider providing forward-looking metrics for the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79), consistent with their business or strategic planning time horizons. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.

### Supplemental Guidance for Asset Managers

Asset managers should describe metrics used to assess climate-related risks and opportunities in each product or investment strategy. Where relevant, asset managers should also describe how these metrics have changed over time.

<sup>88</sup> Financial organizations may find it more difficult to quantify exposure to climate-related risks because of challenges related to portfolio aggregation and data availability. The Task Force suggests financial organizations provide qualitative and quantitative information, where data and methodologies allow.



## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

Where appropriate, asset managers should provide metrics considered in investment decisions and monitoring.

Asset managers should describe the extent to which their assets under management and products and investment strategies, where relevant, are aligned with a well below 2°C scenario, using whichever approach or metrics best suit their organizational context or capabilities.<sup>89, 90</sup> Asset managers should also indicate which asset classes are included.

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

### Guidance for All Sectors

Organizations should provide their Scope 1 and Scope 2 GHG emissions independent of a materiality assessment, and, if appropriate, Scope 3 GHG emissions and the related risks.<sup>91</sup> All organizations should consider disclosing Scope 3 GHG emissions.<sup>92, 93</sup>

GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.<sup>94</sup> As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.<sup>95</sup>

GHG emissions and associated metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics.

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<sup>89</sup> This could include forward-looking metrics, GHG emissions targets and progress against them, reducing emissions in their operations and value chains, and engagement with investee companies on their transition to a low-carbon economy. The Task Force acknowledges that there are challenges to implementing portfolio alignment methodologies, including the resources involved, and encourages organizations to disclose qualitative and quantitative information given existing data and methodologies. The Portfolio Alignment Team's, *Measuring Portfolio Alignment*, October 2021 outlines potential approaches and associated design decisions for portfolio alignment tools.

<sup>90</sup> While the Task Force's supplemental guidance for asset managers addresses considerations when reporting to clients, the Task Force believes an asset managers' disclosure of the extent to which their assets under management are aligned with a well below 2°C scenario may also be of interest to a wider range of stakeholders. As such, the Task Force encourages asset managers to disclose this information publicly, where appropriate.

<sup>91</sup> Emissions are a prime driver of rising global temperatures and, as such, are a key focal point of policy, regulatory, market, and technology responses to limit climate change. As a result, organizations with significant emissions are likely to be impacted more significantly by transition risk than other organizations. In addition, current or future constraints on emissions, either directly by emission restrictions or indirectly through carbon budgets, may impact organizations financially.

<sup>92</sup> The Task Force strongly encourages all organizations to disclose Scope 3 GHG emissions. While the Task Force recognizes the data and methodological challenges associated with calculating Scope 3 GHG emissions, it believes such emissions are an important metric reflecting an organization's exposure to climate-related risks and opportunities. For guidance on reporting Scope 3 GHG emissions, see the GHG Protocol's *The Corporate Value Chain (Scope 3) Accounting and Reporting Standard*.

<sup>93</sup> When considering whether to disclose Scope 3 GHG emissions, organizations should consider whether such emissions are a significant portion of their total GHG emissions. For example, see discussion of 40% threshold in the Science Based Targets initiative's (SBTi's) paper *SBTi Criteria and Recommendations*, Version 4.2, April 2021, Section V, p. 10.

<sup>94</sup> While challenges remain, the GHG Protocol methodology is the most widely recognized and used international standard for calculating GHG emissions. Organizations may use national reporting methodologies if they are consistent with the GHG Protocol methodology.

<sup>95</sup> For industries with high energy consumption, metrics related to emission intensity are important to provide. For example, emissions per unit of economic output (e.g., unit of production, number of employees, or value-added) is widely used.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

### Supplemental Guidance for Asset Managers

Asset managers should disclose GHG emissions for their assets under management and the weighted average carbon intensity (WACI) for each product or investment strategy, where data and methodologies allow. These emissions should be calculated in line with the *Global GHG Accounting and Reporting Standard for the Financial Industry* developed by the Partnership for Carbon Accounting Financials (PCAF Standard) or a comparable methodology (See [Table 2](#), p. 50).<sup>96</sup>

In addition to WACI, asset managers should consider providing other carbon footprinting metrics they believe are useful for decision-making. See [Table 3](#) (p. 52) for additional carbon footprinting and exposure metrics.<sup>97</sup>

### Recommended Disclosure c)

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

### Guidance for All Sectors

Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., consistent with the cross-industry, climate-related metric categories in [Table A2.1](#) (p. 79), where relevant, and in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a low-carbon economy.

In describing their targets, organizations should consider including the following:

- whether the target is absolute or intensity based;
- time frames over which the target applies;
- base year from which progress is measured; and
- key performance indicators used to assess progress against targets.

Organizations disclosing medium-term or long-term targets should also disclose associated interim targets in aggregate or by business line, where available.

Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.

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<sup>96</sup> The Task Force recognizes the PCAF Standard currently does not provide explicit guidance on calculating GHG emissions for certain financial products including private equity that refers to investment funds, green bonds, sovereign bonds, loans for securitization, exchange traded funds, derivatives, and initial public offering (IPO) underwriting. The PCAF notes “guidance on such financial products will be considered and published in later editions of the Standard” (*PCAF Standard*, p. 44). The Task Force encourages asset managers to disclose GHG emissions for additional financial products, where data are available or can be reasonably estimated, as methodologies are published.

<sup>97</sup> The Task Force acknowledges the challenges and limitations of current carbon footprinting metrics, including that such metrics should not necessarily be interpreted as risk metrics. The Task Force recognizes that some asset managers may be able to report weighted average carbon intensity or GHG emissions for only a portion of the assets they manage given data availability and methodological issues.

## 5. Carbon Footprinting and Exposure Metrics

The tables below provide descriptions, formulas, and additional information for common carbon footprinting and exposure metrics. [Table 2](#) provides details on GHG emissions metrics for banks, asset owners, and asset managers. [Table 3](#) (p. 52) provides carbon footprinting metrics that organizations may find useful to report, including weighted average carbon intensity for both investing and insurance underwriting activities.

Table 2

### GHG Emissions Metrics for Banks, Asset Owners, and Asset Managers

Asset Class	Description	Formula	Activities	
			Lending	Investing
Listed Equity	Equity that is traded on a stock exchange or another securities exchange and is on the balance sheet of the financial institution.	$\sum_c \left( \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Company emissions}_c \right)$ <p>EVIC = enterprise value including cash<sup>98</sup></p> <p>Note: the value of outstanding listed equity is defined based on its market value (i.e., market price times number of shares). See page 49 of the PCAF Standard.</p>	--	✓
Listed Corporate Bonds	Listed corporate bonds that are traded on a market and are on the balance sheet of the financial institution.	<p>To private companies:</p> $\sum_c \left( \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{Company emissions}_c \right)$ <p>c = borrower or investee company</p> <p>To listed companies:</p> $\sum_c \left( \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Company emissions}_c \right)$ <p>EVIC = enterprise value including cash c = borrower or investee company</p> <p>Note: the value of outstanding corporate bonds is defined based on the book value of the debt that the borrower owes to the lender. See page 49 of the PCAF Standard.</p>	--	✓
Business Loans	All loans and lines of credit for general corporate purposes to businesses, nonprofits, and any other structure of organization that are not traded on a market and are on the balance of the financial institution.	<p>To listed companies:</p> $\sum_c \left( \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Company emissions}_c \right)$ <p>To private companies:</p> $\sum_c \left( \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{Company emissions}_c \right)$ <p>EVIC = enterprise value including cash c = borrower or investee company</p>	✓	--

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<sup>98</sup> PCAF Standard aligns with the definition of EVIC as provided by the EU Technical Expert Group on Sustainable Finance's *Handbook on Climate Benchmarks and benchmarks' ESG disclosures*, defined as: "The sum of the market capitalization of ordinary shares at fiscal year-end, the market capitalization of preferred shares at fiscal year-end, and the book values of total debt and minorities' interests. No deductions of cash or cash equivalents are made to avoid the possibility of negative enterprise values" (*PCAF Standard*, p. 62).

Table 2

**GHG Emissions Metrics for Banks, Asset Owners, and Asset Managers** (continued)

Asset Class	Description	Formula	Activities	
			Lending	Investing
Unlisted Equity	All equity investments for general corporate purposes to businesses, nonprofits, and any other structure of organization that are not traded on a market and are on the balance sheet of the financial institution.	$\sum_c \left( \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{Company emissions}_c \right)$ <p>c = borrower or investee company</p> <p>Note: the outstanding amount is the outstanding value of equity that the financial institution holds in the private company. It is calculated by multiplying the relative share of the financial institution in the respective investee by the total equity of the respective investee according to its balance sheet. See pp. 61-62 of the PCAF Standard.</p>	--	✓
Project Finance	All loans or equities to projects for specific purposes that are on the balance sheet of the financial institution.	$\sum_p \left( \frac{\text{Outstanding amount}_p}{\text{Total equity} + \text{debt}_p} \times \text{Project emissions}_p \right)$ <p>p = project</p>	✓	✓
Commercial Real Estate (CRE)	On-balance sheet loans and investments for the purchase and refinance of commercial real estate (CRE).	$\sum_b \left( \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Energy consumption}_{b,e} \times \text{Emission factor}_e \right)$ <p>b = building e = energy source</p>	✓	✓
Mortgages	On-balance sheet loans for the purchase and refinance of residential property, including individual homes and multifamily homes with a small number of units.	$\sum_b \left( \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Energy consumption}_{b,e} \times \text{Emission factor}_e \right)$ <p>b = building e = energy source</p>	✓	--
Motor Vehicle Loans	On-balance sheet loans and lines of credit to businesses and consumers that are used to finance one or several motor vehicles.	$\sum_{v,f} \left( \frac{\text{Outstanding amount}_v}{\text{Total value at origination}_v} \times \text{Distance traveled}_v \times \text{Efficiency}_{v,f} \times \text{Emission factor}_f \right)$ <p>v = vehicle or vehicle fleet f = fuel type</p>	✓	--

Note: PCAF continues to add asset classes. Financial organizations (referred to as financial institutions by PCAF) should refer to the [PCAF Standard](#) for the latest guidance on measuring GHG emissions.<sup>99</sup>

<sup>99</sup> For further details on these metrics, see PCAF, *The Global GHG Accounting and Reporting Standard for the Financial Industry*, November 2020.

