

TCFD Implementation Guide

Using SASB Standards and the CDSB Framework
to Enhance Climate-Related Financial Disclosures
in Mainstream Reporting



Climate
Disclosure
Standards
Board





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ABOUT CDSB

The Climate Disclosure Standards Board (CDSB) was founded in 2007 and is an international consortium of nine business and environmental NGOs committed to advancing and aligning the global mainstream corporate reporting model to equate natural capital with financial capital. It does so by offering companies a framework for reporting environmental and climate information with the same rigor as financial information. In turn, this helps them to provide investors with decision-useful environmental and climate information via the mainstream corporate report, enhancing the efficient allocation of capital. Regulators also benefit from compliance-ready materials. Collectively, CDSB aims to contribute to more sustainable economic, social, and environmental systems.



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ABOUT SASB

The Sustainability Accounting Standards Board (SASB) connects businesses and investors on the financial impacts of sustainability. An independent, standard-setting organization founded in 2011, SASB's mission is to help businesses around the world identify, manage, and report on sustainability factors that matter to investors. SASB standards are developed based on extensive feedback from companies, investors, and other market participants as part of a transparent, publicly documented process. By focusing on the sustainability factors most likely to have financially material impacts in each of 77 industries, SASB standards enable investors and companies to compare performance from company to company within an industry.

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Executive Summary

In June 2017, the Task Force on Climate-related Financial Disclosures (TCFD) issued its final recommendations for producing consistent, comparable, clear, and reliable corporate disclosures of climate-related information that would support informed decision-making and capital allocation by investors, lenders, and insurance underwriters. More than a year and a half later, although more than 617 organizations¹ have publicly expressed support for the TCFD, far fewer appear to have used the recommendations to guide their climate-related disclosures.

In explaining this implementation gap, market participants have cited a need for practical guidance for companies to use in attempting to fulfill the principles-based recommendations and make the 11 recommended disclosures in their mainstream reports. The Sustainability Accounting Standards Board (SASB) and the Climate Disclosure Standards Board (CDSB), two well-established organizations with rigorously developed TCFD-aligned reporting tools, are uniquely positioned to provide this guidance.

This paper is the first in a series of practical, TCFD-focused resources CDSB and SASB intend to develop and make available in the coming months and years, as climate-related tools and reporting practices continue to mature.

By offering how-to guidance, this publication aims to help companies enhance the robustness, consistency, comparability, and utility of TCFD implementation and reporting through SASB and CDSB's market-tested frameworks, standards and resources.

Regardless of whether an organization has a sophisticated approach to managing climate risks and opportunities or is just getting started, it can use this guidance to move forward in supporting improved decision-making, enhanced market resilience, and more sustainable economic growth.

The guidance adheres to the following structure:

- **Overview:** An overview of the TCFD, SASB, and CDSB, and the drive for effective corporate climate-related disclosures;
- **Getting Started:** Key action steps to help companies lay the groundwork for effective climate-related disclosures;
- **Good Practice Disclosure:** Sample disclosures and accompanying discussion to provide companies with a practical understanding of the four core elements of the TCFD recommendations and their specific disclosures (see Figure 1); and
- **Looking Ahead:** A summary of how the CDSB Framework and SASB standards represent a clear solution to TCFD implementation, and areas of future focus.

Figure 1. Four core elements of the TCFD recommendations



¹ as of March 2019. See <https://www.fsb-tcfd.org/tcfd-supporters/>



Part I: Overview



Introduction

In recent years, governments worldwide have rallied around coordinated efforts to meaningfully address climate change. In 2015, the landmark Paris Agreement set the stage for global action. In December 2018, at the Conference of the Parties (COP24) in Poland, nearly 200 nations adopted a “rule book” to guide individual and collective actions aimed at limiting further warming of the planet, with important implications for both the public and private sectors.

Actions like these are driven partly by the potential for threats to human health, infrastructure, natural resources, energy security, and even international order. However, widely-accepted climate scenarios also present a critical economic imperative that cannot—and, indeed, must not—be ignored. “Going green” is not just a matter of “saving the planet”; it is about pursuing economic growth and development that is strategic, resilient, and sustainable.

Although the concept of sustainable finance has been embraced by a growing number of market participants and policy makers,² much work remains to be done. A 2018 Intergovernmental Panel on Climate Change (IPCC) special report on the impacts of climate change found that if greenhouse gas (GHG) emissions continue at their current rate, the Earth’s atmosphere will increase by 1.5°C above pre-industrial levels by 2030.³ This rapidly-approaching reality far exceeds the goal supported by 184 countries in the 2015 Paris Agreement, which aims to hold the increase in global average temperature to “well below 2°C above pre-industrial levels” and “pursu[e] efforts to limit the temperature increase to 1.5°C above pre-industrial levels.”⁴ Not only is this future expected to involve potentially catastrophic impacts on agriculture, coastlines, critical ecosystems, and human poverty, it is estimated to come at a global cost of between US\$54 trillion and US\$69 trillion.⁵

Conversely, a coordinated global transition to a low-carbon and climate-resilient economy is projected to involve

significant financial opportunities. For example, a decisive shift could yield economic gains of US\$26 trillion over the next 12 years compared to a “business-as-usual” scenario.⁶ An ambitious global response could provide an even stronger basis for economic growth that would generate a GDP increase of “around 2.5 percent for the G20 on average in 2050, further increased to about 4.6 percent if avoided climate damages are accounted for.”⁷

The sheer scale of the challenge emphasizes the importance of harnessing the power of market forces to drive climate action that aligns the interests of society at large with those of businesses, their investors, lenders, and insurance underwriters. The United Nations Sustainable Development Goals (SDGs) acknowledge the role of market forces. Target 12.6 of SDG12 on Sustainable Consumption and Production encourages “companies to adopt sustainable practices and integrate sustainable information into their reporting cycles.”⁸ Indeed, a successful global transition to a more climate-resilient and low-carbon economy will require extraordinary financing⁹—far beyond what can be harnessed by governments and civil society alone. Global capital markets are therefore critical to making progress on Climate Action (SDG13) and singularly positioned to contribute to—and benefit from—an extraordinary but essential economic evolution.

Enter the TCFD Recommendations

Recognizing the economic risks and opportunities inherent in a changing climate, the Financial Stability Board (FSB), at the behest of the G20, established the Task Force on Climate-related Financial Disclosures (TCFD) in 2015. The FSB cited the need for consistent, comparable, clear, and reliable corporate disclosure of climate-related information. These disclosures would support informed decision-making by investors, lenders, and insurers in allocating capital and underwriting risk. By developing recommendations for

² Sustainability Accounting Standards Board (SASB) and Climate Disclosure Standards Board (CDSB), *Climate Risk: From Principles to Practice – Phase 1* (2018).

³ Intergovernmental Panel on Climate Change (IPCC), *Global Warming of 1.5°C – An IPCC Special Report* (October 8, 2018).

⁴ United Nations, “Paris Agreement” (December 2015).

⁵ According to the IPCC report (supra note 3), “The mean net present value of the costs of damages from warming in 2100 for 1.5°C and 2°C (including costs associated with climate change-induced market and non-market impacts, impacts due to sea level rise, and impacts associated with large scale discontinuities) are US\$54 and US\$69 trillion, respectively, relative to 1961-1990.”

⁶ New Climate Economy, *Unlocking the Inclusive Growth Story of the 21st Century* (August 2018).

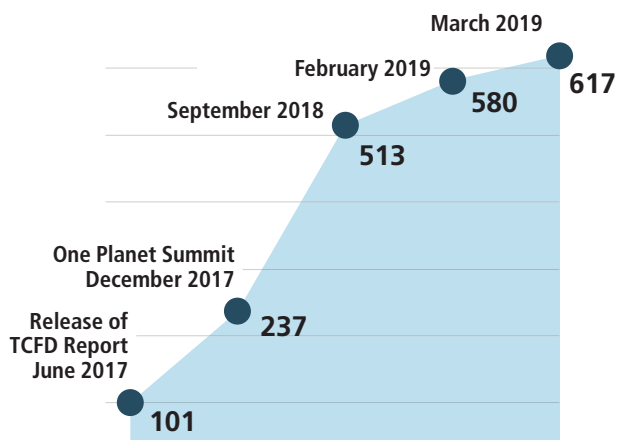
⁷ Organisation for Economic Co-operation and Development, *Investing in Climate, Investing in Growth* (2017).

⁸ CDSB website, “Sustainable Development Goals,” accessed January 31, 2019, at <https://www.cdsb.net/what-we-do/reporting-regulation/sustainable-development-goals>

⁹ International Energy Agency, *Perspectives for the Energy Transition – Investment Needs for a Low-Carbon Energy System* (2017).

these disclosures, which the TCFD released in June 2017,¹⁰ the FSB aimed to ensure more stable, resilient markets over the medium and long term by facilitating a smoother transition—with less abrupt price adjustments—to a lower-carbon and climate-resilient economy.

Figure 2. Number of TCFD Supporters



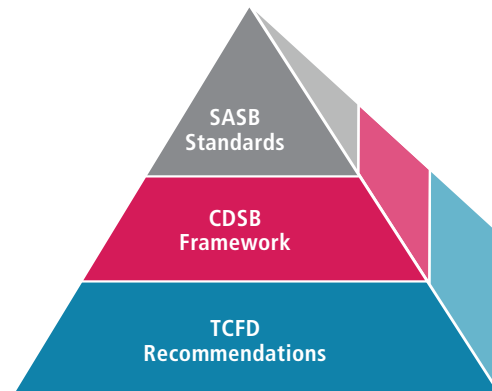
Since their release in June 2017, the TCFD recommendations—which address governance, strategy, risk management, and metrics and targets—have received public expressions of support from more than 617 organizations representing more than US\$8 trillion in market capitalization.¹¹ Meanwhile, hundreds of investors, banks, and other financial organizations responsible for more than US\$100 trillion in assets have also done so.¹² Located in 40 countries on six continents, supporters of the TCFD recommendations span a variety of industries, investors, trade associations, central banks, regulators, and national governments.

However, commitments to implement the recommendations have not always translated quickly into actual or comprehensive disclosures. As the TCFD noted in its 2018 *Status Report*, “climate-related financial disclosures are still in early stages,” and there remains a need “for continued efforts to support implementation of the recommendations.”¹³ In fact, in its *First Steps* report (see Resources), CDSB reviewed the disclosures of 80 of the largest companies by market capitalization across Europe and found that only 38 percent mentioned the TCFD, and far fewer made authentic TCFD disclosures in the first year of reporting after the TCFD’s final report was published.¹⁴

This guide aims to address this implementation gap by providing organizations with practical guidance to fulfilling

the principle-based TCFD recommendations, and making the 11 recommended disclosures in their mainstream report (e.g., annual financial filings), using SASB and CDSB’s market-tested frameworks, standards, and resources.

Figure 3. Alignment of the Frameworks



The TCFD recommendations serve as a global foundation for effective climate-related disclosures. The CDSB Framework helps organizations integrate and disclose financially material climate and natural capital-related information into their annual reports. The SASB standards help organizations to collect, structure, and effectively disclose related performance data for the material, climate-related risks and opportunities they have identified.

SASB and CDSB: Practical Tools

SASB and CDSB, two organizations well-established in the market with rigorously developed TCFD-aligned reporting tools, are uniquely positioned to support the implementation of the recommendations and the 11 associated disclosures in a way that is both cost-effective for companies and decision-useful for investors.

Launched in November 2018, the SASB sustainability accounting standards (the SASB standards), with the CDSB Framework for Reporting Environmental Information and Natural Capital (the CDSB Framework), allow companies to integrate climate-related factors into their investor-focused reporting, as recommended by the TCFD.

SASB and CDSB have demonstrated the considerable alignment of their work with the TCFD recommendations,¹⁵ and continue to refine their approaches to improve harmonization (See Figure 3). For example, in 2018, building on the principles of its Framework which were already aligned with TCFD, CDSB mapped and signposted the four core elements of the TCFD recommendations to its Framework’s reporting requirements.¹⁶ At the same

¹⁰ Task Force on Climate-Related Financial Disclosures (TCFD), *Recommendations of the TCFD* (June 2017).

¹¹ Per the TCFD secretariat.

¹² Ibid.

¹³ TCFD, *2018 Status Report* (September 2018).

¹⁴ CDSB, *First Steps – Corporate climate and environmental disclosure under the EU Non-Financial Reporting Directive* (November 2018).

¹⁵ CDSB and SASB, *Converging on Climate Risk: CDSB, the SASB, and the TCFD* (September 2017).

¹⁶ CDSB *Framework for reporting environmental information and natural capital* (April 2018).

time, SASB updated its standards to more fully embrace all aspects of the TCFD guidance.¹⁷

The shared value of the CDSB Framework and the SASB standards is enhanced by the fact that these initiatives have gained significant traction in global markets. For example, the CDSB Framework is used in 32 countries—by 374 companies across 10 sectors with a combined market capitalization of US\$5.2 trillion. Further, the Framework is well-recognized in the European regulatory environment, with references in the European Commission’s non-binding guidance on the EU Non-Financial Reporting Directive (“NFR Directive”),¹⁸ the UK Companies Act (2006) environmental reporting guidelines,¹⁹ and the London Stock Exchange and Borsa Italiana ESG guidance, among others.²⁰

Meanwhile, a growing number of global companies—including S&P 500 firms such as CBRE Group, Digital Realty Trust, General Motors, Host Hotels, Kellogg’s, Kinder Morgan, Medtronic, Merck, Nike, and NRG Energy—have begun to integrate the SASB standards into their financial filings, sustainability reports, and other core communications to investors.²¹ Likewise, investors have begun to incorporate the SASB standards into their investment analyses and decision-making processes.²² Since 2016, 40 institutional investors representing a combined US\$30 trillion in assets under management have joined SASB’s Investor Advisory Group (IAG). The IAG comprises leading asset owners and asset managers who recognize the need for consistent, comparable, and reliable disclosure of financially material, decision-useful sustainability information for investors. Like the CDSB Framework, the SASB standards have also been recognized by the European Commission as a suitable framework for meeting the five content categories in Articles 19a and 29a of the NFR Directive.²³

As standard-setters, stock exchanges, regulators, and policymakers work to shape the future of climate-related and natural capital reporting, companies can leverage the existing SASB and CDSB resources to jumpstart their implementation of the TCFD recommendations. In so doing, they can enhance their understanding, assessment, and management of key climate-related risks and opportunities while also contributing to more efficient, stable, and resilient capital markets. Through the lens of financial materiality, an investment in strategic climate action can bridge the divide between “doing good” and “doing well,” not only

addressing societal needs, but also creating sustainable, long-term value for companies and their shareholders in the process.

¹⁷ SASB, *Standards Application Guidance* (October 2018).

¹⁸ European Commission, *Guidelines on Non-Financial Reporting* (June 2017).

¹⁹ UK Department for Environment Food & Rural Affairs, *Environmental Reporting Guidelines: Including mandatory greenhouse gas emissions reporting guidance* (June 2013).

²⁰ London Stock Exchange Group, *Revealing the Full Picture: Your Guide to ESG Reporting* (January 2018).

²¹ An analysis of SEC filings for fiscal year 2016 revealed 805 instances of companies disclosing information on SASB metrics across all sectors, including 15 companies—most of them 20-F filers, such as Diageo and Deutsche Bank—that provided disclosure on at least half of the metrics included in the provisional SASB standard for their industry.

²² SASB, *ESG Integration Insights – 2017 Omnibus Edition* (2017).

²³ *Supra* note 18.



Part II: Getting Started



Getting Started on TCFD Implementation

Like traditional financial reporting, rigorous climate-related financial disclosures do not happen overnight. The path from start to finish can involve twists and turns, as well as the coordination of many moving parts, thereby requiring the collaboration and expertise of a variety of corporate functions to achieve an organization’s ultimate reporting objectives.

This guide recognizes that each organization is unique, starting from its own baseline and possessing its own capacities and processes for robust implementation. Thus, the guide generally covers implementation practices that are likely to vary to some degree based on an organization’s specific characteristics and circumstances, including its size, structure, and/or operating context. Where guidance is presented in an industry-specific context (such as the annotated excerpts of disclosures included in the following sections), corporate professionals will be called upon to exercise their own industry expertise and professional judgment to translate the guidance for their own organization.

Laying the Groundwork for Effective Disclosures

This guidance is primarily focused on disclosure. However, before meaningful climate-related information can be reported, an organization must first integrate climate assessment, monitoring, and management into its routine business activities. For example, this may involve establishing or refining priorities, policies, processes, and practices related to measuring, assessing, managing, and reporting climate-related financial information—from strategic planning and enterprise-level risk management (ERM) to internal performance assessments and external reporting cycles.

The following checklist, expanded and adapted from CDSB’s 2017 Practical Action TCFD Checklist,²⁴ details many of the key action steps companies can take now to prepare themselves for reporting information that is aligned with the TCFD recommendations (see Figure 4).

Figure 4. Action Steps to Lay the Groundwork



Beyond TCFD

The action steps outlined here may also be applicable to a wide range of financially material environmental, social, and governance (ESG) matters. For example, “green” finance extends well beyond carbon to an array of natural capital and environmental dependencies, and sustainable finance can incorporate a host of issues traditionally considered to be non-financial in nature, such as social and human capital.

The CDSB Framework is designed to facilitate effective disclosure of a company’s full spectrum of natural capital, environmental, and climate-related risks and opportunities in the mainstream report. Similarly, and complementary to the CDSB Framework, SASB standards are multi-dimensional, addressing social and human capitals, business model and innovation issues, and leadership and governance matters in addition to environmental and natural capital.

The approach described here to lay the groundwork for effective climate-related disclosures may prove useful in integrating these other non-financial issues, as appropriate, into a company’s routine business activities.

²⁴ Adapted from CDSB, *TCFD recommendations: a checklist of practical next steps* (April 2017).

1 Secure the support of your board of directors and executive leadership team.

The TCFD recommended disclosures place significant emphasis on the importance of governance, and contain two recommended disclosures related to board oversight of climate-related risks and management's role in assessing and managing those risks. These governance-related disclosures recognize that effective management of financially material, climate-related risks and opportunities requires direct oversight and executive leadership—starting with the board of directors. Leadership sets the tone at the top to establish key climate-related factors as core business drivers that should be identified, assessed, measured, managed, and reported like any other business-critical issue.

2 Integrate climate change into key governance processes, enhancing board-level oversight through audit and risk committees.

What's new about the TCFD's work is that it asks boards to understand and integrate climate-related issues into strategic and financial decisions, and to link climate-related information with financial information. A good way to start this process is to identify the CEO, senior executive(s), or board committee(s) responsible for climate policies, strategy, and information, and to define a process for board oversight of these issues.

It is also important to engage the risk committee of the organization, as they will already be looking at the financial impacts of external risks on the business. Helping them understand how climate change poses a threat to the organization, considering different time horizons (i.e. short-, medium-, and long-term), is a key step to ensuring disclosures adhere to the TCFD recommendations.

Finally, audit committees should scrutinize climate-related financial information with the same rigor they use for financial information. Applying the same process and quality assurance to climate disclosure will make a difference in the way climate risks and opportunities are understood and communicated.

3 Bring together sustainability, governance, finance, and compliance colleagues to agree on roles.

One of the key goals of the TCFD is to elevate climate-related issues to the board level. But to do this will likely also require integrated management processes to be put in place within an organization.

A report by the World Business Council for Sustainable Development (WBCSD) on sustainability and risk management in the corporate sector showed that there is

a disconnect between what the sustainability functions in companies consider as material risks for their business and the risks disclosed in the organization's mainstream financial filings. Indeed, on average, only 29 percent of the areas deemed material in a sustainability report were included in a company's legal disclosure of risks. Notably, 35 percent of member companies did not disclose any of the sustainability risks identified in their sustainability reports in their legal filings.²⁵ As the report further notes, this disconnect is largely due to a lack of cross-functional collaboration, particularly in the identification and evaluation of risks and opportunities. This collaboration can facilitate more effective management of risks, oversight at the board level, and external reporting.

4 Look specifically at the financial impacts of climate risk and how it relates to revenues, expenditures, assets, liabilities, and financial capital.

Given the scale, unpredictability, and long-term nature of climate change-related issues, understanding financial exposure can be challenging. The TCFD highlights two primary types of climate risks, which can be mapped to the CDSB Framework and SASB's climate framework: physical and transitional.²⁶ Physical risks may include extreme weather events, such as drought or flooding, and the longer-term impact of increasing average global mean temperatures. Transitional risks, on the other hand, may include the global transition to a low-carbon economy, new regulations, and innovations in energy efficiency. These risks may have impacts across the entire structure of a business. Revenues may be affected by shifting customer demands and new regulatory requirements, while costs can be impacted by the availability and price of raw materials.

