

Climate Change

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Contents

- Introduction.....2**
- Objectives2**
- Section 1: Climate-related Risks3**
- Section 2: How Should the Financial Sector Respond?.....4**
- Section 3: What Can Supervisors Do?.....13**
- Conclusions.....14**
- References16**
- Additional Readings17**

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Introduction¹

Climate change is occurring and it poses significant risks. Overall, the world has been getting warmer, which most scientists agree is because of carbon dioxide and other greenhouse gas (GHG) emissions generated by economic activities. The warming is reflected not only in higher average temperatures but also in more frequent and severe weather-related events, such as floods, droughts, and heat waves. These physical risks have already had social and economic consequences, which are likely to grow in importance with the extent of climate change.

Encouragingly, governments and others have taken steps to limit the extent of climate change and mitigate its consequences. For example, many countries have agreed to limit the future GHG emissions within their economies. However, it is far from certain that the targets will be attained or whether doing so will be as effective as hoped in mitigating the physical risks of climate change.

Furthermore, the transition to a lower-GHG economy itself poses risks. For example, the replacement of carbon-based sources of energy with renewable sources could impose additional costs on businesses and consumers, which could reduce economic growth and threaten the survival of some companies.

It is essential that both financial sector supervisors and those they supervise are aware of the risks posed by climate change and take appropriate action in response to these risks. The physical and transition risks can affect not only supervised organizations but also their customers and other counterparties, for example, companies in which they invest. The Financial Stability Board (FSB) has recognized the importance of climate change by forming a task force to develop recommendations for climate-related financial disclosures.² It has noted that inadequate information can lead to mispricing of assets, misallocation of capital, and even financial stability concerns if abrupt corrections occur.

The risks posed by climate change are relevant to all types of financial sector supervision. For example, market conduct supervisors should consider whether organizations' products and disclosures help consumers and investors to deal with climate change. Prudential supervisors should assess whether organizations have investment, lending, and insurance underwriting policies and risk management practices that recognize the risks posed by climate change.

Objectives

Supervisors should understand the potential implications of climate change to the organizations they supervise and the consumers served by those organizations.

The sections of this note cover the following aspects of climate change:

- Climate-related Risks
- How Should the Financial Sector Respond?
- What Can Supervisors Do?

This note will help you:

- Understand the climate-related risks that are most relevant to the financial sector, including transition and physical risks;

¹ This note was prepared by Michael Hafeman on behalf of Toronto Centre.

² The Task Force on Climate-related Financial Disclosures, which published its Recommendations in December 2016 and its Final Report in June 2017.

- Understand the ways in which organizations operating in the financial sector might respond to these risks, through their governance, strategies, risk management, metrics and targets, and disclosures; and
- Identify steps that financial sector supervisors can take in response to climate change.

This Toronto Centre Supervisory Guidance Note is designed to help guide you toward making appropriate choices when considering possible regulations or supervisory actions in the context of your particular circumstances.

Section 1: Climate-related Risks

The FSB’s Task Force on Climate-related Financial Disclosures (TCFD) divided climate-related risks into two major categories: (1) risks related to the transition to a lower-carbon economy and (2) risks related to the physical impacts of climate change.³ It noted that other approaches have been used, but suggested that a consistent categorization of climate-related risks and opportunities would promote alignment of disclosures. This section summarizes climate-related risks using the TCFD categorization.

Transition risks arise because transitioning to a lower-carbon economy may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. Transition risks include:

- Legal and policy risks – policy actions might seek to constrain actions that have adverse effects or to encourage actions that promote adaptation to climate change; examples include carbon-pricing mechanisms and promotion of sustainable land-use practices. Legal actions might be taken against organizations for their failure to mitigate impacts of climate change, failure to adapt to climate change, or providing insufficient disclosure around material financial risks. Some of the legal risks might flow through to insurance companies via the liability insurance they have underwritten.
- Technology risk – technological improvements or innovations that support the transition can affect costs and competitiveness.
- Market risk – supply and demand can shift as climate-related risks and opportunities are increasingly considered.
- Reputation risk – reputation can be affected by perceptions of an organization’s contribution to or detractor from the transition.