Table 3

## Common Carbon Footprinting and Exposure Metrics

Metric	Supporting Information	
Weighted Average Carbon Intensity: Investments	<i>Description</i>	Portfolio's exposure to carbon-intensive companies, expressed in tons CO <sub>2</sub> e/\$M revenue.
	<i>Formula</i>	$\sum_n^i \left( \frac{\text{current value of investment}_i}{\text{current portfolio value}} \times \frac{\text{issuer's Scope 1 and Scope 2 GHG emissions}_i}{\text{issuer's \$M revenue}_i} \right)$
	<i>Methodology</i>	Scope 1 and Scope 2 GHG emissions are allocated based on portfolio weights (the current value of the investment relative to the current portfolio value), rather than the equity ownership approach (as described under methodology for Total Carbon Emissions). Gross values should be used.
	<i>Key Points</i> + / -	<ul style="list-style-type: none"> <li>+ Metric can be more easily applied across asset classes since it does not rely on equity ownership approach.</li> <li>+ The calculation of this metric is fairly simple and easy to communicate to investors.</li> <li>+ Metric allows for portfolio decomposition and attribution analysis.</li> <li>- Metric is sensitive to outliers.</li> <li>- Using revenue (instead of physical or other metrics) to normalize the data tends to favor companies with higher pricing levels relative to their peers.</li> </ul>
Weighted Average Carbon Intensity: Insurance Premiums <sup>100</sup>	<i>Description</i>	Portfolio of insurance transactions' exposure to carbon-intensive companies, expressed in tons CO <sub>2</sub> e/\$M revenue.
	<i>Formula</i>	$\sum_n^i \left( \frac{\text{gross written premium of insurance transaction}}{\text{total GWP volume of insurance portfolio}} \times \frac{\text{insured's Scope 1 and Scope 2 GHG emissions}_i}{\text{insured's \$M revenue}_i} \right)$
	<i>Methodology</i>	The methodology measures the intensity of a portfolio of insurance transactions using carbon intensity information for each legal entity or company (commercial insurance) or individual insured (personal lines insurance) should be used. Where GHG emissions on a company level are not available, industry or country information can be used. Where gross written premium information is not available, information on capital required, capacity, or expected loss can be used.
	<i>Key Points</i> + / -	<ul style="list-style-type: none"> <li>+ Metric can be more easily applied across asset classes since it does not rely on equity ownership approach.</li> <li>- Using revenue to normalize the data tends to favor companies with higher pricing levels relative to their peers.</li> </ul>
Total Carbon Emissions	<i>Description</i>	The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO <sub>2</sub> e.
	<i>Formula</i>	$\sum_n^i \left( \frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} \times \text{issuer's Scope 1 and Scope 2 GHG emissions}_i \right)$
	<i>Methodology</i>	Scope 1 and Scope 2 GHG emissions are allocated to investors based on an equity ownership approach. Under this approach, if an investor owns 5 percent of a company's total market capitalization, then the investor owns 5 percent of the company as well as 5 percent of the company's GHG (or carbon) emissions. While this metric is generally used for public equities, it can be used for other asset classes by allocating GHG emissions across the total capital structure of the investee (debt and equity).

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<sup>100</sup> Source: CRO Forum, "Carbon footprinting methodology for underwriting portfolios," May 1 2020.

Table 3

### Common Carbon Footprinting and Exposure Metrics (continued)

Metric	Supporting Information	
Total Carbon Emissions	<i>Key Points</i>	<ul style="list-style-type: none"> <li>+ Metric may be used to communicate the carbon footprint of a portfolio consistent with the GHG protocol.</li> <li>+ Metric may be used to track changes in GHG emissions in a portfolio.</li> <li>+ Metric allows for portfolio decomposition and attribution analysis.</li> <li>– Metric is generally not used to compare portfolios because the data are not normalized.</li> <li>– Changes in underlying companies' market capitalization can be misinterpreted.</li> </ul>
Carbon Footprint	<i>Description</i>	Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tons CO <sub>2</sub> e/\$M invested.
	<i>Formula</i>	$\frac{\sum_n^i \left( \frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} \times \text{issuer's Scope 1 and Scope 2 GHG emissions}_i \right)}{\text{current portfolio value (\$M)}}$
	<i>Methodology</i>	<p>Scope 1 and Scope 2 GHG emissions are allocated to investors based on an equity ownership approach as described under methodology for Total Carbon Emissions.</p> <p>The current portfolio value is used to normalize the data.</p>
	<i>Key Points</i> + / -	<ul style="list-style-type: none"> <li>+ Metric may be used to compare portfolios to one another and/or to a benchmark.</li> <li>+ Using the portfolio market value to normalize data is fairly intuitive to investors.</li> <li>+ Metric allows for portfolio decomposition and attribution analysis.</li> <li>– Metric does not take into account differences in the size of companies (e.g., does not consider the carbon efficiency of companies).</li> <li>– Changes in underlying companies' market capitalization can be misinterpreted.</li> </ul>
Carbon Intensity	<i>Description</i>	Volume of carbon emissions per million dollars of revenue (carbon efficiency of a portfolio), expressed in tons CO <sub>2</sub> e/\$M revenue.
	<i>Formula</i>	$\frac{\sum_n^i \left( \frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} \times \text{issuer's Scope 1 and Scope 2 GHG emissions}_i \right)}{\sum_n^i \left( \frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} \times \text{issuer's \$M revenue}_i \right)}$
	<i>Methodology</i>	<p>Scope 1 and Scope 2 GHG emissions are allocated to investors based on an equity ownership approach as described under methodology for Total Carbon Emissions.</p> <p>The company's (or issuer's) revenue is used to adjust for company size to provide a measurement of the efficiency of output.</p>
	<i>Key Points</i> + / -	<ul style="list-style-type: none"> <li>+ Metric may be used to compare portfolios to one another and/or to a benchmark.</li> <li>+ Metric takes into account differences in the size of companies (e.g., considers the carbon efficiency of companies).</li> <li>+ Metric allows for portfolio decomposition and attribution analysis.</li> <li>– The calculation of this metric is somewhat complex and may be difficult to communicate.</li> <li>– Changes in underlying companies' market capitalization can be misinterpreted.</li> </ul>

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Table 3

**Common Carbon Footprinting and Exposure Metrics** *(continued)*

Metric	Supporting Information	
Exposure to Carbon-Related Assets	<i>Description</i>	The amount or percentage of carbon-related assets <sup>101</sup> in the portfolio, expressed in \$M or percentage of the current portfolio value.
	<i>Formula for Amount</i>	$\sum \$M \text{ current value of investments in carbon-related assets}$
	<i>Formula for Percentage</i>	$\frac{\sum \text{current value of investments in carbon-related assets}}{\text{current portfolio value}} \times 100$
	<i>Methodology</i>	This metric focuses on a portfolio's exposure to sectors and industries considered the most GHG emissions intensive. Gross values should be used.
	<i>Key Points</i> + / -	<ul style="list-style-type: none"> <li>+ Metric can be applied across asset classes and does not rely on underlying companies' Scope 1 and Scope 2 GHG emissions.</li> <li>- Metric does not provide information on sectors or industries other than those included in the definition of carbon-related assets (i.e., energy and utilities sectors under the Global Industry Classification Standard excluding water utilities and independent power and renewable electricity producer industries).</li> </ul>

*Note: The term "portfolio" used in the table above is defined as "fund or investment strategy" for asset owners, "product or investment strategy" for asset managers, and "lending and other financial intermediary business activities" for banks.*

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<sup>101</sup> Recognizing that the term "carbon-related assets" is not well defined, the Task Force encourages banks to use a consistent definition to support comparability. For purposes of disclosing information on significant concentrations of credit exposure to carbon-related assets under this framework, the Task Force suggests banks define carbon-related assets as those assets tied to the four non-financial groups identified by the Task Force in its 2017 report (see Table 4, p. 56). There may be industries or sub-industries that are appropriate to exclude, such as water utilities and independent power and renewable electricity producer industries. Banks should describe which industries they include.

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## E. Supplemental Guidance for Non-Financial Groups

While every industry could experience potential financial impacts from climate-related risks and opportunities, the Task Force developed supplemental guidance for non-financial industries (and their related supply and distribution chains) more likely to be financially impacted than others due to their exposure to certain transition and physical risks around greenhouse gas (GHG) emissions, energy, or water dependencies associated with their operations and products.<sup>102</sup> These non-financial industries are grouped into four key areas (referred to as non-financial groups): Energy; Transportation; Materials and Buildings; and Agriculture, Food, and Forest Products.<sup>103</sup> The industries within each group are provided in [Table 4](#).<sup>104</sup>

Table 4

### Industries Associated with the Four Non-Financial Groups

Energy	Transportation	Materials and Buildings	Agriculture, Food, and Forest Products
– Oil and Gas	– Air Freight	– Metals and Mining	– Beverages
– Coal	– Passenger Air Transportation	– Chemicals	– Agriculture
– Electric Utilities	– Maritime Transportation	– Construction Materials	– Packaged Food and Meats
	– Rail Transportation	– Capital Goods	– Paper and Forest Products
	– Trucking Services	– Real Estate Management and Development	
	– Automobiles and Components		

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Supplemental guidance for the non-financial groups is provided for select recommended disclosures related to strategy and metrics and targets, as shown in [Figure 8](#).

Figure 8

### Supplemental Guidance for Non-Financial Groups

Groups	Governance		Strategy			Risk Management			Metrics and Targets		
	a)	b)	a)	b)	c)	a)	b)	c)	a)	b)	c)
<b>Energy</b>			■	■					■		
<b>Transportation</b>			■	■					■		
<b>Materials and Buildings</b>			■	■					■		
<b>Ag, Food, and Forest Products</b>			■	■					■		

The Task Force developed supplemental guidance for the non-financial groups to provide such organizations further background and information to consider when developing disclosures consistent with the Task Force's recommendations. This supplemental guidance should be read and applied in conjunction with the guidance for all sectors.

<sup>102</sup> SASB, *SASB Climate Risk Technical Bulletin #: TB001-10182016*, October 2016.

<sup>103</sup> These four groups and their associated industries are intended to be indicative of the economic activities associated with these industries rather than definitive industry categories.

<sup>104</sup> Box 2 of the *2017 report* provides more details on the selection of these four groups.

## Governance

Disclose the organization's governance around climate-related risks and opportunities.