Investors and stakeholders need greater clarity on how organizations are assessing these climate-related risks and opportunities, and how they are planning to respond. Understanding and communicating the potential financial impacts of climate-related risks and opportunities will generate more decision-useful information, thereby supporting more informed investment, lending, and insurance underwriting decisions.

5 Assess your business against at least two scenarios.

While some businesses are being affected by climate risks today, most are likely to encounter the most significant effects over the medium to long term, with uncertainty related to timing and scale. As the TCFD recommendations stressed, "scenario analysis is a process for identifying and assessing a potential range of outcomes of future events

²⁵ World Business Council for Sustainable Development (WBCSD), *Sustainability and enterprise risk management: The first step towards integration* (2017).

²⁶ SASB, *Climate Risk Technical Bulletin* (October 2016).

under conditions of uncertainty.” These scenarios enable businesses to explore how climate change may affect them, and a growing body of climate-specific guidance has been developed for using them.²⁷

Businesses should use a selection of scenarios that cover a reasonable range of future outcomes to help inform their strategic and financial planning processes. The TCFD recommends that organizations use, at a minimum, a 2°C or lower scenario and should further consider using an additional two or three scenarios that are most relevant to their circumstances. These additional scenarios could be related to Nationally Determined Contributions (NDC),²⁸ business-as-usual cases, or increased climate-related physical risks, for example. Organizations could begin by focusing these scenarios on a specific asset or aspect of their business before expanding to wider operations, and, eventually, their whole business.

6 Adapt existing enterprise-level and other risk management processes to take account of climate risk.

Organizations need to start preparing for the impacts that a changing climate could have on their business. An example of good practice for the integration of sustainability issues within ERM processes is highlighted in a WBCSD report on sustainability and risk management in the corporate sector:²⁹

“Sustainability documentation coupled with traditional risk identification and analysis tools can provide risk managers with information to support integrated risk assessments [...]. Sharing materiality assessment results and associated quantitative data with the risk function is critical.”

The WBCSD, in conjunction with the Committee of Sponsoring Organizations of the Treadway Commission (COSO), has issued further guidance for applying ERM to sustainability-related risks with the aim of helping companies leverage and enhance existing management of issues such as climate risk.³⁰ This guidance helps companies quantify, stress test, and use scenario analysis to assess and prioritize ESG risks such as those related to climate change.

7 Solicit feedback from engaged investors about what information they need to know about climate-related financial risks and opportunities.

As the primary users of the information companies disclose, investors play a crucial role in the process. They have developed strategies for incorporating screens, tilting, ESG integration, impact investing, and shareholder engagement based on sustainability information, including climate-related information. However, acting on these strategies depends on appropriate governance mechanisms to generate performance information that is decision-useful.

In recent years, the investor community has begun to call for higher-quality reporting of climate-related and other ESG information—particularly in mainstream reports—and to highlight the lack of comparability among the financially material sustainability information reported by peer companies. These issues affect investors’ decision-making processes, and reflect on the relationship they create with companies. Engaging with investors will help make the disclosure process more useful for both parties, and will benefit shareholder relationships.

8 Look at existing tools you may already use to help you collect and report climate-related financial information such as the CDP questionnaire, the CDSB Framework, and the SASB standards.

The catalytic work of the TCFD builds on what many other organizations in the reporting space have been doing for decades, and has brought consideration of climate-related risks and opportunities into the mainstream. This is evidenced by multiple cross-references to existing reporting frameworks in the TCFD’s final report. Recognizing and aligning these existing efforts will be crucial to ensure a rapid scaling-up of effective climate-related disclosures across the corporate sector.

With more than 7,000 companies, representing more than 50 percent of global market capitalization, disclosing environmental and climate data through CDP in 2018, many are already providing helpful governance, risk, strategy, and metrics and targets disclosures. The CDP questionnaire has been fully aligned to the TCFD recommendations since 2018. CDP helps companies collect, report, and structure their environmental data. There are further opportunities to develop financial and forward-looking disclosures, and to take a more integrated approach by reporting this information alongside financial data in mainstream filings.

To this end, organizations can also use the complementary CDSB and SASB resources to prepare for disclosure in line with the TCFD recommendations. CDSB’s Framework is the only TCFD-referenced reporting framework that focuses specifically on how companies can integrate climate change

²⁷ See, for example: TCFD, *Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities* (June 2017); and Dr. Jane Thstrup Jagd, Centre for ESG Research, and CDSB, “How can companies considering TCFD recommended scenario analysis provide disclosures that help investors: a short guide” (2018).

²⁸ The Paris Agreement (Article 4, paragraph 2) requires each party to prepare, communicate, and maintain successive nationally determined contributions (NDCs) that it intends to achieve in pursuit of shared climate goals.

²⁹ *Supra* note 25.

³⁰ WBCSD and COSO, *Enterprise Risk Management: Applying enterprise risk management to environmental, social and governance-related risks* (February 2018).

into mainstream financial filings. The CDSB Framework's guiding principles and requirements for disclosure mirror those described by the TCFD, making it the most-referenced and fully aligned with the TCFD recommendations. Meanwhile, the best-practice performance metrics included in the SASB standards are the only ones that focus specifically on financially material factors—in other words, the climate-related impacts that are critical to companies and their investors.

9 Plan to use the same quality assurance and compliance approaches for climate-related financial information as for finance, management, and governance disclosures.

Companies need to ensure that their quality assurance and compliance approaches for climate-related financial disclosures are as rigorous as they are for financial disclosures. They can do so by setting up or adapting existing internal controls and external assurance processes, as these efforts enhance and support objectivity and credibility while reassuring report readers that disclosures are reliable.

The design, implementation, and maintenance of a robust system of internal control over climate-related information can enhance its utility for internal and external decision makers. Meanwhile, external assurance can support businesses in identifying and disclosing significant issue assessment processes and, where practical, involve internal teams in charge of sustainability measurement, valuation, and reporting as well as internal audit, risk management, and related functions.

10 Prepare the information you report as if it were going to be assured, even if you decide not to do so right now.

Companies must consider the fundamental principles and requirements for effective disclosure, as outlined by the TCFD, the CDSB Framework, and the SASB standards, and outline how they can be applied to their practices and processes. Relevance, balance, completeness, consistency, and comparability must be reflected through processes exploring relevant subject matter, sector specifics, business needs, and technical requirements. These shared principles (see Figure 5) support effective disclosures, and implementing them can support future assurance engagements.

Companies can enjoy significant benefits from using external assurance.³¹ These benefits may include improved decision-making, lower cost of capital, greater coverage by analysts, improved risk management, and enhanced

brand reputation.³² Furthermore, the relationship between service provider and client, and the processes and procedures developed through that relationship, are often key determining factors in establishing assurance engagements that truly support enhanced credibility, trust, and the preparation of decision-useful information.

11 Look at the existing structure of your annual report and think about how you can incorporate the recommendations into your discussion of risks, management's discussion and analysis (MD&A), and the governance section.

The first step to strengthening the relationship between climate change and overall corporate strategy, performance, and prospects is to apply the concept of connectivity across the disclosures. As CDSB highlighted in its analysis of FTSE 350 companies' environmental reporting and GHG disclosures in annual reports, this helps to show a holistic picture of the factors that affect the organization's ability to create value over time.³³

The consistency and comparability of disclosures could be enhanced through the development of key performance indicators (KPIs)—such as those identified by the SASB standards—that are connected to financial information, consistent over successive time periods and with accepted industry benchmarks, and focused on financially material matters.

A key element of the TCFD's work is the recommendation to include climate-related financial information in mainstream reports. Companies need to think about how to best use the existing structure of their mainstream annual reports to integrate these new disclosures. Think of integration and connectivity as your north star: your annual report should tell a clear and coherent story, and guide the report user, connecting the dots between governance, strategy, risk management, target-setting, and performance.

³¹ WBCSD, *Generating Value from External Assurance of Sustainability Reporting* (February 2016).

³² American Institute of Certified Public Accountants (AICPA), "CPAs. The preferred choice for assurance on sustainability information" (May 2015).

³³ CDSB, *Comply or Explain* (January 2016).



Part III: Good-Practice Disclosures



TCFD-Aligned Sample Disclosures

The early actions checklist above provides a high-level overview of key steps companies can take along the implementation path toward effective TCFD disclosure.³⁴ The remainder of this guide is intended to illustrate practical examples of how SASB and CDSB resources support the preparation of effective TCFD disclosures, helping companies translate the recommendations from principles to practice. Thus, the following sections of the guide are focused primarily on the reporting exercise. This approach was designed to fulfill a specific need identified by many market participants during the extensive engagement SASB undertook to update its standards and in CDSB's corporate engagement activities. These individuals and organizations cited a lack of real-world, good-practice examples of what decision-useful, climate-related financial disclosures could look like.

Although the mock disclosures included below are tailored to specific industries (as climate-related financial disclosures should be), they were selected to illustrate principles, reporting requirements, and practices that may be applied within any industry context by leveraging the expertise and professional judgment of the preparer.

The examples and associated guidance cover the four core elements of climate-related financial disclosures (as shown in Figure 1):

- **Governance:** The organization's oversight of climate-related risks and opportunities;
- **Strategy:** The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning;
- **Risk Management:** The processes used by the organization to identify, assess, and manage climate-related risks; and
- **Metrics and Targets:** The metrics and targets used to assess and manage relevant climate-related risks and opportunities.

These four core elements are supported by 11 specific recommended disclosures (including one related to scenario analysis) and guidance (both general and sector-specific), which rest on a set of underlying principles intended to facilitate high-quality, comparable, and decision-useful disclosures. The TCFD intentionally did not develop detailed, industry-specific standards or metrics for disclosing climate risk. Instead, the TCFD explicitly referenced existing standards that companies can use to identify the climate-related risks and metrics most relevant to their industry. Because of their alignment with the recommendations (see Figures 5 and 6), the CDSB Framework and the SASB standards are among the most frequently cited tools in TCFD's Implementation Annex.³⁵

³⁴ For readers seeking additional preparatory guidance, many of these topics are covered in greater detail in the *SASB Implementation Guide for Companies* and in the CDSB Framework.

³⁵ TCFD, *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures* (June 2017).

Figure 5. Alignment of TCFD-CDSB-SASB Principles³⁶

TCFD	CDSB	SASB
PURPOSE OF PRINCIPLES		
<p>Principles for Effective Disclosures Intended to “help achieve high-quality and decision-useful disclosures that enable users to understand the impact of climate change on organizations.”</p>	<p>Guiding Principles and Reporting Requirements Principles [P] are designed to ensure that environmental and climate information in mainstream reports is useful to investors, is correct and complete, and supports assurance activities. Requirements [REQ] are designed to encourage standardized disclosure of environmental and climate information that complements and supplements other information in mainstream reports.</p>	<p>SASB Criteria for Accounting Metrics Designed to ensure the delivery of material, decision-useful information to the capital markets in a way that is cost-effective.</p>
ALIGNMENT OF PRINCIPLES		
Disclosures should present relevant information	[P1] Environmental information shall be prepared by applying the principles of relevance and materiality [P5] Disclosures shall be clear and understandable	SASB metrics are applicable to most companies in the industry
Disclosures should be specific and complete	[P2] Disclosures shall be faithfully represented [P3] Disclosures shall be connected with other information in the mainstream report [P7] Disclosures shall be forward-looking	SASB metrics are complete, capturing a fair representation of performance
Disclosures should be clear, balanced and understandable	[P2] Disclosures shall be faithfully represented [P5] Disclosures shall be clear and understandable	SASB metrics are useful to decision-makers and neutral (free from bias)
Disclosures should be consistent over time	[P4] Disclosures shall be consistent and comparable	SASB metrics are comparable over time
Disclosures should be comparable among organizations within a sector, industry, or portfolio	[P4] Disclosures shall be consistent and comparable	SASB metrics are comparable across peers within an industry
Disclosures should be reliable, verifiable, and objective	[P2] Disclosures shall be faithfully represented [P6] Disclosures shall be verifiable	SASB metrics are verifiable
Disclosures should be provided on a timely basis	[REQ-09] Disclosures shall be provided on an annual basis	SASB metrics are useful to decision-makers

³⁶ Extracted from Table 21 from CDSB, *CDSB Framework for reporting environmental and natural capital information: Advancing and aligning disclosure of environmental information in mainstream reports* (April 2018).

The CDSB Framework includes seven Guiding Principles that set out *how* to report, and 12 Requirements that establish *what* to report. The principles are fully aligned with those of the TCFD and SASB (see Figure 5). Meanwhile, there are considerable synergies among the TCFD recommended disclosures and the reporting requirements of the CDSB Framework, the SASB standards and SASB Application Guidance, as shown in the table below (see Figure 6).

Figure 6. Alignment of TCFD Recommended Disclosures with the Requirements of the CDSB Framework and SASB Standards.

- CDSB Requirement is aligned with TCFD recommendations
- ◊ SASB metrics and guidance are aligned with TCFD recommendations
- # SASB metrics are aligned with TCFD guidance in key industries

Recommendations of the Task Force on Climate-Related Financial Disclosures

CDSB FRAMEWORK REQUIREMENTS	Governance		Strategy			Risk Management			Metrics & Targets		
	G a)	G b)	S a)	S b)	S c)	RM a)	RM b)	RM c)	MT a)	MT b)	MT c)
REQ-01: Governance	●	●						●	●		
REQ-02: Policies, Strategy & Targets		●	●	●			●		●	●	●
REQ-03: Risks & Opportunities			●	●	●	●	●	●			
REQ-04: Sources of Impacts									●	●	●
REQ-05: Performance & Comparison									●	●	●
REQ-06: Outlook			●	●	●		●	●			
REQ-07: Organisational Boundary											
REQ-08: Reporting Policies											
REQ-09: Reporting Period											
REQ-10: Restatements											
REQ-11: Conformance											
REQ-12: Assurance											
SASB STANDARDS	G a)	G b)	S a)	S b)	S c)	RM a)	RM b)	RM c)	MT a)	MT b)	MT c)
Standards Application Guidance	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊
Industry-Specific Standard(s)	#	#			#		#	#	◊	#	◊

Using the full set of CDSB Framework Requirements to make your TCFD disclosures

As shown in Figure 6, CDSB Framework requirements 1-6 are explicitly linked to the 11 TCFD recommended disclosures. Although the figure may appear to suggest that CDSB requirements 7-12 extend beyond the TCFD recommendations, these requirements directly support the TCFD's Fundamental Principles for Effective Disclosures—with the exception of requirements 11 (Conformance) and 12 (Assurance). The CDSB requirements are aimed at enhancing the clarity, quality, consistency, comparability, reliability, and decision-usefulness of the disclosures—a shared aim of the TCFD, CDSB, and SASB. Although they may not represent the formal disclosure recommendations of the TCFD, requirements 7-12 represent good reporting practice in the context of disclosing climate risks and opportunities in mainstream reports. Using the full set of CDSB Framework requirements is therefore beneficial to producing effective TCFD disclosures.

CDSB Framework Requirements 7-12 are summarized here, and preparers can find further details on applying these requirements to their TCFD disclosures in the CDSB Framework. CDSB Framework Requirement 7 relates to the organizational boundary for reporting. For reporting of climate-related risks and opportunities in the mainstream report, climate-related information should, at minimum, be prepared for the entities within the boundary of the organization, or group, for which the mainstream report is prepared. It further requires disclosure of the basis upon which the organizational reporting boundary has been determined. The TCFD also advocates for disclosures to be made through the vehicle of the mainstream report, i.e., public financial filings, and preparers of the TCFD-recommended disclosures should also clearly state the organizational boundary used to make such disclosures in the mainstream report.

CDSB Framework Requirement 8 on reporting policies requires preparers to cite the reporting provisions used for preparing the climate-related information, and to confirm the consistency of their use from one reporting period to the next. This is in keeping with TCFD Principle 4, which requires disclosures to be consistent over time and “presented using consistent formats, language and metrics from period to period to allow for inter-period comparisons.”³⁷ Similarly, CDSB Framework Requirement 9 on the reporting period and TCFD Principle 7 both require disclosures to be provided “on a timely basis” and at least annually. The CDSB Framework requires the reporting period for the mainstream report and climate-related information to be the same, subject to certain exceptions, such as a different reporting periods due to legal specifications.

CDSB Framework Requirement 10 on restatements requires disclosures to report and explain any prior year restatements, i.e., to disclose and explain amendments made to previously-reported information. TCFD Principle 4 also calls for explanations of changes in disclosures and related approaches or formats.

When looking at the requirements, there are two areas where the CDSB Framework differs from the TCFD recommendations—specifically in regard to conformance and assurance. CDSB Framework Requirement 11 requires a statement of conformance with the CDSB Framework or equivalent, stating that the preparer has applied the principles to the climate-related information reported and complied with the requirements. Where there is partial conformance (e.g., incomplete information provided), the report preparer should explain the relevant circumstances, the nature of the omission, and the organization's plans for full conformance in the mainstream report. The final requirement on assurance (REQ-12) states that if assurance has been provided over whether reported environmental and climate information is in conformance with the CDSB Framework, it must be included or cross-referenced to the statement of conformance.

³⁷ See the 2017 TCFD Final Report, Chapter F, Fundamental Principles for Effective Disclosure, p. 68.

About the Mock Disclosures

The mock examples included in the following sections are hypothetical, but were adapted from a representative sample of actual disclosures, addressing the four core elements of the TCFD recommendations. These mock disclosures aim to provide reporting companies with specific illustrations of how the SASB and CDSB tools and resources can readily be applied to facilitate TCFD-ready reporting of climate-related risks and opportunities. In drawing from and building on actual disclosures, the mock disclosures are intended to present examples of effective disclosure to enhance the efforts of companies looking to get started today. They are not, therefore, meant to represent an ideal or perfect organization, either in terms of reporting or performance.

The examples include disclosure excerpts from three hypothetical companies:

- OilCo** is an integrated oil and gas company with global operations. Its primary activities include exploring for, extracting, and/or producing energy products such as crude oil and natural gas, which comprise the upstream operations of the oil and gas value chain. OilCo develops both conventional and unconventional and both on-shore and off-shore oil and gas reserves, including shale oil and/or gas reserves, oil sands, and gas hydrates. The company contracts with downstream providers to conduct certain activities and to obtain equipment and oilfield services.
- AgriCo** is a global agricultural products company engaged in processing, trading, and distributing vegetables and fruits, and producing and milling agricultural commodities such as grains, sugar, consumable oils, maize, soybeans, and animal feed. AgriCo sells its products directly to consumers and to businesses for use in consumer and industrial products. The company typically purchases agricultural products, including commodities, from third-party entities around the world that grow such products (either directly or indirectly). The company is also involved in wholesale and distribution.

- AutoCo** is a global automobile manufacturer of passenger vehicles, light trucks, and motorcycles. The company designs, builds, and sells vehicles that run using a range of traditional and alternative fuels and powertrains. It sells these vehicles to dealers for consumer retail sales as well as directly to fleet customers, including car rental and leasing companies, commercial fleets, and governments. Due to the global nature of the industry, AutoCo has manufacturing facilities, assembly plants, and service locations in countries around the world.

Each company's mock disclosures are included in the following sections:

	Governance	Strategy	Risk Management	Metrics & Targets
OilCo	✓	✓	✓	✓
AgriCo		✓		✓
AutoCo			✓	

As the TCFD recommendations are more broadly adopted and the management and reporting of climate-related risks and opportunities evolves, what is considered realistic and achievable will likely change. The examples presented below are based on a review and analysis of existing disclosures to identify current good reporting practices, enhanced with additional content to more fully meet the TCFD recommendations by leveraging the SASB standards and CDSB Framework. Meanwhile, a specific organization's disclosures should always be guided primarily by the reporting requirements of the jurisdiction under which it operates. For example, an organization should also include the statements or disclosures that are appropriate or required under relevant law for the application of safe harbors from legal liability available for the provision of forward-looking information.

Core Element 1: Governance

An organization's board of directors and executive leadership team play an increasingly important role in addressing climate-related risks and opportunities. Accordingly, investors and other users of financial filings have a growing interest in developing a robust understanding of how an organization's governance functions are involved in assessing, managing and overseeing these issues.

For example, as climate change represents a systematic risk for investors—one which cannot be managed through diversification—it is likely to present risks and opportunities throughout an entire portfolio. As a result, investors must focus on company performance. Thus, as the Task Force has noted, when “assessing organizations’ financial and operating results, many investors want insight into the governance and risk management context in which such results are achieved.”

Thus, governance is the first of four core elements of TCFD-recommended climate-related financial disclosures. Disclosures under this core element can aid investors, insurance underwriters and other stakeholders in assessing “whether climate-related issues receive appropriate board and management attention.” The TCFD distinguishes between climate-related governance and management in its recommended disclosures—both of which are important for investors to make such an assessment.

