

# BEYOND THE HORIZON: CORPORATE REPORTING ON CLIMATE CHANGE



Fatima Maria Ahmad  
*Center for Climate and Energy Solutions*

September 2017

While many companies across a variety of sectors recognize and disclose their climate risks and opportunities, reporting is not consistent and often not included in financial reporting. Some investors and stakeholders have called for increased disclosure of material information in financial filings and others are focused on the opportunity to improve the quality and consistency of voluntary reporting. Recommendations from an industry-led task force are a promising first step that may lead to greater transparency and consistency in all forms of climate-related disclosures. This will help companies respond to growing concerns and better position themselves to take advantage of potential opportunities and prepare for risks. Increased disclosure in financial reports, however, is not without challenges, including uncertainty about climate impacts, implications for other types of risks and relevant timeframes for analysis, the need to determine materiality under U.S. securities laws, data quality and precision, internal coordination, costs and complexity, and divergent perspectives on the usefulness of scenario analysis and metrics and targets. Over time and with experience, we anticipate that companies will develop best practices that address many of these challenges facing reporting of climate risks and opportunities.

## INTRODUCTION

Over the last two decades, building on a broader emphasis on corporate social responsibility (CSR), corporate reporting on climate change has increased. In the C2ES report, *Weathering the Next Storm*, for example, we found more than half of S&P Global 100 companies (55 percent) mentioned climate change in their CSR reports and about 40 percent mentioned it in their financial filings. Many stakeholders, however, have been asking that companies improve and expand their financial reporting on material climate risks and opportunities. Comments to the U.S. Securities and Exchange Commission (SEC), for example, ask the agency to mandate better financial reporting on sustainability

issues, including on climate change.<sup>1</sup> At the same time, some leaders in the financial sector have called for greater focus on the connection between climate change and systemic vulnerabilities in the financial sector. In particular, Mark Carney, governor of the Bank of England and Chairman of the Financial Stability Board, outlined concerns about a chronic short-term perspective in an influential speech titled “Breaking The Tragedy of the Horizon: Climate Change and Financial Stability.”<sup>2</sup>

With these concerns in mind, the G20 finance ministers and Central Bank governors asked the Financial Stability Board (FSB) to review the financial implications of climate change as part of the FSB’s mandate to

promote international financial stability and they, in turn, created an industry-led Task Force on Climate-related Financial Disclosures to look into the issue and suggest how financial reporting on climate risks and opportunities could be improved.<sup>3, 4</sup>

Draft recommendations were published in December 2016 and final recommendations released in June 2017. Designed to promote more consistent and transparent financial reporting, the final recommendations provide guidance on how and what companies should report. These recommendations are voluntary and specifically suggest that companies consider reporting in their financial documents about their governance, strategy, risk management, and metrics and targets related to climate change. The recommendations acknowledge that companies may determine that some of this information is not suitable for financial reporting and in that case should report this information in voluntary reports with a similar level of internal review. Recognizing the need for flexibility, the task force also provided additional guidance specifically for the financial sector and for key non-financial groups, such as energy, transportation, materials and buildings, and agriculture, food, and forest products.

The task force's recommendations are particularly significant because the effort was industry led and informed by the perspective of companies that report their financial data ("data preparers") as well as those

that use this information to make investment, insurance underwriting, and lending decisions ("data users"). After the recommendations were released, more than 100 companies (15 of which are headquartered in the United States), publicly stated their support.<sup>5</sup>

This brief reviews the types of climate-related risks and opportunities that may impact companies and, with examples, explores how and where companies currently disclose information about climate risks and opportunities, including some of the challenges associated with reporting. It also considers potential implications of the task force's recommendations and outlines areas for further work, including a key task force recommendation that companies assess how their businesses could be impacted under a range of future climate scenarios, including one where average warming is limited to 2 degrees Celsius.

To understand these issues, we reviewed a variety of reports, including two previous C2ES reports on business resilience to climate risk in 2013 and 2015, information submitted to voluntary reporting frameworks, corporate sustainability reports and financial filings, and the task force's draft and final recommendations. We also conducted interviews and workshops with members of our C2ES Business Environmental Leadership Council (BELC) to solicit input on what is working and what can be improved in the arena of climate reporting.

## REPORTING CLIMATE RISKS AND OPPORTUNITIES

The Financial Stability Board's Task Force on Climate-related Financial Disclosures identified two major categories of climate-related risks—*transition risks* and *physical risks*. The task force's recommendations outline these risks and opportunities and their related financial impacts in detail.<sup>6</sup> Abbreviated lists of these risks and opportunities are included here as **Tables 1, 2, and 3**. While companies have faced many of these risks in the past, climate change can act as a risk multiplier, amplifying and making certain risks more prominent and the impacts more significant. *Transition risks* involve changes in law, policy, technology, and markets related to the transition to a lower-carbon energy supply. *Physical risks* from climate change may be acute or chronic, and

include, for example, damages to fixed assets or supply chain disruptions from extreme weather events, as well as changes in water availability and lasting impacts

---

C2ES thanks JPMorgan Chase & Co. for its support of this work. As a fully independent organization, C2ES is solely responsible for its positions, programs, and publications—including conclusions in this report. For further information, please visit [www.c2es.org/about/c2es-funding-guiding-principles](http://www.c2es.org/about/c2es-funding-guiding-principles). We would also like to thank the Business Environmental Leadership Council company representatives who generously volunteered their time as part of our working group on this topic. Several C2ES staff including Bob Perciasepe, Janet Peace, Laura Rehrmann, and Meg Storch also provided very helpful comments and suggestions.

on markets and consumer demand. Two top areas of concern for companies identified in the C2ES report *Weathering the Storm*<sup>7</sup> are direct impacts on production capacity (such as property damage or supply interruptions) and the related financial impacts (such as higher commodity prices or maintenance costs).

Companies assessing the impact of climate change on their business may also identify potential opportunities, such as expanded markets for existing products and services, new markets for new products, and operating cost reductions (e.g., energy or insurance cost reductions associated with better management of extreme weather impacts). For example, companies in the materials sector in particular, may be able to market new light-weight materials for transportation and may be able to develop new materials that are made from manmade carbon dioxide. Additional detail on companies describing

climate-related opportunities is available in Appendix B. As many as 75 of the S&P Global 100 companies identified potential market opportunities resulting from a changing climate in their climate-related disclosures.<sup>8</sup>

Companies often report these risks and opportunities in a variety of locations including their corporate sustainability reports, websites, various voluntary reporting frameworks and their financial filings—including their annual reports. Nearly 400 mandatory and voluntary frameworks for climate and sustainability disclosure exist.<sup>9</sup> Voluntary frameworks with some of the highest corporate participation include the CDP (formerly called the Carbon Disclosure Project), the Global Reporting Initiative, and the PRI (formerly called the United Nations Principles for Responsible Investment) (summarized in **Table 4**).<sup>10,11</sup>

**TABLE 1: Examples of Climate-Related Transition Risks and Potential Financial Impacts**

RISK TYPE	POTENTIAL FINANCIAL IMPACTS
<i>Law and Policy:</i> Increased regulation and pricing of GHG emissions, mandates to use certain products and services, litigation exposure	Increased operating costs and asset write-offs, impairments, and early retirements
<i>Technology:</i> Substitution of current products and services with lower emission alternatives, investments in new technologies that are unsuccessful, costs of adopting new lower emission technologies	Asset write-offs and early retirements, reduced demand for existing products and services, increased expenditures and capital investments related to research and development (R&D) and adoption of new technologies
<i>Market:</i> Customer behavior changes, increased materials costs	Reduced demand for existing products and services, increased production costs
<i>Reputation:</i> Consumer preference changes, increased stakeholder concerns	Reduced revenue and availability of capital because of lower demand for products and services

**TABLE 2: Examples of Climate-Related Physical Risks and Potential Financial Impacts**

RISK TYPE	POTENTIAL FINANCIAL IMPACTS
<i>Acute:</i> Increased frequency and severity of extreme weather events such as hurricanes and floods	Reduced revenue due to supply chain interruptions, disruption of customer operations, demand destruction, transportation challenges, reduced workforce availability that disrupts production capacity; asset write-offs and early retirements due to damage
<i>Chronic:</i> Changed precipitation patterns, increased variability in weather, rising temperatures and sea levels	Increased operating and capital costs, reduced revenues from reduced production capacity

**TABLE 3: Examples of Climate-Related Opportunities and Potential Financial Impacts**

OPPORTUNITY TYPE	POTENTIAL FINANCIAL IMPACTS
<i>Increased Resource Efficiency:</i> Options to use more energy-efficient methods of production, distribution and transportation; recycling of materials, and options to reduce water use	Increased revenues from increased production capacity, reduced operating costs, and increased valuation of energy-efficient real property
<i>Energy Source Changes:</i> Options to use lower emission and distributed generation energy sources and technologies, option to participate in carbon markets and to take advantage of policy incentives	Reduced operating costs and exposure to fuel price changes, reduced exposure to policy risks related to carbon pricing, increased availability of capital, increased demand for products and services due to reputational benefits
<i>New Products and Services:</i> Development of low emission products and services ranging from new materials to new insurance services	Increased revenue from new products and services and from enhanced competitive position relative to industry competitors
<i>New Markets:</i> Options to enter into new markets and to take advantage of policy incentives	Increased revenues through public-private partnerships and diversification of assets
<i>Improved Resilience:</i> Options to diversify and substitute resources, options to invest and harden infrastructure including energy infrastructure	Increased valuation of physical infrastructure, protection of production capacity during extreme weather, increased revenue from new products and services that ensure resilience

**TABLE 4. Voluntary Climate and Sustainability Reporting Frameworks**

VOLUNTARY REPORTING FRAMEWORKS	DESCRIPTION
<i>Global Reporting Initiative (GRI)</i>	Launched in 1997, GRI provides frameworks for comprehensive sustainability reporting, including on emissions, energy, water, human rights, corruption and information on materials, waste, and biodiversity. GRI provides sector-specific guidance for electric utilities, mining and metals, oil and gas, and others.
<i>CDP</i>	Launched in 2000, CDP uses an annual questionnaire that over 5800 companies and 533 cities voluntarily complete to report their greenhouse gas emissions (Scope 1–3) and energy use. <sup>12</sup> A separate questionnaire reviews water use. This information is stored in a CDP database. CDP provides sector-specific guidance for electric utilities, auto manufacturing, oil and gas, and others.
<i>PRI (formerly called the United Nations Principles for Responsible Investment)</i>	Launched in 2006, the PRI is an independent organization that promotes responsible investment by institutional investors. With over 1,700 signatories representing over \$62 trillion assets under management, <sup>13</sup> the PRI promotes voluntary integration of environmental, social and governance (ESG) issues across different types of investments. As part of this effort, they also require annual assessments in their reporting framework from signatories to demonstrate how key sustainability issues are addressed.

These reporting frameworks each have different features, but all play an important role in enhancing climate-related disclosures. CDP's mission is to accelerate solutions to climate change by collecting and disseminating relevant climate information. Many companies interviewed for this brief use CDP as the primary vehicle to disclose information about climate risks and opportunities because it is comprehensive and widely used by investors and other stakeholders.

GRI's mission is broader, focusing beyond climate and on sustainability impacts (including societal issues). Similarly, however, its mission is to increase transparency and catalyze action toward a more sustainable society. Its process includes actual reporting to GRI and guidance on the development of internal CSR reports. Many of the companies we interviewed follow GRI standards for their CSR reports, while using CDP to disclose information specifically about climate risks and opportunities.

The PRI was created as a complement to the United Nations Global Compact, through which 7,000 companies committed to incorporating human rights, labor, environmental, and anti-corruption priorities in their strategies and operations.<sup>14</sup> The PRI includes an online transparency and assessment reporting framework to ensure accountability. "Transparency Reports" based on these responses highlight how companies are implementing the reporting principles. More detailed assessments of how these responses compare to peer organizations are also prepared but it is up to the company whether these assessments are made public.

