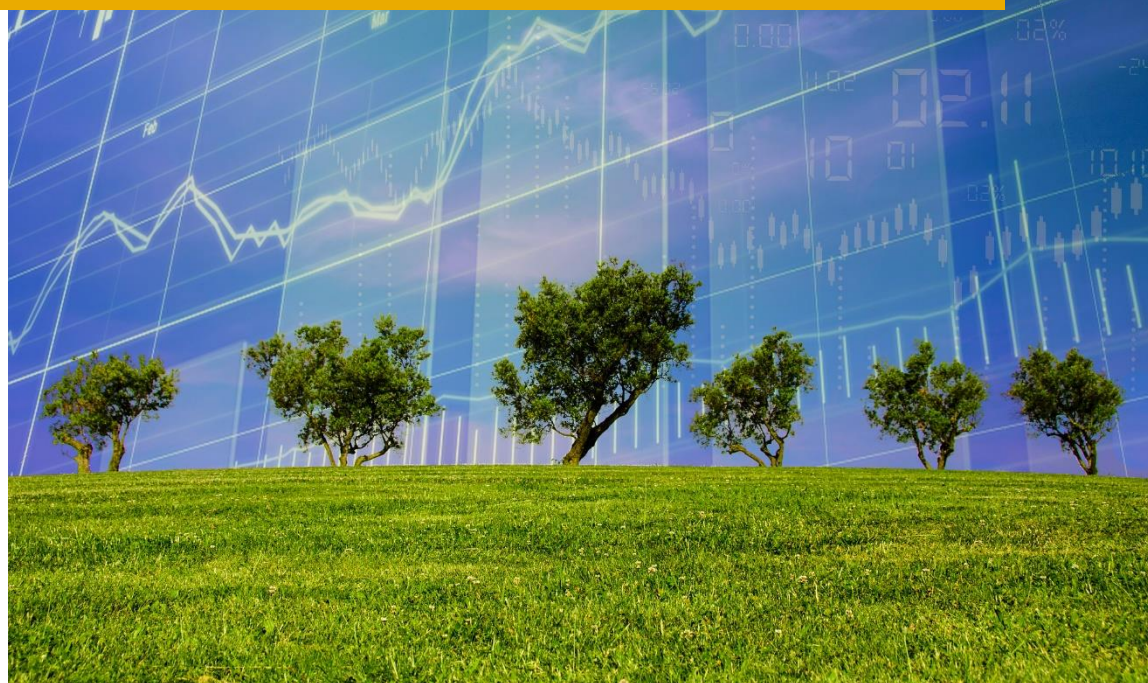


Climate-related Financial Disclosures: Examples of Leading Practices in TCFD Reporting by Financial Firms



August 2019

Foreword

It is often said that sunlight is the best medicine. That phrase feels particularly apt for green finance, where better disclosure and greater transparency are crucial to boosting the market.

\$100 trillion of new investment is needed before 2030 to ensure that global temperature increase stays below 2 degrees, as agreed at the Paris Climate Summit in 2015.

No part of society can lift this weight individually. That's where finance comes in. Our sector connects all levels of human activity – governments, businesses, charities, and individual citizens. It can provide and arrange the financing required to bring about the transition to a zero-carbon economy.

So far, green finance has occupied a market niche. Growth has been rapid, but from a low base. Deals and projects may tout their green credentials, but investors often have few means to test whether these are truly credible. This has deterred investment and prevented green finance from entering the mainstream.

The Task Force on Climate-related Financial Disclosures (TCFD), led by the Financial Stability Board (FSB), aims to change that. It has developed consistent, comparable disclosure standards on green finance, arming investors with better information when they decide where to put their money.

Progress on TCFD adoption is encouraging – major international financial services providers are integrating the recommendations into their internal processes and external communications. This report from the Institute of International Finance's Sustainable Finance Working Group details the efforts that individual members have made in implementing specific aspects of the standards, such as on governance, strategy and risk management. By highlighting examples of good disclosure, the report will help inform further discussion on this issue within the financial sector, and with other stakeholders.

Over 750 organisations have so far signalled their support for the TCFD process. However, adoption of the recommendations has not yet reached a critical mass. Firms that have started the implementation process vary in how they link their disclosures to the specific TCFD recommendations, and in how those disclosures are published. Idiosyncrasies like these hamper comparability between institutions, but bringing more adopters into the fold will likely introduce greater overall convergence.

A future report will discuss how to improve adoption of the standards, and improve the quality and comparability of information released by existing users.



Daniel Klier

Chair of the Institute of International Finance's Sustainable Finance Working Group and HSBC Group Head of Strategy and Global Head of Sustainable Finance

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I. INTRODUCTION

In 2015, the G20 Finance Ministers asked the Financial Stability Board (FSB) to provide guidance on how to account for climate change risks to the financial system. Through a variety of channels, including trends of warming temperatures, melting polar ice caps, and rising sea levels—as well as shocks such as flooding and drought—climate change has been affecting the environment in ways that are already destabilizing economies, undermining political stability, and threatening food and water security.

Yet until recently the impact of climate change on financial stability has been relatively low on the global policy agenda, hence this link has been less well understood than it should be. In his response to the G20 Finance Ministers' call to action, BoE Governor and then-FSB Chair Mark Carney famously cited the so-called “tragedy of the horizon”—i.e., the likelihood that the impact of climate change will be felt primarily beyond the traditional horizons of political, business, and credit cycles that tend to inform policy. In other words, by the time climate change becomes a defining issue for financial stability and the integrity of the global financial system, it may already be too late to reverse the damage. Against this backdrop, recent research from the [ECB](#) and [BOE](#) as well as commentary from the [BIS](#) and the [Federal Reserve Bank of San Francisco](#), has highlighted a range of important links between climate change and financial stability.

The public and private sectors both have important roles to play in achieving Paris Agreement emissions goals. Among the many public sector initiatives addressing the effects of climate change on the global financial system, the work of the Central Banks and Supervisors Network for Greening the Financial System (NGFS) stands out. The private financial services industry is also making progress: in 2015, the FSB established the [Task Force on Climate-related Financial Disclosures](#) (TCFD), a private sector-led initiative, in the spirit of Governor Carney's assertion that an “efficient market reaction to climate change risks as well as the technologies and policies to address them must be founded on transparency of information” and his call to develop “consistent, comparable, reliable and clear disclosure around the carbon intensity of different assets.” The TCFD has developed a framework for voluntary, consistent climate-related financial risk disclosures for use by companies in providing decision-useful information to investors, lenders, insurers, and other stakeholders; firms in the broader corporate sector as well as in the financial services industry have begun implementing the TCFD recommendations.

However, applying these recommendations presents a number of challenges. While the Climate Disclosure Standards Board and the Sustainability Accounting Standards Board have published a [TCFD Implementation Guide](#) for the corporate sector, targeted guidance for the financial services industry remains limited at the time of writing.¹ To help address this gap, the IIF Sustainable Finance Working Group (SFWG) has reviewed TCFD disclosures from the financial services sector to help identify leading practices, with the expectation that firms can learn from each other by seeing “what good looks like.”

Colleagues from across the industry are thus encouraged to engage with other firms—and with regulators—as they implement the TCFD's recommendations. Engagement is all the more important given how fast climate-related disclosure is evolving, and discussion that such disclosure may need to become mandatory. Indeed, potential regulatory approaches are briefly summarized towards the end of this report,

¹ ShareAction's Asset Owners Disclosure Project is a commendable exception, which includes the reports [Practical Solutions and Building Blocks for Asset Owners from Beginner to Best Practice](#) and [Got It Covered? Insurance in a Changing Climate](#).

with a view to assessing the relative merits of principles-based and prescriptive disclosure frameworks. The window to help shape the framework for disclosure is thus still open—but may not be for long. Acting quickly now will help firms benefit from climate- and transition-related opportunities while also avoiding a “Minsky moment” whereby assets are repriced rapidly in response to an abrupt realization of physical, liability, and transition risks from climate change. By acting now, financial firms can help mitigate the damage that climate change has yet to inflict, and will also equip themselves to better navigate the risks and opportunities in the uncharted waters ahead.

OBJECTIVES OF THE TCFD

In an April 2019 [article](#), Mark Carney, Banque de France Governor François Villeroy de Galhau and NGFS Chair Frank Elderson called on financial institutions to “raise the bar” to address climate-related risks. Part of the crucial role of the financial services industry is ensuring effective disclosure of climate-related risks—by financial firms as well as their corporate clients—so that all stakeholders can better assess the threats that climate change poses to the global economy and financial system.

In aiming to develop “voluntary, consistent, and comparable climate-related financial disclosures” that provide “decision-useful information,” the TCFD seeks to support appropriate risk pricing and capital allocation, and to identify, assess, and manage financial risks and opportunities from climate change to improve financial valuation. The TCFD notes that disclosures should “enable users to understand the impact of climate change on organizations” and highlights the “lack of information on the financial implications around the climate-related aspects of an organization’s business” as a key gap in current disclosure. In other words, up until now there has been a focus on disclosing climate-related information, such as greenhouse gas (GHG) emissions, without evaluating the associated financial risks and opportunities.

OBJECTIVES OF THIS REPORT

This report, produced under the auspices of the IIF SFWG, aims to provide insight on current “leading practices” among financial firms in implementing TCFD recommendations, providing a snapshot of “what good disclosure looks like.” These examples should help prompt discussion within the industry and inform dialogue with regulators and supervisors on how to achieve the goals of the TCFD, particularly on appropriate pricing of climate-related risks and financial stability. As a first priority, good climate-related disclosures should mirror TCFD recommendations closely—and in the order the TCFD has specified so as to facilitate comparability across firms. While challenging, explicitly linking firm disclosures to specific TCFD recommendations can help reveal disclosure gaps and encourage firms to address them—making this voluntary disclosure of climate-related risks as effective as possible.

This report is not intended to be a comprehensive list of good disclosure practices; rather, it is intended to provide examples that financial firms around the world may find helpful in developing their own reporting on climate-related risks. This first edition of the report will serve as a baseline; annual updates will include more examples and serve as a means of tracking improvements in climate-related financial disclosure. Many firms acknowledge disclosure of climate-related financial risks to be a relatively new practice: further refinement is needed. It is also clear that the pace of progress towards the Paris Agreement goals and the assessment reports of the Intergovernmental Panel on Climate Change (IPCC) will continue to inform the evolving discussion around climate-related disclosures.

TCFD RECOMMENDATIONS

In its *Final Report* published in June 2017, the TCFD recommends that firms disclose climate-related financial risks and opportunities across Governance, Strategy, Risk Management, and Metrics and Targets categories (Table 1). The governance recommendations call for firms to describe board oversight of and management’s role in assessing climate-related risks and opportunities. Strategy disclosure recommendations include describing climate-related risks and opportunities across the short, medium, and long terms; their impact on business units, strategy, and financial planning; and on resilience of that strategy in light of climate-related risk scenarios. Risk management disclosures should describe processes for identifying, assessing, and managing climate-related risks, as well as how these processes are integrated into an organization’s risk management framework. Metrics and targets recommendations include specifying the metrics used in strategy and risk management climate-related disclosures, revealing GHG emissions, and describing targets to manage climate-related risks and opportunities. To promote disclosure of “decision-useful” information, the TCFD has outlined seven Principles for Effective Disclosures, which should: 1) represent relevant information; 2) be specific and complete; 3) be clear, balanced, and understandable; 4) be consistent over time; 5) be comparable among companies within a sector, industry, or portfolio; 6) be reliable, verifiable, and objective; 7) be provided on a timely basis.

