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

December 14, 2016

# Letter from Michael R. Bloomberg

December 14, 2016

Mr. Mark Carney  
Chairman  
Financial Stability Board  
Bank for International Settlements  
Centralbahnplatz 2  
CH-4002 Basel  
Switzerland

Dear Chairman Carney,

On behalf of the Task Force on Climate-related Financial Disclosures, I am pleased to present this report setting out our recommendations for helping businesses disclose climate-related financial risks and opportunities within the context of their existing disclosure requirements.

Warming of the planet caused by greenhouse gas emissions poses serious risks to the global economy and will have an impact across many economic sectors. But until now, it has been difficult for investors to know which companies are most vulnerable to climate change, which are best prepared, and which are taking action. As the FSB has highlighted, without effective disclosure of these risks, the financial impacts of climate change may not be correctly priced – and as the costs eventually become clearer, the potential for rapid adjustments could have destabilizing effects on markets.

The Task Force's recommendations aim to begin fixing this problem. What gets measured better gets managed better. Widespread adoption of the recommendations will help ensure that climate-related financial issues are routinely considered in business and investment decisions and encourage an effective dialogue between companies and banks, insurers and investors. That will lead to smarter, more efficient allocation of capital, and speed the transition to a low-carbon economy.

I want to thank the Financial Stability Board for its leadership in promoting better disclosure of climate-related financial risks, and for its support of the Task Force's work. I am also grateful to the Task Force members and Secretariat for their extensive contributions and dedication to this effort. We look forward to receiving feedback from our public consultation, which will help to improve the recommendations' effectiveness – and build a stronger, more sustainable global economy.

Sincerely,



Michael R. Bloomberg

## Executive Summary

### **Financial Markets and Transparency**

One of the essential functions of financial markets is to price risk to support informed, efficient capital-allocation decisions. Accurate and timely disclosure of current and past operating and financial results is fundamental to this function, but it is increasingly important to also understand the governance and risk management context in which financial results are achieved. The financial crisis of 2007-2008 was an important reminder of the repercussions that weak corporate governance and risk management practices can have on asset values. This has resulted in increased demand for transparency from organizations on their governance structures, strategies, and risk management practices. Without the right information, investors and others may incorrectly price or value assets, leading to a misallocation of capital.

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Increasing transparency makes markets more efficient  
and economies more stable and resilient.

—Michael R. Bloomberg

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### **Financial Implications of Climate Change**

One of the most significant, and perhaps most misunderstood, risks that organizations face today relates to climate change. While it is widely recognized that continued emission of greenhouse gases will cause further warming of the planet and this warming could lead to damaging economic and social consequences, the exact timing and severity of physical effects are difficult to estimate. The large-scale and long-term nature of the problem makes it uniquely challenging, especially in the context of economic decision making. Accordingly, many organizations incorrectly perceive the implications of climate change to be long term and, therefore, not necessarily relevant to decisions made today.

The potential impacts of climate change on organizations, however, are not only physical and do not manifest only in the long term. To stem the disastrous effects of climate change within this century, nearly 200 countries agreed in December 2015 to reduce greenhouse gas emissions and accelerate the transition to a lower-carbon economy. The reduction in greenhouse gas emissions implies movement away from fossil fuel energy and related physical assets. This coupled with rapidly declining costs and increased deployment of clean and energy-efficient technologies could have significant, near-term financial implications for organizations dependent on extracting, producing, and using coal, oil, and natural gas. While such organizations may face significant climate-related risks, they are not alone. In fact, climate-related risks and the expected transition to a lower-carbon economy affect most economic sectors and industries. While changes associated with a transition to a lower-carbon economy present significant risks, they also create significant opportunities for a broad range of organizations focused on climate change mitigation and adaptation solutions.

Because this transition to a lower-carbon economy requires significant and, in some cases, disruptive changes across economic sectors and industries in the near term, financial policymakers are interested in the implications for the global financial system, especially in terms of avoiding severe financial shocks and sudden losses in asset values. Potential shocks and losses in value include the economic impact of precipitous changes in energy use and the revaluation of carbon-intensive assets—real and financial assets whose value depends on the extraction or use of fossil fuels. Given such concerns, and the potential impact on financial intermediaries and investors, the G20 Finance Ministers and Central Bank Governors asked the Financial Stability Board to review how the financial sector can take account of climate-related

issues. As part of its review, the Financial Stability Board identified the need for better information to support informed investment, lending, and insurance underwriting decisions to improve understanding and analysis of climate-related risks and opportunities, and over time, to help promote a smooth rather than an abrupt transition to a lower-carbon economy.

## **Task Force on Climate-related Financial Disclosures**

To help identify the information needed by investors, lenders, and insurance underwriters to appropriately assess and price climate-related risks and opportunities, the Financial Stability Board established an industry-led task force: the Task Force on Climate-related Financial Disclosures (Task Force). The Task Force was asked to develop voluntary, consistent climate-related financial disclosures that would be useful to investors, lenders, and insurance underwriters in understanding material risks.

The 32-member Task Force is global; its members come from various organizations, including large banks, insurance companies, asset managers, pension funds, large non-financial companies, accounting and consulting firms, and credit rating agencies. In its work, the Task Force drew on member expertise, stakeholder engagement, and existing climate-related disclosure regimes to develop a singular, accessible framework for climate-related financial disclosure.

The Task Force developed four widely adoptable recommendations on climate-related financial disclosures that are applicable to organizations across sectors and jurisdictions (Figure 1). Importantly, the Task Force's recommendations apply to financial-sector organizations, including banks, insurance companies, asset managers, and asset owners. Large asset owners and asset managers 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.

Figure 1

### **Key Features of Recommendations**

- Adoptable by all organizations
- Included in financial filings
- Designed to solicit decision-useful, forward-looking information on financial impacts
- Strong focus on risks and opportunities related to transition to lower-carbon economy

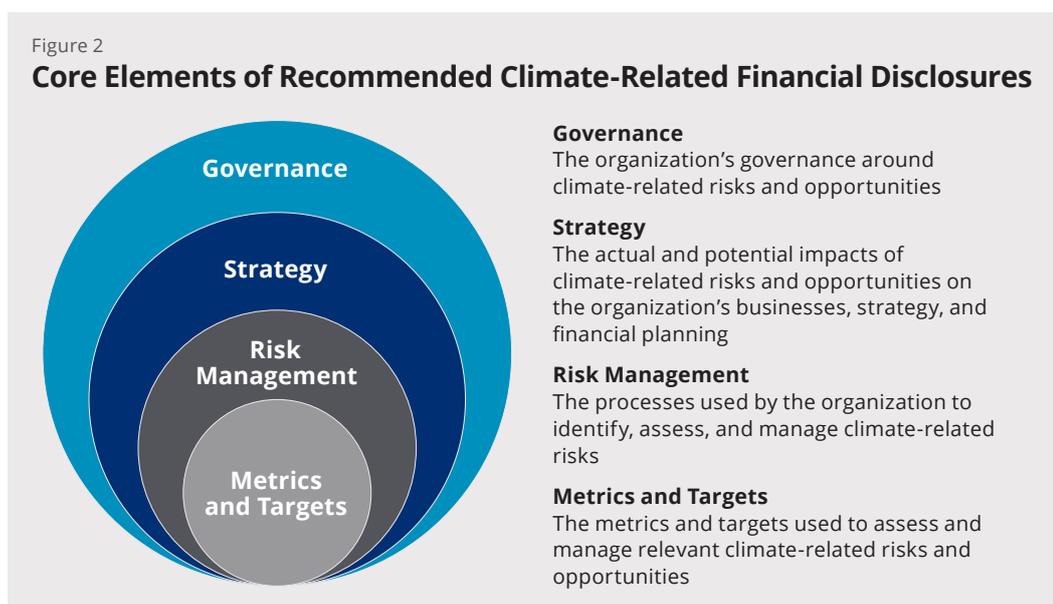
### **Disclosure in Mainstream Financial Filings**

The Task Force recommends that preparers of climate-related financial disclosures provide such disclosures in their mainstream (i.e., public) financial filings. In most G20 jurisdictions, companies with public debt or equity have a legal obligation to disclose material risks in their financial filings—including material climate-related risks. The Task Force believes climate-related risks are material risks for many organizations, and this framework should be useful to organizations in complying more effectively with existing disclosure obligations. In addition, disclosure in mainstream financial filings should foster shareholder engagement and broader use of climate-related financial disclosures, thus promoting an informed understanding of climate-related risks and opportunities by investors and others.

The Task Force also believes that publication of climate-related financial information in mainstream financial filings will help ensure that appropriate controls govern the production and disclosure of the required information. More specifically, the Task Force expects the governance processes for these disclosures would be similar to those used for existing public financial disclosures and would likely involve review by the chief financial officer and audit committee, as appropriate.

## Core Elements of Climate-Related Financial Disclosures

The Task Force structured its recommendations around four thematic areas that represent core elements of how organizations operate: governance, strategy, risk management, and metrics and targets (Figure 2). The four overarching recommendations are supported by recommended disclosures that build out the framework with information that will help investors and others understand how reporting organizations think about and assess climate-related risks and opportunities.<sup>1</sup> In addition, there is guidance to support all organizations in developing climate-related financial disclosures consistent with the recommendations and recommended disclosures. The guidance assists preparers by providing context and suggestions for implementing the recommended disclosures. For the financial sector and certain non-financial sectors, *supplemental* guidance was developed to highlight important sector-specific considerations and provide a fuller picture of potential climate-related financial impacts in those sectors.



## Scenario Analysis

One of the Task Force's key recommended disclosures is related to the disclosure of potential impacts of climate-related risks and opportunities on an organization's businesses, strategies, and financial planning under different potential future states (scenarios), including a 2° Celsius scenario.<sup>2</sup> Disclosure of how organizations analyze different climate-related scenarios and the considerations associated with the individual scenarios is a key step to better understanding the potential financial implications of climate change on an organization. Over time, the Task Force would expect to see more quantitative analyses in disclosures, including the underlying assumptions associated with the climate-related scenarios used.

<sup>1</sup> See Figure 3 on p. 16 for the Task Force's recommendations and recommended disclosures.

<sup>2</sup> A 2°C scenario lays out an energy system deployment pathway and an emissions trajectory consistent with limiting the global average temperature increase to 2°C above the pre-industrial average. The Task Force is not recommending that organizations use a specific 2°C scenario.

## **Conclusion**

Recognizing that climate-related financial reporting is still at an early stage, the Task Force's recommendations provide a foundation to improve investors' and others' ability to appropriately assess and price climate-related risk and opportunities. The Task Force's recommendations aim to be ambitious, but also practical for near-term adoption. The Task Force expects to advance the quality of mainstream financial disclosures related to the potential effects of climate change on organizations today and in the future and to increase investor engagement with boards and senior management on climate-related issues.

Improving the quality of climate-related financial disclosures begins with organizations' willingness to adopt the Task Force's recommendations. Organizations already reporting climate-related information under other frameworks may be able to disclose under this framework immediately and are strongly encouraged to do so. Those organizations in early stages of evaluating the impact of climate change on their businesses and strategies can begin by disclosing climate-related issues as they relate to governance, strategy, and risk management practices. The Task Force recognizes the challenges associated with measuring the impact of climate change on an organization or an asset, but believes by moving climate-related issues into mainstream financial filings, practices and techniques will evolve more rapidly. Improved practices and techniques, including data analytics, should further improve the quality of climate-related financial disclosures and, ultimately, support more appropriate pricing of risks and allocation of capital in the global economy.

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# A Introduction

# A Introduction

## 1. Background

It is widely recognized that continued emission of greenhouse gases will cause further warming of the Earth and that warming above 2° Celsius (2°C), relative to the pre-industrial period, could lead to catastrophic economic and social consequences.<sup>3</sup> As evidence of the growing recognition of the risks posed by climate change, in December 2015, nearly 200 governments agreed to strengthen the global response to the threat of climate change by “holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels,” referred to as the Paris Agreement.<sup>4</sup> The large-scale and long-term nature of the problem makes it uniquely challenging, especially in the context of economic decision making. Moreover, the current understanding of the potential financial risks posed by climate change—to companies, investors, and the financial system as a whole—is still at an early stage.

There is a growing demand for decision-useful, climate-related information by a range of participants in the financial markets.<sup>5</sup> Creditors and investors are increasingly demanding access to risk information that is consistent, comparable, reliable, and clear. There has also been increased focus, especially since the financial crisis of 2007-2008, on the negative impact that weak corporate governance can have on shareholder value, resulting in increased demand for transparency from organizations on their risks and risk management practices, including those related to climate change.

The growing demand for decision-useful, climate-related information has resulted in the development of several climate-related disclosure standards. Many of the existing standards, however, focus on disclosure of climate-related information, such as greenhouse gas (GHG) emissions and other sustainability metrics. Users of such climate-related disclosures commonly cite the lack of information on the financial implications around the climate-related aspects of an organization’s business as a key gap. Users also cite inconsistencies in disclosure practices, a lack of context for information, use of boilerplate, and noncomparable reporting as major obstacles to incorporating climate-related risks and opportunities (collectively referred to as climate-related issues) as considerations in their investment, lending, and insurance underwriting decisions over the medium and long term.<sup>6</sup> In addition, evidence suggests that the lack of consistent information hinders investors and others from considering climate-related issues in their asset valuation and allocation processes.<sup>7</sup>

In general, inadequate information about risks can lead to a mispricing of assets and misallocation of capital and can potentially give rise to concerns about financial stability since markets can be vulnerable to abrupt corrections.<sup>8</sup> Recognizing these concerns, the G20 (Group of 20) Finance Ministers and Central Bank Governors requested that the Financial Stability Board (FSB) “convene public- and private-sector participants to review how the financial sector can take account of climate-related issues.”<sup>9</sup> In response to the G20’s request, the FSB held a meeting of public- and private-sector representatives in September 2015 to consider the implications of climate-related issues for the financial sector. “Participants exchanged views on

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<sup>3</sup> Intergovernmental Panel on Climate Change. Fifth Assessment Report, Cambridge University Press, 2014. <http://www.ipcc.ch/report/ar5/>.

<sup>4</sup> United Nations Framework Convention on Climate Change. “The Paris Agreement,” December 2015, [http://unfccc.int/files/essential\\_background/convention/application/pdf/english\\_paris\\_agreement.pdf](http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf).

<sup>5</sup> Fellow, Avery. “Investors Demand Climate Risk Disclosure.” Bloomberg, February 2013. [www.bloomberg.com/news/2013-02-25/investors-demand-climate-risk-disclosure-in-2013-proxies.html](http://www.bloomberg.com/news/2013-02-25/investors-demand-climate-risk-disclosure-in-2013-proxies.html).

<sup>6</sup> Sustainability Accounting Standards Board (SASB). “SASB Technical Bulletin 2016-01—Climate Risk,” working draft. 2016. <http://using.sasb.org/sasb-climate-risk-framework>.

<sup>7</sup> Mercer LLC. Investing in a Time of Climate Change, 2015, <https://www.mercer.com/our-thinking/investing-in-a-time-of-climate-change.html>.

<sup>8</sup> Mark Carney. “Breaking the tragedy of the horizon—climate change and financial stability,” (speech, Lloyd’s, London, September 29, 2015). <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx>.

<sup>9</sup> “Communiqué from the G20 Finance Ministers and Central Bank Governors Meeting in Washington, D.C. April 16-17, 2015.” April 2015. [g20.org/tr/wp-content/uploads/2015/04/April-G20-FMFCBG-Communique-Final.pdf](http://www.g20.org/tr/wp-content/uploads/2015/04/April-G20-FMFCBG-Communique-Final.pdf).

the existing work of the financial sector, authorities, and standard setters in this area and the challenges they face, areas for possible further work, and the possible roles the FSB and others could play in taking that work forward. The discussions continually returned to a common theme: the need for better information.”<sup>10</sup>

In most G20 jurisdictions, companies with public debt or equity have a legal obligation to disclose material risks in their financial reports—including material climate-related risks. However, the absence of a standardized framework for disclosing climate-related financial risks makes it difficult for organizations to determine what information should be included in their filings and how it should be presented. Even when reporting similar climate-related information, disclosures are often difficult to compare due to variances in legal and voluntary frameworks. The resulting fragmentation in reporting practices and lack of focus on financial impacts have prevented investors, lenders, insurance underwriters, and other users of disclosures from accessing complete information that can inform their economic decisions. Furthermore, because financial-sector organizations’ disclosures depend, in part, on those from the companies in which they invest or lend, regulators face challenges in using financial-sector organizations’ existing disclosures to determine system-wide exposures to climate-related risks.