## U.S. SECURITIES & EXCHANGE COMMISSION (SEC) REQUIREMENTS

In addition to the above voluntary reporting frameworks, if a company is publicly traded it must also provide periodic filings to the U.S. Securities and Exchange Commission, such as Form 10-Ks for domestic issuers and Form 20-F for foreign issuers. The 1933 Securities Act and the 1934 Securities Exchange Act were enacted to protect investors by requiring the disclosure of basic information. In the 1970s, the SEC explained that disclosure of environmental and social concerns was not required unless another law requires it or unless it was particularly relevant, "material," to the financial considerations of the company.<sup>15</sup> The concept of materiality is broadly defined: "information is material if there is a substantial likelihood that a reasonable investor would consider it important in deciding how to vote or make an

investment decision, or put another way, if the information would alter the total mix of available information."<sup>16</sup>

Using this general test, legal experts have explained that "[c]limate-related risk and opportunity information is arguably material if there is 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 information made available."<sup>17</sup> Currently, "there is no binding legal guidance on the materiality of climate change risks. Moreover, identifying material climate risk information is extremely difficult given the ubiquity of climate change impacts themselves."<sup>18</sup> As discussed later in this issue brief, legal requirements related to materiality continue to evolve in response to ongoing investigations and litigation.<sup>19</sup>

The SEC has provided some guidance on how to interpret the application of climate change disclosure requirements in financial reporting, but it has been limited. In 2010, to provide greater clarity about how to consider climate issues within existing reporting requirements, the SEC issued interpretive guidance.<sup>20</sup> Experts have observed that "the guidance does not explain what risks a company should assess—nor does it fully explain how a regulated company should evaluate whether such risks are 'material.' Instead, the SEC provides only general guidance as to when climate-related risks and impacts might trigger a federal disclosure requirement."<sup>21</sup>

The four categories of business impacts that the SEC identified which might trigger disclosure requirements are:

1. *Impact of Legislation and Regulation*—A company must determine whether pending climate-related legislation or regulation is reasonably likely to be enacted. If so, the company must determine whether it is reasonably likely to have a material effect on the company, its financial condition, or its operations.
2. *Impact of International Accords*—A company must determine the effect of international agreements, such as the European Union Emissions Trading System. More recent examples include the potential effects of the Paris Agreement, the Kigali Amendment to phase down hydrofluorocarbons, or the International Civil Aviation Organization agreement to reduce greenhouse gas emissions, including through the use of market-based measures.
3. *Indirect Consequences of Regulation or Business Trends*—Legal, technological, political, and scientific

developments regarding climate change may increase or decrease demand for a company's products and services. Reputational impacts may also need to be considered.

4. *Physical Impacts*—Increased weather severity, sea-level rise, and changes in water availability may have direct impacts on a business (such as property damage or disrupted operations) and may have indirect impacts by disrupting operations of major suppliers or customers.<sup>22</sup>

While the 2010 guidance provided some clarity on reporting climate change information, it noted that disclosures may be less effective when unnecessary, uninformative, or duplicative because they may obscure material information. Overall, the guidance reflected an understanding that there is a realm of climate-related information that is of increasing interest to investors. To help companies translate these issues into financial terms, the SEC referred to sections of Regulation S-K (the existing regulation on financial reporting in Form 10-Ks) to explain how these existing regulations provide authority for financial reporting on climate change:

- Item 101: *Description of Business*, including costs of compliance with environmental laws<sup>23</sup>
- Item 103: *Legal Proceedings*<sup>24</sup>
- Item 303: *Management's Discussion & Analysis (MD&A)*, including known trends, events, and

uncertainties that are reasonably likely to have a material effect<sup>25</sup>

- Item 503(c): *Risk factors* that make an investment in the company speculative or risky.<sup>26</sup>

The 2010 guidance was a helpful first step but many open questions remain. For example, companies and stakeholders continue to have different perspectives on what constitute “known trends,” “reasonably likely,” and “material effect” in MD&A disclosures. Historically, MD&A disclosure requirements are flexible in order to provide companies with the latitude to exercise judgment to provide the most useful information. Some stakeholders, however, have been seeking more prescriptive guidance to increase focus on climate and sustainability issues.

Since the 2010 guidance was issued, the SEC's Division of Corporate Finance has issued 25 comment letters advising companies on their climate-related financial disclosures.<sup>27</sup> Of these, 17 were issued right after the guidance and comment letters have tapered off since then. It remains to be seen if the Trump administration will change how the 2010 SEC climate change guidance is used. Asked during his confirmation hearing whether companies should report on the physical risks of climate change, new SEC Chairman Jay Clayton said, “I know that the SEC has issued guidance in this area. Public companies should be very mindful of that guidance as they're crafting their disclosure.”<sup>28</sup>

## FSB TASK FORCE RECOMMENDATIONS AND EXAMPLES

Even with these voluntary climate disclosure frameworks and financial disclosure guidance that suggests the types of climate-related impacts that companies should consider, the G20 finance ministers and Central Bank governors asked the global Financial Stability Board (FSB) in 2015 to review *how* the financial sector can better anticipate and respond to the implications of climate change.<sup>29</sup> The FSB launched an industry-led Task Force on Climate-Related Financial Disclosures to develop a comprehensive set of recommendations to guide voluntary disclosures in financial filings. Improving the quality and consistency of these disclosures should help investor decision making. Notably, the FSB anticipates that the financial sector may be able to facilitate a smoother transition to a lower carbon energy

supply through its investment, lending, and insurance underwriting decisions if it is armed with more accurate, consistent and up-to-date information.<sup>30</sup>

The task force's recommendations for specific disclosures fall into four key areas:

1. **Governance**—The organization's corporate leadership structure for overseeing, assessing, and managing climate-related risks and opportunities
2. **Risk Management**—The process used by the organization to identify climate risks and opportunities
3. **Strategy**—The organization's assessment and response to the likely financial impacts of climate risks and opportunities, where such information is material

**4. Metrics and Targets**—The data and goals used to monitor and respond to climate risks and opportunities, where such information is material.<sup>31</sup>

The recommendations encourage companies to report in their financial filings their governance and risk management efforts and, if financially “material,” should disclose their strategy, metrics and targets. The task force recommendations are more detailed than the SEC guidance which generally identified the types of climate-related impacts that could be considered. The task force recommendations provide examples and suggestions for how these issues should be considered and assessed. Along these lines, the task force recommended the use of *scenario analysis* as a tool for developing disclosures related to strategy. Scenario analysis is a “process for identifying and assessing the potential implications of a range of plausible future states under conditions of uncertainty.”<sup>32</sup> Scenario analysis could be particularly helpful when reviewing the long-term transition and physical risks related to climate change given the amount of uncertainty involved, as described later in this issue brief.

The task force recommended that qualitative information from scenario analysis about the resilience of a company’s business strategy should be disclosed in mainstream annual financial filings, if material. They anticipated that these strategy assessments would be reviewed by an organization’s chief financial officer and audit committee.<sup>33</sup> Further, they suggested that very large organizations (with more than \$1 billion in annual revenue) and resource-intensive organizations conduct a “robust” scenario analysis to evaluate the resilience of their business strategy in a more quantitative manner.

While the task force recommends including climate-related disclosures in financial filings, their recommendations also seek to improve the creation and use of these disclosures in voluntary reporting frameworks, such as those described in **Table 4**. Many large companies publicly report on their climate risks and opportunities somewhere.<sup>34</sup> This reporting, however, is widely inconsistent in scope and quality, with some companies describing issues related to their climate risk in a sentence or two and others devoting entire reports to related topics. Questionnaires in voluntary reporting frameworks that are informed by the task force’s recommendations will help improve consistency across platforms.<sup>35</sup>

More broadly, the task force’s recommendations provide a useful framework for identifying and assessing climate risks and opportunities in all forms of climate reporting. Improving the scope, depth and consistency of what companies consider and report should yield a more complete evaluation of the issues, enhance management and ultimately improve preparation. As companies assess these issues in more depth, it is reasonable to expect that over time, more reporting about climate risks and opportunities will end up in U.S. financial filings. More in depth and consistent reporting in all venues will also help all stakeholders assess and understand how companies are addressing climate-related issues.

The task force’s recommended disclosures, and a few company examples, for each of these four key areas and for scenario analysis are described below. The examples are primarily illustrative; they provide context to help explain disclosure recommendations that can seem abstract and they demonstrate that some companies have experience conducting the types of analysis and reporting on the issues identified by the task force, even if these are not currently included in financial filings. A summary of the key recommended disclosures for the financial sector and the four key non-financial groups (energy, transportation, materials and buildings, and agriculture, food, and forest products) with the highest greenhouse gas emissions and energy usage are included in **Appendix A**.

## GOVERNANCE

Key to assessing that a company has put into place the systems and processes for identifying and managing climate-related risks and opportunities, is management oversight. Are corporate boards and management part of the ongoing process? The task force recommended that all companies report on the two items below:

- a. Describe the board’s oversight of climate-related risks and opportunities**, including, for example, how frequently the board is informed about climate-related issues and whether the board considers climate-related issues when reviewing company strategy, action plans, risk management policies, budgets, and business plans as well as setting performance objectives, monitoring implementation, and overseeing major expenditures, acquisitions, and divestitures.<sup>36</sup>

**b. Describe management’s role in assessing and managing climate-related risks and opportunities,** including for example, whether a management-level position has been assigned climate-related responsibilities and whether and how they report to the board.<sup>37</sup>

A review of 2016 responses to CDP questionnaires reveals that in advance of task force recommendations some companies have taken significant steps to put into place corporate governance of climate risks and opportunities. For example, six members of the Board of Directors of **Sempra Energy** and the executive vice president and general counsel participate in the Environmental, Health, Safety and Technology Committee. This committee monitors legal and technological developments within its jurisdiction and evaluates how to respond. The vice president of corporate compliance and governance, the chief compliance officer, and the chief sustainability officer brief the committee frequently. In 2015, it met four times and climate risks and opportunities were discussed.<sup>38</sup>

At **Schneider Electric**, the Board of Human Resources and Corporate Social Responsibility Committees review the sustainability strategy and meets three times a year. The company’s Executive Sustainability Committee includes company leaders responsible for strategy, global human resources, and global supply chain, and the sustainability senior vice president. The committee reviews the company’s climate change action plans focused on achieving energy savings targets, emissions reductions from products in research and development (R&D), and revenue targets for products with calculated carbon footprints. The executive vice president for global supply chain manages the company’s CO<sub>2</sub> reduction action plan based on quarterly updates from the senior vice president for global safety, environment and real estate.<sup>39</sup> The metrics in the action plans are audited by Ernst & Young.

## RISK MANAGEMENT

Companies manage a range of business risks within their existing risk management structures. Given that climate change will have broad transition and physical impacts, the task force recommended that it be integrated into an organization’s risk management structures rather than being isolated in a silo of sustainability issues. The task

force provided three recommendations on what should be included in mainstream annual financial filings:

**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.**<sup>40</sup>

While large businesses often have well-defined processes in their business continuity plans to manage the risks associated with extreme weather impacts, two issues often impact their effectiveness. First, these plans tend to rely on historical risk data rather than on forward-looking, science-based assumptions about how these risks are likely to change in the future.<sup>41</sup> Second, companies must comply with existing engineering standards that fail to reflect climate change risks, making it harder to justify going beyond the minimum standards to incorporate resilience.<sup>42</sup>

**Diageo** is a large company that produces beverage alcohol with global operations and a compelling climate risk strategy. It identified rising temperatures as a risk to the availability of agricultural materials necessary for their products. In their annual report, their CDP responses and their sustainability report, they discuss elements of their strategy for mitigating the risks of climate change including switching to other types of crops that can be grown in a warmer climate. The company also created a Water Blueprint strategy that includes water efficiency targets and investments to protect stressed watersheds which will help mitigate water shortages for their production as well as help local communities.<sup>43</sup> Information about the Water Blueprint strategy can be found in Diageo’s 2016 financial filing, the Form 20-F (for foreign issuers—internationally headquartered companies who issue stock in the United States.<sup>44</sup> Diageo explains, “Mitigating climate change through appropriate water stewardship is particularly critical for our business, and is an important element in our Water Blueprint.... Leadership in these issues will strengthen our business, reduce costs and mitigate risks. The measures we take will improve our efficiency and make our operations and supply chains more robust.”<sup>45</sup>

## STRATEGY

In light of the uncertainty associated with climate change risks and opportunities, it is important for investors and other stakeholders to understand how a company thinks about the relationship between its business strategy and climate change. The task force recommended three disclosures on strategy that should be included in annual financial filings, where such information is financially material:

- a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.** The task force acknowledged that short-, medium-, and long-term timeframes would vary by company and recommended that each company describe what it considers to be the relevant definitions of each time horizon in light of the life of their assets and infrastructure. For each time horizon, the task force recommended that companies identify specific transition and physical risks that could have a material financial impact on the organization, and describe the process used to determine those risks and opportunities.<sup>46</sup>
- b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning, including for example, on products and services, supply chains, mitigation and adaptation activities, R&D investment, and operations.** Companies should describe how climate-related issues are integrated into financial planning regarding operating costs and revenues, capital expenditures and capital allocation, acquisitions or divestments, and access to capital.<sup>47</sup>
- c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.** The task force recommended that companies describe how their strategies could be affected by climate-related risks and opportunities and how their strategies could change in response to those risks and opportunities. The time horizons of the climate scenarios should be described as well.<sup>48</sup>

In response to public comments, the final task force recommendations on strategy were revised from “should always disclose” to instead emphasize that companies

should disclose this information “where such information is material.” While the task force recognized that information in financial filings must be material under applicable securities laws, it emphasized that “climate-related risk is a non-diversifiable risk that affects nearly all industries, [and] many investors believe it requires special attention.”<sup>49</sup> The task force also cautioned against making judgments about the materiality of risks or opportunities based on perceptions of the longer-term nature of some climate-related risks.<sup>50</sup> As discussed later in this issue brief, determining the materiality under U.S. securities laws of climate risks and opportunities will be one of the challenges that U.S. companies will need to address as they consider implementation of the task force recommendations.