Physical risks resulting from climate change can be event-driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks can have personal and financial implications for individuals, such as injury, death, property damage, and loss of employment. Organizations can suffer direct damage to assets and indirect impacts from supply chain disruption. Organizations’ financial performance might also be affected by changes in water availability, sourcing, and quality; food security; and extreme temperature changes impacting organizations’ premises, operations, supply chain, transport needs, and employee safety. For example, the performance of an agricultural business might be affected by its crops being damaged by salt-water intrusion and its facilities being flooded by storm surges, both of which are risks that can be increased by sea-level rise.

Physical risks can be particularly important to insurance companies because a primary focus of their business is providing protection against the financial effects of such risks. A report by the

³ Task Force on Climate-related Financial Disclosures, *Recommendations of the Task Force on Climate-related Financial Disclosures*, December 14, 2016, and June 2017 “Final Report”.

Prudential Regulation Authority examined the impact of climate change on the UK insurance sector.⁴ It identified many ways in which insurance companies can be affected by physical risks, including: claims related to global natural catastrophes and floods and windstorms in the UK; disruptions in insurance arrangements, such as flood insurance; the impact of climate change on the clustering of windstorms, which affects correlations and hence capital requirements; indirect risks, such as supply-chain disruption; asset-side effects, such as on the value of real estate investments; and mortality and morbidity effects on life and health insurance claims.

Both transition risks and physical risks can affect the assets of all organizations operating in the financial sector. Those that provide loans or trade the securities of companies with direct exposure to climate-related risks, such as producers or intensive consumers of fossil fuels, real property owners, and agricultural or food companies, may accumulate climate-related risks via their loan and investment portfolios.

The TCFD also noted that efforts to mitigate and adapt to climate change can create opportunities for organizations, for example, through resource efficiency and cost savings, the adoption of low-emission energy sources, the development of new products and services, the creation or expansion of markets, and building resilience along the supply chain. Some of these opportunities might be directly relevant to organizations in the financial sector, for example, occupying more efficient office facilities, developing new insurance products, or increasing diversification through green bonds and infrastructure investments. Others might be relevant through their effects on customers and other counterparties.

Climate-related risks and opportunities can have significant financial impacts. They can affect both the revenues and expenditures on the income statement, as well as the assets, liabilities, and capital on the balance sheet. The TCFD provides some examples of risks, opportunities, and their potential financial impacts.⁵ It also notes that the risks, opportunities, and financial impacts can vary by industry, and provides references to several such analyses that have been published.⁶

Section 2: How Should the Financial Sector Respond?

Organizations operating in the financial sector should take account of climate-related risks and opportunities if they are to remain viable organizations. But they also have fiduciary responsibilities that extend beyond making profits for their owners. The financial system exists to meet various needs of society, performing basic functions that include:

- Facilitating the exchange of goods and services;
- Mobilizing the savings of households and firms;
- Allocating resources;
- Monitoring management and exerting corporate control; and
- Facilitating the management, pooling, trading, hedging, and diversifying of risks.

The broader responsibilities of the financial sector are highlighted by the United Nations Sustainable Development Goals (SDG). The SDG are accompanied by a series of industry-specific matrices, which identify opportunities for industries to develop shared value in reaching the goals.⁷ SDG

⁴ Prudential Regulation Authority (PRA), *The Impact of Climate Change on the UK Insurance Sector* (London: PRA, September 2015).

⁵ Task Force on Climate-related Financial Disclosures, *Recommendations of the Task Force on Climate-related Financial Disclosures*, December 14, 2016, and June 2017 “Final Report”. See tables 1 and 2.

⁶ Ibid, box 3.

⁷ United Nations Global Compact and KPMG International, *SDG Industry Matrix: Financial Services*, 2015.