Additional Guidance on Governance

The World Economic Forum, which chairs CDSB's Board, together with PwC have published guidance that provides a “compass to enable more effective climate governance.” It includes “a set of principles and questions to guide the development of good climate governance—designed to help the reader practically assess and debate their organization's approach to climate governance and frame their thinking about how the latter could be made more robust.” This publication may be of particular interest to those who wish to delve further into the role of the board in overseeing climate-related issues.

For more information, see: World Economic Forum and PwC, *How to Set Up Effective Climate Governance on Corporate Boards: Guiding principles and questions* (January 2019).

The TCFD recommends the following disclosures for all organizations:

G a) *Disclose the role of the board of the organization in overseeing climate-related issues.*

G b) *Disclose the role of management in assessing and managing climate-related issues.*

By following CDSB Framework Requirements 1 and 2 and SASB Standards Application Guidance 5.0(a) in making its governance-related disclosures, an organization can also satisfy key aspects of the TCFD recommendations while providing investors with decision-useful information that complements and supplements the financial statements.

How to read the excerpt for this TCFD-recommended disclosure element (Governance):

A mock excerpt from a hypothetical organization's disclosure is presented in the left-hand column, with accompanying analysis in the right-hand column. The annotations in the right-hand column reference the guidance provided by the TCFD for the respective disclosure and illustrate how applying key requirements of the CDSB Framework and the appropriate industry-specific SASB standard can aid companies in preparing disclosures in accordance with the TCFD recommendations.

Although the annotations do not always explicitly address how the principles shared by the TCFD, CDSB, and SASB (see Figure 5) have been applied, it is assumed these principles were considered in determining how to disclose such information in the mainstream report.

As this disclosure excerpt is presented for illustrative purposes, we have not applied every CDSB requirement or aspect of the SASB standard—instead, we pull out key examples to show how these two complementary tools can be used to more fully meet the TCFD recommendations. Each paragraph in the excerpt is numbered for ease of reference, with the number in the excerpt (on the left) corresponding with the numbered annotation (on the right) indicating where a specific CDSB Framework requirement or SASB industry standard enables the disclosure.

MOCK DISCLOSURE: GOVERNANCE

Excerpt from OilCo Annual Report

Climate-related Risk & Opportunities - Overview

The Board of Directors has delegated to the Integrated Sustainability Advisory Committee (ISAC), a committee of independent directors appointed by the Board, on matters relating to sustainable management of the Company's activities. The committee directly reports to and advises the Board on such matters. **1** The Committee reviews internal compliance with both internally established and externally applicable sustainability codes and principles across all business units, reviews compliance with environmental, health, and safety matters, reviews the results of internal scenario planning and analysis related to the impacts of environmental and social trends and uncertainties, and advises the Disclosure Committee regarding the determination of materiality of sustainability issues for the purposes of disclosure herein. **2**

LEARNING FROM OILCO DISCLOSURES

Guidance and Questions to Consider

The following questions, derived from the guidance for all sectors included in the TCFD's final report, help mainstream preparers more fully consider suggested aspects of governance that could be disclosed under the TCFD's two recommended governance-related disclosures. Applying the CDSB Framework (and, in particular, its governance requirement, REQ-01 and requirement REQ-02 related to management's relevant policies, strategies, and targets) and metrics from the respective SASB industry standard or other available sources of information (e.g., generated through the CDP Questionnaire) can be helpful tools for an organization to think through and prepare the contents of its disclosures.

G**a)**

Disclose the role of the board of the organization in overseeing climate-related issues.

What are the processes and frequency by which the board are informed about climate-related issues?

CDSB FRAMEWORK: REQ-01 of the CDSB Framework requires that disclosures in this area must describe the governance of environmental policies, strategies, and information, including those related to climate. Mirroring the TCFD recommendation, REQ-01 also suggests that preparers should consider how the highest governing body approaches and is informed of climate-related issues, including the respective processes used and frequency. In the OilCo excerpt, the highest governing body in the company responsible for related policies, strategy, and information appears to be the Board. **1** However, the Integrated Sustainability and Advisory Committee (ISAC) informs the Board of climate-related impacts, and is charged with reviewing actual or potential climate-related risks, and reporting back to the Board with recommendations. **2 3** ISAC informs the Board at Board meetings. **6** Although the precise frequency, as requested by both the TCFD and REQ-01, is not stated, the OilCo excerpt suggests such updates occur quarterly. **9** OilCo's Board is also informed about climate-related issues through a second mechanism, an independent Sustainability Expert Panel which advises both the ISAC and Board and produces a report once per annum for the Board. **14**

SASB STANDARD: SASB Standards Application Guidance 5.0(a), like the TCFD recommendations, calls for disclosures regarding the Board's role in overseeing climate-related risks and opportunities. More specifically, it calls for the "reporting entity [to] design, implement, and maintain a system of governance around developing and disclosing sustainability information [including climate information]—including management involvement, board oversight and internal control—that is substantially similar to what it uses for financial reporting." **2**

MOCK DISCLOSURE: GOVERNANCE

Excerpt from OilCo Annual Report

As such, the ISAC has responsibility for reviewing actual or potential climate-related impacts to the Company and making recommendations to the Board and its relevant committees, as appropriate, regarding its findings. **3** As part of this process, the Company conducted an assessment to determine climate-related risks and opportunities it faces; the assessment utilizes the Recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) and relevant sections of the Sustainability Accounting Standards Board's (SASB) Sustainability Accounting Standard for the Oil & Gas – Exploration & Production (EM-EP) industry as key inputs to this process with respect to its identification, assessment, and monitoring of climate-related risks. The Company conducted this assessment as part of its integrated planning and risk management process. The ISAC reviewed the results of the assessment and provided specific recommendations pertaining to sustainability-related risks and opportunities to the Board or its appropriate committee, including those risks and opportunities related to the climate. **4**

The following section includes climate disclosures recommended by the TCFD for all sectors, those specifically recommended by the TCFD for the energy sector, and metrics from the SASB EM-EP Standard.

LEARNING FROM OILCO DISCLOSURES

Which of the following board committees are informed about climate-related issues: audit, risk, or other committees? (Specify which ones.)

CDSB FRAMEWORK: The OilCo excerpt states that the ISAC provides recommendations to the Board or "its appropriate committee," but does not specify these committees as suggested by the TCFD guidance. **4** CDSB Framework REQ-01 advises that the organizational structure should be disclosed and consideration be given to both specific committees and individuals. This helps to make clear who is accountable for what—both at the level of committees and individuals, as appropriate. Consistent with SASB Standards Application Guidance 5.0(a), REQ-01 guides preparers to explain whether climate-related policies and strategies are subject to the same governance processes, including disclosure controls and procedures, as adopted for financial management. This point is also reinforced by the TCFD recommendations, which state that "climate-related financial disclosures should be subject to appropriate internal governance processes." REQ-01 suggests that a company should consider explaining "the nature and reliability of underlying information and control systems used (oversight) by the highest governing body to prepare environmental [i.e. climate-related] information ..." It further emphasizes that, "since these disclosures should be included in annual financial filings, the governance processes should be similar to those used for existing financial reporting." Preparers should therefore consider disclosing whether risk and audit committees, which typically form part of the company's internal governance structure, are informed of climate-related issues and/or inform the Board of such issues. **4**

MOCK DISCLOSURE: GOVERNANCE

Excerpt from OilCo Annual Report

Governance

As described previously, the ISAC has oversight of climate-related risks as part of its overall responsibility for reviewing the Company's sustainability strategy and policy, risk identification and management, and environmental and social compliance. [5](#)

Members of the ISAC meet with the directors of operations of each business unit on a quarterly basis to review the Company's exposure to and management of all relevant, applicable, or material sustainability issues, including those related to the climate. Before each board meeting, the ISAC meets to assess and prioritize these issues before presenting its findings to the full board. The board also provides direction, through the ISAC, to the directors of operations of each business unit on which sustainability and climate issues are likely to present potentially material risks and/or opportunities and establishes performance expectations with the executive leadership team regarding the management of such risks as well as the preparation of associated disclosures in conjunction with the Disclosure Committee. [6](#)

Given the evolving social and regulatory conditions related to the climate, the board incorporates climate-related issues into most strategic decisions, particularly those related to its oversight of risk management, infrastructure, research and development, resource efficiency programs, acquisitions and divestitures, and regulatory compliance. All major decisions are reviewed by the ISAC to specifically assess exposure to and management of sustainability-related risks, including climate risk. Annual budgets are also reviewed by the ISAC, and recommendations from the ISAC to the Board include an assessment of the extent to which sustainability-related impacts have been fully considered. [7](#)

Responsibility for monitoring progress against sustainability-related goals and targets falls on the ISAC members and the directors of operations of each business unit. [8](#) The ISAC updates the board quarterly, and the board provides feedback and direction. [9](#) Managers across most functions within each business unit are responsible for monitoring performance and reporting to the directors of operations. Managers are also all responsible for the oversight of potential climate-related trends, risks, and potential uncertainties, performing associated risk assessments, preparing action plans based on the results of such assessments, and reporting the results of such risk assessments and associated action plans to the ISAC in the quarterly

LEARNING FROM OILCO DISCLOSURES

How does the board, including its committees, consider climate-related issues when reviewing and guiding strategy and management plans of action, and in considering risk management policies?

CDSB FRAMEWORK: REQ-01 directs companies to consider specifying the executive officer, board committee, or highest governing body responsible for environmental [and climate] policies and strategy. More specifically, it advises potentially disclosing: (a) whether such entity/individuals consider climate-related issues in reviewing the company's guiding strategy, major plans of action, and risk management strategies; and (b) how progress is reported back to the highest governing body where responsibility for climate-related strategy has been delegated. In the OilCo example, it is noted that the ISAC reviews all major decisions to assess exposure to and management of sustainability-related risks. [7](#) Although climate-related risks are not explicitly stated, they may likely be captured under the wider umbrella of sustainability-related risks. Earlier in the same paragraph, the excerpt makes clear that the Board incorporates climate-related issues into most strategic decisions and in its management of risks. The process by which both the Board and ISAC consider climate-related issues in these three areas is described in some detail throughout the OilCo excerpt. [4](#) [6](#) [10](#)

SASB STANDARD: Most of the quantitative metrics included in the SASB standards support target-setting and many explicitly call for discussion of performance targets. [8](#) For example, in accordance with SASB metric EM-EP-110a.3, OilCo discusses its Scope 1 emissions reduction targets and provides an assessment of its performance against those targets in the Strategy section below. These targets can thereby facilitate the assessment and management of climate-related risks and opportunities by management and can also provide visibility of actual or required changes and illustrate changes important for the Board to perform their oversight function.

SASB STANDARD: Although OilCo's excerpt does not specify the concrete measures the company uses to assess management's climate-related performance, the SASB standards may be useful in this regard. [11](#) Because they address climate-related and other topics that are likely to be financially material, the associated quantitative and qualitative performance metrics should facilitate Board-level reporting that provides insight into the effectiveness of a company's climate-related strategy, risk management, and operational performance.

MOCK DISCLOSURE: GOVERNANCE

Excerpt from OilCo Annual Report

review process. **10** Company management is responsible for managing climate-related risks and opportunities at a satisfactory level of performance as part of their ongoing duties. To assess management performance, the ISAC recommends specific performance expectations, including both qualitative and quantitative measures of performance, to the Board as part of the annual planning process. **11** Performance against the prior year's agreements is reviewed annually by the ISAC and the results are presented to the Board. Although no specific performance incentives are provided related to these responsibilities, sub-par performance relative to the established agreements could adversely affect a person's position with the Company. **12**

LEARNING FROM OILCO DISCLOSURES

How does the board, including its committees, consider climate-related issues when: considering annual budgets and business plans; overseeing major capital expenditures, acquisitions, and divestitures; and setting organizational performance objectives?

CDSB FRAMEWORK: Mirroring the TCFD guidance, REQ-01 also advises an organization to consider including details in its governance disclosure regarding whether the highest governing body considers climate when: a) reviewing budgets and business plans; **7 10 12** b) setting organizational performance objectives; **9 12** and c) overseeing major capital expenditures, acquisitions and divestitures. **7** See the signposted paragraphs to learn how OilCo addressed these points in its disclosures.

How does the board monitor and oversee progress against goals and targets for addressing climate-related issues?

CDSB FRAMEWORK: REQ-01 advises the company to disclose whether the highest governing body considers climate-related issues when monitoring implementation and performance. **9 10 12** It is noted in the OilCo extract that the ISAC recommends both qualitative and quantitative performance measures to the Board as part of its annual planning process, and the Board reviews such performance. **12** The relationship between management and ISAC, which then reports to the Board in the OilCo example, is also described. **10** REQ-02 also provides further guidance to preparers on describing goals, targets, and timelines for addressing climate-related issues that the Board (or its delegate) can monitor and oversee progress against. As per REQ-02, and to help primary users (i.e., investors) assess the rationale, quality, and efficiency of the company's policies, strategies, and targets, OilCo discloses its key performance targets and timelines in the Metrics & Targets section below.

G *Disclose the role of management in assessing and managing climate-related issues.*
b)

To which management-level positions or committees has the organization assigned climate-related responsibilities? Do they specifically include assessing and managing climate-related risks?

For each management-level position or committee identified with climate-related responsibilities, does this position report to the board or a committee of the board?

MOCK DISCLOSURE: GOVERNANCE

Excerpt from OilCo Annual Report

In 2012, Company management engaged an external climate-risk consulting firm to assess the validity of internal projections and improve external information-gathering processes. The 2012 assessment established a set of recommendations to achieve these improvements. The assessment was made available to the ISAC, and the ISAC conducts an annual review of management's implementation of the associated recommendations. In 2014, at the request of the ISAC, management engaged the firm again for a subsequent review to assess the implementation of the original set of recommendations, as well as to review and revise (as necessary) the set of recommendations based on evolving market and regulatory conditions. The revised set of recommendations are currently being implemented by management, with annual progress reviews performed by the ISAC. **13**

With respect to external information-gathering processes, and per the recommendations of the independent assessment noted above, in 2014 the Company has established an independent Sustainability Expert Panel, consisting of subject matter experts on relevant or material sustainability-related risks and opportunities to which the company is exposed. The committee consists of 14 individuals each serving 3-year terms, with members recommended by the ISAC to the Board for review and approval. The membership of the Sustainability Expert Panel can be found on the Company's website. The Sustainability Expert Panel is responsible for advising the ISAC, and ultimately the full Board as well as Company management, on emerging regulations, market conditions, and scientific studies related to sustainability-related risks to which the company is exposed. In conjunction with Company management, the Panel produces an annual report of its findings to the ISAC, which is presented by the ISAC to the Board. **14**

LEARNING FROM OILCO DISCLOSURES

What are the associated organizational structures , including management level positions and committees, for governance and management of climate-related risks and opportunities and how do they relate to one another?

CDSB FRAMEWORK: REQ-02 requires that a company should describe the resources allocated to managing and delivering the company's policy, strategy, and targets related to environmental and climate matters and whether these are separated or integrated within the wider business. OilCo's excerpt identifies the committee (ISAC) to which it has assigned climate-related responsibilities **1** along with a discussion of management-level positions and their reporting relationships. **9 10** This description also helps readers better understand how an organizational structure can facilitate (or hinder) management's effective assessment and management of climate-related risks and opportunities, in accordance with the TCFD guidance for all sectors and CDSB REQ-01 and REQ-02.

What are the processes by which management is informed about climate-related issues?

How does management monitor climate-related issues? What specific committees or positions have responsibility for this monitoring?

CDSB FRAMEWORK: In accordance with REQ-01, the OilCo excerpt identifies the processes by which management is informed about climate-related issues, including through quarterly meetings between ISAC members and the directors of operations of each business unit, **6** and through the information generated in the Sustainability Expert Panel's annual report. **14** In terms of monitoring performance related to these issues, the disclosure excerpt states that OilCo management is "responsible for managing climate-related risks and opportunities ... as part of their ongoing duties." **9** To ensure that monitoring and management is aligned with company objectives, OilCo has observed CDSB REQ-01, which advises that a company also disclose how management-level staff are held accountable and incentivized for addressing environmental (e.g., climate-related) issues. **12**

Core Element 2: Strategy

Many organizations currently face impacts from climate-related issues, which are likely to increase over time, with important implications for businesses, strategy, and financial planning. Improved disclosures on current and anticipated climate risks and opportunities, and on the organizational outlook, can enhance investors' understanding of how strategic functions are likely to be impacted over the short, medium, and long terms. Strategy is the second of four core elements of TCFD-recommended, climate-related financial disclosures.

The TCFD recommends the following disclosures for all companies, subject to a materiality assessment:

- S**
a) *Disclose the climate-related risks and opportunities the organization has identified over the short, medium, and long term.*
- S**
b) *Disclose the impact of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.*
- S**
c) *Disclose the resilience of the organization's strategy, taking into consideration different climate-related scenarios including a 2°C or lower scenario.*

In addressing recommended strategy disclosure (c), report preparers should consider the guidance contained in the TCFD technical supplement, *The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities*. Although we address the TCFD's recommended disclosure on resilience and scenario analysis, we do not provide detailed guidance on the process of undertaking scenario analysis, as there are several comprehensive resources available on this (and other aspects of strategy) on the TCFD Knowledge Hub at [tcfhub.org](https://www.tcfhub.org).

Additionally, companies in certain key industries should consider the TCFD's supplemental guidance for strategy disclosures, which is tailored to their respective circumstances (see "Supplemental Guidance" sidebar above). For example, the TCFD recommends that companies in key financial and non-financial industry groups make all

Supplemental Guidance

In addition to its general recommendations, the TCFD also issued sector-specific guidance for companies in the financial and non-financial sectors it considers most likely to be affected by climate change and the transition to a lower-carbon economy. This guidance acknowledges "the need to consider the variability of climate-related impacts across and within different sectors and markets."

For example, in addition to certain industry- or sector-specific strategy and risk management disclosures, the TCFD has encouraged organizations to provide metrics "tailored to their particular climate-related risks and opportunities," and has suggested that "in determining the most relevant and useful metrics, organizations are encouraged to engage with their key stakeholders, including investors."

The supplemental guidance applies to companies in the following industries:

Financial Sector

- Banks
- Insurance Companies
- Asset Owners
- Asset Managers

Non-Financial Groups

- Energy
- Transportation
- Materials and Buildings
- Agriculture, Food, and Forest Products

three recommended strategy disclosures regardless of the outcome of the materiality assessment by the reporting organization (see "Additional Guidance on Materiality" sidebar). The narrative provided below from AgriCo considers the Supplemental Guidance for non-financial industries for the Agriculture, Food, and Forest Products non-financial group.

How to read the excerpt for this TCFD recommended disclosure element (Strategy):

Mock excerpts from two hypothetical organizations' disclosures, one drawn from the agricultural industry and the other from the oil and gas industry, are presented below. The excerpt from each organization is presented in the left-hand column, with accompanying analysis in the right-hand column. The annotations in the right-hand column reference the guidance provided by the TCFD for the respective TCFD disclosure and illustrate how applying key requirements of the CDSB Framework and the appropriate industry-specific SASB standard can help organizations prepare disclosures in accordance with the recommendations.

Although the annotations do not always explicitly address how the principles shared by the TCFD, CDSB, and SASB (see Figure 5) have been applied, it is assumed these principles were considered in determining how to disclose such information in the mainstream report.

As this disclosure excerpt is presented for illustrative purposes, we have not applied every CDSB requirement or aspect of the SASB standard—instead, we pull out key examples to show how these two complementary tools can be used to more fully meet the TCFD recommendations. Each paragraph in the excerpt is numbered for ease of reference, with the number in the excerpt (on the left) corresponding with the numbered annotation (on the right) indicating where a specific CDSB Framework requirement or SASB industry standard enables the disclosure.

Additional Guidance on Materiality

For most organizations, the TCFD's recommended disclosures related to Strategy and Metrics & Targets are subject to a materiality assessment. CDSB has published a position paper covering what the Task Force said about the application of materiality to climate-related financial disclosures.

Materiality is referred to "as a concept designed to guide the application of professional judgement for the purpose of determining acceptable levels of information disclosure in mainstream reports thereby informing decision-making by the users of those reports" (p. 3).

The paper defines information as material "if omitting it or misstating it could influence or be reasonably expected to influence the decisions, including the economic decisions, that users of the annual report might make about the company based on the annual report as a whole" (p. 16). It then concludes with possible strategies for effective materiality determination, including but not limited to developing a climate reporting strategy and disclosing the company's climate reporting policy, and ensuring that material metrics "reflect the indicators, targets and metrics used by management for running the business on the basis that what is relevant for the business will be material for the audience" (p. 21).