The task force recommended that if large companies (over \$1 billion in annual revenue) in the energy, transportation, materials and buildings, and agriculture, food, and forest products sectors decide not to include their climate-related strategy in their annual financial filings, they should at least include them in other annual reports that are widely distributed and subject to internal review equivalent to financial filings.<sup>51</sup> This is because “these organizations are more likely than others to be financially impacted over time” and “investors are interested in monitoring how these organizations’ strategies evolve.”<sup>52</sup>

**Dow Chemical Company** is an example of a company integrating its climate strategy into its financial filings. In its most recent Form 10-K for 2016, Dow listed the four elements of its energy roadmap: aggressively pursuing energy conservation and efficiency, increasing and diversifying energy resources, developing alternative energy sources, and transitioning toward more sustainable energy.<sup>53</sup> These elements of the company's energy roadmap help address many of the transition risks that could be a consequence of climate change including “cap and trade schemes; increased greenhouse gas limits; and taxes on GHG emissions, fuel and energy,” some of which may result in the “increased cost of purchased energy, additional capital costs for installation or modification of GHG emitting equipment, and additional costs associated directly with GHG emissions, all of which are primarily related to energy use.”<sup>54</sup> Dow also notes, however, that “[i]t is difficult to estimate the potential impact of these regulatory matters on energy prices.”<sup>55</sup>

Regarding physical risks, Dow's Form 10-K notes that “it is difficult to predict and assess the probability and opportunity of a global warming trend on Dow

specifically. Preparedness plans are developed that detail actions needed in the event of severe weather. These measures have historically been in place and these activities and associated costs are driven by normal operational preparedness. Dow continues to study the long-term implications of changing climate parameters on water availability, plant siting issues, and impacts and opportunities for products.<sup>56</sup>

Additional detail on both risks and potential opportunities is provided in Dow's 2016 sustainability report, which provides a risks matrix listing both transition and physical climate risks as well as their potential financial impacts on revenues, expenditures, assets and liabilities, and capital over the short, medium, and long term.<sup>57</sup> The sustainability report also notes that the company's climate change working group is updating scenario analyses to determine impacts on feedstocks, energy and products.<sup>58</sup>

## METRICS AND TARGETS

The use of similar climate-related metrics and targets enables investors and stakeholders to analyze a company's performance and compare companies within a sector. The task force recommended three specific types of 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 emissions, and the related risks.**
- c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.**<sup>59</sup>

The task force recommended that companies disclose internal metrics used to assess climate-related risks such as data on water, energy and land use, and waste management and how these have changed over time.<sup>60</sup> Disclosure of any internal carbon price and any metrics to assess climate-related opportunities, such as revenue from products and services designed for a lower-carbon economy, were suggested as well.<sup>61</sup>

They also had specific recommendations about how greenhouse gas emissions should be calculated, referencing the World Resources Institute's Greenhouse Gas Protocol methodology as one that would allow for

comparability between companies.<sup>62</sup> The task force further suggested that companies should consider using generally accepted industry-specific greenhouse gas efficiency ratios.<sup>63</sup>

Finally, the task force recommended that companies disclose the metrics used to manage climate-related risks against targets, such as internal targets for greenhouse gas emissions and water and energy use, efficiency goals, avoided emissions goals, as well as targets for climate-related opportunities, such as net revenue goals for products and services designed for a lower-carbon economy.<sup>64</sup> It also suggested that disclosures about metrics and targets be alongside company reporting about strategy because, while metrics alone are useful, how these change strategy is likely of more interest to investors.

As with the recommendations on strategy, in response to public comment, the recommendations on metrics and targets were revised from always disclose to instead emphasize that companies should provide the disclosures in mainstream annual financial filings "where such information is material." If not including the information in financial filings, companies are encouraged to disclose the information in other annual reports that are widely distributed and subject to equivalent internal review as financial filings.<sup>65</sup>

The task force recommended disclosure of internal carbon prices, which several companies have developed. While approaches vary, three basic types of carbon pricing are used: a direct fee, a shadow carbon price and an implicit carbon price. The most common approach is to use a shadow carbon price. **Royal Dutch Shell, BP and BHP** use a shadow price approach. This approach applies a theoretical price on carbon to evaluate potential investment decisions.<sup>66</sup> Both Royal Dutch Shell and BP use a shadow carbon price of \$40 per metric ton and BHP uses a shadow carbon price range of \$24–80 per metric ton.<sup>67</sup> **Microsoft and Swiss Re** use a *carbon fee* approach, which is assessed on a company's business units per metric ton and creates a revenue stream that can be used to invest in projects to help achieve a company's emissions reduction targets. Microsoft uses the revenue from its internal carbon fee to invest in energy efficiency, renewable energy and carbon offset projects.<sup>68</sup> Finally, **Unilever** developed an *implicit carbon price*, representing the marginal abatement cost of measures (including regulatory compliance costs) adopted to reduce a company's greenhouse gas emissions.<sup>69</sup> Implicit carbon prices may serve as a benchmark for companies exploring adopting

shadow carbon prices and carbon fees. Implicit carbon prices help companies review their carbon footprint, enhance internal communication around energy issues, and evaluate policy proposals. Unilever developed its implicit carbon price of \$10 per metric ton by calculating the costs of generating and purchasing renewable energy and the resulting avoided tons and then applied the implicit carbon price against the cost of energy-efficiency improvements in the design of its new factories.<sup>70</sup> Subsequently, Unilever announced it is using a shadow carbon price of \$27 per metric ton and that it is piloting a carbon fee program.<sup>71</sup>

An increasing number of companies (almost half of Fortune 500 companies) have climate or clean energy targets.<sup>72</sup> Companies use a variety of methods to set these targets and each has its merits and challenges.<sup>73</sup> One method that some investors have advised us they are interested in is the Science Based Targets initiative (SBTi), which is a collaboration between the UN Global Compact, CDP, the World Resources Institute, and the World Wide Fund for Nature. The SBTi reviews the most recent climate science to help determine greenhouse gas emissions reduction targets for companies in different sectors consistent with keeping global temperature increases below 2 degrees Celsius compared to pre-industrial levels. The collaboration is trying to promote the establishment of science-based targets as a standard business practice by 2020. Working with SBTi, **Hewlett-Packard Enterprise Company** established science-based targets in December 2016.<sup>74</sup> The company will reduce its Scope 1 and 2 emissions 25 percent from 2015 levels by 2025. It will also increase the energy performance of its product portfolio by 30 times to reduce greenhouse gas emissions by 95 percent per operation. **Colgate Palmolive** established science-based targets in May 2017.<sup>75</sup> The company will reduce its Scope 1 and 2 manufacturing emissions 25 percent from 2002 levels by 2020 and 50 percent by 2050. To reduce Scope 3 emissions, it will promote water conservation awareness and increase by 50 percent the recycled content of packaging.

Using targets of any kind can help a company identify options and measure their success. Additional examples of corporate targets and metrics can be found in **Appendix B**.

## SCENARIO ANALYSIS

Also in response to public comment on the initial draft, the task force revised its scenario analysis recommendations in three ways. First, it simplified its general recommendation on conducting scenario analysis to focus on qualitative disclosures related to the resilience of an organization's strategy to climate risks and opportunities.<sup>76</sup> Second, it emphasized that, where relevant, organizations should consider scenarios with increased physical risks.<sup>77</sup> Third, it established a threshold for organizations that should conduct more robust, or quantitative, scenario analysis: large nonfinancial companies in the key non-financial groups (energy; transportation; materials and buildings; and agriculture, food and forest products) with over \$1 billion in annual revenue.<sup>78</sup> For these large companies, it is important to disclose additional information, such as the scenarios used (including the 2 degrees Celsius or lower scenario) and the parameters, assumptions, and analytical choices involved. For example, the task force suggested that it would be useful for a company to disclose its assumptions about how and when technology will develop in response to the transition to a lower-carbon energy supply and how that will impact the company's products and services. The task force noted that companies should strive for scenario analysis to be transparent and consistent year over year, and to yield results that are comparable across scenarios.<sup>79</sup>

The recommendations build on the work of many companies including: **Royal Dutch Shell**, **BHP**, **National Grid**, **New York State Common Retirement Fund (NYSCRF)** and the **California State Teachers Retirement System (CalSTRS)** which have all independently commissioned and/or published reports analyzing the implications of future scenarios.<sup>80,81</sup>

Royal Dutch Shell started using scenarios as a business tool to evaluate its strategic options in the 1970s.<sup>82</sup> Its 2016 analysis examines how the global energy system could move to "net-zero" emissions over the next 10–20 years, which the company views as a collective ambition that will require an effective policy framework with the Paris Agreement as an important first step.<sup>83</sup> To support this goal, Shell plans to explore key solutions such as carbon capture and storage, biofuels and hydrogen-based fuels, and natural gas production.<sup>84</sup> Through

a “patchwork of solutions,” the report concludes that it should be possible to meet global energy demands in the second half of the century while achieving net-zero emissions.<sup>85</sup>

**BHP** issued two reports outlining the resilience of its portfolio to future climate scenarios. In the first *Climate Change: Portfolio Analysis* report, the company identified four scenarios:

- A New Gear: Innovation delivers step-change growth in developed economies.
- Closed Doors: National self-interest drives economic policy leading to low growth.
- Global Accord: Unified focus on limiting climate change to 2 degrees Celsius.
- Two Giants: U.S.- and China-led hubs drive technology-enabled growth.<sup>86</sup>

All of the scenarios assume climate change is happening but “what varies between them is the extent of the global response.”<sup>87</sup> The report concluded that diversification in the BHP portfolio would ensure resilience to climate-related transition risks.<sup>88</sup> BHP’s scenario planning process includes tracking trends and events (referred to as signposts and triggers) to determine which scenarios are becoming more dominant so that company strategy can be revised appropriately.<sup>89</sup> In 2016, BHP issued a follow-up *Climate Change: Portfolio Analysis, Views After Paris* report in light of the adoption of the Paris Agreement.<sup>90</sup> This report concluded that the Paris Agreement supported an orderly transition to a lower carbon energy supply, which is one of the characteristics of the Global Accord scenario.<sup>91</sup> The report also concluded that the company’s diverse portfolio remained resilient, because its commodities that are exposed to transition risk are of high quality and low cost and will remain competitive, and because it can adjust its holdings in response to changes in policy and technology.<sup>92</sup> BHP is a foreign issuer and the results of this scenario analysis were not referenced in its most recent financial filing with the SEC.<sup>93</sup>

**National Grid** operates in both the United States and the United Kingdom and has conducted scenario analyses to test the resilience of natural gas and power networks using climate projections provided by the UK national government.<sup>94</sup> National Grid published this analysis in its 2017 *Future Energy Scenarios* report which included an examination of how new business trends and changes in regulation could impact them. The four scenarios explored included:

- Consumer Power: High economic growth, but low-carbon transition is market-driven.
- Two Degrees: High economic growth and effective, long-term environmental policies.
- Steady State: Slow economic growth and policies focused primarily on energy security.
- Slow Progression: Slow economic growth and policies focused on cost-efficient environmental initiatives).<sup>95</sup>

**NYSCRF** is the nation’s third largest public pension plan and has roughly \$192 billion in assets.<sup>96</sup> In 2015, it commissioned Mercer Consulting to conduct a scenario analysis to better understand the climate exposure of certain asset classes and sectors and determine a strategy to optimize beneficiary returns.<sup>97</sup> The scenario analysis used four future scenarios:

- Transformation: Ambitious climate policy limits global warming to 2 degrees Celsius.
- Coordination: Climate policy limits global warming to 3 degrees Celsius.
- Fragmentation (Lower Damages): Limited climate action leads to 4 degrees Celsius.
- Fragmentation (Higher Damages): Limited climate action leads to warming above 4 degrees Celsius with more severe physical impacts.

One of the key findings of the scenario analysis was that climate change impacts on the total portfolio were potentially significant, especially for the equity portfolio under the “Transformation” scenario.<sup>98</sup> Key recommendations for next steps included establishing climate risk management practices and a holistic climate risk management strategy for the organization.

**CalSTRS** is the nation’s second largest pension fund and has roughly \$213.5 billion in assets.<sup>99</sup> In 2016, it also commissioned Mercer Consulting to conduct scenario analysis of its investments using the same four scenarios.<sup>100</sup> Like with NYSCRF, the analysis showed that CalSTRS’ equity investments could be potentially significantly negatively impacted by the “Transformation” scenario.<sup>101</sup> This is true despite the fact that the managers of the two pension funds had slightly different investment strategies: while NYSCRF investments tilted towards Materials, Industrials, and Financials and away from Energy, Utilities, Information Technology and Consumer Staples, CalSTRS tilted away from Financials and Materials and towards Information Technology.<sup>102</sup>

## OPPORTUNITIES AND CHALLENGES

The preceding company examples demonstrate that there is experience across sectors identifying climate risks and opportunities and adapting a company's business strategy to respond to them. The next step and one embraced by the task force is encouraging greater consistency and transparency about climate risks and opportunities throughout corporate reports and especially in financial reporting for investors and lenders. A number of opportunities may flow from adoption of the task force's recommendations.