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

### Guidance for All Sectors

In describing the board's oversight of climate-related issues, organizations should consider including a discussion of the following:

- processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues;
- whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well as setting the organization's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures; and
- how the board monitors and oversees progress against goals and targets for addressing climate-related issues.

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

### Guidance for All Sectors

In describing management's role related to the assessment and management of climate-related issues, organizations should consider including the following information:

- whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues;
- a description of the associated organizational structure(s);
- processes by which management is informed about climate-related issues; and
- how management (through specific positions and/or management committees) monitors climate-related issues.

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## Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

**Recommended Disclosure a)**  
Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.

### Guidance for All Sectors

Organizations should provide the following information:

- a description of what they consider to be the relevant short-, medium-, and long-term time horizons, taking into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms;
- a description of the specific climate-related issues potentially arising in each time horizon (short, medium, and long term) that could have a material financial impact on the organization; and
- a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization.

Organizations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate. In describing climate-related issues, organizations should refer to [Tables A1.1](#) and [A1.2](#) (pp. 75–76).

**Recommended Disclosure b)**  
Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and

### Guidance for All Sectors

Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning.

Organizations should consider including the impact on their businesses, strategy, and financial planning in the following areas:

- Products and services
- Supply chain and/or value chain
- Adaptation and mitigation activities

# Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

financial planning.

- Investment in research and development
- Operations (including types of operations and location of facilities)
- Acquisitions or divestments
- Access to capital

Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time.

Organizations should describe the impact of climate-related issues on their financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities).<sup>105</sup>

If climate-related scenarios were used to inform the organization's strategy and financial planning, such scenarios should be described.

Organizations that have made GHG emissions reduction commitments, operate in jurisdictions that have made such commitments, or have agreed to meet investor expectations regarding GHG emissions reductions should describe their plans for transitioning to a low-carbon economy, which could include GHG emissions targets and specific activities intended to reduce GHG emissions in their operations and value chain or to otherwise support the transition.<sup>106</sup>

### Supplemental Guidance for Non-Financial Groups

Organizations should consider discussing how climate-related risks and opportunities are integrated into their (1) current decision-making and (2) strategy formulation, including planning assumptions and objectives around climate change mitigation, adaptation, or opportunities such as:

- Research and development (R&D) and adoption of new technology.
- Existing and committed future activities such as investments, restructuring, write-downs, or impairment of assets.
- Critical planning assumptions around legacy assets, for example, strategies to lower carbon-, energy-, and/or water-intensive operations.
- How GHG emissions, energy, and water and other physical risk exposures, if applicable, are considered in capital planning and allocation; this could include a discussion of major acquisitions and divestments, joint-ventures, and investments in technology, innovation, and new business areas in light of changing climate-related risks and opportunities.
- The organization's flexibility in positioning/repositioning capital to address emerging climate-related risks and opportunities.

### Recommended Disclosure c)

Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios,

### Guidance for All Sectors

Organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a low-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.<sup>107</sup>

Organizations should consider discussing:

- where they believe their strategies may be affected by climate-related risks and opportunities;

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<sup>105</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

<sup>106</sup> Organizations may agree to meet investor expectations regarding GHG emissions reductions for various reasons, including concerns about access to or the cost of capital if they fail to do so.

<sup>107</sup> In interpreting the phrase "2°C or lower," organizations should consider aligning their scenario analysis with Article Two of the 2015 [Paris Agreement](#) which commits parties to "holding the increasing in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

# Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

including a 2°C or lower scenario.

- how their strategies might change to address such potential risks and opportunities;
- the potential impact of climate-related issues on financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities);<sup>108</sup> and
- the climate-related scenarios and associated time horizon(s) considered.

Refer to Section D in the [Task Force's report](#) for information on applying scenarios to forward-looking analysis.

## Supplemental Guidance for Non-Financial Groups

Organizations with more than one billion U.S. dollar equivalent (USDE) in annual revenue should consider conducting more robust scenario analysis to assess the resilience of their strategies against a range of climate-related scenarios, including a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.<sup>109, 110</sup>

Organizations should consider discussing the implications of different policy assumptions, macro-economic trends, energy pathways, and technology assumptions used in publicly available climate-related scenarios to assess the resilience of their strategies.<sup>111</sup>

For the climate-related scenarios used, organizations should consider providing information on the following factors to allow investors and others to understand how conclusions were drawn from scenario analysis:

- Critical input parameters, assumptions, and analytical choices for the climate-related scenarios used, particularly as they relate to key areas such as policy assumptions, energy deployment pathways, technology pathways, and related timing assumptions.
- Potential qualitative or quantitative financial implications of the climate-related scenarios, if any.<sup>112</sup>

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<sup>108</sup> These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms. The Task Force encourages organizations to include quantitative information, where data and methodologies allow.

<sup>109</sup> The Task Force expects the application of scenarios as a tool for forward-looking assessments of climate-related risk will evolve over time as scenarios, tools, and data are further developed and refined.

<sup>110</sup> Inclusion of a 2°C or lower scenario is intended to serve as an anchor point for all organizations that aligns with current international climate agreements, recognizing that the Paris Agreement currently says "well below 2 degrees."

<sup>111</sup> This will help identify the key characteristics that are relevant to assessing long-term strategy (e.g., changes in regulation, technology, and physical impact).

<sup>112</sup> In discussing potential qualitative or quantitative financial implications, the Task Force is not asking organizations to provide a financial forecast (for which scenario analysis is not appropriate). Organizations are asked to provide an indication of direction or ranges of potential financial implications, for example, directionally where key financial aspects such as CapEx, R&D, supply chains, or revenue might be headed.

## Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

### Recommended Disclosure a)

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

### Guidance for All Sectors

Organizations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organizations determine the relative significance of climate-related risks in relation to other risks.

Organizations should describe whether they consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) as well as other relevant factors considered.

Organizations should also consider disclosing the following:

- processes for assessing the potential size and scope of identified climate-related risks and
- definitions of risk terminology used or references to existing risk classification frameworks used.

### Recommended Disclosure b)

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

### Guidance for All Sectors

Organizations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organizations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations.

In describing their processes for managing climate-related risks, organizations should address the risks included in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as appropriate.

### Recommended Disclosure c)

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

### Guidance for All Sectors

Organizations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.

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## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

### Recommended Disclosure a)

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

### Guidance for All Sectors

Organizations should provide the key metrics used to measure and manage climate-related risks and opportunities, as described in [Tables A1.1](#) and [A1.2](#) (pp. 75–76), as well as metrics consistent with the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79).<sup>113</sup> Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable.

Where climate-related issues are material, organizations should consider describing whether and how related performance metrics are incorporated into remuneration policies.

Where relevant, organizations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a low-carbon economy.

<sup>113</sup> Financial organizations may find it more difficult to quantify exposure to climate-related risks because of challenges related to portfolio aggregation and data availability. The Task Force suggests financial organizations provide qualitative and quantitative information, where data and methodologies allow.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

Metrics should be provided for historical periods to allow for trend analysis. Where appropriate, organizations should consider providing forward-looking metrics for the cross-industry, climate-related metric categories described in [Table A2.1](#) (p. 79), consistent with their business or strategic planning time horizons. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.

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For all relevant metrics, organizations should consider providing historical trends and forward-looking projections (by relevant country and/or jurisdiction, business line, or asset type). Organizations should also consider disclosing metrics that support their scenario analysis and strategic planning process and that are used to monitor the organization's business environment from a strategic and risk management perspective.

Organizations should consider providing key metrics related to GHG emissions, energy, water and other physical risk exposures, land use, and, if relevant, investments in climate adaptation and mitigation that address potential financial aspects of shifting demand, expenditures, asset valuation, and cost of financing.

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

### Guidance for All Sectors

Organizations should provide their Scope 1 and Scope 2 GHG emissions independent of a materiality assessment, and, if appropriate, Scope 3 GHG emissions and the related risks.<sup>114</sup> All organizations should consider disclosing Scope 3 GHG emissions.<sup>115, 116</sup>

GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.<sup>117</sup> As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.<sup>118</sup>

GHG emissions and associated metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics.

<sup>114</sup> Emissions are a prime driver of rising global temperatures and, as such, are a key focal point of policy, regulatory, market, and technology responses to limit climate change. As a result, organizations with significant emissions are likely to be impacted more significantly by transition risk than other organizations. In addition, current or future constraints on emissions, either directly by emission restrictions or indirectly through carbon budgets, may impact organizations financially.

<sup>115</sup> The Task Force strongly encourages all organizations to disclose Scope 3 GHG emissions. While the Task Force recognizes the data and methodological challenges associated with calculating Scope 3 GHG emissions, it believes such emissions are an important metric reflecting an organization's exposure to climate-related risks and opportunities. For guidance on reporting Scope 3 GHG emissions, see the GHG Protocol's [The Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#).

<sup>116</sup> When considering whether to disclose Scope 3 GHG emissions, organizations should consider whether such emissions are a significant portion of their total GHG emissions. For example, see discussion of 40% threshold in the Science Based Targets initiative's (SBTi's) paper [SBTi Criteria and Recommendations](#), Version 4.2, April 2021, Section V, p. 10.

<sup>117</sup> While challenges remain, the GHG Protocol methodology is the most widely recognized and used international standard for calculating GHG emissions. Organizations may use national reporting methodologies if they are consistent with the GHG Protocol methodology.

<sup>118</sup> For industries with high energy consumption, metrics related to emission intensity are important to provide. For example, emissions per unit of economic output (e.g., unit of production, number of employees, or value-added) is widely used.

## Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

### **Recommended Disclosure c)**

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

### **Guidance for All Sectors**

Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., consistent with the cross-industry, climate-related metric categories in [Table A2.1](#) (p. 79), where relevant, and in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a low-carbon economy.

In describing their targets, organizations should consider including the following:

- whether the target is absolute or intensity based;
- time frames over which the target applies;
- base year from which progress is measured; and
- key performance indicators used to assess progress against targets.

Organizations disclosing medium-term or long-term targets should also disclose associated interim targets in aggregate or by business line, where available.

Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.

