

BEST PRACTICES AND CHALLENGES: USING SCENARIOS TO ASSESS AND REPORT CLIMATE-RELATED FINANCIAL RISK



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After the publication of recommendations by the Task Force on Climate-related Financial Disclosures (TCFD) in June 2017, C2ES issued a September 2017 report, *Beyond the Horizon: Corporate Reporting on Climate Change*.¹ In that report, C2ES identified areas where more work was needed to support companies in implementing the TCFD's recommendations – one such area included helping companies use scenario analysis to assess climate-related risks and opportunities.

In addition, a growing number of shareholder proposals ask companies to consider the financial impact of different climate scenarios. Companies that proactively conduct and report the results of climate-related scenario analysis will likely be better positioned for conversations with shareholders and other stakeholders.

This report identifies best practices that companies are employing to meet this aspect of the TCFD recommendations. It also includes a discussion of some challenge areas, including how companies are navigating a more complex disclosure landscape, addressing legal concerns related to disclosure, and taking a holistic look at both transition and the physical risks of climate change.

BEST PRACTICES

- **Make use of publicly available scenarios and leverage them by customizing corporate scenario exercises around company-specific risks and opportunities.** Stakeholders are familiar with the parameters and assumptions in publicly available scenarios, but companies need to explain how those scenarios were modified and used to stress test their particular portfolio and circumstances.
- **Focus scenario exercises and disclosures on a few key variables associated with long-term climate-related risks and opportunities that could have a material impact on the business.** Stakeholders want to understand how companies manage the uncertainty and long-term risks of climate change. It is not intended to be a predictive exercise, nor an exhaustive one. Rather, it provides an opportunity to evaluate potential strategies compatible under a range of outcomes to make companies more financially resilient.
- **Use a range of scenarios when conducting a scenario-based risk analysis, including those that do not meet 2 degrees C.** Exploring a broad range of futures and testing those against a company's strategy will help illustrate financial resilience under a variety of climate-related outcomes. Beyond assessing the risks and opportunities related to an energy transition, companies should also consider the physical impacts of climate change and analyze them along the entire value chain.
- **Scenario exercises should be reviewed on a regular basis as part of a strategic management process.** Outcomes from scenario exercises are unlikely to change significantly from year to year if assumptions and inputs remain stable, but companies should regularly monitor signposts that might indicate a potential need to change strategy or positioning on a regular basis.

CHALLENGES

- **Not all outputs from a company's climate-related risk analysis are appropriate for inclusion in financial filings, but companies should make relevant, non-material information easily accessible to stakeholders.** Companies will continue to make materiality determinations regarding what is reported in financial filings on a case-by-case basis, but the TCFD framework can also guide the type of information companies choose to share more broadly.
- **Demand for climate-related data is rapidly growing, but simple data points are sometimes insufficient to accurately portray a company's climate-related risk profile.** Relating context is an important part of the disclosure process, particularly around quantifiable metrics. Companies need to make sure stakeholders have the information needed to contextualize information disclosed about the outcomes of their scenario exercises.
- **The financial community is still determining what data is needed to accurately assess climate-related financial risks and opportunities and how to interpret the information currently available.** Ongoing communication between and among stakeholders will be an important part of improving data and disclosures related to scenario analysis. Better communication and education will help to clarify expectations about how such information will be used.
- **To date, most corporate climate scenario exercises have focused on assessing the transition to a low-carbon economy rather than the physical impacts of climate change.** To better identify potential physical risks, more actionable science is needed. Global climate models are good at predicting large-scale changes like average temperature, but not capable of predicting localized impacts such as where an extreme weather events will occur. However, global models can estimate changes in frequencies of some kinds of weather events, and downscaled climate data can be used by companies to assess highly localized, asset-level climate-related vulnerabilities.