First, for those companies that practice some but not all of the recommendations, adopting more of the recommendations may increase internal understanding and communication about climate related issues and encourage additional evaluation of existing strategies. Second, expanded climate-related evaluation and disclosures may help companies better position themselves to take advantage of opportunities and prepare for risks. Third, proactively addressing the growing concerns of stakeholders and investors concerning climate change may reduce costs for companies related to information requests and shareholder proposals. Finally, armed with better information, investors may be able to identify opportunities and invest in companies focusing on climate solutions.

But increased disclosure of climate risks and opportunities in financial reports is not without challenges. Many companies are still in the early stages of understanding of how climate change could impact their operations and supply chains. Others are unsure how to translate the implications of their climate metrics into their financial statements. Still others are concerned that the quality of some data is not yet good enough to include in financial filings. The task force recognized these challenges in its final recommendations and believed many of these could be overcome with time and experience. They also suggested that even where climate-related information was not deemed material for financial reports, it should be included, to the extent possible, in other annual reports that have comparable senior level review and sign-off. Including this information in other reports is important because it demonstrates to stakeholders that key climate issues are being considered and managed.

In workshops, webinars, and interviews with members of the C2ES Business Environmental Leadership Council, we heard and discussed various concerns and challenges that companies could face as they move to

implement these recommendations. These challenges generally fell into 8 categories:

1. Uncertainty related to how granular climate change impacts can be analyzed and the speed of the transition to a lower carbon energy supply
2. Lack of clarity on appropriate timeframes to consider and how they would determine the best timeline for their individual companies
3. Legal issues related to determining materiality and a perception that financial disclosure of climate risks would not be of interest to average investors
4. Ambiguity on the appropriate level of detail and how to start with what they already have;
5. Differences in the quality and precision of financial and sustainability data
6. How quickly internal coordination can be improved where needed
7. Overall costs and complexity of completing the analysis
8. Usefulness of scenario analysis and financial disclosure of metrics and targets.

Notably while companies identified these concerns, none said these challenges were insurmountable. Indeed, as the previous section illustrated, many companies are already taking steps to improve their climate-related disclosures within their financial filings and other annual reports. It seems likely that many of the challenges explained in this issue brief will be addressed with time and experience and reporting on climate risks in all forms of disclosure will improve.

**Uncertainty.** In 2013, C2ES reported that nearly one-quarter (24) of S&P Global 100 companies encountered challenges in investing in climate resilience because of the uncertainty around when, where, and how severe physical impacts will be.<sup>103</sup> Companies also encountered challenges in translating climate science to impacts on their operations in terms of their standard business metrics.<sup>104</sup> In 2015, C2ES found that while the quantity of climate-related data and tools had increased, companies remained concerned about data limitations because of the lack of granular, or geographically specific, information that could be considered "actionable science."<sup>105</sup> On transition risks, the multiple decision-makers involved

in energy and environmental policy and the unpredictability of technological advancements add complexity to making business decisions about the future. A scenarios approach has been proposed as a way to address this uncertainty by encouraging companies to explore forward looking information and assumptions, though deciding if this information is material and suitable for financial filings or whether it should be part of another report, like the company's sustainability report is another question. As described earlier, companies consider what they can and should disclose in financial filings based on their understanding of U.S. securities laws, which do not require reporting of highly uncertain information.

**Timeframes.** Compounding the uncertainty involved with anticipating climate impacts, the issue of timeframes in financial reporting requires thoughtful consideration. Some companies have stated that climate change is a relevant issue for investors over the long-term but may not be financially material to investors' decisions to buy or sell securities in the next two to three years. A company's perspective on the near-term materiality of climate risks may vary by company, industry or sector. Furthermore, as companies look further into the future, the level of uncertainty regarding potential business impacts increases. At the same time, if many companies in a sector or across the economy focus exclusively on the next few quarters or few years, there is a greater risk of a "tragedy of the horizon" problem, which refers to a widespread short-term perspective in financial filings that obscures systemic risks to the financial system posed by inadequate transparency on climate risks.<sup>106</sup> The "tragedy of the horizon" was one of the driving factors behind the creation of the FSB task force.

**Determining Materiality and Identifying the Audience.** In preparing financial reports, U.S. companies determine the materiality of information with a view towards minimizing litigation risks related to providing too little, too much, or confusing information.<sup>107</sup> As described earlier, under U.S. securities laws, there are penalties associated with omitting material information and other content needed to ensure disclosures are not misleading. Companies may also choose to limit the overall volume of information they provide to reduce the risk of inadvertent errors or misrepresentations. Walking this line between enough, but not too much, can be challenging but it is important, especially because compared to many other countries, the United States is more litigious on the content of financial reports.<sup>108</sup>

Adding to this challenge is the awareness that public communications must be consistent with a company's internal knowledge and internal analysis of an issue. Recent action against Exxon Mobil is a prime example. In addition to ongoing investigations by the attorneys general in New York and Massachusetts, former and current Exxon Mobil employees sued the company in February 2017 alleging that the company provided misleading and false statements on the financial risks of climate change which impacted the value of company stock the employees purchased through the company savings plan.<sup>109</sup>

At least one expert has speculated these investigations may have implications for how companies think about materiality determinations: "Specifically, if a company conducted internal assessments and evaluations of its regulatory risks, business risks, and physical risks, yet failed to adequately disclose how such forecasts were known to affect their business, could that company be exposed to non-disclosure liability if the disclosure of such assessments might have affected a reasonable investor's decision making? If answered in the affirmative, the same rationale could hold true for any public company that has conducted, but not adequately disclosed, climate risk assessments that forecast material impacts to the company."<sup>110</sup> Materiality determinations can be challenging and compounding this is the reality that stakeholders and investor perceptions about what is reasonable and acceptable may be changing.

**Level of Detail.** Related to the legal issue of determining materiality is that some companies said they believe investors are more interested in how companies manage sustainability issues and think about environmental risks rather than in evaluating a company's raw data about emissions, waste, or energy and water use. We also heard that while sustainability data may inform mainstream annual financial filings, corporate social responsibility (CSR) reports (and company websites and social media) offer the ability to put information into a broader context that may be preferable for maintaining relationships with customers and communities. Certainly, even as the importance of climate-related financial reporting increases, it will remain critical to use CSR reports, company websites, and social media to maintain relationships with customers and communities. The task force suggested that if recommended disclosures on strategy and metrics and targets are not material, they should be disclosed by large companies in other company reports,

like their CSR reports, that are subject to similar internal review.

**Data Quality and Precision.** During company interviews, we heard that the sustainability data many companies have access to is not as precise as their financial data because their internal control systems to collect the data are not as robust and the information is not always verified by third parties. For example, data about emissions that result in the supply chain, including the emissions associated with raw material inputs, distribution or consumption of a final product (also called Scope 3 emissions), is less precise than information about a company's own direct emissions (Scope 1 emissions) or the indirect emissions that result from the use of electricity (scope 2 emissions). In addition, for some types of sustainability data, like information about water use and waste management practices, data collection methods often involve estimates rather than actual measurements. To address this, the task force suggested that companies "include in their disclosures a description of gaps, limitations, and assumptions made as part of their assessment of climate-related issues."<sup>111</sup> The recommendations also anticipate that climate-related financial disclosures will be reviewed by a company's chief financial officer and audit committee, so there may be an incentive for companies to invest in technologies that improve the quality of the data.

**Internal Coordination.** The timeframes for financial data may not be well-aligned with sustainability data and the personnel who manage each may not be well connected to each other. Greenhouse gas emissions data for the prior year, for example, may not be ready for publication on the same timeline as company 10-K filings and may need to be reported in later filings. In addition, securities compliance officers may not be well-versed in climate risks while sustainability and environment compliance officers may not be integrated into the company's risk management processes or well-connected to other relevant groups within the company.<sup>112</sup> As companies gain greater experience integrating climate risks and opportunities into corporate reporting and especially financial reporting using the task force's recommendations, many of these internal coordination challenges are likely to be resolved through "learning by doing." Indeed, the task force stated that "by encouraging disclosure of climate-related financial information in public financial filings, coordination between organizations' climate-related 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."<sup>113</sup>

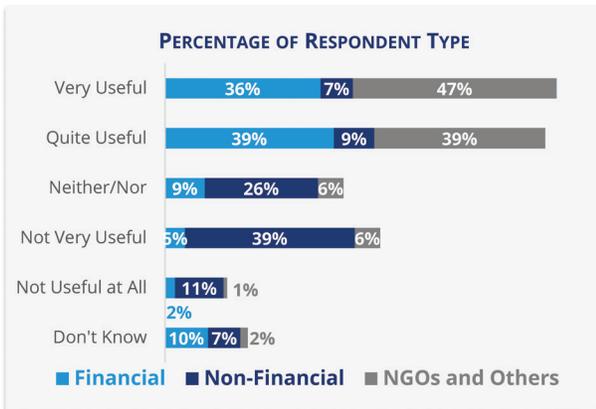
**Costs and Complexity.** The number of climate reporting efforts and their disparate nature increases the costs and complexity for companies. Improving the consistency of reporting and to the extent it is material, "mainstreaming" reporting of climate risks and opportunities in financial filings along the lines of the recommendations from the task force might reduce this complexity. It might also reduce costs related to shareholder resolutions by proactively responding to investors' concerns. As discussed previously, however, some information may not be relevant or material for these reports and other reporting frameworks provide an opportunity to provide the broader context. The key then, is to improve the consistency across reporting frameworks as much as possible. The task force's recommendations provide a good template for more consistent reporting on climate relevant issues.

**Scenario Analysis and Metrics and Targets.** Based on input on the draft recommendations from hundreds of stakeholders, there was a divide between financial companies and non-financial companies on two factors.<sup>114</sup> As shown in **Figures 1** and **2**, roughly three-quarters of financial companies found scenario analysis and the illustrative examples of metrics and targets to be useful while less than a quarter of non-financial companies agreed on scenario analysis and roughly one-third agreed on metrics and targets.<sup>115</sup> In both cases, non-governmental organizations shared the same perspective as financial companies. As a result, pressure on companies to conduct scenario analysis and to share metrics and targets is likely to persist. One of the primary purposes of scenario analysis is to assess how robust a corporate strategy is under a range of possible futures and one of the likely outcomes of this assessment is a better appreciation of long term risks and opportunities. Many companies already conduct scenario analysis and others told us they are interested in learning more about it but have questions about what information would be useful to investors. Scenario analysis is a powerful tool that can help companies understand their risks and opportunities but greater coordination between companies, investors, and other stakeholders may be needed on how to implement this part of the task force's recommendations.

**FIGURE 1: Usefulness of Scenario Analysis**

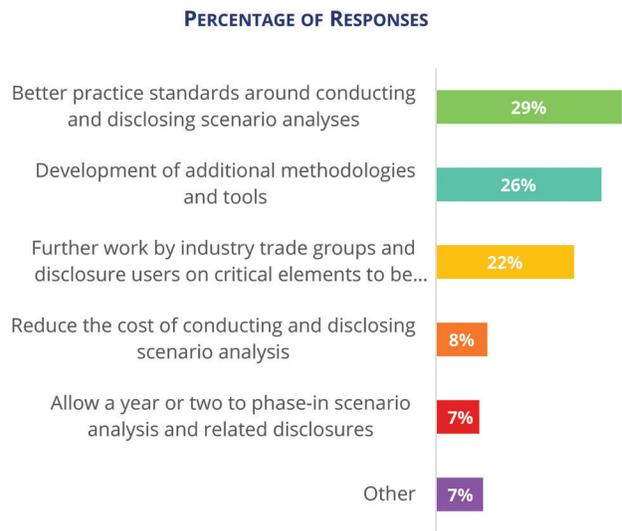
All respondents were asked about the usefulness of a description of potential performance across a range of scenarios to understanding climate-related impacts on an organization’s businesses, strategy, and financial planning.

RESPONDENTS	USEFUL	NOT USEFUL	NEITHER	DON'T KNOW
All	69%	14%	11%	6%



Base size (asked of All): 306

All respondents were asked about the most effective measures to address potential challenges around conducting scenario analysis and disclosing the recommended information.



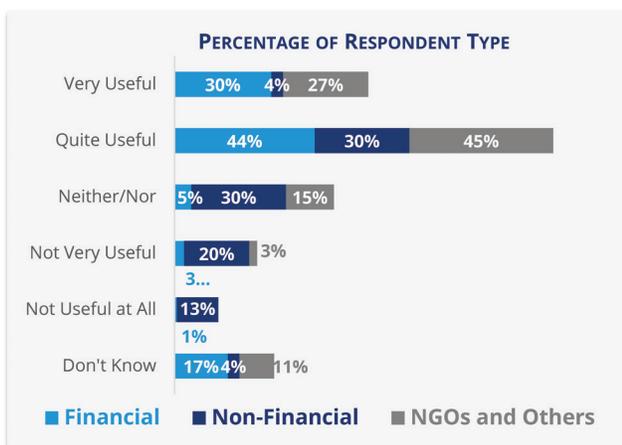
Base size (asked of All): 306

Source: FSB Task Force on Climate-related Financial Disclosures

## FIGURE 2: Metrics and Targets

All respondents were asked about the usefulness of the illustrative examples of metrics and targets provided for non-financial groups.