It adds that "climate issues should be treated as materiality "alerts" where they:

- Give rise (now or in the timescales over which materiality is determined) to financial impacts;
- Threaten the resilience of the company's strategy or business model;
- Affect the ability of the company to generate or preserve value; or
- "Keep the directors awake at night" (p. 22)

For more information, see:

CDSB, *Position Paper: Materiality and Climate-related Financial Disclosures* (2018); and

CDSB, *Position Paper on Relevance & Materiality, Organizational Boundaries and Assurance* (2015).

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Excerpt from AgriCo Annual Report

Strategy**Short-, medium-, and long-term risks and opportunities**

The Company considers short-, medium-, and long-term risks per the horizons noted below: **1**

- Short-term risks – risks that may impact near-term financial results, including those that may materialize within the current annual reporting cycle.
- Medium-term risks – risks that may materially impact our financial results due to longer-term manifestation of climate-related impacts that may require us to significantly adjust our strategy, including those that may materialize over a 2-5 year timeframe.
- Long-term risks – risks that may fundamentally impact the viability of our long-term strategy and business model, including those that may materialize over a 5-10 year timeframe.

The Company assesses the materiality of climate-related risks based on their likelihood of occurrence as well as the estimated magnitude of resulting financial impact. The materiality assessment performed is substantially similar to that which the Company applies to all business risks and opportunities.

2 Based on this assessment, the company has identified the following short-term, medium-term, and long-term risks: **3**

Short-term risks

- Scope 1 Emissions (Transition, Policy and Legal Risk) – The Company's operations result in the generation of Scope 1 emissions. The Company's emissions are primarily generated by its processing facilities as well by transportation of goods. **4**
- » **Processing Facilities.** Our processing facilities account for approximately 62% of our total Scope 1 emissions. Currently, none of our emissions are subject to a carbon-pricing regulation. We do not anticipate any such risks to emerge in the short-term; however, we continue to monitor emerging regulatory developments, including Nationally Determined Contributions per the Paris Agreement, and are assessing and utilizing these contributions to guide our medium- and long-term strategy to mitigate policy and legal risk.

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Guidance and Questions to Consider

The following questions, derived from the guidance for all sectors included in the TCFD's final report, help mainstream report preparers more fully consider suggested aspects of strategy that could be disclosed under the TCFD's three recommended strategy disclosures. Applying the CDSB Framework requirements, SASB Application Guidance 5.0(b), and metrics from the respective SASB industry standard or other available sources of information (e.g., generated through the CDP Questionnaire) can be helpful tools for an organization to think through and prepare the contents of its strategy disclosures.

S *Disclose the climate-related risks and opportunities the organization has identified over the short, medium, and long terms.*

a)

What does the company consider as relevant short-, medium-, and long-term time horizons, taking into consideration the useful life of its assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms?

CDSB FRAMEWORK: REQ-02 of the CDSB Framework requires disclosures to include the timelines, targets, and KPIs used to assess the effectiveness of an organization's environmental strategy and policies. It mirrors the TCFD in calling for disclosure that describes what the company considers to be short-, medium-, and long-term time horizons, taking into consideration the useful life of its assets. In the excerpt, AgriCo differentiates between three different time horizons at the beginning of its disclosure. **1** Further, AgriCo has considered the life of its assets/infrastructure in the medium term **5** and long term, **27** including its vehicle fleet and processing facilities.

What are the specific climate-related issues for each time horizon (short-, medium-, and long-term) that could have a material financial impact on the organization?

CDSB FRAMEWORK: The TCFD calls for strategy disclosures to be disaggregated by individual climate-related risks and opportunities, specifying the time horizon during which each could have a material financial impact on the organization. The CDSB Framework (in REQ-02 and REQ-03) directly mirrors this ask. In response, AgriCo has undertaken a materiality assessment **2** and detailed the specific climate-related and natural capital impacts it anticipates during each of the three defined time horizons. For example, under the short- **6** and medium-term **18** time horizons, AgriCo identifies weather-related disruptions to its ability to effectively source and process

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- » **Transportation.** Our transportation infrastructure, including a company-owned fleet of marine, road, and rail vehicles, account for approximately 35% of our total Scope 1 emissions. Currently, none of our transportation-related emissions are subject to a carbon-pricing regulation. We are in the process of retiring old vehicles in favor of newer, more fuel-efficient vehicles based on normal attrition. However, in the medium to long term we anticipate the early retirement of some vehicles before the end of their useful life as part of our emissions-reduction strategy, discussed in the section below. **5**
- **Ingredient Sourcing (Acute Physical Risks)** – The Company has suppliers located in areas that are subject to acute physical climate risks. The Company has evaluated risks to key products and has developed associated strategies to mitigate such risks, as noted below. **6**
- » **Peanut Oil.** The Company faces potential disruption to its ability to process peanuts into peanut oil as a result of increasing storm frequency and severity in the Gulf Coast, USA region. Such disruption could result in an adverse impact to the Company's revenues. **7** In 2018, damage to peanut supplier facilities caused by Hurricane Michael delayed harvesting activities, which threatened to interrupt processing operations at our Georgia processing plant. The facility also experienced minor damage due to the storm, resulting in minor capital expenditures. **8** The Company also identified short-term risks to its physical assets that may result in significant capital expenditure to repair damaged facilities as a result of future storm events or lost revenues due to downtime to repair facilities. **9** In response, the Company has established a supplier engagement strategy to assess climate-related risks in the peanut supply chain and is working with suppliers to implement strategies to mitigate such risk. The Company is considering strategic partnerships with key suppliers to reinforce or redesign harvesting facilities to increase their resiliency and reduce the likelihood of significant disruptions resulting from storms. To date, the company has completed an initial assessment of 70% of its supplier facilities and operations for climate risk, and will have assessed 100% of such facilities by the end of 1Q 2019. The Company has prioritized engagement to those suppliers that present the greatest risk based on this initial assessment. For our own processing

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peanuts as having the potential for a material financial impact on the company.

SASB STANDARDS: SASB Application Guidance 5.0(b) similarly recommends an organization disclose its strategic approach regarding actual and potential impacts of climate-related risks and opportunities on its businesses, strategy, and financial planning, over the short, medium, and long term. **3**

SASB STANDARD: In accordance with SASB metric FB-AG-110a.2, AgriCo has provided a discussion of its short- **4** and medium-term **11** strategy to manage Scope 1 emissions, its emissions reduction targets, **13** and an analysis of its performance against those targets. **14**

SASB STANDARD: Per SASB metric FB-AG-430a.3, AgriCo has provided a discussion of its strategy to manage environmental (including climate-related) risks arising from commodity sourcing over the short, **6** medium, **18 20** and long terms. **25**

CDSB FRAMEWORK: REQ-03 suggests organizations develop a "narrative that bridges their vision of a possible future and how their business model would be resilient to emerging material risks and exploit new opportunities." Similarly, under REQ-03, a company should explain the time frames for assessing both risks and opportunities, including an estimate of when they are expected to materialize. However, AgriCo's disclosure is weighted heavily toward discussion of climate-related risks and does not identify any opportunities that may arise across its three specified time horizons in the transition to a low-carbon and climate-resilient economy. **3**

CDSB FRAMEWORK: REQ-06 requires management to summarize its conclusions about the effect of environmental (and climate) impacts, risks, opportunities, and policy outcomes on the company's future performance and position. Although the AgriCo excerpt discusses climate-related impacts related to specific short-, medium-, and long-term risks, **3** its disclosure could be strengthened by including such a summary (i.e., in management's outlook statement), providing an overview of how these risks in aggregate may impact the company's overall strategic position and planning, as well as explaining how this relates to the information disclosed under the Risk Management section.

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Excerpt from AgriCo Annual Report

facilities, we have completed a structural integrity review for 100% of our owned and operated plants, and have developed a 5-year plan to address critical findings to ensure our facilities are resilient to potential heightened storm frequency and intensity. **10**

Medium-term risks

- Scope 1 Emissions (Transition, Policy and Legal Risk) **11**
 - » **Processing Facilities.** We anticipate that carbon-pricing regulations may emerge over the medium- to long-term timeframe, and such regulations may result in a significant financial impact to the company's operations, including an increase in operating costs as well as potential capital expenditures to reduce emissions. **12** To mitigate this risk, the Company established a strategy to both reduce overall energy consumption by 20%, generate half of our energy from company-owned renewable sources, and achieve a 40% reduction in GHG emissions by 2035. **13** Per the disclosures in the Metrics and Targets section, the company has achieved a reduction in energy consumption from its baseline set in 2016 of 6% for its processing facilities, and has increased its share of energy consumption from renewable sources from 10% to 17% over this timeframe. As a result, the Company has achieved a 10% reduction in GHG emissions from its processing facilities over this time frame. **14** The Company continues to identify and execute energy efficiency projects to reduce our overall energy consumption, and we expect our third solar installation to be completed in late 2019 at our Georgia processing facility.
 - » **Transportation.** Based on the outcome of our climate risk assessment activities, the Company anticipates that regulations designed to limit Scope 1 emissions may emerge over the medium- to long-term timeframe, and such regulations may result in a significant financial impact to the company's operations. In addition, fuel efficiency standards in some markets may require early retirement of portions of our transportation fleet and replacement with more fuel-efficient vehicles. **15** Such regulatory developments may result in significant increases in direct expenses associated with generated emissions as well as the requirement for additional capital expenditures to replace existing transportation fleet infrastructure. **16** As

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What process(es) are used to determine which risks and opportunities could have a material financial impact on the company?

CDSB FRAMEWORK: The TCFD recommends that organizations "determine materiality for climate-related issues consistent with how they determine the materiality of other information included in their financial filings." AgriCo indicates that it has adopted "a substantially similar" approach. **2** CDSB Principle 1.4 suggests that organizations "evaluate their own circumstances to identify material environmental information for inclusion in mainstream reports" and under its statement of conformance with the CDSB Framework (REQ-11), an organization "should explain the outcome of the process used for identifying material environmental [including climate-related] information." This could include the results of applying existing guidance on materiality assessment from SASB and others.

CDSB FRAMEWORK: In instances where management is unable to assess the magnitude of the impact and/or timing of uncertain events, CDSB Principle 2 (Disclosures shall be faithfully represented), which is aimed at ensuring the completeness of disclosures, advises management to state "the time periods in which resolution of the uncertainties is expected," disclose the "difficulties involved in assessing the situation," and adopt a "cautious approach" providing "suitable disclosure about any uncertainty." For example, in the AgriCo disclosure, the company notes uncertainty related to extreme weather events, **10** regulatory risks, **12 15** and future scenarios. **26**

CDSB FRAMEWORK: Note that REQ-04 treats GHG emissions from operations, entities, and activities within the financial reporting boundary of the organization as material. AgriCo discloses its strategy for addressing Scope 1 emissions over the short **4** and medium terms, **11** and also includes related performance data in the Metrics & Targets section below, using the SASB standard to shed light on the effectiveness of the strategies outlined here. This illustrates the connectivity of information across the four core elements.

What are the company's risks and opportunities disaggregated by sector and/or geography?

CDSB FRAMEWORK: REQ-04 (Environmental impact sources) states that environmental results should be disaggregated, categorized, or broken down by geography or sector, as well as by business activity/division, risk profile, and source where it is likely to aid understanding. Moreover, REQ-02 (Management's role) advises preparers to describe the targets against which delivery of the environmental strategy and policies apply to a specific geography. Similarly, REQ-03 (Risks and Opportunities) advises preparers to explain whether current and anticipated material risks and opportunities apply organization-wide or are specific to geographies, business units, or assets. AgriCo provides

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Excerpt from AgriCo Annual Report

such, the company has undertaken several strategies to mitigate these risks. First, the company has set a target to reduce its overall energy consumption, including fuel consumption, by 20%, and to generate half of our energy from renewable sources, including renewable fuel, by 2035. To accomplish this, the Company has performed an assessment of its transportation fleet and has established an early retirement and replacement plan to achieve the Company's fuel consumption reduction target. Per the disclosures in the Metrics and Targets section, the company has reduced its energy consumption across its transportation fleet by 8% from its baseline set in 2016. It has increased the share of fuel consumption from renewable fuels from 5% to 16% over this timeframe. **17** As a result, the Company has achieved a 16% reduction in its GHG emissions from its transportation fleet over this timeframe.

- Ingredient Sourcing (Physical Risks, Acute) **18**
 - » **Peanut Oil.** The Company anticipates increasing storm frequency and severity over the medium-term time horizon. As noted in the short-term risk section, the company has established a supplier engagement strategy and has assessed its own facilities to ensure their resiliency. Over the medium-term, the Company has identified opportunities to diversify its sourcing of peanuts across multiple geographic regions to mitigate acute climate risk resulting from storm events. **19** The Company has included consideration of such climate-related risks as part of its global growth strategy. Specifically, the company has adopted a review of climate-related risks as part of its annual business planning and risk review procedure, including the review of its strategic investments. For its own facilities, the company expects to have completed its critical infrastructure improvement projects by 2025.
- Ingredient Sourcing (Physical, Chronic Risk) **20**
 - » **Cocoa.** The Company sources the majority of its cocoa beans from Ghana and Brazil. **21** Per the Intergovernmental Panel on Climate Change's Impacts, Adaptation, and Vulnerability Part B: Regional Aspects Report, cocoa crop suitability in Ghana is likely to decrease at low elevations and increase at high elevations. In Brazil, the shifting precipitation patterns may result in increased cocoa tree mortality in Bahia, and may result in competition for arable land with coffee cultivation. **22** The Company is

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disclosures disaggregated by geography, citing risks specific to the Gulf Coast **7** and the State of Georgia **8** in the U.S., Ghana, and Brazil, **21** and the need for diversification of its input sources to multiple geographic regions. **19** The CDSB Framework further encourages companies to refer to the SASB standards "to understand material topics for their sector."

SASB STANDARD: Across its disclosures in the Strategy and Metrics & Targets sections, AgriCo has provided disclosure on all the climate-related factors identified by the SASB standard as specific to the Agricultural industry, including GHG emissions, **11** energy management, water management, and materials sourcing. **18**

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

b)

What is the impact of climate-related risks and opportunities on the company's businesses and strategy (e.g., on its products and/or services, supply and value chains, adaptation and mitigation activities, R&D investment, and operations)?

CDSB FRAMEWORK: REQ-03 calls for disclosures to explain the effects of climate-related risks and opportunities on the company, including "in terms of operations, supply chain, business model, ... achievement of strategic objectives, asset impairment or write-downs, [and] long-term viability." It also requires disclosure of "the businesses, products, services, assets, markets and geographical areas that are likely to be affected." The AgriCo excerpt indicates the company has identified a range of impacts from climate-related risks on its businesses and strategy. For example, the company discloses multiple strategies to reduce GHG emissions, including its energy mix **13 17** and the fuel efficiency of its vehicles. **5 15** It has also identified supply chain risks. **10 19 22** Should these risks materialize as projected, AgriCo states that they may ultimately affect the company's ability to maintain its current product mix and business lines. **26**

SASB STANDARD: Related to SASB metrics FB-AG-110a.3 and FB-AG-130a.1, AgriCo has identified targets to reduce its overall energy consumption and source half of its energy from renewable sources. **17** While SASB includes GHG Emissions and Energy Management as two separate disclosure topics, AgriCo's strategy addresses all forms of energy, including electrical and hydrocarbon-based energy. The performance data reported in the Metrics & Targets section below enables investors assess the extent to which AgriCo is on track to reach its targets.

SASB STANDARD: Per SASB metric FB-AG-440a.1, AgriCo identifies its principal crops and describes the specific risks and opportunities to those crops presented by climate

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Excerpt from AgriCo Annual Report

partnering with suppliers in Ghana to develop contingency plans to expand cultivation area to higher elevations should temperatures continue to increase at current rates; per the Company's scenario analysis, its baseline scenario would require that approximately 40% of its current supply from Ghana would need to be shifted to regions that are not currently under cultivation. The Company has identified several signposts as part of its scenario analysis that would accelerate its partnership strategy with key suppliers to invest in higher-elevation production areas. In Brazil, the company is working with cocoa and coffee farmers to shift crop cultivation areas in a coordinated fashion in response to shifting temperature and precipitation patterns. Specifically, the Company has identified areas of coffee cultivation in Minas Gerais that may be supplanted by cocoa cultivation as coffee cultivation shifts to more southernly parts of the country. The Company's scenario analysis suggests that such shifts may need to occur in a 5- to 15-year time frame, depending on the rate of global temperature rise and associated impacts to cocoa crop yields. **23** In response, the Company has committed to invest approximately \$20M over the next 5 years to develop jointly owned cocoa cultivation areas with suppliers in northern Minas Gerais. **24**

Long-term Risks

- Ingredient Sourcing (Physical Risks, Acute and Chronic) **25**
 - » **Product Mix.** The Company has identified long-term risks to its product mix in terms of its ability to source key ingredients as a result of both acute and chronic physical climate risk. Specifically, changes in global average temperature, rising sea levels, shifting precipitation patterns, and changes in storm frequency and severity, may place significant strain on the company's ability to reliably source certain agricultural products, including those discussed above. **26** The Company has incorporated the International Panel on Climate Change's Impacts, Adaptation, and Vulnerability Part B: Regional Aspects Report into its scenario analysis and is evaluating multiple long-term strategies in response to these risks. In some scenarios, the Company may divest from certain assets or product lines that no longer remain economically viable due to shifting cultivation areas and/or product yields. **27** For the detailed results of long-term

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change. **6 18 20 25** In conjunction with related performance data included in the Metrics & Targets section below (e.g., SASB metric FB-AG-440a.2), the discussion enhances the reader's understanding of how resilient the company's strategy is in the face of both acute and chronic physical risks from climate change.

How do identified climate-related risks and opportunities affect and serve as an input to the company's financial planning process? What are the time period(s) used, and how does the organization prioritize these risks and opportunities?

Has the organization used climate-related scenarios to inform its strategy and financial planning?

CDSB FRAMEWORK: Mirroring the TCFD, REQ-03 requires preparers to disclose the financial impacts of climate-related risks and opportunities on their financial planning processes, including a description of any climate-related scenarios that inform such planning (see Strategy disclosure C below). AgriCo's disclosures include a discussion of how climate-related scenarios have informed or may later influence its financial plans, **23** including an existing US\$20 million investment in supply chain mitigation strategies **24** and the potential for divestment from certain assets or product lines due to the effects of climate change. **27** Each of these impacts is associated with a defined time horizon, as required by REQ-03. Although AgriCo does not explain how climate-related risks and opportunities are prioritized (per REQ-03), this point is covered further in the Risk Management section of this guide. This further illustrates the importance of looking at the connectivity of information across all 11 TCFD recommended disclosures to obtain a holistic picture of how the company is addressing climate-related risks and opportunities and the associated financial impacts.

What is the impact of climate-related risks and opportunities on the organization's financial planning in terms of operating costs and revenues; capital expenditures and capital allocation; acquisitions/divestments; and access to capital?

CDSB FRAMEWORK: REQ-03 echoes the TCFD recommendations in requiring preparers to disclose the specific financial impacts of climate-related risks and opportunities on their organization. In its disclosures, AgriCo details real and anticipated financial impacts, including capital expenditures related to increasing storm severity and frequency, **8 9** the potential for lost revenue due to such storms, **7** operating costs and capital expenditures arising from carbon pricing, **12** direct expenses and expenditures related to fuel-efficiency standards

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Excerpt from AgriCo Annual Report

climate-related impacts to the Company's current and potential future product mix, as well as the impacts on the viability of the company's current processing facilities, please refer to the discussion of the Company's scenario analysis below. **28**

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and emissions-reducing regulations, **16** and supply chain investments to respond to climate change. **24**

How do the disclosures on the impact of climate-related risks and opportunities on the company's businesses, strategies and financial planning reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time?

CDSB FRAMEWORK: The management's outlook statement required by REQ-06 should draw on and connect the information used to make disclosures under REQs-01-05 in order to provide a more holistic picture of the organization's ability to create value of over time. Although AgriCo's disclosures includes a discussion of anticipated future climate scenarios **26** and related impacts on the long-term viability of its overall product mix, **27** it refers to readers to its full scenario analysis disclosure **28** for more details on how climate-related risks and opportunities may affect the company's future performance and position.