13 is to “take urgent action to combat climate change and its impacts”, for which the Financial Services matrix identifies the following opportunities:

- Invest in – and/or raise finance for – climate risk mitigation, climate resilience and climate adaptation including climate and green bonds, and other debt and equity instruments.
- Increase coverage of national and regional natural catastrophe insurance schemes.
- Integrate climate risks into underwriting practices, investment analysis and decision making.
- Evaluate the risk of ‘stranded assets’ and consider global exposure limits or divestment across industry segments such as fossil fuel energy generation, coal mining, coal transportation infrastructure and unconventional oil extraction.
- Be an active steward of investments in portfolio companies, engaging with management and exercising shareholder voting roles to influence more climate-sensitive and climate-resilient business strategies that are inclusive of men, women and children.
- Measure and publicly disclose the carbon footprint of investment portfolios on an annual basis in accordance with The Montréal Carbon Pledge (including listed equities, fixed income, private equity, property and infrastructure).
- Take steps to measure, reduce and report climate exposure and progress on actions to confront climate change, continuing to increase the level of transparency and consistency of reporting across the industry sector.
- Consider supporting “Caring for Climate”, which is the UN Global Compact, UNEP and the secretariat of the UNFCCC’s initiative aimed at advancing the role of business in addressing climate change (endorsed by nearly 400 companies from 60 countries).

Support is available to financial sector organizations to help them respond to climate change. For example, the United Nations Environment Program – Finance Initiative (UNEP FI) is a partnership between United Nations Environment Program and the global financial sector created in the context of the 1992 Earth Summit with a mission to promote sustainable finance. Over 200 financial institutions, including banks, insurers and investors, work with UNEP to understand today’s environmental challenges, why they matter to finance, and how to actively participate in addressing them. Climate change is one of UNEP FI’s core themes, and involves the following:

- The key areas of focus for banking practitioners include: understanding portfolio carbon risk; defining and measuring climate performance; and a dedicated training program on climate change risks and opportunities.
- Work with the insurance industry is carried out through its Principles for Sustainable Insurance (PSI) Initiative. The PSI is a framework to address environmental, social and governance risks and opportunities in the insurance business – and a global initiative to strengthen the insurance industry’s contribution to building resilient, inclusive and sustainable communities and economies. The PSI, together with UN Environment’s Inquiry into the Design of a Sustainable Financial System and insurance regulators and supervisors from around the world, launched the Sustainable Insurance Forum for Supervisors (SIF) in December 2016. The SIF’s work program includes a focus on disclosure, access to insurance, sustainable insurance roadmaps, climate risk, disaster risk reduction and capacity building for supervisors.
- UNEP FI gathers over 40 leading institutional investors and asset managers committed to considering environmental, social and governance (ESG) issues as part of their business principles, strategies and operations. UNEP FI investment members are committed to help finance and achieve a sustainable and green economy and society. The Investment Committee drives and helps deliver the UNEP FI investment work program, working with UNEP FI members to generate tools, research, and to promote more transparent and sustainable business and investment practices. It

engages policymakers and regulators to identify and tackle regulatory barriers to sustainable investment.

Other initiatives have been established to foster the development of solutions for dealing with climate-related risks – and other sustainability issues. For example:

- The Sustainable Banking Network (SBN) is a community of financial sector regulatory agencies and banking associations from emerging markets committed to advancing sustainable finance in line with international good practice. The SBN facilitates the collective learning of members and supports them in policy development and related initiatives to create drivers for sustainable finance in their home countries.
- The Insurance Development Forum (IDF) is a public/private partnership led by the insurance industry and supported by international organisations. The IDF aims to optimise and extend the use of insurance and its related risk management capabilities to build greater resilience and protection for people, communities, businesses, and public institutions that are vulnerable to disasters and their associated economic shocks.

Organizations operating in the financial sector should develop and implement responses to climate-related risks through their governance, strategies, operations, risk management, metrics and targets, and disclosures. Their approach to dealing with climate-related risks should be part of their enterprise risk management processes. The climate-related risks most relevant to an organization will vary with the sector or sectors in which it operates and the specific nature of its business activities.

The financial disclosure recommendations published by the TCFD provide insight on what organizations in various industries should be doing to deal with climate-related risks. It recommends disclosures related to governance, strategies, risk management, and metrics and targets. The TCFD emphasizes that its recommendations apply to financial-sector organizations, including banks, insurance companies, asset owners⁸, and asset managers. It notes that large asset owners and asset managers sit at the top of the investment chain and, therefore, have an important role to play in influencing the organizations in which they invest to provide better climate-related financial disclosures. Each recommendation is accompanied by supporting recommended disclosures, each of which comes with implementation guidance.⁹ Some of the guidance applies to organizations in all sectors, but supplemental guidance has also been provided for certain industries, including banks, insurance companies, asset owners, and asset managers.¹⁰ But an organization cannot disclose what it is doing unless it is doing something!