BACKGROUND

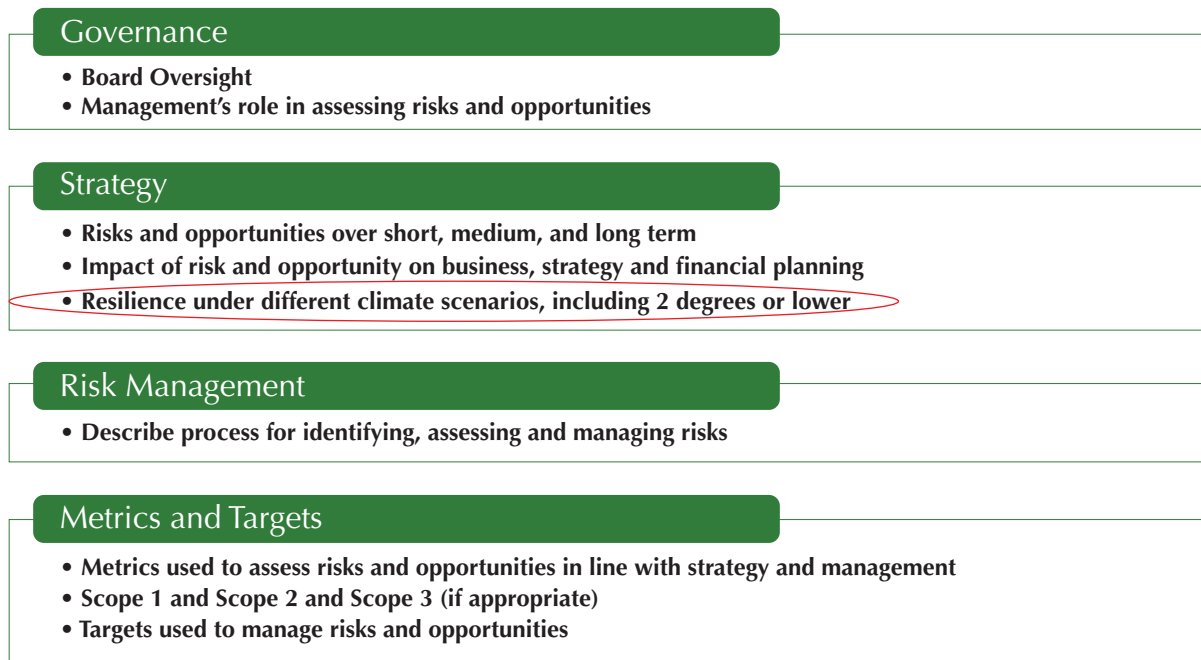
The financial community has shown increasing interest in understanding the risks that climate change presents to the global financial system. In 2015, the G20 finance ministers and Central Bank governors asked the Financial Stability Board (FSB) to review the financial implications of climate change as part of the FSB's mandate to promote international financial stability. In response, the FSB launched the Task Force on Climate-related Financial Disclosures (TCFD) at COP21 in Paris.

The TCFD released a set of final recommendations in June 2017. The recommendations consisted of a framework for financial and non-financial organizations with public debt or equity to disclose climate-related financial information. The TCFD recommends companies describe climate-related risks and opportunities over the short, medium and long term in their public financial filings. The framework includes recommendations for reporting on governance, strategy, risk management, and metrics and targets, and the recommendation that companies should assess the robustness of their strategy against various climate scenarios (**Figure 1** and **Box 1**).

In the United States, a prescriptive framework regarding disclosure of climate-related risks does not exist; therefore, companies have flexibility in reporting. Only "material" risks are required to be included in U.S. Securities and Exchange Commission (SEC) filings. The SEC defines material as "a substantial likelihood that a reasonable investor would consider it important." In 2010, the SEC issued general guidance on climate change, focusing on the impact of legislation and regulation, international agreements, indirect consequences of regulation, and the physical impacts of climate change.

Designed to promote more consistent and transparent financial reporting, the TCFD's voluntary recommendations provide guidance on how companies globally should disclose both the risks and opportunities related to physical climate change impacts and a transition to a low-carbon economy (**Box 2**). Through this exercise, stakeholders hope to understand how companies are managing the long-term risks of climate change and seeking out potential opportunities.

FIGURE 1: TCFD Disclosure Framework



Source: Task Force on Climate-related Financial Disclosures, Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017), <https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf>.

BOX 1: TCFD Guidance related to Strategy and Scenarios

The following is taken directly from the Task Force on Climate-related Financial Disclosure's recommendations on using scenarios.

Guidance

Organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a lower-carbon economy consistent with a 2-degree-C-or-lower scenario (2-degree scenario) and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.

Organizations should consider discussing the following:

- where they believe their strategies may be affected by climate-related risk and opportunities
- how their strategies might change to address such potential risks and opportunities
- the climate-related scenarios and associated time horizon(s) considered

Recommended Disclosure

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

GROWING INVESTOR DEMAND FOR CLIMATE REPORTING

Regardless of trends being reflected through this new TCFD framework, it is important to place it in context with rising demand for climate-related information from the investment community. In the past 10 years, the number of companies facing environmental shareholder proposals has nearly doubled, as has the average number of favorable votes for those resolutions.