RESPONDENTS	USEFUL	NOT USEFUL	NEITHER	DON'T KNOW
All	66%	9%	13%	12%

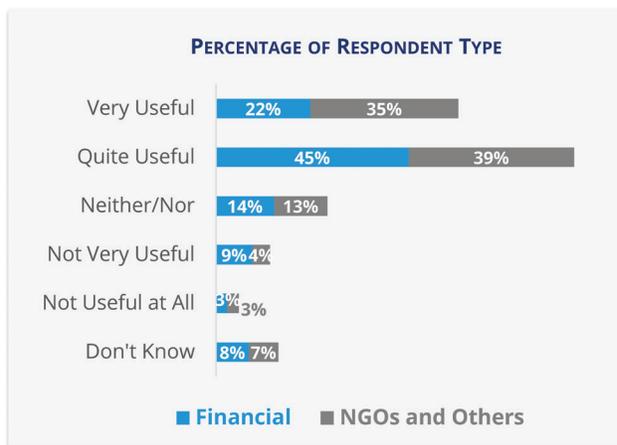


Base size (asked of All): 306

Source: FSB Task Force on Climate-related Financial Disclosures

Users were asked how useful disclosure of GHG emissions associated with investments would be for economic decision-making (e.g., investing decisions).

RESPONDENTS	USEFUL	NOT USEFUL	NEITHER	DON'T KNOW
Users	70%	10%	13%	7%



Base size (asked of Users): 192

## NEXT STEPS

At this early stage, it appears that many companies and investors are supportive of the task force's recommendations. When the recommendations were released, more than 100 CEOs (15 of which are headquartered in the United States) publicly stated their support.<sup>116</sup> In May 2017, 217 investors representing \$15 trillion in assets sent a letter expressing support for the recommendations and urging global leaders to implement them.<sup>117</sup> The most common driver cited by financial companies that would encourage their adoption of the recommendations is "adoption by industry peers" and the most common driver cited by non-financial companies is "requests from investors."<sup>118</sup> This is consistent with what we learned in our interviews with companies.

Looking ahead, the FSB extended the task force through September 2018 so that it may promote adoption of its recommendations and review the extent to which they are meeting the needs of data preparers and data users.<sup>119</sup> The task force said it will work with

the organizers of other climate reporting frameworks to promote consistency, and some of that consistency is already developing. As previously noted, CDP is already evolving its questionnaires to be more in line with the task force's recommendations. In April 2017, the Asset Owners Disclosure Project noted that it correlated its assessment categories with the draft task force recommendations for the sake of consistency.<sup>120</sup> Recognizing that not all climate-related information is financially material for all companies and thus suitable for financial filings, consistency in these other disclosure frameworks is important and could simplify corporate reporting. Even outside of these voluntary reporting frameworks, the recommendations provide a benchmark for the types of information that companies should identify, manage, and include in their CSR reports.

Additional work, however, is needed to overcome some of the challenges identified in this report and improve

climate related disclosures in all types of reporting. In July 2017, 11 global banks representing \$7 trillion in assets joined the U.N. Environment Finance Initiative to create a work group to develop analytical tools to improve assessment and disclosure of climate risks and opportunities, in what is described as a “first mover project to implement the recommendations”.<sup>121</sup>

Greater collaboration is also needed between companies, investors, and other stakeholders around scenario analysis. In our workshops and interviews, we heard that companies seek to better understand the steps involved with scenario analysis and would like to meet with investors to learn more about what they are seeking. There is particular interest in identifying a consistent framework for scenario analysis, best practices, and determining how far in the future these should extend and the level of reporting detail. Generally, companies are concerned about disclosing the right level of information, neither too much nor too little compared to their industry peers. Companies are also interested in learning how to conduct this analysis in-house. There is also a need to understand how to communicate the results of scenario analysis. For companies that have sophisticated modeling capabilities, it is important to educate investors and other stakeholders to clarify any misperceptions. For example, average investors may perceive scenario analysis to be company predictions or forecasts about the future when, in fact, scenario analysis is intended to be used as a business tool to stress test the resilience of a company’s strategy and portfolio.

It may also be useful to include ratings agencies in these collaborative discussions. It would be especially useful to understand whether and to what extent climate risk impacts debt and equity investments differently. In our conversations with ratings agencies, we learned that investors are also increasingly asking for better ways to understand companies’ exposure to sustainability issues, including climate change. In response, ratings agencies are proposing new products such as the *S&P Global Ratings Green Evaluations* launched in April 2017. The connection between these new products and scenario analysis conducted by companies should be explored.

Pressure for increased disclosure of climate-related risks and opportunities is not likely to decline. Two-thirds of institutional investors say companies do not adequately disclose information about environmental, social, and governance (ESG) risks and they continue to express those concerns through shareholder resolutions.<sup>122,123</sup> In January 2017, the CEO of State Street Global Advisors, an asset manager with \$2.4 trillion under management,

wrote a public letter to the boards of directors of the companies State Street invests in stating that State Street planned to focus on board oversight of sustainability issues, including climate change, because they “can have a material impact on a company’s ability to generate returns” over the long-term.<sup>124</sup> In April 2017, the Asset Owners Disclosure Project concluded that a 60 percent majority of asset owners are taking action on climate risks and opportunities.<sup>125</sup>

Shareholder activists are not the only ones pushing for more climate risk disclosure. As noted earlier, several state attorneys are also exploring the issue. New York Attorney General Eric Schneiderman, for example, is using the Martin Act, New York’s anti-fraud law for securities and commodities, to investigate whether potentially inadequate reporting by ExxonMobil on climate change risks in financial filings constitutes financial fraud.<sup>126</sup> This investigation could lead to referral for civil action or criminal prosecution. U.S. state attorneys in Massachusetts and California have also announced investigations.

Finally, other G-20 nations have moved forward with new laws and requirements related to climate-related financial disclosures. In 2014, the European Union adopted Directive 2014/95, which requires certain large firms’ financial or other public reports to disclose energy and water use and greenhouse gas emissions.<sup>127</sup> A new European Union directive requires reporting on climate risks by certain pension funds.<sup>128</sup> France has also enacted requirements on climate-related financial disclosures. In particular, Article 173 of the French Law on Energy Transition for Green Growth directed publicly traded companies to describe in their annual reports their climate risks and their strategy to mitigate these risks.<sup>129</sup> The law also requires institutional investors to describe in their annual reports how investment decisions take into account ESG criteria and align with the French strategy for energy transition. Most recently, in June 2017, the Bank of England announced an internal review of the banking sector to determine its exposure to climate-related risks, which could lead to its support for enhanced regulation.<sup>130</sup> With all of these requirements, it is clear that companies with international operations will be moving forward to disclose additional information on climate-related financial risks and, as they gain this experience, it is reasonable to expect that the quality and consistency of reporting will improve and over time, more of this reporting will end up in U.S. financial filings.

## CONCLUSION

The final recommendations from the task force provide an initial template for aligning climate reporting that will inform existing reporting frameworks. These recommendations strike a balance between the need for greater transparency for stakeholders and investors about potential climate risks and opportunities and the need for companies to have flexibility in how they report on these issues. Over time, as corporate systems and processes are refined, greater consideration of climate risks in all reporting platforms, including financial filings, will likely result.

Greater transparency will have several benefits, including the development of better corporate governance practices and improved internal communication around climate risks and opportunities. Proactively addressing investors' concerns may also reduce costs for companies related to information requests and shareholder proposals. Most importantly, as the FSB noted when it launched the task force, transparency about this information may facilitate a smoother transition to a lower-carbon economy as stakeholders and investors have better information to judge whether risks and opportunities are being addressed.

It is an encouraging sign that over 100 companies have publicly stated their support for the task force's recommendations. Even in the absence of action by U.S. regulators, companies are likely to expand and enhance their climate-related disclosures for a variety of reasons including: investor interest, action by state regulators, and European policy.

In our conversations with companies, we learned that the quantity and disparate nature of climate disclosure efforts increase the cost and complexity of climate risk reporting. Industry-led solutions like the task force's recommendations that offer specific guidance on what should be reported and where it should be disclosed can promote consistency and expanded effort.

Challenges ahead include determining the appropriate timeframes and level of detail to include in

disclosure, overcoming difficulties with internal coordination and differences in the precision of financial and sustainability data, and exploring how to conduct and communicate sophisticated internal analysis about climate risks and opportunities. Companies in the financial sector and in key non-financial groups have experience conducting the types of scenario analysis referenced in the task force's recommendations and others will "learn by doing." We expect (and hope) that over time more companies will include this important information in their financial reporting, if it is material, or in other types of annual reports. Even in other annual reports, these recommendations should help improve the quality and consistency of what is reported.

Climate change is a significant business risk and most large companies are addressing it. Nevertheless, identifying how the issue is being managed, what strategies are being pursued to manage the risks and opportunities in various climate scenarios, what targets and metrics are used to measure progress, and then disclosing this information—either in financial reports or in other annual documents—can ensure that the issue is recognized company-wide. Increased and expanded disclosure can also reassure investors and other stakeholders that the issue is properly addressed, and can smooth the progress to a lower carbon economy.

More work will be needed to help companies implement the task force's recommendations, particularly regarding tools like scenario analysis. There is an important opportunity for companies, investors, and other stakeholders to work together to identify a consistent framework for scenario analysis and to highlight best practices. This type of collaboration between companies, investors, and other stakeholders around the task force's recommendations will be essential to maximize their adoption across multiple sectors.

## APPENDIX A

# SECTOR-SPECIFIC SUPPLEMENTAL GUIDANCE ON RECOMMENDED DISCLOSURES

The task force developed supplemental guidance to help the financial sector and the non-financial sectors most likely to be affected by climate-related transition and physical risks, such as those with high levels of greenhouse gas emissions and energy and water use. For the financial sector, the task force provided supplemental guidance for banks, insurance companies, asset owners, and asset managers. The supplemental guidance focuses on strategy, risk management, and metrics and targets. For non-financial groups, the task force provided supplemental guidance for the energy; transportation; materials and buildings; and agriculture, food and forest products sectors. The supplemental guidance focuses on strategy and metrics and targets.

### SUPPLEMENTAL GUIDANCE ON RECOMMENDED DISCLOSURES: THE FINANCIAL SECTOR

In creating the task force, the FSB highlighted the significant role that financial sector disclosures will play. They may prevent a *carbon bubble* by helping investors identify “concentrations of carbon-related assets” in the financial sector and understand the “financial system’s exposures to climate-related risks.”<sup>131</sup> In addition to enabling an early assessment of climate risks, financial sector disclosures may “facilitate market discipline” and provide data on material financial impacts from climate change that can be analyzed at a systemic level.<sup>132</sup>

In light of this special role, the task force developed supplemental guidance for banks, insurance companies, asset owners, and asset managers while recognizing that asset owners and managers may use a different reporting format and a different definition of materiality as compared to corporate financial reporting.<sup>133</sup> One challenge we heard from financial sector companies during our interviews is that sophisticated internal analysis may be difficult to communicate to stakeholders, particularly with respect to the use of scenario analysis. Average investors may perceive this analysis to be a company’s predictions or forecasts when it is intended to serve as a business tool to stress test a company’s portfolio.