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The following sections provide a description of how each of the four key non-financial groups may be affected by climate-related issues along with a few examples of metrics that may be relevant to the group. The Task Force has also identified cross-industry, climate-related metric categories it believes are relevant for all organizations ([Table A2.1](#), p. 79). In addition, organizations in these groups should define metrics and targets that are tailored to their particular climate-related risks and opportunities. In determining the most relevant and useful metrics, organizations are encouraged to engage with their key stakeholders, including investors, and review publicly available frameworks.<sup>119</sup>

<sup>119</sup> Existing frameworks provide a range of metrics that an organization may find useful in disclosing various aspects of its climate-related risks and opportunities. See, for example, GHG Protocol, Global Reporting Initiative, ISO Standards, Sustainability Accounting Standards Board, Climate Disclosure Standards Board, World Resources Institute, World Business Council for Sustainable Development, CDP, and various industry-specific guidance.

## 1. Energy Group

Energy is a critical element in the economy, serving as a primary or necessary input in most economic activities. This group comprises organizations extracting, processing, producing, and distributing fossil fuels or electric energy to other sectors of the economy. It includes, but is not limited to, industries listed in [Figure 9](#).

While many climate-related issues impact the Energy Group, organizations in this group should consider providing disclosures related to financial implications of potential physical impacts (e.g., reliance on water in areas of high water stress, severe storm/flood mitigations) and transition impacts (e.g., policy requirements, carbon prices, new technology, changes in market demand) of climate-related risks and opportunities.

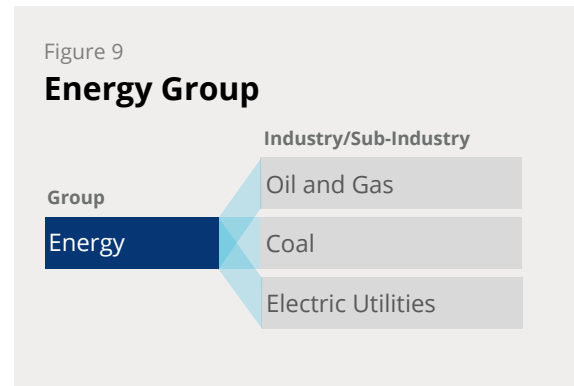
As fossil fuel and electricity providers, the organizations in this group generally have significant financial exposure around transition issues related to GHG emissions and, in many cases, are dependent on the availability of water. For example, a majority of the current electricity supply comes from non-renewable fossil fuel resources, resulting in a significant exposure to transitions around global GHG emissions—either directly through utility companies' own energy use for production or indirectly through combustion of fossil fuels.<sup>120</sup> Electric utilities, therefore, face significant transition risk (i.e., the financial risk arising from the changes in asset valuations caused by the structural shift toward a low-carbon energy system). This is because the utility sector's asset valuations are at risk from the disruptive impact of the policy, technology, and portfolio changes that will occur over the next two to three decades as policies, technology, and markets shift to a low-carbon energy system.

In addition to GHG emissions, both hydroelectric power generation and cooling for nuclear and non nuclear power generation use large quantities of water.<sup>121</sup> Physical risks affecting water supplies creates a potentially important exposure for this industry.

Oil, gas, and coal extraction face similar transition risks as key suppliers to electric utilities. These industries also rely on water to a significant degree.<sup>122, 123, 124</sup>

These characteristics make the Energy Group particularly sensitive to physical, policy, or technological changes affecting fossil fuel demand, energy production and usage, emissions constraints, and water availability. The regulatory and competitive landscape that surrounds electric utilities also differs significantly between jurisdictions, thus making assessment of climate-related risks very challenging.

As a result, both the transition risks and physical risks associated with climate change may impact the operating costs and asset valuation of organizations engaged in energy activities. In particular, organizations within the Energy Group are generally capital intensive, require major financial investments in fixed assets and supply chain management, and have longer business strategy/capital



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<sup>120</sup> According to International Energy Agency (IEA) data, CO<sub>2</sub> emissions from fuel combustion across all energy sectors and activities totaled 33.5 Gigatons (Gt) in 2018, thereby accounting for 65 percent of total anthropogenic GHG emissions (51.9 Gt CO<sub>2</sub>e). Electricity and heat production on its own accounted for 14Gt, representing 42 percent of all CO<sub>2</sub> emissions from fuel combustion and 27 percent of all anthropogenic GHG emissions. To put this into context, the next highest emitting industrial sector was transportation, which accounted for 8.3Gt (25 percent of all CO<sub>2</sub> emissions from fuel combustion, and 16 percent of total anthropogenic GHG emissions). IEA, *CO<sub>2</sub> Emissions from Fuel Combustion: Highlights*, 2020; PBL Netherlands Environmental Assessment Agency, *Trends in Global CO<sub>2</sub> and Total Greenhouse Gas Emissions: 2020 Report*, 2020.

<sup>121</sup> van Vilet, M., et al., "Power-generation system vulnerability and adaptation to changes in climate and water resources," 2016.

<sup>122</sup> IPIECA, *Water Resource Management in the Petroleum Industry*, 2005.

<sup>123</sup> International Council on Mining and Metals (ICMM), *In Brief: Water stewardship framework*, 2014.

<sup>124</sup> World Resources Institute (WRI), *Water-Energy Nexus: Business Risks and Rewards*, Washington, DC, 2016.



allocation planning horizons relative to many other sectors—horizons that may be particularly affected by climate-related risks and opportunities. This requires careful assessment of climate-related risks and opportunities to inform decisions about future sustainability and profitability.

Transparent and decision-useful climate-related disclosures are crucial to fully understand the impact of climate change on business strategy and financial plans in energy activities. Consequently, disclosures should focus on qualitative and quantitative assessments and potential impacts of the following:

- changes in compliance and operating costs, risks, or opportunities (e.g., older, less-efficient facilities or un-exploitable fossil fuel reserves in the ground);
- exposure to regulatory changes or changing consumer and investor expectations (e.g., expansion of renewable energy in the mix of energy supply); and
- changes in investment strategies (e.g., opportunities for increased investment in renewable energy, carbon-capture technologies, and more efficient water usage).

Energy Group organizations should consider providing additional industry-specific metrics.<sup>125</sup> Examples of potential metrics include percent of water withdrawn in regions with high baseline water stress and amount of gross global Scope 1 emissions from (1) combustion, (2) flared hydrocarbons, (3) process emissions, (4) directly vented releases, and (5) fugitive emissions/leaks.

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<sup>125</sup> For more sector-specific information, see SASB, “[Climate Risk Technical Bulletin](#),” April 12, 2021, WBCSD, “[TCFD Oil and Gas Preparer Forum](#),” July 18 2018, and WBCSD, “[TCFD Electric Utilities Preparer Forum](#),” July 16, 2019.

## 2. Transportation Group

The Transportation Group includes, but is not limited to, industries listed in [Figure 10](#).

Transportation is critical to the economy and drives a significant portion of emissions and demand for energy through the production and, more important, the use phase. The industry is under increasing policy and regulatory pressure to achieve emissions targets for the use phase. Increasing constraints on emissions fuel efficiency will continue to impact costs in this group, particularly around investments in innovation (new technologies and efficiencies).<sup>126</sup>

The Transportation Group, therefore, will likely face financial challenges from two major drivers. First, policymakers are setting stricter targets for emissions and fuel efficiency from transportation carriers. Second, new technology around low-emission/fuel-efficient carriers (e.g., electric cars) is creating a shift in the competitive and investment landscape. New technological innovations and new market entrants can weaken companies' market position, resulting in lower revenues, higher costs, and narrower margins. The effects of these two drivers may be compounded by the length of product cycles for transportation products, such as cars and trucks, and especially for air and rail and marine equipment. As with the Energy Group, investments in long-lived assets (e.g., manufacturing facilities, airplanes, ships) and longer planning horizons are relevant factors that must be taken into account when considering the climate-related risks and opportunities.

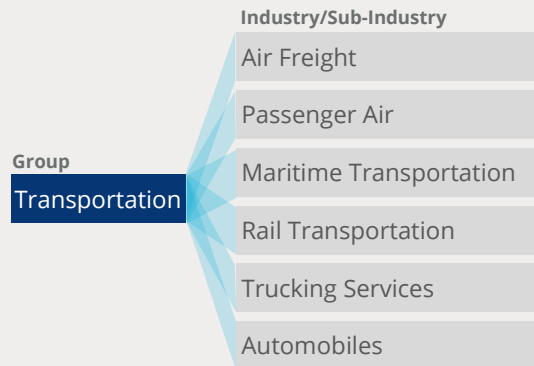
Consequently, disclosures should focus on qualitative and quantitative assessments and potential impacts of the following:

- financial risks around current plant and equipment, such as potential early write-offs of equipment and R&D investments or early phasing out of current products due to policy constraints or shifts or the emergence of new technology;
- investments in research and development of new technologies and potential shifts in demand for various types of transportation carriers; and
- opportunities to use new technologies to address lower-emissions standards and increased fuel-efficiency requirements, including transport vehicles (cars, ships, planes, rail) that run on a range of traditional and alternative fuels.

Transportation Group organizations should consider providing additional industry-specific metrics.<sup>127</sup> Examples of potential metrics include sales weighted average fleet fuel economy by region and weight/number of people transported, Energy Efficiency Design Index (EEDI) for new ships, life cycle reporting of GHG emissions of transportation products (air, ship, rail, truck, auto).

Figure 10

### Transportation Group



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<sup>126</sup> Moody's Global Credit Research, "Moody's: Auto sector faces rising credit risks due to carbon transition," September 20, 2016.

<sup>127</sup> For more sector-specific information, see SASB, "Climate Risk Technical Bulletin," April 12, 2021 and WBCSD, "TCFD Auto Preparer Forum," May 26, 2021.

### 3. Materials and Buildings Group

The Materials and Buildings Group includes, but is not limited to, industries listed in [Figure 11](#).

Materials and Buildings Group organizations are typically capital intensive, require high investments in plants, equipment, and buildings that are (relatively) fixed in terms of location, and dependent on sources of raw and refined materials. This may reduce the flexibility of organizations in this group to adapt to risks of climate change.

Many of this group's activities result in financial exposures around high GHG emissions and high energy consumption. Furthermore, a number of industries in this group are dependent on water availability and/or vulnerable to the effects of acute or chronic physical risks from weather events.

Since the group is capital intensive and the plants and facilities have a long life span, accelerated R&DDD (research, development, demonstration, and deployment) is critically important. Thus, disclosures relating to R&DDD plans and progress are valuable to see the current and future situation and risks of organizations in the group.