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Excerpt from OilCo Annual Report

Scenario analysis of different impacts

At present, it is not entirely clear how the climate will change in the future or what the response from regulatory agencies and customers will be. Despite this uncertainty, the pathways by which climate change will affect the Company are clear: operating costs, capital expenditures, and commodity price and demand changes. In considering potential price and demand changes in the context of our strategy, we have applied the International Energy Agency's (IEA) scenarios published in its 2018 World Energy Outlook (WEO), which include three scenarios: (1) the "Current Policies Scenario" scenario that assumes no changes to policies currently in place as of publication of the WEO, (2) the "New Policies Scenario," reflecting the effects of announced policies, such as those in the NDCs made for the Paris Accord, and (3) the "Sustainable Development Scenario" that represents an integrated approach to avoid an increase in global temperature beyond 2°C above pre-industrial levels. **1** The Company additionally developed two internal scenarios to analyze the resilience of our strategies to specific technological breakthroughs, including (4) a Rapid Electrification scenario representing a rapid shift toward full electrification of energy infrastructure with associated significant reduction of demand for liquid hydrocarbons, and (5) a Rapid Decarbonization scenario representing rapid geopolitical cohesion around deep decarbonization of the global economy. **2**

The Company's ability to profitably extract all its reserves depends, to a degree, on extraction costs and the price of crude oil and other hydrocarbons. The Company makes continual efforts to improve the efficiency of our exploration and production costs in order to reduce the impact prices have on our operations. Still, a substantial fall in the price of oil and/or gas could make the extraction of certain reserves financially infeasible. **3**

Separately, the company currently estimates and discloses its reserves as required by Item 1202(a) of Regulation S-K. This method makes use of historical prices of oil and gas. Here, the Company has conducted a sensitivity analysis of its proved and probable reserves based on price scenarios outlined by the IEA in its WEO publication. **4**

Under prices outlined in the "Sustainable Development Scenario," the Company may see a reduction in the size of its proved and probable reserves. The scenario projects that prices will deviate significantly from the Current Policies baseline after the year 2020. Previously, the Company had projected this scenario to be highly

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Guidance and Questions to Consider

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

What are the climate-related scenarios and associated time horizon(s) considered by the organization?

What critical input parameters, assumptions, and analytical choices underlie these climate-related scenarios (e.g., policy assumptions, energy deployment pathways, technology pathways, and timing)?

CDSB FRAMEWORK: REQ-03 advises all organizations to consider applying a basic level of scenario analysis for strategic planning and risk management processes and to describe the scenarios used. As an oil and gas company, OilCo is likely to be more significantly affected by climate-related risks, and has therefore taken a somewhat more in-depth approach, per the TCFD recommendations. The company identifies five scenarios, including three widely used third-party scenarios **1** as well as two internally-developed scenarios. **2** While the third-party (IEA) scenarios model key climate-related trends with annual data through 2040, the company does not specify the timeframes covered by its internally developed scenarios—although it notes they are based on an IEA scenario. **7** The IEA scenarios contain detailed inputs and assumptions, including a range of macroeconomic trend data and regional supply and demand models. The company refers to a more robust description of its scenario analysis on its website, an approach which allows for the company to adhere to CDSB Framework Principle 2 (that there should be faithful representation of information about the scenarios, which is neutral, complete, and supported by sufficient evidence); and to Principle 5 (that the strategy disclosures are presented clearly and concisely, and use appropriate signposts—in this case to the relevant section of OilCo's website where detailed information about the scenarios is made available). **9**

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Excerpt from OilCo Annual Report

unlikely to occur. However, after the signing of the Paris Agreement and the associated ‘rulebook’ agreed to in Katowice in 2018, management revised its assumptions and now expects this scenario to be reasonably likely to occur. **33** Still, given continuing demand for hydrocarbons, the mix and type of our hydrocarbon reserves, and our broadening focus to include lower-carbon energy sources, we believe the Company remains well positioned for continued demand for our products. **6**

In preparing its Rapid Electrification and Rapid Decarbonization scenarios, the company utilized the Sustainable Development Scenario as a base case, but applied its own forecasts for hydrocarbon supply, demand, and price based on the Company’s internal analysis of these cases. **7** These scenarios are viewed by the Company as being highly unlikely to occur; however, the application of these scenarios provided the Company with an understanding of the resilience of its strategy and asset base should they occur. In addition, the Company identified several short-, medium-, and long-term signposts that would indicate that these scenarios were increasingly likely to occur, as opposed to the New Policies or Sustainable Development Scenarios, which the company views as more likely pathways. **8** The full details of the Company’s scenario analysis can be found in our separate Scenario Analysis publication, found on our website. **9**

Sensitivity of reserve levels to future scenarios in which a price is charged on carbon emissions

Based on reasonable estimates of the type of the Company’s hydrocarbon reserves, we have determined the likely carbon dioxide emissions that would be associated with their combustion. The company maintains no reserves of coal and minimal reserves of unconventional hydrocarbons like tar sands that typically have a higher carbon content than traditional deposits. Therefore, on a CO₂-per-barrel basis, the estimated emissions in our reserves ranks below the industry average (0.11 t CO₂ / BOE as compared to an industry average of 0.18 t CO₂ / BOE). **10** The Company reviews the carbon-intensity of reserves in the future as part of its overall reserves evaluation process, including its modeling of the energy intensity of production, transport, and refining as well as consideration of pricing for different types of hydrocarbon assets (i.e., potential discounts of such reserves relative to benchmark crudes due to increased downstream processing costs resulting from climate impacts). As such, the Company takes into account the marginal risk for reserves with a higher carbon content in its capital allocational process, and addresses such

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How resilient are the company’s strategies to climate-related risks and opportunities, taking into consideration a) transition to a lower-carbon economy consistent with a 2°C or lower scenario, and b) where relevant to the company, scenarios consistent with increased physical climate-related risks?

What are the implications of different policy assumptions, macro-economic trends, energy pathways, and technology assumptions used in climate-related scenarios to assess the resilience of the organization’s strategies?

CDSB FRAMEWORK: REQ-06, like the TCFD guidance, calls for discussion of the resilience of the organization’s strategies to future climate-related scenarios. OilCo’s disclosure focuses primarily on its resilience to transition risks, such as the risk of stranded assets due in part to the fluctuation of hydrocarbon prices **3** and the sensitivity of its reserves to various price scenarios. **4 12** OilCo also provides information to facilitate an assessment of its climate-resilience versus that of peer companies, **9** using a common indicator of CO₂-intensity per REQ-02, which advises the use of “generally accepted sector/ regional benchmarks to provide a basis for comparison” in line with CDSB Principle 4 that disclosures shall be consistent and comparable, e.g. across a sector. OilCo also provides a discussion of its resilience to physical risks, **19** including the anticipated impacts of extreme weather conditions on legacy assets and the company’s approach to mitigate those impacts. These disclosures adhere to REQ-03, which suggests companies form “a narrative that bridges their vision of a possible future and how their business model would be resilient to emerging material risks and exploit new opportunities.” Despite the risks and opportunities identified, management expresses a generally positive outlook on its resilience. **6** This concise summary of the outlook by management is also in keeping with REQ-06, although it could be further strengthened by clearly stating the time horizons for this outlook, and how they relate to the scenarios used.

MOCK DISCLOSURE: STRATEGY

Excerpt from OilCo Annual Report

risks employing methodologies described above, including not developing such reserves, staging development, or deploying technologies to mitigate associated risks. **11**

The table below shows the company’s estimates of its current Proved and Probable reserves based on the results of its scenario analysis analyzing the scenarios noted above, per the International Energy Administration’s World Energy Outlook, as well as its own internally developed scenarios: **12**

Price Case	Proved Reserves		Probable Reserves	
	Oil MMbbls	Gas MMscf	Oil MMbbls	Gas MMscf
Current Policies(base)	435	5,828	757	7,200
New Policies	428	5,805	722	7,015
Sustainable Development	378	4,800	701	6,430
Rapid Electrification	326	4,950	623	6,590
Rapid Decarbonization	295	3,950	581	5,540

Impact of price and demand for hydrocarbons and carbon regulations on capital expenditure strategy for exploration, acquisition, and development **13**

Our operations require large capital investments, and the decision to make such investments depends heavily on our ability to recoup them. If the price of or demand for hydrocarbons fall substantially, we may find it financially infeasible to pursue extraction in some areas. **14**

Many factors affect prices for oil and gas, including macroeconomic conditions, currency values, and the ability of some industry entities to influence prices. As a result, prices are extremely difficult to predict accurately. However, the Company does make projections to facilitate decision making. The Company’s current projections account for a wide variety of price scenarios; some of these scenarios factor in prices affecting hydrocarbons, which could be in the form of carbon taxes or cap-and-trade systems. These projections inform the Company’s risk management and business planning processes, and they enable the Company to adjust its asset allocation strategy. **15**

The Company also invests in projects and technologies to manage climate risk and capture

LEARNING FROM OILCO DISCLOSURES

SASB STANDARDS: OilCo discloses data on the sensitivity of its hydrocarbon reserve levels to future price projection scenarios that account for a price on carbon emissions, per SASB metric EM-EP-420a.1. **12** This information is useful together with the accompanying discussion of how changes in price, demand, and regulation may influence the company’s capital expenditure strategy for exploration, acquisition, and development of assets (per metric EM-EP-420a.4) **13** and other quantitative indicators included in the Metrics & Targets section below (i.e., EM-EP-420a.2 and EM-EP-420a.3). Collectively, these disclosures are designed to facilitate assessment of a company’s business model resilience with respect to the transition to a climate-constrained economy, as well as comparison and benchmarking against peer organizations.

MOCK DISCLOSURE: STRATEGY

Excerpt from OilCo Annual Report

opportunities, including in advanced biofuels, energy efficiency, water treatment and reprocessing, and the design and construction of facilities for extreme weather conditions. The Company's strategic and business planning considers the value of these projects in the context of its overall approach to climate change risk management. **16**

Although the Company prepares for many scenarios, it believes that extreme reductions in demand for or prices of hydrocarbons are unlikely in the short term, but specific localized impacts may occur based on the emergency of regulations impacting regional demand for products associated with legacy assets. Some of the countries in which we operate have yet to adopt carbon pricing regulations or systems. Although many countries are likely to institute at least some form of carbon-related regulation or pricing in the future, the Company believes that it will be able to recoup a significant share of its capital expenditures related to extraction before such pricing systems are fully implemented. Ultimately, the Company consistently monitors the potential for carbon regulation implementation and engages in scenario planning on a regular basis to better inform its operating—and capital expenditure—decisions. **17**

Some operations, especially hydraulic fracturing, can be expensive and require substantial capital investments. Our 2013 acquisitions, which increased the amount of these operations under our control, have required a limited amount of capital expenditures. When bidding on the companies, we did account for these costs, and they did not substantially exceed our estimates. **18**

Physical risk analysis

The Company incorporates the consideration of physical climate risk in its design of new facilities as well as in review of the climate resilience of existing facilities, which included a review of meteorological forecast data jointly developed as part of the Company's partnership with leading academic institutions. This review has resulted in several projects to increase the climate resilience of legacy assets to extreme weather conditions, including increased wind speeds, flooding, and other factors. The company also stress-tests new facility designs using probabilistic models of future weather events to ensure the resilience of these assets to a range of possible outcomes, including the influence of climate change on the frequency and severity of extreme weather events. Such design considerations have resulted in additional capital investments in some legacy assets to retrofit these facilities for future anticipated conditions, as well as marginal additional costs associated with structural enhancements or

LEARNING FROM OILCO DISCLOSURES

Where does the company believe its strategies may be affected by climate-related risks and opportunities? And how might these evolve to address climate-related risks and opportunities?

CDSB FRAMEWORK: As per REQ-03, OilCo discusses a variety of actual and potential causes and sources of climate-related risk and opportunity. These include risks to its ability to profitably extract all its reserves, **3** the potential for a reduction in the size of those reserves, **5** and physical risks to the company's assets and infrastructure. **19** The excerpt also addresses possible transition-related opportunities that may arise from product and process innovations. **16**

CDSB FRAMEWORK: REQ-05 encourages organizations to discuss "the extent to which forward-looking disclosures, including any outputs from scenario analysis, made in previous reporting periods have borne out. This should include how and why the performance of the organization misses, meets or exceeds previously made forward-looking disclosures." In the excerpt, OilCo notes that, in the wake of the Paris Agreement, its assessment has changed regarding the likelihood of a Sustainable Development Scenario materializing. **5**

CDSB FRAMEWORK: Although the company does not provide specific details, OilCo notes it has developed short-, medium-, and long-term signposts to help it determine when and how its strategies may need to evolve as the likelihood of its internally developed scenarios increase. **8** Such disclosure adheres to REQ-06, which calls for organizations to address "any future environmental regulation, market trends, or practice that might disrupt its businesses, strategy, and financial planning."

How has the company used climate-related scenarios to inform its strategy and financial planning?

CDSB FRAMEWORK: REQ-03 calls for an organization to explain the impacts of climate-related risks and opportunities on its financial planning processes. Accordingly, OilCo's disclosure addresses key impacts, primarily those related to the effects of changes in price and demand on the company's ability to recoup its capital investments. **14** For example, OilCo describes how the outputs of its scenario analyses have influenced its asset allocation strategy, **15** how its capital allocation is informed by a consideration of the marginal risk associated with high-carbon reserves, **11** and the influence of regulation on capital expenditures, **17** which also follows REQ-06 ("future environmental regulation ... that might disrupt ... financial planning"). The company also provides examples of how these considerations have influenced specific decisions and projects. **18 19**

MOCK DISCLOSURE: STRATEGY

Excerpt from OilCo Annual Report

other factors for several new facilities currently being constructed. **19**

To the extent that these risks materialize and we are unprepared for them, we may incur unexpected costs, which could have a material effect on our financial results of operations. We also face financial risk if we prepare for physical impacts that ultimately do not occur.

LEARNING FROM OILCO DISCLOSURES

SASB STANDARD: OilCo discloses data regarding the embedded emissions in its reserves, per SASB metric EM-EP-420a.2. **10** OilCo directly connects this metric to its strategy, noting that it considers the risks associated with the carbon content of its reserves when making capital allocational decisions. OilCo also compares its performance to that of peers, demonstrating how this strategy has differentiated it from its competition.

Core Element 3: Risk Management

Although some organizations have begun to apply traditional enterprise risk management (ERM) processes to the identification, assessment, and management of climate-related risks, the practice is not yet widespread or well developed. In the absence of a robust approach to monitoring and managing these risks, organizations may face unexpected impacts to their success, profitability, or even viability. Lacking reliable information about how these risks are managed, investors are unable to properly evaluate the risk profile of an organization or its securities. The TCFD recommendations therefore call for all companies to disclose their climate-related risk management practices and how they are integrated into the organization's overall ERM function. The TCFD calls for three main risk management disclosures:

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

Additionally, companies in the Financial Sector may need to make additional risk management disclosures to satisfy the TCFD's Supplemental Guidance.

How to read the two excerpts for this TCFD-recommended disclosure element (Risk Management):

Mock excerpts from two hypothetical organizations' disclosures, one drawn from the automobile industry and the other from the oil and gas industry, are presented below. The excerpt from each organization is in the left-hand column, with accompanying analysis in the right-hand column. The annotations in the right-hand column reference the guidance provided by the TCFD for the respective disclosure and illustrate how applying key requirements of the CDSB Framework and the appropriate industry-specific SASB standard can help companies prepare disclosures in accordance with the recommendations.

Although the annotations do not always explicitly address how the shared principles of the TCFD, CDSB, and SASB (see Figure 5) have been applied, it is assumed these

Additional Guidance on Risk Management

Effective risk management disclosure is likely to be a function and outcome of an effective risk management program. For organizations seeking to incorporate climate change or other ESG factors into their enterprise-level approach to risk management, the WBCSD has developed guidance in conjunction with the COSO, whose ERM framework is among the most widely used in the world.

For more information, see: WBCSD and COSO, [Applying Enterprise Risk Management to Environmental, Social and Governance-related Risks](#) (October 2018).

principles were considered in determining how to disclose such information in the mainstream report.

As these two disclosure excerpts are presented for illustrative purposes, we have not applied every CDSB requirement or aspect of the SASB standard—instead, we pull out key examples to show how these two complementary tools can be used to more fully meet the TCFD recommendations. Each paragraph in the excerpt is numbered for ease of reference, with the number in the excerpt (on the left) corresponding with the numbered annotation (on the right) indicating where a specific CDSB Framework requirement or SASB industry standard enables the disclosure.

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from AutoCo Annual Report

Risk Management**Climate Risk Identification and Assessment 1**

Climate change is viewed by management as a potentially significant risk. The Company consistently applies a standard risk management process throughout all levels of the organization to identify and assess all relevant business risks and opportunities, including those related to the climate. The Chief Risk Officer is responsible for overseeing the Company's risk management process, which is carried out in the context of its strategy and business objectives and a risk appetite and risk tolerance determined annually – or more frequently, as appropriate – by the Board's Risk Committee through discussions with the executive leadership team. The Chief Risk Officer chairs the Company's Risk Management Committee, which consists of the Treasurer, Corporate Controller, and Regional Chief Risk Officers. The Risk Management Committee is responsible for designing, implementing, and conducting the Company's overall risk management framework, including guidance and activities related to the Company's exposure to climate-related risk. 2 Specifically, the Risk Management Committee has identified the following financially material climate-related risk exposures, which are discussed in greater detail in the Strategy section above: 3

- **Transition, Policy & Legal Risk** – The Company is exposed to multiple channels of climate-related regulatory risks. These risks include the Company's exposure to legislation that would place a price on the Company's direct greenhouse gas emissions, which are primarily generated at the Company's manufacturing facilities. 4 In addition, the Company is exposed to regulations related to vehicle-generated emissions, often in the form of increasingly stringent fuel efficiency standards or mandates, and in some cases related to the production of zero-emission vehicles or vehicles that run on a range of alternative fuels. 5
- **Transition, Market Risk** – The Company is exposed to shifts in consumer preference for vehicles in response to climate-related factors. Specifically, regulatory factors that impact the price of hydrocarbon-based fuel may impact consumer demand for certain products, weakening the Company's market position and financial results of operations. 6
- **Transition, Technology Risk** – The Company is exposed to the development of new technologies

LEARNING FROM AUTOCO DISCLOSURES

Guidance and Questions to Consider

The following questions, derived from the guidance for all sectors included in the TCFD's final report, can help mainstream preparers more fully consider suggested aspects of their risk management processes that could be disclosed under the TCFD's three recommended risk management-related disclosures. Applying the CDSB Framework (and its requirement to disclose material risks affecting the organization, REQ-03) together with metrics from the respective SASB industry standard or other available sources of information (e.g., generated through the CDP Questionnaire) can be helpful tools for an organization to think through and prepare the contents of its disclosures.

R**a)**

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

What processes does the organization use to identify and assess climate-related risks?

SASB STANDARD: In accordance with SASB Application Guidance 5.0(c), AutoCo has disclosed its process to identify and assess climate-related risks. 1

CDSB FRAMEWORK: REQ-03 calls for companies to "explain how environmental risks ... are integrated into risk management processes" to better inform readers how they identify and assess climate-related factors. The AutoCo excerpt describes how climate-related risks are surfaced using a "bottom-up" process that begins with risk management teams in each region 10 and culminates in an enterprise-wide assessment. 13 This includes a discussion of the roles involved, 2 10 the methodology employed, 11 12 and the approach to consolidating assessments at the enterprise level. 13 Specifying that its process for managing climate-related risks is applied "throughout all levels" of the organization, 2 AutoCo also addresses key risks that are unique to specific business units (e.g., GHG emissions and manufacturing) 4 or geographies (e.g., severe weather events and sea-level rise). 8 9 REQ-03 also advises report preparers to consider applying a basic level of scenario analysis for risk management processes. While AutoCo refers to scenario analysis, it does not explain in this excerpt how it is applied in the context of its risk management process. 23 This also shows the interconnected nature of the risk management- and strategy-related TCFD disclosures.

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from AutoCo Annual Report

that may adversely impact consumer demand for certain products. Specifically, the development of low-emission or zero-emission vehicles as well as developments in ride-sharing and autonomous driving vehicles may result in changes in consumer behavior that may impact demand for the Company's products and impact the competitive landscape. **7**

- **Physical, Acute Risk** – The Company's manufacturing facilities are located in regions that may be impacted by severe weather events, including potential damage to physical assets as well as disruptions to manufacturing activities. **8**
- **Physical, Chronic Risk** – Several of the Company's manufacturing facilities are located in areas that may be at risk due to rising sea levels. **9**

These risks and others are assessed by risk management teams in each of our core operating regions – Europe, China, South Africa, Asia/Oceania, and the Americas – consisting of the Regional President, Regional Chief Risk Officer, and other regional leadership positions that may include those with expertise related to supply chain management, materials sourcing, product design, manufacturing operations, regulatory compliance, market research, or other subject matter depending on the nature of the risk. **10** Risk assessments are performed using the Company's integrated risk management process, which is aligned with the COSO Enterprise Risk Management – Integrating with Strategy and Performance framework. **11** The Company's ERM process includes guidance to ensure a systematic and methodical assessment of the timing, likelihood, and magnitude of the risks to which the Company is exposed. Regional risk management teams assess each of the climate-related risk exposures identified by the Risk Management Committee, as well as any additional risk exposures identified by the regional team. Risks are prioritized by regional management teams based on the relative likelihood and magnitude of the range of expected financial impacts. **12**

The Risk Management Committee then reviews and consolidates risk assessments at the portfolio level, ensuring they reflect the combined impact of interrelated risks and opportunities such that they may be managed effectively. **13** With respect to the climate-related risks outlined above, the Company's approach resulted in the medium-term (2-5 years) assessments illustrated in the chart below, which reflect a general, long-term trend toward material financial or operational impacts that are more likely and of greater magnitude.