**1. Banks.** Banks may be exposed to climate risks through lending to or trading securities of companies with significant greenhouse gas emissions, energy, and water use. The task force recommended that banks

“describe significant concentrations of credit exposure to carbon-related assets.”<sup>134</sup> In recent years, some banks have been taking steps to reduce exposure to certain types of carbon-related assets, such as coal. In 2016, **JPMorgan Chase** updated its Environmental and Social Policy Framework to include restrictions on financing of coal-fired power and coal mining.<sup>135</sup> The task force also recommended that banks describe climate risks in the context of traditional banking risk categories.<sup>136</sup> **Bank of America** integrates climate risk into its existing risk framework, especially as a component of credit, operational, compliance, and reputational risk.<sup>137</sup>

**2. Insurance Companies.** The task force recommended that insurance companies describe the impacts of climate risks on their business.<sup>138</sup> **The Hartford’s** 2016 annual report includes examples of physical climate risks, such as increased frequency and severity of storms, more frequent brush fires, and more deluge flooding.<sup>139</sup> The company also noted the “amount we charge for catastrophe exposure may be inadequate if the frequency or severity of catastrophe losses changes over time or if the models we use to estimate the exposure prove inadequate.”<sup>140</sup> The task force also recommended that insurance companies describe any climate-related products that may be under development.<sup>141</sup> An example is **Swiss Re’s** expansion into insuring the renewable energy sector. In 2015, the company established a Center of Competence for Wind Power.<sup>142</sup> It also identified an opportunity to move into the \$40 billion global micro insurance market as subsistence farmers scale up to meet the demand of growing urban populations in the context of increased extreme weather and drought.<sup>143</sup>

**3. Asset Owners.** This broad category includes public and private sector pension plans as well as insurance companies, foundations, and endowments that invest assets. The financial reporting requirements that apply to them vary widely. The task force highlighted that asset owners may be able to influence companies to improve their climate-related financial disclosures. It specifically recommended that asset owners disclose their engagement activity with those companies.<sup>144</sup> **Amalgamated Bank** is an example of an asset owner that is actively engaging with its portfolio companies on climate change. The company’s Longview Funds filed shareholder

proposals seeking information on whether new economy companies could achieve net-zero energy efficiency by 2030.<sup>145</sup> It believes that “if portfolio companies defer action on climate change, that could have significant negative effects on their long-term economic health and the value of investments in those companies.”<sup>146</sup> The company recently committed to using 100 percent renewable energy and achieving net-zero electricity in its operations to practice what it preaches.<sup>147, 148</sup>

In April 2017, the Asset Owners Disclosure Project pointed out the climate risk reporting leadership of major asset owners, including the **New York State Common Retirement Fund** (highlighted for its use of metrics and targets), the **California Public Employees Retirement System**, and the **California State Teachers’ Retirement System**.<sup>149</sup>

**4. Asset Managers.** Like asset owners, asset managers are exposed to climate-related risks and opportunities through their investments. The reporting requirements that apply to asset managers also vary widely. Notably, where an asset manager is a public company, both its clients and its shareholders would be the audience for an asset manager’s climate-related financial disclosures. The task force recommended that asset managers describe how they factor climate risks into their investment products and strategies.<sup>150</sup> In April 2017, the Asset Owners Disclosure Project concluded that reporting by asset managers on governance, strategy, and risk management is strong and tends to exceed the quality of similar reporting by asset owners.<sup>151</sup> In particular, **Goldman Sachs Asset Management**, **BlackRock Inc.**, **J.P. Morgan Asset Management** and **Morgan Stanley** were identified as U.S. industry leaders.<sup>152</sup> The report identified a lingering industry-wide problem with metrics & targets, including on quantification of low-carbon investments.<sup>153</sup>

#### **SUPPLEMENTAL GUIDANCE ON RECOMMENDED DISCLOSURES: NON-FINANCIAL GROUPS**

The task force recommended that all companies provide key disclosures on governance, strategy, risk management, and metrics and targets. The task force provided supplemental guidance to the financial sector on the recommended disclosures on strategy, risk management, and metrics and targets. Outside of the financial sector, other industries can be exposed to systemic climate risks because of their high greenhouse gas emissions and energy and water use. These sectors include:

1. Energy
2. Transportation
3. Materials and buildings
4. Agriculture, food, and forest products

**1. Energy.** Companies in energy industries, including oil and gas, coal, and electric utilities, generally have substantial greenhouse gas emissions and rely heavily on water availability (which is so fundamental to operations, it can often be seen as a lens through which climate impacts are assessed).<sup>154</sup> They are exposed to transition risks related to changes in laws, policy, and technology related to the shift to a lower-carbon energy supply. CDP has observed that this sector has been relatively weak in emissions reporting.<sup>155</sup> The energy sector is also a prime target for those advocating for action on climate change. Ensuring that energy companies create processes to address climate change as part of their governance and strategy and ensuring that they measure and report emissions are all seen as important elements for creating a pathway to a lower carbon future.

**2. Transportation.** This sector includes air freight, passenger air, maritime transportation, rail transportation, trucking services, and automobiles. While aviation and marine transport companies are subject to international requirements related to climate change, all of the transport sector is facing increased pressure related to emissions of greenhouse gases and other pollution. Automakers may face stricter emissions standards and competition from new technology such as electric vehicles. Electric vehicles and autonomous vehicles may also play a role in greenhouse gas mitigation but some suggest they could also make emissions worse.<sup>156</sup> Extreme weather can shut down local or regional routes, delay passengers, and impact supply chains. A warming ocean and sea-level rise can cause problems for ports and cargo transport. Scenario analysis is particularly useful where the exact nature of change is still evolving and where new technology is rapidly developing.

**3. Materials and Buildings.** This sector is defined as including industries such as metals and mining, chemicals, construction materials, capital goods, and real estate management and development. These industries tend to have significant greenhouse gas emissions and energy use. Some of them use a lot of water. They also tend to involve capital-intensive investments in equipment, plants, and buildings. For these reasons, they are

exposed to transition and physical risks related to climate change. At the same time, there may be many climate-related opportunities for companies in the materials sector in particular.

**4. Agriculture, Food, and Forest Products.** The task force grouped industries focused on beverages, agriculture, packaged foods and meats, and paper and forest products. Companies in these industries will experience climate-related transition and physical risks in different ways depending on whether they are primary producers or processors and depending on their level of water use. On the positive side, there may be climate-related opportunities to increase their efficiency by lowering the energy and water intensity of their products through new technologies, to reduce waste using new practices, and to develop new products and services with lower energy and water intensity.<sup>157</sup>

The task force provided supplemental guidance to all of these four key non-financial groups on strategy and metrics and targets:

**Strategy.** Companies should discuss how climate risks and opportunities are integrated into decisions about R&D and adoption of new technology, decisions about investments and write-downs of assets, strategies to reduce operations at legacy assets that are energy- or water-intensive, and the company's flexibility to reposition capital in response to emerging climate risks and opportunities.<sup>158</sup> Large companies with over \$1 billion in annual revenue should conduct robust scenario analysis to test the resilience of their business strategies in multiple scenarios including a 2 degrees Celsius or lower scenario and scenarios with increased physical risks.<sup>159</sup>

**Metrics and Targets.** Companies should provide historical trends and projections for metrics like greenhouse gas emissions, energy, water and land use, and waste management practices.<sup>160</sup> Companies should also provide

information about investments in climate mitigation that would respond to transition risks.<sup>161</sup>

This supplemental guidance differs from that provided for the financial sector in two ways. First, the financial sector received supplemental guidance on risk management due to the financial sector's use of industry-specific risk terminology, modeling tools, and company engagement practices by banks, insurance companies, and asset owners and asset managers.

Second, supplemental guidance on strategy and metrics and targets was customized for the financial and key non-financial sectors. For example, the supplemental guidance for banks on strategy and metrics and targets focused on areas where investors may have concerns, such as "significant concentrations of credit exposure to carbon-related assets"<sup>162</sup> and the "amount and percentage of carbon-related assets relative to total assets."<sup>163</sup> In contrast, the supplemental guidance for the key non-financial groups related to investor concerns about high levels of greenhouse gas emissions and energy and water use. This requires a more specialized look at company strategy and the metrics and targets employed to develop and monitor company strategies. In particular, the task force emphasized that large companies in the key non-financial groups with over \$1 billion in annual revenue should conduct more robust and quantitative scenario analysis.<sup>164</sup>

The supplemental guidance demonstrates how the task force promoted consistency in climate risk reporting while also allowing for flexibility. The broadly applicable recommendations on governance, strategy, risk management, and metrics and targets apply to all organizations. On a more detailed level, the supplemental guidance recognizes the different characteristics of each industry and provides examples of the types of considerations a company should consider in developing financial disclosures.

## APPENDIX B

# EXAMPLES OF CLIMATE-RELATED STRATEGY AND METRICS AND TARGETS FROM KEY NON-FINANCIAL GROUPS

### ENERGY

**Strategy.** **Pacific Gas & Electric Company (PG&E)** has publicly articulated its strategy regarding climate change. In 2006, PG&E released a Climate Change Policy Framework that established a company priority of keeping PG&E emissions low and advocating for a national, market-based approach to greenhouse gas regulation.<sup>165</sup> For PG&E stakeholders, the PG&E Climate Change Policy Framework ensured that the company's internal and external strategies were consistent.

**Exelon's** most recent 10-K report highlights how strategy analysis could be integrated into financial filings. After describing the potential nature of climate change regulation at the federal, regional, and state levels, the report describes Exelon's voluntary climate change efforts as a climate-related opportunity:

Exelon remains one of the largest, lowest carbon electric generators in the United States: nuclear for base load, natural gas for marginal and peak demand, hydro and pumped storage, and supplemental wind and solar renewables. As further legislation and regulation imposing requirements on emission of GHG and air pollutants are promulgated, Exelon's low-carbon, low-emission generation fleet will position the company to benefit from its comparative advantage over other generation fleets.<sup>166</sup>

**Metrics and Targets.** **NRG Energy** is a U.S. energy company that has adopted an emissions reduction target after participating with the SBTi. It aims to reduce emissions 90 percent from 2014 levels by 2050 with an interim goal of 50 percent by 2030.<sup>167</sup> **DTE Energy** also announced a new emissions reduction target of 80 percent by 2050.<sup>168</sup> To achieve these targets, the company will construct additional renewable energy capacity, transition power sources from coal to natural gas, maintain operation of an existing nuclear plant, and enhance energy efficiency options for customers.<sup>169</sup>

### TRANSPORTATION

**Strategy.** As temperatures increase and there are greater extremes in weather, transportation-related industries may experience disruptions due to climate impacts. For

example, in June 2017, **American Airlines** cancelled over 40 flights in Phoenix due to a heat wave that prevented planes from taking off.<sup>170</sup> Airports in different locations will experience climate-related atmospheric changes differently based on their elevation.<sup>171</sup> Climate-related jet stream changes are expected to increase the length of some flights and shorten the length of others.<sup>172</sup> Investors will need to consider whether airlines have identified how atmospheric changes in frequently traveled routes will affect the company's profit margins and whether there are strategies in place to mitigate the financial impacts. Additional transparency on these issues would help assess how companies are addressing these risks.

**Metrics and Targets.** The most recent 10-K report of **General Motors** demonstrates how a transportation company may integrate metrics and targets into its financial filings. The report states:

We have committed to meeting the electricity needs of our operations worldwide with renewable energy by 2050. . . In 2016, we also met the EPA Energy Star Challenge for Industry (EPA Challenge) at 12 of our sites globally by reducing energy intensity an average of 18% at these sites. To meet the EPA Challenge industrial sites must reduce energy intensity by 10% in five years or fewer. Two of the sites achieved the goal for the first time, bringing the total number of owned sites to have met the EPA Challenge to 75, with many sites achieving the goal multiple times. These efforts minimize our utility expenses and are part of our approach to addressing climate change through setting a greenhouse gas emissions reduction target, collecting accurate data, following our business plan and publicly reporting progress against our target.<sup>173</sup>

### MATERIALS AND BUILDINGS

**Strategy.** **Alcoa** anticipates increased demand for aluminum as a lightweight metal as companies face stricter fuel-efficiency and emissions regulations.<sup>174</sup> To capitalize on this opportunity, Alcoa launched the new "Sustana" line of aluminum products that will improve the carbon footprint of its customers' supply chains.<sup>175</sup> Alcoa is also reviewing its production process to identify

improvements that would reduce its environmental footprint, including opportunities to transform byproducts and coproducts into commercially viable products.

Similarly, **Bayer** has taken steps to reduce its emissions and revise its strategy to account for the transition to a low-carbon energy supply. In 2007, the Bayer Climate Program was established to reduce the company's carbon footprint.<sup>176</sup> Through the Bayer Climate Check, emissions were reduced at 140 production plants and opportunities to focus on materials for lightweight transportation to China were identified.<sup>177</sup> Through the "enCO2re" R&D effort, the company is exploring using carbon dioxide instead of petroleum to produce plastics.<sup>178</sup>

**Metrics and Targets.** **Rio Tinto** is a company in the materials and buildings sector that has focused extensively on creating an inventory of emissions.<sup>179</sup> These efforts began in the 1990s, before the company was required to do so by regulators. Rio Tinto uses methodologies established by the Intergovernmental Panel on Climate Change and International Standard Organization 16064-1 to measure direct and indirect emissions (Scopes 1 and 2) and the emissions from the three highest sources in Rio Tinto's supply chain.

## AGRICULTURE, FOOD, AND FOREST PRODUCTS

**Strategy.** **Diageo** is a beverage alcohol company that created a Water Blueprint strategy that includes water efficiency targets and investments to protect stressed watersheds as well as investments in community access

to sanitation and clean water. The company identified its most critical agricultural commodities (agave, barley, cream, grapes, sorghum, and sugar) to develop a strategy for long-term sourcing of these products, including sourcing more drought-tolerant crops like cassava and sorghum in Africa.<sup>180</sup>

**Weyerhaeuser** is a forest products company that integrates climate risks into its financial filings. In its annual report for 2016, it notes that compliance with new climate policy such as regulation of carbon dioxide emissions, new fuel standards, and a carbon price "might require significant expenditures."<sup>181</sup> The annual report explains that while legislative and regulatory activity is uncertain, it could "limit harvest levels or result in significantly higher costs for energy and other raw materials" and "could have an adverse impact on our results of operations and profitability."<sup>182</sup>

**Metrics and Targets.** **Nestle** reports that 17 percent of its energy is derived from renewable sources and, as part of the RE100 initiative, it aims to increase that to 100 percent.<sup>183</sup> The company also has a science-based target of reducing greenhouse gas emissions from manufacturing operations by 35 percent from 2010, from distribution operations by 10 percent from 2014, and from warehouses by 10 percent from 2014.<sup>184</sup> The company's focus on transparency and progress toward its targets has earned accolades from CDP and the Dow Jones Sustainability Index.

