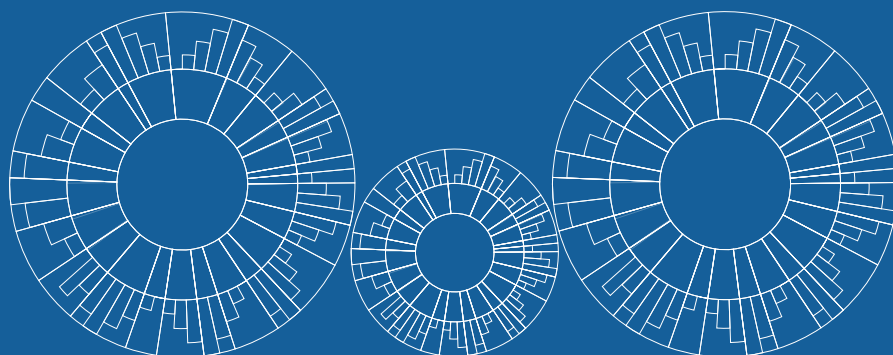


Climate Change and Climate Risk Oversight

A GUIDE FOR CORPORATE LEADERS AND DIRECTORS



With support from



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Prepared by Stephanie Bertels and Mireta Strandberg-Salmon

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Stephanie Bertels and Mireta Strandberg-Salmon, *Climate Change and Climate Risk Oversight*, (Embedding Project, 2021).

DOI: 10.6084/m9.figshare.1442807

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Executive Summary

Climate change is a planetary emergency that presents severe risks to businesses, society, and the global economy. The science is clear - human activities such as burning fossil fuels and deforestation are causing accelerated global warming. Climate change is already having impacts worldwide, with disproportionate effects on vulnerable and marginalised communities and on the Global South.

Climate change threatens the future success of businesses from all sectors. Businesses around the world have a key role to play to help avoid the worst impacts of climate change by supporting emissions reduction and climate adaptation. Emissions must be halved by 2030 and reach net zero by 2050 and businesses must do their part to help drive the transition to a just, net-zero future. In addition, businesses will need to make proactive investments in climate adaptation to prevent damage to crucial natural and physical infrastructure.

This guide supports corporate leaders and directors to understand:

- The science behind climate change,
- The present and future impacts of climate change,
- The physical risks climate change poses to business operations and the transition risks associated with the shift to a net-zero economy, and
- The emerging expectations for corporate directors regarding their fiduciary duty in the face of climate risks.

More and more, the public, investors, lenders, and insurers are calling for businesses to embed climate risks and opportunities into their strategic planning and decision-making. Leading companies are responding to these societal demands - which are increasingly becoming regulatory obligations - through climate-aligned disclosure, goal setting, position statements, and financing.

This guide outlines the key questions corporate directors should be asking to ensure rigorous climate risk oversight and advance credible climate action.