In response, the FSB established the industry-led Task Force on Climate-related Financial Disclosures (TCFD or Task Force) in December 2015 to design a set of recommendations for consistent “disclosures that will help financial market participants understand their climate-related risks.”<sup>11</sup> See [Box 1](#) (p. 5) for more information on the Task Force.

## 2. The Task Force’s Remit

The FSB called on the 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>12,13</sup>

The FSB noted that disclosures by the financial sector in particular would “foster an early assessment of these risks” and “facilitate market discipline.” It would also “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.”<sup>14</sup>

The FSB also emphasized that “any disclosure recommendations by the Task Force would be voluntary, would need to incorporate the principle of materiality and would need to weigh the balance of costs and benefits.”<sup>15</sup> As a result, in devising a principle-based framework for voluntary disclosure, the Task Force sought to balance the needs of the users of disclosures with the challenges faced by the preparers. The FSB further stated that the Task Force’s climate-related financial disclosure recommendations should not “add to the already well developed body of existing disclosure schemes.”<sup>16</sup> In response, the Task Force drew from existing disclosure frameworks where possible and appropriate.

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<sup>10</sup> FSB, “FSB to establish Task Force on Climate-related Financial Disclosures.” December 4, 2015. [www.fsb-tcfd.org/wp-content/uploads/2016/01/12-4-2015-Climate-change-task-force-press-release.pdf](http://www.fsb-tcfd.org/wp-content/uploads/2016/01/12-4-2015-Climate-change-task-force-press-release.pdf).

<sup>11</sup> Ibid.

<sup>12</sup> FSB, “Proposal for a Disclosure Task Force on Climate-Related Risks,” November 9, 2015. [www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf](http://www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf).

<sup>13</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. The Task Force believes further work is needed on defining carbon-related assets and their potential financial impacts.

<sup>14</sup> FSB, “Proposal for a Disclosure Task Force on Climate-Related Risks,” November 9, 2015. [www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf](http://www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf).

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

The FSB also noted the Task Force should determine whether the target audience of users of climate-related financial disclosures should extend beyond investors, lenders, and insurance underwriters. Investors, lenders, and insurance underwriters (“primary users”) are the appropriate target audience. These primary users assume the financial risk and reward of the decisions they make. The Task Force recognizes that many other organizations, including credit rating agencies, equity analysts, stock exchanges, investment consultants, and proxy advisors also use climate-related financial disclosures, allowing them to push information through the credit and investment chain and contribute to the better pricing of risks by investors, lenders, and insurance underwriters. These organizations, in principle, depend on the same types of information as primary users.

This report presents the Task Force’s recommendations for climate-related financial disclosures and includes supporting information on climate-related risks and opportunities, scenario analysis, and issues that the Task Force considered in developing its recommendations. In addition, the Task Force developed a “stand-alone” document—[Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures](#) (Annex)—for organizations to use when preparing disclosures consistent with the recommendations. The Annex provides supplemental guidance for the financial sector as well as for non-financial sectors potentially most affected by climate change and the transition to a lower-carbon economy. The supplemental guidance assists preparers by providing additional context and suggestions for implementing the recommended disclosures.

The Task Force’s recommendations provide a foundation for climate-related financial disclosures and aim to be ambitious, but also practical for near-term adoption. The Task Force expects that reporting of climate-related risks and opportunities will evolve over time as organizations, investors, and others contribute to the quality and consistency of the information disclosed.

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Box 1

## Task Force on Climate-related Financial Disclosures

The Task Force membership, first announced on January 21, 2016, has international representation and spans various types of organizations, including banks, insurance companies, asset managers, pension funds, large non-financial companies, accounting and consulting firms, and credit rating agencies—a unique collaborative partnership between the users and preparers of financial reports.

In its work, the Task Force drew on its members' expertise, stakeholder engagement, and existing climate-related disclosure regimes to develop a singular, accessible framework for climate-related financial disclosure. See Appendix 1 for a list of the Task Force members and Appendix 2 for more information on the Task Force's approach.

### Task Force Membership

The Task Force is comprised of 32 global members representing a broad range of economic sectors and financial markets and a careful balance of users and preparers of climate-related financial disclosures.



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## B Climate-Related Risks, Opportunities, and Financial Impacts

## B Climate-Related Risks, Opportunities, and Financial Impacts

Through its work, the Task Force identified a growing demand by investors, lenders, insurance underwriters, and other stakeholders for decision-useful, climate-related financial information. Improved disclosure of climate-related risks and opportunities will provide investors, lenders, insurance underwriters, and other stakeholders with the metrics and information needed to undertake robust and consistent analyses of the potential financial implications of climate change.

The Task Force found that while several climate-related disclosure frameworks have emerged across different jurisdictions in an effort to meet the growing demand for such information, there is a need for a standardized framework to promote alignment across existing regimes and G20 jurisdictions and to provide a common framework for climate-related financial disclosures. An important element of such a framework is the consistent categorization of climate-related risks and opportunities. As a result, the Task Force defined, as described below, specific categories for climate-related risks and climate-related opportunities. The Task Force's recommendations serve to encourage organizations to evaluate and disclose, as part of their financial statement preparation and reporting processes, the climate-related risks and opportunities that are most pertinent to their business activities. The main climate-related risks and opportunities that organizations should consider are described below and in [Tables 1 and 2](#) (pp. 11-12).

### 1. Climate-Related Risks

The Task Force divided climate-related risks into two major categories: (1) risks related to the *transition* to a lower-carbon economy and (2) risks related to the *physical* impacts of climate change.<sup>17</sup>

#### a. Transition Risks

Transitioning to a lower-carbon economy may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. Depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of financial and reputational risk to organizations.

#### Policy and Legal Risks

Policy actions around climate change continue to evolve. Their objectives generally fall into two categories—policy actions that attempt to constrain actions that contribute to the adverse effects of climate change or policy actions that seek to promote adaptation to climate change. Some examples include implementing carbon-pricing mechanisms to reduce GHG emissions, shifting energy use toward lower emission sources, adopting energy-efficiency solutions, encouraging greater water efficiency measures, and promoting more sustainable land-use practices. The financial impact of policy changes depends on the nature of the policy change.<sup>18</sup>

Another growing risk is litigation or legal risk. Recent years have seen an increase in climate-related litigation claims being brought before the courts by property owners, municipalities, states, insurers, shareholders, and public interest organizations.<sup>19</sup> Reasons for such litigation include the failure of organizations to mitigate impacts of climate change, failure to adapt to climate change, and the insufficiency of disclosure around material financial risks.

<sup>17</sup> In the Task Force's "Phase I" report, transition risks are referred to as non-physical risks.

<sup>18</sup> Organizations should assess not only the potential direct effects of policy actions on their operations, but also the potential second and third order effects on their supply and distribution chains.

<sup>19</sup> Peter Seley. "Emerging Trends in Climate Change Litigation." Law 360, March 7, 2016. <http://www.law360.com/articles/766214/emerging-trends-in-climate-change-litigation>.

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### Technology Risk

Technological improvements or innovations that support the transition to a low-carbon, energy-efficient economic system can have a significant impact on organizations. For example, the development and use of emerging technologies such as renewable energy, battery storage, energy efficiency, and carbon capture and storage will affect the competitiveness of certain organizations, their production and distribution costs, and ultimately the demand for their products and services from end users. To the extent that new technology displaces old systems and disrupts some parts of the existing economic system, winners and losers will emerge from this “creative destruction” process. The timing of technology development and deployment, however, is a key uncertainty in assessing technology risk.

### Market Risk

While the ways in which markets could be affected by climate change are varied and complex, one of the major ways is through shifts in supply and demand for certain commodities, products, and services as climate-related risks and opportunities are increasingly taken into account.

### Reputation Risk

Climate change has been identified as a potential source of reputational risk tied to changing customer or community perceptions of an organization’s contribution to or detractor from the transition to a lower-carbon economy.

## b. Physical Risks

Physical risks resulting from climate change can be event driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks may have financial implications for organizations, such as direct damage to assets and indirect impacts from supply chain disruption. Organizations’ financial performance may also be affected by changes in water availability, sourcing, and quality; food security; and extreme temperature changes impacting organizations’ premises, operations, supply chain, transport needs, and employee safety.

### Acute Risk

Acute physical risks refer to those that are event-driven, including increased severity of extreme weather events, such as cyclones, hurricanes, or floods.

### Chronic Risk

Chronic physical risks refer to longer-term shifts in climate patterns (e.g., sustained higher temperatures) that may cause sea level rise or chronic heat waves.

## 2. Climate-Related Opportunities

Efforts to mitigate and adapt to climate change also produce opportunities for organizations, for example, through resource efficiency and cost savings, the adoption 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. Some areas of opportunity are described below.

### a. Resource Efficiency

There is growing evidence and examples of organizations that have successfully reduced operating costs by improving efficiency across their production and distribution processes, buildings, machinery/appliances, and transport/mobility—in particular in relation to energy efficiency but also including broader materials, water, and waste management. Such actions can result in direct cost savings to organizations’ operations over the medium to long term and contribute to the global efforts to curb emissions.<sup>20</sup> Innovation in technology is assisting

<sup>20</sup> Environmental Protection Agency Victoria (EPA Victoria), “Resource Efficiency Case Studies,” Lower your impact. [www.epa.vic.gov.au/business-and-industry/lower-your-impact/resource-efficiency/case-studies](http://www.epa.vic.gov.au/business-and-industry/lower-your-impact/resource-efficiency/case-studies).

this transition; such innovation includes developing efficient heating solutions and circular economy solutions, making advances in LED lighting technology and industrial motor technology, retrofitting buildings, employing geothermal power, offering water usage and treatment solutions, and developing electric vehicles.

## **b. Energy Source**

According to the International Energy Agency (IEA), to meet global emission-reduction goals, countries will need to transition a major percentage of their energy generation to low emission alternatives such as wind, solar, wave, tidal, hydro, geothermal, nuclear, biofuels, and carbon capture and storage.<sup>21</sup> For the past two years, clean energy investments have exceeded fossil fuel investments.<sup>22</sup> The trend toward decentralized clean energy sources, rapidly declining costs, improved storage capabilities, and subsequent global adoption of these technologies are significant. Organizations that shift their energy usage toward low emission energy sources could potentially save on annual energy costs.<sup>23</sup>

## **c. Products and Services**

Organizations that innovate and develop new low-emission products and services may improve their competitive position and capitalize on shifting consumer and producer preferences. Some examples include consumer goods and services that place greater emphasis on a product's carbon footprint in its marketing and labeling (e.g., travel, food, beverage and consumer staples, mobility, printing, fashion, and recycling services) and producer goods that place emphasis on reducing emissions (e.g., adoption of energy-efficiency measures along the supply chain).

## **d. Markets**

Organizations that pro-actively seek opportunities in new markets and types of assets may be able to diversify their activities and better position themselves for the transition to a lower-carbon economy. In particular, opportunities exist for organizations to access new markets through collaborating with governments, development banks, small-scale local entrepreneurs and community groups in developed and developing countries as they work to shift to a lower-carbon economy.<sup>24</sup> New opportunities can also be captured through underwriting or financing green bonds and infrastructure (e.g., low-emission energy production, energy efficiency, grid connectivity, or transport networks).

## **e. Resilience**

Many organizations' profitability depends heavily on suppliers and employees, and opportunities exist to build capacity and improve contingency planning in "at-risk" communities.<sup>25</sup> Opportunities also exist in specific sectors. For example, organizations involved in agriculture have opportunities related to cultivar adaptation and efficient water management, and, insurance companies have opportunities to underwrite new assets (e.g., renewable-energy technology installations).

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<sup>21</sup> IEA, "Global energy investment down 8% in 2015 with flows signaling move towards cleaner energy," September 14, 2016. <https://www.iea.org/newsroomandevents/pressreleases/2016/september/global-energy-investment-down-8-in-2015-with-flows-signalling-move-towards-clean.html>.

<sup>22</sup> T. Randall, "Leapfrogging to Solar: Emerging Markets Outspend Rich Countries for the First Time." Bloomberg, November 23, 2015. <http://www.bloomberg.com/news/articles/2015-11-23/leapfrogging-to-solar-emerging-markets-outspend-rich-countries-for-the-first-time>.

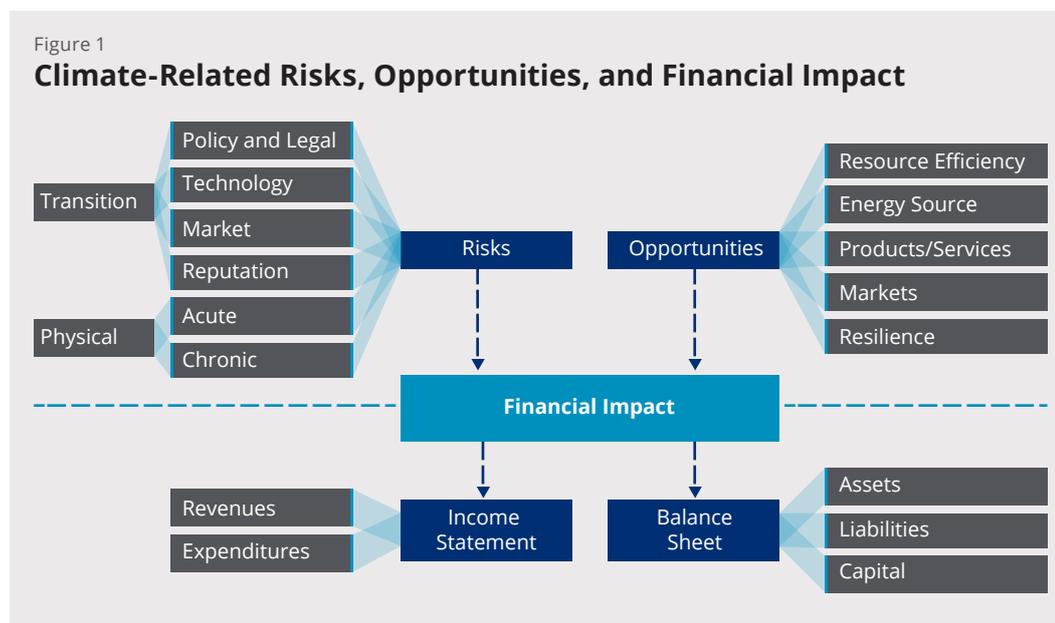
<sup>23</sup> Ceres, Power Forward: How American Companies Are Setting Clean Energy Targets and Capturing Greater Business Value, 2014. <http://www.ceres.org/resources/reports/power-forward-supplement-climate-and-energy-targets-set-by-fortune-500-companies/view>.

<sup>24</sup> G20 Green Finance Study Group, G20 Green Finance Synthesis Report. 2016. [http://unepinquiry.org/wp-content/uploads/2016/09/Synthesis\\_Report\\_Full\\_EN.pdf](http://unepinquiry.org/wp-content/uploads/2016/09/Synthesis_Report_Full_EN.pdf). The launch of the Green Finance Study Group was adopted by the G20 Finance and Central Bank Deputies in December 2015. See more at: <http://unepinquiry.org/g20greenfinancerepositoryeng/>.

<sup>25</sup> T. Norton, M. Ryan, and F. Wang, "Business Action for Climate-Resilient Supply Chains: A Practical Framework for Identifying Priorities to Evaluating Impact." 2015. (San Francisco: BSR working paper) [www.bsr.org/reports/BSR\\_Report\\_Climate\\_Resilient\\_Supply\\_Chains.pdf](http://www.bsr.org/reports/BSR_Report_Climate_Resilient_Supply_Chains.pdf).

### 3. Financial Impacts

Better information on and better understanding of the potential financial implications of climate-related risks and opportunities on organizations is the key goal of the Task Force’s work. Investors, lenders, and insurance underwriters need to understand how climate-related risks and opportunities are likely to impact an organization’s future cash flows and its assets and liabilities in order to make more informed financial decisions.



As outlined in Figure 1, climate-related risks and opportunities can affect organizations’ revenues and expenditures, and possibly estimates of future cash flows, as well as their assets and liabilities in a number of ways. Thus, it is important to undertake both historical and forward-looking analyses when considering the potential financial impacts of climate change on an organization, with greater need for forward-looking analyses as the efforts to mitigate and adapt to climate change are without historical precedent. This is one of the reasons the Task Force believes scenario analysis is important for organizations to incorporate into their strategic and financial planning.

Examples of climate-related risks and opportunities and their potential financial impacts are summarized in [Tables 1](#) and [2](#) (pp. 11-12).