In the 2017 proxy season, among the 158 environmental or sustainability proposals that were submitted, 36 percent of environmental proposals received support from more than 30 percent of shareholders, compared to an average of 9 percent of proposals that received a

similar level of shareholder support from 2011 to 2015. Already in the 2018 season, 21 proposals have been filed. Of those, 12 asked companies to specifically disclose the impact of the IEA's 2-degree scenario.

Companies have historically focused more on the interests of institutional investors rather than "environmental, social and governance" (ESG) investors, but more institutional investors are expressing interest in understanding the financial implications of climate change. In fact, ESG is one of the fastest growing investment areas.⁸

BEST PRACTICES

Given the rising stakes and growing interest of investors in understanding long-term climate-related risks and opportunities, companies that proactively report on 2-degree scenario analysis will be better positioned for future conversations with their stakeholders. However, the complexity of conducting scenarios and the lack of company resources to conduct them are among the concerns cited most often by companies regarding the TCFD's scenario recommendation. Through conversations with a range of stakeholders, C2ES has identified

several best practices that can help companies start using scenarios to evaluate their climate-related risks and opportunities. While scenario analysis can be complicated, companies can benefit by starting early and learning how to use it as a tool to enhance their strategic thinking. This allows companies to work gradually toward more complex analysis that can better inform their management decisions related to climate risks and opportunities.

BOX 2: Transition vs. Physical Impact Scenarios

Scenarios can be used to consider business resilience under a range of circumstances. Those focused on meeting a specific warming target, such as 2 degrees, are often called “transition scenarios” and tend to focus on the policy and technology needed to meet that target. Scenarios that focus more on climate impacts are often called “physical impact scenarios” and are based on the outcomes of global climate models, such as those put forward by the Intergovernmental Panel on Climate Change.

The Task Force on Climate-related Disclosures recommends companies consider how future scenarios might play out to meet the Paris Agreement goal of limiting the increase of global average temperatures to 2 degrees. However, there is not one explicit pathway to 2 degrees, nor is it certain global ambition will rise to meet this goal. Several organizations, including the International Energy Agency, publish a range of scenarios, including ones that meet and do not meet a 2-degree target. Different analytical lenses may be used to explore potential impacts under a 2-degree transition scenario, such as carbon price, energy demand, commodity prices, efficiency technology, policy, macro-economic and demographic variables, etc.

Beyond transition risk, companies should also consider how the physical impacts of climate change might affect their business resiliency. Physical climate scenarios can help companies consider the risk of severe climate change impacts and where and when those impacts might materialize.

When assessing physical impacts of climate change using scenarios, asset-level analysis is very relevant as the physical location of different assets could be more closely correlated to climate-related risks. For example, coastal assets are more likely to be vulnerable to flooding and inland assets are more likely to be vulnerable to drought. Companies should also consider potential impacts on their entire value chain, which could include opportunities as well as risks. However, more asset-level reporting guidance is needed, including how to gauge the viability of different asset types over different time frames or how to assess the localized physical risks to specific projects.

Companies should consider both transition and physical impact scenarios when assessing climate-related risks and opportunities, since the interplay between the two types of scenarios is important. For example, a 1.5-degree scenario would have fewer physical risks than a 2-degree scenario, but would likely involve a faster transition. A faster transition could increase policy risks that companies might face, or open new opportunities for companies providing low-carbon solutions.

LEVERAGE EXISTING TOOLS

Some companies may choose to adopt assumptions provided in published scenarios and analyze their company strategy and financial resilience against those scenarios as written (**Box 3**). Existing scenarios can also be leveraged to help companies stress test either their own assumptions (e.g. technology cost curves) or their own circumstances (e.g. related to the physical location of their assets). Companies should focus their scenario analysis around those variables that carry the greatest potential risk.

Using widely accepted and understood scenarios means that stakeholders will be familiar with the general assumptions of those models. Therefore, companies

would need to explain only how those scenarios were either modified or leveraged to stress test their particular company’s risks. This helps to simplify both the scenarios exercise itself as well as the eventual reporting process.

CONSIDER A RANGE OF SCENARIOS

Although companies may wish to simplify the scenario exercise as they get started, over time company analysis may look across a broader range of outcomes. No single scenario is expected to prove correct when considering outcomes associated with timeframes that go out decades. Therefore, exploring a range of scenarios, including various scenarios that meet a 2-degree target, as well as those that do not, will give companies a better sense of potential risks and opportunities.