Table 1 — TCFD Recommendations and Supporting Recommended Disclosures

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

Source: TCFD – June 2017 Annex

² Scope 1 GHG emissions are direct emissions from sources that are owned or controlled by an entity. Scope 2 GHG emissions are indirect emissions from sources that are owned or controlled by an entity (e.g. electricity, heat, or steam purchased from a utility provider). Scope 3 GHG emissions are from sources not owned or directly controlled by an entity but related to the entity’s activities (e.g. employee commutes).

SUPPLEMENTAL GUIDANCE FOR THE FINANCIAL SECTOR

The TCFD has provided supplemental guidance for the financial sector across Strategy, Risk Management, and Metrics and Targets and has specified guidance for financial firms by type: banks, insurance companies, asset owners, and asset managers (Table 2). There is no supplemental guidance for the financial sector regarding Governance. Banks have only three supplemental recommendations, whereas asset managers and insurance companies each have five, and asset owners have six.

Table 2 – Supplemental Guidance for the Financial Sector

| Types of Financial Institutions | Governance | | Strategy | | | Risk Management | | | Metrics and Targets | | |
|---------------------------------|------------|----|----------|----|----|-----------------|----|----|---------------------|----|----|
| | a) | b) | a) | b) | c) | a) | b) | c) | a) | b) | c) |
| Banks | | | ☐ | | | ☐ | | | ☐ | | |
| Insurance Companies | | | | ☐ | ☐ | ☐ | ☐ | | ☐ | | |
| Asset Owners | | | | ☐ | ☐ | ☐ | ☐ | | ☐ | ☐ | |
| Asset Managers | | | | ☐ | | ☐ | ☐ | | ☐ | ☐ | |

Source: TCFD – June 2017 Annex

CRITERIA TO SELECT LEADING PRACTICES

With input from the SFWG, TCFD disclosures were selected from a group of over 40 financial institutions. The following examples are intended to help users in understanding approaches to disclosure of climate-related financial risks and opportunities, and can also serve as models for other firms to draw from in preparing their disclosures. Good disclosure should be helpful to both users and preparers; towards this end practices were compared to each recommendation and specific guidance for each type of financial institution. In looking for examples of sound disclosure practices, reference was also made to specific Enhanced Disclosure Task Force (EDTF)³ principles—including the goal of providing information that is comparable across firms; a comprehensive overview of all key activities and risks; and a clear, balanced and understandable format.

As the TCFD offers clear guidance on sound disclosure practices, financial firms can best provide decision-useful information by adhering as closely as possible to each recommendation. By mapping disclosures into the TCFD framework, firms can better communicate objectives for each item, while also making disclosures easier for users to compare across firms. Comparability is a key criterion for good disclosure: in some cases, firms provide relevant and potentially decision-useful disclosures but do not explicitly link them to specific TCFD recommendations. The resulting lack of comparability makes it harder to achieve a more uniform and harmonized framework for climate-related financial disclosures—

³ EDTF, *Enhancing the Risk Disclosures of Banks*, available on the FSB website [here](#).

a fundamental goal for both public and private sector stakeholders. Linking disclosures explicitly to specific TCFD recommendations is thus a key element of “what good looks like.”

II. TCFD IMPLEMENTATION: LEADING PRACTICES

The TCFD’s *2019 Status Report* summarizes the results of an artificial intelligence review of 2016, 2017, and 2018 disclosures across several industries, which found that banking had the highest level of implementation overall.⁴ While many financial services firms provided information corresponding to most TCFD recommendations, they varied in the degree to which they explicitly linked disclosures to specific recommendations—as noted above, this hinders comparability of disclosures across firms. Much of the reviewed disclosure would also benefit from clearer identification of risks and opportunities around climate change. For instance, some organizations disclose strategic measures without explaining management’s perception of the risks and opportunities that the measures are meant to address. Most disclosures provided qualitative information, and several firms also disclosed quantitative metrics; some even presented quantitative results of scenario analyses for a portion of their portfolio. However, only a minority of firms disclosed their criteria for materiality. As data availability and methodology improve, more quantitative disclosures—including around scenario analysis—should be helpful in assessing the materiality of climate change risks.

Firms published climate-related financial disclosures in a variety of report types including: annual reports or climate position papers; in Environmental, Social, and Governance (ESG) or Corporate Social Responsibility (CSR) reports; in an integrated report or Global Reporting Initiative (GRI) documents; and as standalone TCFD reports. The number of pages dedicated to TCFD-related information ranged from just one to 30 pages; standalone TCFD reports tended to be lengthier than climate-related financial disclosures included in annual reports. Without seeking to endorse any specific type of report as a leading practice, it is nonetheless clear that better-aligned disclosure practices and similar reporting across firms would enhance comparability. However, limited data availability—and the fact that the field of climate-related disclosure practices has only come into existence recently—has meant that firms are adopting varying approaches as they seek the best way to assess and disclose these risks and opportunities. As sound disclosure practices gradually emerge and more firms follow examples set by their industry peers, more convergence in reporting should result.

Material risks that environmental factors pose to a company and the risks that a company’s activities pose to the environment are conceptually distinct but interrelated. Some firms have already incorporated both concepts in their TCFD practices by assessing the scenarios (e.g., 1.5°C, 2°C, 3°C, etc.) that their portfolio’s current GHG emissions levels are aligned with, demonstrating the rising awareness among financial firms of the relationship between financial stability and climate change.

⁴ TCFD, *2019 Status Report*, [page 11](#). The TCFD Secretariat excluded asset managers and asset owners from the artificial intelligence review because these two industries often provide climate-related financial disclosures to clients and beneficiaries in types of financial reporting that may not be publicly-available.

The following sections of this report describe examples of TCFD implementation practices that merit the attention of firms from across the financial services industry. While the disclosures cited below are not intended to constitute an exhaustive list of leading practices, we hope they will help firms assess the decision-usefulness of their own TCFD reporting. The examples provided cover each of the TCFD’s four main recommendation categories — Governance, Strategy, Risk Management, and Targets and Metrics — and are further categorized by TCFD recommendation (summarized in Table 1) and, where relevant, by supplemental guidance to different types of financial firms: banks, insurance companies, asset owners, and asset managers (summarized in Table 2).

GOVERNANCE

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

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

Firms describe both board oversight and management’s role in the assessment and management of climate-related issues in a variety of different ways. Some disclose how these bodies are briefed, the frequency of board meetings or committees, what they review (e.g. objectives, strategy and plans), and/or how they regard climate issues compared to other priorities. Other firms disclose their organizational structures, explaining the responsibilities of the board, management and relevant committees. A few disclose their environmental management system (e.g. UBS’s annual objectives and plans are managed as a part of ISO 14001 – certified environmental management system (EMS) with defined management accountabilities across the firm).⁵ Most reviewed firms disclose a baseline level of information on governance (key to achieving the Paris Agreement goals and mainstreaming sustainable finance, along with a shift to a longer-term focus).

Given these general trends and practices, the focus in this section is on how governance disclosure can be improved further across the financial services sector rather than singling out specific examples. Helpful guidance on climate-related governance is provided in the World Economic Forum’s report *How to Set Up Effective Climate Governance on Corporate Boards*.⁶ There is no one-size-fits-all approach to climate governance, and effective governance styles will vary as a function of organizational purpose, business model and other factors. However, the guiding principles and questions presented below can help set up appropriate governance, as users will want to know the answers to these questions when assessing governance effectiveness as it relates to climate-related risks and opportunities:

⁵ See page 2 of UBS’s [Our climate strategy](#)

⁶ World Economic Forum, [How to Set Up Effective Climate Governance on Corporate Boards Guiding principles and questions](#)

- The board’s accountability for long-term climate issues;
- the board’s composition to assure sufficiently diverse expertise in climate issues;
- the board committee’s structure to effectively integrate climate considerations;
- the board’s assurance of management’s assessment of the short-, medium-, and long-term materiality of climate-related risks and opportunities for the company;
- and how the company’s management incentive scheme is designed to align the interests of executive directors to the long-term prosperity of the company.

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

***Guidance for All Sectors** – In describing management’s role related to the assessment and management of climate-related issues, organizations should consider including the following information: whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues; a description of the associated organizational structure(s); processes by which management is informed about climate-related issues, and; how management (through specific positions and/or management committees) monitors climate-related issues.*

Please refer to Governance, Recommended Disclosure a), Guidance for All Sectors.

STRATEGY

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

***Guidance for All Sectors** – Organizations should provide the following information: a description of what they consider to be the relevant short-, medium-, and long-term horizons, taking into consideration the useful life of the organization’s assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms; specific climate-related issues for each time horizon (short, medium, and long term) that could have a material financial impact on the organization and distinguish whether the climate-related risk are transition or physical risks; and a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization. Organizations should consider providing a description of their risks and opportunities by sector and geography, as appropriate. In describing climate-related issues, organizations should refer to Tables A1 and A2 (pp. 72-73) in the [TCFD’s June 2017 Annex](#) on Implementing the Recommendations.*

Intesa Sanpaolo: The TCFD September 2018 *Status Report* singles out Intesa Sanpaolo’s disclosures as an example that may be decision-useful for users. The firm succinctly summarizes direct and indirect risks from climate change in tables that clearly identify time frame (short-, medium-, and long-term horizons), potential impacts, and actions to manage and mitigate these potential threats. Users benefit from a well-categorized taxonomy of climate-related transition and physical risks facing preparers.⁷ This disclosure is clear and relatively comprehensive but could be more comparable if tied explicitly to Strategy – Recommended Disclosure a) – Guidance for All Sectors.

⁷ Intesa Sanpaolo, *Environment and climate change: management of potential risks and impacts*, page 50. See [here](#).

Supplemental Guidance – Banks — Banks should describe significant concentrations of credit exposure to carbon-related assets.⁸ Additionally, banks should consider disclosing their climate-related risks (transition and physical) in their lending and other financial intermediary business activities.

ING: ING has partnered with the 2° Investing Initiative (2°ii) to extend the latter’s Paris Agreement Capital Transition Assessment ([PACTA](#)) framework—which is a free and open-source climate scenario analysis tool for corporate bond and publicly-listed equity portfolios that uses sector roadmaps to slow global warming—to corporate lending portfolios. This work is closely tied to ING’s open-source Terra approach, which focuses on sectors in the bank’s loan book that are most exposed to greenhouse gas emissions, including energy, automotive, shipping & aviation, steel, cement, residential mortgages, and commercial real estate. This approach is still in its early stages but has the potential to be clear, comprehensive, and comparable, though it would benefit from being linked directly to appropriate TCFD recommendations, such as Strategy – Recommended Disclosure a) – Supplemental Guidance – Banks.⁹

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

Guidance for All Sectors – Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning. Organizations should consider including the impact on their businesses and strategy in the following areas: products and services; supply chain and/or value chain; adaptation and mitigation activities; investment in research and development; and operations (including types of operations and location of facilities). Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations’ disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time. Organizations should also consider including in their disclosures the impact on financial planning in the following areas: operating costs and revenues; capital expenditures and capital allocation; acquisitions or divestments; and access to capital. If climate-related scenarios were used to inform the organization’s strategy and financial planning, such scenarios should be described.