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Table 1

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

Type	Climate-Related Risks	Potential Financial Impact
<b>Transition Risks</b>  A Introduction  B Climate-Related Risks, Opportunities, and Financial Impacts  C Recommendations and Guidance  D Scenario Analysis and Climate-Related Issues  E Key Issues Considered and Areas for Further Work  F Conclusion  Appendices	<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., compliance costs)</li> <li>– Write-offs and early retirement of existing assets due to policy change</li> <li>– Impaired assets</li> <li>– Increased insurance premiums</li> <li>– 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>– Upfront 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>– Upfront research and development (R&amp;D) expenditures in new and alternative technologies</li> <li>– Upfront capital investments in technology development</li> <li>– Upfront costs to adopt/deploy new practices and processes<sup>1</sup></li> </ul>
	<b>Markets</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>– Changing revenue mix and sources Re-pricing of assets and speed of re-pricing (e.g., fossil fuel reserves, land valuations, securities valuations)</li> </ul>
	<b>Reputation</b> <ul style="list-style-type: none"> <li>– Shift 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 demand for goods/services</li> <li>– Reduction or disruption in production capacity (e.g., shutdowns, delayed planning approvals, interruptions to supply chain)</li> <li>– 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>– Reduction or disruption in production capacity (e.g., shutdowns, transport difficulties, supply chain interruptions)</li> <li>– Impacts to workforce management and planning (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>
<b>Physical Risks</b>		

Table 2

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

Type	Climate-Related Risks	Potential Financial Impact
<b>Resource Efficiency</b>	<ul style="list-style-type: none"> <li>– Use of more efficient modes of transport</li> <li>– More efficient production and distribution processes</li> <li>– Use of recycling</li> <li>– More efficient buildings</li> <li>– Reduced water usage and consumption</li> </ul>	<ul style="list-style-type: none"> <li>– Reduced operational costs (e.g., through efficiency gains and cost reductions)</li> <li>– Increased production capacity</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)</li> <li>– Better prepared for changes in or additions to government policies and regulations</li> </ul>
<b>Energy Source</b>	<ul style="list-style-type: none"> <li>– Lower-emission sources of energy</li> <li>– Supportive policy incentives</li> <li>– Emergence of new technologies</li> <li>– Participating in carbon market</li> <li>– Energy security and shift toward decentralization</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 energy price increases</li> <li>– Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon</li> <li>– Generate return on investment in low-emission technology</li> <li>– Increase in capital availability (e.g., as more investors favor lower-emissions producers)</li> <li>– Reputational benefits and increased demand for goods/services</li> </ul>
<b>Products and Services</b>	<ul style="list-style-type: none"> <li>– Develop and/or expand low emission goods and services</li> <li>– Climate adaptation and insurance risk solutions</li> <li>– R&amp;D and innovation</li> <li>– Diversify business activities</li> <li>– Shifting 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>– Increased resilience to changes in government policies and regulations</li> <li>– Better competitive position to reflect shifting consumer preferences</li> </ul>
<b>Markets</b>	<ul style="list-style-type: none"> <li>– New markets</li> <li>– Public-sector incentives</li> <li>– Community needs and initiatives</li> <li>– Development banks</li> </ul>	<ul style="list-style-type: none"> <li>– Increased access to new and emerging markets (e.g., partnerships with governments, development banks)</li> <li>– Increased diversification (e.g., green bonds and infrastructure)</li> <li>– Increased resilience in existing supply chain relationships</li> <li>– Increased demand for goods/services in new markets</li> </ul>
<b>Resilience</b>	<ul style="list-style-type: none"> <li>– Participate in renewable energy programs and adopt energy-efficiency measures</li> <li>– Resource substitutes/diversification</li> <li>– New assets and locations needing insurance coverage</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>

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# C Recommendations and Guidance

## C Recommendations and Guidance

### 1. Recommendations for All Sectors

To fulfill its remit, the Task Force developed four widely adoptable recommendations on climate-related financial disclosures applicable to organizations across sectors and jurisdictions. In developing its recommendations, the Task Force considered the challenges for preparers of disclosures as well as the benefits of such disclosures to investors, lenders, insurance underwriters, and other stakeholders. To achieve this balance, the Task Force engaged in significant outreach and consultation with users and preparers of disclosures and drew upon existing climate-related disclosure regimes. The insights gained from the outreach and consultations directly informed the development of the recommendations.

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.<sup>26</sup> Because climate-related risks and opportunities are relevant for organizations across all sectors, the Task Force encourages other organizations to implement these recommendations as well. In addition, the Task Force believes that asset managers and asset owners, including public- and private-sector pension plans, insurance companies, endowments, and foundations, should implement its recommendations.<sup>27</sup>

The Task Force believes climate-related financial information should be provided to asset managers' clients and asset owners' beneficiaries so that they may better understand the performance of their assets, consider the risks of their investments, and make more informed investment choices.

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The Task Force believes that climate-related risks are material risks for many organizations. This framework should be useful to organizations in complying with existing disclosure obligations more effectively.

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The Task Force also recommends that preparers of climate-related financial disclosures provide such disclosures in their mainstream (i.e., public) financial filings.<sup>28</sup> In most G20 jurisdictions, public companies have a legal obligation to disclose material risks in their financial filings—including material climate-related risks. The Task Force believes that publication of climate-related financial information in mainstream financial filings will ensure that appropriate controls govern the production and disclosure of the required information. In addition, it will foster shareholder engagement and broader utilization of such disclosures, promoting an informed understanding of climate-related risks and opportunities by investors and others. Further, users of climate-related financial disclosures will be able to access current information in a timely way, as mainstream financial filings require publication at least annually.

The Task Force believes that climate-related financial disclosures should be subject to appropriate internal governance processes. Since these disclosures should be included in mainstream financial reports or other public documents, the governance processes should be similar to those used for existing public financial disclosures and would likely involve review by the chief financial officer and audit committee, as appropriate. For those organizations that do

<sup>26</sup> In the case a recommended disclosure is not made, the Task Force encourages preparers to provide the rationale for omitting the disclosure.

<sup>27</sup> Unless otherwise specified, the use of the term "insurance companies" in this report includes re-insurers.

<sup>28</sup> The Task Force recognizes that reporting by asset managers and asset owners to their clients and beneficiaries, respectively, often occurs outside mainstream financial filings. For purposes of adopting the Task Force's recommendations, asset managers and asset owners should use their existing means of financial reporting to their clients and beneficiaries where relevant and where feasible.

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not have publicly traded debt or equity securities, including some asset managers and asset owners, these climate-related financial disclosures should follow similar review and approval protocols currently used by those organizations for similar communications.

The Task Force structured its recommendations around four thematic areas that represent core elements of how organizations operate—governance, strategy, risk management, and metrics and targets. 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 think about and assess climate-related risks and opportunities. In addition, there is guidance to support all organizations in developing climate-related financial disclosures consistent with the recommendations and recommended disclosures as well as *supplemental* guidance for specific sectors. The structure is depicted in Figure 2 below.

Figure 2

## Recommendations and Guidance



### Recommendations

Four widely adoptable recommendations tied to: governance, strategy, risk management, and metrics and targets

### Recommended Disclosures

Specific recommended disclosures organizations should include in their financial filings to provide decision-useful information

### Guidance for All Sectors

Guidance providing context and suggestions for implementing the recommended disclosures for all organizations

### Supplemental Guidance for Certain Sectors

Guidance that highlights important considerations for certain sectors and provides a fuller picture of potential climate-related financial impacts in those sectors

Supplemental guidance is provided for the financial sector and for non-financial sectors potentially most affected by climate change

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Figure 3

## Recommendations and Supporting Recommended Disclosures

### Governance

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

#### Recommended Disclosures

- a) Describe the board's oversight of climate-related risks and opportunities.
- b) Describe management's role in assessing and managing climate-related risks and opportunities.

### Strategy

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

#### Recommended Disclosures

- a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.
- b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.
- c) Describe the potential impact of different scenarios, including a 2°C scenario, on the organization's businesses, strategy, and financial planning.

### Risk Management

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

#### Recommended Disclosures

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

### Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities.

#### Recommended Disclosures

- a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
- b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
- c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

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To underpin its recommendations and help guide current and future developments in climate-related financial reporting, the Task Force developed seven principles for effective disclosure (Figure 4), which are described more fully in [Appendix 6](#). 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 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 internationally accepted frameworks for financial reporting and are generally applicable to most providers of financial disclosures. 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.

In addition, the Task Force recognizes that many organizations already disclose information on climate-related issues under other voluntary and mandatory reporting frameworks. For these organizations, significant effort has gone into developing processes and collecting information needed for disclosing under these regimes. The Task Force expects preparers disclosing climate-related information under other regimes will be able to use existing processes when providing disclosures in financial filings based on the Task Force’s recommendations.

## 2. Guidance for All Sectors

The Task Force has 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. Recognizing organizations have differing levels of capacity to disclose under the recommendations, the guidance provides descriptions of the types of information that should be disclosed or considered.

Figure 4  
**Principles for Effective Disclosures**

- 1 Disclosures should represent relevant information
- 2 Disclosures should be specific and complete
- 3 Disclosures should be clear, balanced, and understandable
- 4 Disclosures should be consistent over time
- 5 Disclosures should be comparable among companies within a sector, industry, or portfolio
- 6 Disclosures should be reliable, verifiable, and objective
- 7 Disclosures should be provided on a timely basis

## a. 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 risks and opportunities as well as management’s role in assessing and managing climate-related issues.<sup>29</sup> Such information supports users’ evaluations of whether material climate-related issues receive appropriate board and management attention.

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Governance	
Disclose the organization’s governance around climate-related risks and opportunities.	
<p><b>Recommended Disclosure a)</b> Describe the board’s oversight of climate-related risks and opportunities.</p>	<p><b>Guidance for All Sectors</b> In describing the board’s oversight of climate-related issues, organizations should consider including a discussion of the following:</p> <ul style="list-style-type: none"> <li>– processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues,</li> <li>– 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</li> <li>– how the board monitors and oversees progress against goals and targets for addressing climate-related issues.</li> </ul>
<p><b>Recommended Disclosure b)</b> Describe management’s role in assessing and managing climate-related risks and opportunities.</p>	<p><b>Guidance for All Sectors</b> In describing management’s role related to the assessment and management of climate-related issues, organizations should consider including the following information:</p> <ul style="list-style-type: none"> <li>– 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,</li> <li>– a description of the associated organizational structure(s),</li> <li>– processes by which management is informed about climate-related issues, and</li> <li>– how management (through specific positions and/or management committees) monitors climate-related issues.</li> </ul>

<sup>29</sup> Climate-related risks can be divided into two major categories: transition risks and physical risks. See Tables 1 and 2 (pp. 11-12) for more information.

## b. Strategy

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.	
<p><b>Recommended Disclosure a)</b> Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.</p>	<p><b>Guidance for All Sectors</b> Organizations should provide the following information:</p> <ul style="list-style-type: none"> <li>- 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,</li> <li>- specific climate-related issues for each time horizon (short, medium, and long term) that could have a material financial impact on the organization and distinguish whether the climate-related risks are physical or transition risks, and</li> <li>- a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization.</li> </ul> <p>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 <a href="#">Tables 1 and 2</a> (pp. 11-12).</p>
<p><b>Recommended Disclosure b)</b> Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.</p>	<p><b>Guidance for All Sectors</b> Building on recommended disclosure (a), organizations should disclose how identified climate-related issues have affected their businesses, strategy, and financial planning.</p> <p>Organizations should consider including the impact on their businesses and strategy in the following areas:</p> <ul style="list-style-type: none"> <li>- Products and services</li> <li>- Supply chain and/or value chain</li> <li>- Adaptation and mitigation activities</li> <li>- Investment in research and development</li> <li>- Operations (including types of operations and location of facilities)</li> </ul> <p>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 also consider including in their disclosures the impact on financial planning in the following areas:</p> <ul style="list-style-type: none"> <li>- Operating costs and revenues</li> <li>- Capital expenditures and capital allocation</li> <li>- Acquisitions or divestments</li> <li>- Access to capital</li> </ul> <p>If climate-related scenarios were used to inform the organization's strategy and financial planning, such scenarios should be described.</p>
<p><b>Recommended Disclosure c)</b> Describe the potential impact of different scenarios, including a 2°C scenario, on the organization's businesses, strategy, and financial planning.</p>	<p><b>Guidance for All Sectors</b> Organizations should describe how their strategies are likely to perform under various forward-looking, climate-related scenarios (e.g., potential effects under different scenarios) and any resulting changes to their strategies and financial plans, risk management activities, or targets/ metrics to mitigate risks and take advantage of opportunities.</p>

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### c. Risk Management

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 into 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.	
<p><b>Recommended Disclosure a)</b> Describe the organization’s processes for identifying and assessing climate-related risks.</p>	<p><b>Guidance for All Sectors</b> 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.</p> <p>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.</p> <p>Organizations should also consider disclosing the following:</p> <ul style="list-style-type: none"> <li>– processes for assessing the potential size and scope of identified climate-related risks and</li> <li>– definitions of risk terminology used or references to existing risk classification frameworks used.</li> </ul>
<p><b>Recommended Disclosure b)</b> Describe the organization’s processes for managing climate-related risks.</p>	<p><b>Guidance for All Sectors</b> 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.</p> <p>In describing their processes for managing climate-related risks, organizations should address the risks included in <a href="#">Tables 1 and 2</a> (pp. 11-12), as appropriate.</p>
<p><b>Recommended Disclosure c)</b> Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management.</p>	<p><b>Guidance for All Sectors</b> Organizations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.</p>

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## d. Metrics and Targets

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. They also provide a basis upon which investors and other stakeholders can compare organizations within a sector or industry.

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Metrics and Targets	
Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities.	
<p><b>Recommended Disclosure a)</b> Describe 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>Guidance for All Sectors</b> Organizations should provide the key metrics used to measure and manage climate-related risks and opportunities, as described in <a href="#">Tables 1 and 2</a> (pp. 11-12). Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable.</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. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.</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> Organizations should provide their Scope 1 and Scope 2 GHG emissions and, if appropriate, Scope 3 GHG emissions and the related risks.<sup>30</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>31</sup></p> <p>As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.<sup>32</sup></p>
<p><b>Recommended Disclosure c)</b> Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.</p>	<p><b>Guidance for All Sectors</b> Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., 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.</p> <p>In describing their targets, organizations should consider including the following:</p> <ul style="list-style-type: none"> <li>– whether the target is absolute or intensity based,</li> <li>– time frames over which the target applies,</li> <li>– base year from which progress is measured, and</li> <li>– key performance indicators used to assess progress against targets.</li> </ul> <p>Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.</p>

<sup>30</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. See the All Sector guidance in the Annex if you have any questions.

<sup>31</sup> While challenges remain, the GHG Protocol methodology is the most widely recognized and used international standard for calculating GHG emissions.

<sup>32</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. See sector-specific supplemental guidance for more information.

### 3. Supplemental Guidance for Financial and Non-Financial Sectors

The Task Force also developed supplemental guidance for the financial sector as well as for certain non-financial sectors (see the [Annex](#)). The supplemental guidance assists preparers in the financial sector and other sectors potentially most affected by climate change and the transition to a lower-carbon economy by providing additional context and suggestions for implementing the recommended disclosures and should be used in conjunction with the guidance for all sectors.

Figure 5 provides a mapping of the recommendations (governance, strategy, etc.) and recommended disclosures (a, b, c) for which supplemental guidance was developed for the relevant industries and groups in the financial and non-financial sectors. The majority of the sector-specific guidance relates to the recommendations and supporting recommended disclosures on strategy and metrics and targets. The supplemental guidance is not intended to be exhaustive and examples of metrics are provided for illustrative purposes for the non-financial sectors. Organizations are encouraged to define metrics and targets that address the key disclosure areas in the Task Force’s sector-specific supplemental guidance and to provide additional metrics 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.

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Figure 5

#### Supplemental Guidance for Financial and Non-Financial Sectors

Industries and Groups	Governance		Strategy			Risk Management			Metrics and Targets		
	A	B	A	B	C	A	B	C	A	B	C
<b>Financial</b>	<b>Banks</b>		■			■			■		
	<b>Insurance Companies</b>			■	■	■	■		■		
	<b>Asset Owners</b>			■	■	■	■		■	■	
	<b>Asset Managers</b>			■			■	■	■	■	
<b>Non-Financial</b>	<b>Energy</b>	■		■			■		■	■	
	<b>Transportation</b>			■	■				■	■	■
	<b>Materials and Buildings</b>			■	■				■	■	■
	<b>Agriculture, Food, and Forest Products</b>			■	■				■	■	■

While climate change affects virtually all economic sectors and activities, the level of exposure and the impact of climate-related risks differs by organization, sector, and industry.<sup>33</sup> Sectors with a significant exposure to energy or water dependencies, significant GHG emissions, or physical locations subject to acute or chronic physical impacts are particularly vulnerable to both physical and transition climate-related risks. For example, sectors with significant GHG emissions and energy usage may be disproportionately affected by transition risks, such as policy and technology changes; sectors with dependencies on water may be significantly affected by physical risks, such as floods and droughts.