## ENDNOTES

- 1 See, e.g., Consumer Federation of America, Letter to Brent J. Fields, Secretary, U.S. Securities and Exchange Commission (SEC), Business and Financial Disclosure Required by Regulation S-K, File No. S7-06-16, Jul. 25, 2016.
- 2 Mark Carney, “Breaking the Tragedy of the Horizon—Climate Change and Financial Stability” (Speech, London, Sep. 29, 2015), <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx>.
- 3 G20 Finance Ministers and Central Bank Governors, *Communique on Apr. 16–17, 2015 Meeting* (Washington, D.C.: G20, 2015), <http://g20.org.tr/wp-content/uploads/2015/04/April-G20-FMCSBG-Communique-Final.pdf>.
- 4 The Task Force on Climate-Related Financial Disclosures was chaired by Michael Bloomberg, and comprised of 32 members from major banks, insurance companies, asset managers and owners, pension funds, non-financial companies, consultants, accounting firms, and credit rating agencies.
- 5 Financial Stability Board (FSB) Task Force on Climate-related Financial Disclosures (TCFD), *Statement of Support and Supporting Companies* (Basel: FSB TCFD, 2017), <https://www.fsb-tcfd.org/publications/final-tcfd-recommendations-report-statement-support-june-2017/>.
- 6 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 10–11 (Basel: FSB TCFD, 2017), <https://www.fsb-tcfd.org/publications/final-recommendations-report/>.
- 7 Meg Crawford and Stephen Seidel, *Weathering the Storm: Building Business Resilience to Climate Change* xi, 11–13 (Arlington: C2ES, 2013), <https://www.c2es.org/publications/weathering-storm-building-business-resilience-climate-change>. “Concerns about disruption to production or increases to operational costs are cited by a majority of all sectors, except banking & financial services.” Ibid at xi. The S&P Global 100 includes large-cap companies whose businesses are global in nature and for which a substantial portion of their operating income, assets, and workforce come from multiple countries (with the exception of those in the electric power sector). Ibid at 4.
- 8 Ibid at xii, 16–19.
- 9 FSB TCFD, *Phase I Report of the Task Force on Climate-Related Financial Disclosures* 8 (Basel: FSB TCFD, 2016), <https://www.fsb-tcfd.org/publications/phase-i/>.
- 10 Related to the issue of reporting frameworks is the existence of the Sustainability Accounting Standards Board (SASB). Launched in 2011, SASB is an independent non-profit standards-setting organization that sets sustainability related accounting standards that are designed to be complementary to financial accounting standards. To inform and protect investors, it has developed a number of sector-specific standards for use in SEC filings. Sectors include non-renewable resources, transportation, renewable resources and alternative energy, infrastructure, and others. Of these four climate reporting frameworks (CDP, GRI, PRI, and SASB), only the SASB’s standards are focused on the information disclosed in financial filings.
- 11 EPA also requires large emitters (with greater than 25k metric tons of emissions) to report their emissions in their Greenhouse Gas Reporting Program (GHGRP). This program (codified at 40 CFR Part 98) requires reporting of greenhouse gas (GHG) data and other relevant information from large GHG emission sources, fuel and industrial gas suppliers, and CO2 injection sites in the United States.
- 12 CDP, *Out of the Starting Blocks: Tracking Progress on Corporate Climate Action 4* (London: CDP, 2016), <https://www.cdp.net/en/research/global-reports/tracking-climate-progress-2016>. Scope 1 emissions are all direct GHG emissions. Scope 2 emissions are indirect GHG emissions from consuming purchased electricity, heat and/or steam. Scope 3 emissions are other indirect GHG emissions not included in Scope 2 that occur in a company’s value chain (both upstream and downstream). Examples include extraction and production of purchased materials and fuels, transportation in vehicles that are owned by others, transmission and distribution losses, outsourced activities, and waste disposal.
- 13 PRI, *Aligning Values: Why Corporate Pension Plans Should Mirror Their Sponsors* 5 (London: PRI, 2017), <https://www.unpri.org/page/sustainability-leaders-issue-call-to-action-to-ceos>.

14 PRI, *Brochure: An Investor Initiative in Partnership with UNEP Finance Initiative and the UN Global Compact* 3, 12 (London: PRI, 2016), <https://www.unpri.org/about>.

15 40 Fed. Reg. 51,656 (Oct. 14, 1975) (“Environmental and Social Disclosure, Release No. 33-5627”).

16 75 Fed. Reg. 6290, 6293 (Feb. 8, 2010) (“Commission Guidance Regarding Disclosure Related to Climate Change”), citing *Basic Inc. v. Levinson*, 485 U.S. 224, 231 (1988), quoting *TSC Industries, Inc. v. Northway, Inc.*, 426 U.S. 438, 449 (1976).

17 Cameron Prell, “Are Climate Change-Related Risks Becoming a Material Concern for Public Companies?” Crowell & Moring Client Alert, Oct. 28, 2016 (internal quotes omitted), <https://www.crowell.com/NewsEvents/AlertsNewsletters/all/Are-Climate-Change-Related-Risks-Becoming-a-Material-Concern-For-Public-Companies>.

18 Ibid.

19 Specifically, experts note that the high-profile Exxon Mobil investigation suggests where the law may be headed: “The NYAG investigation raises a potentially significant new twist on the SEC disclosure requirements. Specifically, if a company conducted internal assessments and evaluations of its Regulatory Risks, Business Risks, and Physical Risks, yet failed to adequately disclose how such forecasts were known to affect their business, could that company be exposed to non-disclosure liability if the disclosure of such assessments might have affected a reasonable investor’s decision making? If answered in the affirmative, the same rationale could hold true for any public company that has conducted, but not adequately disclosed, climate risk assessments that forecast material impacts to the company.” Ibid.

20 75 Fed. Reg. 6290 (Feb. 8, 2010) (“Commission Guidance Regarding Disclosure Related to Climate Change”).

21 Cameron Prell, “Are Climate Change-Related Risks Becoming a Material Concern for Public Companies?”

22 75 Fed. Reg. 6290 (Feb. 8, 2010) (“Commission Guidance Regarding Disclosure Related to Climate Change”).

23 17 C.F.R. § 229.101(c)(1)(xii).

24 17 C.F.R. § 229.103.

25 17 C.F.R. § 229.303.

26 17 C.F.R. § 229.503(c).

27 U.S. Government Accountability Office (GAO), *Supply Chain Risks: SEC’s Plans to Determine if Additional Action is Needed on Climate-Related Disclosure Have Evolved* 19 (Washington, D.C.: GAO, 2016), <https://www.gao.gov/products/GAO-16-211>.

28 Benjamin Hulac, “Clayton: Companies Must Be “Mindful” of Climate Rules,” *E&E News*, Mar. 24, 2017, <https://www.eenews.net/climatewire/2017/03/24/stories/1060052002>.

29 G20 Finance Ministers and Central Bank Governors. *Communique on Apr. 16–17, 2015 Meeting* (Washington, D.C.: G20, 2015).

30 FSB, *Proposal for a Disclosure Task Force on Climate-related Risks* 4 (Basel: FSB, 2015), <http://www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf>.

31 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 14.

32 Ibid at 25.

33 Ibid at iv.

34 Meg Crawford and Stephen Seidel, *Weathering the Storm: Building Business Resilience to Climate Change* x, 9.

35 In October 2016, CDP announced it would evolve its questionnaires to be more sector-specific, in line with the task force’s draft recommendations. CDP, *Out of the Starting Blocks: Tracking Progress on Corporate Climate Action* 57.

36 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 19.

- 37 Ibid.
- 38 Sempra Energy, CDP Climate Change Information Request, response to question CCI.1a (2016).
- 39 Schneider Electric, CDP Climate Change Information Request, response to question CCI.1a (2016).
- 40 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 20–21.
- 41 Meg Crawford and Stephen Seidel, *Weathering the Storm: Building Business Resilience to Climate Change* 13–15.
- 42 Ibid at 32–33.
- 43 Janet Peace and Katy Maher, *Weathering the Next Storm: A Closer Look at Business Resilience* 13, 26 (Arlington: C2ES, 2015), <https://www.c2es.org/publications/weathering-next-storm-closer-look-business-resilience>.
- 44 Diageo, 2016 Form 20-F (2017).
- 45 Ibid.
- 46 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 20.
- 47 Ibid.
- 48 Ibid at 21.
- 49 Ibid at 17.
- 50 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 33–34.
- 51 Ibid at 17.
- 52 Ibid.
- 53 Dow Chemical Company, *2016 Form 10-K* (2017).
- 54 Ibid.
- 55 Ibid.
- 56 Dow Chemical Company, *2016 Form 10-K* (2017).
- 57 Dow Chemical Company, *Redefining the Role of Business in Society: 2016 Sustainability Report* 23 (Midland, MI: Dow Chemical Company, 2016), <http://www.dow.com/en-us/news/press-releases/dow-2016-sustainability-report>.
- 58 Ibid.
- 59 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 22–23.
- 60 Ibid at 22.
- 61 Ibid.
- 62 Ibid.
- 63 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 22–23.
- 64 Ibid at 23.
- 65 Ibid at 22–23.
- 66 Manjot Bhan Ahluwalia, *The Business of Pricing Carbon: How Companies Are Pricing Carbon to Mitigate Risks and Prepare for a Low-Carbon Future* (Arlington, VA: Center for Climate and Energy Solutions, 2017).
- 67 Ibid.
- 68 Ibid.

69 Ibid.

70 Manjot Bhan Ahluwalia, *The Business of Pricing Carbon: How Companies Are Pricing Carbon to Mitigate Risks and Prepare for a Low-Carbon Future*.

71 Ibid.

72 WWF et al, *Power Forward 2.0: How American Companies Are Setting Clean Energy Targets and Capturing Greater Business Value* (Washington: WWF, 2017), <https://www.worldwildlife.org/publications/power-forward-3-0-how-the-largest-us-companies-are-capturing-business-value-while-addressing-climate-change>.

73 Ibid.

74 Science Based Targets Initiative, *Companies Taking Action* (2017), <http://sciencebasedtargets.org/companies-taking-action>.

75 Ibid.

76 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 28.

77 Ibid at 21.

78 FSB TCFD, *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures* 48 (Basel: FSB TCFD, 2017), <https://www.fsb-tcfid.org/publications/final-implementing-tcfid-recommendations/>.

79 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 29.

80 Royal Dutch Shell, *A Better Life with a Healthy Planet: Pathways to Net Zero* (The Hague: Royal Dutch Shell, 2016), <http://www.shell.com/energy-and-innovation/the-energy-future/scenarios/a-better-life-with-a-healthy-planet.html>; BHP, *Climate Change: Portfolio Analysis* (Melbourne: BHP, 2015), <http://www.bhp.com/-/media/bhp/documents/investors/reports/2015/bhpbillitonclimatechangeportfolioanalysis2015.pdf>; BHP, *Climate Change: Portfolio Analysis, Views After Paris* (Melbourne: BHP, 2016); <http://www.bhp.com/-/media/bhp/documents/investors/reports/2016/bhpbillitonclimatechangeportfolioanalysis2016.pdf>; National Grid, *Future Energy Scenarios* (National Grid: Warwick, UK, 2017), <http://fes.nationalgrid.com>.

81 Mercer, *Investing in a Time of Climate Change: New York State Common Retirement Fund Portfolio Climate Risk Assessment* (New York: Mercer, 2015), [https://www.osc.state.ny.us/pension/NYSCRF\\_climate\\_change\\_report.pdf](https://www.osc.state.ny.us/pension/NYSCRF_climate_change_report.pdf); Mercer, *Investing in a Time of Climate Change: California State Teachers Retirement System Portfolio Climate Change Risk Assessment* (New York: Mercer, 2016), <https://www.calstrs.com/investing-time-climate-change-study>.

82 FSB TCFD, *Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities* (Basel: FSB TCFD, 2017), <https://www.fsb-tcfid.org/publications/final-technical-supplement/>.