BOX 3: Published Global Climate Scenarios vs. Company Scenario Exercises

Scenarios are tools used by many different actors, including scientists, policymakers and businesses, to consider a range of circumstances that could occur years or decades in the future. Scenarios are used to challenge traditional thinking about how economic, geopolitical, technological or environmental factors might shape the future. Different scenarios might focus on particular factors, such as environmental or policy issues. Therefore, understanding the underlying focus and assumptions used in a scenario exercise is important in interpreting the outcomes.

The recommendation of the Task Force on Climate-related Disclosures is for companies to apply scenario analysis to their strategic management process—not necessarily create new scenarios, even though some companies may choose to do this. By looking at the long-term future through several different lenses, the scenario exercise is intended to test a company's performance under a variety of futures to help the management team develop a robust long-term strategy.

It is important to keep in mind that the TCFD is not a policy mechanism—the goal of the TCFD scenarios recommendation is not to ensure that all companies follow a strategy that meets a 2-degree pathway. Rather, it is aimed at ensuring financial stability in the wake of a future that is carbon constrained or experiences greater physical impacts of climate change.

The TCFD acknowledges that several organizations and companies have published scenarios covering a range of climate-related outcomes; those models and scenarios can be leveraged by companies when assessing the robustness of their strategy to climate-related risks and opportunities.

Among the best-known transition scenarios are the International Energy Agency's scenarios published through its *World Energy Outlook* and *Energy Technology Perspectives* reports. For example, *Energy Technology Perspectives* includes scenarios that limit global average temperatures to 2, 4 and 6 degrees.

The Intergovernmental Panel on Climate Change publishes scenarios focusing on physical impacts, using representative concentration pathways, which have modeled different trajectories of carbon dioxide concentrations in the atmosphere. Using global climate models to assess company-level impacts is still in its naissant, particularly with respect to downscaling the data. However, the *Fourth National Climate Assessment*, to be finalized later this year, will provide analysis on regional climate impacts for the first time.³

FOCUS ON KEY VARIABLES

The number of variables that can be analyzed in a scenario exercise is infinite. However, companies should focus their evaluation and reporting on a few key variables where there is potential for long-term, material risk. For example, managers at an oil and gas company might wish to understand the implications of increased electrification of the transportation sector on the company's longer-term financial viability. As such, one aspect of the company's scenario analysis might focus on peak oil demand or a significant drop in the long-term price of oil, while also examining potential increased demand for natural gas. For another company with significant operations near a coastline, the physical impacts of sea level rise and increased storm surge might be more relevant to explore. The risks faced by different types of companies are unique, so every company

needs to strategically identify its own risk factors or opportunities that could influence company financial growth and stability.

The TCFD framework provides flexibility around how companies consider reporting outcomes from scenario exercises. Companies are still working through the challenges of how to translate climate risks or opportunities into future financial outcomes. As such, most companies describe what variables they stress-tested through the scenario exercise, identify the range of uncertainty considered, and report how they use those outcomes to inform their strategic management process. In addition, some companies may choose more descriptive disclosures to avoid cross-comparisons with other companies. This is because numeral outputs are unlikely to be directly comparable, given the many variables involved in conducting scenario exercises. It is also improbable that all assumptions were stress-tested in the same manner.

TABLE 1: Different Approaches to Climate Disclosure Using Scenarios

COMPANY	REPORT TYPE	PUBLIC SCENARIOS USED	TYPES OF RISKS DESCRIBED	OPPORTUNITIES DESCRIBED	SCENARIO OUTCOMES
<i>Chevron</i>	Standalone <i>Climate Change Resilience: A Framework for Decision Making</i>	IEA: Current Policies, New Policies, and Sustainable Development scenarios	Operational, physical, geopolitical and legislative, strategic	Production with flexibility, lower-cost production, gas, chemicals, energy efficiency, carbon capture and storage, renewable energy	Discussed impact on business segments (upstream & downstream/ chemicals) over short term and long term
<i>Duke Energy</i>	Standalone <i>2017 Climate Report to Shareholders</i>	Science Based Targets Initiative: Contraction of Absolute Emissions scenario	Physical, policy and economic	Increased demand for zero carbon sources, electrified transportation	Analyzed one possible pathway in line with 2 degrees and included description of their strategy to meet that future
<i>Statoil</i>	Chapter in existing report <i>2017 Sustainability Report</i>	IEA: Current Policies, New Policies, and Sustainable Development scenarios	Market and technology shifts, policy and legal, physical risks, reputation	Offshore wind, carbon capture use and storage, hydrogen	Described outcomes in terms of sensitivity to net present value

Sources: *Chevron, Climate Change Resilience: A Framework for Decision Making*, (Chevron, March 2018), <https://www.chevron.com/-/media/shared-media/documents/climate-change-resilience.pdf>. *Duke Energy, 2017 Climate Report to Shareholders*, (Duke Energy Corporation, March 2018), https://www.duke-energy.com/_/media/pdfs/our-company/shareholder-climate-report.pdf. *Statoil, 2017 Sustainability Report*, (Statoil, March 2017), <https://www.equinor.com/content/dam/statoil/documents/sustainability-reports/statoil-sustainability-report-2017-23march.pdf>.

