



# IMPLEMENTING THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD) RECOMMENDATIONS

A GUIDE FOR ASSET OWNERS

# THE SIX PRINCIPLES

## PREAMBLE TO THE PRINCIPLES

As institutional investors, we have a duty to act in the best long-term interests of our beneficiaries. In this fiduciary role, we believe that environmental, social, and governance (ESG) issues can affect the performance of investment portfolios (to varying degrees across companies, sectors, regions, asset classes and through time). We also recognise that applying these Principles may better align investors with broader objectives of society. Therefore, where consistent with our fiduciary responsibilities, we commit to the following:

- 1 We will incorporate ESG issues into investment analysis and decision-making processes.**
- 2 We will be active owners and incorporate ESG issues into our ownership policies and practices.**
- 3 We will seek appropriate disclosure on ESG issues by the entities in which we invest.**
- 4 We will promote acceptance and implementation of the Principles within the investment industry.**
- 5 We will work together to enhance our effectiveness in implementing the Principles.**
- 6 We will each report on our activities and progress towards implementing the Principles.**



## PRI's MISSION

We believe that an economically efficient, sustainable global financial system is a necessity for long-term value creation. Such a system will reward long-term, responsible investment and benefit the environment and society as a whole.

The PRI will work to achieve this sustainable global financial system by encouraging adoption of the Principles and collaboration on their implementation; by fostering good governance, integrity and accountability; and by addressing obstacles to a sustainable financial system that lie within market practices, structures and regulation.

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# KEY MESSAGES

Financial markets require high quality and timely data on climate-related risks to operate efficiently through the energy transition. The recommendations from the FSB Taskforce on Climate-Related Financial Disclosure (TCFD) provide a common international framework through which investors and companies can make informed decisions about their exposure to climate-related risks and opportunities in their businesses and future capital allocation plans. The TCFD was a financial industry-led initiative and has been publicly backed by over 238 companies, including 150 financial institutions, and investors representing a combined market capitalisation of over US\$6 trillion and representing US\$81.7 trillion assets under management<sup>1</sup>. Following the publication of the recommendations, the industry's focus is now shifting towards adoption and implementation<sup>2</sup>, with some asset owners already releasing their initial responses<sup>3</sup>.

Building on this momentum, this guide sets out a practical framework to support asset owners in their efforts to implement the TCFD recommendations. Specifically, the guide focuses on the 'actions' that asset owners can take to improve processes around governance, strategy, risk management and metrics/targets. While there is also some discussion of the 'Principles for good TCFD reporting practice' and a mapping to the PRI Reporting Framework, the guide does not focus on 'how' to report on these issues so much as what 'actions' are needed to align with the TCFD framework.

## TCFD: WHAT ARE THE BENEFITS FOR ASSET OWNERS?

Asset owners can benefit from supporting and committing to implementing the TCFD recommendations for the following reasons:

- **Translation of material climate-related risks and opportunities into financial metrics.** Climate and environmental risks are in part the result of market failure and as such not reflected in prices. The TCFD recommendations provide a coherent and comparable framework through which climate science, technological change and government policy can in time be translated into metrics that investors can use to assess and manage an emerging mega trend.
- **A means to improve risk management and identification of opportunities.** Financial institutions could have capital at risk as a result of the energy transition. The credit rating agency Moody's has identified 14 sectors, with \$2 trillion of rated debt, with immediate or emerging climate-related risk<sup>4</sup>. Research at a leading central bank has identified \$26 trillion in capital re-allocation needed by 2040<sup>5</sup> to deliver the objective of the Paris Agreement of limiting warming well below two degrees. The low carbon energy transition is also driving new market opportunities. The TCFD recommendations provide a useful overarching framework for asset owners to assess potential impairment to portfolios and identify new investment opportunities.
- **A comparable, flexible framework:** The TCFD recommendations were developed by experts from 31 countries. They have been endorsed by 238 companies, including 150 financial institutions representing \$81.7 trillion. The framework is flexible for organisations with different strategies, sizes and geographic markets, with practical guidance for high-impact sectors and on forward-looking disclosures. This makes broad-based adoption and consistency in disclosures more achievable.



**Martin Skancke**, Chair, PRI Board and **Fiona Reynolds**, CEO, PRI

<sup>1</sup> <https://www.fsb-tcfd.org/statement-support-supporting-companies-june-2017/>

<sup>2</sup> <https://www.fsb-tcfd.org/news/>

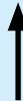
<sup>3</sup> See for example AP2' climate report based on TCFD recommendations, <http://www.ap2.se/globalassets/hallbarhet-agarstyrning/klimat/tcfd/ap2s-climate-report-based-on-tcfd-recommendations.pdf>

<sup>4</sup> Moody's Investors' Service (November 2015) Environmental risk heat map

<sup>5</sup> Unpublished report, PRI sources

- **Forward looking approach.** Conventionally, climate disclosure has relied on historical data. Yet, environmental problems such as climate change are non-linear in nature and will grow over time. Scenario analysis, which is already commonly used in investment analysis could be applied to climate change to assist asset owners in understanding how portfolios could be affected over a longer time horizon.
- **Increase trust in financial markets:** Disclosure and transparency helps to encourage trust in capital markets. In addition, companies (and directors) may face legal liability exposure by failing to assess and manage climate risk in accordance with their duties or failing to report risks. Without credible comparability of climate related disclosures, which are most reliably based on a level playing field of disclosure requirements, it is difficult for financial system users and beneficiaries to trust the information they receive.
- **Respond to beneficiary demand:** Beneficiaries and wider stakeholders are increasingly requesting information about climate change and how it is being managed. Disclosure in line with the TCFD recommendations would provide information for end-beneficiaries to understand how climate-related impacts are being managed and (where relevant) to make better informed choices about their retirement savings.

**Figure 1: Mapping TCFD recommendations to potential actions for asset owners. Source: Adapted from FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures, Figure 4, page 14.**

TCFD Recommendations		PRI Reporting Framework: Governance and Strategy	Potential Actions for Asset Owners		
GOVERNANCE	<b>Board oversight:</b> (a) Disclose the Board's oversight of climate-related risks and opportunities	SG 7.1 CC SG 7.1a CC	Clarify oversight responsibilities	Articulate risks	Review Board-approved policies
	<b>Role of management:</b> (b) Describe management's role in assessing and managing climate-related risks and opportunities	SG 7.1 CC SG 7.1b CC	Define management responsibilities	Define processes	Disclose process and progress
STRATEGY	<b>Identify risks and opportunities:</b> (a) Describe the climate-related risks and opportunities over the short, medium and long-term	SG 14.1 CC SG 14.2a CC	Identify risks	Identify opportunities	Define processes
	<b>Impact on investment strategy:</b> (b) Describe the impact of climate-related risks and opportunities on investment strategy	SG 1.3a CC SG 1.3b CC	Asset allocation frameworks	Performance review processes	Due diligence processes
	<b>Resilience of investment strategy:</b> (c) Describe the resilience of the investment strategy, taking into consideration different climate related scenarios, including a 2 ° C or lower scenario	SG 13.1a CC	Evaluate climate-related scenarios	Undertake scenario analysis	Describe response
RISK MANAGEMENT	<b>Assess risks:</b> (a) Describe the processes for identifying and assessing climate-related risks	SG 14.7 CC SG 14.9 CC	Identify data sources	Undertake engagement	Utilise data
	<b>Manage risks:</b> (b) Describe the processes for managing climate-related risks	SG 14.7 CC SG 14.8 CC	Assess materiality	Prioritise risks	Mitigate risks
	<b>Integrate risks:</b> (c) Describe how climate-related risks are integrated into risk management processes	SG 14.7 CC	Governance of risks	Measure risks	Monitor risks
METRICS / TARGETS	<b>a) Use of metrics:</b> Disclose the metrics used to assess climate-related risks and opportunities in line with the investment strategy and risk management process.	SG 14.4 CC SG 14.4a CC	Disclose metrics	 Review process 	 Link to strategy and risk management 
	<b>b) Measurement of GHG emissions:</b> Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	SG 14.4a CC	Disclose GHG emissions		
	<b>c) Set targets:</b> Describe the targets used to manage climate related risks and opportunities and performance against targets	SG 14.4b CC	Disclose targets		

## WHAT ARE THE PRIORITY ACTIONS FOR ASSET OWNERS IN THE NEAR TERM?

As summarised above, this guide sets out a range of actions across the four pillars of the TCFD framework, not all of which will be do-able for all asset owners from the outset. Indeed, the processes, resources and actions may need to be built up over time, depending on the starting point of each asset owner. The priority actions that asset owners should consider taking in the near term to begin to align with the TCFD framework include:

- **Governance:** Review governance arrangements to ensure there is effective board level oversight and internal management processes are in place to effectively manage the climate-related risks and opportunities.
  - **Strategy:** Begin the process of analysing portfolio resilience to climate-related scenarios, including a 2 degree or less outcome.
  - **Risk management:** Assess the potential financial materiality of climate-related risks on the investment portfolio and evaluate the actions that need to be taken to mitigate these risks, as well as capturing new opportunities.
  - **Metrics:** Measure GHG emissions where data are available or can be reasonably estimated, for each fund or investment strategy.
  - **Engagement:** Engage with companies and external fund managers, to encourage greater transparency and alignment with the TCFD recommendations.
  - **Disclose:** publicly disclose all of the above actions and outcomes in annual reports and the climate risk in PRI's reporting framework,
- As part of the strategy disclosure, fund managers could explain the impact that it has had on product development and mandate design.
  - Explain whether the impact of climate-related scenarios on future outcomes has been considered as part of the investment process, both in terms of expected risk and return and the identification of new opportunities.
  - Describe the process and outcomes from engaging with companies and other investee entities on climate-related risks and opportunities.
  - Provide details of voting records on climate-related resolutions.
- **Risk management:** The process for assessing and integrating climate-related investment risks (physical and transition) into investment decisions.
    - As part of the risk management disclosure, managers should report on the 'higher risk' companies that do not intend to report on climate-related risks and opportunities in line with the TCFD recommendations (to highlight the need to escalate engagement efforts).
    - If scenario analysis is undertaken, disclose the process, assumptions, conclusions and actions that arose from the analysis, including the overall resilience of the portfolio to a 2 degree or less outcome.
    - Related to the above, describe the assessment of the companies and/or assets most 'at risk' from transition and physical impact risks, under what climate scenario, and over what timeframe.
    - Explain how these risks are being managed, monitored and mitigated.
  - **Metrics and targets:** The utilisation of climate-related metrics as part of the investment process.
    - Provide, at a minimum, GHG emissions on an annual basis, in line with the TCFD recommendations.
    - Explain the chosen methodology and rationale, including any assumptions and shortcomings.
    - Describe how these metrics have impacted on investment decisions and internal processes (including engagement activities and company valuations).
    - Disclose any climate-related goals or targets that the organisation has adopted.
    - Explain how progress against these goals is being monitored over time.

## WHAT SHOULD ASSET OWNERS REQUEST FROM THEIR EXTERNAL FUND MANAGERS?

For many asset owners where assets are managed externally, implementing the TCFD framework will require some degree of engagement with fund managers. As part of this process, asset owners could request that their fund managers disclose the following:

- **Intention to disclose:** Whether they support the TCFD recommendations and if they intend to report in line with the key pillars of the framework.
- **Governance:** The oversight and management arrangements of climate-related risks and opportunities, and how this has changed (or will change in the future) in light of the TCFD recommendations.
- **Strategy:** The strategy for identifying the risks and opportunities related to climate change, and how these are delineated over the short, medium and long term.