Intesa Sanpaolo: As noted in the TCFD September 2018 *Status Report*, Intesa Sanpaolo’s disclosure describes potential effects of risks on the firm’s businesses, strategy and financial planning (in tabular format as noted above). Users benefit from clearly-indicated links between risks and potential fallout, as such contextual explanations enable users to better understand climate-related financial impacts. While clear and relatively comprehensive, this disclosure would have been even more decision-useful to users by indicating how these risks and opportunities are prioritized, allowing users to better assess materiality. Comparability could be enhanced by referring to appropriate TCFD recommendations, including Strategy – Recommended Disclosure b) – Guidance for All Sectors.

HSBC: HSBC indicates in the Strategy section of its 2018 TCFD disclosure that it has launched new products to facilitate the transition to a low-carbon economy and that it has pledged to provide \$100 billion in sustainable finance by 2025. Preparers note that the bank had already reached \$28.5 billion of

⁸ The TCFD encourages banks to use a consistent definition to support comparability. For credit exposure to carbon-related assets, the TCFD recommends banks define carbon-related assets as those tied to the energy and utilities sectors under the Global Industry Classification Standard, excluding water utilities and independent power and renewable electricity producer industries.

⁹ ING describes its Terra approach on its website [here](#).

that goal by the time of writing and that it was developing metrics to better measure and recognize changes undertaken by clients making the transition towards a low-carbon economy. HSBC describes how sustainability training and online learning for all its employees is key to incorporating the impact of climate-related risks and opportunities in its strategy. Such educational efforts are an important component of a holistic picture depicting firms' capacity to create value over time as climate-related impacts on operations and strategy continue to increase.

Deutsche Bank: Deutsche Bank co-authored a research paper with a climate intelligence advisory firm titled *Measuring Physical Climate Risk in Equity Portfolios* in late 2017. Although this document is not formal TCFD disclosure, it does provide a useful broader perspective on how physical risks from climate change can affect operations, supply chains and their investment portfolio.¹⁰ Due to data and methodological limitations, many organizations are still hesitant to disclose granular information regarding climate change in their annual reports. Until data availability and methodology improve, such research may prove helpful in providing users with more granular, decision-useful information. While relatively clear and comprehensive, comparability could again be enhanced by referring to relevant TCFD recommendations throughout the report.

Supplemental Guidance – Insurance Companies — *Insurance companies should describe the potential impacts of climate-related risks and opportunities, as well as provide supporting quantitative information where available, on their core businesses, products, and services, including: information at the business division, sector, or geography levels; how the potential impacts influence client, cedent, or broker selection; and whether specific climate-related products or competencies are under development, such as insurance of green infrastructure, specialty climate-related risk advisory services, and climate-related client engagement.*

Swiss Re: In its Annual Report's TCFD Climate Strategy section, Swiss Re describes in a clear, comprehensive, and relatively comparable way the physical and transition risks and opportunities and their potential impacts on both re/insurance and investment businesses. Swiss Re's preparers provide decision-useful information to users by listing potential transmittal channels of climate risks, providing analytical narratives on how climate risks can affect their core businesses, and concluding whether these risks are manageable for Swiss Re. As examples, physical risks include reduction or disruption of Swiss Re's business operations, modelling and pricing of weather-related natural perils, impacts on the economic viability of (re)insurance protection, and impact on real assets exposed to weather-related natural perils. Transition risks include climate-related litigation risks and risks from technological and market shifts. Opportunities related to physical risks include the ability to offer effective natural catastrophe protection and weather insurance solutions and to expand (re)insurance protection by focusing on non-traditional clients, underdeveloped markets and innovative risk transfer instruments. Opportunities related to transition risks include the development of a market for offshore wind risks and investment opportunities in green bonds, infrastructure renewables and sustainable real estate.¹¹ Comparability could be enhanced

¹⁰ Figure 2. Four Twenty Seven's climate risk indicators in page 3, operational risk indicators in page 10, supply chain indicators in page 12, and market risk indicators in page 13 of Deutsche Asset Management' report, *Measuring physical climate risk in equity portfolios*, co-authored by Four Twenty Seven. See [here](#).

¹¹ Swiss Re, *2018 Financial Report*, available [here](#).

further by going beyond the TCFD's Strategy pillar and linking disclosed information to the details of specific recommendations as explicitly as possible.

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

GMPF (The Greater Manchester Pension Fund): In the TCFD disclosures that feature in its 2018 annual report, GMPF clearly describes how ESG policies and considerations, including climate change, are incorporated into the mandates of external fund managers, and also into the selection and monitoring of them. It also describes how ESG factors are considered in conjunction with other factors such as financial return, liquidity and complexity across different asset classes. GMPF's disclosure is clearly organized, neatly following the TCFD recommendation framework, although a part of their disclosures may fit better in a different section or potentially refer to multiple sections via a tagging system. For example, although risk categories such as market/technology shifts, reputation and policy/legal feature in Risk Management – Recommended Disclosure (a), such information is also relevant to Strategy – Recommended Disclosure (a).¹²

Supplemental Guidance – Asset Managers — *Asset managers should describe how climate-related risks and opportunities are factored into relevant products or investment strategies. Asset managers should also describe how each product or investment strategy might be affected by the transition to a lower-carbon economy.*

Amundi: In its 2018 climate change report, Amundi notes that it has designed financial products across major asset classes as a means of financing the energy transition. On the equity side, these include low-carbon indices co-developed with Swedish National Pension Fund AP4, Fonds de Réserve pour les Retraites (FRR) and MSCI, with subsequent launch of indexed and ETF investment solutions; and the Green Technology Equity Socially Responsible (SRI) Strategy – which invests in shares of European companies that derive a minimum of 20% of their revenue from the development of green technologies. On the fixed income side, Amundi offers multiple green bond strategies in order to finance the energy transition, key energy transition players, and key sector leaders, as well as to enable investors to measure the positive impact of their investments on the environment in tons of CO₂ avoided per million invested. These disclosures help investors and other users better assess transition risks and opportunities and enables them to better understand the climate-related impact of their investments.¹³

DNB: In its 2018 annual report, DNB Asset Management (DNB AM) describes characteristics of some of their dedicated sustainability-themed funds, including carbon intensity and ESG ratings for portfolio constituents. These descriptions of funds alongside with tables which summarize climate-related risks and opportunities and potential financial impacts for DNB AM help users to better understand how climate issues are factored into relevant products or investment strategies. Separately, DNB AM participates

¹² GMPF, *2018 Annual Report*, [Page 33](#).

¹³ Amundi, *Investing for our Future: Mobilizing Investors and Innovating against Climate Change*, [Page 6](#).

in UNEP FI's Investor Pilot,¹⁴ which includes 20 institutional investors and uses Carbon Delta standardized methodologies for forward-looking, scenario-based assessment of climate-related risks and opportunities (e.g. Climate Value at Risk, Portfolio Warming Potential, etc.).¹⁵

Recommended Disclosure c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.¹⁶

Guidance for All Sectors – Organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a lower-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks. Organizations should consider discussing: where they believe their strategies may be affected by climate-related risks and opportunities; how their strategies might change to address such potential risks and opportunities; and the climate-related scenarios and associated time horizon(s) considered. Refer to Section D in the [TCFD's June 2017 report](#) for information on applying scenarios to forward-looking analysis.

AXA and Citi: AXA's¹⁷ and Citi's¹⁸ disclosures are useful because they provide not only the results of scenario analysis but also detailed assumptions and methodologies. This level of granular disclosure provides high credibility for disclosed information by allowing users a chance for verification. In addition, their analysis and disclosures are helpful because Citi describes limitations of their methodologies and potential next steps, while AXA explains different analytical methodologies for different asset classes (e.g. sovereign, real assets, etc.). Furthermore, AXA discloses the result of a Climate Value-at-Risk (Climate VaR) exercise on their portfolio, which is decision-useful quantitative information to assess organizational resilience.

SMBC: SMBC conducted a scenario analysis on water disaster-related physical risks. They used the Representative Concentration Pathways (RCP) 2.6 scenario (2 °C) and the RCP 8.5 scenario (4 °C), taking into account the probability of flooding for each climate scenario. Interestingly, they disclosed that accumulated credit costs expected by 2050 would be approximately JPY 30-40 billion. Such clear quantitative disclosure provides a high level of granularity that will likely prove especially helpful to users, and future disclosures from the financial services industry are likely to increasingly include similar levels of detail as methodology, data availability, and disclosure practices improve.¹⁹

Supplemental Guidance – Insurance Companies — *Insurance companies that perform climate-related scenario analysis on their underwriting activities should provide the following information: description of the climate-related scenarios used, including the critical input parameters, assumptions and considerations, and analytical choices. In addition to a 2°C scenario, insurance companies with substantial exposure to weather-related perils should consider*

¹⁴ UNEP FI, May 2019, [CHANGING COURSE, a comprehensive investor guide to scenario-based methods for climate risk assessment, in response to the TCFD](#).

¹⁵ DNB Group, 2018 [Annual Report](#), pp. 48-49.

¹⁶ ANZ, Barclays, BBVA, BNP Paribas, Bradesco, CITI, DNB, Itau, NAB, Rabobank, RBC, Santander, Société Générale, Standard Chartered, TD, and UBS participated in banking pilot projects under the auspices of the United Nations Environment Program (UNEP FI), collaborated with Oliver Wyman and Acclimatise to develop methodologies to test their climate resilience.

¹⁷ AXA, *Transition risk analysis: our approach to assessing climate impacts on Axa's Corporate Bonds & Equity portfolio*, page 8. See [here](#).

¹⁸ Citi, *Finance for a Climate-Resilient Future* — Citi's TCFD Report, Section 2: Climate scenario analyses, page 8. See [here](#).

¹⁹ Disclosure of Information in Response to Recommendations by the TCFD. [News Release](#).

using a greater than 2°C scenario to account for physical effects of climate change and time frames used for the climate-related scenarios, including short-, medium-, and long-term milestones.

Aviva: Aviva provides climate-related financial disclosures that are relatively clear, comprehensive, and comparable. The firm uses the PACTA model, which tests alignment with the International Energy Agency’s 2°C scenario and focuses on utilities, fossil fuels, and the automotive sectors owing to their high carbon intensity. Preparers also refer to the IPCC’s 4°C and 1.5°C scenarios. Much of this information appears in Aviva’s Risk management, Metrics and Targets and dedicated Climate VaR sections of its *Climate-Related Financial Disclosure 2018* report, though its comparability could be enhanced by referring to Strategy — Recommended Disclosure c) — Supplemental Guidance — Insurance Companies and other relevant TCFD recommendations.²⁰

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

Ontario Teachers’ Pension Plan: In the Strategy section of its TCFD disclosures, OTPP examines the how three scenarios (a low-carbon world, status quo representing pre-2018 world commitments, and a high-carbon world) could affect plan assets as well as investee companies. The analysis considers various sources of risk, including policy, legal, technology, capital, consumer preferences, and physical risk.²¹

TPT Retirement Solutions: TPT uses a multi-asset climate change scenario tool developed with the consultancy Mercer to track its exposure to climate-related opportunities and risks across asset classes, including developed market global equities, emerging market global equities, real estate, infrastructure, emerging market debt, high-yield debt, and investment-grade credit. TPT also uses a two degrees scenario analysis framework from the consultancy 2°ii that considers a portfolio’s deviation over a five year time frame from an optimally-diversified portfolio in terms of energy and technologies under the two degrees pathway as defined by the International Energy Agency.²²

OPTrust: OPTrust evaluated the impact of various climate change scenarios over the medium and long terms on their overall fund, as indicated in its TCFD disclosures.²³ This firm also partnered with Mercer to conduct a portfolio climate risk assessment to evaluate its current climate-related risks and opportunities, the results of which feature in a separate report.²⁴

Environmental Agency Pension Fund: EAPF collaborated with Mercer to model the impact of four scenarios to 2050 on its fund. The exercise reflected the economic cost of emissions, physical damages, and policy developments of each scenario, which were: Transformation (2°C), Coordination (3°C), Fragmentation (lower damages - 4°C), and Fragmentation (higher damages - 4°).²⁵ Of note, EAPF participated

²⁰ Aviva, *Aviva’s Climate-Related Financial Disclosure 2018*, available [here](#).