WHERE, WHEN, AND WHAT TO DISCLOSE

The TCFD provides a good framework for companies to assess their climate-related financial risks and opportunities, and it is flexible, which allows companies to evolve their assessments and reporting over time. Even though the framework is voluntary, growing demand for information on climate change from the investment community means that companies should continue to strive to keep stakeholders informed with better information. Ongoing communication between and among stakeholders will be an important part of improving disclosures as well as increasing reporting entities’ understanding of how such information will be used.

Since the materiality of climate-related risks and opportunities will vary by company and over time, it is important for businesses to make a range of information available. Companies will likely choose to do this via a variety of formats and publications. However, the disclosures should be publicly available and companies should be ready to direct stakeholders to them when requested.

Several companies have started incorporating elements of the TCFD framework into their stakeholder reports, which range from annual sustainability reports to stand-alone climate reports intended for shareholders. C2ES identified three examples – reports by Chevron, Duke Energy and Statoil.¹⁰ **Table 1** illustrates some of

the different approaches that companies are taking to describe their climate-related risks and opportunities and how they are using scenario analysis to analyze the robustness of their strategies.

All three reports described their companies’ overall strategy in a carbon-constrained future. They each described their risks, including physical risks, policy risks and market-related risks. In addition, all three companies described potential business opportunities in a low-carbon future. In terms of their approach to scenario analysis, both Chevron and Statoil used three IEA policy scenarios (which range from business-as-usual to a 2-degree case). Duke Energy chose to focus their analysis on one scenario—a 2-degree case developed by the Science Based Targets Initiative. The described outcomes of the scenario exercises varied by company. Chevron described the short-term and long-term impacts of the 2-degree case on different business segments. Duke Energy described specifically how its generation portfolio could be adjusted to align with the 2-degree scenario analyzed. Statoil described possible changes in the company’s net present value under each of the three IEA scenarios.

In terms of how often company scenario exercises should be conducted and reported, most stakeholders

agree that strategic management discussions should happen annually. But detailed scenario analysis might occur on a less frequent basis. Assumptions and expectations embedded into scenario exercises tend to remain relatively stable when looking out several decades, so the outcomes of company scenario analyses are unlikely to significantly change from year to year. To

reflect management's interest in monitoring potential systemic shifts, companies could consider reporting on the key signposts the company is watching that might indicate a need to change strategy or positioning. Those signposts should be related to the key variables identified and stress-tested in the scenario process.

OTHER CHALLENGES

TCFD is not a third-party reporting entity, but it provides a framework to guide disclosure. However, some companies are responding to increased requests for climate-related reporting by using the TCFD framework to develop their own standalone report. Other companies have responded by dropping certain frameworks and focusing on more complete reporting through just one or two particular frameworks.

Over-reporting is not consistent with the spirit of the TCFD recommendations, but companies should

consider how their stakeholders might view a change in their reporting and disclosure approach. Such changes could have positive or negative reputational impact. For example, issuing a stand-alone TCFD report might be viewed positively by some stakeholders, but the same company may also choose to stop reporting through another third-party regime, which other stakeholders might view negatively. Individual companies should determine the most appropriate avenues of disclosure keeping in mind their own stakeholder interests and expectations.

NAVIGATING LEGAL ISSUES

Companies will continue to report only the most relevant and material information in their financial filings. But as pressure to disclose more climate-related information grows, companies must consider how disclosure might make a company more vulnerable to legal issues or provide added value to potential investors. The potential risks of under or over disclosure range from increased possibility of litigation to navigating an increasingly more complex disclosure landscape.

Legal action is rising against companies, as some state and local authorities are ramping up litigation related to climate-related charges. For example, the attorney generals of Massachusetts and New York are investigating whether Exxon Mobil misled the public regarding what it knew about the harmful effects of climate change.¹¹ Acknowledgement of climate-related

issues and disclosure about risks and opportunities could potentially reduce the risks of such litigation for some companies.