The remainder of this guide further examines each of the TCFD recommendations and provides guidance for asset owners on implementation across the 4 pillars of: governance, strategy, risk management and metrics/targets. The guide highlights some practical actions that can be taken, including the tools/resources that are available to support scenario analysis, as well as examples of how this has been addressed to date by some asset owners.

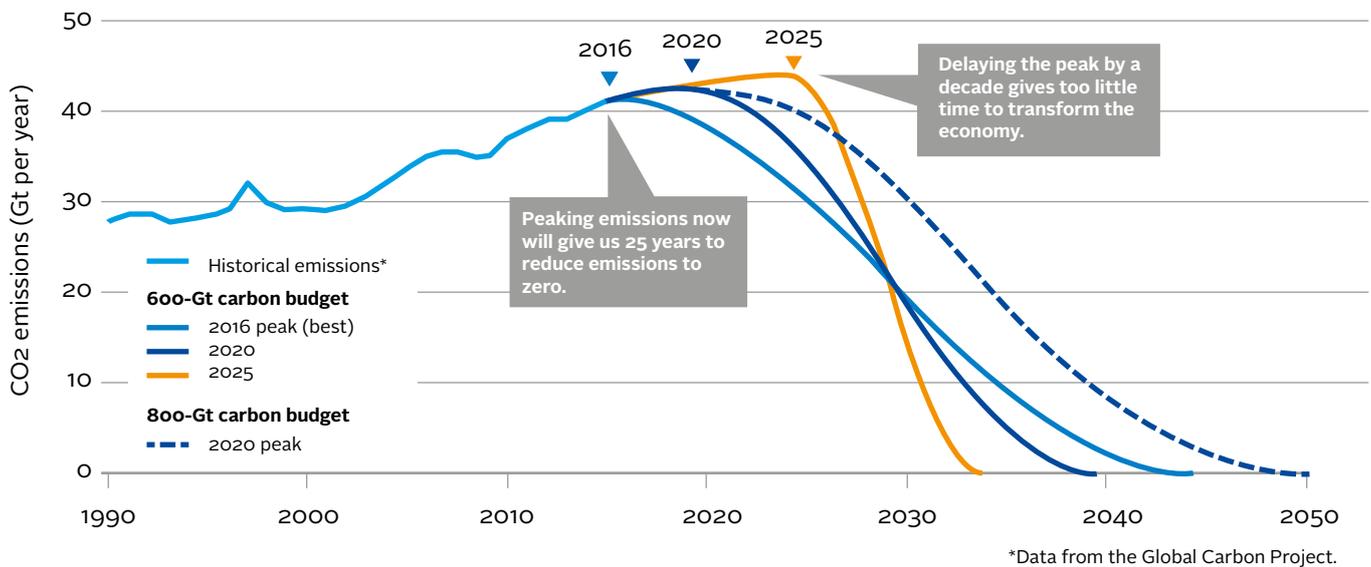
# CLIMATE CHANGE: WHY SHOULD ASSET OWNERS CARE?

Climate change is a risk multiplier<sup>6</sup>. It exacerbates existing issues with energy, resource and food security and is changing the odds on extreme weather events<sup>7</sup>. The size and inertia in the climate system creates a multi-decadal lag between carbon dioxide emitted today and its full economic impact, meaning that climate-related risk will grow over time<sup>8</sup>.

Investors could have capital at risk as a result of the low carbon transition, which is transforming the economics of the energy sector. Moreover, meeting the objectives of the

Paris Agreement will require a notable acceleration of this trend. Figure 2 shows pathways towards a two-degrees world. Since it is accumulative rather than annual emissions that counts, either one of these requires global emissions to reach zero in the next 20-35 years, a longer timeframe would require the development and mass deployment of negative emission technology. There is, therefore, a tight boundary in terms of the time remaining before global emissions can start bending downwards (2020) and the annual rate of reductions required thereafter.

**Figure 2: Emission pathways to a two degrees world. Source: Nature (2017) “Three years to safeguard our climate” 28th June 2017.**



The TCFD final recommendations identified two types of climate-related risks and opportunities relevant to investors<sup>9</sup>:

- **Physical risks:** The impacts on insurance liabilities, financial assets and disruption to trade from more frequent & severe extreme weather events, stress to food, energy and resource security that arise from climate change.

- **Transition risks:** The impacts from the process of adjusting towards a low and ultimately zero carbon economy. Technological change or shifts in government policy could prompt a re-valuation of a large range of assets as costs and opportunities become apparent.

Improved disclosure and information about these risks is therefore essential for achieving an efficient market response to climate change.

6 IPCC (2014) Climate Change 2014 Synthesis Report, page 3 available <http://www.ipcc.ch/report/ar5/syr/>

7 Op. cit. page 5

8 Op. cit.; King et al (2015) Climate Change: A Risk Assessment, page 45, <http://www.csap.cam.ac.uk/projects/climate-change-risk-assessment/>; Hanson et al (2005) Earth's Energy Imbalance: confirmation and implications, NASA Goddard Institute

9 See pages 5-8, [FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures](#)

# PRINCIPLES FOR GOOD TCFD DISCLOSURE

To support investors in meeting the TCFD recommended disclosures, the PRI has integrated new climate-related indicators based on the TCFD recommendations into the 2018 Reporting Framework. These indicators are voluntary to report and disclose. Responses will be accessible in the form of a stand-alone climate transparency report which will assist organisations in aligning with the TCFD recommendations.

A summary of some of the principles underpinning good disclosure in line with the TCFD are highlighted in Figure 3. It is worth reiterating that Figure 3 highlights the high-level principles in relation to disclosure, as distinct from the actions that arise from the TCFD recommendations (the latter of which is the primary focus of this guide).

**Figure 3: Principles for good TCFD disclosure. Source: Adapted from FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures, Figure 4, page 14.**

In general, firms should build their disclosures closely on the guidance on the TCFD final report on pp. 19-23, considering all the items mentioned. Additional supplementary guidance for individual is provided in the annex of the report.

TCFD reporting will be a journey. Preparers could start with the soft information disclosure, but also indicate a multi-year reporting plan that would ratchet up in complexity over time.

Issue	Disclose
<b>1. Strategy / Governance</b>	As outlined in the guidance, it would be important to make sure it is clearly described <b>how</b> climate-related risks and opportunities influence the firm's strategy – it is important to describe the <b>how</b> .
<b>2. Boilerplate versus firm-specific</b>	Generalised, boilerplate statements such as 'climate risks are real' and 'the transition will have a huge impact' should be avoided. Instead firms should discuss <b>how the firm could be impacted</b> and what it means for their strategy.
<b>3. Quantitative versus qualitative</b>	<p>Disclose metrics and targets, including those suggested in the supplementary guidance (Annex I).</p> <p>For asset owners, for instance, this would include:                      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.</p>
<b>4. Scenario analysis</b>	<p>Make sure to consider a range of scenarios. Describe <b>how</b> management has considered them and <b>how</b> they affect the strategy. For financials it is acceptable to conduct scenario analysis not for the entire portfolio but rather on a few key sectors.</p> <p>Make clear <b>how</b> the 2 degree and lower scenario differs from other scenarios and how it affects portfolios. Describe assumptions, methods and outputs clearly (details on this in the <a href="#">Technical Supplement: The use of scenario analysis in disclosure of climate-related risks and opportunities</a> to the TCFD report.)</p>
<b>5. Location of disclosure</b>	Annual report, website, member communications

# GOVERNANCE

The TCFD recommendations highlight the importance of putting good governance structures in place to ensure that there is effective oversight of climate-related risks and opportunities. The PRI has also emphasised the importance of good governance frameworks to encompass Environmental, Social and Governance (ESG) issues across its signatory base, including through the 2018 PRI Reporting Framework<sup>10</sup> that incorporates climate-related indicators, which has been developed based on the recommendations of the TCFD<sup>11</sup>.

The specific TCFD recommendations in relation to governance of climate-related impacts (for all sectors) include:

- Describe the board's oversight of climate-related risks and opportunities
- Describe management's role in assessing and managing climate-related risks and opportunities

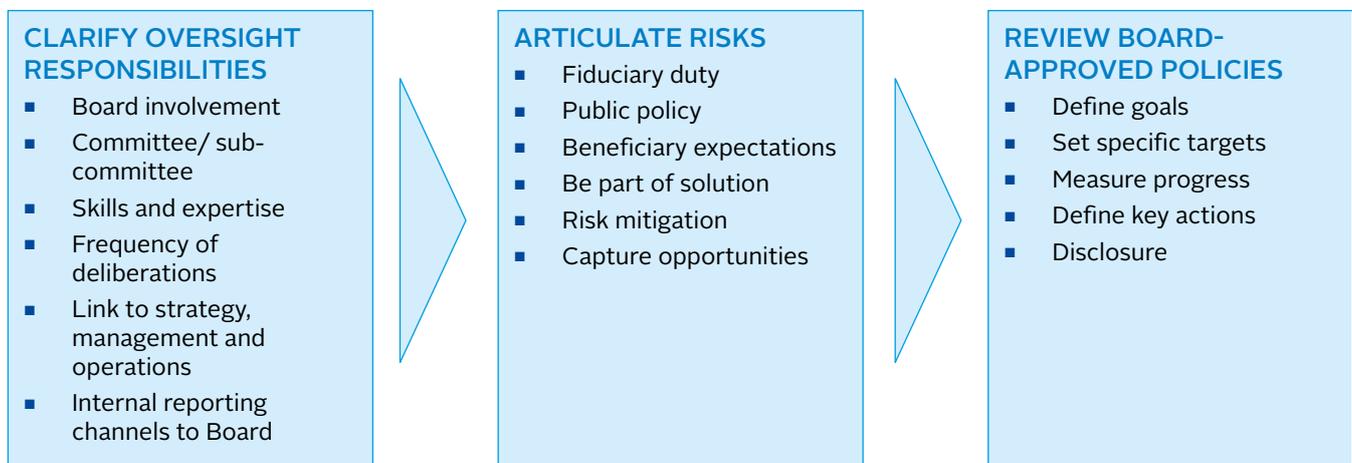
## WHAT DOES THIS MEAN FOR ASSET OWNERS?

While some suggested actions are provided in the TCFD's Guidance for All Sectors<sup>12</sup>, these are intentionally high level to ensure that they are applicable to all organisations, including the financial and non-financial sectors<sup>13</sup>. In terms of specific actions for asset owners, it would be beneficial to review existing governance arrangements to ensure that there is adequate board oversight and management of climate-related risks and opportunities, consistent with the TCFD recommendations.

## BOARD OVERSIGHT

Figure 4 sets out some possible actions for asset owners to take to improve Board level oversight of climate-related issues.

**Figure 4: Actions for Asset Owners to improve board oversight.**



<sup>10</sup> PRI Reporting Framework 2018 Strategy and Governance (2017)

<sup>11</sup> [Guidance on PRI Pilot Climate Reporting](#) (2018) based on the recommendations of the FSB Task Force on Climate-related Financial Disclosures

<sup>12</sup> See page 19, FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures, <https://www.fsb-tcf.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf>

<sup>13</sup> FSB TCFD (2017) Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures, Supplemental Guidance for the Financial Sector, Figure 8, page 22.