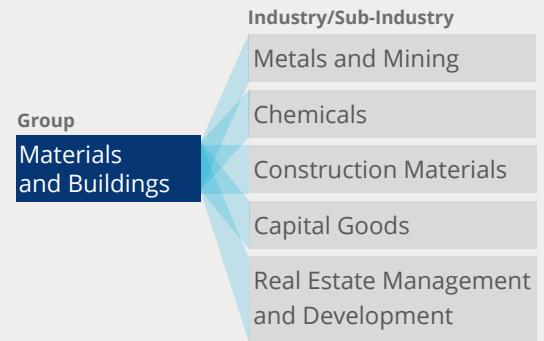
Consequently, disclosures should focus on qualitative and quantitative assessments and potential impacts of the following:

- Stricter constraints on emissions and/or pricing carbon emissions and related impact on costs.
- The construction materials and real estate sectors should assess risks related to the increasing frequency and severity of acute weather events or increasing water scarcity that impact their operating environment.
- Opportunities for products (or services) that improve efficiency, reduce energy use, and support closed-loop product solutions.

Materials and Buildings Group organizations should consider providing additional industry-specific metrics.<sup>128</sup> Examples of potential metrics include building energy intensity by area, building water intensity (by occupants or square area), percent of fresh water withdrawn in regions with high or extremely high baseline water stress, and area of buildings, plants, or properties located in designated flood hazard areas.

Figure 11

#### Materials and Buildings Group



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<sup>128</sup> For more sector-specific information, see SASB, "Climate Risk Technical Bulletin," April 12, 2021 and WBCSD, "Construction and Building Materials TCFD Preparer Forum," July 1, 2020.

## 4. Agriculture, Food, and Forest Products Group

The Agriculture, Food, and Forest Products Group includes, but is not limited to, industries listed in Figure 12.

Climate-related risks and opportunities in this group largely emanate from GHG emissions and water and waste management driven by land use, production practices, and changing land-use patterns.<sup>129</sup>

The absolute and relative impacts of climate-related transition and physical risks will vary between producers and processors of food and fiber.

Producers, such as agriculture and forestry enterprises, will likely be impacted financially to a somewhat greater degree by GHG and water risks (including extreme weather events and shifts in precipitation patterns) than processors. Agriculture and forest producers generate significant non-point GHG emissions, primarily through land-use practices and changes to them (e.g., grazing, soil tillage practices, conservation practices, feedlot practices, deforestation, or afforestation).<sup>130</sup>

Processors, such as food, beverage, and fiber processors (e.g., paper), will likely be impacted relatively less by direct GHG emissions (Scope 1), but more by indirect GHG emissions (Scope 3) arising from their supply and distribution chains. Processors will also have a similar emphasis on water and waste risks and opportunities as compared with producers. Beverage production and paper production, for example, depend on access to significant water resources and, in the case of beverage production, high-quality water resources. Risks and opportunities around waste include residual materials such as paper and wood waste, wastewater, and post-processing animal byproducts.

Assessing the impacts of climate-related risks and opportunities for the Agriculture, Food, and Forest Products Group involves a number of interactions and trade-offs among the climate-related aspects of land use, water, waste, carbon sequestration, biodiversity, and conservation, complicated by short-run competing goals around food security (e.g., maintaining production sufficient to meet the rising demand for food, fiber, fodder, and biofuels).

Policies and regulations around land use and conservation requirements, for example, may constrain or preclude certain uses of land and water resources (e.g., deforestation, riparian rights, tillable land). Such policies may lead to significant asset impairment if forest or agricultural lands cannot be used to produce food or fiber.

Opportunities in the Agriculture, Food, and Forest Products Group largely fall into three categories:

- Increasing efficiency by lowering the level of carbon and water intensity per unit of output (e.g., through drought-resistant hybrids, nutrient-efficient genetically modified organisms (GMOs), feed and feed practices that reduce livestock methane emissions).



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<sup>129</sup> According to the Intergovernmental Panel on Climate Change (IPCC), agriculture and forestry is responsible for “just under a quarter of anthropogenic GHG emissions mainly from deforestation and agricultural emissions from livestock, soil, and nutrient management. Anthropogenic forest degradation and biomass burning (forest fires and agricultural burning) also represent relevant contributions.” (IPCC. “Agriculture, Forestry and Other Land Use (AFOLU),” In: *Climate Change 2014: Mitigation of Climate Change*, 2014. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change). Agriculture is also a heavy user of water, primarily for irrigation.

<sup>130</sup> For more information, see definitions of *land use change* and *indirect land use change* on page 1,265 of the IPCC’s *Climate Change 2014: Mitigation of Climate Change*.

- Reducing inputs and residual waste for a given level of output (e.g., nutrient management practices, tillage practices, conservation practices, biofuels, food waste reduction).
- Developing new products and services with lower carbon and water intensity (e.g., bioplastics).

Disclosures, therefore, should focus on qualitative and quantitative information related to both the group’s policy and market risks in the areas of GHG emissions and water, and its opportunities around carbon sequestration, increasing food and fiber production, and reducing waste, including:

- Efforts to reduce GHG emissions and water intensity, including such non-point GHG sources as crop nutrient processes, livestock management processes, erosion, tillage practices, watershed practices, and forest management.
- Efforts to improve sustainability through better recycling of outputs and residual waste (e.g., wood products, food waste, and animal byproducts).
- Climate-related impacts on food and fiber production (e.g., extreme weather or water events).
- Opportunities that capture shifts in business and consumer trends toward food and fiber products, processes and services that produce lower emissions and are less water-/waste-intensive while maintaining adequate food security (e.g., bioplastics, GMOs, new uses for wood/animal byproducts).

Agriculture, Food, and Forest Product Group organizations should consider providing additional industry-specific metrics.<sup>131</sup> Examples of potential metrics include total water withdrawn and total water consumed, percent of water withdrawn and consumed in regions with high or extremely high baseline water stress, emissions from biological processes, changes in carbon stocks as a result of land use, and land use changes.

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<sup>131</sup> For more sector-specific information, see SASB, “[Climate Risk Technical Bulletin](#),” April 12, 2021 and WBCSD, “[Food, Agriculture and Forest Products TCFD Preparer Forum](#),” April 9, 2020.

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## F. Fundamental Principles for Effective Disclosure

To underpin its recommendations and help guide current and future developments in climate-related financial reporting, the Task Force developed a set of principles for effective disclosure.<sup>132</sup> As understanding of, and approaches to, climate-related issues evolve over time, so too will climate-related financial reporting. These principles can help achieve high-quality and decision-useful disclosures that enable users to understand the impact of climate change on organizations. The Task Force encourages organizations adopting its recommendations to consider these principles as they develop climate-related financial disclosures.

The Task Force's disclosure principles are largely consistent with other mainstream, internationally accepted frameworks for financial reporting and are generally applicable to most providers of financial disclosures. They are informed by the qualitative and quantitative characteristics of financial information and further the overall goals of producing disclosures that are consistent, comparable, reliable, clear, and efficient, as highlighted by the FSB in establishing the Task Force. The principles, taken together, are designed to assist organizations in making clear the linkages and connections between climate-related issues and their governance, strategy, risk management, and metrics and targets.

### Principle 1: Disclosures should present relevant information

The organization should provide information specific to the potential impact of climate-related risks and opportunities on its markets, businesses, corporate or investment strategy, financial statements, and future cash flows.

- Disclosures should be eliminated if they are immaterial or redundant to avoid obscuring relevant information. However, when a particular risk or issue attracts investor and market interest or attention, it may be helpful for the organization to include a statement that the risk or issue is not significant. This shows that the risk or issue has been considered and has not been overlooked.
- Disclosures should be presented in sufficient detail to enable users to assess the organization's exposure and approach to addressing climate-related issues, while understanding that the type of information, the way in which it is presented, and the accompanying notes will differ between organizations and will be subject to change over time.
- Climate-related impacts can occur over the short, medium, and long term. Organizations can experience chronic, gradual impacts (such as impacts due to shifting temperature patterns), as well as acute, abrupt disruptive impacts (such as impacts from flooding, drought, or sudden regulatory actions). An organization should provide information from the perspective of the potential impact of climate-related issues on value creation, taking into account and addressing the different time frames and types of impacts.
- Organizations should avoid generic or boilerplate disclosures that do not add value to users' understanding of issues. Furthermore, any proposed metrics should adequately describe or serve as a proxy for risk or performance and reflect how an organization manages the risk and opportunities.

### Principle 2: Disclosures should be specific and complete

- An organization's reporting should provide a thorough overview of its exposure to potential climate-related impacts; the potential nature and size of such impacts; the organization's governance, strategy, processes for managing climate-related risks, and performance with respect to managing climate-related risks and opportunities.

<sup>132</sup> These principles are adapted from those included in the Enhanced Disclosure Task Force's "Enhancing the Risk Disclosures of Banks."

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- To be sufficiently comprehensive, disclosures should contain historical and future-oriented information in order to allow users to evaluate their previous expectations relative to actual performance and assess possible future financial implications.
- For quantitative information, the disclosure should include an explanation of the definition and scope applied. For future-oriented data, this includes clarification of the key assumptions used. Forward-looking quantitative disclosure should align with data used by the organization for investment decision-making and risk management.
- Any scenario analyses should be based on data or other information used by the organization for investment decision-making and risk management. Where appropriate, the organization should also demonstrate the effect on selected risk metrics or exposures to changes in the key underlying methodologies and assumptions, both in qualitative and quantitative terms.

### **Principle 3: Disclosures should be clear, balanced, and understandable**

- Disclosures should be written with the objective of communicating financial information that serves the needs of a range of financial sector users (e.g., investors, lenders, insurers, analysts). This requires reporting at a level beyond compliance with minimum requirements. The disclosures should be sufficiently granular to inform sophisticated users, but should also provide concise information for those who are less specialized. Clear communication will allow users to identify key information efficiently.
- Disclosures should show an appropriate balance between qualitative and quantitative information and use text, numbers, and graphical presentations as appropriate.
- Fair and balanced narrative explanations should provide insight into the meaning of quantitative disclosures, including the changes or developments they portray over time. Furthermore, balanced narrative explanations require that risks as well as opportunities be portrayed in a manner that is free from bias.
- Disclosures should provide straightforward explanations of issues. Terms used in the disclosures should be explained or defined for a proper understanding by the users.