#### **a. Financial Sector**

The Task Force developed supplemental guidance for the financial sector with a specific focus on banks, insurance companies, asset managers, and asset owners (which include public- and private-sector pension plans, insurance companies, endowments, and foundations). The Task Force believes that disclosures by the financial sector could foster an early assessment of climate-related risks and opportunities, improve pricing of climate-related risks, and lead to more informed capital allocation decisions. Such disclosures might also “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.”<sup>34</sup>

#### **b. Non-Financial Sectors**

The Task Force developed supplemental guidance for the non-financial sectors with a specific focus on 12 industries that account for the largest proportion of GHG emissions, energy usage, and water usage. These industries were organized into four groups—Energy; Materials and Buildings; Transportation; and Agriculture, Food, and Forest Products—based on similarities in climate-related risks as shown in [Box 2](#) (p. 24).

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<sup>33</sup> SASB research demonstrates that 72 out of 79 Sustainable Industry Classification System (SICS™) industries are significantly affected in some way by climate-related risk.

<sup>34</sup> FSB, “Proposal for a Disclosure Task Force on Climate-Related Risks,” November 9, 2015. [www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf](http://www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf).

## Selected Non-Financial Industries/Sub-Industries by Disclosure Group

In an effort to focus supplemental disclosure guidance on those non-financial sectors and industries with the highest likelihood of climate-related financial impacts, the Task Force assessed three factors most likely to be affected by both transition risk (policy and legal, technology, market, and reputation) and physical risk (acute and chronic)—GHG emissions, energy usage, and water usage.

The underlying premise in using these three factors is that climate-related physical and transition risks will likely manifest themselves primarily and broadly in the form of constraints on GHG emissions, effects on energy production and usage, and effects on water availability, usage, and quality. Other factors, such as waste management and land use, are also important, but may not be as determinative across a wide range of industries or may be captured in one of the primary categories.

In taking this approach, the Task Force consulted a number of sources regarding the ranking of various sectors and industries according to these three factors. The various rankings were used to determine an overall set of sectors and industries that have significant exposure to transition or physical risks related to GHG emissions, energy, or water. The sectors and industries were grouped into four categories of industries that have similar sets of economic activities and climate risk exposures.

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. Other industries with similar activities and climate-related exposures should consider the guidance as well.

The Task Force validated its approach using a variety of sources, including:

- 1 The TCFD Phase I report public consultation, soliciting more than 200 responses which ranked Energy, Utilities, Materials, Industrials and Consumer Staples/Discretionary, in that order, as the Global Industry Classification Standard (GICS) sectors most important for disclosure guidelines to cover.
- 2 Numerous sector-specific disclosure guidance documents, to understand various breakdowns by economic activity, sector, and industries, including from the following sources: CDP, GHG Protocol, Global Real Estate Sustainability Benchmark (GRESB), Global Reporting Initiative (GRI), Institutional Investors Group on Climate Change (IIGCC), IPIECA (the global oil and gas industry association for environmental and social issues), and the Sustainability Accounting Standards Board (SASB).
- 3 The Intergovernmental Panel on Climate Change (IPCC) report “Climate Change 2014 – Mitigation of Climate Change,” which provides an analysis of global direct and indirect emissions by economic sector. The IPCC analysis highlights the dominant emissions-producing sectors as Energy; Industry; Agriculture, Forestry, and Other Land Use; and Transportation and Buildings (Commercial and Residential).
- 4 Research and documentation from NGO and industry organizations that provide information on which industries have the highest exposures to climate change, including those from: Cambridge Institute of Sustainability Leadership, China’s National Development & Reform Commission (NDRC), Environmental Resources Management (ERM), IEA, S&P Global Ratings, Moody’s, and WRI/UNEPFI.

Based on its assessment, the Task Force identified the sectors and industries listed in the table below as those that would most benefit from supplemental sector-specific guidance.

Energy	Transportation	Materials and Buildings	Agriculture, Food, and Forest Products
<ul style="list-style-type: none"> <li>- Oil and Gas</li> <li>- Coal</li> <li>- Electric Utilities</li> </ul>	<ul style="list-style-type: none"> <li>- Air Freight</li> <li>- Passenger Air Transportation</li> <li>- Maritime Transportation</li> <li>- Rail Transportation</li> <li>- Trucking Services</li> <li>- Automobiles</li> <li>- Related Transportation Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>- Metals and Mining</li> <li>- Chemicals</li> <li>- Construction Materials</li> <li>- Capital Goods</li> <li>- Real Estate Management and Development</li> </ul>	<ul style="list-style-type: none"> <li>- Beverage</li> <li>- Agriculture</li> <li>- Packaged Foods and Meats</li> <li>- Paper and Forest Products</li> </ul>

For each of the four groups, the Task Force developed supplemental guidance intended to provide further technical background for organizations to consider in formulating their disclosures under the Task Force’s recommendations. Nevertheless, organizations that may not belong to one of the four groups may still wish to review and consider the issues and topics contained in the supplemental guidance.

Organizations should disclose the financial implications related to significant physical risks (e.g., reliance on water in areas of high water stress, severe weather events, or flooding) and transition risks (e.g., policy, technology, or market changes) and related opportunities (see risks and opportunities outlined in [Tables 1 and 2](#) (pp. 11-12)). In particular, organizations should consider the financial implications of transition and physical risks and opportunities in the following areas:<sup>35</sup>

### Income Statement

- **Revenues** — As the demand for end products (e.g., energy) evolves due to changes in climate-related policies, technology, and market dynamics, organizations should consider the potential impact on their future revenues and identify potential opportunities for enhancing current revenues or developing new revenues. In particular, given the increasing number of jurisdictions adopting explicit carbon pricing as a mechanism to regulate emissions, it is important for energy- and emission-dependent industries to consider the potential impacts of carbon pricing on existing and future business revenues.
- **Expenditures** — An organization’s response to climate-related risks and opportunities depends in part on the organization’s cost structure. Lower-cost suppliers are likely to be more resilient to cost and demand changes in the market as a result of climate-related risks and opportunities and more flexible in their ability to address such risks and opportunities. By discussing and providing an indication of their cost structure and flexibility in relation to various climate-related risks and opportunities, organizations will be better able to inform investors about the investment potentials for a particular organization.

### Balance Sheet

- **Assets and Liabilities** — Supply and demand changes due to climate-related policy, technological, or market changes also could impact the valuation of an organization’s assets or cost of its liabilities going forward. On the asset side, utilization of long-lived assets and, where relevant, reserves may be particularly affected by climate-related risks or opportunities. On the liability side, organizations may face changes in borrowing or other financing costs and various contingent liabilities. It is important for organizations to provide an indication of the climate-related profile of their assets and liabilities, particularly long-lived assets and reserves. This should focus on existing and committed future activities and decisions requiring new investment, restructuring, write-downs, or impairment.
- **Capital** — Organizations may have capital investments that have long payback periods. Given this longer time period, the likelihood of risk profiles changing is higher. It is important for organizations and stakeholders to have an understanding of capital allocation and how this relates back to climate-related risks and opportunities as well as organizations’ flexibility in shifting capital allocation in the face of changing climate-related risks and opportunities.

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<sup>35</sup> Further explanation of these areas is provided in [Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures](#).

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# D Scenario Analysis and Climate-Related Issues

## D Scenario Analysis and Climate-Related Issues

Some organizations are affected by risks associated with climate change today. However, for many organizations, the most significant effects of climate change are likely to emerge over the medium to longer term and their timing and magnitude are uncertain. This uncertainty presents challenges for individual organizations in understanding the potential effects of climate change on their businesses, strategies, and financial performance. To appropriately incorporate the potential effects in their planning processes, organizations need to consider how their risks and opportunities may evolve and the potential implications under different conditions. One way to do this is through the use of scenario analysis.

Scenario analysis is a well-established method for developing strategic plans that are more flexible or robust to a range of future states. The use of scenario analysis for assessing climate-related risks and opportunities and their potential implications, however, is relatively recent. While several organizations use scenario analysis to assess the potential effects of climate change, only a few have disclosed results publicly and fewer still have disclosed information about their scenario analyses in financial filings.<sup>36</sup>

The disclosure of organizations' forward-looking assessments of climate-related issues is important for investors and other stakeholders in understanding how vulnerable individual organizations are to transition and physical climate-related risks and how such vulnerabilities are or would be addressed. As a result, the Task Force believes that organizations should use scenario analysis to assess potential business, strategic, and financial implications of climate-related risks and opportunities and disclose those in their financial filings.

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Scenario analysis is an important and useful tool for understanding the strategic implications of climate-related risks and opportunities.

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This section provides additional information on using scenario analysis as a tool to assess potential implications of climate-related risks and opportunities. In addition, a technical supplement, "The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities," on the Task Force's website provides further information on the types of climate-related scenarios, the application of scenario analysis, and the key challenges in implementing scenario analysis.<sup>37</sup>

### 1. Overview of Scenario Analysis

Scenario analysis is a process for identifying and assessing a potential range of outcomes of future events under conditions of uncertainty. Scenarios are hypothetical constructs and not intended to represent a full description of the possible future. Instead, scenarios provide a way for organizations to consider how the future might look if certain trends continue or certain conditions are met. 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.

Scenario analysis can be qualitative, relying on descriptive, written narratives, or quantitative, relying on numerical data and models, or some combination of both. Qualitative scenario analysis explores relationships and trends for which little or no numerical data is available, while quantitative scenario analysis can assess a range of potential financial or other measurable impacts. Both rely on scenarios that are internally consistent, logical, and based on explicit assumptions and constraints that result in plausible future development paths.

<sup>36</sup> Some organizations in the energy and investment sectors have made public disclosures based on climate-related scenario analysis and discussed how the energy transition would affect their current asset portfolio, including in some instances publishing that information in their financial filings.

<sup>37</sup> <https://www.fsb-tcfd.org/publication/technical-supplement/>

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As summarized in Figure 6, there are several reasons why scenario analysis is a useful tool for organizations in assessing the potential implications of climate-related risks and opportunities.

Figure 6

## Reasons to Consider Using Scenario Analysis for Climate Change

- 1 Scenario analysis can help organizations consider issues, like climate change, that have the following characteristics:
  - Possible outcomes that are highly uncertain (e.g., the physical response of the climate and ecosystems to higher levels of GHG emissions in the atmosphere)
  - Outcomes that will play out over the medium to longer term (e.g., timing, distribution, and mechanisms of the transition to a lower-carbon economy)
  - Potential disruptive effects that, due to uncertainty and complexity, are substantial
- 2 Scenario analysis can enhance organizations' strategic conversations about the future by considering, in a more structured manner, what may unfold that is different from business-as-usual. Importantly, it broadens decision makers' thinking across a range of plausible scenarios, including scenarios where climate-related impacts can be significant.
- 3 Scenario analysis can help organizations frame and assess the potential range of plausible business, strategic, and financial impacts from climate change and the associated management actions that may need to be considered in strategic and financial plans. This can lead to more robust strategies under a wider range of uncertain future conditions.
- 4 Scenario analysis can help organizations identify indicators to monitor the external environment and better recognize when the environment is moving toward a different scenario state (or to a different stage along a scenario path). This allows organizations the opportunity to reassess and adjust their strategies and financial plans accordingly.<sup>38</sup>
- 5 Scenario analysis can assist investors in understanding the robustness of organizations' strategies and financial plans and in comparing risks and opportunities across organizations.

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## 2. Exposure to Climate-Related Risks

The effects of climate change on specific sectors, industries, and individual organizations are highly variable (see [Box 3](#) on p. 30). It is important, therefore, that all organizations consider applying a basic level of scenario analysis in their strategic planning and risk management processes. Organizations more significantly affected by transition risk (e.g., fossil fuel-based industries, energy-intensive manufacturers, and transportation activities) and/or physical risk (e.g., agriculture, transportation and building infrastructure, insurance, and tourism) should consider a more in-depth application of scenario analysis.<sup>39</sup>

### a. Exposure to Transition Risks

Transition risk scenarios are particularly relevant for resource-intensive organizations with high GHG emissions within their value chains, where policy actions, technology, or market changes aimed at emissions reductions, energy efficiency, subsidies or taxes, or other constraints or incentives may have a particularly direct effect.

<sup>38</sup> J. Maack, Scenario Analysis: A Tool for Task Managers. [http://siteresources.worldbank.org/INTPSIA/Resources/490023-1121114603600/13053\\_scenarioanalysis.pdf](http://siteresources.worldbank.org/INTPSIA/Resources/490023-1121114603600/13053_scenarioanalysis.pdf).

<sup>39</sup> Transition risk is the risk around the nature, extent and timing of climate-related policies, the deployment of climate-friendly technologies, and market changes in response to climate-related risks. Physical risks are those associated with the physical effects of climate change, and potential impacts on organizations include physical damage to assets, business disruptions, and increased capital expenditures needed to address variations in weather patterns.

A key type of transition risk scenario is a so-called 2°C scenario, which lays out a pathway and an emissions trajectory consistent with holding the increase in the global average temperature to 2°C above pre-industrial levels. A 2°C scenario provides a common reference point that is aligned with the objectives of the Paris Agreement and will support investors' evaluation of the potential magnitude and timing of transition-related implications for individual organizations across different organizations within a sector; and across different sectors.

### **b. Exposure to Physical Risks**

A wide range of organizations are exposed to climate-related physical risks. Physical climate-related scenarios are particularly relevant for organizations exposed to acute or chronic climate change, such as those with:

- long-lived, fixed assets;
- locations or operations in climate-sensitive regions (e.g., coastal and flood zones);
- reliance on availability of water; and
- value chains exposed to the above.

Physical risk scenarios generally identify extreme weather threats of moderate or higher risk before 2030 and a larger number and range of physical threats between 2030 and 2050. Although most climate models deliver scenario results for physical impacts beyond 2050, organizations typically focus on the financial consequences of physical risk scenarios over shorter time frames that reflect the lifetimes of their respective assets or liabilities, which vary across sectors and organizations.

## **3. Recommended Approach to Scenario Analysis**

The Task Force believes that all organizations exposed to climate-related risks should consider: (1) using scenario analysis to help inform their strategic and financial planning processes and (2) disclosing the potential impacts and related organizational responses. The Task Force recognizes that, for many organizations, scenario analysis is or would be a highly qualitative exercise. However, organizations with more significant exposure to transition risk and/or physical risk should undertake more rigorous qualitative and, if relevant, quantitative scenario analysis.

A critical aspect of scenario analysis is the selection of a set of scenarios (not just one) that covers a reasonable variety of future outcomes, both favorable and unfavorable. In this regard, the Task Force recommends organizations use a 2°C scenario in addition to two or three other scenarios most relevant to their circumstances, such as scenarios related to Nationally Determined Contributions (NDCs), business-as-usual scenarios, or other challenging scenarios.<sup>40</sup>

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<sup>40</sup> "The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities" provides more information on scenario inputs, analytical assumptions and choices, and assessment and presentation of strategic and financial impacts

Box 3

## Analyses of Sectors and Industries Affected by Climate-Related Risks

**Mercer**  
Investing in a Time of  
Climate Change

Highlights the potential variability of climate change on returns across 14 asset classes and 14 industry sectors over a 35-year period. It concludes that median annual returns could vary from +3.5% (for renewables) to -4.9% (for coal) under different climate scenarios.

**Moody's Investors  
Service**  
Environmental Risks  
Heat Map

Qualitatively scores 86 rated sectors globally for credit exposure to environmental risks in terms of both the materiality and timing of any likely credit effects. Scoring is based on five subcategories of environmental risk, of which one subcategory is carbon regulation. It identified 13 sectors with very high or high exposure to carbon regulations.

**S&P Global Ratings**  
How Environmental  
and Climate Risks  
Factor Into Corporate  
Ratings

Identifies subsectors which are most exposed to environmental and climate-related risks and how ratings have been impacted over a two year look back period by risk. Highlights nearly 300 cases where such risks impacted the rating analysis and around 60 cases where rating revisions were made.