**CLARIFY OVERSIGHT RESPONSIBILITIES**

The TCFD includes a recommendation for the Board to be able to describe its oversight of climate-related risks and opportunities<sup>14</sup>. Building on well-established best practice governance standards<sup>15</sup>, this will include actions such as articulating responsibilities, ensuring the Board representatives have sufficient climate-related skills and expertise, agreeing the frequency in which the Board (and/

or committees) will consider climate-related issues and how it will feed through to their oversight of strategy, performance and tracking progress over time, including defining internal reporting channels. Some examples of actions taken by asset owners to bolster oversight responsibilities are highlighted in Figure 5.

**Figure 5: Asset Owner examples: Oversight responsibilities.**

<p><b>CalSTRS</b> US based public pension fund</p>	<p>The Fund's investment team produces a Green Initiative Task Force report that is approved by the CIO and reported to the Board annually.</p> <p><a href="#">CalSTRS green report</a></p> <p>It includes the Fund's climate-related actions across the following areas:</p> <ul style="list-style-type: none"> <li>■ Risk management with respect to climate impacts.</li> <li>■ Reviewing fund managers climate-related capabilities.</li> <li>■ Engaging with corporations on climate issues.</li> <li>■ Voting on climate related shareholder proposals.</li> <li>■ Climate related research efforts and participation.</li> <li>■ Allocation to low carbon, energy efficient assets.</li> <li>■ Performance of sustainable investment assets.</li> <li>■ Issues, outlook and other initiatives.</li> </ul>
<p><b>Canada Pension Plan Investment Board (CPPIB)</b> Pension Fund, Canada</p>	<p>The Fund has developed a cross-departmental Climate Change Working Group (CCWG) that reviews climate change risks and opportunities in light of global developments.</p> <p><a href="#">CPPIB Climate change approach</a></p> <p>The first focus is a bottom-up review of our investment due diligence as it relates to the consideration of climate change risks and opportunities. The second focus is to consider approaches for a top-down assessment of climate risk across our total portfolio. The CCWG's other focus is to consider how climate change is positioned in our overall risk framework.”</p>

<sup>14</sup> See page 19, FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures, <https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf>

<sup>15</sup> While different governance structures exist across different regions and types of asset owner organisations (including public and private-sector pension funds, sovereign wealth funds, endowments, charities and insurance companies), there are common features and characteristics as to what 'good governance' looks like, including: OECD Guidelines for Pension Fund Governance (<http://www.oecd.org/finance/private-pensions/oecdguidelinesforpensionfundgovernance.htm>); various papers presented at the 2017 OECD/IOPS Global Forum on Private Pensions (<https://www.oecd.org/daf/fin/private-pensions/Oct-2017-OECD-IOPS-Global-Forum-Mauritius-Presentations.zip>); Ambachtsheer, K (various) The State of Global Pension Fund Governance Today: Board Competency Still a Problem ([http://w.cembenchmarking.com/Files/Documents/Governance\\_Study\\_Paper\\_June\\_2007.pdf](http://w.cembenchmarking.com/Files/Documents/Governance_Study_Paper_June_2007.pdf)), How effective is pension fund governance today, and do pension funds invest for the long term? Findings from a new survey (<http://kpa-advisory.com/policy-papers/how-effective-is-pension-fund-governance-today-and-do-pension-funds-invest-for-the-long-term-findings-from-a-new-survey/>); Clark, G., and Urwin, R. (various) Leadership, collective decision-making, and pension fund governance (<http://www.docs.fce.unsw.edu.au/fce/Research/ResearchMicrosites/CPS/2008/papers/Clark.pdf>).

## ARTICULATE RISKS

It is generally accepted to be industry best practice for asset owners to have a set of agreed ‘investment beliefs’ or ‘guiding principles’ to frame the development and implementation of investment policies and processes<sup>16</sup>.

It is equally important for boards to articulate an organisation’s beliefs with respect to climate-related risks, as a way to guide decisions over the medium to long term<sup>17</sup>. Examples of actions that some asset owners have taken to articulate the risks related to climate change are provided in Figure 6.

**Figure 6: Asset Owner examples: Articulate climate change risks. Source: Publicly available material, direct sourcing from websites and institutional reporting material.**

<p><b>AP2</b> The Second AP Fund, Sweden</p>	<p><a href="#">AP2 climate change position paper</a> A CEO approved climate change position paper sets out the Fund’s beliefs, integration process and key actions to contribute to the low carbon transition.</p> <p><i>“Climate issues, and above all climate change, represent both huge risks and big opportunities for long-term investors such as AP2. Climate change is deemed to have the potential to impact long-term returns considerably.”</i></p>
<p><b>CalPERS</b> US based public pension fund</p>	<p><a href="#">CalPERS investment beliefs</a> A board approved core investment belief makes specific reference to climate change.</p> <p><i>“Investment Belief 9: Risk to CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error. As a long-term investor, CalPERS must consider risk factors, for example climate change and natural resource availability that emerge slowly over long time periods, but could have a material impact on company or portfolio returns.”</i></p>
<p><b>Norges Bank Investment Management</b> Manager of Government Pension Fund, Global Norges Bank</p>	<p><a href="#">NBIM climate strategy</a> The organisation has set out its beliefs as part of a climate change strategy document. The paper sets out the purpose of having the statement, its relevance to investment management decisions, and expectations in terms of corporate behavior.</p> <p><i>“Climate outcomes may affect company and portfolio return over time. To reduce future risk and increase opportunities, Norges Bank Investment Management have an interest in well-functioning carbon markets and other measures that may contribute to an efficient transition to a low-emissions economy.”</i></p>

<sup>16</sup> PRI (2018) [Asset Owner Strategy Guide: How to Craft and Investment Strategy](#) discusses the importance of an asset owner’s vision and mission as part of the investment strategy process. Willis Towers Watson (2017) [Building stronger foundations – Investment beliefs](#). Bauer, R., et al (2010) [Investment Beliefs that Matter: New Insights into the Value Drivers of Pension Funds](#).

<sup>17</sup> Mercer (2017) [Climate Risk – Can you Afford to Ignore it?](#) New FSB Guidelines present asset owners with a framework for expected action.

### REVIEW BOARD-APPROVED POLICIES

Most asset owners have a set of investment policies that operationalise their investment beliefs; the same applies to climate-related considerations. Including climate-related impacts into investment policies will help to provide an overarching framework to guide an organisation’s approach to managing the climate-related risks and opportunities<sup>18</sup>.

Investment policies can also help organisations to meet and satisfy evolving regulatory requirements, as well as provide valuable information for stakeholders and end-beneficiaries. Some examples of actions that asset owners have taken to adopt board-approved policies with respect to climate change are provided in Figure 7.

**Figure 7: Asset owner examples: Board-approved policies. Source: Publicly available material, direct sourcing from websites and institutional reporting material.**

<p><b>NZ Super Fund</b> Superannuation fund based in New Zealand</p>	<p>The Fund has a Board approved climate change investment strategy: <a href="#">NZ Super Climate Change Strategy</a></p> <p>As well as a Board-approved Carbon Reduction paper: <a href="#">NZ Super Carbon Reduction paper</a></p>
<p><b>AP4</b> The Fourth Swedish National Pension Fund</p>	<p><a href="#">AP4 climate change policy</a></p> <p>The Fund has publicly issued various position statements, research papers and targets with respect to climate change via its website and through press statements.</p> <p>The Fund mentions climate change in its board approved <a href="#">Ownership Policy</a>. The Fund shares its goals and outcomes on an annual basis via its <a href="#">website</a>.</p>
<p><b>Ilmarinen</b> Finnish based insurance and pension fund provider</p>	<p>The company has a <a href="#">climate change policy</a> that has been approved by the ownership policy management team that reports to the Board on an annual basis. The policy sets a roadmap for action from 2016-2020, including 8 goals and related measurable outcomes.</p> <p>Climate change is also featured in the company’s annual <a href="#">sustainability report</a>, including carbon metrics and 2 degree alignment analysis.</p>

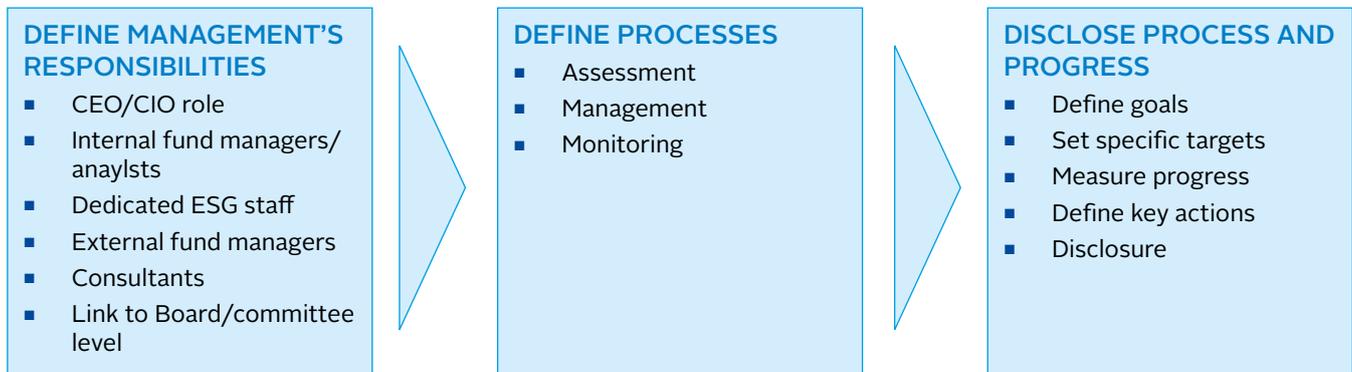
### ROLE OF MANAGEMENT

The TCFD included a recommendation for the management of an organisation to be able describe its role in assessing and managing climate-related risks and opportunities<sup>19</sup>. For asset owners, this will invariably involve considering the role of the CEO, CIO, as well as the internal and external investment managers, ESG staff and consultants and other service providers.

The TCFD also recommended that asset owners be able to describe the processes that are in place to implement the policies and achieve the goals of the organisation, as well as clarifying the processes around disclosure. Figure 8 sets out some possible actions for asset owners to take to describe management’s role in the governance of climate-related issues.

<sup>18</sup> See for example PRI (2018) [Asset Owner Strategy Guide: How to Craft and Investment Strategy](#); and PRI (2016) [Investment Policy: Processes and practice. A guide for asset owners](#)  
<sup>19</sup> See page 19, FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures, <https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf>

**Figure 8: Management of climate-related risks and opportunities.**



### DEFINE MANAGEMENT'S RESPONSIBILITIES

Central to best practice governance standards across the investment industry is the need to clarify the role of management in the day-to-day running and implementation of the Board-approved investment strategy and policies<sup>20</sup>. The same governance standards apply to the management of climate-related risks and opportunities, where the roles of the CEO, CIO, internal portfolio management teams, external fund managers, ESG staff and advisors as well as investment consultants and other service providers need to be considered. Asset owners should also define how management's responsibilities link back up to the Board (and/or any Board level committees or sub-committees) in terms of reporting and decision-making processes.