²¹ OTPP, *2018 Climate Change Report*, available [here](#).

²² TPT Retirement Solutions, *Climate Change Disclosure Report: Risk and opportunities in the growth portfolio*, available [here](#).

²³ OPTrust, *Climate Change: Delivering on Disclosure*, available [here](#).

²⁴ OPTrust and Mercer, *OPTrust Portfolio Climate Risk Assessment*, available [here](#).

²⁵ EAPF, *Policy to address the impacts of climate change*, available [here](#).

in ShareAction’s Asset Owners Disclosure Project, which examines the climate strategy practices of 22 asset owners across several jurisdictions.²⁶

ATP Group: ATP Group discusses scenario analysis extensively in its *Responsibility 2018* report with a view to incorporating climate considerations into its investment processes. The firm refers to four scenarios for future GHG concentrations developed by the UN Climate Panel in its recent Assessment Report (AR5), referred to as four possible Representative Concentration Pathways (RCP).²⁷ ATP also discloses the results of the PACTA scenario analysis tool in analyzing the exposure of its portfolio of listed equities and corporate bonds to transition risk, but describes the limits of PACTA methodology in its *Responsibility 2018* report.²⁸

RISK MANAGEMENT

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

Guidance for All Sectors – Organizations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organizations determine the relative significance of climate-related risks in relation to other risks. Organizations should describe whether they consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) as well as other relevant factors considered. Organizations should also consider disclosing the following: processes for assessing the potential size and scope of identified climate-related risks and definitions of risk terminology used or references to existing risk classification frameworks used.

Société Générale: Regarding transition risks, Société Générale provides an overview of its risk management processes via internal ratings reviews, scenario analysis and client engagement, although some details, such as underlying assumptions, have not been disclosed. The bank measures additional credit risk from climate change and incorporates it into their annual internal rating reviews. A 2040 scenario analysis was conducted on their lending portfolio under an assumption of the identical extension of the loans and the non-adaptation measures of borrowers. When a client is identified as vulnerable, the client relations manager must issue an opinion on how the client can reduce its vulnerability. Although the company does not describe the significance of climate-related risks relative to other risks as recommended by the TCFD, it explains that climate risk is incorporated into their risk typology and is a factor that could aggravate other existing risks, including credit risk.²⁹

Supplemental Guidance – Banks — Banks should consider characterizing their climate-related risks in the context of traditional banking industry risk categories such as credit risk, market risk, liquidity risk, and operational risk. Banks should also consider describing any risk classification frameworks used (e.g. the Enhanced Disclosure Task Force’s framework for defining “Top and Emerging Risks”).³⁰

²⁶ ShareAction, *Practical Solutions and Building Blocks for Asset Owners from Beginner to Best Practice*, available [here](#).

²⁷ ATP Group, Responsibility reports, available [here](#).

²⁸ ATP Group, Responsibility reports, Climate in ATP, available [here](#).

²⁹ Société Générale, *Registration Document 2019 – Annual Financial Report 2018*, Evaluation of transition risks (p. 272), types of risks (p. 149).

³⁰ The EDTF defined a top risk as “a current, emerged risk which has, across a risk category, business area or geographical area, the potential to have a material impact on the financial results, reputation or sustainability of the business and which may crystallize within a short, perhaps one

J.P. Morgan: J.P. Morgan identifies climate-related credit, investment, market, and operational risks and evaluates and manages each risk category through its Independent Risk Management (IRM) function. The firm’s Global Environmental and Social Risk Management team — which is a part of IRM — manages its environmental and social risks through the establishment of governance standards and restrictions in higher-risk sectors. J.P. Morgan’s Environmental and Social Policy Framework describes the firm’s methods for assessing environment- and social-related reputational and financial risks.³¹

Supplemental Guidance – Insurance Companies — *Insurance companies should describe the processes for identifying and assessing climate-related risks on re-insurance portfolios by geography, business division, or product segments, including the following risks: physical risks from changing frequencies and intensities of weather-related perils, transition risks resulting from a reduction in insurable interest due to a decline in value, changing energy costs, or implementation of carbon regulation, and liability risks that could intensify due to a possible increase in litigation.*

Suitable reinsurance portfolio examples have yet to be identified.

Supplemental Guidance – Asset Owners — *Asset owners should describe, where appropriate, engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks to improve data availability and asset owners’ ability to assess climate-related risks.*

Varma,³² TPT Retirement Solutions,³³ OPTrust³⁴, OTPP,³⁵ ATP Group,³⁶ and EAPF:³⁷ Numerous asset owners describe their engagement with issuers in varying degrees of detail. Such decision-useful descriptions highlight various approaches, such as investee engagement by sector or other types of specific corporate engagement initiatives that the asset owner has undertaken.

Supplemental Guidance – Asset Managers — *Asset managers should describe, where appropriate, engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks in order to improve data availability and asset managers’ ability to assess climate-related risks. Asset managers should also describe how they identify and assess material climate-related risks for each product or investment strategy. This might include a description of the resources and tools used in the process.*

BlackRock: As recommended in the TCFD supplemental guidance for asset managers, in its 2018 investment stewardship report BlackRock discloses in a clear, comprehensive, and relatively comparable manner how they engage with companies they invest in.³⁸ BlackRock sends letters to the CEOs and General Counsels of carbon-intensive companies to ask their views on risks and opportunities from climate change and how climate risk might influence future long-term capital expenditure plans, GHG emissions,

year, time horizon.” EDTF defined an emerging risk as “one which has large uncertain outcomes which may become certain in the longer term (perhaps beyond one year) and which could have a material effect on the business strategy if it were to occur.”

³¹ J.P. Morgan Chase & Co., *Understanding Our Climate-Related Risks and Opportunities*, available [here](#).

³² Varma, “Pension assets increasingly climate friendly — carbon footprint of Varma’s investments in dramatic decline,” available [here](#).

³³ TPT Retirement Solutions, *Climate Change Disclosure Report: Risk and opportunities in the growth portfolio*, available [here](#).

³⁴ OPTrust, *Climate Change: Delivering on Disclosure*, available [here](#).

³⁵ OTPP, *2018 Climate Change Report*, available [here](#).

³⁶ ATP Group, Responsibility reports, available [here](#).

³⁷ EAPF, *Policy to address the impacts of climate change*, available [here](#).

³⁸ BlackRock *Investment Stewardship 2018 Annual Report*.

management of GHG emissions, and whether companies conducting scenario analysis eventually integrate conclusions from this research into their business strategy.³⁹ This kind of engagement is seen as indispensable in assessing future performance, and hence to BlackRock's portfolio management strategies.

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

Guidance for All Sectors – Organizations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organizations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations. In describing their processes for managing climate-related risks, organizations should address the risks included in Tables A1 and A2 (pp. 72-73) in the [TCFD's June 2017 Annex on Implementing the Recommendations](#), as appropriate.

Barclays: Barclays creates a materiality matrix in its 2018 ESG report to describe the significance of climate risks to the bank relative to other ESG risks. The matrix is based on subjective judgement but supported by many inputs including direct stakeholder engagement (e.g. surveys). The matrix thus provides valuable insights on how management views climate risks in a clear, relatively comprehensive, and comparable way. Separately, the preparers explain that in 2019-20 that the bank will attempt to determine which climate risks are expected within which time horizons, and also by sector and geography.⁴⁰ As with almost all other disclosures reviewed, comparability could be enhanced by explicitly linking content to specific, relevant TCFD recommendations.

DNB: Although DNB does not describe its processes for determining materiality, it notes that its most material climate-related risks and opportunities emanate from its corporate lending activities. As such, the preparers evaluate ESG factors, which encompass climate risk, for each corporate client as part of its credit risk management processes. DNB also highlights how it is using green loans and bonds and various forms of engagement with clients to incentivize their transition to low-carbon and climate-resilient businesses. Through these explanations, DNB describes their processes for mitigating and controlling climate-related risks on their corporate lending.⁴¹ While clear and relatively comprehensive, explicit links to relevant TCFD recommendations would enhance comparability.

Supplemental Guidance – Insurance Companies — Insurance companies should describe key tools or instruments, such as risk models, used to manage climate-related risks in relation to product development and pricing. Insurance companies should also describe the range of climate-related events considered and how the risks generated by the rising propensity and severity of such events are managed.

Aviva: Aviva specifically uses its Climate VaR model to evaluate the impact that different extreme weather hazards have across clearly-defined IPCC scenarios to determine the impact on premiums and therefore pricing of its general insurance products. A similar approach is used on the life insurance side.⁴²

³⁹ "BlackRock [Investment Stewardship's approach to engagement on climate risk](#)."

⁴⁰ Focusing on key issues, significance to Barclays in page 10. TCFD implementation on page 28 and after. [Barclays ESG Report 2018](#).

⁴¹ DNB Group, 2018 [Annual Report](#), pp. 48-49.

⁴² Aviva, 2018 [Climate related financial disclosure](#), page 21.

While clear and comprehensive, more overt links to relevant TCFD recommendations could enhance comparability.

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

GMPF: GMPF describes its efforts to manage climate risks through engagement with investees, both through external fund managers and in collaboration with wider industry groups. Although GMPF does not directly describe how they manage their portfolio positioning as suggested by the TCFD, their explanations of how they engage with companies to improve their approach to becoming more resilient and more transparent in reporting appears to be well-aligned with the purpose of this guidance.⁴³

Supplemental Guidance – Asset Managers — *Asset managers should describe how they manage material climate-related risks for each product or investment strategy.*

PIMCO: PIMCO's analysts and portfolio managers spend a significant amount of time meeting with senior management of issuers, e.g. conducting over 4000 calls and in-person meetings in 2017. In addition to discussing financial matters, they focus on material ESG issues, such as how risk management and business strategy address conduct, cybersecurity and carbon risk. This includes encouraging increased transparency and reporting on ESG matters, as well as alignment with emerging global standardized frameworks such as the Sustainability Accounting Standards Board (SASB). Although PIMCO does not have access to all the channels available to more equity-focused investors (in particular proxy voting), they have found regular dialogue across multiple touchpoints to be a highly effective method of communication.⁴⁴

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

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

Standard Chartered: Standard Chartered describes how climate risks are recognized and integrated into its overall risk management in its *Annual Report 2018*. Preparers list its principal risk types and principal uncertainties, and climate related physical risks and transition risks are included in principal uncertainties. The firm discusses the potential impact, likelihood, velocity of change and context of climate issues, and describes its mitigating actions and next steps. The firm discusses other principal uncertainties in a comparable manner so that users can understand how climate issues are regarded in their overall risk management and the relative significance of climate issues to the organization in the context of other uncertainties. Standard Chartered also highlights the physical and transition risks and opportu-

⁴³ GMPF, *2018 Annual Report*, [Page 34](#).