LEARNING FROM AUTOCO DISCLOSURES

Does the organization consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) or other relevant factors?

CDSB FRAMEWORK: REQ-03 calls for organizations to disclose and analyze "actual and potential causes and sources of environmental risks and opportunities," including a discussion of "whether they consider [relevant] existing or emerging regulatory requirements." In its disclosure, AutoCo addresses its exposure to potential carbon-pricing legislation, **4** fuel-economy standards, and regulations related to zero-emissions and alternative-fuel vehicles. **5** The company also identifies regulations that may influence fuel prices and consumer demand. **6** AutoCo also addresses other key, industry-specific considerations, such as the transition risks related to the development of new technologies and innovations, including low-emission and zero-emission vehicles, ride-sharing, and autonomous vehicles. **7** The company's disclosures also identify, as required by REQ-03, "the businesses, products, services, assets, markets and geographical areas that are likely to be affected." **8 9**

SASB STANDARD: As stated above, risk management and strategy are inherently reinforcing, so AutoCo's disclosure cross-refers to the Strategy section above, **3** where readers can access a discussion of the company's strategy for managing the risks enumerated here. This includes those related to fleet fuel economy and emissions, **5** which are addressed by SASB metric TR-AU-410a.3. Furthermore, in the Metrics & Targets section below, AutoCo includes quantitative performance measures, per the SASB Automobiles Industry Standard, related to fleet fuel economy (TR-AU-410a.1) and the production of zero-emission and hybrid vehicles (TR-AU-410a.2). These metrics are essential to the company's overall disclosure on these topics **6 7** as they provide visibility into the effectiveness of AutoCo's strategic planning and chosen risk management and mitigation responses.

What is the organization's process for assessing the potential size and scope of identified climate-related risks?

CDSB FRAMEWORK: REQ-03 calls for the disclosure of "processes for assessing the potential magnitude and scope of environmental impacts." Although AutoCo states that inputs to this process are likely to vary depending on the nature of the risk, **10** it describes an approach that involves a cross-functional team, is always informed by subject matter expertise, and carries out "systematic and methodical" assessments based on an established ERM framework (COSO), **11** which emphasizes the use of both quantitative and qualitative risk assessment approaches. The outputs of this process include estimates of likelihood, magnitude, scope, and timing, which inform the Risk Management Committee's materiality assessments. **15**

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from AutoCo Annual Report

Material Climate-Related Risk and Opportunity Assessment and Response Matrix ¹⁴

Impact	High	[Transfer Risk; Share Opportunity] Physical, Acute • Transition, Technology •	[Mitigate Risk; Embrace Opportunity] Transition, Policy & Legal • Transition, Market •
	Low	[Accept Risk; Ignore Opportunity]	Physical, Chronic • [Control Risk; Enhance Opportunity]
		Low	High

Likelihood

Based on this analysis, the Risk Management Committee assesses the materiality of each risk to the Company. The Risk Management Committee works with the Disclosure Committee to develop its disclosures based on the Company’s exposure to material risk factors, including climate-related risks. ¹⁵

Climate Risk Management Process ¹⁶

After risks are identified and assessed, the Company’s risk management process involves the development, recommendation, review, and implementation of response plans appropriate to the risk or opportunity in question. As indicated in the above chart, the Company typically pursues a category of response (mitigate, transfer, accept, control) depending on the quadrant in which the near-, medium-, and long-term assessments fall, although the Risk Management Committee may adjust such risk-specific responses as appropriate given the Company’s risk portfolio, appetite, and tolerance. ¹⁷ For example, the Company’s assessment of transition-related climate risks indicated a medium- to high-likelihood and high-impact opportunity to embrace the industry’s technological, regulatory, and demand-driven evolution toward low- or zero-emission products. As indicated in the Strategy disclosures above, the Company has thus elected to respond by scaling up production of existing hybrid and electric models in line with regional demand projections during the near to medium term; to undertake the design and development of additional EV models in the

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How does the organization determine the relative significance of climate-related risks in relation to other risks?

CDSB FRAMEWORK: REQ-03 calls for companies to explain “the relative significance” of climate-related risks “in relation to others within the business.” Although the AutoCo excerpt does not explicitly address the significance of individual climate-related risks in relation to others the company faces, it implies that such considerations are factored into a “systematic and methodical assessment” that helps the company prioritize risks based on the relative likelihood, magnitude, and timing of financial impacts. ¹²

What risk classification framework(s) and definitions of risk terminology does the organization use?

CDSB FRAMEWORK: REQ-03 requires companies to “include definitions of risk terminology used or references to existing risk classification frameworks used.” In its disclosure, AutoCo specifies that its risk management process follows the COSO Framework. ¹¹

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

How does the organization make decisions to mitigate, transfer, accept, or control climate-related risks?

SASB STANDARD: In accordance with SASB Application Guidance 5.0(c), AutoCo has disclosed its process for managing climate-related risks. ¹⁶

CDSB FRAMEWORK: AutoCo has applied REQ-03 to better inform readers how it manages the climate-related risks it faces. This includes an explanation of how and the extent to which the organization is able to mitigate, transfer, accept, or control risks and maximize opportunities directly or indirectly through its customers, supply chain, markets, or other channels. ^{17 18 19 20} This disclosure, along with the accompanying discussion referenced in the Strategy section, also fulfills a key element of REQ-02, which calls for the disclosure of “information relating to offsetting and other mitigating actions.”

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from AutoCo Annual Report

medium term, including a safe and affordable, short-range mini-EV in to capture share of the rapidly growing markets in developing regions such as China; and to enter into exclusive R&D agreements with selected suppliers (sharing risk and opportunity) to accelerate the development of more efficient, solid-state battery technology over the long term. **18**

These response plans, like others in the Company, were developed and recommended by regional risk management teams, and then reviewed and modified as necessary or appropriate by the Risk Management Committee. In addition to supporting teams in assessing the financial impacts associated with each risk exposure, the Company's risk management approach also provides guidance to help quantify in financial terms the risk-reduction opportunities associated with decisions to mitigate, transfer, accept, or control an identified risk. For example, the Company's ERM guidance includes multiple scenarios that regional teams must assess and report against in relation to their assessment and response recommendations. **19**

Once approved, risk response plans are implemented under the oversight of the Risk Management Committee, across the relevant regions and functions, and in the context of the Company's integrated internal control environment. The Risk Management Committee is responsible for monitoring the effective functioning of its risk management process, including the implementation of response plans. Specifically, the Committee oversees the completion of an annual audit of regional risk management plans, including assurance that the plans are being followed as designed, and assessment of the effectiveness of the plans in delivering the intended risk reduction. Results from the audit are reported to the Committee and are monitored on a quarterly basis to ensure priority action items are addressed in a timely fashion. For certain climate-related risks and opportunities, the Company's internal audit extends to key suppliers, such as due diligence on third-party capabilities to design parts for fuel efficiency, to more effectively assess risks and to monitor the effectiveness of associated responses. **20**

Integration with Overall Risk Management **21**

The Risk Management Committee is responsible for the Company's integrated ERM process, which includes the identification, assessment, management, and monitoring of all risks to which the Company is exposed, including climate-related risks. As noted above, this process is aligned with

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How does the organization prioritize climate-related risks? How does the organization determine what climate-related information is material?

CDSB FRAMEWORK: REQ-03 calls for a discussion of how climate-related risks and opportunities are prioritized. By plotting its climate-related risks and opportunities on a 2x2 matrix, AutoCo is able to prioritize those associated with higher estimated impact and/or higher anticipated likelihood. **14** AutoCo's risk and disclosure committees are then able to undertake more informed materiality assessments of the respective risks identified and related information. **15**

Does the organization address all relevant categories of climate-related risks (i.e. transition risks, including policy and legal, technology, market, and reputation, as well as physical risks, including acute and chronic risks)

CDSB FRAMEWORK: The TCFD recommendations follow a climate-risk framework that categorizes key areas of risk (physical risks and transition risks) and opportunity (including resource efficiency, energy sources, products and services, etc.). Of these, AutoCo's disclosure addresses relevant exposures such as acute and chronic physical risks, market- and policy-related transition risks, and product- and market-based opportunities. **18** By applying REQ-03, an organization can produce robust disclosure on all categories of climate-related risk, helping the reader better understand the degree of control the organization may exercise or whether the source of risks and opportunities originates with external parties on which the organization is dependent for performance (e.g., supply chain, utilities, logistics, infrastructure, etc.). **20**

SASB STANDARD: The effectiveness of the short-, medium-, and long-term strategies described by AutoCo to manage the identified risks can be verified by reviewing the company's disclosure of SASB metric TR-AU-410a.2 (related to its production of the vehicles noted here) in the Metrics & Targets section below. **18**

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

Is the organization's approach to managing climate-related risks integrated into a broader risk management program? If so, how?

SASB STANDARD: In accordance with SASB Application Guidance 5.0(c), AutoCo includes a discussion of how climate-related risks are integrated into the entity's overall risk management process. **21**

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from AutoCo Annual Report

the framework outlined by COSO's Enterprise Risk Management – Integrating with Strategy and Performance. **22** The Risk Management Committee reports the outcomes of its approach to ERM, including climate-related risks, to the Risk Committee of the Board annually. In addition, to facilitate effective risk oversight, data are reported on business costs (e.g., capital investments, costs of carbon permits) associated with climate change, progress toward relative and absolute targets for reducing operational greenhouse gas emissions, and 2 degrees Celsius scenario analysis. **23**

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CDSB FRAMEWORK: REQ-03 requires an organization “explain how environmental risks and opportunities are integrated into risk management processes.” AutoCo’s disclosure notes that climate-related factors are considered alongside other risks and opportunities in the organization’s integrated ERM process. **22** This disclosure also fulfills a key element of REQ-01, which calls for a discussion of whether the highest governing body considers climate-related issues when monitoring implementation and performance. **23**

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from OilCo Annual Report

Risk Management

We identify and assess climate-related risks as part of our overall sustainable business strategy, which is reviewed by the ISAC. Accordingly, the company also incorporates sustainability factors, including climate change, directly into its comprehensive Integrated Risk Management Process throughout all levels of the organization—including at the enterprise level—to identify, assess, manage, and monitor related risks and opportunities. **1** The executive leadership team is responsible for ensuring the application of the Process and for reviewing the effectiveness of corporate strategy in prioritizing, addressing, managing, and mitigating enterprise-level risks, including those related to sustainability (and climate)-related factors. Business unit leaders are responsible for developing and ensuring compliance with business-unit specific risk management plans and associated performance agreements, as well as for assessing and reporting the magnitude of financial impacts associated with such risks to the executive leadership team for appropriate consideration and development of risk management plans. **2** The Process is applied at the operational level to the Company's projects through integration into the Company's standardized approach to project management as well as to operating facilities through its operational policies and procedures. In such settings, the Company's Hazard Identification and Risk Assessment Policy includes sustainability-related risk factors, including climate risk, in the hazard assessments performed throughout all levels of the organization in operational decision-making. **3** The ISAC works with the board, business unit directors, and managers to ensure climate-related risks have been adequately considered in the Company's Integrated Risk Management Process. **4**

When assessing risks, the Company evaluates each risk depending on the potential magnitude of impacts resulting from the risk as well as the likelihood that the risk will materialize and impact the Company. In assessing the magnitude and likelihood of a risk resulting in a material financial impact to the Company, the Company also evaluates the expected timing over which the risk may materialize, including short-, medium-, and long-term horizons. **5** Climate-related risks are among the risks considered in the application of the Company's Integrated Risk Management Process, and are assessed using the same methodology as all other risks to which the Company is exposed. **6** In evaluating climate-related risks specifically, the Company has identified potential financial impacts that include the demand for our products and

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Guidance and Questions to Consider

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

What processes does the organization use to identify and assess climate-related risks?

SASB STANDARD: In accordance with SASB Application Guidance 5.0(c), OilCo has disclosed its process to identify and assess climate-related risks. **4**

CDSB FRAMEWORK: Pursuant to REQ-03, OilCo describes how climate-related risks are integrated into its risk management processes, including a discussion of the roles involved, **2** the methodology employed, **6** and the various levels of the enterprise at which it is applied. **1 3**

Does the organization consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) or other relevant factors?

CDSB FRAMEWORK: REQ-03 calls for organizations to disclose and analyze "actual and potential causes and sources of environmental risks and opportunities," including a discussion of "whether they consider existing or emerging regulatory requirements" that may be relevant. **8 22**

SASB STANDARD: Each of the regulatory risk categories cited by OilCo correspond to disclosure topics included in the SASB Oil & Gas – Exploration & Production Industry Standard, and are supported by disclosures provided in the Metrics & Targets section below. **8**

What is the organization's process for assessing the potential size and scope of identified climate-related risks?

CDSB FRAMEWORK: As per REQ-03, OilCo describes its process for assessing the size and scope of identified climate risks, which involves estimates of the likelihood and magnitude, as well as an evaluation of the timing, of financial impacts. **5** Through its risk management process, the company has identified specific financial impacts associated with each risk, **7** which help inform the deliberations of the Disclosure Committee regarding materiality, as discussed in the Governance section above.

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from OilCo Annual Report

market prices for hydrocarbons, which may impact revenues; capital expenditures required to meet new regulatory requirements or to respond to physical climate risks; and additional operating costs associated with abatement technologies, such as carbon capture and sequestration. **7** Depending on the potential impact of the identified risk relative to the risk threshold the Company is willing to accept, appropriate risk mitigation and monitoring strategies are put in place, with associated controls and assurance mechanisms. More information about how we consider existing, evolving, and emerging regulations related to climate change is available elsewhere in this report, particularly in the “Greenhouse Gas Emissions,” “Water Management,” “Community Relations,” and “Reserves Valuation & Capital Expenditures” sections. **8**

The Company has identified three primary channels of climate-related risks to which it is exposed: physical climate risk, market-driven transition risk, and regulatory risk. **9** For each risk, the Company has developed specific risk mitigation strategies, as noted above in the Strategy section. Specifically: **10**

Physical Climate Risk

The Company identified several channels of physical climate risk to which it is exposed. These include increased storm frequency and/or severity, flooding, and access to water. **11** Each of the Company’s operating locations were assessed for exposure to these physical climate-related risks, and specific, localized mitigation strategies were developed and put in place. **12** With respect to storm frequency and/or severity, the Company has revised its engineering guidance to reflect potential changes in maximum wind speeds in certain locations exposed to extreme weather events, such as hurricanes or typhoons. The Company will require its new facilities to adhere to these revised standards, and certain legacy assets are being retrofitted to meet the new standards, depending on the magnitude of risk exposure for those assets. With respect to flooding, the Company conducted a risk review with all business units to assess the potential impacts of severe flooding based on a one-hundred-year flood event. In some instances, based on work the company has conducted in partnership with academic institutions, an additional safety factor was applied to the one-hundred-year flood event data, resulting in higher anticipated impacts and associated risks. As a result, the company identified several instances where operations may be adversely impacted to the extent that additional capital expenditures were justified to

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How does the organization determine the relative significance of climate-related risks in relation to other risks?

CDSB FRAMEWORK: Although OilCo’s Risk Management disclosure does not explicitly cover how the company determines the relative significance of risk exposures—including those related to climate—the excerpt implies that such assessments are based on the likelihood, magnitude, and timing of financial impacts. **5** As described in the Governance section above, this information would inform how the ISAC assesses and prioritizes risks for presentation to OilCo’s board, as well as how it guides response planning with management. These disclosures might be strengthened through the application of REQ-03, which compels an explanation of “the relative significance” of climate-related risks “in relation to others within the business” and “how these risks are prioritized.”

What risk classification framework(s) and definitions of risk terminology does the organization use?

CDSB FRAMEWORK: REQ-03 requires companies to “include definitions of risk terminology used or references to existing risk classification frameworks used.” For example, in its disclosure, OilCo specifies that its market-based transition risk assessments are informed by scenario models established and defined by the International Energy Agency (IEA). **18**

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

How does the organization make decisions to mitigate, transfer, accept, or control climate-related risks?

SASB STANDARD: In accordance with SASB Application Guidance 5.0(c), OilCo has disclosed its process for managing climate-related risks. **10**

CDSB FRAMEWORK: The OilCo excerpt details a process through which operating facilities develop risk response strategies for review by the ERM team, such as those described for water management. **15** The disclosure also provides an overview of the response strategies, which, in accordance with REQ-03, “explain how and the extent to which the organization is able to mitigate transfer, accept, or control risks and maximize opportunities.” **14**

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from OilCo Annual Report

make assets more flood-resilient. **13** Similar to the analysis performed for storm frequency/severity, the Company has prioritized retrofitting existing facilities for flooding, and has incorporated this data into its engineering bases for newly built facilities. Finally, the company has identified risks related to access to water, especially in areas of current or future anticipated water stress. The Company relies upon access to water for many aspects of its operations, including for hydrocarbon treatment and processing, for heating and cooling, and for well development activities, such as hydraulic fracturing. The Company has deployed several technologies in water-scarce environments to mitigate risks related to freshwater access, such as water recycling and treatment facilities to recover and/or process saline water sources into freshwater. **14** All facilities exposed to risks related to water access must submit a water management plan describing specific strategies that the facility will implement to manage, mitigate, and monitor its water use. Such plans are produced using guidance from the Company's risk management to ensure consistency in evaluating the likelihood and magnitude of financial impacts arising from reduced access fresh water. Using such guidance, business unit teams then evaluate their facility-specific exposure, and in some instances these impacts have justified additional capital expenditures in water treatment facilities to mitigate such risks. **15** Such plans aggregated at the business unit level and submitted to the company's Enterprise Risk Management team for review, including an assessment of their sensitivity to the results of the Company's scenario analysis, discussed above. **16**

Market-Driven Transition Risks

The Company has identified potential significant long-term risks related to the anticipated transition to a lower-carbon economy. **17** Specifically, the declining cost of renewable energy generation technologies combined with the electrification of traditional hydrocarbon fuel users may adversely impact long-term demand for hydrocarbon fuels (as described in the Strategy section above). To account for such risks, the Company's internal price forecast for hydrocarbons takes into account several scenarios that reflect varying pathways through which this risk may manifest, including the IEA's Current Policies, New Policies, and Sustainable Development Scenario, as well as the Company's internally developed Rapid Electrification and Rapid Decarbonization Scenarios. **18** Existing assets, as well as new assets, are evaluated by project teams for their resilience under this range

LEARNING FROM OILCO DISCLOSURES

How does the organization prioritize climate-related risks and determine what climate-related information is material?

CDSB FRAMEWORK: Although OilCo's Risk Management disclosure does not explicitly cover how the company determines the relative significance of risk exposures—including those related to climate—the excerpt implies that such assessments are based on the likelihood, magnitude, and timing of financial impacts. **5** As described in the Governance section above, this information would inform how the ISAC assesses and prioritizes risks for presentation to the board, as well as how it guides response planning with management. These disclosures might be strengthened through the application of REQ-03, which compels an explanation of "the relative significance" of climate-related risks "in relation to others within the business" and "how these risks are prioritized."

Does the organization address all relevant categories of climate-related risks (i.e., transition risks including policy and legal, technology, market, and reputational risks, as well as physical risks, including acute and chronic risks)?