The recommendations, supporting recommended disclosures, and supplemental guidance for the financial sector published by the TCFD are outlined in table 1.¹¹ Although the guidance applicable to all sectors is very important, it has been omitted in the interest of brevity. The standards and guidance on

⁸ Asset owners include public- and private-sector pension plans, insurance companies, endowments, and foundations. Insurance companies includes reinsurers.

⁹ Task Force on Climate-related Financial Disclosures, *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures*, December 14, 2016.

¹⁰ The supplemental guidance for insurance companies focuses on the risks that arise through their insurance underwriting activities. Insurance companies are also asset owners and are therefore expected to apply the supplemental guidance for both insurance companies and asset owners.

¹¹ This table includes information extracted from tables in: Task Force on Climate-related Financial Disclosures, *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures*, December 14, 2016. See the source document for the guidance applicable to all sectors.

enterprise risk management and disclosure published by international organizations are also relevant to both the actions that should be taken and the information that should be disclosed.¹²

Organizations should undertake stress testing and scenario analysis as they develop strategies for dealing with climate-related risks, just as they do with respect to other risks. Although limitations on the data available about the effects of climate change pose challenges to quantitative stress testing, shortcomings might be addressed through qualitative analysis of the potential outcomes under alternative scenarios. The TCFD has published guidance on the use of scenario analysis in disclosure of climate-related risks and opportunities.¹³ The guidance includes references to publicly-available climate-related scenarios related to both transition risks and physical risks. These and other resources should be used by organizations to develop scenarios particularly relevant to the nature of their business. For example, Lloyd's has developed an analysis of the insurance impacts of acute disruption to the global food supply, which might be caused – at least in part – by climate change.¹⁴

¹² See the publications of organizations such as the Basel Committee on Banking Supervision (BCBS), the International Association of Insurance Supervisors (IAIS), the International Organization of Securities Commissions (IOSCO), the Organization of for Economic Cooperation and Development (OECD), the International Organization of Pension Supervisors (IOPS), and the International Accounting Standards Board (IASB).

¹³ Task Force on Climate-related Financial Disclosures, *Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities*, December 14, 2016.

¹⁴ Lloyd's, *Food System Shock: The Insurance Impacts of Acute Disruption to Global Food Supply*, June 2015.

Table 1. Recommendations, Supporting Recommended Disclosures, and Supplemental Guidance for the Financial Sector

	Governance	Strategy	Risk Management	Metrics and Targets
Recommendations	<i>Disclose the organization's governance around climate-related risks and opportunities.</i>	<i>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.</i>	<i>Disclose how the organization identifies, assesses, and manages climate-related risks.</i>	<i>Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.</i>
	Recommended Disclosures	Recommended Disclosures	Recommended Disclosures	Recommended Disclosures
Supplemental Guidance for:	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.
Banks	No Supplemental Guidance.	Banks should describe significant concentrations of credit exposure to carbon-related assets. Additionally, banks should consider disclosing their climate-related risks (transition and physical) in their lending and other financial intermediary business activities.	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").	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: <ul style="list-style-type: none"> – Industry – Geography – Credit quality (e.g., investment grade or non-investment grade, internal rating system) – 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.

	Governance	Strategy	Risk Management	Metrics and Targets
Insurance Companies	No Supplemental Guidance.	No Supplemental Guidance.	<p>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:</p> <ul style="list-style-type: none"> – 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. 	<p>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 jurisdictions.</p>
Asset Owners	No Supplemental Guidance.	No Supplemental Guidance.	<p>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.</p>	<p>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 how these metrics have changed over time.</p> <p>Where appropriate, asset owners should provide metrics considered in investment decisions and monitoring.</p>

	Governance	Strategy	Risk Management	Metrics and Targets
Asset Managers	No Supplemental Guidance.	No Supplemental Guidance.	<p>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.</p> <p>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.</p>	<p>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.</p> <p>Where appropriate, asset managers should provide metrics considered in investment decisions and monitoring.</p>
	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.
Banks	No Supplemental Guidance.	No Supplemental Guidance.	No Supplemental Guidance.	No Supplemental Guidance.