⁴⁴ PIMCO, *ESG Investing Report*. See [here](#).

nities that climate change poses to corporations, governments, and households. In 2017 the bank included climate change as a principal uncertainty within its enterprise-wide risk management framework.⁴⁵

METRICS AND TARGETS

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

Guidance for All Sectors – Organizations should provide the key metrics used to measure and manage climate-related risks and opportunities, as described in Tables A1 and A2 (pp. 72-73).⁴⁶ Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable. Where climate-related issues are material, organizations should consider describing whether and how related performance metrics are incorporated into remuneration policies. Where relevant, organizations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a lower-carbon economy. Metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.

AXA, Aviva, ING, and Société Générale: AXA⁴⁷ and Aviva⁴⁸ provide the results of Portfolio Warming Potential Analysis (developed by Carbon Delta) to assess which warming scenario (e.g., 1.5°C, 2°C, 3°C, etc.) their current portfolio’s GHG emissions are aligned with. ING⁴⁹ and Société Générale⁵⁰ provide similar analyses in the PACTA approach developed by 2° Investing Initiative to measure their lending portfolios’ alignment with the objectives of the Paris Agreement. They acknowledge the challenges and limitations of these methodologies, including that they are not directly linked to financial risks and still under development. As a result, in some cases, firms only disclosed the qualitative results of these quantitative exercises. However, these analyses help provide a holistic understanding of climate-related risks and opportunities that other emissions-related disclosures (e.g. xx% reduction in compared with yyyy baseline) fail to provide.

Citi and UBS: Many firms disclose climate-related opportunities, with metrics depending on firms’ business models and strategic priorities. For example, Citi⁵¹ provides the dollar amount invested in environmental financing, such as for projects in renewable energy, water quality and conservation, and sustainable transportation, while UBS⁵² lists total deal value in equity or debt capital market services related to Climate Change Mitigation and Adaptation (CCMA) and total deal value of financial advisory services related to CCMA.

⁴⁵ Standard Chartered, *Annual Report 2018*. See [here](#).

⁴⁶ See Tables 3 and 5 in the Appendix to this report.

⁴⁷ “2°C” Portfolio Alignment [Analysis](#), page 17.

⁴⁸ Aviva, *2018 Climate related financial disclosure*, Portfolio Warming Potential on page 12.

⁴⁹ The Terra approach that ING developed with 2° Investing Initiative. See ING’s *2018 Annual Report* [here](#).

⁵⁰ Société Générale, [Registration Document 2019 – Annual Financial Report 2018](#), aligning sectors with a 2°C trajectory, page 272.

⁵¹ Citi, *Finance for a Climate-Resilient Future – Citi’s TCFD Report*, \$100 Billion Environmental Finance Goal, [page 28](#).

⁵² UBS, [Our climate strategy – Taking action to support a low-carbon economy](#), page 4.

Zurich Insurance Group: Zurich provides a variety of key performance indicators (KPIs) on a historical basis for responsible investments, community investments, and the environmental performance. The Environmental KPIs include not only CO₂e emissions but also: renewable electricity as a percentage of total electricity consumption; energy consumption per full-time employee (FTE); percentage usage of FSC certified copy paper; kilometers of business travel; metric tons of waste; million cubic meters of water.⁵³

Supplemental Guidance – Banks — *Banks should provide the metrics used to assess the impact of (transition and physical) climate-related risks on their lending and other financial intermediary business activities in the short, medium, and long term. Metrics provided may relate to credit exposure, equity and debt holdings, or trading positions, broken down by industry, geography, credit quality (e.g. investment grade or non-investment grade, internal rating system), and average tenor. Banks should also provide the amount and percentage of carbon-related assets relative to total assets as well as the amount of lending and other financing connected with climate-related opportunities.*⁵⁴

UBS: UBS provides “Carbon-related assets (USD Bn)” and “Proportion of total net credit exposure (%)”. As recommended by the TCFD, UBS defines carbon-related assets as energy and utility sectors in Global Industry Classification Standards (GICS). The relative metrics (i.e. % of total) are helpful to users from a comparability perspective.⁵⁵

Supplemental Guidance – Insurance Companies — *Insurance companies should provide aggregated risk exposure to weather-related catastrophes of their property business (i.e., annual aggregated expected losses from weather-related catastrophes) by relevant jurisdiction.*

AXA: On physical risk assessment, AXA uses its internal “NatCat” models, which are generally used to assess the impact of natural catastrophes on insured exposure, to evaluate the financial impact of flooding and windstorms on buildings in the firm’s real estate portfolio in seven countries. AXA discloses both potential average annual losses and potential losses occurring every 100 years for each of these seven countries.⁵⁶

Swiss Re: Swiss Re uses annual expected losses (AEL) for weather-related natural perils as an indicator for its average current climate-related risk exposure; changes in the AEL show the evolution of the company’s climate risk exposure. The company reports AEL for the four weather-related risks with the highest AELs (North Atlantic hurricanes, U.S. tornados, European windstorms and Japanese tropical cyclones).⁵⁷

Supplemental Guidance – Asset Owners — *Asset owners should describe metrics used to assess climate-related risks and opportunities in each fund or investment strategy. Where relevant, asset owners should also describe*

⁵³ Zurich, “Measuring our progress on responsible business practices,” available [here](#).

⁵⁴ The TCFD recommends banks define carbon-related assets as those tied to the energy and utilities sectors under the Global Industry Classification Standard, excluding water utilities and independent power and renewable electricity producer industries.

⁵⁵ UBS, [Our climate strategy – Taking action to support a low-carbon economy](#), page 4.

⁵⁶ Axa, [Climate-related investment & insurance report](#), [page 11](#).

⁵⁷ Swiss Re, [2018 Financial Report](#), available [here](#).

how these metrics have changed over time. Where appropriate, asset owners should provide metrics considered in investment decisions and monitoring.

ATP Group: ATP Group discloses the carbon footprint formula that it uses: $\sum_{i=1}^n ([\text{current value of investment}_i / \text{issuer's market capitalization}_i] * \text{issuer's Scope 1 \& 2 GHG emissions}_i)$. This simple metric for calculating the carbon footprint of investments highlights the portfolio's total volume of carbon emissions.⁵⁸

Supplemental Guidance – Asset Managers — *Asset managers should describe metrics used to assess climate-related risks and opportunities in each product or investment strategy. Where relevant, asset managers should also describe how these metrics have changed over time. Where appropriate, asset managers should provide metrics considered in investment decisions and monitoring.*

J.P. Morgan Asset Management: J.P. Morgan Asset Management highlights four broad metrics that measure an investment portfolio's exposure to climate risks: total carbon emissions, relative carbon emissions, carbon intensity, and weighted average carbon intensity (WACI). The firm has chosen to use WACI as it best allows it to understand portfolio exposure to climate risks and disclose these to clients. However, J.P. Morgan Asset Management also notes methodological limitations of using WACI, noting that it is backward looking and therefore excludes company policies and other forward-looking information. Moreover, WACI analysis excludes short positions, derivatives, sovereigns, securitized products, and bonds issued by trusts.⁵⁹

Recommended Disclosures b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions,⁶⁰ and the related risks.

Guidance for All Sectors – *Organizations should provide their Scope 1 and Scope 2 GHG emissions and, if appropriate, Scope 3 GHG emissions and the related risks. GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.⁶¹ As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.⁶² GHG emissions and associated metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics.*

Unicredit, Bank of America, and Wells Fargo: In disclosing its Scope 3 emissions in its *Climate Change 2018* report for the Carbon Disclosure Project (CDP), Unicredit includes Category 15 emissions, which are emissions related to a firm's lending and investment activities. Measuring this emissions category is crucial for assessing financial services industry exposure to climate-related risks and opportunities. Unicredit's analysis applies to a subset of its portfolio: general financing, leasing, factoring, and

⁵⁸ Arbejdsmarkedets Tillaegspension Group, *Responsibility report*, [Page 22](#).

⁵⁹ "Choosing a Climate Risk Metric," 7 August 2019, available on the J.P. Morgan Asset Management [website](#).

⁶⁰ Scope 1 GHG emissions are direct emissions from sources that are owned or controlled by an entity. Scope 2 GHG emissions are indirect emissions from sources that are owned or controlled by an entity (e.g. electricity, heat, or steam purchased from a utility provider). Scope 3 GHG emissions are from sources not owned or directly controlled by an entity but related to the entity's activities (e.g. employee commutes).

⁶¹ Organizations may use national reporting methodologies if they are consistent with the GHG Protocol methodology.

⁶² For industries with high energy consumption, metrics related to emission intensity are important to provide. For example, emissions per unit of economic output (e.g. unit of production, number of employees, or value-added) is widely used.

bonds and equity for at-risk sectors in Italy — pulp and paper, oil and gas, iron and steel, energy, building, automotive, aluminum, and aerospace.⁶³ Bank of America⁶⁴ and Wells Fargo⁶⁵ also provide detailed GHG emissions data across Scopes 1, 2, and 3 in their respective CDP reports.

HSBC and Amundi: Most organizations provide their GHG emissions. A few firms like HSBC⁶⁶ and Amundi⁶⁷ even provide GHG efficiency ratios, which allow users to better understand the extent to which a firm’s activities impacts the environment in a comparable manner like carbon dioxide emissions in tonnes per FTE (full-time-equivalent), CO₂ emissions per employee, etc. However, many comparability issues remain in terms of labeling, definitions, and scope, as well as how financial firms apply carbon accounting principles with respect to the [GHG Protocol](#). This issue and others are discussed further in the “Metrics Convergence” section below.

Supplemental Guidance – Asset Owners — *Asset owners should provide the weighted average carbon intensity, where data are available or can be reasonably estimated, for each fund or investment strategy. In addition, asset owners should provide other metrics they believe are useful for decision-making along with a description of the methodology used. See Table 2 (p.43 in the [TCFD’s June 2017 Annex on Implementing the Recommendations](#)) for common carbon footprinting and exposure metrics, including weighted average carbon intensity.*⁶⁸

ATP Group: In its 2017 Responsibility report, ATP Group provides an extensive discussion of how it calculated the carbon footprint of its equity portfolio according to the four methods listed by the TCFD in its recommendations for investors: Total Carbon Emissions, Carbon Footprint, Carbon Intensity, and Weighted Average Carbon Intensity (WACI). In its 2018 Responsibility report, ATP extended the calculations to its corporate bond portfolio for WACI — covering Scope 1 and 2 emissions across corporate bonds and listed equities but also Scope 3 emissions for listed equities.⁶⁹

OTPP: In the Metrics and Targets section of its TCFD disclosures, OTPP indicates that it reports the WACI of companies in its investment portfolio — expanding its 2017 coverage in 2018 to include this metric for its private holdings. The firm notes that it is also in the process of obtaining data for coverage on its corporate and sovereign credit portfolios.⁷⁰

TPT Retirement Solutions: TPT discloses the carbon intensity of its underlying funds in a disaggregated manner and compares each fund to MSCI ACWI as a benchmark.⁷¹

⁶³ Unicredit, *Climate Change 2018*, available [here](#).