### **Principle 4: Disclosures should be consistent over time**

- Disclosures should be consistent over time to enable users to understand the development and/or evolution of the impact of climate-related issues on the organization's business. Disclosures should be presented using consistent formats, language, and metrics from period to period to allow for inter-period comparisons. Presenting comparative information is preferred; however, in some situations it may be preferable to include a new disclosure even if comparative information cannot be prepared or restated.
- Changes in disclosures and related approaches or formats (e.g., due to shifting climate-related issues and evolution of risk practices, governance, measurement methodologies, or accounting practices) can be expected due to the relative immaturity of climate-related disclosures. Any such changes should be explained.

### **Principle 5: Disclosures should be comparable among organizations within a sector, industry, or portfolio**

- Disclosures should allow for meaningful comparisons of strategy, business activities, risks, and performance across organizations and within sectors and jurisdictions.
- The level of detail provided in disclosures should enable comparison and benchmarking of risks across sectors and at the portfolio level, where appropriate.
- The placement of reporting would ideally be consistent across organizations—i.e., in financial filings—in order to facilitate easy access to the relevant information.

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## Principle 6: Disclosures should be reliable, verifiable, and objective

- Disclosures should provide high-quality reliable information. They should be accurate and neutral—i.e., free from bias.
- Future-oriented disclosures will inherently involve the organization’s judgment (which should be adequately explained). To the extent possible, disclosures should be based on objective data and use best-in-class measurement methodologies, which would include common industry practice as it evolves.
- Disclosures should be defined, collected, recorded, and analyzed in such a way that the information reported is verifiable to ensure it is high quality. For future-oriented information, this means assumptions used can be traced back to their sources. This does not imply a requirement for independent external assurance; however, disclosures should be subject to internal governance processes that are the same or substantially similar to those used for financial reporting.

## Principle 7: Disclosures should be provided on a timely basis

- Information should be delivered to users or updated in a timely manner using appropriate media on, at least, an annual basis within the mainstream financial report.
- Climate-related risks can result in disruptive events. In case of such events with a material financial impact, the organization should provide a timely update of climate-related disclosures as appropriate.

Reporters may encounter tension in the application of the fundamental principles set out above. For example, an organization may update a methodology to meet the comparability principle, which could then result in a conflict with the principle of consistency. Tension can also arise within a single principle. For example, Principle 6 states that disclosures should be verifiable, but assumptions made about future-oriented disclosures often require significant judgment by management that is difficult to verify. Such tensions are inevitable given the wide-ranging and sometimes competing needs of users and preparers of disclosures. Organizations should aim to find an appropriate balance of disclosures that reasonably satisfy the recommendations and principles while avoiding overwhelming users with unnecessary information.

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# Appendices

## Appendix 1: Climate-Related Risks, Opportunities, and Financial Impacts

The central objective of the Task Force’s recommendations is to encourage organizations to evaluate and disclose, as part of their financial filing preparation and reporting processes, the material climate-related risks and opportunities that are most pertinent to their business activities.

The Task Force divided climate-related risks into two major categories: (1) risks related to the transition to a low-carbon economy and (2) risks related to the physical impacts of climate change. The Task Force identified certain subcategories under each of these categories.

Transition Risks	Physical Risks
<ul style="list-style-type: none"> <li>– Policy and Legal</li> <li>– Technology</li> <li>– Market</li> <li>– Reputation</li> </ul>	<ul style="list-style-type: none"> <li>– Acute</li> <li>– Chronic</li> </ul>

The Task Force divided climate-related opportunities into five major categories related to resource efficiency and cost savings, the adoption of low-emission energy sources, the development of new products and services, access to new markets, and building resilience along the supply chain.

Opportunities	
<ul style="list-style-type: none"> <li>– Resource Efficiency</li> <li>– Energy Source</li> <li>– Products and Services</li> </ul>	<ul style="list-style-type: none"> <li>– Markets</li> <li>– Resilience</li> </ul>

Tables A1.1 and A1.2 (pp. 75–76) provide examples and potential financial impacts related to the specific categories of climate-related risks and opportunities the Task Force identified. Please note that the sub-category risks and examples described under each major category are not mutually exclusive, and some overlap exists.

Table A1.3 (p. 77) provides additional examples of how organizations could be affected by climate-related financial impacts.

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Table A1.1

## Examples of Climate-Related Risks and Potential Financial Impacts

Type	Climate-Related Risks <sup>133</sup>	Potential Financial Impacts	
A. Introduction  B. Recommendations  C. Guidance for All Sectors  D. Supplemental Guidance for the Financial Sector  E. Supplemental Guidance for Non-Financial Groups  F. Fundamental Principles for Effective Disclosure  Appendices	Transition Risks	<b>Policy and Legal</b> <ul style="list-style-type: none"> <li>– Increased pricing of GHG emissions</li> <li>– Enhanced emissions-reporting obligations</li> <li>– Mandates on and regulation of existing products and services</li> <li>– Exposure to litigation</li> </ul>	<ul style="list-style-type: none"> <li>– Increased operating costs (e.g., higher compliance costs, increased insurance premiums)</li> <li>– Write-offs, asset impairment, and early retirement of existing assets due to policy changes</li> <li>– Increased costs and/or reduced demand for products and services resulting from fines and judgments</li> </ul>
		<b>Technology</b> <ul style="list-style-type: none"> <li>– Substitution of existing products and services with lower emissions options</li> <li>– Unsuccessful investment in new technologies</li> <li>– Costs to transition to lower emissions technology</li> </ul>	<ul style="list-style-type: none"> <li>– Write-offs and early retirement of existing assets</li> <li>– Reduced demand for products and services</li> <li>– Research and development (R&amp;D) expenditures in new and alternative technologies</li> <li>– Capital investments in technology development</li> <li>– Costs to adopt/deploy new practices and processes</li> </ul>
		<b>Market</b> <ul style="list-style-type: none"> <li>– Changing customer behavior</li> <li>– Uncertainty in market signals</li> <li>– Increased cost of raw materials</li> </ul>	<ul style="list-style-type: none"> <li>– Reduced demand for goods and services due to shift in consumer preferences</li> <li>– Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g., waste treatment)</li> <li>– Abrupt and unexpected shifts in energy costs</li> <li>– Change in revenue mix and sources, resulting in decreased revenues</li> <li>– Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations)</li> </ul>
		<b>Reputation</b> <ul style="list-style-type: none"> <li>– Shifts in consumer preferences</li> <li>– Stigmatization of sector</li> <li>– Increased stakeholder concern or negative stakeholder feedback</li> </ul>	<ul style="list-style-type: none"> <li>– Reduced revenue from decreased demand for goods/services</li> <li>– Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions)</li> <li>– Reduced revenue from negative impacts on workforce management and planning (e.g., employee attraction and retention)</li> <li>– Reduction in capital availability</li> </ul>
		<b>Acute</b> <ul style="list-style-type: none"> <li>– Increased severity of extreme weather events such as cyclones and floods</li> </ul>	<ul style="list-style-type: none"> <li>– Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)</li> <li>– Reduced revenue and higher costs from negative impacts on workforce (e.g., health, safety, absenteeism)</li> </ul>
		<b>Chronic</b> <ul style="list-style-type: none"> <li>– Changes in precipitation patterns and extreme variability in weather patterns</li> <li>– Rising mean temperatures</li> <li>– Rising sea levels</li> </ul>	<ul style="list-style-type: none"> <li>– Write-offs and early retirement of existing assets (e.g., damage to property and assets in “high-risk” locations)</li> <li>– Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants)</li> <li>– Increased capital costs (e.g., damage to facilities)</li> <li>– Reduced revenues from lower sales/output</li> <li>– Increased insurance premiums and potential for reduced availability of insurance on assets in “high-risk” locations</li> </ul>

<sup>133</sup> The sub-category risks described under each major category are not mutually exclusive, and some overlap exists.

Table A1.2

## Examples of Climate-Related Opportunities and Potential Financial Impacts

Type	Climate-Related Opportunities <sup>134</sup>	Potential Financial Impacts	
A. Introduction  B. Recommendations  C. Guidance for All Sectors  D. Supplemental Guidance for the Financial Sector  E. Supplemental Guidance for Non-Financial Groups  F. Fundamental Principles for Effective Disclosure  Appendices	<b>Resource Efficiency</b>	<ul style="list-style-type: none"> <li>– Use of more efficient modes of transport</li> <li>– Use of more efficient production and distribution processes</li> <li>– Use of recycling</li> <li>– Move to more efficient buildings</li> <li>– Reduced water usage and consumption</li> </ul>	<ul style="list-style-type: none"> <li>– Reduced operating costs (e.g., through efficiency gains and cost reductions)</li> <li>– Increased production capacity, resulting in increased revenues</li> <li>– Increased value of fixed assets (e.g., highly rated energy-efficient buildings)</li> <li>– Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs</li> </ul>
	<b>Energy Source</b>	<ul style="list-style-type: none"> <li>– Use of lower-emission sources of energy</li> <li>– Use of supportive policy incentives</li> <li>– Use of new technologies</li> <li>– Participation in carbon market</li> <li>– Shift toward decentralized energy generation</li> </ul>	<ul style="list-style-type: none"> <li>– Reduced operational costs (e.g., through use of lowest cost abatement)</li> <li>– Reduced exposure to future fossil fuel price increases</li> <li>– Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon</li> <li>– Returns on investment in low-emission technology</li> <li>– Increased capital availability (e.g., as more investors favor lower-emissions producers)</li> <li>– Reputational benefits resulting in increased demand for goods/services</li> </ul>
	<b>Products and Services</b>	<ul style="list-style-type: none"> <li>– Development and/or expansion of low emission goods and services</li> <li>– Development of climate adaptation and insurance risk solutions</li> <li>– Development of new products or services through R&amp;D and innovation</li> <li>– Ability to diversify business activities</li> <li>– Shift in consumer preferences</li> </ul>	<ul style="list-style-type: none"> <li>– Increased revenue through demand for lower emissions products and services</li> <li>– Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services)</li> <li>– Better competitive position to reflect shifting consumer preferences, resulting in increased revenues</li> </ul>
	<b>Markets</b>	<ul style="list-style-type: none"> <li>– Access to new markets</li> <li>– Use of public-sector incentives</li> <li>– Access to new assets and locations needing insurance coverage</li> </ul>	<ul style="list-style-type: none"> <li>– Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks)</li> <li>– Increased diversification of financial assets (e.g., green bonds and infrastructure)</li> </ul>
	<b>Resilience</b>	<ul style="list-style-type: none"> <li>– Participation in renewable energy programs and adoption of energy-efficiency measures</li> <li>– Resource substitutes/diversification</li> </ul>	<ul style="list-style-type: none"> <li>– Increased market valuation through resilience planning (e.g., infrastructure, land, buildings)</li> <li>– Increased reliability of supply chain and ability to operate under various conditions</li> <li>– Increased revenue through new products and services related to ensuring resiliency</li> </ul>

<sup>134</sup> The opportunity categories are not mutually exclusive, and some overlap exists.