### DEFINE PROCESSES

The TCFD included a recommendation for the management of an organisation to be able to define the processes around how climate-related risks and opportunities are assessed, how they are managed and the way in which these are monitored over time<sup>21</sup>. While some asset owner organisations may have internal staff and expertise on climate-related issues that they can utilise, others might rely more heavily on the information obtained from their consultants, external fund managers, ESG advisors and/or service providers. There is no prescribed industry best practice standard in this regard as each fund's circumstances and resources will vary; rather asset owners are encouraged to define their processes and describe how it works in practice. Some of the issues that the management team of an asset owner organisation might wish to consider as part of this process are outlined in Figure 9.

<sup>20</sup> It is widely noted that one of the main components of good governance include transparency, systems for conflict resolution, and accountability for each function and role, this includes the role of management and how that relates to the Board in its oversight and fiduciary responsibilities. See for example Stewart, F. and J. Yermo (2008), "Pension Fund Governance: Challenges and Potential Solutions", OECD Working Papers on Insurance and Private Pensions, No. 18, OECD publishing; and PRI (2018) Asset Owner Strategy Guide: How to Craft and Investment Strategy

<sup>21</sup> See page 19, FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures, <https://www.fsb-tcf.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf>

**Figure 9: Processes for managing climate-related risks and opportunities.**

<p>(1) Processes for <b>assessing</b> risks and opportunities:</p>	<ul style="list-style-type: none"> <li>■ <b>Information:</b> At the total portfolio level, consider what information is needed to evaluate climate-related risks and opportunities, and where can it be sourced.</li> <li>■ <b>In-house resources:</b> To what extent can the risks and opportunities be assessed utilising in-house resources, including internal fund managers, ESG specialists, risk specialists, or other staff members.</li> <li>■ <b>External fund managers:</b> At the mandate level and where assets are managed externally, evaluate the processes used by external fund managers to assess climate-related risks and opportunities as part of their investment process.</li> <li>■ <b>Consultants:</b> Clarify the role of investment consultants and/or external service providers to provide further insight into assessing the climate-related risks and opportunities.</li> </ul>
<p>(2) Processes for <b>monitoring</b> risks and opportunities:</p>	<ul style="list-style-type: none"> <li>■ <b>Frequency:</b> Specify the frequency for monitoring process.</li> <li>■ <b>Internal review process:</b> Monitor the climate-related risks and opportunities at the total portfolio level and identify any notable changes to the outlook from previous assessments (e.g. preparation of briefing papers by in-house staff, consultants and/or reports from external fund managers).</li> <li>■ <b>External fund managers:</b> Review the efficacy of the processes utilised by external fund managers, including the managers’ external reporting efforts, as well as asking managers supplementary questions as suggested in Highlight 2.</li> </ul>
<p>(3) Processes for <b>managing</b> risks and opportunities:</p>	<ul style="list-style-type: none"> <li>■ <b>Actions:</b> Consider the appropriate course of action to take to mitigate any identified risks and/or to capture new opportunities, in line with the investment policy and beliefs. For example, this might include altering existing investment mandate design, allocating to new mandates, bolstering engagement with fund managers, corporations and policy makers, to name a few.</li> <li>■ <b>Monitoring:</b> Continue the ongoing cycle for assessing risks and opportunities, as set out in (1).</li> <li>■ <b>Changes:</b> Further consider and respond to any identified changes in the assessment of climate-related risks and opportunities over time.</li> </ul>

**DISCLOSE PROCESS AND PROGRESS**

Disclosure of the process for managing climate-related impacts will involve some consideration of the internal reporting channels, the external reporting mechanisms, as well as practical aspects around the format and frequency of disclosure. To implement this recommendation, the management teams within asset owner organisations will need to consider reporting the progress for managing climate-related impacts, both internally and externally. In relation to external reporting, the updated PRI Reporting Framework 2018: Strategy and Governance<sup>22</sup>, specifically incorporates climate-related indicators that are mapped to the TCFD recommendations<sup>23</sup>. Some of the questions that the management teams might wish to consider as part of these deliberations are provided in Figure 10, as well as considered further in ‘Principles for good TCFD reporting practice.’

**Figure 10: Management’s disclosure of climate-related risks and opportunities.**

- How can we best report on progress for managing climate-related risks and opportunities internally, to the Board and relevant investment committees? E.g. Board papers, workshops, other?
- What are the best ways for us to report on our activities externally? E.g. PRI Reporting Framework, website, member communication, other?
- What information should be included in the reporting?
- How often should we report?
- Who will need to be involved in preparing the information and how will that differ for internal versus external communication needs? E.g. Internal investment staff, ESG staff, marketing and communication staff, external service providers, other?

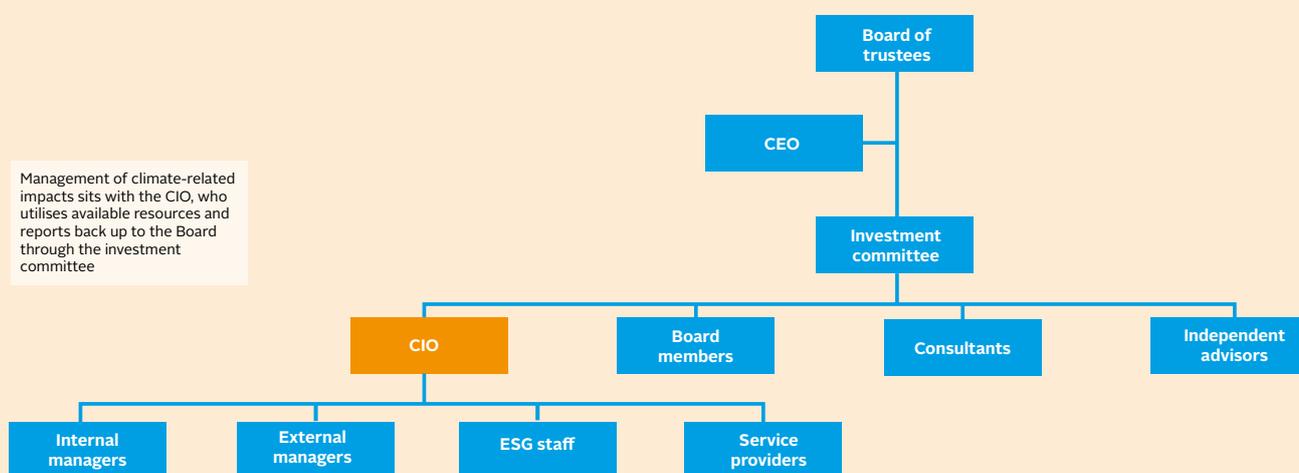
<sup>22</sup> [PRI Reporting Framework 2018 Strategy and Governance](#): Climate-related indicators (2017)

<sup>23</sup> [PRI Reporting Framework 2018: Strategy and Governance](#) (Climate-related indicators only), page 5, with further details on pages 8-9

## HIGHLIGHT 1

### MANAGEMENT'S RESPONSIBILITIES AND GOVERNANCE ARRANGEMENTS TO INCORPORATE CLIMATE-RELATED IMPACTS

An illustrative example of the management responsibilities and governance arrangements of an asset owner organisation is provided below. It focuses in particular on the investment committee relationship and how climate-related impacts might feed through to the management teams, and back up to the Board and relevant committees. It suggests, in this particular example, that the management responsibility could sit with the CIO and the investment teams, ESG staff and/or consultants that fall within the CIO's responsibilities. The CIO could then report back up through to the investment committee and the Board of trustees through the regular reporting channels.



Alternatively, some asset owners may also incorporate climate-related impacts into the risk management committee responsibilities, or other related sub-committees. It is important to note that there is no one, unique solution to the governance arrangements that will apply to all pension funds given the myriad of different fund structures, committees and regulations that exist across jurisdictions and fund types. Importantly, the TCFD recommendations emphasise the need for organisations (including asset owners) to consider and explain the arrangements that are in place, rather than prescribe a one-size-fits-all solution. This illustrative example is provided for discussion purposes as asset owners undertake their own review of governance arrangements.

# STRATEGY

The TCFD recommendations highlighted the importance of integrating climate-related impacts into an organisation's business, strategy and financial planning<sup>24</sup>, including:

- **Identify risks and opportunities** - Describe the climate-related risks and opportunities over the short, medium and long term
- **Impact on investment strategy** - Describe the impact of climate-related risks and opportunities on the investment strategy
- **Resilience of investment strategy** - Describe the resilience of the investment strategy, taking into consideration different climate related scenarios, including a 2°C or lower scenario

## WHAT DOES THIS MEAN FOR ASSET OWNERS?

Crafting an investment strategy is the first step within an asset owner's overall investment process. Asset owners should craft a clear and explicit investment strategy that comprehensively considers: all long-term trends affecting

their portfolios, how the fund fulfils the asset owner's fiduciary duty and how it can operate as efficiently as possible for beneficiaries and other stakeholders.

Consideration of long-term trends affecting portfolios should include any material climate-related risks and opportunities for investments. Asset owners need to ensure that they have evaluated the impact of material climate-related risks and opportunities on their investment strategy, and analysed the resilience of the investment strategy to climate-related scenarios, consistent with the TCFD recommendations.

The PRI Asset Owner Strategy Guide proposes a strategy process, highlighting that to be effectively embedded in any organisation, any responsible investment considerations must be part of the core investment strategy process. Examples of how some asset owners are linking climate-related risks and opportunities to investment strategy are provided below.

Figure 11: Crafting an investment strategy Source: The PRI Asset Owner Strategy Guide



Responsible investment considerations must be part of the core investment strategy process – not a separate, parallel effort.

24 See page 20, FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures

**Figure 12: Examples of linking climate-related risks and opportunities to strategy. Source: Publicly available material, direct sourcing from websites and institutional reporting material.**

<p><b>NZ Super Fund</b> Superannuation fund based in New Zealand</p>	<p>The board approved a target to reduce the carbon emission intensity of the Fund by at least 20% and reduce the carbon reserves exposure of the Fund by at least 40% by 2020. The Guardians intend to publicly report on the Fund’s carbon footprint in relation to these targets annually.</p> <p><a href="#">NZ Super low carbon equity</a></p> <p>The Fund has also shifted its global passive equity portfolio (NZ\$14 billion) into a low-carbon portfolio.</p>
<p><b>ERAFP</b> French Public Sector Pension Fund</p>	<p>The Fund has a general position statement on climate change published on its website. Climate change is mentioned as part of its board approved SRI charter that assigns major importance to the need to limit GHG emissions.</p> <p>The Fund has committed to measure and report its carbon emissions on an annual basis. <a href="#">The Fund invested</a> €750 million of its passively managed equity investments into a bespoke solution designed together, which has reduced the carbon intensity by “some 40%”.</p> <p>The Fund is also moving to invest €50 million between now and the end of 2017 into international equity funds aimed at combating climate change.</p>

## IDENTIFY RISKS AND OPPORTUNITIES

Figure 13 sets out some possible actions that asset owners can take to identify the climate-related risks and opportunities and to define the processes around this, drawing from the TCFD final report and recommendations, as well as other sources.

**Figure 13: Actions for asset owners to identify risks and opportunities. Source: Adapted from the Final Report, TCFD Recommendations, Table 1, pages 10-11.**



### IDENTIFY RISKS AND OPPORTUNITIES

In line with the TCFD recommendations, asset owners might focus on identifying climate-related risks and opportunities by mapping the exposure of specific investment mandates, portfolios or assets that are considered to be more 'sensitive' to climate-related impacts, and/or they may undertake a total portfolio assessment that encompasses all assets. A range of industry guides and tools for investors have been developed over recent years to assist asset owners in this process<sup>25</sup>, some highlights of which are provided in Figure 14.