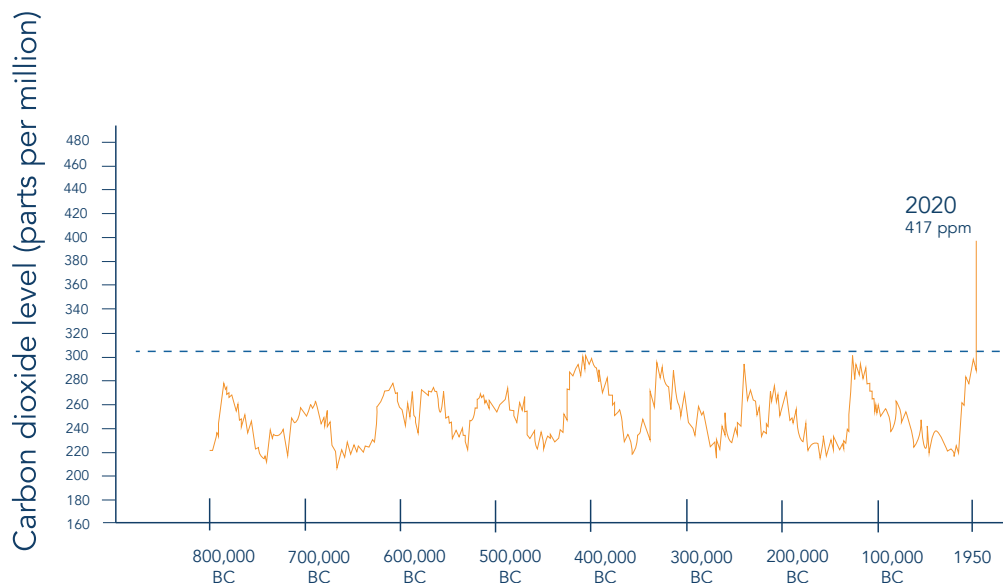
Introduction

There is global scientific consensus on the risks and severity of climate change. Climate change is real, it is global, the consequences are severe and intensifying, and humans are driving this impending crisis. Climate change – and the actions required to address it – will have significant impacts on economic resilience, the stability of global financial markets, the wellbeing of communities, and the success of companies that operate within them. Central banks, investors, lenders, and insurance underwriters are calling the climate crisis a systemic risk to our financial system. No business, regardless of the sector, is immune. Companies that fail to address the climate crisis and the business risks it creates do so at their own peril.

For business leaders, a new duty of care is emerging. Corporate directors must be proactive in understanding the science behind the climate crisis and possible future climate scenarios to fully grasp the implications for society and the business that they lead and govern. Climate change is a complex challenge with significant business risks. To manage these risks, corporate directors must consider intersecting scientific, macroeconomic, and policy-related uncertainties over timeframes much longer than conventional strategic planning cycles. This guide will help you understand the science behind climate change, why climate change matters to businesses, and what actions your business can take to accelerate the transition to a net-zero, climate-resilient future.

The Science of Climate Change

Human activities such as burning fossil fuels, deforestation, and land use change release carbon dioxide, nitrous oxide, methane, and other greenhouse gases into the atmosphere. Over the last century, the atmospheric concentration of these greenhouse gases has steadily increased, reaching levels significantly higher than anything on record in the last 800,000 years.¹ Of all industrial carbon dioxide emitted since the beginning of the Industrial Revolution in the 18th century, more than half has been released since 1988 — the same year the Intergovernmental Panel on Climate Change (IPCC) began its work.² As greenhouse gases accumulate in the atmosphere, they trap heat. This is causing a long-term increase in global average temperatures — a phenomenon called global warming.



Source: <https://climate.nasa.gov/evidence/>

The IPCC is the United Nations body for assessing climate science, impacts, risks, and opportunities. The IPCC provides governments with scientific reports to inform climate policy and international climate change negotiations. IPCC scientists review thousands of scientific papers each year to produce the assessment reports, making the IPCC the world's leading voice on climate science.³

¹ https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf

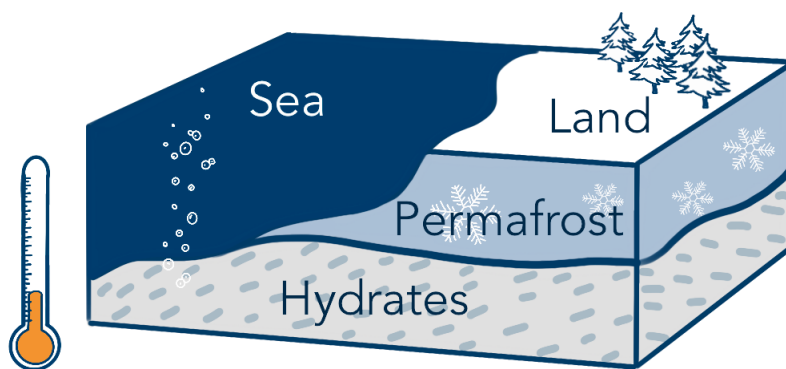
² <https://blog.ucsusa.org/peter-frumhoff/global-warming-fact-co2-emissions-since-1988-764>

³ <https://www.ipcc.ch/about/>

Scientists have issued warnings about climate change since at least the 1980s, but recent evidence suggests that climate change is advancing even faster than initially thought. This is because of so-called “tipping points” in the Earth’s climate system, which might lead to abrupt climate changes.⁴

One of these tipping points has to do with the oceans’ capacity to absorb carbon dioxide and heat from the atmosphere. Oceans are the largest carbon sink on the planet. They currently absorb thirty percent of the carbon we emit, and ninety percent of the excess heat generated by increased greenhouse gas emissions.⁵ But at some point, the oceans will absorb less and less carbon dioxide from the atmosphere, which will lead to a more rapid accumulation and thus faster climate change. Also, as oceans absorb carbon dioxide, the acidity of the water increases, and this poses a serious threat to ocean coral and other sea life.