	Governance	Strategy	Risk Management	Metrics and Targets
Insurance Companies	No Supplemental Guidance.	<p>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:</p> <ul style="list-style-type: none"> – 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. 	<p>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.</p> <p>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.</p>	No Supplemental Guidance.

	Governance	Strategy	Risk Management	Metrics and Targets
Asset Owners	No Supplemental Guidance.	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.	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.	<p>Asset owners should provide the weighted average carbon intensity, where data are available or can be reasonably estimated, for each fund or investment strategy.</p> <p>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) for common carbon footprinting and exposure metrics, including weighted average carbon intensity.</p> <p><i>Note: The Task Force acknowledges the challenges and limitations of current carbon footprinting metrics, including that such metrics should not necessarily be interpreted as risk metrics. The Task Force views the reporting of weighted average carbon intensity as a first step and expects disclosure of this information to prompt important advancements in the development of decision-useful, climate-related risk metrics. The Task Force 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.</i></p>

	Governance	Strategy	Risk Management	Metrics and Targets
Asset Managers	No Supplemental Guidance.	<p>Asset managers should describe how climate-related risks and opportunities are factored into relevant products or investment strategies.</p> <p>Asset managers should also describe how each product or investment strategy might be affected by the transition to a low-carbon economy.</p>	Asset managers should describe how they manage material climate-related risks for each product or investment strategy.	<p>Asset managers should provide the weighted average carbon intensity, where data are available or can be reasonably estimated, for each product or investment strategy.</p> <p>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) for common carbon footprinting and exposure metrics, including weighted average carbon intensity.</p> <p><i>Note: The Task Force acknowledges the challenges and limitations of current carbon footprinting metrics, including that such metrics should not necessarily be interpreted as risk metrics. The Task Force views the reporting of weighted average carbon intensity as a first step and expects disclosure of this information to prompt important advancements in the development of decision-useful, climate-related risk metrics. The Task Force recognizes that some asset managers may be able to report weighted average carbon intensity for only portion of the assets they manage given data availability and methodological issues.</i></p>
		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.
Banks		No Supplemental Guidance.	No Supplemental Guidance.	No Supplemental Guidance.

	Governance	Strategy	Risk Management	Metrics and Targets
Insurance Companies		<p>Insurance companies that perform climate-related scenario analysis on their underwriting activities should provide the following information:</p> <ul style="list-style-type: none"> – 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 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. 	No Supplemental Guidance.	No 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.	No Supplemental Guidance.	No Supplemental Guidance.
Asset Managers		No Supplemental Guidance.	No Supplemental Guidance.	No Supplemental Guidance.

Section 3: What Can Supervisors Do?

Climate change is becoming increasingly relevant to the financial sector and the consumers that it serves, and regulators and supervisors need to be proactive in dealing with the emerging risks.

Supervisors need to take steps to understand climate-related risks and their potential impacts, to support the development of a regulatory framework that enables them to be dealt with, and to assess the how well the organizations they supervise are dealing with them. For example, the PRA is focussing on promoting resilience to climate change and supporting an orderly financial sector transition to a lower-carbon economy through a combination of international collaboration, research, dialogue and supervision.¹⁵

Supervisors should take advantage of opportunities for international collaboration, which will enable them to share knowledge and develop robust and consistent approaches to dealing with climate-related risks. Forums for doing so include the international standard-setting organizations, the FSB, and organizations established to focus on climate change and other sustainability issues. Many of the organizations mentioned in section 2 encourage the participation of supervisors. Regional organizations of supervisors might be particularly useful as forums for focusing on the climate-related risks that are most significant in the region.

Supervisors should undertake research and training, which will help them to better understand climate-related risks and build their capacity to deal with them. Such initiatives might be done in collaboration with others, such as industry and professional organizations. For example, research might include gathering and analyzing data on property insurance claims in relation to weather data. Actuaries might be supported in developing analytical tools, such as the Actuaries Climate Index™, which is an objective measure of observed changes in extreme weather and sea levels in North America.¹⁶

Supervisors should develop – or recommend to legislators – laws, regulations, and guidance that support effective responses to climate-related risks. For example, legislation should permit financial sector organizations to participate in green lending and finance. Inappropriate regulatory barriers to innovative insurance solutions for dealing with climate-related risks should be removed. Capital adequacy requirements should take account of climate-related risks. Financial sector organizations and issuers of debt and equity instruments should be required to disclose information that enables consumers, investors, and other counterparties to make decisions that take climate-related risks into account.