### DEFINE PROCESSES

The most important takeaway for asset owners from the TCFD recommendations is the need to start the journey of identifying the key risks and opportunities over different time frames (if that is not already underway) and to have a well-articulated process with a clear link to decision-making at the Board and/or committee level. Some of the considerations involved in defining processes include describing the evaluation process, setting out how this links to Board and committee decision-making, and ongoing process for review and updates (both internally and externally).

### IMPACT ON INVESTMENT STRATEGY

In addition to the 'all sector' recommendations, the TCFD provided [additional guidance](#) for asset owners when considering the impact of climate-related risks and opportunities on their investment strategy.

#### TCFD SUPPLEMENTAL GUIDANCE FOR ASSET OWNERS (B):

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.

Source: FSB TCFD (2017) Implementing the Recommendations of the TCFD, page 35

**Figure 14: Approaches to identify climate-related risks and opportunities.**

<b>Asset allocation analysis</b>	What asset classes, regions and investment mandates are the main contributors to climate-related risks? Which are more likely to present opportunities? Over what timeframes?
<b>Sector analysis</b>	What sectors in the portfolio are more sensitive to the climate-related sources of risk?
<b>Stock level analysis</b>	What companies are more sensitive and less prepared to respond to the climate-related impacts?
<b>Carbon emissions and footprinting</b>	What is the carbon exposure of the equity portfolio in absolute and relative terms. What investment mandates are the main contributors to this exposure? What are the largest emitting investee companies?
<b>Scenario analysis</b>	What are the main sources of risk and opportunity for the portfolio under different climate change scenarios?
<b>Stranded asset analysis</b>	What assets are most at risk from becoming stranded in response to policy and technology shifts? Over what timeframes?

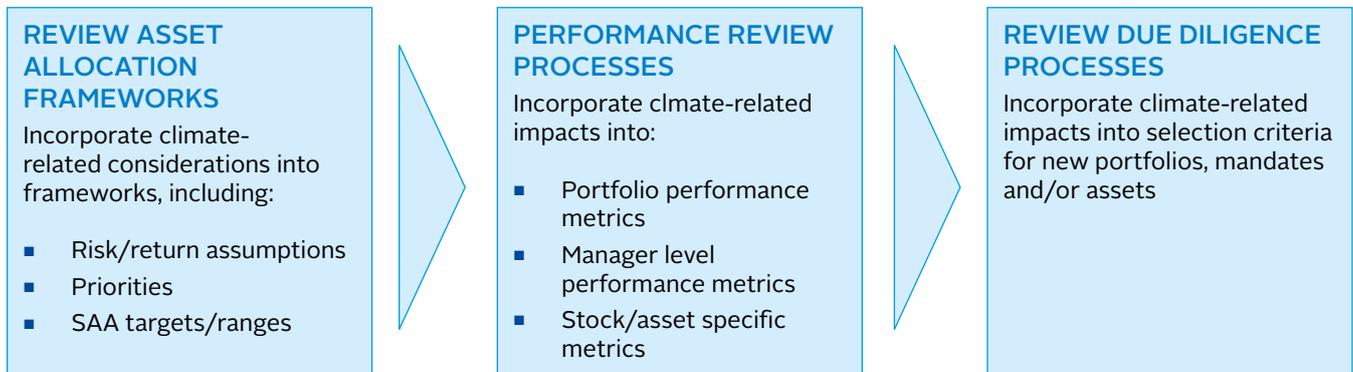
There are a range of possible interpretations as to what this recommendation and guidance could mean in practice in terms of incorporating climate-related impacts into an asset owner's investment strategy. Drawing from emerging best practice and guidance on incorporating ESG issues into investment strategy<sup>26</sup>, some of the possible actions to take are highlighted in Figure 15.

Scenario analysis and its potential impact on an asset owner's investment strategy is further discussed later in this guide.

<sup>25</sup> See for example: PRI (2015) Developing an Asset Owner Climate Change Strategy (2015); IIGCC, IGCC, Ceres/INCR (2015) Climate Change Investment Solutions: A Guide for Asset Owners; Asset Owners Disclosure Project (2017) Climate Change Best Practice methodology

<sup>26</sup> See for example: PRI (2016) Investment Policy: Process and Practice: A guide for asset owners; PRI (2016) Crafting an Investment Strategy: A process guidance for asset owners; PRI (2015) Developing an Asset Owner Climate Change Strategy (2015)

**Figure 15: Actions for asset owners to achieve impact on investment strategy.**



## RESILIENCE OF INVESTMENT STRATEGY

The third pillar of the TCFD recommendations in regard to how climate-related risks and opportunities need to be reflected into an asset owner’s investment strategy focuses on resilience of the investment strategy, particularly under different climate change scenarios<sup>27</sup>. In addition to the all sector recommendations, the TCFD provided the following [additional guidance](#) for asset owners on considering the impact of climate-related risks and opportunities for their investment strategy.

The TCFD also developed a [Technical Supplement](#) on the use of scenario analysis that asset owners will need to closely review<sup>28</sup>.

### TCFD SUPPLEMENTAL GUIDANCE FOR ASSET OWNERS (B):

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.

Source: FSB TCFD (2017) Implementing the Recommendations of the TCFD, page 35

Complementary to the TCFD guidance and Technical Supplement, there are emerging tools, research and industry practices that asset owners can draw from in formulating their actions to consider the resilience of their investment strategy to different climate scenarios (See ‘Scenario analysis’ for further discussion)<sup>29</sup>.

<sup>27</sup> See page 20, FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures

<sup>28</sup> FSB TCFD (2017) Technical Supplement: The use of scenario analysis in disclosure of climate-related risks and opportunities

<sup>29</sup> See for example: Dietz, Simon, et. al. (2016) “Climate value at risk of global financial assets.” Nature Climate Change, 6: 676-679, 2016; Mercer, IFC and Carbon Trust (2011) Climate Change Scenarios – Implications for Strategic Asset Allocation, 2011; Mercer (2015) Investing in a Time of Climate Change; 2<sup>o</sup> Investing Initiative (2016). Transition Risk Toolbox: Scenarios, Data, and Models; IIGCC, IGCC, Ceres/INCR (2015) Climate Change Investment Solutions: A Guide for Asset Owners; Ceres (2017) A Framework for two degrees Scenario Analysis: A Guide for Oil and Gas Companies and Investors for Navigating the Energy Transition; CICERO (2018) Climate scenarios demystified: A climate scenario guide for investors.

# RISK MANAGEMENT

The third pillar of the TCFD recommendations emphasise the need for organisations to manage climate-related risks and to demonstrate how these are integrated into risk management processes. Specifically, the TCFD included a recommendation to:

- **Assess risks** - Describe the processes for identifying and assessing climate-related risks
- **Manage risks** - Describe the processes for managing climate-related risks
- **Integrate risks** - Describe how these processes are integrated into risk management

## WHAT DOES THIS MEAN FOR ASSET OWNERS?

Asset owners need to ensure that they have identified, assessed, managed and integrated the climate-related investment risks into their risk management processes, consistent with the TCFD recommendations.

## ASSESS RISKS

In addition to the ‘all sector’ recommendations, the TCFD provided additional guidance for asset owners when assessing the climate-related risks for portfolios.

### TCFD SUPPLEMENTAL GUIDANCE FOR ASSET OWNERS (A):

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.

Source: FSB TCFD (2017) Implementing the Recommendations of the TCFD, page 35

Figure 16 sets out some possible actions that asset owners can take to assess the climate-related risks for their investments, drawing from the TCFD final report and recommendations, as well as other sources.

**Figure 16: Actions for asset owners to assess climate-related risks.**



## IDENTIFY DATA SOURCES

There are different ways for asset owners to access data and information on climate-related risks, some of which are listed in Figure 17.

**Figure 17: Ways to access information on climate-related risks.**

<b>Consultants and third-party advisors</b>	What climate-related risks are incorporated into the advice and services provided by investment consultants and other advisors?
<b>Analyst/fund manager research</b>	What climate-related risks are incorporated into research from investment analysts and fund managers? To what extent is this research stock/asset specific?
<b>Company reports</b>	To what extent do investee companies publicly disclose their climate-related risks? What reporting framework do they utilise? Where are the greatest gaps?
<b>Climate research</b>	What scientific and climate-specific research is available and relevant for assessing the transition and physical impact risks of climate change for investments?
<b>Data providers</b>	What company or asset specific climate-related data and tools are available from data providers and researchers?
<b>NGOs/other research</b>	What other sources of climate-related research and data are available from alternative sources of information, including scientific bodies, NGOs, think-tanks and industry groups that asset owners could utilise?

30 See pages 21-22, FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures

## UNDERTAKE ENGAGEMENT

The TCFD encourages asset owners to engage with reporting entities to reduce information asymmetry and improve data availability through reporting of climate-related information by investee companies and other entities. There are a range of engagement actions that asset owners can take in this regard to promote the wider adoption of the TCFD's recommendations around disclosure of climate-related risks, some of which include:

- Proxy voting: support resolutions that are directed towards improving the disclosure of climate-related risks.

### Example: ExxonMobil shareholders vote for greater disclosure of company's climate change risks

In 2017, over 50 of ExxonMobil's institutional shareholders voted in favour of the resolution requesting that the company produce an annual report on the risks to its business from extreme climate change and government policies seeking to reduce carbon emissions. The resolution, which the company's Board of Directors opposed, was ultimately by 62% of shares voted in Exxon's May 2017 annual meeting.

- Direct engagement: engage with investee companies directly to encourage them to disclose the climate-related risks, consistent with the TCFD recommendations.

### Example: Vanguard calls on companies to adopt climate risk disclosure

In August, the CEO of Vanguard issued an open letter to the directors of public companies worldwide highlighting climate risk as potentially putting value at stake for many companies. The letter encouraged the use of disclosure of "sustainability risks that bear on a company's long-term value creation projects." McNabb put pressure on directors to evaluate potential climate risk and consider it part of their fundamental responsibility to disclose relevant and material risks.

- Collaborative engagement: participate in collaborative investor initiatives that are focused on improving corporate disclosure on climate-related risks.

### Example: Climate Action 100+

In December 2017, 225 investors with more than USD 26.3 trillion assets under management pledged to engage with 100+ companies to accelerate climate action. Specifically, as part of their collaborative engagement, investors from around the world are asking companies to: Implement a strong governance framework which clearly articulates the board's accountability and oversight of climate change risk; take action to reduce greenhouse gas emissions across their value chain; provide enhanced corporate disclosure, in line with the TCFD recommendations.

- Portfolio management engagement: request fund managers to engage with investee companies to improve climate-related disclosure standards (Highlight 2)
- Engagement service providers: utilise the services of corporate engagement service providers to encourage companies to disclose climate risks as set out in the TCFD recommendations.

## UTILISE DATA

Asset owners need to communicate (internally and externally) how it will utilise the data and information that is available on climate-related risks. This will not only improve the risk management processes of asset owner organisations by solidifying an ongoing process for the evaluation of climate risks, but it will also encourage companies to continue to improve disclosure of climate-related risks when it is apparent that this information is increasingly being embedded into investment decision-making processes.