⁶⁴ Bank of America, *2018 CDP Climate Change submission*, available [here](#).

⁶⁵ Wells Fargo & Company, *Climate Change 2018*, available [here](#).

⁶⁶ HSBC, *Annual Report and Accounts 2018*, carbon dioxide emissions in tonnes per FTE, page 66

⁶⁷ Amundi, *Corporate Social Responsibility Report 2017*, CO₂ emissions per employee, page 44.

⁶⁸ The TCFD acknowledges the challenges and limitations of current carbon footprinting metrics, including that such metrics should not necessarily be interpreted as risk metrics; that it views reporting weighted average carbon intensity as a first step towards advancements in developing decision-useful, climate-related risk metrics; and that it recognizes that some asset owners may be able to report weighted average carbon intensity for only a portion of their investments given data availability and methodological issues.

⁶⁹ ATP Group, Responsibility reports, available [here](#).

⁷⁰ OTPP, *2018 Climate Change Report*, available [here](#).

⁷¹ TPT Retirement Solutions, *Climate Change Disclosure Report: Risk and opportunities in the growth portfolio*, available [here](#).

GMPF: GMPF indicates in Recommended Disclosure b) in the Metrics and Targets section of its TCFD disclosures that the WACI of its active equity holdings were over 20% more intensive than that of a TCFD-recommended benchmark.⁷²

Supplemental Guidance – Asset Managers — *Asset managers should provide the weighted average carbon intensity, where data are available or can be reasonably estimated, for each fund or investment strategy. In addition, asset managers should provide other metrics they believe are useful for decision-making along with a description of the methodology used. See Table 2 (p.43 in the [TCFD's June 2017 Annex on Implementing the Recommendations](#)) for common carbon footprinting and exposure metrics, including weighted average carbon intensity.*

UBS,⁷³ Aviva,⁷⁴ AXA and Swiss Re: The asset management arms of these firms provide the weighted average carbon intensity of their portfolio (e.g. tCO₂ / \$ M Sales) in addition to their own GHG emissions. Although the weighted average carbon intensity covers for only a portion of their portfolio at this stage due to data availability and methodological issues, intensity-based metrics allow users to better understand the extent how much firm's portfolios impact on environment in a comparable manner. AXA provides different carbon footprinting metrics for different asset classes (e.g. for equities and corporate bonds: direct tCO₂ / \$ M Sales; for sovereign debt: tCO₂ / \$ M of GDP; and for real estate: kg CO₂ per square meter).⁷⁵ Swiss Re reports the weighted average carbon intensity of credit and equity investment portfolios by region (e.g. US and UK).⁷⁶

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

Guidance for All Sectors – *Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a lower-carbon economy. In describing their targets, organizations should consider including the following: whether the target is absolute or intensity based; time frames over which the target applies, base year from which progress is measured, and key performance indicators used to assess progress against targets. Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.*

AXA: In line with TCFD guidance suggesting that targets be described so users can tell whether achievements are aligned with specific requirements, constraints or goals, AXA describes its green investments with reference to the goal recommended by the [United Nations](#) encouraging signatories of the Principles for Responsible Investment (PRI) to invest 1% of their assets in clean technologies and renewable energy by 2020.⁷⁷

⁷² GMPF, *2018 Annual Report*, [Page 34](#).

⁷³ UBS, *Our climate strategy – Taking action to support a low-carbon economy*, page 4.

⁷⁴ Aviva, *Climate related financial disclosure 2018*, carbon foot-printing of investments, page 11. See [here](#).

⁷⁵ AXA, *Climate-related investment & insurance report*, carbon footprinting, [page 24](#).

⁷⁶ Swiss Re, *2018 Financial Report*, available [here](#).

⁷⁷ AXA, *Climate-related investment & insurance report*, page 15.

III. KEY CONSIDERATIONS

This review of climate-related financial disclosures from financial services firms has revealed several issues that preparers and users should consider as they seek to improve the decision-usefulness of their future climate reporting. Ensuring industry-wide comparability and convergence of metrics, scenarios, and other reported information is crucial to achieve high-quality disclosure of how financial institutions are exposed to climate-related risks and opportunities through their assets and operations. Data availability and methodology are also ongoing challenges facing firms, which have managed to address these to varying degrees in collaboration with consultancies that have relevant expertise in this field. Further considerations include transparency and the materiality of climate-related risks and opportunities, as in some cases such information may be more appropriate for supervisory reporting than for public disclosure. Finally, public and private sector stakeholders alike should carefully weigh the relative merits of principles-based as opposed to prescriptive regulatory approaches, with a view to establishing a globally-harmonized framework that is flexible enough to accommodate the currently broad range of climate-related disclosure practices while also sufficiently restrictive to rein in excessive divergences.

COMPARABILITY

Users face significant challenges in comparing TCFD disclosures in their current form, as firms have adopted a wide range of approaches to disclosing their climate-related financial risks. Financial institutions as preparers vary significantly in terms of the type of report in which they convey their TCFD disclosures; the degree to which they explicitly link their disclosures to specific TCFD recommendations; and the variety of metrics, metrics definitions, base years, and scenarios they use to evaluate climate-related risks and opportunities. For instance, there is no scenario or common set of scenarios that has emerged as a frequent or standard practice among preparers.⁷⁸ Indeed, a 2018 industry survey conducted by Oliver Wyman and the International Association of Credit Portfolio Managers (IACPM) indicates that firms use a broad array of scenarios.⁷⁹ As business models and strategic priorities vary across companies and sectors, fully standardizing disclosure practices may be neither possible nor appropriate. Nevertheless, climate-related disclosure users could benefit from further efforts by preparers to adopt similar approaches to the TCFD's recommendations, facilitating comparability across firms.

METRICS CONVERGENCE

One of the areas where financial institutions as preparers exhibit the widest divergences in TCFD implementation practices relating to metrics and their definitions. The disclosures reviewed for this report suggest that preparers use a large number of different metrics, which poses challenges to users, for whom disclosed information is most decision-useful when it is consistent and comparable.⁸⁰

Types of metrics used vary considerably across the two broad categories of climate-related risks and opportunities: first, the "indirect" financial impact from assets held in firm loan books and investing portfolios, and second, the "direct" climate-related financial impact of firm operations. While both channels

⁷⁸ However, certain scenario frameworks are used by multiple preparers, e.g. Mercer scenarios, the PACTA scenario analysis tool etc.

⁷⁹ Oliver Wyman and IACPM, [Climate change – managing a new financial risk](#), Exhibit 11: Climate scenarios used in the industry.

⁸⁰ Formally assessing which metrics are most widely-used may be an avenue of further research.

appear to be effective conduits of climate-related financial risks and opportunities, it is chiefly the transmission mechanism via asset holdings that presents the climate-driven financial stability risks now at the [forefront](#) of central bank deliberations. To illustrate, in its *First Comprehensive Report* released in April 2019, the NGFS asserts that “there is a strong risk that climate-related financial risks are not fully reflected in asset valuations” and notes that the transition to “net zero” emissions will likely have a “significant impact on all sectors of the economy affecting financial asset values.” The NGFS further highlights the need for “physical asset level data, physical and transition risk data and financial assets data” in order to enhance the assessment of climate-related risks and opportunities.⁸¹

Indirect Metrics — Financial Firm Asset Portfolios

A number of firms disclose comprehensive and comparable metrics relating to portfolio GHG emissions, the impact that climate change might have on the firms themselves, and how firm activities affect the environment. These disclosures provide decision-useful information for users, as they offer forward-looking perspectives on firm goals. However, challenges and limitations remain in terms of methodology and the scope of portfolio coverage. Examples of relevant metrics include:

- Weighted average carbon intensity of investee scope 1 and 2 emissions — tCO₂e/USD Mn Sales or invested, tCO₂e/USD Mn GDP for sovereign exposure — kg CO₂e/square meters for real estate exposure
- Exposure to carbon intensive sectors — sector portfolio weights and sectoral contribution to weighted average carbon intensity
- Alignment analysis of portfolio with Paris Agreement objectives — Carbon Delta’s portfolio warming potential, and 2 Degree Investing Initiative’s Paris Agreement Capital Transition Assessment (PACTA) — °C
- Climate risk analysis of sovereign exposures: Notre Dame University’s Notre Dame-Global Adaptation Index — °C
- Climate VaR — USD Mn

Other types of metrics that firms disclose provide a sense of their contributions to sustainable finance objectives, but these types of disclosures tend to be less comparable across reports. Reasons for this lack of comparability include the absence of clear definitions of “green and brown;” lack of clarity on which industries should be considered carbon intensive; and which financial activities should be tracked (e.g. investing, lending, advising). In addition, some firms disclose only absolute numbers, making it more difficult to compare results with those from other financial firms. Examples of relevant metrics include:

- Carbon-related assets — USD Bn and/or % of total assets⁸²
- Investments or loans for environmental purposes — USD Bn
- Proportion of Socially Responsible Investment (SRI)/total assets under management — %
- Proportion of wholesale loans to high emitting sectors/total loans — %

⁸¹ Network for Greening the Financial System, [First Comprehensive Report: A call for action — Climate change as a source of financial risk — April 2019](#).

⁸² TCFD recommendations define carbon-related assets as energy and utilities sectors in GICS, but based on current disclosures, it is unclear whether all financial institutions follow this recommendation. Reviewing financial institutions’ sector exclusion lists may help align disclosure practices for carbon-related assets.

Further metrics relate to business models and strategic priorities and provide useful supplemental explanations that help track a firm's progress in relation to relevant strategies. Though this information is difficult to compare across firms, it can be useful for tracking progress at individual firms. Regarding CO₂ emissions reductions specifically, firms use different base years, which inhibits cross-firm comparison and assessment of how closely aligned firm efforts are with Paris Agreement objectives. (This divergence might be a consequence of different base years used in different countries for Nationally Determined Contributions (NDCs)). Examples of relevant metrics include:

- Number of strategic transactions in support of Switzerland's Energy Strategy 2050 — #
- Total deal value in equity or debt capital market services related to climate change mitigation and adaptation (CCMA) — USD Bn
- Total deal value of financial advisory services related to CCMA — USD Bn
- Finance Arrangement in the Renewable Energy Sector — USD Mn
- Green bond issues arranged — EUR Bn
- Money raised for environmental purposes — EUR Bn
- Sustainable building portfolio developed — EUR Bn
- % of global real estate portfolio LEED-certified — %
- GHG emissions avoided since yyyy — mt CO₂e
- New renewable energy capacity added since yyyy — MW
- Number of climate-related shareholder resolutions voted upon — #
- Proportion of supported climate-related shareholder resolutions — %

Direct Metrics — Financial Firm Activities

A high proportion of firms reviewed disclose GHG emissions related to their business activities. However, firms differ in their use of names, definitions (Gross/Net⁸³, CO₂ or CO₂e), Scopes (1, 2 and/or 3), and items included in Scope 3, which refers to indirect metrics as described in the previous section. There is wide divergence in Scope 3 disclosures, given the wide array of activities these indirect metrics encompass: upstream Scope 3 emissions include business travel, paper consumption, emissions disposal, grey fleet, water, thermal power, transport of goods, and/or energy consumption, while downstream Scope 3 activities include investment portfolios, processing/use of sold products, distribution, end-of-life treatment of sold products, and franchise.