Another tipping point has to do with greenhouse gases trapped in ice. Vast amounts of carbon dioxide and methane are stored in frozen deposits called gas hydrates under the ocean floor or under permafrost in high latitudes. The gases in these hydrates are precariously close to being released because of rising temperatures. If this happens, massive amounts of greenhouse gases will be emitted into the atmosphere, with grave consequences for climate change.⁶



⁴ <https://www.nature.com/articles/d41586-019-03595-0>

⁵ <https://www.nationalgeographic.com/science/article/greenhouse-gases-lurk-in-oceans-could-make-warming-far-worse#:~:text=The%20oceans%20absorb%20a%20third,carbon%20sink%20on%20the%20planet>

⁶ <https://www.nature.com/scitable/knowledge/library/methane-hydrates-and-contemporary-climate-change-24314790/>

Forests and soils are also carbon sinks, storing one quarter of global carbon emissions.⁷ But deforestation is rampant. Globally, the planet loses an area of tree cover equivalent to the size of the United Kingdom every year.⁸ In addition to regulating the climate, forests provide ecosystem services and goods that are essential to human wellbeing. By damaging forests and soils, we are eroding the very foundations of our economies, livelihoods, food security, health, and quality of life.



Significant investments are being made to fund the development of artificial carbon sinks, including carbon capture and storage technologies. However, no technology can match the scale and efficiency of the Earth's natural systems. Greenhouse gas emissions from human activities are changing the climate so quickly that ecosystems and human society are struggling to adapt. Climate risks for businesses and society will continue to worsen unless we transition rapidly to a net-zero economy.

⁷ Dinerstein, E., Vynne, C., Sala, E., Joshi, A., Fernando, S., Lovejoy, T., Mayorga, J., Olson, D., Asner, G., Baillie, J., Burgess, N., Burkart, K., Noss, R., Zhang, Y., Baccini, A., Birch, T., Hahn, N., Joppa, L., & Wikramanayake, E. (2019). A Global Deal for Nature: Guiding principles, milestones, and targets. *Science Advances*, 5(4), 1-17. DOI:10.1126/sciadv.aaw2869

⁸ <https://forestdeclaration.org/summary>

The Impacts of Climate Change

Rising temperatures are causing catastrophic climate impacts worldwide. Climate change is contributing to increased extreme weather events like hurricanes, flooding, heat waves, and droughts. It is also accelerating the melting of sea ice and glaciers, leading to global sea level rise. In 2020 alone, global disasters exacerbated by climate change cost over 200 billion US dollars.⁹

Climate change is also damaging the health of the ecosystems upon which humans and all other species depend, leading to heightened climate-related social crises. Seasons are shifting in many regions, with impacts on vectors that spread disease. Changing weather patterns also threaten food production by increasing the volatility of agricultural yields. This poses significant threats to food security worldwide. Global warming is leading to decreased streamflow and reduced snow and ice cover, contributing to water stress on every continent.¹⁰ As water is crucial for human health and hygiene, agriculture, energy, and ecosystems, water shortages threaten social, environmental, and economic resilience. Today, 1 percent of the planet is too hot to support human life. But within the next fifty years, almost 20 percent of the planet could suffer this fate, leading to mass migration.¹¹ By 2050, it is estimated that there will be over 200 million climate refugees.¹²



Climate models predict that within 50 years, almost 20% of the planet could be an unlivable hot zone (adapted from source 11)

⁹ <https://www.munichre.com/en/company/media-relations/media-information-and-corporate-news/media-information/2021/2020-natural-disasters-balance.html>

¹⁰ <https://unesdoc.unesco.org/ark:/48223/pf0000372985.locale=en>

¹¹ <https://www.nytimes.com/interactive/2020/07/23/magazine/climate-migration.html>