Table A1.3

## Examples of Potential Climate-Related Impacts by Financial Category

Category and Definition	Climate-Related Implications <sup>135</sup>	Examples of Potential Impacts	Rationale and Illustrative Metrics
<b>Revenue</b> Income from normal business activities, usually from the sale of goods and services	<p>Changing market demand for product and services due to climate-related risks/opportunities, such as a shift in customer preferences.</p> <p>Sensitivity of existing revenue streams, products, and services to constraints on, or perceptions of, carbon intensity, emissions, water intensity, land use.</p> <p>Development of new revenue streams, products, and services in response to climate-related opportunities.</p>	<p>- Revenue from operational disruption</p> <p>+/- Revenue from changing sales of products/services</p>	<p>Drivers of climate change, such as water usage, emissions, and land use, are expected to be the focus of regulations (e.g., standards, emission limits, carbon prices), technology development, and market changes. These policy, market, and technology changes may result in a significant shift in an organization's future earning capacity depending on the emissions, energy, and water intensity of its products and services relative to constraints and demands.</p> <p>Example Metrics:</p> <ul style="list-style-type: none"> <li>• Percentage of revenue by product or service line</li> <li>• Energy, emissions, water intensity of each product or service line</li> </ul>
<b>Expenditures: OpEx</b> Ongoing cost of running a company	<p>Required or discretionary increases in operating expenditures to address climate-related risk mitigation, adaptation, regulatory requirements, or cost of supply/materials.</p> <p>Decreases in expenses as a result of increased energy or water efficiency in response to climate-related risks.</p>	<p>+ R&amp;D in new technology, products, services</p> <p>+/- Purchased energy and water and other costs of supply/materials</p> <p>+ Increased production costs due to changing output requirements (e.g., waste treatment, emissions controls)</p> <p>+ Costs to improve energy or water conservation and efficiency capabilities</p> <p>+ Expenses to address physical risks (e.g., insurance premiums, recovery expenses)</p>	<p>Drivers of climate change, such as water usage, emissions, and land use, are expected to be the focus of regulations (e.g., standards, emission limits, carbon prices), technology development, and market changes. These policy, market, and technology changes may result in a significant shift in an organization's cost of supply and operating expenses depending on the emissions, energy, and water intensity and land use of an organization in its business activities.</p> <p>Example Metric: Percentage of R&amp;D expenditures for low-carbon alternatives and energy/water efficiencies</p>
<b>Assets: CapEx</b> An expense where the benefit continues over a long period; non-recurring nature; results in acquisition of permanent assets	<p>Required or discretionary increases in capital expenditures to address climate-related risk mitigation, adaptation, or regulatory requirements.</p>	<p>+ CapEx in equipment or new technologies to manage transition risk, adaptation, and conservation/efficiency efforts</p> <p>+ CapEx for physical risk mitigation (e.g., facilities location/hardening, resiliency capabilities)</p> <p>+/- Investment hurdles affected by internal and external carbon prices</p>	<p>Drivers of climate change, such as water usage, emissions, and land use, are expected to be the focus of regulations (e.g., standards, emission limits, carbon prices), technology development, and market changes. These policy, market, and technology changes may result in a significant shift in an organization's planned capital expenditures, including acquisition or disposal of assets, investments in land and facilities, acquisition of new technology, and other shifts, depending on how the organization responds to identified climate-related issues.</p> <p>Example Metrics:</p> <ul style="list-style-type: none"> <li>• Percentage of CapEx allocated to low-carbon/renewable assets, deployment of low-carbon technology, efficiency of facilities</li> <li>• Internal/external carbon price and discount rate used to establish investment hurdle rates</li> </ul>

<sup>135</sup> The information contained in this table is not intended to reflect accounting treatments, but rather seeks to lay out a general understanding of how climate-related risks might affect general financial categories. Importantly, there are a number of relationships among some of the financial implications illustrated in the table. For example, legal liabilities for climate change (a contingent liability) may be realized as an expense if a judgment is rendered. Similarly, expenses on mitigation and adaptation efforts may result in future cost savings (expense reductions).

Table A1.3

## Examples of Potential Climate-Related Impacts by Financial Category *(continued)*

Category and Definition	Climate-Related Implications <sup>56</sup>	Examples of Potential Impacts	Rationale and Illustrative Metrics
<b>Assets: Tangible</b> Land, equipment, facilities, reserves, cash, etc.	Changes in the value of an organization's assets, or the acquisition or sale of assets, as a result of climate-related risks and opportunities.	+/- Value of assets based on emissions, energy or water intensity; carbon price; demand  - Write-offs/early retirement of existing assets due to high emissions, energy, or water intensity  - Physical damage or impairment of assets due to weather events and other acute or chronic physical climate effects	Climate change, especially the transition to a low-carbon economy, may affect the value of an organization's assets (either positively or negatively) depending on how the organization is positioned regarding emissions, energy, water, and land use.  Example Metrics: <ul style="list-style-type: none"> <li>• Value, and percent by value, of assets located in coastal or flood zones</li> <li>• Breakdown of assets by associated current or potential future emissions (MT CO<sub>2</sub>e), water intensity, or energy intensity</li> </ul>
<b>Assets: Intangible</b> Brand, copyrights, goodwill	Changes in an organization's reputation as a result of perceptions about its management of climate-related risks and opportunities.	+/- Brand value  +/- Value of copyrights  - Reduction or disruption in production capacity (e.g., shutdowns, delayed planning approvals, interruptions to supply chain)  - Impacts on workforce management (e.g., employee attraction and retention)	How an organization plans and invests in a transition to a low-carbon economy may positively or negatively affect perceptions about the organization and its reputation, which in turn may affect its future earning capacity, market valuation, employee relationships, and relationships with regulators and customers. Climate-related risks and opportunities also may positively or negatively affect the value of technology patents or copyrights.
<b>Liabilities</b> Contingent liabilities <sup>136</sup>	The potential for liability or civil/criminal penalties for the organization's climate-related activities.	+ Legal liability for climate-related risks  + Compliance penalties	As laws, regulations, and case law related to an organization's preparedness for climate change evolves, the incident or probability of contingent liabilities arising for an organization may increase.  Example Metric: Amount reserved for pending legal actions
<b>Liabilities</b> Current liabilities (<= 1 year)	Changes in cost and level of current liabilities as a result of climate-related risks and opportunities.		Drivers of climate changes, such as water usage, emissions, and land use, are expected to be the focus of regulations (e.g., standards, emission limits, carbon prices), technology development, and market changes. These policy, market and technology changes may result in a significant shift in an organization's revenues, cost of supply/materials/production, and capital expenses. An organization's demonstrated ability to manage these changes (positively or poorly) may affect:
<b>Financing</b> Long-term debt liabilities (> 1 year)	Changes in cost and level of long-term debt as a result of climate-related risks and opportunities.	+/- Amount of debt  +/- Amount of equity capital  +/- Credit rating	
<b>Financing</b> Equity capital	Changes in the cost and level of equity capital as a result of climate-related risks and opportunities.	+/- Stock price  +/- Debt interest rates	<ul style="list-style-type: none"> <li>• Access to capital and debt markets</li> <li>• Equity price and risk premium on debt</li> <li>• Creditworthiness</li> <li>• Exposure to divestment risk</li> <li>• Ability/flexibility in responding to climate-related risks and opportunities by being able to competitively tap financing markets</li> </ul>

<sup>136</sup> Contingent liabilities are liabilities that may be incurred depending on the outcome of an uncertain future event. Likelihood of loss is often described as probable, reasonably possible, or remote; ability to estimate loss is described as known, reasonably estimable, or not reasonably estimable.

## Appendix 2: Cross-Industry, Climate-Related Metric Categories

As part of the Task Force’s work to monitor and promote organizations’ adoption of its recommendations, it has periodically published guidance to support preparers in their implementation efforts (see [Section A.5. Summary of Additional Supporting Materials](#)). In October 2021, the Task Force published [Guidance on Metrics, Targets, and Transition Plans](#), which includes seven metric categories ([Table A2.1](#)) the Task Force believes are generally applicable to all organizations.<sup>137</sup> Importantly, the seven metric categories are not additions to the Metrics and Targets recommendation as they relate to metrics that have been part of the Task Force’s guidance for all sectors since the release of its 2017 report.

The Task Force is highlighting these specific metric categories because they are important proxies for measuring climate-related risks and opportunities, form the basis for estimating climate-related financial impact, and are important inputs into investment, lending, and insurance underwriting decisions. While these metric categories are relevant across organizations, they may be operationalized differently to reflect industry-specific risks and opportunities. More information regarding the cross-industry, climate-related metric categories can be found in the [Guidance on Metrics, Targets, and Transition Plans](#).

While some organizations already disclose metrics consistent with the cross-industry, climate-related metric categories, the Task Force recognizes others—especially those in the early stages of disclosing climate-related financial information—may need time to adjust internal processes before disclosing such information. In addition, some of the metric categories may be less applicable to certain organizations. For example, data and methodologies for certain metrics for asset owners (e.g., impact of climate change on investment income) are in early stages of development. In such cases, the Task Force recognizes organizations will need time before such metrics are disclosed to their stakeholders.

Table A2.1

### Cross-Industry, Climate-Related Metric Categories

Metric Category	Example Unit of Measure <sup>138</sup>	Rationale for Inclusion
<b>GHG Emissions</b> Absolute Scope 1, Scope 2, and Scope 3; emissions intensity <sup>139</sup>	MT of CO <sub>2</sub> e	Disclosure of GHG emissions is crucial for users to understand an organization’s exposure to climate-related risks and opportunities. Disclosure of both absolute emissions across an organization’s value chain and relevant emissions intensity provides insight into how a given organization may be affected by policy, regulatory, market, and technology responses to limit climate change.
<b>Transition Risks</b> Amount and extent of assets or business activities vulnerable to transition risks*	Amount or percentage	Disclosure of the amount and extent of an organization’s assets or business activities vulnerable to climate-related transition risks allows users to better understand potential financial exposure regarding such issues as possible impairment or stranding of assets, effects on the value of assets and liabilities, and changes in demand for products or services.