**HIGHLIGHT 2****ENGAGING WITH FUND MANAGERS ON TCFD RECOMMENDATIONS**

Asset owners can engage with fund managers on climate-related risks and opportunities and encourage them to support the TCFD recommendations, including asking questions in relation to:

**1. Organisation-wide support for the TCFD recommendations:**

- Does your organisation support the TCFD recommendations?
- If no, please explain the rationale behind this decision
- If yes, when do you anticipate an implementation plan will be implemented?

**2. Governance:**

- Has your organisation included climate-related impacts as part of the Board and/or management group's oversight responsibilities?
- If no, please explain the rationale
- If yes, please explain how this oversight process works in practice
- Are climate-related impacts included in the organisation's investment beliefs and policies?
- What processes are in place to implement these beliefs and policies internally?
- How is progress reviewed, by whom and how often?

**3. Strategy:**

- Is there a firm-wide strategy in place to identify the risks and opportunities related to climate change?
- If no, please explain the rationale
- If yes, to what extent are these impacts delineated over the short, medium and long term?
- What impact, if any, has this strategy had on the organisation's plans around product development and design (for new and existing mandates)?
- Has the organisation considered the impact of climate-related scenarios on future outcomes in terms of expected risk and return, as well as the identification of new opportunities?
- Can you describe how you engage with investee companies and/or entities on climate-related risks and opportunities?
- Can you provide details of your organisation's voting record on climate-related resolutions?

**4. Risk management:**

- Has a process been established to assess and integrate climate-related investment risks (transition and physical impacts) into investment decisions?
- If no, please explain the rationale
- If yes, what sources of information and data are used, and why?
- Are you able to ascertain the companies and/or investee entities who do not intend to report on climate-related impacts in line with the TCFD recommendations?
- Are you able to assess the resilience of the portfolio to a 2 degree or less scenario outcome and report this assessment on an annual basis?
- What is your assessment of the assets in the portfolio that are the most 'at risk' from climate impacts (both transition and physical risks), under what scenario and over what timeframe?
- How are you responding to this assessment in terms of mitigating the risks?
- What is your process for monitoring these risks over time?

**5. Metrics and targets:**

- What climate-related metrics, if any, does your organisation use?
- Can you describe how these metrics have impacted on investment decisions?
- If you are not already doing so, would you be willing to report the GHG emissions of the portfolio on an annual basis in line with the TCFD recommendations?
- Has your organisation adopted any climate-related targets or goals?
- If yes, please provide details of how progress will be monitored over time

## MANAGE RISKS

In addition to the 'all sector' recommendations, the TCFD provided additional guidance for asset owners in relation to managing climate-related risks of investment portfolios (provided below).

Building on this guidance, Figure 18 suggests a possible course of action for asset owners to take to manage climate-related risks, consistent with the TCFD recommendations. To the extent that sufficient internal resources allow, it is suggested that the Board be involved in approving each stage of this process, to encourage stronger alignment between management actions and Board-approved policies in managing climate-related risks.

### TCFD SUPPLEMENTAL GUIDANCE FOR ASSET OWNERS (B):

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.

Source: FSB TCFD (2017) Implementing the Recommendations of the TCFD, page 36

**Figure 18: Actions for asset owners to manage climate-related risks.**



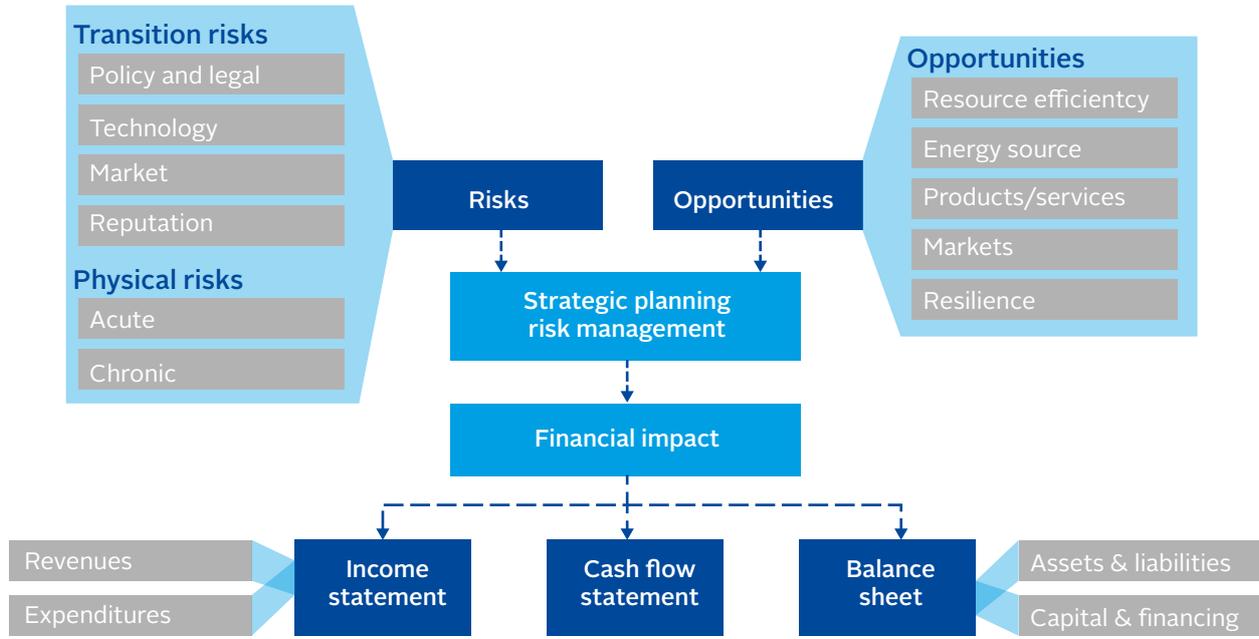
### ASSESS MATERIALITY AND PRIORITISE RISKS

The assessment of the potential financial materiality of climate-related risks and opportunities on an investment portfolio is a crucial component of the TCFD framework. At a minimum, asset owners should seek to disclose the process that was used to undertake this assessment and the rationale for the conclusions and actions (if any) that have been taken.

By way of guidance, the TCFD final report included a number of climate-related risks and a high-level framework for asset owners to build upon as part of the assessment of climate-related risks, including both transition and physical risks (Figure 19). The [TCFD Final Report Annex](#) also included a breakdown of these risks and how it might impact on financial performance of investee entities, drawing from a number of industry studies and research on climate-related risks<sup>31</sup>.

<sup>31</sup> See for example: Mercer 'Investing in a Time of Climate Change'; Moody's Investors Service 'Environmental Risks Heat Map'; S&P Global Ratings 'How Environmental and Climate Risks Factor into Corporate Ratings'; Sustainability Accounting Standards Board Technical Bulletin #TB001-101816; and World Resources Institute (WRI) and United Nations Environment Program Finance Initiative (UNEP FI) 'Proposed Discussion Framework on Carbon Asset Risk.'

**Figure 19: Climate-related risks and opportunities.** Source: Reproduced from TCFD final report annex report, appendix 1, pages 71-77



Climate-related risks exist alongside other investment risks, it is therefore important to undertake a materiality assessment and to stipulate where the priorities sit compared to other investment risks. As part of this process, asset owners might consider some of the issues highlighted in Figure 20.

**MITIGATE RISKS**

The TCFD guidance referred to the need for asset owners to consider mitigation actions to manage any climate-related risks that have been identified. The PRI recently joined forces with other investor organisations to establish the Investor Agenda<sup>32</sup>, which provides a framework for investors to commit to taking action to mitigate the effects of climate change.

**Figure 20: Climate change and investment risks.**

<b>Total portfolio risk</b>	What are the highest climate-related risks in the short, medium and long-term for the total portfolio? What priority is assigned to climate-related risks, alongside other risks that are being managed?
<b>Asset class risks</b>	Are there some asset classes where the climate-related risks might be considered to be higher priority than others?
<b>Mandate or individual portfolio risks</b>	Are there some mandates and/or individual portfolios where the climate-related risks might be considered to be higher priority than others?
<b>Sector risks</b>	Are there some sector exposures where the climate-related risks are considered to be higher priority than others?
<b>Company or asset specific risks</b>	Are there some mandates and/or individual portfolios where the climate-related risks are considered to be higher priority than others?

<sup>32</sup> The Investor Agenda has been developed by seven partner organisations: Asia Investor Group on Climate Change, CDP, Ceres, Investor Group on Climate Change, Institutional Investors Group on Climate Change, Principles for Responsible Investment and UNEP Finance Initiative. These organisations intend to produce an annual report on the actions that investors have taken and on the outcomes that have been achieved.

Specifically, the Investor Agenda sets out 4 main areas for action that investors can take to mitigate climate-related risks (Figure 21).

These actions provide a useful framework for asset owners to consolidate their efforts to mitigate climate-related risks (as well as capture new opportunities) and the PRI encourages signatories to review the [Investor Agenda](#) actions and to support the initiative.

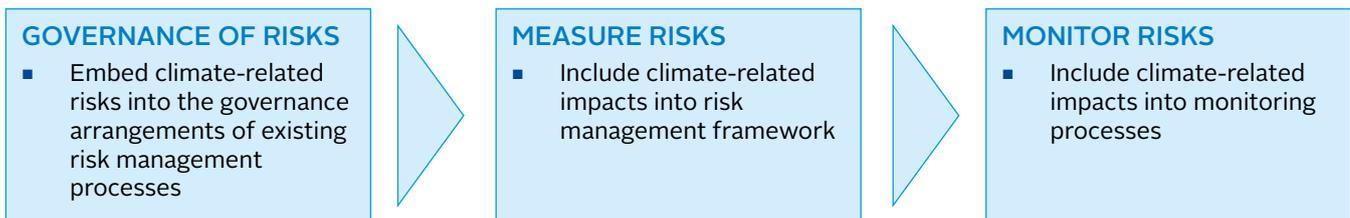
## INTEGRATE RISKS

The third pillar for managing climate-related risks in line with the TCFD recommendations relates to integrating these into existing risk management processes. Some of the possible actions for asset owners to take to bring climate change into risk management frameworks are highlighted in Figure 22.

**Figure 21: The Investor Agenda – Actions to mitigate climate-related risks.**

<b>Investment</b>	Make low carbon investments, phase out investments in coal and integrate climate change into portfolio analysis and decision-making.
<b>Corporate engagement</b>	Support the <a href="#">Climate Action 100+</a> initiative and the CDP’s disclosure and action request.
<b>Investor disclosure</b>	Report in line with the TCFD’s recommendations.
<b>Policy advocacy</b>	Urge governments to implement the Paris Agreement and to enhance their climate policy ambition by 2020.

**Figure 22: Integrate climate change into risk management frameworks.**



While asset owners may have different systems and processes in place for risk management, there are some best practice industry standards that are useful to revisit as a way to frame the integration of climate-related risks<sup>33</sup>. Based on these standards, asset owners might consider some of the questions set out in Figure 22.