¹² <https://publications.iom.int/books/mrs-ndeg31-migration-and-climate-change>

Climate justice

The responsibility for climate change is not evenly distributed. The G8 nations (the USA, EU-28, Russia, Japan, and Canada) are responsible for 85 percent of excess global greenhouse gas emissions.¹³ And only 25 corporate and state-owned entities are responsible for producing over half of the global industrial emissions emitted since 1988.¹⁴

Despite this, the impacts of climate change place a disproportionate burden on countries in the global South, even though they have historically contributed the least to the climate crisis. On the one hand, because of their geographical location, Southern countries are more likely to experience extreme weather events. Climate adaptation in the Global South could cost up to \$500 billion annually by 2050.¹⁵ On the other hand, their socio-economic situation and ongoing legacies of colonialism, capitalism, and racism challenge their capacity to adapt and respond.

At the same time, around the globe, Black, Indigenous, and People of Colour communities often face disproportionate vulnerability to the impacts of climate change stemming from social inequities that are likely to be exacerbated as we transition.¹⁶ The shift will also impact livelihoods for a range of workers. Jobs in carbon-intensive industries might be lost, while jobs aligned with the net-zero transition might be gained, but possibly not in the same locations or to the benefit of the same groups of workers.

¹³ [https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(20\)30196-0/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30196-0/fulltext)

¹⁴ <https://www.theguardian.com/sustainable-business/2017/jul/10/100-fossil-fuel-companies-investors-responsible-71-global-emissions-cdp-study-climate-change>

¹⁵ <https://www.un.org/sustainabledevelopment/blog/2016/05/unep-report-cost-of-adapting-to-climate-change-could-hit-500b-per-year-by-2050/>

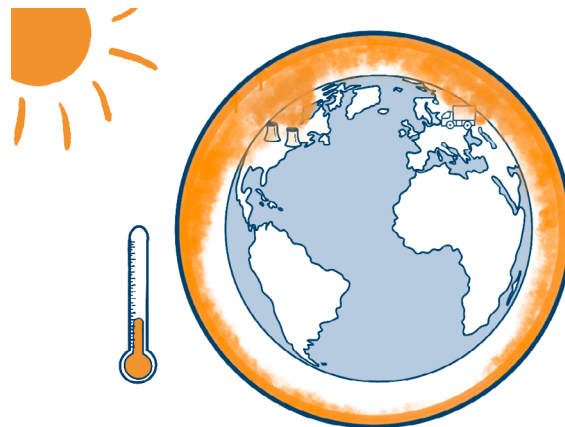
¹⁶ <https://www.business-humanrights.org/en/big-issues/climate-justice/>

The public is increasingly calling for climate justice, demanding that those who are responsible for climate change be held accountable and that transition plans take into account the need for equity. Many countries are prioritising climate justice in the transition to a net-zero economy by promoting worker training in sustainable industries, funding climate adaptation projects that serve remote and historically disadvantaged communities, and investing in nature-based climate solutions that recognise and respect the rights and lands of Indigenous Peoples.

Businesses also need to do their part to advance climate justice. In addition to mitigating climate change, businesses will increasingly be expected to use their power and voice to advocate for stronger climate policy responses from governments and to help address social inequities as we transition. To support a resilient and prosperous future, businesses must do their part to ensure that both the costs and benefits of climate action are distributed in a way that is equitable.

Climate Risks and Opportunities

No country or business is immune to climate impacts. Yet, while we have known about climate change for decades, we have been slow to act. We are now on a path to increasing climate impacts that will continue to intensify for the foreseeable future. According to the IPCC, to avoid the worst climate impacts, global emissions must be halved by 2030 and reach net zero by 2050.¹⁷ But despite pledges from countries and companies to reduce carbon emissions, temperatures continue to rise. Without transforming our economies to bring emissions down, we will overwhelm the planet's ability to recover, with devastating consequences.



International movements and demonstrations are placing increased pressure on governments and businesses to act. And nearly two thousand jurisdictions, including several national governments, have declared a climate emergency.¹⁸ Investors, lenders, insurers, and customers increasingly expect businesses to embed climate risks and opportunities into their strategic planning. Voluntary initiatives are emerging to support businesses on their path to embedding climate action and disclosure in their corporate strategies, and governments worldwide are increasingly mandating corporate climate action.