Supervisors should ensure that their stress-testing frameworks capture climate-related risks. This includes the stress tests performed as part of macroprudential supervision, as well as those designed to help assess risks at the entity or group levels.

Last – but far from least – supervisors should take steps to ensure that the organizations they supervise are dealing effectively with climate-related risks. For example, they might perform a thematic review of the own-risk and solvency assessments prepared by insurance companies (and internal capital adequacy assessments prepared by banks) to evaluate the extent to which climate-related risks are being appropriately identified and assessed. As supervisors deal with individual organizations, they should assess whether their governance, strategies, operational practices, risk management frameworks, and disclosures meet regulatory requirements and take adequate account of climate-related risks. If not,

¹⁵ Prudential Regulation Authority (PRA), *The Impact of Climate Change on the UK Insurance Sector*, (London: PRA, September 2015).

¹⁶ The Actuaries Climate Index™ (ACI) is an educational tool designed to help inform actuaries, public policymakers, and the general public about climate trends and some of the potential impacts of a changing climate on the United States and Canada. It is intended to provide a useful monitoring tool of climate trends and will be updated quarterly as data for each meteorological season becomes available.

they should intervene in an appropriate and proportionate manner. For example, an organization might be required to revise its investment and lending policies to avoid concentrations of assets in industries that are particularly subject to climate-related risks.

Once again, collaboration with other organizations might assist supervisors in their efforts. For example, in the United States, the National Association of Insurance Commissioners has developed a climate-risk disclosure survey and Ceres, a non-profit organization, has analyzed the responses and published a report and scorecard.¹⁷

Conclusions

Climate change is occurring and it poses significant risks. It is essential that both financial sector supervisors and those they supervise are aware of the risks posed by climate change and take appropriate action in response to these risks. The risks posed by climate change are relevant to all types of financial sector supervision.

Climate-related risks fall into two major categories: (1) risks related to the transition to a lower-carbon economy and (2) risks related to the physical impacts of climate change. Transition risks arise because transitioning to a lower-carbon economy may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. Physical risks resulting from climate change can be event-driven (acute) or longer-term shifts (chronic) in climate patterns.

Physical risks can be particularly important to insurance companies because a primary focus of their business is providing protection against the financial effects of such risks. Both transition risks and physical risks can affect the assets of all organizations operating in the financial sector.

Efforts to mitigate and adapt to climate change can also create opportunities for organizations, for example, through resource efficiency and cost savings, the adoption of low-emission energy sources, the development of new products and services, the creation or expansion of markets, and building resilience along the supply chain. Climate-related risks and opportunities can have significant financial impacts.

Organizations operating in the financial sector should take account of climate-related risks and opportunities if they are to remain viable organizations. But they also have fiduciary responsibilities that extend beyond making profits for their owners. The broader responsibilities of the financial sector are highlighted by the United Nations Sustainable Development Goals (SDG). Support is available to help them respond to climate change, through initiatives such as the United Nations Environment Program – Finance Initiative (UNEP FI), the Sustainable Banking Network (SBN), and the Insurance Development Forum (IDF).

Organizations operating in the financial sector should develop and implement responses to climate-related risks through their governance, strategies, operations, risk management, metrics and targets, and disclosures. The financial disclosure recommendations published by the TCFD provide insight on what organizations in various industries should be doing to deal with climate-related risks. Organizations should undertake stress testing and scenario analysis as they develop strategies for dealing with climate-related risks, just as they do with respect to other risks.

¹⁷ Max Messervy, *Insurer Climate Risk Disclosure Survey Report & Scorecard: 2016 Findings & Recommendations* (Boston: Ceres, October 2016). Ceres is a non-profit organization advocating for sustainability leadership.

Climate change is becoming increasingly relevant to the financial sector and the consumers that it serves, and regulators and supervisors need to be proactive in dealing with the emerging risks. Supervisors should:

- Take advantage of opportunities for international collaboration, which will enable them to share knowledge and develop robust and consistent approaches to dealing with climate-related risks;
- Undertake research and training, which will help them to better understand climate-related risks and build their capacity to deal with them;
- Develop – or recommend to legislators – laws, regulations, and guidance that support effective responses to climate-related risks;
- Ensure that their stress-testing frameworks capture climate-related risks; and
- Take steps to ensure that the organizations they supervise are dealing effectively with climate-related risks.