**Sustainability  
Accounting  
Standards Board**  
Technical Bulletin  
2016-01 on Climate  
Risk

Profiles climate-related risk across 79 industries related to: physical effects; transition to a low-carbon economy; and climate-related regulation. It also considers revenue impacts, cost impacts, asset impacts, and financing impacts. It identified 72 industries significantly affected by climate-related risk, although the risk manifests itself differently from one industry to the next.

**World Resources  
Institute (WRI) and  
United Nations  
Environment  
Program Finance  
Initiative (UNEP FI)**  
Proposed Discussion  
Framework on Carbon  
Asset Risk

Explores sector-level exposure to three indicators of carbon risk (sector carbon intensity of sales, physical assets life span, and EBIT margin). The report identifies sectors with the highest potential exposure to a low-carbon transition. They include organizations with:

- fossil assets: coal and consumable fuels that have high carbon intensity per \$ sales,
- fossil-fuel-dependent infrastructure such as utilities, pipelines, airports and railways that have high physical asset life spans,
- high-carbon assets facing a shift to low-carbon technologies (e.g., energy-using equipment in the transport sector), and
- high carbon assets without low-carbon competitors (such as for production of basic materials).

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For an organization at the initial or early stages of implementing scenario analysis or with limited exposure to climate-related issues, the Task Force recommends disclosing how, qualitatively or directionally, the organization's strategy and financial plans may be affected under relevant climate change scenarios. This information helps investors, lenders, insurance underwriters, and other stakeholders understand the robustness of an organization's forward-looking strategy and financial plans across a range of possible future states. Scenario analysis disclosures can be most useful when they are related to the organization's main financial information.

Organizations with more significant exposure to climate-related issues should consider disclosing key inputs and assumptions related to their scenario analysis to allow users to understand the process and its limitations. In particular, it is important to understand the critical parameters and assumptions that materially affect the conclusions drawn.<sup>41</sup> As a result, the Task Force believes that organizations with significant climate-related exposures should *strive* to disclose the elements described in [Figure 7](#) (p. 31).

<sup>41</sup> "The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities" provides more information on scenario inputs, analytical assumptions and choices, and assessment and presentation of strategic and financial impacts.

Figure 7

## Disclosure Considerations for Certain Non-Financial Organizations

Organizations with more significant exposure to climate-related issues should consider disclosing key aspects of their scenario analysis, such as the ones described below.

- 1 The scenarios used, including the 2°C scenario, the key assumptions and considerations underlying each scenario, and whether scenarios with major disruptions (positive and negative) from business-as-usual (breakthroughs, breakdowns) were considered<sup>42</sup>
- 2 Any adjustments or differences of the 2°C scenario used from publicly available 2°C scenarios
- 3 Critical input parameters, assumptions, and analytical choices for the scenarios used, including such factors as:
  - Internal carbon prices and assumptions of how they develop over time<sup>43</sup>
  - Assumptions about policy responses and timing
  - Assumptions about technology responses and timing (e.g., evolution of products/services, the technology used to produce them, and costs to implement)
  - Assumptions made around potential differences in input parameters across regions, countries, asset locations, and/or markets
  - Approximate sensitivities to key assumptions
- 4 Time frames used for scenarios, including short-, medium-, and long-term milestones (e.g., how organizations consider timing of potential future implications under the scenarios used)
- 5 Information about the conclusions drawn from scenario analysis, including the organization's likely strategic performance under the various scenarios considered, potential implications for the organization's value chain, capital allocation decisions, research and development expenditures, and material financial implications for the organization's operating results and/or financial position

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### 4. Applying Scenario Analysis

While the Task Force recognizes the complexities of scenario analysis and the potential resources needed to conduct it, it encourages organizations to use scenario analysis to assess climate-related risks and opportunities. For organizations just beginning to use scenario analysis, a qualitative approach that progresses and deepens over time may be appropriate.<sup>44</sup> Greater rigor and sophistication in the use of data and quantitative models and analysis may be warranted for organizations with more extensive experience in conducting scenario analysis. Organizations may decide to use existing external scenarios and models (e.g., those provided by third-party vendors) or develop their own, in-house modeling capabilities. The choice of approach will depend on an organization's needs, resources, and capabilities.

In conducting scenario analysis, organizations should strive to achieve:

- transparency around parameters, assumptions, analytical approaches, and time frames;
- comparability of results across different scenarios and analytical approaches;
- adequate documentation for the methodology, assumptions, data sources, and analytics;
- consistency of methodology year over year;
- sound governance over the scenario analysis conduct, validation, approval, and application;

<sup>42</sup> The objective of the Paris Agreement is to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. The IEA is developing a 1.5°C scenario that organizations may find useful.

<sup>43</sup> For example, the assumptions made about how internal carbon prices would develop over time; whether the internal carbon price applies to specific facilities or projections of demand for fossil fuels, only at the margin or as a base cost; whether it is applied to specific economic sectors or across the whole economy and in what regions; or whether a common internal carbon price is used at multiple points in time or differentiated prices.

<sup>44</sup> Organizations considering undertaking scenario analysis may wish to conduct various sensitivity analyses around key climate factors as a precursor to scenario analysis, recognizing that sensitivity analysis and scenario analysis are different, but complementary, processes.

- linkage of scenario analysis to related financial reporting disclosures; and
- effective disclosure of scenario analysis that will inform and promote a constructive dialogue between investors and organizations on the range of potential impacts and robustness of the organization’s strategy under various future climate states.

In applying scenario analysis, organizations should consider implications for their strategies, capital allocation, and costs and revenues, both at an enterprise-wide level and at the level of specific regions and markets where specific implications of climate change for the organization are likely to arise. Financial-sector organizations should consider using scenario analysis to evaluate the potential impact of climate-related scenarios on individual assets or investments, investments or assets in a particular sector or region, or underwriting activities.

The Task Force’s supplemental guidance recognizes that organizations will be at different levels of experience in using scenario analysis. However, it is important for organizations to use scenario analysis and develop the necessary organizational skills and capabilities to assess climate-related risks and opportunities, with the expectation that organizations will evolve and deepen their use of scenario analysis over time. The objective is to assist investors and other stakeholders in better understanding:

- the degree of robustness of the organization’s strategy and financial plans under different plausible future states of the world;
- how the organization may be positioning itself to take advantage of opportunities and plans to mitigate or adapt to climate-related risks; and
- how the organization is challenging itself to think strategically about longer-term climate-related risks and opportunities.

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# E Key Issues Considered and Areas for Further Work

## E Key Issues Considered and Areas for Further Work

The diverse perspectives of Task Force members as well as outreach efforts to preparers and users of climate-related financial disclosures and other stakeholders provided valuable insight into the challenges that different organizations—both non-financial and financial—may encounter in preparing disclosures consistent with the Task Force’s recommendations. The Task Force considered these issues and others in developing and refining its recommendations and sought to balance the burden of disclosure on preparers with the need for consistent and decision-useful information for users (i.e., investors, lenders, insurance underwriters, and other stakeholders). The Task Force acknowledges that its work provides a foundation for climate-related financial disclosures that will evolve over time. Accordingly, the Task Force has identified several areas, as summarized in Figure 8 below, where further research, analysis, and methodological and standards development may be useful.

Figure 8

### Key Areas for Further Work

<b>Relationship to Other Reporting Initiatives</b>	Encourage standard setting organizations and others to actively work toward greater alignment of frameworks and to support adoption
<b>Data Quality and Financial Impact</b>	Undertake further research and analysis to better measure and understand how climate-related issues translate into potential financial impacts
<b>Reporting GHG Emissions Associated with Investments</b>	Develop methodologies for allocating emissions in asset classes beyond equities, including non-corporate bonds, property/real estate, infrastructure, private equity, and alternative assets Improve data quality, increase understanding of climate-related risks and opportunities, and enhance risk measurement methodologies broadly
<b>Scenario Analysis</b>	Further develop applicable 2°C (or lower) transition scenarios and supporting outputs and tools/user interfaces Develop broadly accepted methodologies, datasets and tools for scenario-based evaluation of physical risk by organizations Make datasets and tools publicly available and provide commonly available platforms for scenario analysis

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### 1. Relationship to Other Reporting Initiatives

Some organizations expressed concern that multiple disclosure frameworks and mandatory reporting requirements increase the administrative burden of disclosure efforts. Specifically, the additional time, cost, and effort required to analyze and disclose new climate-related information could penalize those with less capacity to respond.

The Task Force considered existing voluntary and mandatory climate-related reporting frameworks in developing its recommendations and provides information in the Annex on the alignment of existing frameworks, including those developed by the CDP (formerly the Carbon Disclosure Project), Climate Disclosure Standards Board (CDSB), the Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC), and the Sustainability Accounting Standards Board (SASB), with the Task Force’s recommended disclosures. The Task Force’s recommendations provide a common set of principles that should help existing disclosure regimes come into closer alignment over time. Preparers, users, and other stakeholders share a common interest in encouraging such alignment as it relieves a burden for reporting entities, reduces fragmented disclosure, and provides greater comparability for users. The Task Force also encourages standard setting bodies to support adoption of the recommendations and alignment with the recommended disclosures.

## 2. Location of Disclosures and Materiality

In considering possible reporting venues, the Task Force reviewed existing regimes for climate-related disclosures across G20 countries. While many G20 countries have rules or regulatory guidance that require climate-related disclosure for organizations, most are not explicitly focused on climate-related *financial* information.<sup>45</sup> In addition, the locations of these disclosures vary significantly and range from surveys sent to regulators to sustainability reports to annual financial filings (see [Appendix 3](#)).

The Task Force also reviewed financial filing requirements applicable to public companies across G20 countries and found that in most G20 countries, issuers have a legal obligation to disclose material risks in their financial reports—which includes material, climate-related risks. Such reporting may take the form of a general disclosure of material information, but many jurisdictions require disclosure of material information in specific sections of the financial filing (e.g., in a discussion on risk factors).<sup>46</sup>

Based on its review, the Task Force recommends preparers of climate-related financial disclosures provide such disclosures in their mainstream (i.e., public) financial filings. The Task Force believes publication of climate-related financial information in mainstream financial filings will ensure that appropriate controls govern the production and disclosure of the required information.

Some of the Task Force's recommended disclosures are line item disclosures, and some involve an assessment of materiality. The Task Force believes it is important to an understanding of an organization's financial and operating results to have insight into the governance and risk management context in which such results are achieved. The recommended disclosures related to governance and risk management directly address this need for context. For the recommended disclosures that involve an assessment of materiality, the Task Force believes organizations should determine materiality for climate-related issues consistent with how they determine the materiality of other risks affecting their business and consistent with their financial filing requirements. 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. Organizations have extensive experience with evaluating the materiality of particular risks, and the Task Force is confident they will bring that experience to bear in addressing climate-related risks.

Figure 9

### Reporting by Asset Owners

The financial reporting requirements and practices of asset owners vary widely and differ from what is required of organizations with public debt or equity. Some asset owners have no public reporting, while others provide extensive public reporting. For purposes of adopting the Task Force's recommendations, asset owners should use their existing channels of financial reporting to their beneficiaries and others where relevant and feasible.

### Reporting by Asset Managers

Reporting to clients by asset managers also takes different forms, depending on the requirements of the client and the types of investments made. For example, an investor in a mutual fund might receive quarterly, or download from the asset manager's website, a "fund fact sheet" that reports, among other information, the top holdings by value, the top performers by returns, and the carbon footprint of the portfolio against a stated benchmark. An investor in a segregated account (one in which he or she is the sole investor) might receive more detailed reporting, including items such as the aggregate carbon intensity of the portfolio compared with a benchmark, the portfolio's exposure to green revenue (and how this changes over time), or insight into portfolio positioning under different climate scenarios. The Task Force appreciates that climate-related risk reporting by asset managers is in the very early stages and encourages progress and innovation by the industry.

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<sup>45</sup> Organization for Economic Co-operation and Development (OECD) and CDSB, "Climate Change Disclosure in G20 Countries: Stocktaking of Corporate Reporting Schemes." November 18, 2015. [www.oecd.org/investment/corporate-climate-change-disclosure-report.htm](http://www.oecd.org/investment/corporate-climate-change-disclosure-report.htm).

<sup>46</sup> N. Ganci, S. Hammer, T. Reilly, and P. Rodel, "Environmental and Climate Change Disclosure under the Securities Laws: A Multijurisdictional Survey." Debevoise & Plimpton, March 2016. [http://www.debevoise.com/~media/files/insights/publications/2016/03/20160316\\_environmental\\_and\\_climate\\_change\\_disclosure\\_under\\_the\\_security.pdf](http://www.debevoise.com/~media/files/insights/publications/2016/03/20160316_environmental_and_climate_change_disclosure_under_the_security.pdf).

The Task Force recognizes reporting by asset managers and asset owners to their clients and beneficiaries, respectively, generally occurs outside mainstream financial filings (Figure 9, p. 35). For purposes of adopting the Task Force's recommendations, asset managers and asset owners should use their existing channels of financial reporting to their clients and beneficiaries where relevant and where feasible.

### 3. Sensitivities Around Transparency

Some organizations expressed concern about the potential commercial and litigation risks associated with disclosing climate-related financial information, particularly as part of their financial filings. Some noted concerns about disclosing information on scenario analysis that is commercially sensitive to an organization's competitive position, such as assumptions around future changes in government policy and commodity (including carbon) prices. Others noted that the disclosures could put organizations at greater risk of litigation given the high degree of uncertainty around the future timing and magnitude of climate-related impacts.

The Task Force recognizes that organizations may want more experience with scenario analysis before including such information in financial filings. While disclosure in mainstream financial filings should be the ultimate goal of preparers, disclosure via other forms (e.g., website, sustainability report) may be an interim step on the path to disclosure in mainstream financial filings. In addition, the Task Force encourages organizations to disclose forward-looking, decision-useful information consistent with the recommended disclosures along with appropriate cautionary language that allows users of the disclosures to understand the factors that drove the assessment.

### 4. Data Quality and Financial Impact

Some preparers expressed concern about assessing and disclosing the financial implications of climate change with a high degree of accuracy and reliability. The most common difficulties identified are summarized below.

- The gaps in emissions measurement methodologies, including Scope 3 emissions<sup>47</sup> and product life-cycle emissions<sup>48</sup> methodologies, make reliable and accurate estimates difficult.
- The lack of robust and cost-effective tools to quantify the potential impact of climate-related risks and opportunities at the asset and/or project level makes aggregation across an organization's activities and/or investment portfolios problematic and costly.
- The need to consider the variability of climate-related impacts across and within different sectors and markets further complicates the process (and magnifies the cost) of assessing potential climate-related financial impacts.
- The high degree of uncertainty around the timing and magnitude of climate-related risks makes it difficult to determine and disclose the potential impacts with precision.

The Task Force recognizes these challenges and encourages preparers to include in their disclosures a description of gaps, limitations, and assumptions made as part of their assessment of climate-related issues. In addition, the Task Force encourages further research and analysis by sector and industry experts to better measure and understand how climate-related issues translate into potential financial impacts.

<sup>47</sup> Scope 3 emissions are all indirect emissions that occur in the value chain of the reporting company, including both upstream and downstream emissions. GHG Protocol, <http://www.ghgprotocol.org/calculation-tools/faq>.

<sup>48</sup> Product life cycle emissions are all the emissions associated with the production and use of a specific product, from cradle to grave, including emissions from raw materials, manufacture, transport, storage, sale, use, and disposal. GHG Protocol, [www.ghgprotocol.org/calculation-tools/faq](http://www.ghgprotocol.org/calculation-tools/faq).

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## 5. Reporting GHG Emissions Associated with Investments

As part of the Task Force's discussions with preparers, some asset owners and asset managers expressed concern about reporting on emissions related to their own or their clients' investments given the current data challenges and existing accounting guidance on how to measure and report GHG emissions associated with investments. In particular, they voiced concerns about the accuracy and completeness of the reported data, which is mainly limited to listed companies, as well as data gaps for several asset classes, including non-corporate bonds, property/real estate, infrastructure, private equity, and alternative assets. They also noted issues related to methodology, including double counting of emissions and aggregating within an asset class and across multiple asset classes.

The Task Force acknowledges the challenges and limitations of reporting GHG emissions associated with investments, including that GHG emissions should not necessarily be interpreted as a risk metric. However, the Task Force believes reporting metrics that provide some visibility into the concentration of carbon-related assets is important. The Task Force views the reporting of GHG emissions associated with investments as a first step and expects disclosure of this information to prompt important advancements in the development of decision-useful, climate-related risk metrics. As such, the Task Force encourages asset owners and asset managers to report to their beneficiaries and clients GHG emissions associated with their investments, where feasible, consistent with the GHG Protocol methodology and normalized for every million of the reporting currency invested. The Task Force recognizes that some asset owners and asset managers may be able to report such information on only a portion of their investments given data availability and methodological issues. Nonetheless, increasing the number of organizations reporting this type of information should help speed the development of better climate-related risk metrics.