83 Shell, *A Better Life with a Healthy Planet: Pathways to Net Zero* 1.

84 Ibid at 3.

85 Ibid at 5.

86 BHP, *Climate Change Portfolio Analysis* 9.

87 Ibid at 7.

88 Ibid at 14.

89 Ibid at 8.

90 BHP, *Climate Change: Portfolio Analysis, Views After Paris*.

91 Ibid at 10.

92 Ibid.

- 93 BHP, 2016 Form 20-F/A, 2017.
- 94 Meg Crawford and Stephen Seidel, *Weathering the Storm: Building Business Resilience to Climate Change* 76.
- 95 National Grid, *Future Energy Scenarios* (National Grid: Warwick, UK, 2017), <http://fes.nationalgrid.com/>.
- 96 New York State Common Retirement Fund, <http://www.osc.state.ny.us/pension/>
- 97 Mercer, *Investing in a Time of Climate Change: New York State Common Retirement Fund Portfolio Climate Risk Assessment*
- 98 Ibid.
- 99 California State Teachers' Retirement System, <https://www.calstrs.com/>.
- 100 Mercer, *Investing in a Time of Climate Change: California State Teachers Retirement System Portfolio Climate Change Risk Assessment*.
- 101 Ibid.
- 102 Mercer, *Investing in a Time of Climate Change: New York State Common Retirement Fund Portfolio Climate Risk Assessment*; Mercer, *Investing in a Time of Climate Change: California State Teachers Retirement System Portfolio Climate Change Risk Assessment*.
- 103 Meg Crawford and Stephen Seidel, *Weathering the Storm: Building Business Resilience to Climate Change* xiii.
- 104 Ibid at 21.
- 105 Ibid at ix, 30–31.
- 106 Mark Carney, "Breaking the Tragedy of the Horizon – Climate Change and Financial Stability."
- 107 Hamza Ali, "The Legal Risks of Reporting Climate Risks," *Environmental Finance*, Jun. 27, 2017.
- 108 Ibid.
- 109 Geoffrey Supran and Naomi Oreskes, "What Exxon Mobil Didn't Say About Climate Change," *New York Times*, Aug. 22, 2017, <https://www.nytimes.com/2017/08/22/opinion/exxon-climate-change-.html?ref=opinion>.
- 110 Cameron Prell, "Are Climate Change-Related Risks Becoming a Material Concern for Public Companies?"
- 111 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 36.
- 112 Janet Peace and Katy Maher, *Weathering the Next Storm: A Closer Look at Business Resilience* 13.
- 113 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 39.
- 114 FSB TCFD, *Public Consultation Summary* 3–4, 6 (Basel: FSB TCFD, 2017).
- 115 Ibid at 6, 10–11.
- 116 FSB TCFD, *Statement of Support for the TCFD Recommendations and Supportive Quotes*.
- 117 PRI, *Letter from Global Investors to Governments of the G7 and G20 Nations* (May 8, 2017), <https://www.unpri.org/press-releases/letter-from-global-investors-to-governments-of-the-g7-and-g20-nations>.
- 118 FSB TCFD, *Public Consultation Summary* 12.
- 119 FSB, *Press Release: FSB Assesses Implementation Progress and Effects of Reforms* (Feb. 28, 2017), <http://www.fsb.org/2017/02/fsb-assesses-implementation-progress-and-effects-of-reforms/>.
- 120 Asset Owners Disclosure Project (AODP), *Global Climate Index 2017: Rating the World's Investors on Climate-Related Financial Risk 2* (London: AODP, 2017), <http://aodproject.net/global-climate-index-2017/>.
- 121 United Nations Environmental Programme, *Press Release: Eleven of the World's Leading Banks to Work with United Nations to Promote Climate Transparency in Financial Markets* (Jul. 11, 2017), <http://www.unep.org/newscentre/eleven-worlds-leading-banks-work-united-nations-promote-climate-transparency-financial-markets>. The 11 banks are: ANZ, Barclays, Bradesco, Citi, Itau,

National Australia Bank, Royal Bank of Canada, Santander, Standard Chartered, TD Bank Group, and UBS.

122 Ernst & Young Global Limited, *Tomorrow's Investment Rules 2.0: Emerging Risk and Stranded Assets Have Investors Looking for More from Nonfinancial Reporting* (London: Ernst & Young, 2015), <http://www.ey.com/gl/en/services/specialty-services/climate-change-and-sustainability-services/ey-tomorrows-investment-rules-2>

123 Shareholder resolutions are a way for investors to proactively raise management issues for discussion and voting during a company's annual meeting with shareholders. They are generally non-binding on management. A recent report summarized the business value of these resolutions in the following way: "The shareholder resolution process is important because it allows investors to communicate with boards, management and other shareholders about ways to protect their interests in a proactive, forward-looking way on important corporate governance, risk and policy issues affecting companies, before a crisis arises that erodes shareholder value." Ceres, *The Business Case for the Current SEC Shareholder Proposal Process* 7 (Boston: Ceres, 2017), <https://www.ceres.org/resources/reports/business-case-current-sec-shareholder-proposal-process>. See also U.S. Securities and Exchange Commission, *Staff Legal Bulletin No. 14E (CF)* (Oct. 27, 2009), <https://www.sec.gov/interps/legal/cfsbl14e.htm>.

124 Ronald O'Hanley, Letter to Board Members (Boston, MA: State Street Global Advisors, Jan. 26, 2017), <https://www.ssga.com/investment-topics/environmental-social-governance/2017/Letter-and-ESG-Guidelines.pdf>.

125 AODP, *Global Climate Index 2017: Rating the World's Investors on Climate-Related Financial Risk* 3.

126 The Martin Act, N.Y. Gen. Bus. L. §§ 352–53 (2014). The Martin Act provides authority for the New York Attorney General to investigate potential fraud related to the "issuance, exchange, purchase, sale, promotion, negotiation, advertisement, investment advice or distribution within or from this state, of any stocks, bonds, notes, evidences of interest or indebtedness or other securities . . ." Ibid at § 352(1). The scope of fraud contemplated by the Martin Act includes "any device, scheme or artifice to defraud or for obtaining money or property by means of false pretense, representation or promise . . . or that any person, partnership, corporation, company, trust or association, or any agent or employee thereof, shall have employed, or employs, or is about to employ, any deception, misrepresentation, concealment, suppression, fraud, false pretense or false promise . . ." Ibid. The Martin Act also authorizes the Attorney General to initiate civil proceedings and criminal actions based on the results of the investigation.

127 Directive 2014/95/EU of the European Parliament and of the Council (2014), <http://eur-lex.europa.eu/eli/dir/2014/95/oj>.

128 Institutions for Occupational Retirement Provision Directive II, Directive 2016/2341 of the European Parliament and of the Council (2016), <http://eur-lex.europa.eu/eli/dir/2016/2341/oj>.

129 PRI, *French Energy Transition Law: Global Investor Briefing* 7 (London: PRI, 2016), <https://www.unpri.org/news/what-the-french-energy-transition-law-means-for-investors-globally>; Forum Pour L'Investissement Responsable, *Article 173-VI: Understanding the French Regulation on Investor Climate Reporting* 13 (Paris: Forum Pour L'Investissement Responsable, 2016), [http://www.frenchsif.org/isr-esg/wp-content/uploads/Understanding\\_article173-French\\_SIF\\_Handbook.pdf](http://www.frenchsif.org/isr-esg/wp-content/uploads/Understanding_article173-French_SIF_Handbook.pdf).

130 Pilita Clark, "Bank of England to Probe Banks' Exposure to Climate Change," *Financial Times*, Jun. 16, 2017, <https://www.ft.com/content/ec4d3446-52a1-11e7-a1f2-db19572361bb>.

131 FSB, *Proposal for a Disclosure Task Force on Climate-related Risks* 4

132 Ibid at 2.

133 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 18.

134 Ibid at 24.

135 JPMorgan Chase & Co., *Environmental Social and Governance Report 2016* 17 (New York, NY: JPMorgan Chase & Co., 2017), <https://www.jpmorganchase.com/corporate/Corporate-Responsibility/document/jpmc-cr-esg-report-2016.pdf>.

136 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 24.

- 137 Bank of America, CDP Climate Change Information Request, response to question CC2.1a (2016).
- 138 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 29.
- 139 The Hartford, *Annual Report 16* (Hartford, CT: The Hartford, 2016), <https://ir.thehartford.com/~media/Files/T/Thehartford-IR/documents/events/annual-report-2016.pdf>.
- 140 Ibid.
- 141 FSB TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* 29.
- 142 Swiss Re, CDP Climate Change Information Request, response to question CC2.2a (2016).
- 143 Ibid at response to question CC6.1b.
- 144 FSB TCFD, *Implementing the Recommendations of the Task Force on Climate-related Disclosures* 35.
- 145 Amalgamated Bank, *LongView Funds: Corporate Governance and Proxy Voting Report Executive Summary 3, Jul. 1, 2016 to Dec. 31, 2016* (New York, NY: Amalgamated Bank, 2017), [https://www.amalgamatedbank.com/sites/default/files/AB\\_01\\_LongView\\_031017\\_F.PDF](https://www.amalgamatedbank.com/sites/default/files/AB_01_LongView_031017_F.PDF).
- 146 Ibid.
- 147 Amalgamated Bank, *Press Release: Amalgamated Bank Announces Series of Environmental Initiatives; Takes Historic Steps to Actively Address Climate Risk* (Sep. 19, 2016), <https://www.amalgamatedbank.com/article/2016-09-19/amalgamated-bank-announces-series-environmental-initiatives-takes-historic-steps>.
- 148 Amalgamated Bank. *LongView Funds: Corporate Governance and Proxy Voting Report Executive Summary 3, Jul. 1, 2016 to Dec. 31, 2016*.
- 149 AODP, *Global Climate Index 2017: Rating the World's Investors on Climate Related Financial Risk* 11.
- 150 FSB TCFD, *Implementing the Recommendations of the Task Force on Climate-related Disclosures* 35.
- 151 AODP, *Global Climate Index 2017: Rating the World's Investors on Climate Related Financial Risk* 36.
- 152 Ibid at 19.
- 153 Ibid at 30.
- 154 Janet Peace and Katy Maher, *Weathering the Next Storm: A Closer Look at Business Resilience*.
- 155 CDP, *Out of the Starting Blocks: Tracking Progress on Corporate Climate Action* 12.
- 156 Austin Brown, Brittany Repac, and Jeff Gonder, *Autonomous Vehicles Have a Wide Range of Possible Energy Impacts* (presentation, U.S. National Renewable Energy Laboratory Workshop on Road Vehicle Automation, Jul. 16, 2013) (NREL/PO-6A20-59210), <http://www.nrel.gov/docs/fy13osti/59210.pdf>.
- 157 FSB TCFD, *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures* 85.
- 158 Ibid at 48.
- 159 Ibid.
- 160 Ibid at 50.
- 161 FSB TCFD, *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures* 50.
- 162 Ibid at 24.
- 163 Ibid at 26.
- 164 Ibid at 48.
- 165 Janet Peace, et al., *Preparing for Carbon Pricing: Case Studies from Company Experience—Royal Dutch Shell, Rio Tinto,*

and Pacific Gas and Electric Company (Washington, D.C.: Partnership for Market Readiness, 2015), <https://www.c2es.org/publications/preparing-carbon-pricing-case-studies-pge-rio-tinto-shell>.

166 Exelon Corporation, 2016 Form 10-K (2017).

167 CDP, *Out of the Starting Blocks: Tracking Progress on Corporate Climate Action* 22.

168 DTE Energy, *Press Release: DTE Energy Announces Plan to Reduce Carbon Emissions by 80 Percent: Plan Expands Renewable Energy While Maintaining Affordability, Reliability for Customers* (May 16, 2017), <http://newsroom.dteenergy.com/2017-05-16-DTE-Energy-announces-plan-to-reduce-carbon-emissions-by-80-percent#sthash.XAqbPray.dpbs>.

169 Ibid.

170 Zach Wichter, "Too Hot to Fly? Climate Change May Take a Toll on Air Travel," *New York Times*, Jun. 20, 2017, <https://www.nytimes.com/2017/06/20/business/flying-climate-change.html>.

171 Ibid.

172 Ibid.

173 General Motors, 2016 Form 10-K (2017).

174 Alcoa Corporation, 2016 Alcoa Sustainability Report 12 (Pittsburgh, PA: Alcoa Corporation, 2016), <http://www.alcoa.com/sustainability/en/pdf/2016-Sustainability-Report.pdf>.

175 Ibid.

176 Bayer, CDP Climate Change Information Request, response to question CC1.1a (2016).

177 Bayer, CDP Climate Change Information Request, response to question CC2.2a (2016).

178 Ibid.

179 Janet Peace, et al., *Preparing for Carbon Pricing: Case Studies from Company Experience: Royal Dutch Shell, Rio Tinto, and Pacific Gas and Electric Company* 17–19.

180 Janet Peace and Katy Maher, *Weathering the Next Storm: A Closer Look at Business Resilience* 26.

181 Weyerhaeuser, 2016 Annual Report and Form 10-K 26 (Federal Way, WA: Weyerhaeuser, 2017), <http://investor.weyerhaeuser.com/quarterly-and-annual-results>.

182 Ibid.

183 Nestle, *Nestle in Society: Summary Report* 33 (Vevey: Nestle, 2016), <http://www.nestle.com/csv>

184 Ibid.



The Center for Climate and Energy Solutions (C2ES) is an independent, nonpartisan, nonprofit organization working to forge practical solutions to climate change. We advance strong policy and action to reduce greenhouse gas emissions, promote clean energy, and strengthen resilience to climate impacts.