References

The Actuaries Climate Index™ (ACI) is an educational tool designed to help inform actuaries, public policymakers, and the general public about climate trends and some of the potential impacts of a changing climate on the United States and Canada. The index is an objective measure of observed changes in extreme weather and sea levels. It is intended to provide a useful monitoring tool of climate trends and will be updated quarterly as data for each meteorological season becomes available.

<http://actuariesclimateindex.org/home/>

Messervy, Max. *Insurer Climate Risk Disclosure Survey Report & Scorecard: 2016 Findings and Recommendations*. Boston: Ceres, October 2016.

<http://www.ceres.org/resources/reports/2016-insurer-climate-risk-disclosure-survey/view>

Lloyd's. *Food System Shock: The Insurance Impacts of Acute Disruption to Global Food Supply*. June 2015.

<http://www.lloyds.com/news-and-insight/risk-insight/library/society-and-security/food-system-shock>

Prudential Regulation Authority (PRA). *The Impact of Climate Change on the UK Insurance Sector*. London: PRA, September 2015.

<http://www.bankofengland.co.uk/pradefra0915.pdf>

Task Force on Climate-related Financial Disclosures

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

www.fsb-tcfd.org

Task Force on Climate-related Financial Disclosures. *Phase I Report of the Task Force on Climate-related Financial Disclosures*. March 31, 2016.

Task Force on Climate-related Financial Disclosures. *Recommendations of the Task Force on Climate-related Financial Disclosures*. December 14, 2016.

Task Force on Climate-related Financial Disclosures. *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures*. June 2017.

Task Force on Climate-related Financial Disclosures. *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures*. December 14, 2016. A revised version was published in June 2017.

Task Force on Climate-related Financial Disclosures. *Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities*. December 14, 2016. A revised version was published in June 2017.

<https://www.fsb-tcfd.org/publications/>

United Nations Global Compact and KPMG International. *SDG Industry Matrix: Financial Services*. 2015.

https://www.unglobalcompact.org/docs/issues_doc/development/SDGMatrix_FinancialSvcs.pdf

Additional Readings

Most of the Key References include references to other documents and sources of information. A few of them have been listed below.

Rodel, Paul, et. al. “Environmental and Climate Change Disclosure under the Securities Laws: A Multijurisdictional Survey.” Client Update, Debevoise & Plimpton, March 2016.

http://www.debevoise.com/~media/files/insights/publications/2016/03/20160316_environmental_and_climate_change_disclosure_under_the_security.pdf.

The Insurance Development Forum (IDF) is a public/private partnership led by the insurance industry and supported by international organisations. The IDF was first announced at the United Nations Conference of the Parties (COP21) Paris Climate summit in 2015 and was officially launched by leaders of the United Nations, the World Bank and the insurance industry in 2016.

The IDF aims to optimise and extend the use of insurance and its related risk management capabilities to build greater resilience and protection for people, communities, businesses, and public institutions that are vulnerable to disasters and their associated economic shocks.

The IDF will initially focus on building greater resilience to climate and natural hazards risks in line with the G7 InsuResilience target of extending climate risk insurance coverage to an additional 400 million people across vulnerable countries by 2020. To achieve this target the IDF will coordinate and implement insurance related risk management capabilities across the following two priority working initiatives:

- Technical Assistance Facility (TAF) – The TAF will develop a platform that helps governments assess and understand their risks and develop and deploy effective integrated insurance solutions tailored to their unique challenges. The TAF will serve as a central mechanism to integrate all relevant IDF activities with the aim of helping governments extend insurance coverage to 300 million of the world’s most vulnerable people.
- Microinsurance – The Microinsurance initiative will work together with private, mutual, governmental and civil society partners to extend relevant ‘on-the-ground’ insurance solutions to an additional 100 million vulnerable people.

While the IDF will initially contribute to the achievement of the G7 InsuResilience target, its scope is expected to expand in time to include additional insurance-related priorities across the wider UN Agenda 2030.