## 6. Scenario Analysis

As described in section D on Scenario Analysis and Climate-Related Issues, scenario analysis is a well-established strategic planning tool for addressing uncertain futures, but its application to climate-related risks and opportunities is relatively recent. The Task Force recognizes that incorporating scenario analysis into strategic and financial planning processes will evolve over time as organizations "learn by doing." To facilitate progress in this area, the Task Force encourages further work as follows:

- further developing applicable 2°C (or lower) transition scenarios and supporting outputs and tools/user interfaces, including sector or geographic scenarios;
- developing broadly accepted methodologies, data sets, and tools for scenario-based evaluation of physical risk by organizations;
- making these data sets and tools publicly available to facilitate use by organizations, reduce organizational transaction costs, minimize gaps between jurisdictions in terms of technical expertise, enhance comparability of climate risk assessments by organizations, and help ensure comparability for investors; and
- creating more industry specific (financial and non-financial) guidance for preparers and users of climate-related scenarios.

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## 7. Accounting Considerations

As part of its work, the Task Force considered the interconnectivity of its recommendations with existing financial statement and disclosure requirements. The Task Force determined that the two primary accounting standard setting bodies, the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), have issued standards to address risks and uncertainties affecting companies. Both International Accounting Standard (IAS) 37 “Provisions, Contingent Liabilities and Contingent Assets” and Accounting Standards Codification (ASC) 450 “Contingencies” provide guidance on how to account for and disclose contingencies. Additionally, IAS 36 “Impairment of Assets” and ASC 360 “Long-lived Asset Impairment” provide guidance on assessing the impairment of long-lived assets. The disclosures of both contingencies and management’s assessment and evaluation of long-lived assets for potential impairment are critically important in assisting stakeholders in understanding an organization’s ability to meet future reported earnings and cash flow goals.

In most G20 countries, financial executives will recognize that the Task Force’s disclosure recommendations will result in more quantitative financial disclosures, particularly disclosure of metrics, about the financial impact that climate-related risks have or could have on an organization. Specifically, asset impairments may result from assets adversely impacted by the effects of climate change and/or additional liabilities may need to be recorded to account for regulatory fines and penalties resulting from enhanced regulatory standards. Additionally, cash flows from operations, net income, and access to capital could all be impacted by the effects of climate-related risks (and opportunities). Therefore, financial executives (e.g., chief financial officers, chief accounting officers, and controllers) will need to be involved in the organization’s evaluation of climate-related risks and opportunities and the efforts undertaken to manage the risks and maximize the opportunities. Finally, careful consideration will need to be given to the linkage between scenario analyses performed to assess the potential impact of climate-related risks and opportunities (as suggested in the Task Force’s recommendations) and assumptions underlying cash flow analyses used to assess asset (e.g., goodwill, intangibles, and fixed assets) impairments.

## 8. Time Frames for Short, Medium, and Long Term

The Task Force acknowledges the difficulties in specifying time frames across sectors for short, medium, and long term given that the timing of climate-related impacts on businesses will vary—particularly policy, technology, and market risks. The Task Force is, therefore, not specifying time frames and encourages preparers to decide how to define their own time frames according to the life of their assets, the profile of the climate-related risks they face, and/or the sectors and geographies in which they operate.

In assessing climate-related issues, organizations should be sensitive to the time frames used to conduct their assessments. While many organizations conduct operational and financial planning over a 1-2 year time frame and strategic and capital planning over a 2-5 year time frame, climate-related risks may have implications for an organization over a longer period. It is, therefore, important for organizations to consider the appropriate time frames when assessing climate-related risks.

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## 9. Scope of Coverage

To promote more informed investing, lending, and insurance underwriting decisions, the Task Force recommends all financial and non-financial organizations with public debt and/or equity adopt its recommendations.<sup>49</sup> Because climate-related risks and opportunities are relevant for organizations across all sectors, the Task Force encourages all other organizations to adopt these recommendations as well. In addition, the Task Force believes that asset managers and asset owners, including public- and private-sector pension plans, insurance companies, endowments, and foundations, should implement its recommendations. The Task Force believes climate-related financial information should be provided to asset managers' clients and asset owners' beneficiaries so that they may better understand the performance of their assets, consider the risks of their investments, and make more informed investment choices.

Consistent with existing global stewardship frameworks, asset owners should engage with the organizations in which they invest to encourage adoption of these recommendations. They should also ask their asset managers to adopt these recommendations. Asset owners' expectations in relation to climate-related risk reporting from organizations and asset managers are likely to evolve as data quality improves, understanding of climate-related risk increases, and risk measurement methodologies are further developed.

The Task Force recognizes that several asset owners expressed concern about being identified as the potential "policing body" charged with ensuring adoption of the Task Force's recommendations by asset managers and underlying organizations. The Task Force appreciates that expectations must be reasonable and that asset owners have many competing priorities, but encourages them to help drive adoption of the recommendations. Because asset owners and asset managers sit at the top of the investment chain, they have an important role to play in influencing the organizations in which they invest to provide better climate-related financial disclosures.

## 10. Organizational Ownership

Some organizations have not formalized responsibility for climate-related risk assessment and management. Even for organizations with clearly assigned responsibilities for climate-related issues, the relationship between those responsible for climate risk (e.g., "environmental, social and governance" experts, chief investment officers) and those in the finance function can range from regularly scheduled interactions and exchanges of information to minimal or no interaction. According to some preparers, lack of clarity around responsibility for climate-related risk assessments and management, compounded by a lack of integration into organizations' financial reporting processes, could adversely impact implementation of the recommendations.

The Task Force believes that by encouraging disclosure of climate-related financial information in public financial filings, coordination between organizations' climate risk experts and the finance function will improve. Similar to the way organizations are evolving to include cyber security issues in their strategic and financial planning efforts, so too should they evolve for climate-related issues.

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<sup>49</sup> Thresholds for climate-related financial disclosures should be aligned to the financial disclosure requirements more broadly in the jurisdictions where a preparer is incorporated and/or operates and is required to make financial disclosures.

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# F Conclusion

## F Conclusion

The Task Force’s recommendations are a foundation for improved reporting of climate-related issues in mainstream financial filings with several resulting benefits (outlined in Figure 10). The recommendations aim to be ambitious, but also practical for near-term adoption. The Task Force expects that reporting of climate-related risks and opportunities will evolve over time as organizations, investors, and others contribute to the quality and consistency of the information disclosed.

Figure 10

### Benefits of Recommendations

- Foundation for immediate adoption and flexible enough to accommodate evolving practices
- Promote board and senior management engagement on climate-related issues
- Bring the “future” nature of issues into the present through scenario analysis
- Support understanding of financial sector’s exposure to climate-related risks
- Designed to solicit decision-useful, forward-looking information on financial impacts

### 1. Evolution of Climate-Related Financial Disclosures

The Task Force recognizes that challenges exist, but all types of organizations can develop disclosures consistent with its recommendations. The recommendations provide a foundation for immediate adoption and are flexible enough to accommodate evolving practices. As data analytics and modeling for climate-related information become more widespread, disclosures can mature accordingly.

Organizations already reporting climate-related financial information under other frameworks may be well-positioned to disclose under this framework immediately and are encouraged to do so. Those with less experience can begin by considering and disclosing how climate-related issues may be relevant in their current governance, strategy, and risk management practices. This initial level of disclosure will allow investors to review, recognize, and understand how organizations consider climate-related issues and their potential financial impact.

The Task Force also recognizes that organizations may want more experience with scenario analysis before including this information in financial filings, but disclosure through other channels is still important. Qualitative explanations can come first, then, with more experience and maturity, the Task Force would expect to see disclosure of more quantitative scenario analyses, including underlying assumptions, in financial filings.

### 2. Widespread Adoption Critical

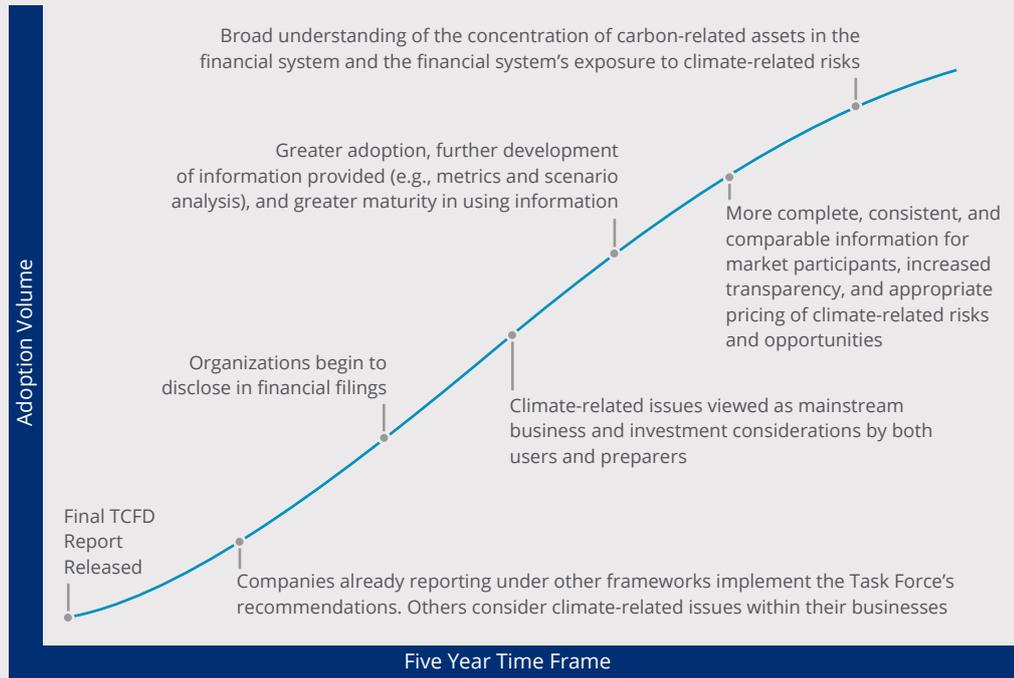
In the Task Force’s view, the success of these recommendations depends on near-term, widespread adoption by organizations in the financial and non-financial sectors. Through widespread adoption, financial risks and opportunities related to climate change will become a natural part of organizations’ risk management and strategic planning processes. As this occurs, organizations’ and investors’ understanding of the potential financial implications associated with transitioning to a lower-carbon economy and physical climate-related risks will grow, information will become more decision-useful, and risks and opportunities will be more accurately priced, allowing for the more efficient allocation of capital. [Figure 11](#) (p. 42) outlines a possible path for implementation.

Widespread adoption of the recommendations will require ongoing leadership by the G20 and its member countries. Such leadership is essential to continue to make the link between these recommendations and the achievements of global climate objectives. Leadership from the FSB is also critical to underscore the importance of better climate-related financial disclosures for the functioning of the financial system.

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Figure 11

### Implementation Path (Illustrative)



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The Task Force is not alone in its work. A variety of stakeholders, including stock exchanges, investment consultants, credit rating agencies, and others can provide valuable contributions toward adoption of the recommendations. The Task Force believes that advocacy for these standards will be necessary for widespread adoption, including educating organizations that will disclose climate-related financial information and those that will use those disclosures to make financial decisions. To this end, the Task Force notes that strong support by the FSB and G20 authorities would have a positive impact on implementation. Members of the Task Force stand ready to support the FSB and G20 authorities in promoting adoption of the recommendations.

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# Appendix 1: Task Force Members

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### Denise Pavarina

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Executive Director  
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### Graeme Pitkethly

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### **Russell Picot**

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### **Joe Perry**

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### **Rupert Thorne**

Deputy to the Secretary General  
Financial Stability Board

# Appendix 2: Task Force Objectives and Approach

## 1. Objectives

The Task Force engaged with key stakeholders throughout the development of its recommendations to ensure that its work would (1) promote alignment across existing disclosure regimes, (2) consider the perspectives of users and the concerns of preparers of climate-related financial disclosures, and (3) be efficiently implemented by organizations in their financial reporting.

## 2. Approach

In addition to the expertise of its members, a broad range of external resources informed the Task Force's recommendations, including existing voluntary and mandatory climate-related reporting frameworks, governance and risk management standards, government reports and research, expert resources, and various other stakeholders such as industry participants, trade associations, and non-governmental organizations (NGOs).

### a. Leveraging Expertise

Task Force members come from a range of companies, including large financial companies, large non-financial companies, accounting and consulting firms, and credit rating agencies, and brought a range of practical expertise and global perspectives on preparing and using climate-related financial disclosures. Through six plenary meetings, Task Force members contributed significantly to developing a consensus-based, industry-led approach to climate-related financial disclosure.

Due to the technically challenging and broad focus of its work, the Task Force also sought input from experts in the field of climate change, particularly in relation to scenario analysis. The Task Force engaged Environmental Resources Management (ERM) to inform its work by developing a technical paper on scenario analysis—[The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities](#). Several members of the Task Force, joined by representatives from 2° Investing Initiative (2°ii), Bloomberg New Energy Finance (BNEF), Bloomberg Quantitative Risk Experts, Carbon Tracker, CDP, and the London School of Economics and Political Science led a working group to oversee ERM's technical considerations. A workshop was also held with experts from Oxford Martin School. Additionally, the International Energy Agency (IEA) provided input regarding how scenario analysis can be conducted and used.

### b. Research and Information Gathering

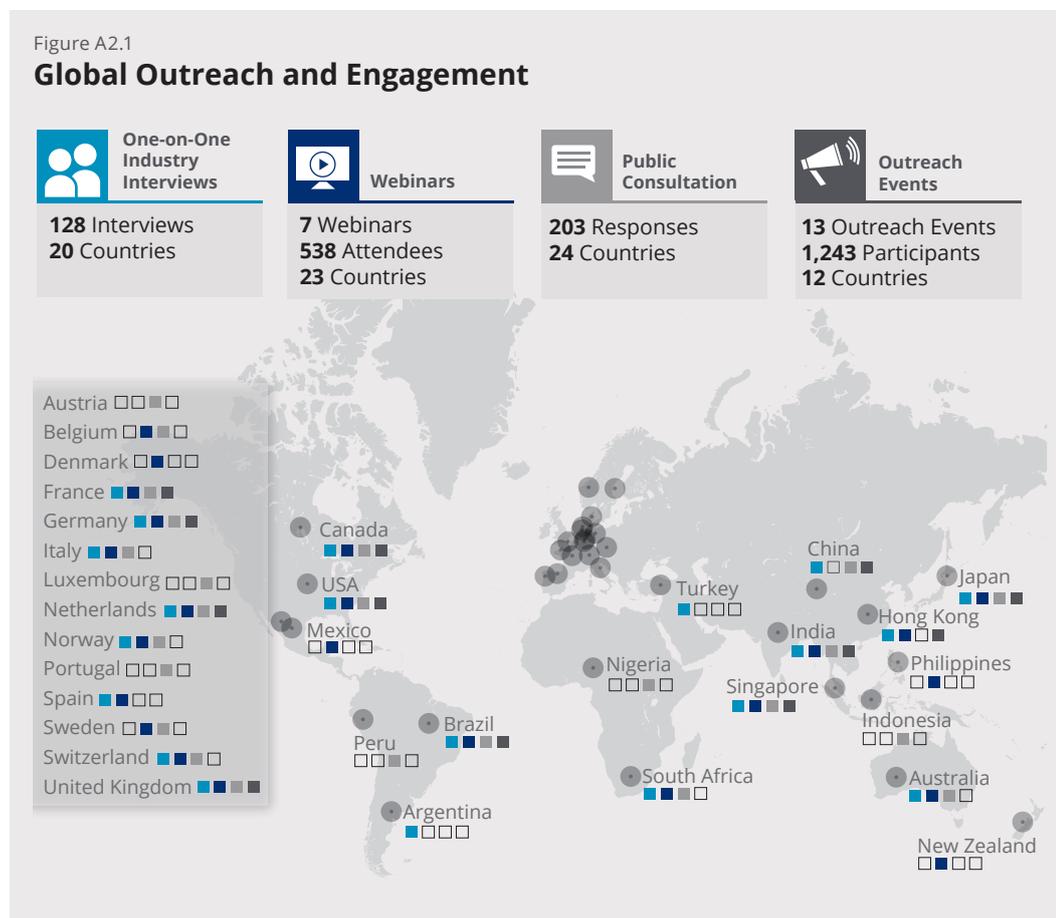
The Task Force's work drew on publications and research conducted by governments, NGOs, industry participants, as well as disclosure regimes with a focus on climate-related issues. The Task Force reviewed existing mandatory and voluntary reporting regimes for climate-related disclosure to identify commonalities and gaps across existing regimes and to determine areas meriting further research and analysis by the Task Force. The work of organizations regarded as standard setters, as well as several organizations active in developing reporting mechanisms for climate-related issues, served as the primary references for the Task Force in developing its recommendations and supporting guidance. The Task Force also considered resources related to sector-specific climate issues in the development of the supplemental guidance

### c. Stakeholder Engagement

Engagement with users, preparers, and other stakeholders in relevant industries and sectors across G20 countries and other countries was important in developing the Task Force's recommendations. The Task Force conducted four types of engagement to support this effort: public consultation, industry interviews, outreach events, and webinars.