¹⁷ <https://www.ipcc.ch/sr15/chapter/spm/>

¹⁸ <https://climateemergencydeclaration.org/climate-emergency-declarations-cover-15-million-citizens/>; <https://carbonpricingdashboard.worldbank.org/>

The Task Force on Climate-related Financial Disclosures

In the wake of the 2007-2008 global financial crisis, the G20's Financial Stability Board established the Task Force on Climate-related Financial Disclosures (the TCFD) to better understand the risks of climate change to the global economy and to help businesses identify, understand, monitor, and oversee the changes necessary to mitigate climate risks and realise the opportunities associated with a climate transition.¹⁹ The TCFD recommendations provide a global reference for businesses from all sectors to assess and disclose their climate-related financial risks and develop scenario-informed strategies to address climate impacts.

More and more companies are voluntarily disclosing their climate risks in their financial filings and reporting, and climate risk disclosure is mandatory in some jurisdictions. New Zealand was the first country to require mandatory climate risk reporting in line with the TCFD guidelines. Several other countries are enacting or considering similar mandatory disclosure requirements.

Given our current trajectory of warming, the resilience of businesses, the economy, society, and Earth's ecosystems are at risk. The TCFD recognises two categories of climate risks: physical risks and transition risks.²⁰

¹⁹ <https://assets.bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf>

²⁰ <https://assets.bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf>

Physical risks	Transition risks
Physical risks related to the physical impacts of climate change include: • Damage to assets and supply chain disruptions; • Impacts on employee health from extreme temperatures; • Availability of water and other inputs for business needs; • Disruptions from drought, flooding, forest fires, and other extreme weather events.	Transition risks related to the transition to a net-zero, climate-resilient future include: • Policy changes, such as carbon pricing and changing disclosure requirements; • Technological changes and technology substitution; • Reputation and litigation risks, such as changing customer demands and social acceptance of corporate transition strategies; • Market risks, such as changing supply and demand for products and services.

Physical risks can be classified as acute or chronic. Acute physical risks are immediate and event-driven, including increased severity of flooding and hurricanes. Chronic physical risks result from long-term shifts in climate patterns, including sea level rise and rising temperatures.²¹

Regulation and litigation are two prominent transition risks for businesses. Regulation will reshape the way businesses think about and respond to climate change. As governments implement policies to drive the net-zero economy transition, companies will be required to adapt to a new regulatory environment. For example, carbon pricing systems are being implemented or considered on every continent. Litigation over climate rights and liabilities is also on the rise. Energy companies face lawsuits from cities, states, and the public, and governments face lawsuits from their citizens, including youth, for failing to protect their right to a healthy future.²²

The evolving landscape of physical and transition climate risks and societal expectations has significant implications for future business success.

²¹ <https://assets.bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf>

²² <https://www.unep.org/resources/report/global-climate-litigation-report-2020-status-review>

Climate risk oversight

Corporate directors have a crucial role to play in addressing both the risks and opportunities of climate change. As climate risks intensify and societal expectations regarding the role of businesses shift, expectations for directors with respect to their duty of care are evolving rapidly. To succeed and lead in this emerging business environment, corporate directors must be able to demonstrate that they are informed about climate risks and have a strategy to address them. As we develop a better understanding of the impacts of climate change, demands for corporate action will only intensify.

Businesses are responding to emerging risks and expectations by transitioning from a focus on compliance with existing regulations, to monitoring and disclosing their emissions and climate risks, and increasingly, to articulating a clear and credible strategy to do their part to reduce emissions and adapt to the disruptive risks of climate change.

The success of your business depends on the resilience of the social and environmental systems where you operate. As a result, a growing number of companies are adjusting their strategies to ensure they operate within social, environmental, and economic system limits.



Our [Embedded Strategies Guide](#) helps companies respond to the growing calls for businesses to articulate their purpose and strategy in alignment with the need to shift the global economy towards a rapid climate transition. This guide will help you develop a contextual strategy and goals that ensure your company is doing its part to maintain the resilience of key social and environmental systems.



Our guide on [Understanding Community Resilience](#) helps companies assess their impacts on community wellbeing and understand how they can support community resilience.