CDSB FRAMEWORK: OilCo's disclosure addresses key categories of risk that are well-aligned with the TCFD recommendations, i.e., physical and transition risks (including regulatory risks). In doing so, the company adheres to many important elements of REQ-03. For example, its disclosures help readers understand how such risks may impact the availability or quality of natural capital, **11** whether the risks apply organization-wide or are specific to geographies, business units, or assets, **12** and how the risks may financially impact the organization. **13**

SASB STANDARD: Water represents an increasingly scarce resource, the quality and availability of which is likely to be affected significantly by climate change. Thus, it represents a physical risk for companies in water-intensive industries, such as OilCo. The effectiveness of OilCo's risk response measures with respect to access to water can be verified by the reader in the Metrics & Targets section below, using the quantitative disclosures of the company's water withdrawals and consumption (EM-EP-140a.1) normalized by its overall drilling and exploration and well development activities (EM-EP-000.B, EM-EP-000.C). **14**

CDSB FRAMEWORK: Different types of climate-related risks and opportunities are likely to manifest over different time horizons, which may vary from industry to industry based on the life of the assets associated with a given business model and other factors. OilCo's disclosures specify the relevant time frames over which the company expects the risks to materialize,

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from OilCo Annual Report

of scenarios using the Company's internal price forecasts. Such information is presented by project teams to business unit leadership or, if the total project budget is above the \$250MM threshold, to the executive leadership team before an investment decision is made regarding the project being evaluated. The Company assesses these risks for individual assets as well as across its portfolio of assets. **19** As a result of these exercises, the Company has significantly expanded its natural gas resource base, as described in the Strategy section above. In addition, it has shifted to a staged-development model for assets that may be more exposed to climate-related risks, and has identified signposts that would inform management that such assets may not merit further capital expenditure due to the manifestation of the transition risks it has identified. Finally, the Company has increased its R&D investment in renewable energy as a long-term transition strategy, including maintaining positions in several bioethanol refineries, as well as in advanced biofuels production.

Regulatory Risk

The Company has identified the potential for regulatory risks to its financial health in the short, medium, and long term. Specifically, the Company invests in long-lived, fixed assets whose value may be impacted by changes in regulations that result in a price on the Company's carbon emissions. To mitigate this risk, the Company requires all operating facilities to monitor and report their carbon emissions, and that all new projects include a carbon emission forecast for the operating life of the asset as part of its project approval package. These carbon emissions are assessed by the Company's compliance team to estimate a range of potential financial impacts, based on assumptions regarding the potential price of such emissions over the life of the asset. In addition, the Company has adopted a goal to reduce our carbon emissions by 10% in 2030 relative to a January 1, 2014 baseline, as described in the Strategy section above. **20** This overall goal is built into an internal "carbon budget" that is apportioned to each business unit by the executive leadership team, and each business unit is responsible to apportion that budget across its assets and operations. In addition, all facilities are required to report their methane emissions specifically, and progress to meet the corporate-wide goal of no more than 0.2% of total gas handled by a given facility. **21** All operating assets are required to report their carbon emissions against their individualized reduction goals, and those that emit above their target submit mitigation plans to

LEARNING FROM OILCO DISCLOSURES

as required by REQ-03, **17** and the company defines those time horizons in the Strategy section above.

SASB STANDARD: In its Risk Management disclosure (and related information contained in the Strategy section), OilCo provides a discussion of how price and demand for hydrocarbons and/or climate regulation influence its capital expenditure strategy for exploration, acquisition, and development of assets. This disclosure follows SASB's qualitative discussion-and-analysis metric EM-EP-420a.4. **19** The disclosure is further supported by the quantitative data associated with metrics EM-EP-420a.1 and EM-EP-420a.2 (reported below in the Metrics & Targets section), which inform the reader as to the resilience of OilCo's hydrocarbon assets to scenarios that include a price on carbon.

SASB STANDARD: The disclosure of GHG reduction targets is aligned with SASB metric EM-EP-110a.3 which, combined with the emissions data provided in the Metrics & Targets section reported per EM-EP-110a.1 and EM-EP-110a.2, provide the reader with relevant and useful data to assess the company's relative exposure to emissions-related regulatory risk. **20**

SASB STANDARD: Also in the context of transition risk, SASB metric EM-EP-110a.1 recommends that the company disclose the percentage of its overall GHG emissions that can be attributed to methane. SASB metric EM-EP-110a.3 recommends that companies discuss reduction strategies specific to emissions reduction sources, recognizing the risks associated with such sources may vary. Here, OilCo has identified methane emissions as a priority risk factor, due to the impact this risk may have on the success of the company's strategy to shift its production profile to natural gas as a long-term hedge against regulatory climate risk. **21**

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

Is the organization's approach to managing climate-related risks integrated into a broader risk management program? If so, how?

SASB STANDARD: In accordance with SASB Application Guidance 5.0(c), OilCo states that it has a process in place to ensure climate-related risks have been adequately considered in the company's integrated risk management process. **4**

CDSB FRAMEWORK: REQ-03 requires an organization "explain how environmental risks ... [including climate risks] are integrated into risk management processes." OilCo's disclosure notes that facility-specific risk assessments and response plans are aggregated at the business unit level and submitted to the company's Enterprise Risk Management team for review,

MOCK DISCLOSURE: RISK MANAGEMENT

Excerpt from OilCo Annual Report

reach the target. Performance is monitored at the business unit level and reported to the executive leadership team annually and is reviewed by the ISAC. Finally, the Company engages with regulators to ensure a robust understanding of the nature of carbon emissions in the industry and to encourage policies that balance environmental concerns with economic opportunity and growth. The Company's Public Policy team maintains relationships with appropriate regulatory agencies in all regions in which the Company operates. **22**

LEARNING FROM OILCO DISCLOSURES

including an assessment of their sensitivity to the results of the Company's scenario analysis. **16**

Core Element 4: Metrics & Targets

In addition to the more qualitative considerations related to governance, strategy, and risk management, organizations can benefit greatly from measuring and managing their performance on climate-related issues using quantitative metrics and targets. Indeed, such measures can illuminate the effectiveness of an organization's approach to the first three core TCFD elements and to its consideration of climate-related risks and opportunities across different time horizons, including the medium to longer term. (Note that the latter point is also addressed in the section above covering Core Element 2 on Strategy.) The TCFD recommendations encourage the disclosure of relevant metrics to help investors and other decision makers "better assess the organization's potential risk-adjusted returns, ability to meet financial obligations, general exposure to climate-related issues, and progress in managing or adapting to those issues."³⁸ Importantly, this data and information can also facilitate consistency and comparability, i.e., the apples-to-apples comparison of organizations within a given industry or sector.

CDSB Framework REQ-04 advises that "narrative should accompany quantitative results where it assists the reader in understanding the associated financial impacts to the organization." Where quantitative information is unavailable for sources of environmental impact from operations, entities, and activities within the organization's reporting boundary, results should be expressed in qualitative terms. This is a useful point for preparers to note as TCFD reporting matures.

The TCFD recommends the following disclosures for all companies, subject to a materiality assessment:

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

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

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

Additionally, companies in certain key industries may need to make additional metrics and targets disclosures to satisfy the TCFD's Supplemental Guidance (see Page 23). For example, the TCFD recommends that large companies in key financial and non-financial industry groups disclose greenhouse gas emissions (GHG) regardless of the outcome of the materiality assessment by the reporting company.

How to read the excerpt for this TCFD recommended disclosure element (Metrics & Targets):

Mock excerpts from two hypothetical organizations' disclosures, one drawn from the automobiles industry and the other from the oil and gas industry, are presented below. The excerpt from each organization is presented in the left-hand column, with accompanying analysis in the right-hand column. The annotations in the right-hand column reference the guidance provided by the TCFD for the respective TCFD disclosure and illustrate how applying key requirements of the CDSB Framework and the appropriate industry-specific SASB standard can help organizations prepare disclosures in accordance with the recommendations.

Although the annotations do not always explicitly address how the principles shared by the TCFD, CDSB, and SASB (see Figure 5) have been applied, it is assumed these principles were considered in determining how to disclose such information in the mainstream report.

As these disclosure excerpts are presented for illustrative purposes, we have not applied every CDSB requirement or aspect of the SASB standard—instead, we pull out key examples to show how these two complementary tools can be used to more fully meet the TCFD recommendations. Each paragraph in the excerpt is numbered for ease of reference, with the number in the excerpt (on the left) corresponding with the numbered annotation (on the right) indicating where a specific CDSB Framework requirement or SASB industry standard enables the disclosure.

³⁸ *Supra* note 10.

MOCK DISCLOSURE: METRICS & TARGETS

Excerpt from AgriCo Annual Report

Metrics and Targets

The Company has implemented the SASB standard for the Agricultural Products industry to prepare its disclosures based on the risk exposures discussed in the preceding Governance, Strategy, and Risk Management sections. **1** The methodologies underlying these Metrics & Targets disclosures are detailed in the Agricultural Products standard available at [sasb.org](https://www.sasb.org).

As of this report, the Company has not formally integrated these or other sustainability-related performance metrics into its policies for remuneration or other incentives for executive leadership, management, or employees. However, we have begun to explore the feasibility of such a program in helping us more effectively and efficiently deliver on our climate-related, environmental, and other sustainable business goals without creating unintended, adverse consequences. This work is a joint undertaking of the board's sustainability and compensation committees, who have engaged with a third-party advisory firm to develop company-specific recommendations, which will be submitted to the board of directors for consideration by the fourth quarter of 2019. **2**

LEARNING FROM AGRICO DISCLOSURES

Guidance and Questions to Consider

Answering the following questions can help a company better understand how the performance metrics included in their respective SASB industry standard(s)—or other metrics, as appropriate—together with the CDSB Framework requirements can facilitate fulfillment of the TCFD recommendations for Metrics & Targets.

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

Which performance metrics does the company use to assess and manage financially material climate-related risks and opportunities such as those related to water, energy, land use, and waste management?

SASB STANDARD & CDSB FRAMEWORK: AgriCo has identified its performance metrics, including those related to water, energy, and other issues, by using the SASB standard for the Agricultural Products industry, which includes climate-related topics that AgriCo has identified as material to its business. **1** In addition to addressing the TCFD recommendations, these disclosures also satisfy CDSB REQ-04 (Sources of Environmental Impact), which calls for quantitative and qualitative performance results. REQ-04 adds that methodologies for preparing these results should be stated, and although the disclosure does not specify the methods, it does refer to where further details can be found on SASB's recognized methodologies. In citing the SASB industry standard, the disclosure also meets REQ-08 (Reporting Policies) in citing that this industry-specific standard has been used to prepare the disclosures. In subsequent disclosures, it will also be necessary to confirm that these reporting provisions have been used consistently from one reporting period to the next.

Are these climate-related performance metrics incorporated into the company's remuneration policies? If so, how?

CDSB FRAMEWORK: In assessing AgriCo's performance against targets, the company's disclosure helps investors better understand whether, how, and to what extent the company's incentive programs for executives, management, and employees are—or might be—aligned with long-term strategy to promote sustainable value creation. **2** CDSB REQ-01 (Governance) requires companies to consider disclosing how management-level staff are held accountable for and incentivized for addressing environmental issues. Although climate-related performance metrics are not incorporated into the company's remuneration policies as of yet, this disclosure shows the current state of

MOCK DISCLOSURE: METRICS & TARGETS

Excerpt from AgriCo Annual Report

Similarly, the Company is exploring whether and how it might establish an “internal price” on carbon to mitigate pricing and regulatory risks and thus ensure a smoother transition to anticipated future scenarios. Incorporating such a price into strategic planning and project finance may serve as a useful mechanism to help us better achieve and build on the greenhouse gas emissions and energy efficiency targets discussed below, build a more resilient supply chain, and potentially gain competitive advantage in a changing economic and regulatory environment over the long-term. The sustainability committee has begun investigating a variety of structures, including emissions fees, shadow pricing, and implicit pricing, in the context of the UN Global Compact’s Business Leadership Criteria on Carbon Pricing, with recommendations to the board anticipated by the first quarter of 2020. **3**

Greenhouse Gas Emissions

Metric	Year Ended December 31,		
	2016	2017	2018
Gross global Scope 1 emissions, in thousands of metric tons CO ₂ -e	9,625	9,125	8,800
Fleet fuel consumed in GJ	807	772	740
Percentage renewable	5%	8.5%	16%

The Company has set a target to reduce overall energy consumption by 20% and greenhouse gas emissions by 40% by 2035 relative to a 2019 baseline. The Company’s emissions primarily consist of direct emissions from its processing facilities as well as its transportation fleet. To date, the Company has achieved a reduction in its emissions from its processing facilities of 10% and from its transportation fleet of 8%, resulting in gross reduction of 8.5%. Based on its results to date, the Company remains committed to its 2035 target. **4**

Related to its greenhouse gas emission reduction target, the Company set a target for its fuel usage (including all energy sources) to be 50% renewable by 2035. The Company similarly remains on track to achieve this goal.

LEARNING FROM AGRICO DISCLOSURES

practice and that this is actively being considered by the company.

Has the company established an internal carbon price?

CDSB FRAMEWORK: Although AgriCo’s direct and indirect emissions are not currently subject to carbon-pricing regulations, the company anticipates such regulations may emerge over the medium to long term (see Strategy, above). Thus, investors can benefit from understanding whether, how, and to what extent the company’s performance improvements may be supplemented by an internal pricing scheme in mitigating this risk. **3** Such disclosure is consistent with REQ-03, which calls for analysis of actual and potential causes of climate-related risk including “the effect of regulation designed to support or limit activity affecting natural capital.”

CDSB FRAMEWORK: REQ-04 of the CDSB Framework requires reporting organizations to, among other things, report material sources of environmental impacts including GHG emissions. The reporting organization is expected to report, in CO₂-equivalent metric tons, absolute and normalized Scope 1 and 2 GHG emissions, calculated by reference to a recognized GHG emissions measurement methodology. AutoCo provides its Scope 1 emissions over a three-year period, in keeping with REQ-05 (Performance and Comparative Analysis) which requires disclosures to convey how environmental results, such as Scope 1 emissions, compare with results from previous years. It also cross-refers to other targets used for assessing environmental performance in accordance with REQ-05. **4**

SASB STANDARD: SASB metric FB-AG-110a.2 includes a discussion of the company’s strategy to manage Scope 1 emissions, including disclosing the company’s emissions reduction target and performance against that target. **4**

MOCK DISCLOSURE: METRICS & TARGETS

Excerpt from AgriCo Annual Report

Energy Management **5**

Metric	Year Ended December 31,		
	2016	2017	2018
Operational energy consumed, in gigajoules	27,900	26,900	26,200
Percentage grid electricity	74%	74%	71%
Percentage renewable	10%	12%	17%

The Company has set a target to reduce overall energy consumption by 20% by 2035. To date, the Company has achieved a reduction of its energy usage of approximately 6%. The Company anticipates it will be able to accomplish its goal per the original timeframe established.

The Company also set a target to increase its share of electricity derived from renewable sources to 50% by 2035. **6** Based on its progress to date in identifying opportunities for solar energy deployment across its operations, the company has increased its share from 10% to 17% since its baseline year in 2016. The remaining installation opportunities that the Company has identified, as well as the completion of energy efficiency projects to lower overall energy usage, are anticipated to enable us to achieve our 2035 goal.

Water Management**7**

Metric	Year Ended December 31,		
	2016	2017	2018
Total water withdrawn, in thousands of m ³ 8	1,503,709	1,495,900	1,480,850
Percentage withdrawn in regions with High or Extremely High Baseline Water Stress	10%	10%	10%
Total water consumed, in thousands of m ³	1,400,825	1,400,800	1,390,720
Percentage consumed in regions with High or Extremely High Baseline Water Stress 9	8%	8%	8%

LEARNING FROM AGRICO DISCLOSURES

SASB STANDARD: SASB metric FB-AG-130a.1 enables AgriCo to demonstrate to its investors that it is on track to meet its goal of diversifying its energy sources increasingly to renewable energy, a key element of its business strategy to mitigate climate risk. **5**

CDSB FRAMEWORK: REQ-03 of the CDSB Framework (Risks and Opportunities) requires disclosures to explain the material environmental risks and opportunities affecting the organization and its management. **5**

Does the company measure climate-related opportunities, such as revenue from products and services designed for a lower-carbon economy?

CDSB FRAMEWORK: AgriCo's energy management disclosure addresses the climate-resilience of the company's energy mix—including opportunities for solar deployment—in the context of its long-term business strategy. Analysis of this discussion is further informed by the company's trajectory on SASB metric FB-AG-130a.1

5 (in particular, its renewable percentage of operational energy consumed). The energy profile of agricultural products companies is likely to become an increasingly important competitive driver as the global economy transitions to a lower-carbon state and the cost, reliability, and availability of energy resources evolves. In this respect, the disclosure has explained the outcomes and financial impacts of this opportunity upon the organization, including in terms of its operations, in accordance with CDSB Framework REQ-03 (Risks and Opportunities). **6**

How can metrics be presented to enable meaningful trend analysis?

CDSB FRAMEWORK: In reporting against its industry's SASB standard, AgriCo has included performance data for its last three reporting periods. **7** The underlying technical protocols that support the SASB accounting metrics establish consistent definitions, calculations, and estimation methodologies that facilitate meaningful trend analysis and help fulfill both the TCFD's principle 4 ("Disclosures should be consistent over time") and CDSB principle 4 ("Disclosures shall be consistent and comparable"). Moreover, REQ-09 (Reporting Period) of the CDSB Framework states that "disclosures shall be provided at least annually" to ensure information is available on a timely basis. The three annual figures presented here allow for the identification of a discernable trend that both the percentage of water withdrawn and water consumed in water-stressed regions has remained relatively stable over the three-year period.

MOCK DISCLOSURE: METRICS & TARGETS

Excerpt from AgriCo Annual Report

The majority of the Company's water withdrawals and consumption are associated with its processing of agricultural products. The Company's processing facilities are largely located in areas that are not characterized by a high degree of water stress. The Company's water usage is a major contributor to overall energy usage, due to the energy required to pump, heat, cool, and treat process water. As such, as part of the Company's efforts to reduce overall energy usage, the Company's water usage has declined year-over-year as a result of the execution of multiple efficiency projects across the organization. **10**

To date, the Company has not established a target for water withdrawal or consumption reduction; however the Company continues to monitor its water usage as well as the potential emergence of water scarcity risk in the regions in which it has extensive processing operations as part of its overall risk management process.

LEARNING FROM AGRICO DISCLOSURES

Are the methodologies used to calculate or estimate climate-related metrics clear?

CDSB FRAMEWORK: By reporting against the SASB standard for its industry, AgriCo ensures its methodologies are clear, as they follow the technical protocols associated with each SASB accounting metric. This type of rigor enhances the comparability of performance data across peer companies, in accordance with TCFD principle 5 ("Disclosures should be comparable among companies within a sector, industry, or portfolio"), CDSB Framework Principle 4 ("Disclosures shall be consistent and comparable," which encourages companies to refer to the SASB standards to understand material topics for their sector), and CDSB Framework REQ-05 which is aimed at supporting comparative analysis. REQ-04 also requires methodologies for preparing these results to be disclosed, which in the AgriCo excerpt are incorporated by reference to the SASB industry standard. **1**

SASB STANDARD: For example, in reporting its water withdrawn and consumed (SASB metric FB-AG-140a.1), AgriCo applied strict definitions supplied by the SASB standard to determine its applicable water sources, what constitutes "fresh water," what activities qualify as "consumption," and which geographic locations are designated as water-stressed by the World Resource Institute. **8**

Supplemental Guidance for Non-Financial Sectors:

Companies that, like AgriCo, operate in key non-financial industries (see list on Page 23) should also consider the following questions:

Do the metrics and targets disclosed provide historical trends and forward-looking projections (by relevant country and/or jurisdiction, business line, or asset type)?

SASB STANDARD: SASB metric FB-AG-140a.1 also enables AgriCo to identify that the majority of its water is not currently consumed in water-scarce regions, due to the location of its processing facilities. **9**

SASB STANDARD: In responding to SASB metric FB-AG-140a.2, AgriCo discusses that it has not identified water use as a major risk factor, and it has not established a corresponding target for water reduction at this time. **10** However, the company also notes that it has achieved a reduction in water usage as part of its energy efficiency efforts, as captured in SASB metric FB-AG-130a.1. **5**

MOCK DISCLOSURE: METRICS & TARGETS

Excerpt from AgriCo Annual Report

Ingredient Sourcing

Metric	Year Ended December 31,		
	2016	2017	2018
Percentage of agricultural products sourced from regions with High or Extremely High Baseline Water Stress	20%	12%	10%

The Company faces product-specific risks associated with both acute and chronic physical climate risk, as discussed in the Strategy section above. **11** The Company experienced a significant decline in the percentage of its products sourced from water stressed regions as a result of the severe drought that occurred in Brazil in 2015-2016, impacting the Company's cocoa-derived products. **12**

As part of its risk assessment process, the Company has identified long-term shifts in precipitation patterns that may impact its cocoa supply chain in both Brazil and Ghana, and has begun engaging suppliers to develop long-term plans to develop irrigation strategies and/or re-optimize cultivation areas. The Company recently announced a \$20M capital expenditure program in Brazil to partner with suppliers to improve their long-term climate resilience, as described in the Strategy section above. **13**

LEARNING FROM AGRICO DISCLOSURES

SASB STANDARD: SASB metric FB-AG-440a.1 includes the list of specific crops that the company has identified as likely to be impacted by climate-related risks. AgriCo identified these crops in its Strategy disclosure (above) along with a discussion of how it plans to mitigate risks associated with sourcing these key ingredients. **11**

SASB STANDARD: SASB metric FB-AG-440a.2 enables AgriCo to identify the degree of water scarcity in regions where it is currently sourcing its products. Here, AgriCo identifies that it does not currently source a significant share of its products from water-scarce regions, but anticipates that this risk will emerge over time, thereby justifying the CAPEX investment noted by AgriCo to mitigate associated risks in its supply chain (see Strategy section). **12**

Do the metrics disclosed support the company's scenario analysis and strategic planning process? Do they enable monitoring of the organization's business environment from a strategic and risk management perspective?