<http://theidf.org/>

The Sustainable Banking Network (SBN) is a unique community of financial sector regulatory agencies and banking associations from emerging markets committed to advancing sustainable finance in line with international good practice. The Network facilitates the collective learning of members and supports them in policy development and related initiatives to create drivers for sustainable finance in their home countries.

http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability+and+disclosure/environmental-social-governance/sbn

Sustainability Accounting Standards Board. “Climate Risk Technical Bulletin.” October 2016.

SASB’s Technical Bulletin on Climate Risk is designed to help investors better understand, measure and manage their exposure to climate-related risk. The research finds that climate change affects 72 out of 79

industries (93 percent of the capital markets, or \$27.5 trillion) but manifests differently from one industry to the next. Due to the ubiquity of climate risk, investors can't simply diversify away from it; instead they must focus on managing it—and on encouraging portfolio companies to manage it—in all its forms.

This technical bulletin highlights findings related to climate risk arising from research conducted by SASB as part of its standards-setting process. The bulletin provides an overview of where climate-related risk is likely to be present in a typical portfolio, and what types of risk are present, along with the financial implications. It also summarizes the quality of existing disclosure on climate-related risk by SEC registrants. Using this bulletin, investors may better understand the nature of their risk exposures in each industry, as well as in which industries that risk is likely to be uncompensated due to inadequate disclosure in mandatory SEC filings.

<https://library.sasb.org/climate-risk-technical-bulletin-preview/> (free excerpt)

United Nations Environment Program – Finance Initiative (UNEP FI) is a partnership between United Nations Environment Program and the global financial sector created in the context of the 1992 Earth Summit with a mission to promote sustainable finance. Over 200 financial institutions, including banks, insurers and investors, work with UNEP to understand today's environmental challenges, why they matter to finance, and how to actively participate in addressing them.

UNEP FI's work also includes a strong focus on policy – by fomenting country-level dialogues between finance practitioners, supervisors, regulators and policy-makers, and, at the international level, by promoting financial sector involvement in processes such as the global climate negotiations.

Finally, UNEP FI hosts the Global Roundtable every other year since 1994.

<http://www.unepfi.org/about/>

Climate Change is one of UNEP FI's core themes. The key areas of focus for banking practitioners include:

- Understanding portfolio carbon risk
- Defining and measuring climate performance
- A dedicated training program on climate change risks and opportunities

UN Environment's work with the insurance industry is carried out through its Principles for Sustainable Insurance (PSI) Initiative. The PSI is a pioneering global framework to address environmental, social and governance risks and opportunities in the insurance business—and a global initiative to strengthen the insurance industry's contribution to building resilient, inclusive and sustainable communities and economies.

United Nations Environment Program Finance Initiative (UNEP FI). *Principles for Sustainable Insurance*. June 2012.

<http://www.unepfi.org/psi/wp-content/uploads/2012/06/PSI-document.pdf>.

The PSI, together with UN Environment's Inquiry into the Design of a Sustainable Financial System and insurance regulators and supervisors from around the world, launched the Sustainable Insurance Forum for Supervisors (SIF) in December 2016. The SIF is a practical arena to strengthen the ability of insurance regulators and supervisors to manage the sustainable development dimensions of their mandates through international cooperation. Held in San Francisco, the first meeting of the Sustainable Insurance Forum included insurance supervisors and regulators from Brazil, California, France, Ghana, Jamaica, Morocco, the Netherlands, Singapore and the UK, as well as the International Association of Insurance Supervisors.

The San Francisco meeting approved the Forum's first year work program for 2017, including a focus on disclosure, access to insurance, sustainable insurance roadmaps, climate risk, disaster risk reduction and capacity building for supervisors.

UNEP FI gathers over 40 leading institutional investors and asset managers committed to considering environmental, social and governance (ESG) issues as part of their business principles, strategies and operations. With the historic adoption of the Paris Agreement and the 17 Sustainable Development Goals (SDGs), UNEP FI investment members are committed to help finance and achieve a sustainable and green economy and society.

The Investment Committee drives and helps deliver the UNEP FI investment work program. The Committee works with UNEP FI members to generate tools, research, and to promote more transparent and sustainable business and investment practices. It engages policymakers and regulators to identify and tackle regulatory barriers to sustainable investment.