<sup>33</sup> OECD/ IOPS Good Practices for Pension Funds' Risk Management Systems (2011); IOPS Working Paper No.11/ OECD Pensions and Insurance Working Paper No.40 <http://www.iopsweb.org/dataoecd/31/33/43946778.pdf>. The IOPS good practices build on the IOPS 'Principles of Private Pension Supervision' and the OECD 'Guidelines for Pension Fund Governance.' They also draw on risk management standards in related sectors, such as the Basel Committee for Banking Supervision 'Framework for Internal Control Systems in Banking Organisations', the International Association of Insurance Supervisors 'Insurance Core Principles and Methodology and work of the Committee of European Insurance and Occupational Pension Supervisors. Beath, A., and MacIntosh, J (2013) Risk-Management Practices at Large Pension Plans: Findings from a Unique 27-Fund Survey, Rotman International Journal of Pension Management, Volume 6, Issue 1. Cantor, D.R., and Dutton, B.B. (2014) A Framework for Pension Risk Management, Risk Management, March 2014, Issue 29. Climate Change Working Group, Actuaries Institute (2016) Climate Risk Management for Financial Institutions, a presentation to the Actuaries Institute, <https://actuaries.asn.au/Library/Events/GIS/2016/20161213CCWGFIIPaperFinalC.pdf>

**Figure 23: Linking climate-related risks into risk management processes. Source: Adapted to consider climate-related risks, based on the OECD/IOPS Good Practices for Pension Funds' Risk Management Systems (2011) framework.**

<b>Investment or market risk</b>	To what extent could climate-related risks increase the risk of losses due to adverse movements in market prices in response to transitional and/or physical impacts?
<b>Counterparty default risk / credit risk</b>	To what extent could climate-related risks increase the risk of loss from the failures of a counterparty to meet its obligations?
<b>Funding and solvency risk</b>	To what extent could climate-related risks impact on the ability of an asset owner to fund its liabilities?
<b>Liquidity Risk</b>	To what extent could climate-related risks impact on the ability of an entity to meet its financial obligations due to lack of fungibility?
<b>Actuarial risk</b>	To what extent could inappropriate actuarial valuation methods and assumptions (e.g. mortality, longevity, disability, liquidity etc.) be adopted that do not adequately reflect climate-related risks?
<b>Governance and agency risks</b>	To what extent could conflict of interest and poor governance practices increase the risk that climate-related impacts are overlooked?
<b>Operational and outsourcing risks</b>	To what extent could weak operational and outsourcing practices increase the risk that climate-related impacts are overlooked?
<b>External and strategic risk</b>	Could climate-related risks increase the sensitivity of the fund to external factors (such as political risk, demographics, competition, technology, reinsurance, mergers, plan sponsor risk, political stability, natural disasters, etc.) and other strategic risks?
<b>Legal and regulatory risk</b>	To what extent could the risk of non-compliance with laws and regulations increase in response to efforts to mitigate climate-related risks by regulators?
<b>Contagion and related party/ integrity risk</b>	To what extent would poor management of climate-related risks damage the asset owner's integrity and reputation?

# METRICS AND TARGETS

The TCFD report included a recommendation to disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities<sup>34</sup>, suggesting in particular disclosure around the following:

- **Use of metrics** – Describe the metrics used to assess climate-related risks and opportunities
- **Measurement of GHG emissions** – Disclose GHG emissions and related risks
- **Setting targets** – Describe targets to manage climate-related risks and opportunities and performance against targets

## WHAT DOES THIS MEAN FOR ASSET OWNERS?

Following the TCFD recommendations on metrics and targets, asset owners need to ensure that they have utilised some of the available climate-related metrics, disclosed the GHG portfolio emissions as well as any climate-related targets that have been adopted. Importantly, asset owners need to have a process in place to review these actions over time, as well as taking steps to ensure that the metrics and targets are integrated into the fund's investment strategy and risk management processes.

## USE OF METRICS

In addition to the 'all sector' recommendations, the TCFD provided additional guidance for asset owners on the utilisation and disclosure of metrics to assess climate-related risks and opportunities.

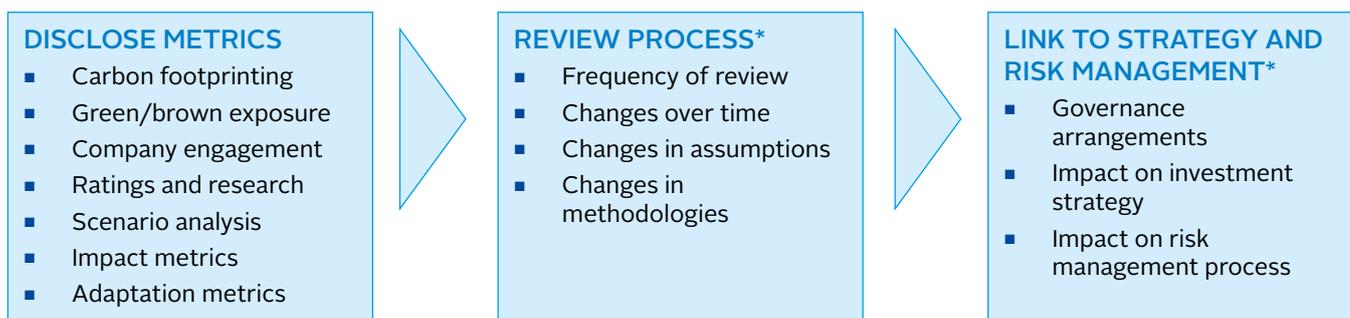
### TCFD SUPPLEMENTAL GUIDANCE FOR ASSET OWNERS (A):

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. Where appropriate, asset owners should provide metrics considered in investment decisions and monitoring.

Source: FSB TCFD (2017) Implementing the Recommendations of the TCFD, page 36

Building on the TCFD guidance, Figure 24 sets out some possible actions that asset owners can take to utilise climate-related metrics, including disclosing the metrics used, having a review process in place and linking these outputs to the investment strategy and risk management processes.

**Figure 24: Actions for Asset Owners to utilise climate-related metrics.**



\* Link to strategy and risk management applies to each of the actions for asset owners to take in line with the TCFD recommendations, including the utilisation of metrics; disclosure of GHG emissions and setting targets.

34 See pages 22-23, FSB TCFD Recommendations of the Task Force on Climate-related Financial Disclosures

## DISCLOSE METRICS

The suggested metrics provided in Figure 19 draw from a number of sources including the TCFD recommendations, the IGCC Transparency in Transition Guide and the PRI Guidance on PRI Pilot Climate Reporting, to name a few. This list is not intended to be exhaustive but illustrative of the range of possible metrics that asset owners may wish to consider as part of their investment strategy and risk management processes. A summary of each of these metrics, their usefulness for asset owners and practical tips on utilisation is provided below.

- **Carbon footprinting:** Asset owners can measure the carbon emissions of the investment portfolio, which can then be used to compare portfolio emissions to global benchmarks, identify priority areas for reduction including the largest carbon emitters and the most carbon intensive companies, and to engage with fund managers and companies on reducing carbon emissions and improving disclosure standards<sup>35</sup>. While there are shortcomings with carbon footprinting that were noted by the TCFD (see (b) measurement of GHG emissions), asset owners can encourage improvements carbon emissions data and disclosure standards through utilisation and engagement in the process.
  - **Green/brown exposure:** Asset owners can measure the exposure to green (low carbon/climate positive) versus brown (high carbon/climate negative) assets held in the investment portfolio<sup>36</sup>. While the definitions of green versus brown assets are still evolving, some sources are provided in Figure 25. Asset owners can also support the Investor Agenda initiative<sup>37</sup>, where the 'investment' actions component of this initiative includes a commitment to report existing and new low carbon investments through the Low Carbon Investor Registry<sup>38</sup>.
  - **Company engagement:** Asset owners can monitor engagement outcomes, focusing in particular on whether companies are providing satisfactory responses to investor concerns and assessing how long engagement dialogue should continue for and what investment decisions which will be taken if companies provide an unsatisfactory response<sup>39</sup>. Through the Investor Agenda initiative, asset owners can support the 'corporate engagement' actions through (for example) supporting the PRI reporting framework Listed Equity Active Ownership module, the Climate Action 100+ and CDPs disclosure and actions requests<sup>40</sup>.
- EU sustainable finance taxonomy
  - Climate Bonds Initiative Taxonomy and Standards
  - IFC Definitions and Metrics for Climate-Related Activities
  - Green Investment Bank definition of 'green impact'
  - Green Bond Principles & Projects Taxonomy
  - FTSE Russell Green Revenues
  - Low Carbon Investment Registry taxonomy
- **Ratings and research:** Asset owners can utilise the outputs from one or more of the various data, research and ratings service providers as part of their assessment of climate-related risks and opportunities. Given the proprietary nature of some of the models upon which the climate-related scores and research are based, some asset owners may chose to complement these metrics with other outputs and indicators of climate-related risks, including qualitative interpretations of the data and outputs<sup>41</sup>.
  - **Scenario analysis:** As the TCFD recommendations highlighted, asset owners can undertake a range scenario analyses to assess the resilience of their investment portfolios to a range of future possible climate-related impacts, including a 2°C or lower scenario. The 'Scenario Analysis' section further discusses the tools and resources available to support scenario analysis and provides some practical examples of the approaches being taken by some asset owners.
  - **Impact metrics:** Asset owners can assess the extent to which their investment actions have made a positive impact on the portfolio and climate-related outcomes. Examples of such metrics include avoided GHG emissions, increased exposure to renewable energy, improvements in energy efficiency, improved water and waste management outcomes<sup>42</sup>. The growing interest and commitment of some asset owners to the Sustainable Development Goals (SDGs) has provided impetus for investors to develop and apply relevant metrics, including climate-related impacts<sup>43</sup> (Figure 26).

**Figure 25: Examples of methodologies and frameworks for defining 'green'. Source: IGCC (2017) Road to Return: Institutional Investors and Low Carbon Solutions, page 4.**

35 PRI (2015) [Developing an Asset Owner Climate Change Strategy](#), pages 8-11

36 See for example: IGCC/AIGCC (2017) [Transparency in Transition: A Guide to Investor Disclosure on Climate Change](#), pages 20-21, 2Dii (2015) [Climate strategies and metrics: Exploring options for institutional investors](#), Figure 4.1, page 35, [http://2degrees-investing.org/IMG/pdf/climate\\_targets\\_final.pdf](http://2degrees-investing.org/IMG/pdf/climate_targets_final.pdf)

37 <https://theinvestoragenda.org/areas-of-impact/investment/>

38 <http://globalinvestorcoalition.org/low-carbon-investment-registry/>

39 PRI (2015) [Developing an Asset Owner Climate Change Strategy](#), pages 15-16

40 <https://theinvestoragenda.org/areas-of-impact/corporate-engagement/>

41 See for example: IGCC/AIGCC (2017) [Transparency in Transition: A Guide to Investor Disclosure on Climate Change](#), pages 26-27, 2Dii (2015) [Climate strategies and metrics: Exploring options for institutional investors](#), Figure 4.1, page 35, [http://2degrees-investing.org/IMG/pdf/climate\\_targets\\_final.pdf](http://2degrees-investing.org/IMG/pdf/climate_targets_final.pdf)

42 See for example: IGCC/AIGCC (2017) [Transparency in Transition: A Guide to Investor Disclosure on Climate Change](#), pages 37-38, 2Dii (2015) [Climate strategies and metrics: Exploring options for institutional investors](#), Sections 1.3 and 1.4, Climate friendliness and carbon risk, pages 10-13, [http://2degrees-investing.org/IMG/pdf/climate\\_targets\\_final.pdf](http://2degrees-investing.org/IMG/pdf/climate_targets_final.pdf)

43 Dutch SDG Working Group (2017) [SDG Impact Indicators: A guide for investors and companies](#).

**Figure 26: Linking SDGs, climate change and impact metrics.**

#### EXAMPLE: SDGS, CLIMATE CHANGE AND IMPACT METRICS

A Dutch-led SDG Working Group was established to focus on the recommendation by the Dutch SDG Initiative “to collaborate to determine a select set of SDG indicators that can be used to track and compare sustainable development investments”. The resulting joint effort is part of the Sustainable Finance Platform, chaired by the Dutch Central Bank. The Working Group (comprised of 20 members from different Dutch financial institutions and companies) produced a discussion document for circulation as part of their efforts to propose a core set of impact indicators for each SDG goal “that is neither comprehensive nor prescriptive and allows for flexibility in application”.