Science-based targets

Articulating a clear emissions reduction pathway that aligns with climate science is a key component of a credible climate strategy. One fifth of Fortune 500 companies have committed to setting a science-based emissions reduction target in line with what science says is necessary to avoid the worst climate impacts.²³

Reflecting the urgency of the climate crisis, the timeframe for action is also being accelerated. The Climate Pledge calls on signatory companies to achieve net zero by 2040 – ten years ahead of the 2050 deadline set by the IPCC.²⁴ Walmart has pledged to reduce the emissions from its global operations to zero by 2040 without using carbon offsets.²⁵ Microsoft has been even more ambitious and committed to be carbon negative by 2030, and to remove its historical emissions by 2050.²⁶



To benchmark your own climate goals or see examples of leading goals, consult the [Embedding Project's Credible Goals Database](#). The Database profiles over five hundred leading goals on climate and other environmental, social, and governance (ESG) issues, and is updated on a weekly basis.

Climate position statements

Investors, employees, customers, and society are also demanding that companies take a clear public position on climate change. Thousands of companies have responded by issuing a climate change position statement. Credible climate position statements clearly explain the climate challenge, link the issue to business risks and opportunities, and clarify corporate climate commitments. Concise, transparent, and accessible climate position statements enable businesses to communicate their position to stakeholders and the communities in which they operate. Position statements also provide the direction and confidence for employees to take action within the business.

²³ <https://sciencebasedtargets.org/blog/the-new-normal-1-000-companies-are-now-setting-science-based-climate-targets>

²⁴ <https://www.theclimatepledge.com/>

²⁵ <https://corporate.walmart.com/newsroom/2020/09/21/walmart-sets-goal-to-become-a-regenerative-company>

²⁶ <https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/>



The Embedding Project reviewed over two thousand climate change position statements and spoke with over two hundred directors from a range of industries to identify leading examples of corporate climate position statements. We published this research in our guide on [Next Generation Governance: Emerging Trends in Climate Change Position Statements](#). Consult this resource for guidance on how to develop your own climate position statement or benchmark your existing position statement against leading practice.



The Embedding Project also created a public [Positions Database](#) that includes over 200 examples of leading position statements and is updated on a monthly basis. Consult the Positions Database to see examples of leading positions articulated by large companies globally that address a range of ESG issues.

A shift towards climate-aligned financing

Corporate leaders will need to anticipate more demanding expectations from investors and lenders as the financial sector drives further demands for corporate climate leadership. Leading financial institutions have committed to transforming their full portfolios of lending and investments to reflect and finance the transition to a more just, net-zero economy. Going forward, financial institutions have a crucial role to play in directing financing towards net-zero infrastructure and solutions as well as supporting clients in carbon-intensive sectors to transition towards a climate-resilient future.²⁷

²⁷ <https://climatealignment.org/>

Accelerating Your Organisation's Climate Leadership

The science behind climate change is clear - we know what action is required to address the climate crisis. It is time for companies to do their part by investing in the changes they need to transform their operations, value chains, and investment practices for a net-zero future. In upholding your duty of care, you have a role to play in ensuring your company addresses the issue of climate change in a credible way.

Here are some questions directors should be asking about the climate risks and opportunities faced by their company:

- Do our board and executives have the necessary expertise to recognise and address emerging climate risks?
- Does our company understand its climate risks and opportunities?
- Have we articulated a credible climate position and set credible climate goals?
- Have we put in place a credible climate strategy?
- Are we disclosing our climate risks and strategy in line with the TCFD?
- Have we established clear innovation priorities?
- Have we adjusted our capital decision-making in line with these priorities?

Considering these questions will be crucial to managing climate risk and accelerating your company's climate action leadership. Now is the time to take action to protect the prospects and wellbeing of your business, of communities, of future generations, and of the planet.

Additional Resources

Climate risk oversight

Running the Risk: How Corporate Boards Can Oversee Environmental, Social and Governance Issues

[This report by Ceres](#) provides guidance to corporate boards on how they can oversee risks posed by ESG issues and includes questions for directors to ask management throughout the risk identification, assessment, and mitigation processes. Drawing on interviews with corporate directors and experts across a range of sectors, the report offers recommendations to help boards improve their companies' resilience to risks such as climate change.

Getting Climate Smart: A Primer for Corporate Directors

[This Primer by Ceres](#) is designed to help corporate directors understand why climate change is a board-relevant issue and how to oversee climate-related risks and opportunities. Consult this resource for guidance on how directors can build climate competency into their boards and how to increase business resilience in the face of climate impacts.