CDSB FRAMEWORK: Finally, the disclosure is explicitly linked to the company's strategic planning and risk management approach, in accordance with the SASB technical protocols for this qualitative, "discussion and analysis" metric. This narrative fits with the CDSB Framework REQ-06 (Outlook) whereby management is required to summarize its conclusions about the effect of environmental impacts, risks and opportunities, and policy outcomes (e.g., long-term shifts in precipitation patterns) on the organization's future performance and position. **13**

MOCK DISCLOSURE: METRICS & TARGETS

Excerpt from OilCo Annual Report

Metrics and Targets

In measuring and managing climate-related risks and opportunities, we use the metrics and targets described earlier in this report. Earlier sections also discuss specific targets and our progress toward them. Three sets of metrics are most relevant to climate-related risks and opportunities: Greenhouse Gas Emissions, Water Management, and Reserves Valuation & Capital Expenditures.

Greenhouse gas emissions: Gross global Scope 1 emissions

The Company implemented a GHG reduction goal of 10% relative to a January 1, 2014 baseline by 2030. As of the time of this filing, we are on track to meet that goal.

For additional data related to climate risk, including our Scope 2 and Scope 3 greenhouse gas emissions, please see our CDP Questionnaire.

Metric	Year Ended December 31,		
	2016	2017	2018
Gross global Scope 1 emissions (in thousands of metric tons CO ₂ -e) 1 2	7,762	7,690	7,640
Percentage from methane	6%	4%	3%
Percentage covered under a regulatory program	3%	3%	5%

Greenhouse gas emissions: Gross global scope 1 emissions by operational source **3**

The majority of the Company's Scope 1 emissions relate to hydrocarbon combustion to generate power and heat. The majority of the Company's methane emissions result from process emissions, venting, and fugitive emissions. The company has achieved significant reductions in its fugitive emissions as a result of the roll-out of its methane emission goal in 2014.

Metric 5	Year Ended December 31, 4		
	2016	2017	2018
Gross global Scope 1 emissions from (in thousands of metric tons CO ₂ -e)			
Flared Hydrocarbons	388	380	378
Other Combustion	6,698	6,592	6,553
Process Emissions	543	540	542
Other Vented Emissions	388	384	384
Fugitive Emissions	237	201	153

[continued on next page]

LEARNING FROM OILCO'S DISCLOSURES

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

Are the company's GHG emissions calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions?

SASB STANDARD: The methodology of the GHG Protocol is incorporated by reference in the SASB technical protocols for GHG emissions metrics, such as those reported by OilCo (e.g., EM-EP-110a.1). **1**

CDSB FRAMEWORK: GHG emissions from operations, entities, and activities within the financial reporting boundary of the organization are treated as material under CDSB REQ-04 (Sources of Environmental Impacts) and therefore it is expected that the organization report, in CO₂-equivalent metric tons, absolute and normalized Scope 1 and 2 GHG emissions, calculated by reference to a recognized GHG emissions measurement methodology. **1 3**

SASB STANDARD: By using SASB metrics EM-EP-110a.1, **2** EM-EP-110a.2, **3** and EM-EP-110a.3 (see Strategy, above), OilCo enables investors to better understand the effectiveness of the company's mitigation strategies to reduce its direct (Scope 1) emissions.

Has the industry established any generally accepted GHG efficiency ratios that may warrant disclosure?

SASB STANDARD: SASB standards are industry-specific, establishing performance metrics (including those related to greenhouse gas emissions) that are most appropriate to the industry context. For example, where OilCo discloses a breakdown of Scope 1 emissions by operational source (EM-EP-110a.2) **3**, an electric utility following its industry standard would likely report emissions associated with power deliveries (IF-EU-110a.2).

Do GHG emissions disclosures include historical periods to allow for trend analysis?

CDSB FRAMEWORK: Like AgriCo above, OilCo has reported its climate-related performance metrics over multiple, successive time periods to facilitate meaningful trend analysis. **4**

MOCK DISCLOSURE: METRICS & TARGETS

Excerpt from OilCo Annual Report

Water management: Fresh water usage, recycling, and usage in water-stressed areas

As noted in the Strategy and Risk Management sections above, the Company assesses water risk based on localized risk factors affecting individual facilities, and has implemented mitigation strategies to reduce fresh water consumption at those facilities or diversify its sources of water through technology deployment.

As a result, while the Company's total water withdrawals have increased as we have expanded production, the amount of water consumed has remained constant due to the deployment of technologies that have increased the ability to reprocess water for multiple uses. Long-term, the Company has set an intensity-based target of 0.3 metric tons of fresh water consumed per metric ton of production by 2020. To date, the Company remains on track to meet this goal due to a successful roll-out of recycling and efficiency projects, which have resulted in water intensity falling from 0.35 in 2016, to 0.34 in 2017, and finally 0.32 in 2018. **6** Additionally, these technologies have primarily been deployed in areas of high water stress, as indicated by the falling percentage of water withdrawals and consumption in these areas.

For additional water-management related metrics, please see the Water Management section of this report.

Metric 7	Year Ended December 31,		
	2016	2017	2018
Total fresh water withdrawn (in thousands of cubic meters)	2,050	2,167	2,240
Percentage in areas of High or Extremely High Baseline Water Stress	14%	12%	10%
Total fresh water consumed (in thousands of cubic meters)	1,750	1,777	1,784
Percentage in areas of High or Extremely High Baseline Water Stress	10%	8%	7%

LEARNING FROM OILCO'S DISCLOSURES

Are the methodologies used to calculate or estimate the metrics clear?

SASB STANDARD: OilCo's climate-related performance metrics were calculated using the detailed technical protocols outlined in the SASB standards—in the case of SASB metric EM-EP-110a.2, for example, using rigorous definitions provided by the American Petroleum Institute. **5**

CDSB FRAMEWORK: Like AgriCo above, OilCo has stated the industry-specific standards and guidelines that have been used to report the metrics in accordance with CDSB Framework REQ-08 (Reporting Policies). **5**

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

Has the company established and communicated climate-related performance targets in line with anticipated regulatory requirements, market constraints, or other goals, such as operational or financial objectives or loss tolerances?

Do disclosures specify whether targets are absolute or intensity-based, the time frames over which they apply, and the base year from which progress is measured?

CDSB FRAMEWORK: In its Metrics & Targets disclosure on water management, OilCo reports an intensity-based performance target along with its performance against this target. This information helps investors better understand the magnitude of the company's mitigation and adaptation efforts as well as the effectiveness of its related risk responses (discussed above in Risk Management), including insight into whether and to what extent additional capital expenditures may be required to achieve the target. In this respect, this intensity-based performance target adheres to CDSB Framework REQ-05 (Performance and comparative analysis), whereby the environmental information disclosed is compared with the performance targets set in the previous reporting periods. **6**

SASB STANDARD: SASB metric EM-EP-140a.1 further illuminates the effectiveness of OilCo's water-related risk management and operational efficiency in the context of expanding production, enabling investors to compare its performance against that of peers operating at a similar scale. **7**

SASB STANDARD: SASB metric EM-EP-420a.2 helps demonstrate that, although OilCo is adding reserves, the normalized carbon-intensity of its reserves is falling as it shifts its asset mix toward less carbon-intensive resources.

MOCK DISCLOSURE: METRICS & TARGETS

Excerpt from OilCo Annual Report

**Reserves Valuation & Capital Expenditures:
Estimated CO₂ emissions embedded in proved
hydrocarbon reserves**

As noted in the Strategy section above, the Company's estimated emissions embedded in our reserves ranks below the industry average, at 0.11 tons of CO₂ per barrel of oil equivalent versus the industry average of 0.18. While the Company's absolute embedded emissions have grown due to the Company's successful exploration efforts resulting in the booking of additional proved reserves, on a per barrel basis the aggregate intensity has fallen as the Company has expanded its portfolio of natural gas and light oil as well as reduced reinvestment in several legacy heavy oil assets. As noted in the Strategy section above, the Company takes into account the long-term climate resilience of assets under a variety of scenarios when making capital allocational decisions, including the carbon intensity of such reserves.

Metric 8	Year Ended December 31,		
	2016	2017	2018
Estimated CO ₂ emissions embedded in proved oil reserves (billions of kg of CO ₂)	834	880	904
Estimated CO ₂ emissions embedded in proved gas reserves (billions of kg of CO ₂)	147	194	206

LEARNING FROM OILCO'S DISCLOSURES

This information, in conjunction with the company's scenario analysis disclosure (above) helps investors better understand the likelihood and magnitude of potential impacts on OilCo's capital expenditure strategy for exploration, acquisition, and development of assets due to anticipated changes in price and demand for hydrocarbons and carbon regulations. **8**

CDSB FRAMEWORK: REQ-06 (Outlook) requires an organization to summarize its conclusions about the effect of environmental impacts, risks and opportunities, and policy outcomes on the organization's future performance and position. This includes consideration of how resilient its strategy is to such risks and opportunities as part of its scenario analysis. This is a good example of showing how disclosures in one or more TCFD element(s) are interconnected. **8**

Mock Disclosures: Key Takeaways

The mock disclosures presented here are intended to provide illustrative examples of effective climate-related reporting on the 11 recommended disclosures in the four core elements of the TCFD recommendations: governance, strategy, risk management, and metrics and targets. However, these disclosures have also been designed to capture and represent current reporting practice with respect to climate-related risks and opportunities. Given that many organizations are in the early phases of disclosing climate-related risks (and to a lesser extent opportunities), and most have even more recently begun the process of specifically addressing the TCFD recommendations, such reporting is likely to mature and become increasingly more sophisticated and widespread over time. As the market evolves, so will its understanding of what constitutes effective disclosures that enable the outcomes sought by the TCFD: “a stronger, more resilient, and sustainable global economy.”³⁹

In carrying out this exercise, CDSB and SASB identified a handful of key takeaways that may be useful to preparers including, in some cases, areas where further exploration by our organizations or others may be warranted. These lessons are as follows:

- 1 Start at the beginning:** Practitioners of sustainability or ESG reporting are no strangers to juggling a variety of tools, but when faced with making TCFD disclosures using the CDSB Framework and SASB standards, veterans of financial reporting may wonder where to begin. Just as with all effective business decision-making, organizations should start by defining their objectives—in this case, fulfilling the TCFD recommendations and its 11 underlying recommended disclosures. This is why the questions that precede the annotations in each of the four core elements above are specifically derived from the TCFD’s own guidance. These questions can provide useful prompts for organizations to better understand how the CDSB and SASB tools can help them develop robust, comparable, and decision-useful disclosures on the climate-related risks and opportunities that are critical to investors, lenders, and insurers to inform their allocation of capital.
- 2 Keep it simple:** Clarity in writing is a reflection of clarity in thinking. When disclosures become overly complex or confusing, they may impede investor understanding of management’s thought processes around climate-related issues, and therefore an investor’s ability to effectively act on the reported information. For example, when enterprise-level risk managers delegate or outsource their climate-related responsibilities to different functions or regional business units, organizational structures can become complex, chains of command can become less clear, and disclosures may be less useful. When approaching climate-related disclosures, organizations should not try to run before they can walk. Reporting is likely to benefit from a straightforward approach, addressing one recommended disclosure at a time—in order—using the TCFD’s fundamental principles for effective disclosure and associated CDSB and SASB principles (see Figure 5) as guidance. More sophisticated—and, in many cases, more streamlined—reporting will become possible as the organization’s approach matures.
- 3 Connectivity is key:** A core principle of the CDSB Framework is that disclosures should be connected with other information in the mainstream report to explain the links between an organization’s governance, strategy, risk management and environmental results. Preparers must recognize that none of the four core elements can stand on its own. Rather, along with an organization’s financial statements, they inform and reinforce one another, establishing a more complete and holistic picture of the organization’s approach to identifying, assessing, measuring, managing, and monitoring climate-related risks and opportunities. For example, an organization’s Strategy disclosures may provide insight into how it has elected to respond to key risks and opportunities. Meanwhile, its Metrics & Targets disclosures would be more likely to shed light on the effectiveness of those strategies. At the same time, performance metrics could be construed as incidental and targets as arbitrary in the absence of a discussion of the organization’s strategy for achieving them.
- 4 Push for proportionality:** The mock disclosures presented here are designed to illustrate how an organization might think about approaching its own climate-related disclosures. As a result, they provide

³⁹ *Supra* note 10.

fulsome, comprehensive examples of effective reporting, addressing many aspects of many issues from the perspective of a large, global organization with extensive operations and plentiful resources. For many organizations, climate-related reporting could be considerably more concise. Applying the principle of materiality will aid in overcoming this proportionality challenge. All organizations should consider how their TCFD-aligned reporting compares to what they disclose on the other financially material risks and opportunities facing the organization, particularly as the TCFD recommendations are intended for inclusion in mainstream financial filings. To ensure disclosure is useful to investors without overwhelming them, the lens of materiality should be applied—particularly to Strategy and Metrics & Targets disclosures, in accordance with the TCFD recommendations.

5 Take an iterative approach to scenario analysis:

The TCFD notes that while some larger organizations and investors are making use of scenario analysis, it is a practice that is still developing and will benefit from “[learning] by doing.” As such, “advancing the use of climate-related scenario analysis will require further work.”⁴⁰ For example, it will likely involve an exchange of experiences as well as further development of data sets, tools, methodologies, and established standards. To this end, the final part of the Strategy section above was developed to reflect the current, relatively limited state of uptake of this practice and associated disclosures. This is an area where CDSB and SASB intend to collaborate further and look to develop additional guidance on how to make enhanced disclosures in mainstream reports, building on the growing and evolving body of practice. Organizations can contribute to such progress by taking an iterative approach, establishing a reasonable baseline for scenario analysis upon which improvements may be built over time. For example, organizations might initially focus scenario analysis and/or related disclosures on a specific asset or aspect of their business before expanding to wider operations, and, eventually, their whole business. Scenario analysis also affords organizations with a tool to help them identify not only risks but strategic opportunities in light of a changing climate—one of the key features of the TCFD.

⁴⁰ *Supra* note 10



Part IV: Looking Ahead



Conclusion

As investors, lenders, and insurance underwriters increasingly seek out and consider financially material information about how companies manage climate change risks, impacts and opportunities, the TCFD recommendations continue to gain traction as a useful resource to guide effective disclosure. SASB and CDSB have materials in place to help companies make decision-useful, effective TCFD disclosures in their mainstream reports. This guide has shown how these tools are not only complementary, but can be used together.

This Guide is intended to:

- Identify actions required to establish a strong foundation for practical and effective TCFD disclosures (see “Laying the Groundwork”); and
- Provide industry-specific examples of what those disclosures might look like, along with practical how-to guidance an organization can use to develop its own practices (see “Core Elements 1-4”).

In doing so, this guide has attempted to demonstrate that the principles-based TCFD recommendations can be less daunting to implement than they might originally appear—particularly for companies with meaningful buy-in from the board of directors and executive leadership team. Doors have been opened on the path forward by the TCFD-ready tools and resources that already exist to guide practical implementation of the recommendations. CDSB and SASB are well-established in the market and have a track record of supporting effective climate-related and environmental disclosures; they jointly represent the clear solution to TCFD implementation for many companies across multiple jurisdictions, industries, and sectors.

As our approaches fully support implementation of the TCFD recommendations, SASB and CDSB are uniquely positioned to help companies move from consideration to concerted action, and we embrace the responsibility we share with other market initiatives and organizations to carry the work of the TCFD forward. Thus, we will continue to deliver on our commitment to the TCFD mission⁴¹ throughout the coming months and years through a variety of programs, including the following:

⁴¹ Specifically, this guidance is intended to “help companies understand what financial markets want from disclosure in order to measure and respond to climate change risks, and [to] encourage firms to align their disclosures with investors’ needs.” See fsb-tcfid.org/about/ for more information on the TCFD’s mission.

CAPACITY BUILDING

Webinars and multi-stakeholder events, deep dives on specific TCFD implementation challenges and possible solutions.

Practical workshops in different jurisdictions on implementing TCFD through the use of the CDSB Framework and SASB standards.

Continuing professional development, including accredited face-to-face and online training by CDSB, SASB, and partners in relevant areas.

KNOWLEDGE MANAGEMENT & TRANSFER

CDSB will continue to manage and develop the **TCFD Knowledge Hub** (tcfidhub.org), by, among other efforts, adding thorough case studies to demonstrate effective approaches to implementation.

TECHNICAL GUIDANCE

Drawing on both internal and market-based expertise (via CDSB’s Technical Working Group and SASB’s Standards Advisory Group), CDSB and SASB will develop and produce additional technical guidance, including **publications and other resources** addressing each of the core TCFD elements.

IMPLEMENTATION SUPPORT

CDSB, through the **TCFD Commitment**, is working with 20 companies committed to implementing the TCFD as far as is reasonably practicable over a period of three years. CDSB has developed **Beyond Disclosure**, a program that provides companies with the support and feedback they need to meet the TCFD recommendations.

Additionally, both CDSB and SASB will continue to participate in the Corporate Reporting Dialogue (CRD), an initiative designed to respond to market calls for greater coherence, consistency, and comparability between corporate reporting frameworks, standards, and related requirements. Through the CRD, CDSB and SASB will collaborate with other CRD Better Alignment Project participants to map their frameworks against the TCFD recommendations and, where possible, identify opportunities for aligning their metrics across all frameworks, taking into account their different focuses and audiences.

Through these efforts and others, CDSB, SASB, and partner organizations seek to deliver on the promise of the TCFD

recommendations and support the rapid uptake at scale of climate-related financial disclosures. The recommendations were intended to “provide a common set of principles that should help existing disclosure regimes come into closer alignment over time.”⁴² By facilitating more streamlined, more effective disclosure of financially material, climate-related information, the TCFD recommendations—implemented using the SASB standards and CDSB Framework—can help companies better meet the changing needs of investors, lenders, and insurance underwriters, while also supporting the efficient functioning of markets, as well as the long-term stability and resilience of the global economy.

⁴² TCFD, *Recommendations of the Task Force on Climate-Related Financial Disclosures* (December 2016).

Glossary

CDSB	Climate Disclosure Standards Board	KPI	Key Performance Indicator
COP24	Conference of Parties 24	NFR Directive	Non-Financial Reporting Directive
COSO	Committee of Sponsoring Organisations of the Treadway Commission	NDC	Nationally Determined Contributions
CRD	Corporate Reporting Dialogue	SASB	Sustainability Accounting Standards Board
ERM	Enterprise Risk Management	SDGs	Sustainable Development Goals
ESG	Environmental, Social, and Governance	TCFD	Task Force on Climate-related Financial Disclosures
GHG	Greenhouse Gas	WBCSD	World Business Council for Sustainable Development
IAG	Investor Advisory Group		
IPCC	Intergovernmental Panel on Climate Change		

Resources

Users of this guidance may also find value in the following CDSB, SASB, and TCFD materials, as well as the many other relevant resources available from the online [TCFD Knowledge Hub](#).

TCFD, *Recommendations of the Task-Force on Climate-Related Financial Disclosures*

<https://www.fsb-tcf.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf>

SASB Standards

<https://www.sasb.org/standards-overview/>

CDSB, *Framework for Reporting Environmental Information and Natural Capital*

https://www.cdsb.net/sites/default/files/cdsb_framework_2.1.pdf

SASB *Climate Risk Technical Bulletin*

<https://library.sasb.org/climate-risk-technical-bulletin/>

SASB *Implementation Guide for Companies*

<https://library.sasb.org/implementation-guide/>

CDSB, *Uncharted Waters: how can companies use financial accounting standards to deliver on the TCFD's recommendations?*

<http://cdsb.cdnf.net/sites/default/files/tcfdandfinancialaccountingrecommendationsv.1.pdf>

CDSB & CDP, *First Steps: Corporate climate and environmental disclosure under the EU Non-Financial Reporting Directive*

https://www.cdsb.net/sites/default/files/cdsb_nfrd_first_steps_2018.pdf

CDSB, supported by ACCA, Tellus Matter and Radley Yeldar, *Communicating climate change in mainstream reports. A guide to using CDSB's Reporting Framework. Version 1.0.*

https://www.cdsb.net/sites/cdsbnet/files/cdsbframeworkguidev1_0_2.pdf



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