<sup>137</sup> TCFD, [Guidance on Metrics, Targets, and Transition Plans](#), October 14, 2021.

<sup>138</sup> The Task Force has noted the most common unit of measure. There are multiple ways to measure and disclose metrics, and different jurisdictions or industries may follow different practices. Allowing for differences in units of measure can help provide organizations with flexibility without significantly impacting comparability as long as units are clearly stated.

<sup>139</sup> The Task Force believes Scope 3 GHG emissions are an important metric reflecting an organization’s exposure to climate-related risks and opportunities and recognizes the data and methodological challenges associated with calculating such emissions. The Task Force encourages organizations to refer to the GHG Protocol’s [The Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#) for guidance on reporting these emissions.

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Table A2.1

**Cross-Industry, Climate-Related Metric Categories** *(continued)*

Metric Category	Example Unit of Measure <sup>140</sup>	Rationale for Inclusion
<b>Physical Risks</b> Amount and extent of assets or business activities vulnerable to physical risks*	Amount or percentage	Disclosure of the amount or extent of an organization's assets or business activities vulnerable to material climate-related physical risks allows users to better understand potential financial exposure regarding such issues as impairment or stranding of assets, effects on the value of assets and liabilities, and cost of business interruptions.
<b>Climate-Related Opportunities</b> Proportion of revenue, assets, or other business activities aligned with climate-related opportunities	Amount or percentage	Disclosure of the proportion of revenue, assets, or business activities aligned with climate-related opportunities provides insight into the position of organizations relative to their peers and allows users to understand likely transition pathways and potential changes in revenue and profitability over time.
<b>Capital Deployment</b> Amount of capital expenditure, financing, or investment deployed toward climate-related risks and opportunities	Reporting currency	Capital investment disclosure by non-financial organizations and financing by financial organizations gives an indication of the extent to which long-term enterprise value might be affected.
<b>Internal Carbon Prices</b> Price on each ton of GHG emissions used internally by an organization	Price in reporting currency, per MT of CO <sub>2</sub> e	Internal carbon prices provide users with an understanding of the reasonableness of an organization's risk and opportunity assessment and strategy resilience. The disclosure of internal carbon prices can help users identify which organizations have business models that are vulnerable to future policy responses to climate change and which are adapting their business models to ensure resilience to transition risks.
<b>Remuneration</b> Proportion of executive management remuneration linked to climate considerations**	Percentage, weighting, description, or amount in reporting currency	Remuneration policies are important incentives for achieving an organization's goals and objectives and may provide insight on an organization's governance, oversight, and accountability for managing climate-related issues.

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<sup>140</sup> The Task Force has noted the most common unit of measure. There are multiple ways to measure and disclose metrics, and different jurisdictions or industries may follow different practices. Allowing for differences in units of measure can help provide organizations with flexibility without significantly impacting comparability as long as units are clearly stated.

Table A2.1

## Cross-Industry, Climate-Related Metric Categories (*continued*)

Metric Category	Example Unit of Measure <sup>140</sup>	Rationale for Inclusion
		<p>Note: While some organizations already disclose metrics consistent with these categories, the Task Force recognizes others—especially those in the early stages of disclosing climate-related financial information—may need time to adjust internal processes before disclosing such information.<sup>141</sup> In addition, some of the metric categories may be less applicable to certain organizations. For example, data and methodologies for certain metrics for asset owners (e.g., impact of climate change on investment income) are in early stages of development. In such cases, the Task Force recognizes organizations will need time before such metrics are disclosed to their stakeholders.</p> <p>On the application of materiality, the Task Force believes all organizations should disclose absolute Scope 1 and Scope 2 GHG emissions independent of a materiality assessment. The disclosure of Scope 3 GHG emissions is subject to materiality; however, the Task Force encourages organizations to disclose such emissions. The other cross-industry, climate-related metric categories remain subject to materiality. Organizations should determine materiality for climate-related metrics consistent with how they determine the materiality of other information included in their financial filings.</p> <p><b>*Transition and Physical Risks:</b> Due to challenges related to portfolio aggregation and sourcing data from companies or third-party fund managers, financial organizations may find it more difficult to quantify exposure to climate-related risks. The Task Force suggests that financial organizations provide qualitative and quantitative information, when available.</p> <p><b>**Remuneration:</b> While the Task Force encourages quantitative disclosure, organizations may include descriptive language on remuneration policies and practices, such as how climate change issues are included in balanced scorecards for executive remuneration.</p>

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<sup>141</sup> Organizations may need time to evaluate and determine which metrics are relevant to disclose, identify and collect data and other information needed for the calculation of metrics, implement new or update existing processes to address or include relevant metrics, etc. The Task Force recognizes the amount of time needed to disclose certain metrics (e.g., physical risks) consistent with the categories identified in Table A2.1.

## Appendix 3: Glossary and Abbreviations

### Glossary

**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.”<sup>142</sup>

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

**CLIMATE-RELATED OPPORTUNITY** refers to the potential positive impacts related to climate change on an organization. Efforts to mitigate and adapt to climate change can produce opportunities for organizations, such as through resource efficiency and cost savings, the adoption and utilization of low-emission energy sources, the development of new products and services, and building resilience along the supply chain. Climate-related opportunities will vary depending on the region, market, and industry in which an organization operates.

**CLIMATE-RELATED RISK** refers to the potential negative impacts of climate change on an organization. Physical risks emanating from climate change can be event-driven (acute) such as increased severity of extreme weather events (e.g., cyclones, droughts, floods, and fires). They can also relate to longer-term shifts (chronic) in precipitation and temperature and increased variability in weather patterns (e.g., sea level rise). Climate-related risks can also be associated with the transition to a lower-carbon global economy, the most common of which relate to policy and legal actions, technology changes, market responses, and reputational considerations.

**ENTERPRISE VALUE INCLUDING CASH** refers to the sum of the market capitalization of ordinary shares at fiscal year-end, the market capitalization of preferred shares at fiscal year-end, and the book values of total debt and minorities’ interests. No deductions of cash or cash equivalents are made to avoid the possibility of negative enterprise values.<sup>143</sup>

**FINANCIAL FILINGS** refer to the annual reporting packages in which organizations 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.<sup>144</sup>

**FINANCIAL PERFORMANCE** refers to an organization’s 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 an organization’s consideration of how it will achieve and fund its objectives and strategic goals. The process of financial planning allows organizations 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, organizations often create “financial plans” that outline the specific actions, assets, and resources (including capital) necessary to achieve these objectives over a 1–5 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 3–5 year financial plan (e.g., investment, research and development, manufacturing, and markets).

<sup>142</sup> OECD, *G20/OECD Principles of Corporate Governance*, 2015.

<sup>143</sup> EU Technical Expert Group on Sustainable Finance, *Financing a Sustainable European Economy: Report on Benchmarks: Handbook of Climate Transition Benchmarks, Paris Aligned Benchmark, and Benchmarks’ ESG Disclosure*, 2019.

<sup>144</sup> Based on Climate Disclosure Standards Board, *CDSB Framework for Reporting Environmental and Climate Change Information*, December 2019.

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**FINANCIAL POSITION** refers to an organization's 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."<sup>145</sup> "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."<sup>146</sup>

#### **GREENHOUSE GAS (GHG) EMISSIONS SCOPE LEVELS**<sup>147</sup>

- **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.<sup>148</sup>

**INTERIM TARGET** refers to a short-term milestone between the organization's medium- or long-term target and current period.

**INTERNAL CARBON PRICE** refers to a monetary value on GHG emissions an organization uses internally to guide its decision-making process in relation to climate change impacts, risks, and opportunities.<sup>149</sup>

**MANAGEMENT** refers to those positions an organization views as executive or senior management positions and that are generally separate from the board.

**PUBLICLY AVAILABLE 2°C SCENARIO** refers to a 2°C scenario that is (1) used/referenced and issued by an independent body; (2) wherever possible, supported by publicly available datasets; (3) updated on a regular basis; and (4) linked to functional tools (e.g., visualizers, calculators, and mapping tools) that can be applied by organizations. 2°C scenarios that presently meet these criteria include IEA 2DS, IEA 450, Deep Decarbonization Pathways Project, and International Renewable Energy Agency.

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

**SCENARIO ANALYSIS** refers to 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.

<sup>145</sup> A. Cadbury, *Report of the Committee on the Financial Aspects of Corporate Governance*, 1992.

<sup>146</sup> OECD, *G20/OECD Principles of Corporate Governance*, 2015.

<sup>147</sup> World Resources Institute and World Business Council for Sustainable Development, *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)*, March 2004.

<sup>148</sup> IPCC, *Climate Change 2014 Mitigation of Climate Change*, 2014.

<sup>149</sup> Based on World Bank, "What is Carbon Pricing?," accessed September 20, 2021.

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**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 in which it operates.

**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.

**VALUE CHAIN** refers to the upstream and downstream life cycle of a product, process, or service, including material sourcing, production, consumption, and disposal/recycling. Upstream activities include operations that relate to the initial stages of producing a good or service (e.g., material sourcing, material processing, supplier activities). Downstream activities include operations that relate to processing the materials into a finished product and delivering it to the end user (e.g., transportation, distribution, and consumption).

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## Abbreviations

**CO<sub>2</sub>**—Carbon dioxide

**CO<sub>2</sub>e** —Carbon dioxide equivalent

**EEDI**—Energy Efficiency Design Index

**EVIC**—Enterprise Value Including Cash

**FSB**—Financial Stability Board

**G20**—Group of 20

**GHG**—Greenhouse gas

**GMO**—Genetically modified organism

**IEA**—International Energy Agency

**IPCC**—Intergovernmental Panel on Climate Change

**MT**—Metric ton

**PCAF**—Partnership for Carbon Accounting Financials

**R&D**—Research and development

**R&DDD**—Research, development, demonstration, and deployment

**SASB**—Sustainability Accounting Standards Board

**SBTi**—Science Based Targets initiative

**TCFD**—Task Force on Climate-related Financial Disclosures

**USDE**—U.S. Dollar Equivalent

**WACI**—Weighted Average Carbon Intensity

**WBCSD**—World Business Council for Sustainable Development

**WRI**—World Resources Institute

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