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Such engagement served two primary purposes: (1) to raise the level of awareness and educate stakeholders on Task Force efforts and (2) to solicit feedback from stakeholders on the Task Force’s proposed recommended disclosures and supplemental guidance for specific sectors. In total, more than 2,000 individuals in 32 countries were included in the Task Force’s outreach and engagement (Figure A2.1).



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### Public Consultation

Following the publication of the Task Force’s Phase I Report, the Task Force conducted a public consultation to solicit additional feedback on the Phase I Report. In total, 203 participants from 24 countries responded to the public consultation. Respondents represented the financial sector, non-financial sectors, NGOs, and other organizations. Phase I Public Consultation comments indicated support for disclosures on scenario analysis as well as disclosures tailored for specific sectors. Key themes from the Phase I Public Consultation, which informed the Task Force’s recommendations and guidance, are included in [Table A2.1](#) (p. 48).

Table A2.1

## Key Themes of Phase I Public Consultation

Key Themes	Survey Response
<b>Components of Disclosures</b>	The majority of respondents were in agreement that disclosures should: <ul style="list-style-type: none"> <li>– be forward-looking,</li> <li>– address an organization's ability to set/achieve targets, with strategies for achievement, and</li> <li>– align with material risks.</li> </ul>
<b>Sector-Specific Disclosures</b>	Respondents were in favor of disclosures for specific sectors 
<b>Scenario Analysis</b>	Respondents see scenario analysis as a key component of disclosure 

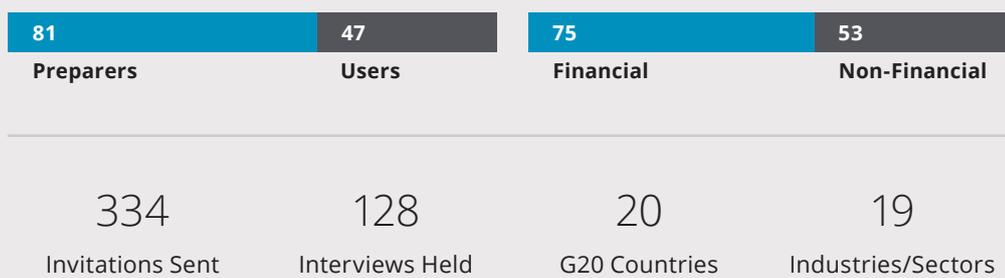
### Industry Interviews

The Task Force conducted 128 industry interviews with users and preparers of financial statements to gather feedback regarding the Task Force's draft recommendations, *supplemental* guidance for certain sectors, and other considerations. Industry interview participants included chief financial officers, investment officers, other finance and accounting officers, risk officers, sustainability officers, and others. Forty-three percent of the participants held finance, legal, or risk positions and 39 percent held environmental and sustainability roles.

Task Force representatives conducted two rounds of industry interviews. The initial round of interviews focused on the second round emphasized specific recommendations and sector-specific guidance. Organizations invited to participate in the interviews met two primary criteria: (1) represented industry and sector leaders likely to be impacted by climate-related risks and opportunities and (2) provided geographic diversity to ensure coverage from each G20 and Financial Stability Board (FSB) represented country. Figure A2.2 provides key industry interview statistics.

Figure A2.2

### Industry Interviews Overview

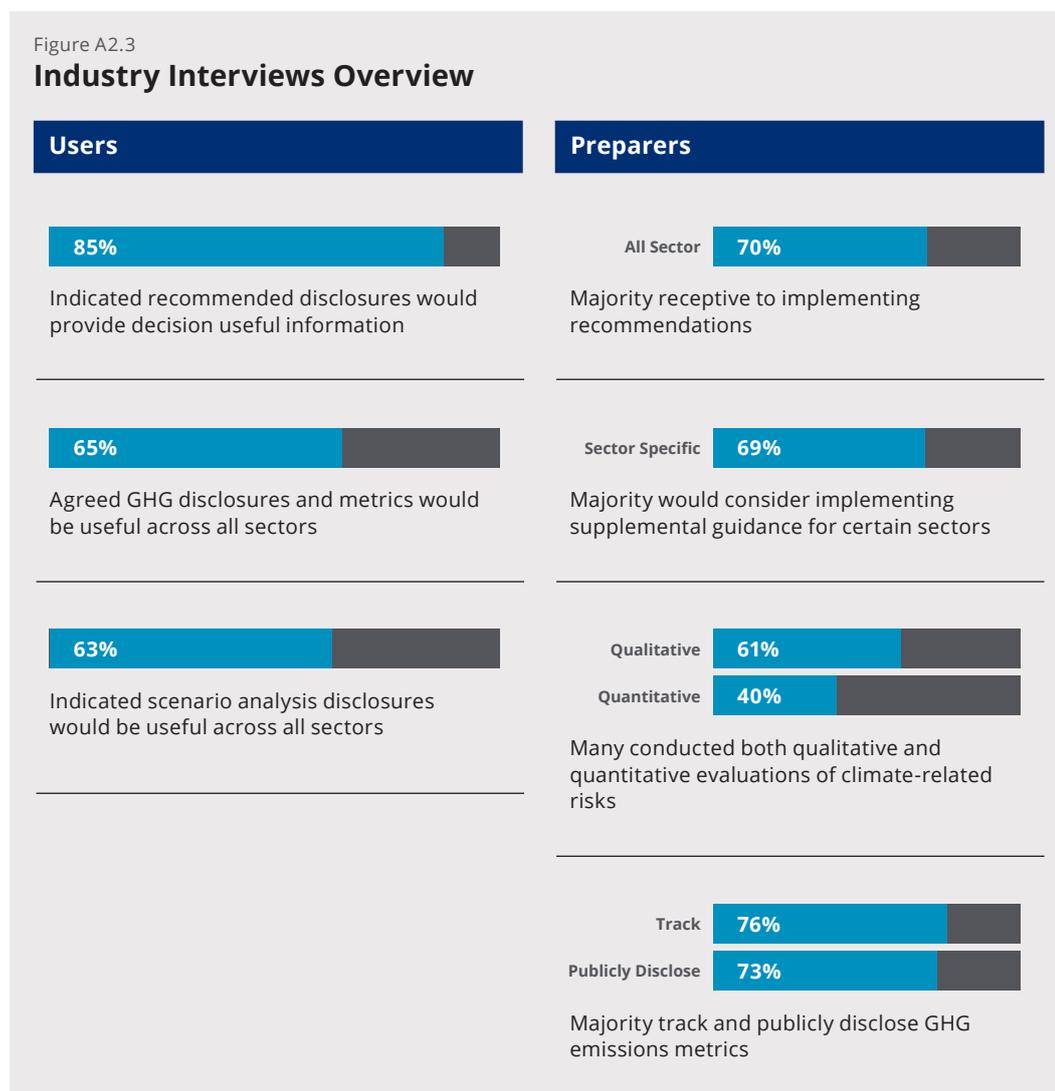


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The interviews provided valuable information that informed the Task Force’s recommendations and guidance. Figure A2.3 provides a summary of key themes from the conversations with users and preparers.



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When comparing preparer responses between non-financial companies (67 percent) and financial companies (33 percent), the responses closely align with the consolidated preparer responses above with the exception of greenhouse gas (GHG) emissions metrics, which have a higher percentage of non-financial respondents that track and publicly disclose such emissions metrics.

Preparers also raised other considerations including: (1) the relationship of Task Force recommendations to other reporting initiatives, (2) how to assess and disclose the financial implications of climate change with a high degree of accuracy and reliability, and (3) reporting GHG emissions associated with investments. Section E Key Issues Considered and Areas for Further Work provides additional discussion of considerations identified during the industry interviews.

Users commented that establishing consistency in metrics reported would be beneficial and acknowledged challenges in regard to the quality of data disclosed by preparers. Regarding scenario analysis, users indicated knowing how the scenario analysis process is applied by an organization would be more important than the outcomes. In addition, they highlighted that organizations should use a range of scenarios rather than just one scenario and indicated the importance of understanding how scenario analysis is used.

### Outreach Events

The Task Force held 13 public outreach events in 12 countries for 1,243 individuals. The events informed stakeholders of the Task Force's work and included panel discussions and keynote speeches by prominent climate-risk and financial experts. Attendees included representatives of financial and non-financial organizations who spanned a variety of corporate functions, including strategy, risk, accounting, portfolio and investment management, corporate sustainability, as well as representatives from industry associations, NGOs, government agencies, research providers, academia, accounting and consulting firms, and media.

### Webinars

Additionally, the Task Force offered seven webinars to educate and increase awareness of the Task Force's efforts as well as to collect additional feedback. The Task Force hosted four webinars and participated in three additional webinars by partnering with the following organizations: Business for Social Responsibility, Global Financial Markets Association, and the National Association of Corporate Directors. These webinars served to supplement the in-person outreach events and offered global stakeholders, regardless of location, an opportunity to engage with the Task Force. The webinars had 538 attendees (representing 365 organizations) across 23 countries.

After each webinar, participants were asked to provide feedback on the Task Force's recommendations through an online survey. Themes from the 71 survey responses included:

- **Preparers.** The majority believe their industry/sector warrants sector-specific recommendations, with most being receptive to implementing sector-specific recommendations. The majority are very or somewhat willing to implement the all-sector recommendations.
- **Users.** Most users believe climate-related disclosure will be very or somewhat useful in making financial decisions.

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## Appendix 3: Select Disclosure Frameworks

To the extent there is corporate reporting of climate-related issues, it happens through a multitude of mandatory and voluntary schemes. Although a complete and comprehensive survey of existing schemes is beyond the scope of this report, the Task Force on Climate-related Financial Disclosures (TCFD or Task Force) considered a broad range of existing frameworks, both voluntary and mandatory. The tables in Appendix 3 outline select disclosure frameworks considered by the Task Force and describe a few key characteristics of each framework, including whether disclosures are mandatory or voluntary, what type of information is reported, who the target reporters and target audiences are, where the disclosed information is placed, and whether there are specified materiality standards.<sup>50</sup> These disclosure frameworks were chosen to illustrate the broad range of disclosure regimes around the world; the tables are broken out into disclosure frameworks sponsored by governments, stock exchanges, and non-governmental organizations (NGOs).

Note: The information presented in the tables below (A3.1, A3.2, and A3.3) is based on information released by governments, stock exchanges, and standard setters and is supplemented by the United Nations Environment Programme (UNEP), “The Financial System We Need: Aligning the Financial System with Sustainable Development,” October 2015, and the Organization for Economic Co-operation and Development (OECD), “Report to G20 Finance Ministers and Central Bank Governors,” September 2015.

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<sup>50</sup> These tables were originally included in the Task Force’s Phase I Report and have been updated where appropriate.

Table A3.1

## Select Disclosure Frameworks, Governments

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Information Disclosed	Disclosure Location	External Assurance Required
<b>Australia:</b> National Greenhouse and Energy Reporting Act (2007)	Financial and nonfinancial firms that meet emissions or energy production or consumption thresholds	General public	Mandatory if thresholds are met	Based on emissions above a certain threshold	GHG emissions, energy consumption, and energy production	Report to government	Regulator may, by written notice to corporation, require an audit of its disclosures
<b>European Union (EU):</b> EU Directive 2014/95 regarding disclosure of nonfinancial and diversity information (2014)	Financial and nonfinancial firms that meet size criteria (i.e., have more than 500 employees)	Investors, consumers, and other stakeholders	Mandatory; must be effective in Member States by December 6, 2016	None specified	Land use, water use, greenhouse gas (GHG) emissions, use of materials, and energy use	Corporate financial report or separate report (published with financial report or on website six months after the balance sheet date and referenced in financial report)	Member States must require that statutory auditor checks whether the nonfinancial statement has been provided.  Member States may require independent assurance for information in nonfinancial statement
<b>France:</b> Article 173, Energy Transition Law (2015)	Listed financial and nonfinancial firms  Additional requirements for institutional investors	Investors, general public	Mandatory	None specified	Consequences on climate change of the company's activities and of the use of goods and services it produces. Institutional investors: GHG emissions, contribution to goal of limiting global warming	Annual report	Mandatory review on the consistency of the disclosure by an independent third party, such as a statutory auditor.
<b>India:</b> National Voluntary Guidelines on Social, Environmental, and Economic Responsibilities of Business (2011)	Financial and nonfinancial firms	Investors, general public	Voluntary	None specified	Materials, energy consumption, water, discharge of effluents, GHG emissions, and biodiversity	Not specified; companies may furnish a report or letter from owner/chief executive officer	Guidelines include third-party assurance as a "leadership indicator" of company's progress in implementing the principles

(Continued)

Table A3.2

**Select Disclosure Frameworks, Governments** *(Continued)*

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Information Disclosed	Disclosure Location	External Assurance Required
<b>UK:</b> Companies Act 2006 (Strategic Report and Directors Report) Regulations 2013	Financial and nonfinancial firms that are "Quoted Companies," as defined by the Companies Act 2006	Investors	Mandatory	Information is material if its omission or misrepresentation could influence the economic decisions shareholders take on the basis of the annual report as a whole (section 5 of the UK FRC June 2014 Guidance on the Strategic Report).	GHG emissions	Directors report	Not required, but statutory auditor must consider whether information is materially incorrect or materially inconsistent with financial statements based on information obtained during financial statement audit
<b>US:</b> NAICs, 2010 Insurer Climate Risk Disclosure Survey	Insurers meeting certain premium thresholds	Regulators	Mandatory if thresholds are met	None specified	General disclosures about climate change-related risk management and investment management	Survey sent to state regulators	Not specified
<b>US:</b> SEC Guidance Regarding Disclosure Related to Climate Change	Financial and nonfinancial firms subject to SEC periodic reporting requirements	Investors	Mandatory	US securities law definition	Climate-related: requirements, treaties and agreements, business trends, and physical impacts	Annual and other reports required to be filed with SEC	Not specified; depends on assurance requirements for information disclosed

Table A3.2

## Select Disclosure Frameworks, Exchange Listing Requirements, and Indices

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Information Disclosed	Disclosure Location	External Assurance Required
<b>Australia:</b> National Greenhouse and Energy Reporting Act (2007)	Listed financial and nonfinancial firms	Investors	Mandatory (comply or explain)	A real possibility that the risk in question could substantively impact the listed entity's ability to create or preserve value for security holders over the short, medium or long term	General disclosure of material environmental risks	Annual report must include either the corporate governance statement or company website link to the corporate governance statement on company's website	Not specified; may depend on assurance requirements for annual report
<b>European Union (EU):</b> EU Directive 2014/95 regarding disclosure of nonfinancial and diversity information (2014)	Listed financial and nonfinancial firms	Investors, regulator	Voluntary (comply or explain)	Criteria explained in Reference Form (Annex 24) of the Instruction CVM n° 480/09	Provide information on whether they prepare a sustainability report or explain why not. Report social and environmental information disclosed; methodology used; if audited/reviewed by an independent entity; and link to information (i.e., webpage).	Discretion of company	Not specified
<b>France:</b> Article 173, Energy Transition Law (2015)	Listed financial and nonfinancial firms	Investors	Voluntary: social responsibilities Mandatory: pollutant discharge	None specified	Waste generation, resource consumption, pollutants	Not specified	Not specified; Companies shall allocate dedicated human resources for regular inspection of implementation of environmental protection policies.
<b>India:</b> National Voluntary Guidelines on Social, Environmental, and Economic Responsibilities of Business (2011)	Listed financial and nonfinancial firms	Investors	Mandatory (comply or explain)	Guidance provided in the Guide, paragraphs 4.7-4.11	Material environmental, social and governance (ESG) factors, performance, targets and related information specified in the Guide	Annual report or standalone report, disclosed through SGXNet reporting platform and company website	Not required