It is noteworthy that the reported amount of GHG emissions can vary significantly depending on how financial firms apply carbon accounting principles, especially with the GHG protocol.⁸⁴ For example, emissions from equity investments are included in financial firms' Scope 1 and 2 in the *equity share approach*, but those are included in category 15 (investments) of Scope 3 in the *control approach* (in cases where the financial firm exerts no control over the investee). This can affect not only financial firms' disclosures of their own direct GHG emissions but also disclosures of their indirect emissions (i.e. weighted average carbon intensity of their assets held in firm loan books and investing portfolios). As

⁸³ The amount of net emissions and that of gross emissions are significantly different as net emissions take into account sinks, carbon offsets or credits.

⁸⁴ [GHG Protocol](#) and its [Technical Guidance for Calculating Scope 3 Emissions](#).

mentioned above, portfolio emissions have much greater implications for the environment, suggesting that formulating a disclosure template or guidance in this area may be a particularly worthwhile endeavor. Considering the implementation challenges, metrics should be simplified to the extent possible, but the financial services industry should work towards a common approach. This topic will be a priority for the IIF Sustainable Finance Working Group.

Further, the extent to which names and definitions align with TCFD-defined metrics remains unclear.⁸⁵ Some metrics refer to emissions per FTE (full-time equivalent) and/or Targets of emission reductions. Direct emissions metrics identified include:

- Carbon footprint: Weighted average carbon intensity — tCO₂e/USD Mn Sales
- GHG footprint: gross GHG emissions minus GHG reductions from renewable energy and GHG offsets — kt CO₂e
- CO₂ Emissions — tCO₂
- Scope 1 & 2 – emissions — mtCO₂e
- Scope 3 – emissions — mtCO₂e
- CO₂ emissions in tonnes per FTE (full-time equivalent) from energy from travel — tCO₂e/USD Mn Sales
- Reduced amount of GHG emissions — tCO₂
- GHG footprint % change from baseline yyyy — Target: –xx% by yyyy — %
- GHG emission cut per employee xx% by yyyy compared to yyyy level — %

Many firms also disclosed other environmental performance metrics pertaining to energy, water and waste. Once again, firms used slightly different metrics and base years, posing the aforementioned challenges relating to cross-firm and Paris Agreement comparability. These metrics include:

- Scope 1 – energy consumed — GWh
- Scope 2 – energy purchased — GWh
- Energy performance improvement per employee xx% by yyyy compared to yyyy level — %
- % reduction in energy consumption (compared with yyyy baseline) — %
- % use of renewable energy for facilities globally (RE100) — %
- % reduction in water consumption (compared with yyyy baseline) — %
- % of water used coming from reclaimed or recycled sources — %
- % diversion rate of waste to landfill (compared with yyyy baseline) — %

DATA AND METHODOLOGICAL CHALLENGES

Identifying, assessing and managing climate-related financial risks presents preparers and users alike with an array of data and methodological challenges. Relevant data varies greatly in its quality and availability, and, at the current incipient stage of climate-related financial research, much work remains to be done in identifying relevant data gaps. Financial institutions need various kinds of data including: historical and forward-looking climate change data; asset-level granular data from clients for physical risk

⁸⁵ [TCFD Annex](#) — *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures* — June 2017, pp. 43-44

assessment; other data from clients such as GHG emissions, turnover from green products and services, and CapEx and OpEx used for green purposes; empirical and analytical data demonstrating the link between climate and credit; and more clarity in scenarios, including those that factor in Paris Agreement Nationally Determined Contributions (NDCs) to emissions reductions.⁸⁶ A first step to tackling this data challenge is to map out data needs and compare these to existing data sources. The IIF is currently considering how the SFWG can contribute to initiatives in this area and has recently begun work on a report that will help set the stage for collaboration among financial firms, regulators, NGOs, data/service providers, academics and other experts to develop a common framework to measure and track climate finance, with an initial focus on “financed emissions” (i.e., global lending and investment-related emissions).⁸⁷ Cross-sectoral communication between financial and non-financial firms will be key, as financial institutions rely heavily on data from clients.

Fortunately, a range of data providers currently track relevant data. For example, the report written by Swiss Sustainable Finance introduced data providers such as Bloomberg Maps, Carbon Delta, CDP, Trucost (S&P Global), MSCI, Sustainalytics, and Vigeo Eiris.⁸⁸ Other relevant providers include 2° Investing Initiative, ShareAction,⁸⁹ Acclimatise, ENCORE, Four Twenty Seven, Oekom, Mercer, Carbone 4, and Think Hazard. Moreover, in 2015 14 Dutch banks launched the Platform for Carbon Accounting Financials (PCAF) in order to work together to jointly develop open source methodologies to measure the carbon footprint of their investments and loans. With support from the consultancy Navigant, PCAF has defined and harmonized carbon footprinting methodologies for eight asset classes — government bonds, listed equity, project finance, mortgages, commercial real estate, corporate debt, corporate/SME loans, and indirect investments — and is currently expanding its membership and coverage from Europe to other regions, including North America.⁹⁰

MATERIAL INFORMATION

Climate disclosures attempt to assess risks and opportunities that are fraught with a high degree of uncertainty, complicating the task for users to adequately understand the implications of this information. For disclosures to be decision-useful, it may be helpful to also provide contextual explanations and granular information on methodology and assumptions used in quantitative analysis. Such transparency can enhance preparers’ credibility while also helping users to better understand climate-related financial impacts on the preparer firm.

Another challenge is that disclosures may often comprise commercially sensitive information including an issuer’s strategic or competitive positioning, which may be not be appropriate for public disclosure. For example, risk appetite among insurers is typically business-sensitive, meaning that insurance companies cannot disclose physical risk assessment results directly to the general public because it affects

⁸⁶ Institute for Global Environmental Strategies (IGES) periodically updates NDC database. <https://pub.iges.or.jp/pub/iges-ndc-database>

⁸⁷ As per the [GHG Protocol](#), these are categorized as Scope 3 Category 15 emissions.

⁸⁸ Swiss Sustainable Finance. [Measuring climate related risks in investment portfolio](#).

⁸⁹ See ShareAction’s Asset Owners Disclosure Project, which includes the reports [Practical Solutions and Building Blocks for Asset Owners from Beginner to Best Practice](#) and [Got It Covered? Insurance in a Changing Climate](#).

⁹⁰ Platform for Carbon Accounting Financials [website](#)

their underwriting policies. In these types of cases, disclosure destined for public sector such as supervisory reporting might be more appropriate than disclosure to the general public. In fact, a “first-mover” problem—whereby publicly-listed firms may wish to avoid disclosing information that may have a material impact on their share price—may already be constraining TCFD disclosures among financial firms, both in terms of the number of firms that have begun to disclose but also in the quality and granularity achieved in their disclosures.

EMERGING REGULATORY APPROACHES

There are diverging views on whether climate-related disclosure requirements should be principles-based or prescriptive.⁹¹ Principles-based approaches allow firms to innovate disclosure practices in market-led ways, which may be suitable in the current environment. On the other hand, a prescriptive approach has the benefit of facilitating the task for users attempting to compare disclosed information across organizations, which may make disclosures more decision-useful. Although the relative merits of each approach remain a subject of lively debate, some jurisdictions have already started to consider incorporating climate change into disclosure requirements.

In France, Article 173 of the Energy Transition for Green Growth Law requires mandatory climate disclosure for institutional investors.^{92, 93, 94} Investors have to disclose financial risks from climate change and measures to address these risks. Article 173 applies the “*comply or explain*” approach in choosing the best way to fulfill the objectives, providing a degree of flexibility in methodology that preparers can use. In the UK, the Green Finance Taskforce recommended companies and investors to use the TCFD framework and for the government to conduct an implementation review in 2020.⁹⁵ Against this backdrop, the Prudential Regulatory Authority (PRA) expects firms to consider engaging with the TCFD framework and other initiatives,⁹⁶ and the Financial Conduct Authority (FCA) asked in a Discussion Paper about industry views on whether a “*comply or explain*” approach to the TCFD would be effective to facilitate climate disclosure.⁹⁷

Although many jurisdictions currently adhere to a market-led, voluntary approach, many preparers and users may anticipate that regulators could ultimately gravitate towards more mandatory- and rules-based frameworks. For instance, in June 2019 Mark Carney declared that “in the future, to achieve a carbon-neutral economy, disclosure must clearly become mandatory.”⁹⁸ Similarly, an April 2019 PRA report states that “firms should recognize the increasing possibility that climate disclosures will be mandated in more jurisdictions, and prepare accordingly.”⁹⁹ Against this backdrop, financial firms would benefit from

⁹¹ Harvard Law School, “[Applying a Principles-based Approach to Disclosing Complex, Uncertain, and Evolving Risks.](#)”

⁹² University of Cambridge, [Sailing from different harbours.](#)

⁹³ Four Twenty Seven, “Art. 173: [France’s Groundbreaking Climate Risk Reporting Law.](#)”

⁹⁴ Forum pour l’Investissement responsable, *Article 173-VI: [Understanding the French regulation on investor climate reporting.](#)*

⁹⁵ Green Finance Taskforce, *Accelerating Green Finance*, Theme 3, Implementing TCFD recommendations, [page 8.](#)

⁹⁶ PRA, *Supervisory Statement | SS3/19 [Enhancing banks’ and insurers’ approaches to managing the financial risks from climate change.](#)*

⁹⁷ FCA, [Climate Change and Green Finance.](#)

⁹⁸ Climate Disclosure Standards Board, “[Are we headed towards mandatory climate disclosure?](#)”

⁹⁹ PRA, *Policy Statement | PS11/19 [Enhancing banks’ and insurers’ approaches to managing the financial risks from climate change.](#)*

understanding how evolving disclosure requirements may affect future industry practices. A useful reference point is provided by the European Commission’s guidelines on non-financial reporting (NFRD), which feature a supplement on reporting climate-related information.¹⁰⁰ While the NFRD guidelines are non-binding, they are seen as direction of travel by many stakeholders, including sustainability auditors, and the guidelines propose specific disclosure examples, including Key Performance Indicators (KPIs), which are comparable to TCFD metrics.

While the debate about principles-based approaches versus prescriptiveness is likely to continue for quite some time, it is of fundamental importance for regulatory and supervisory approaches to continue evolving in a coordinated and harmonized way. The proliferation of disparate and potentially contradictory approaches to disclosure requirements would negatively impact the development and evolution of consistent and comparable industry practices. The role of groups such as the NGFS will likely be instrumental in the development of coordinated approaches at the global level.

Even more importantly, excessive prescriptiveness in requirements would be counterproductive, particularly in a field where common metrics and approaches are still evolving and where a range of practices across the industry is being tested and tried. As this report aims to illustrate, a wide array of practices still exists, and experience needs to be accumulated over time before such practices consolidate and converge. Regulatory and supervisory approaches and requirements that are sufficiently flexible can accommodate such evolution and at the same time provide useful guidance to narrow excessively disparate practices.