Climate risk

Task Force on Climate-related Financial Disclosures

The TCFD emerged in response to growing calls for businesses to transparently measure and evaluate the risks that climate change poses to their assets, suppliers, and future profitability. The TCFD provides comprehensive resources to help businesses develop "consistent, comparable, reliable, clear, and efficient" climate-related financial disclosures. The TCFD's resources focus on governance, strategy, risk, metrics, targets, and the use of scenario analysis to evaluate climate risks and opportunities. The TCFD's [Final Recommendations Report](#) and [Technical Supplement](#) provide in-depth information and tools for using scenario analyses to understand the implications of climate-related risks and opportunities to your organisation.

Climate Risk: Is It on Your Radar?

The Chartered Professional Accountants of Canada produced [this guide](#) to provide information about climate risks for businesses and what a good position statement on climate change looks like. Consult this resource for guidance on how to develop a climate position statement that reflects the information required by investors, lenders, and insurance underwriters to properly assess and price climate-related risks.

Climate action

Science Based Targets Initiative

Specifically focused on the reduction of greenhouse gas emissions, the [Science Based Targets initiative](#) helps companies develop their emissions reduction goals based on the latest climate science. This website offers resources, cases, and support to help your company develop a science-based carbon goal.

Principles for Responsible Banking

The United Nations Environment Programme's Finance Initiative established the [Principles for Responsible Banking](#) to provide a framework for banks to align their strategies and portfolios with the Sustainable Development Goals and with the Paris Agreement goal of limiting global warming to 1.5 degrees Celsius above pre-industrial levels. Over 200 banks have signed on to the Principles for Responsible Banking, representing one third of the global banking industry. Consult the six Principles for guidance on how the financial sector can embed climate action and governance across all business areas.

The Climate Pledge

[The Climate Pledge](#) is a community of companies that are taking collective action to address the climate crisis and ensure a healthy future for all. The Climate Pledge signatories are committed to achieving net-zero carbon emissions by 2040 and are accelerating investment in net-zero products and services. Leading businesses can sign onto the Pledge to demonstrate their commitment to greenhouse gas emissions reporting, decarbonisation, and purchase of credible offsets.

The Climate Justice Playbook for Business: How to Centre Climate Action in Climate Justice

[The Climate Justice Playbook](#) is a guide to help business leaders understand what climate justice is, why it matters to businesses, and how businesses can advance equity through climate action. Developed by B Corp, the COP26 Climate Champions Team, Provoc, and the Skoll Centre for Social Entrepreneurship at the University of Oxford, the Playbook explores how businesses can pursue climate justice to increase community resilience, build sustainable economies, and create diverse corporate cultures that help businesses thrive.

Climate science and impacts

Intergovernmental Panel on Climate Change

As the world's leading voice on climate science, IPCC provides regular reports on climate science to inform international climate policy. [The IPCC reports](#) are a go-to resource for information on climate change, its causes, potential impacts, and response pathways.

Global Climate Change: Vital Signs of the Planet

[NASA's repository on climate change](#) is a reliable and comprehensive starting point for building up your knowledge and understanding of climate change. The platform provides a wealth of relevant and credible information to support the learning of corporate directors, including the latest research, breaking news, and nuanced Q&As on climate change evidence, causes, effects, and solutions.

Greenhouse Gas Protocol

The [Greenhouse Gas Protocol](#) is the global standard for measuring greenhouse gas emissions. Developed by the World Resources Institute and World Business Council on Sustainable Development, the Protocol includes sector-specific guidance, accounting and reporting standards, calculation tools, and online training.

CDP

Best known for their in-depth questionnaire, certification program, and scoring system, [CDP](#) (formerly known as the Carbon Disclosure Project) provides sector-specific climate change research, with full reports available to members and signatories. CDP's resources help corporate directors quickly survey the scene of climate change efforts, needs, and predictions in the context of your industry.

Acknowledgements

The Embedding Project is hosted by the Beedie School of Business at Simon Fraser University.



This research was supported by the Social Sciences and
Humanities Research Council of Canada



Social Sciences and Humanities
Research Council of Canada

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sciences humaines du Canada

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and contributions from our partner companies:

<https://www.embeddingproject.org/our-community>