(Continued)

Table A3.2

**Select Disclosure Frameworks, Exchange Listing Requirements, and Indices** *(Continued)*

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Information Disclosed	Disclosure Location	External Assurance Required
<b>South Africa:</b> Johannesburg Stock Exchange  Listing Requirement Paragraph 8.63;  King Code of Governance Principles (2009)	Listed financial and nonfinancial firms	Investors	Mandatory; Comply or Explain	None specified	General disclosure regarding sustainability performance	Annual report	Required
<b>World, regional, and country-specific indices:</b>  Dow Jones  Sustainability Index, Sample Questionnaires	Financial and nonfinancial firms	Investors	Voluntary	None specified	GHG emissions, SOx emissions, energy consumption, water, waste generation, environmental violations, electricity purchased, biodiversity, carbon, and mineral waste management	Nonpublic	Disclose whether external assurance was provided and whether it was pursuant to a recognized standard

Table A3.3

## Select Disclosure Frameworks, NGOs

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Information Disclosed	Disclosure Location	External Assurance Required
<b>Global:</b> Asset Owners Disclosure Project 2016 Global Climate Risk Survey	Pension funds, insurers, sovereign wealth funds >\$2bn AUM	Asset managers, investment industry, government	Voluntary	None specified	GHG emissions, Carbon	Survey responses; respondents are asked whether responses may be made public	Disclose whether external assurance was provided
<b>Global:</b> CDP Annual Questionnaire (2016)	Financial and nonfinancial firms	Investors	Voluntary	None specified	Energy use, Carbon, GHG emissions (Scope 1-3), Water (separate questionnaire), Forests (separate questionnaire)	CDP database	Encouraged; information requested about verification and third party certification
<b>Global:</b> CDSB Climate Change Reporting Framework, Ed. 1.1 (2012)	Financial and nonfinancial firms	Investors	Voluntary	Allow “investors to see major trends and significant events related to climate change that affect or have the potential to affect the company’s financial condition and/ or its ability to achieve its strategy.”	GHG emissions	Annual report (or any mainstream financial report)	No requirement unless ISA 720 requires the auditor of financial statements to read information accompanying them to identify material inconsistencies between the audited financial statements and accompanying information
<b>Global:</b> GRESB Infrastructure Asset Assessment & Real Estate Assessment	Real estate asset/ portfolio owners	Investors and industry stakeholders	Voluntary	None specified	Real estate sector-specific requirements related to fuel/energy/water consumption and efficiencies, as well as low-carbon products	Data collected through the GRESB Real Estate Assessment disclosed to participants themselves and: <ul style="list-style-type: none"> <li>• In the case of non- listed property funds and companies, to those of that company or fund’s investors that are GRESB Investor Members;</li> <li>• In the case of listed real estate companies, to all GRESB Investor Members that invest in listed real estate securities.</li> </ul>	Disclose whether external assurance was provided

(Continued)

Table A3.3

**Select Disclosure Frameworks, NGOs** (Continued)

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Information Disclosed	Disclosure Location	External Assurance Required
<b>Global:</b> GRI G4 Sustainability Reporting Guidelines (2013)	Any public or private company	All Stakeholders	Voluntary	"May reasonably be considered important for reflecting the organization's economic, environmental and social impacts, or influencing the decisions of stakeholders"	Materials, Energy, Water, Biodiversity, Emissions, Waste	Sustainability reports or "any type of document which requires such disclosure."	Disclosure of policy and practice regarding external assurance
<b>Global:</b> IIGCC Oil & Gas (2010)	Oil and gas industries	Investors	None specified	None specified	GHG emissions, Clean technologies data	Not specified	Not specified
Automotive (2009)	Automotive industry	Investors	None specified	None specified	GHG emissions, Clean technologies data, Carbon	Company's discretion	Not specified
Electric Utilities (2008)	Electrical utilities	Investors	None specified	None specified	GHG emissions, Electricity production	Company's discretion	Disclose how accuracy of GHG emissions information was verified
<b>Global:</b> IIRC International <IR>Framework (2013)	Any public company traded on international exchanges	Investors	Voluntary	Substantively affect the organization's ability to create value over the short, medium and long term	General challenges related to climate change, loss of ecosystems, and resource shortages	Standalone sustainability or integrated report	Not specified; discussion paper released on issues relating to assurance
<b>Global:</b> IPIECA Oil and gas industry guidance on voluntary sustainability reporting	Oil and gas industries	All stakeholders	Voluntary	Material issues for sustainability reporting are those that, in the view of both the company's management and its external stakeholders, affect the company's performance or strategy and/or inform stakeholder assessments or decisions about the company	Energy consumption	Sustainability reporting	Not required but encouraged

Table A3.3

**Select Disclosure Frameworks, NGOs** (Continued)

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Information Disclosed	Disclosure Location	External Assurance Required
<b>Global:</b> PRI Reporting Framework 2016	Investors	Investors	Voluntary	None specified	Investor practices	Transparency report	Not specified
<b>US:</b> SASB Conceptual Framework (2013) and SASB Standards (Various)	Any public company traded on US exchanges	Investors	Voluntary	A substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the “total mix” of the information made available	Sector-specific requirements	SEC filings	Conceptual Framework encourages use of AT 101 for assurance on SASB disclosures; assurance may be required, depending on circumstances

## Appendix 4: 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>51</sup>

**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.

**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).

**GOVERNANCE** refers to “the system by which an organization is directed and controlled in the interests of shareholders and other stakeholders.”<sup>52</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>53</sup>

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<sup>51</sup> OECD, G20/OECD Principles of Corporate Governance, OECD Publishing, Paris, 2015. <http://dx.doi.org/10.1787/9789264236882-en>.

<sup>52</sup> A. Cadbury, Report of the Committee on the Financial Aspects of Corporate Governance. London, 1992. <http://www.ecgi.org/codes/documents/cadbury.pdf>.

<sup>53</sup> OECD, G20/OECD Principles of Corporate Governance, OECD Publishing, Paris, 2015. <http://dx.doi.org/10.1787/9789264236882-en>.

## GREENHOUSE GAS (GHG) EMISSIONS SCOPE LEVELS<sup>54</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>55</sup>

**INTERNAL CARBON PRICE** is an internally developed estimated cost of carbon emissions. Internal carbon pricing can be used as a planning tool to help identify revenue opportunities and risks, as an incentive to drive energy efficiencies to reduce costs, and to guide capital investment decisions.

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

**NATIONALLY DETERMINED CONTRIBUTION (NDC)** refers to the post-2020 actions that a country intends to take under the international climate agreement adopted in Paris.

**ORGANIZATION** refers to the group, company, or companies, and other entities for which consolidated financial statements are prepared, including subsidiaries and jointly controlled entities.

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

**SECTOR** refers to a segment of organizations 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 organizations within a sector.

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<sup>54</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. <http://www.ghgprotocol.org/standards/corporate-standard>.

<sup>55</sup> IPCC, *Climate Change 2014 Mitigation of Climate Change*, Cambridge University Press, 2014. [https://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc\\_wg3\\_ar5\\_full.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_full.pdf).

**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.

**SUSTAINABILITY REPORT** is an organizational report that gives information about economic, environmental, social, and governance performance and impacts. For companies and organizations, sustainability—the ability to be long-lasting or permanent—is based on performance and impacts in these four key areas.

**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

### 2°C

2° Celsius

### ASC

Accounting Standards Codification

### BNEF

Bloomberg New Energy Finance

### CDSB

Climate Disclosure Standards Board

### ERM

Environmental Resources Management

### EU

European Union

### FASB

Financial Accounting Standards Board

### FSB

Financial Stability Board

### G20

Group of 20

### GHG

Greenhouse gas

### GICS

Global Industry Classification Standard

### GRI

Global Reporting Initiative

### IAS

International Accounting Standard

### IASB

International Accounting Standards Board

### IEA

International Energy Agency

### IIGCC

Institutional Investors Group on Climate Change

### IIRC

International Integrated Reporting Council

### IPCC

Intergovernmental Panel on Climate Change

### NGO

Non-governmental organization

### OECD

Organization for Economic Co-operation and Development

### R&D

Research and development

### SASB

Sustainability Accounting Standards Board

### TCFD

Task Force on Climate-related Financial Disclosures

### UN

United Nations

### UNEP

United Nations Environment Programme

### WRI

World Resources Institute

## Appendix 5: References

- “Communiqué from the G20 Finance Ministers and Central Bank Governors Meeting in Washington, D.C. April 16-17, 2015.” April 2015. [g20.org.tr/wp-content/uploads/2015/04/April-G20-FMDBG-Communique-Final.pdf](http://g20.org.tr/wp-content/uploads/2015/04/April-G20-FMDBG-Communique-Final.pdf).
- Cadbury, A. *Report of the Committee on the Financial Aspects of Corporate Governance*. London, 1992. <http://www.ecgi.org/codes/documents/cadbury.pdf>.
- Carney, Mark. “Breaking the tragedy of the horizon—climate change and financial stability.” September 29, 2015. Lloyd’s, London. Speech. <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx>.
- Ceres. *Power Forward: How American Companies Are Setting Clean Energy Targets and Capturing Greater Business Value*, 2014. [www.ceres.org/resources/reports/power-forward-supplement-climate-and-energy-targets-set-by-fortune-500-companies/view](http://www.ceres.org/resources/reports/power-forward-supplement-climate-and-energy-targets-set-by-fortune-500-companies/view).
- Enhanced Disclosure Task Force. *Enhancing the Risk Disclosures of Banks*. October 2012. [http://www.fsb.org/wp-content/uploads/r\\_121029.pdf](http://www.fsb.org/wp-content/uploads/r_121029.pdf).
- Environmental Protection Agency Victoria (EPA Victoria). “Resource Efficiency Case Studies, Lower your impact.” [www.epa.vic.gov.au/business-and-industry/lower-your-impact/resource-efficiency/case-studies](http://www.epa.vic.gov.au/business-and-industry/lower-your-impact/resource-efficiency/case-studies).
- Fellow, Avery. “Investors Demand Climate Risk Disclosure.” Bloomberg, February 2013. [www.bloomberg.com/news/2013-02-25/investors-demand-climate-risk-disclosure-in-2013-proxies.html](http://www.bloomberg.com/news/2013-02-25/investors-demand-climate-risk-disclosure-in-2013-proxies.html).
- FSB. “FSB to establish Task Force on Climate-related Financial Disclosures.” December 4, 2015. <https://www.fsb-tcfd.org/wp-content/uploads/2016/01/12-4-2015-Climate-change-task-force-press-release.pdf>.
- FSB. “Proposal for a Disclosure Task Force on Climate-Related Risks.” November 9, 2015. [www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf](http://www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf).
- G20 Green Finance Study Group. *G20 Green Finance Synthesis Report*. 2016. [http://unepinquiry.org/wp-content/uploads/2016/09/Synthesis\\_Report\\_Full\\_EN.pdf](http://unepinquiry.org/wp-content/uploads/2016/09/Synthesis_Report_Full_EN.pdf).
- Ganci, N., S. Hammer, T. Reilly, and P. Rodel. “Environmental and Climate Change Disclosure under the Securities Laws: A Multijurisdictional Survey.” Debevoise & Plimpton, March 2016. [http://www.debevoise.com/~media/files/insights/publications/2016/03/20160316\\_environmental\\_and\\_climate\\_change\\_disclosure\\_under\\_the\\_security.pdf](http://www.debevoise.com/~media/files/insights/publications/2016/03/20160316_environmental_and_climate_change_disclosure_under_the_security.pdf).
- Greenhouse Gas Protocol. “Calculation Tools, FAQ.” <http://www.ghgprotocol.org/calculation-tools/faq>.
- Intergovernmental Panel on Climate Change (IPCC). *Fifth Assessment Report (AR5)*, Cambridge University Press, 2014. <http://www.ipcc.ch/report/ar5/>.
- International Energy Agency (IEA). “Global energy investment down 8% in 2015 with flows signaling move towards cleaner energy.” September 14, 2016. <https://www.iea.org/newsroomandevents/pressreleases/2016/september/global-energy-investment-down-8-in-2015-with-flows-signalling-move-towards-clean.html>.
- Maack, J. *Scenario Analysis: A Tool for Task Managers*. [http://siteresources.worldbank.org/INTPSIA/Resources/490023-1121114603600/13053\\_scenarioanalysis.pdf](http://siteresources.worldbank.org/INTPSIA/Resources/490023-1121114603600/13053_scenarioanalysis.pdf).
- Mercer LLC. *Investing in a Time of Climate Change*. 2015. <http://siteresources.worldbank.org/EXTSOCIALDEV/Resources/3177394-1167940794463/ScenarioAnalysisMaack.pdf>.

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Moody's Investors Service. "Heat Map Shows Wide Variations in Credit Impact Across Sectors." November 30, 2015. [http://www.moodys.com/viewresearchdoc.aspx?docid=PBM\\_1010009](http://www.moodys.com/viewresearchdoc.aspx?docid=PBM_1010009).

Norton, T., M. Ryan, and F. Wang. "Business Action for Climate-Resilient Supply Chains: A Practical Framework for Identifying Priorities to Evaluating Impact." 2015. BSR working paper. San Francisco, BSR. [www.bsr.org/reports/BSR\\_Report\\_Climate\\_Resilient\\_Supply\\_Chains.pdf](http://www.bsr.org/reports/BSR_Report_Climate_Resilient_Supply_Chains.pdf).

OECD. G20/OECD Principles of Corporate Governance. OECD Publishing, Paris, 2015. <http://dx.doi.org/10.1787/9789264236882-en>.

Randall, T. "Leapfrogging to Solar: Emerging Markets Outspend Rich Countries for the First Time." *Bloomberg*, November 23, 2015. <http://www.bloomberg.com/news/articles/2015-11-23leapfrogging-to-solar-emerging-markets-outspend-rich-countries-for-the-first-time>.

S&P Global Ratings. "How Environmental and Climate Risks Factor Into Corporate Ratings." October 21, 2015. [https://www.globalcreditportal.com/ratingsdirect/renderArticle.do?articleId=1467885&SctArtId=348528&from=CM&nsI\\_code=LIME&sourceObjectId=9373730&sourceRevId=1&fee\\_ind=N&exp\\_date=20251020-17:15:34](https://www.globalcreditportal.com/ratingsdirect/renderArticle.do?articleId=1467885&SctArtId=348528&from=CM&nsI_code=LIME&sourceObjectId=9373730&sourceRevId=1&fee_ind=N&exp_date=20251020-17:15:34).

Seley, Peter. "Emerging Trends in Climate Change Litigation." *Law 360*. March 7, 2016. <http://www.law360.com/articles/766214/emerging-trends-in-climate-change-litigation>.

Sustainability Accounting Standards Board (SASB). "SASB Technical Bulletin 2016-01—Climate Risk." Working draft. 2016. <http://using.sasb.org/sasb-climate-risk-framework>.

Task Force on Climate-related Financial Disclosures. "Phase I Report of the Task Force on Climate-related Financial Disclosures." March 31, 2016. [https://www.fsb-tcfd.org/wp-content/uploads/2016/03/Phase\\_I\\_Report\\_v15.pdf](https://www.fsb-tcfd.org/wp-content/uploads/2016/03/Phase_I_Report_v15.pdf).

United Nations Environment Programme (UNEP). *The Financial System We Need: Aligning the Financial System with Sustainable Development*. 2015. [http://unepinquiry.org/wp-content/uploads/2016/09/The\\_Financial\\_System\\_We\\_Need\\_From\\_Momentum\\_to\\_Transformation.pdf](http://unepinquiry.org/wp-content/uploads/2016/09/The_Financial_System_We_Need_From_Momentum_to_Transformation.pdf).

United Nations Framework Convention on Climate Change. "The Paris Agreement," Dec. 2015, [http://unfccc.int/files/essential\\_background/convention/application/pdf/english\\_paris\\_agreement.pdf](http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf).

World Resources Institute and World Business Council for Sustainable Development. "The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard" (Revised Edition). March 2004. <http://www.ghgprotocol.org/standards/corporate-standard>.

WRI and UNEP FI. *Carbon Asset Risk: Discussion Framework*. August 2015. [http://www.unepfi.org/fileadmin/documents/carbon\\_asset\\_risk.pdf](http://www.unepfi.org/fileadmin/documents/carbon_asset_risk.pdf).

## Appendix 6: 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>56</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.

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<sup>56</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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## 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.
- 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, and others). 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.

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**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.

**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.