IV. CONCLUSION

Disclosure is an essential part of assessing climate-related risks and opportunities, so this report endeavored to illustrate how financial firms might improve their reporting of how climate change may impact their balance sheets, business models and operations. We hope that those who prepare disclosures will benefit from these examples. While much remains to be done, there are firms pioneering innovative approaches to TCFD-based reporting. Many of the examples cited here are clear, comprehensive, and comparable; that said, industry stakeholders must do more to enhance the comparability and convergence of metrics and scenarios, and to address data gaps and methodological challenges. There is a clear need for a suitable regulatory framework that balances flexibility with incentivizing further alignment of climate-related reporting practices. The financial sector has a crucial role to play alongside governments, the broader corporate sector, and civil society to combat climate change and can address this challenge by helping protect the stability of the financial system against climate-related threats—in addition to scaling up finance for mitigation and adaptation activities. Achieving the Paris Agreement’s net zero emissions target by 2050 remains a task of monumental proportions, but the focused effort and innovation that is evident in industry disclosures to date suggest that the financial firms are committed to rise to the occasion.

¹⁰⁰ European Commission, [Guidelines on non-financial reporting: Supplement on reporting climate-related information](#).

Appendix - Tables

TABLE 3 — EXAMPLES OF CLIMATE-RELATED RISKS AND POTENTIAL FINANCIAL IMPACTS

Referred to in Strategy, Recommendation a), Guidance for All Sectors; Risk Management, Recommendation b), Guidance for All Sectors.

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

Source: [TCFD Annex](#) — Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures — June 2017, p. 72

TABLE 4 – COMMON CARBON FOOTPRINTING AND EXPOSURE METRICS

Referred to in Metrics and Targets, Recommendation b), supplemental guidance for asset owners and asset managers.

| Carbon Footprinting and Exposure Metrics | | |
|--|--------------------------|--|
| Metric | Supporting Information | |
| Weighted Average Carbon Intensity | <i>Description</i> | Portfolio’s exposure to carbon-intensive companies, expressed in tons CO ₂ e/\$M revenue. <i>Metric recommended by TCFD.</i> |
| | <i>Formula</i> | $\sum^n ([\text{current value of investment } i / \text{current portfolio value } i] * [\text{issuer’s Scope 1 \& 2 GHG emissions } i / \text{issuer’s \$M revenue } i])$ |
| | <i>Methodology</i> | Unlike the next three metrics, Scope 1 and Scope 2 GHG emissions are allocated based on portfolio weights (the current value of the investment relative to the current portfolio value), rather than the equity ownership approach (as described under methodology for Total Carbon Emissions). Gross values should be used. |
| | <i>Key Points</i> +/- | <ul style="list-style-type: none"> + Metric can be more easily applied across asset classes since it does not rely on equity ownership approach. + The calculation of this metric is fairly simple and easy to communicate to investors. + Metric allows for portfolio decomposition and attribution analysis. - Metric is sensitive to outliers. - Using revenue (instead of physical or other metrics) to normalize the data tends to favor companies with higher pricing levels relative to their peers. |
| Total Carbon Emissions | <i>Description</i> | The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO ₂ e. |
| | <i>Formula</i> | $\sum^n ([\text{current value of investment } i / \text{issuer’s market capitalization } i] * [\text{issuer’s Scope 1 \& 2 GHG emissions } i])$ |
| | <i>Methodology</i> | Scope 1 and Scope 2 GHG emissions are allocated to investors based on an equity ownership approach. Under this approach, if an investor owns 5 percent of a company’s total market capitalization, then the investor owns 5 percent of the company as well as 5 percent of the company’s GHG (or carbon) emissions. While this metric is generally used for public equities, it can be used for other asset classes by allocating GHG emissions across the total capital structure of the investee (debt and equity). |
| | <i>Key Points</i> +/- | <ul style="list-style-type: none"> + Metric may be used to communicate the carbon footprint of a portfolio consistent with the GHG protocol. + Metric may be used to track changes in GHG emissions in a portfolio. + Metric allows for portfolio decomposition and attribution analysis. - Metric is generally not used to compare portfolios because the data are not normalized. - Changes in underlying companies’ market capitalization can be misinterpreted. |
| Carbon Footprint | <i>Description</i> | Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tons CO ₂ e/\$M invested. |
| | <i>Formula</i> | $\sum^n ([\text{current value of investment } i / \text{issuer’s market capitalization } i] * [\text{issuer’s Scope 1 \& 2 GHG emissions } i]) / \text{current portfolio value } (\$M)$ |
| | <i>Methodology</i> | Scope 1 and Scope 2 GHG emissions are allocated to investors based on an equity ownership approach as described under methodology for Total Carbon Emissions. The current portfolio value is used to normalize the data. |
| | <i>Key Points</i> +/- | <ul style="list-style-type: none"> + Metric may be used to compare portfolios to one another and/or to a benchmark. + Using the portfolio market value to normalize data is fairly intuitive to investors. + Metric allows for portfolio decomposition and attribution analysis. - Metric does not take into account differences in the size of companies (e.g. does not consider the carbon efficiency of companies). - Changes in underlying companies’ market capitalization can be misinterpreted. |
| Carbon Intensity | <i>Description</i> | Volume of carbon emissions per million dollars of revenue (carbon efficiency of a portfolio), expressed in tons CO ₂ e/\$M revenue. |
| | <i>Formula</i> | $\sum^n ([\text{current value of investment } i / \text{issuer’s market capitalization } i] * [\text{issuer’s Scope 1 \& 2 GHG emissions } i]) / \sum^n ([\text{current value of investment } i / \text{issuer’s market capitalization } i] * [\text{issuer’s \$M revenue } i])$ |
| | <i>Methodology</i> | Scope 1 and Scope 2 GHG emissions are allocated to investors based on an equity ownership approach as described under methodology for Total Carbon Emissions. The company’s (or issuer’s) revenue is used to adjust for company size to provide a measurement of the efficiency of output. |
| | <i>Key Points</i> +/- | <ul style="list-style-type: none"> + Metric may be used to compare portfolios to one another and/or to a benchmark. + Metric takes into account differences in the size of companies (e.g., considers the carbon efficiency of companies). + Metric allows for portfolio decomposition and attribution analysis. - The calculation of the metric is somewhat complex and may be difficult to communicate. - Changes in underlying companies’ market capitalization can be misinterpreted. |

| | | |
|-----------------------------------|-------------------------------|--|
| Exposure to Carbon-Related Assets | <i>Description</i> | The amount or percentage of carbon-related assets ¹⁰¹ in the portfolio, expressed in \$M or percentage of the current portfolio value. |
| | <i>Formula for Amount</i> | Σ \$M current value of investments in carbon-related assets |
| | <i>Formula for Percentage</i> | $(\Sigma \text{ \$M current value of investments in carbon-related assets}) / \text{current portfolio value} * 100$ |
| | <i>Methodology</i> | This metric focuses on a portfolio's exposure to sectors and industries considered the most GHG emissions intensive. Gross values should be used. |
| | <i>Key Points</i> +/- | + Metric can be applied across asset classes and does not rely on underlying companies' Scope 1 and Scope 2 GHG emissions. - Metric does not provide information on sectors or industries other than those included in the definition of carbon-related assets (i.e. energy and utilities sectors under the Global Industry Classification Standard excluding water utilities and independent power and renewable electricity producer industries). |

Source: [TCFD Annex](#) – Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures – June 2017, pp. 43-44

TABLE 5 – EXAMPLES OF CLIMATE-RELATED OPPORTUNITIES AND POTENTIAL FINANCIAL IMPACTS

Referred to in Strategy, Recommendation a), Guidance for All Sectors; Risk Management, Recommendation b), Guidance for All Sectors.

| Climate-Related Opportunities and Potential Financial Impacts | | |
|---|--|---|
| Type | Climate-Related Opportunities | Potential Financial Impacts |
| Resource Efficiency | <ul style="list-style-type: none"> - Use of more efficient modes of transport - Use of more efficient production and distribution processes - Use of recycling - Move to more efficient buildings - Reduced water usage and consumption | <ul style="list-style-type: none"> - Reduced operating costs (e.g. through efficiency gains and cost reductions) - Increased production capacity, resulting in increased revenues - Increased value of fixed assets (e.g. highly rated energy-efficient buildings) - Benefits to workforce management and planning (e.g. improved health and safety, employee satisfaction) resulting in lower costs - Reduced operational costs (e.g. through use of lowest cost abatement) - Reduced exposure to future fossil fuel price increases - Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon - Returns on investment in low-emission technology - Increased capital availability (e.g. as more investors favor lower-emissions producers) - Reputational benefits resulting in increased demand for goods/services |
| Energy Source | <ul style="list-style-type: none"> - Use of lower-emission sources of energy - Use of supportive policy incentives - Use of new technologies - Participation in carbon market - Shift toward decentralized energy generation | <ul style="list-style-type: none"> - Increased revenue through demand for lower emissions products and services - Increased revenue through new solutions to adaptation needs (e.g. insurance risk transfer products and services) - Better competitive position to reflect shifting consumer preferences resulting in increased revenues |
| Products and Services | <ul style="list-style-type: none"> - Development and/or expansion of low emission goods and services - Development of climate adaptation and insurance risk solutions - Development of new products or services through R&D and innovation - Ability to diversify business activities - Shift in consumer preferences | <ul style="list-style-type: none"> - Increased revenue through demand for lower emissions products and services - Increased revenue through new solutions to adaptation needs (e.g. insurance risk transfer products and services) - Better competitive position to reflect shifting consumer preferences resulting in increased revenues |

¹⁰¹ The TCFD encourages banks to use a consistent definition to support comparability. For credit exposure to carbon-related assets, the TCFD recommends banks define carbon-related assets as those tied to the energy and utilities sectors under the Global Industry Classification Standard, excluding water utilities and independent power and renewable electricity producer industries.

| | | |
|-------------------|---|--|
| Markets | <ul style="list-style-type: none"> - Access to new markets - Use of public-sector incentives - Access to new assets and locations needing insurance coverage | <ul style="list-style-type: none"> - Increased revenues through access to new and emerging markets (e.g. partnerships with governments, development banks) - Increased diversification of financial assets (e.g. green bonds and infrastructure) |
| Resilience | <ul style="list-style-type: none"> - Participation in renewable energy programs and adoption of energy-efficiency measures - Resource substitutes/diversification | <ul style="list-style-type: none"> - Increased market valuation through resilience planning (e.g. infrastructure, land, buildings) - Increased reliability of supply chain and ability to operate under various conditions - Increased revenue through new products and services related to ensuring resiliency |

Source: [TCFD Annex](#) — *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures* — June 2017, p. 73

Contributing Authors



Sonja Gibbs

Managing Director
Global Policy Initiatives
sgibbs@iif.com



Andrés Portilla

Managing Director
Regulatory Affairs
aportilla@iif.com



Paul Della Guardia

Financial Economist
Global Policy Initiatives
pdellaguardia@iif.com



Junichi Fujimori

Policy Advisor
Regulatory Affairs
jfujimori@iif.com



Emre Tiftik

Deputy Director
Global Policy Initiatives
etiftik@iif.com



Greer Meisels

Chief of Staff
gmeisels@iif.com



Raymond Aycock

Program Associate
Global Policy Initiatives
raycock@iif.com



Savannah Haeger

Program Associate
Communications
shaeger@iif.com



Kate Sammer

Digital Media Assistant
Communications
ksammer@iif.com