In determining how and what a company discloses about its climate risk, managers should ensure that they are not omitting any material facts that could lead to potential litigation or jeopardize relationships with other stakeholders.¹² In addition, even though U.S. SEC reporting requirements are unlikely to change in the near future, several countries are considering mandatory climate reporting.¹³ As these processes continue to develop, multinational companies that report in the United States should be prepared to explain how the information they provide to stakeholders in different nations is both consistent in its content but also tailored to local requirements.

MEETING THE NEEDS OF THE FINANCIAL COMMUNITY

With the rise in the financial community's interest in ESG issues, demand for climate-related data grows every year. However, data points are sometimes insufficient to accurately portray a company's climate-related risk profile, and stakeholders need to make sure they can fully contextualize reported information. For example, Trucost analysis based on an evaluation of chemical companies' 2016 publicly disclosed greenhouse gas data on scope 1 and 2 emissions found that carbon intensity is only a partial indicator of carbon pricing risk under a 2-degree scenario.¹⁴

It is important for companies to be proactive in their conversations with investors and to engage early and often with their stakeholders. Companies should aim to provide transparency regarding how they are considering and analyzing these risks and opportunities, as well as what they are learning through scenario exercises. This helps companies to maintain ownership of the narrative while allowing flexibility in how they might structure future assessments and disclosures.

Many individuals in the investment community recognize that assessing and disclosing climate-related risks and opportunities will be an iterative process that will improve over time. And it is important for companies to reinforce the ongoing nature of the exercise with their stakeholders. TCFD suggests that reporting companies use methodologies that are already available and adjust them over time. Individuals in the financial community have stated that information reported by companies through the TCFD framework is not expected to be

perfect—yet, when companies' legal departments are contending with legal concerns about what to disclose this issue become more complicated.

In addition, the financial community is not only interested in learning about climate-related risks, but also climate-related opportunities across the value chain. However, challenges exist on this front as well. Some companies may seek product development opportunities, but disclosing those opportunities publicly could reveal proprietary information that could weaken a company's competitive edge. In addition, some opportunities might have a lower rate of return than a company's main business or have high rates of risk that also need to be taken into account, such as carbon capture use and storage or nuclear projects.

To help drive greater consistency in reporting, several working groups that cover a range of sectors have been put into place to help to ensure methodologies are consistent and comparable. This includes industry-focused groups such as the Edison Electric Institute, which is helping utility companies respond to ESG and sustainability issues using a template. In addition, the United Nations Environmental Programme—Finance Initiative is developing a methodology for the banking sector to report in line with TCFD recommendations. These groups are helping to develop a more consistent approach to scenario analysis, but each company must consider how to apply the analysis to their specific portfolios.

CONCLUSION

C2ES believes that scenarios are important and valuable tools for companies to inform their strategic management of climate-related risks and opportunities. The Task Force on Climate-related Financial Disclosures framework has provided a useful structure to assess and disclose the risks and opportunities associated with climate change – a process that will grow and improve over time.

Many companies are focused on implementing the complex TCFD scenario recommendation, and the space is evolving quickly. Best practices include leveraging existing scenarios and adapting them for company-specific risk factors, focusing in on a few key variables, and utilizing a range of scenarios when conducting scenario-based risk analysis. In addition, scenario exercises should be considered part of the strategic management process and take place on a regular basis. Companies should focus their disclosures on the variables stress-tested through the scenario exercise, and they should also identify the range of uncertainty considered and describe how the outcomes inform strategic decision making.

However, there is still much more work to be done to develop a more consistent and streamlined way for companies to report on their scenario exercises. This

includes greater uniformity around the information companies are reporting and where they are reporting it. The investment community's current focus on understanding climate-related risks and opportunities means that companies should be prepared to make relevant, non-financially material information easily available to stakeholders.

Ongoing communication between and among stakeholders will be an important part of improving data and disclosures as well as clarifying expectations about how such information will be used. Companies should be transparent about how they are using scenarios to analyze climate risks and adjusting their methodology over time.

Company-related scenario exercises have primarily focused on transition risk to date, but assessing physical risk is equally important. While companies need downscaled climate data to more accurately assess the physical impacts of climate change, they can conduct broad assessments with existing information. Likewise, integrating corporate assessments of transition and physical risks will be important moving forward since understanding the impacts of both is paramount to gaining a better overall understanding of climate-related financial risks and assessing potential opportunities.

ENDNOTES

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