The SDGs of most relevance to climate change impacts include SDG 7 and SDG 13.

**SDG 7: Affordable & Clean Energy:** This SDG seeks to ensure access to affordable, reliable, sustainable and modern energy for all. The suggested climate-related impact metrics proposed by the Working Group include:

- Renewable energy produced
- Avoided greenhouse gas emissions
- Number of people with access to affordable, reliable and modern energy services

**SDG 13: Climate Action:** The SDG defers to the Paris Agreement and most of the specific targets relate to adaptation and resilience to climate changes through government actions (rather than the private sector). The suggested climate-related impact metrics by the Working Group relate to climate adaptation and include:

- Water storage capacity
- Flood-resilient floor space
- High-risk assets with climate insurance cover

- **Adaptation metrics:** Asset owners can assess the preparedness of investee companies and entities to the physical impact risks associated with climate change<sup>44</sup>. There are also new investment opportunities related to adaptation impacts that asset owners could consider as part of their strategy discussions.<sup>45</sup> In terms of adaptation risks, an assessment could be undertaken through bespoke research on assets that have been identified as ‘high risk’, through aggregate analysis of climate vulnerability scoring by research providers, as well as through engagement with external fund managers, with some possible questions provided in Figure 27.

#### Figure 27: Possible questions for external fund managers on adaptation risks

- To what extent have you considered the direct physical impact risks of climate change on investee companies and assets held in the portfolio?
- Can you provide some indication of the adequacy of disclosure provided by investee companies and entities in regard to the physical impact risks of climate change?
- Are you able to provide an overview of the most ‘at risk’ assets to the physical effects of climate change in the portfolio, and indicate over what timeframes?
- Are you able to provide some insight into the preparedness of investee companies and assets in terms of responding to the physical impact risks?

<sup>44</sup> See for example: Global Investor Coalition on Climate Change (2015) Climate Change Investment Solutions: A Guide for Asset Owners, pages 22-26, <http://globalinvestorcoalition.org/wp-content/uploads/2015/04/Climate-Change-Investment-Solutions-GuideFINAL.pdf>, IGCC/AIGCC (2017) Transparency in Transition: A Guide to Investor Disclosure on Climate Change, pages 31-32

<sup>45</sup> IGCC/NCCARF/JCU/Eureka (2017) From Risk to Return: Investing in Climate Change Adaptation, <https://igcc.org.au/risk-return-investing-climate-adapation-igcc-mar-2017/>, Global Investor Coalition on Climate Change (2015) Climate Change Investment Solutions: A Guide for Asset Owners, pages 26-29, <http://globalinvestorcoalition.org/wp-content/uploads/2015/04/Climate-Change-Investment-Solutions-GuideFINAL.pdf>

**HIGHLIGHT 3**

**METRICS AND TARGETS - LINK TO INVESTMENT STRATEGY AND RISK MANAGEMENT**

The TCFD recommendations related to metrics and targets emphasised the need for asset owners to adopt a process to review the three actions (disclose metrics; disclose GHG emissions and disclose targets), as well as taking steps to ensure that the metrics and targets are reflected in the fund's investment strategy and risk management processes.

**Review process:**

The TCFD encourages asset owners to have a process in place to review the climate-related metrics, GHG emissions and targets that have been utilised. As set out in preceding Figure 24, this might include describing how frequently the metrics will be reviewed, disclosing any changes over time, as well as highlighting any changes to the assumptions and/or methodologies that may have impacted on the outcomes from previous years.

**Link to investment strategy and risk management:**

The TCFD recommendations and guidance emphasise the importance of linking the disclosure of climate-related metrics, GHG emissions and targets to an asset owner's investment strategy and risk management processes. Figure 17 suggests this might include:

- Describing the governance arrangements, including what will be reported to the Board, relevant committees and management teams for their consideration and possible action, and the frequency of these deliberations.
- Identifying and embedding climate-related metrics, GHG emissions and targets into the asset owner's investment strategy.

These actions will not only help to ensure that the metrics and targets are relevant and impactful for decision-making by asset owners, but it will also provide the Board, committees and management teams with the necessary information to make well-informed investment decisions that take into account climate-related risks and opportunities.

**MEASUREMENT OF GHG EMISSIONS**

In addition to the 'all sector' recommendations, the TCFD provided additional guidance for asset owners in relation to the measurement and disclosure of GHG emissions.

Figure 28 sets out some possible actions that asset owners can take including the disclosure of GHG portfolio emissions, adopting a review process and linking these to the investment strategy and risk management process.

**TCFD SUPPLEMENTAL GUIDANCE FOR ASSET OWNERS (B):**

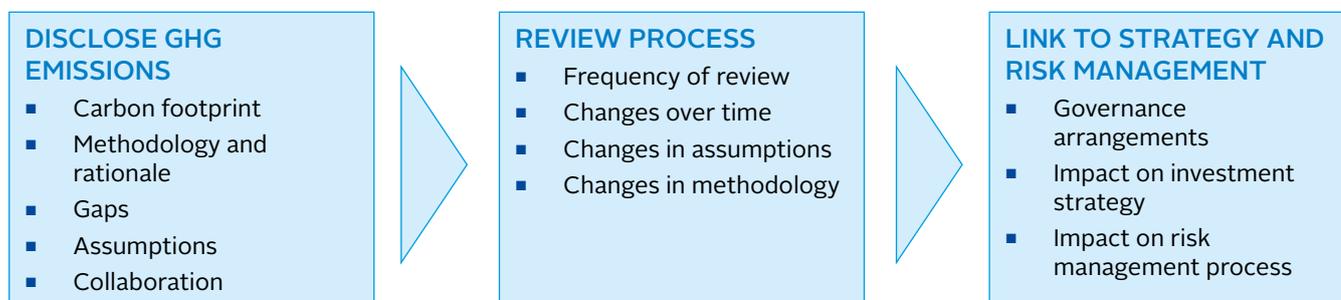
Asset owners should provide the weighted average carbon intensity, where data are available or can be reasonably estimated, for each fund or investment strategy.

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) for common carbon footprinting and exposure metrics, including weighted average carbon intensity.

*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 recognises 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.*

Source: FSB TCFD (2017) Implementing the Recommendations of the TCFD, page 37

**Figure 28: Actions for Asset Owners related to measuring GHG emissions**



### DISCLOSE GHG EMISSIONS

As the supplemental guidance indicates, the TCFD report acknowledged the shortcomings with carbon footprinting, including the data gaps and methodological issues. Indeed, the PRI and the Global Investor Coalition on Climate Change groups (amongst others) have also recognised the limitations of carbon footprinting in terms of carbon risk analysis, including the lack of coverage of unlisted assets, the gaps in corporate reporting, the lack of scope 3 emissions data and the prevalence of different estimation methodologies<sup>46</sup>.

Despite these issues, there is growing consensus across the investment industry - strengthened by the TCFD recommendations - that the measurement and disclosure of carbon footprinting is a valuable exercise for asset owners (and fund managers) to undertake. It will not only potentially contribute to improving the quality and availability of the carbon data over time (as companies improve their disclosure in response to demand, and industry standards around methodology evolve), but it will also provide information for investors on GHG emissions in absolute terms, relative to benchmarks and peers, as well as providing insight into the highest emitting investment mandates and companies that can focus engagement efforts with fund managers and investee companies.

Asset owners will also benefit from complementing carbon footprinting analysis with other climate-related metrics to strengthen their knowledge of the materiality of climate-related risks, including through their engagement efforts with fund managers and investee companies. Examples of some specific actions that asset owners might take are summarised in Figures 29 and 30.

**Figure 29: Actions that asset owners can take to disclose GHG portfolio emissions**

- Undertake and disclose the carbon footprint for the asset classes and investment mandates where the data is available, on an annual basis
- Disclose the methodology used and explain the rationale for taking the approach that has been adopted
- Highlight any notable gaps in the analysis in terms of coverage or data quality issues
- Note any assumptions that have been made that could impact on the results
- Engage with the fund managers and investee companies, focusing efforts on the highest GHG emission contributors to the portfolio
- Describe how the carbon footprinting analysis is complemented by other metrics or analysis
- Describe how the carbon footprinting analysis feeds into the investment strategy and risk management processes
- Consider joining investor collaborative efforts to bolster engagement efforts with the highest GHG emitting companies, such as the Climate Action 100+ initiative

<sup>46</sup> See for example: PRI (2015) [Developing an Asset Owner Climate Change Strategy](#), pages 8-10. Global Investor Coalition on Climate Change (2015) [Climate Change Investment Solutions: A Guide for Asset Owners](#), Highlight 1: Carbon footprinting and portfolio decarbonisation, pages 6-7, <http://globalinvestorcoalition.org/wp-content/uploads/2015/04/Climate-Change-Investment-Solutions-GuideFINAL.pdf>. IGCC/AIGCC (2017) [Transparency in Transition: A Guide to Investor Disclosure on Climate Change](#), pages 16-18

**Figure 30: Examples of carbon footprinting disclosure by asset owners**

As part of their efforts to improve the measurement and management of climate-related risks, a number of asset owners (and fund managers) have undertaken carbon footprinting analysis on their investment portfolios and publicly disclosed these results on their websites, some links are provided below. The PRI has also undertaken regular reviews of the progress and actions by investors which may be beneficial for signatories who are the process of formulating their climate-related strategy and response to the TCFD recommendations<sup>47</sup>.

- **PGGM:**  
[https://www.pggm.nl/english/what-we-do/Documents/PGGM-Annual-Responsible-Investment-report\\_2016.pdf](https://www.pggm.nl/english/what-we-do/Documents/PGGM-Annual-Responsible-Investment-report_2016.pdf)
- **FRR:**  
[http://www.fondsdereserve.fr/documents/FRR\\_Carbon\\_Footprint.pdf](http://www.fondsdereserve.fr/documents/FRR_Carbon_Footprint.pdf)
- **Environment Agency Pension Fund:**  
[https://www.eapf.org.uk/~/\\_media/document-libraries/eapf2/investment-pages/voting-and-engagement-reports/2016/q3-2016/eapf-carbon-metrics-report-public-report-2016.pdf](https://www.eapf.org.uk/~/_media/document-libraries/eapf2/investment-pages/voting-and-engagement-reports/2016/q3-2016/eapf-carbon-metrics-report-public-report-2016.pdf)
- **AP2:**  
<http://www.ap2.se/en/sustainability-and-corporate-governance/climate/carbon-footprint/>
- **VARMA:**  
<https://www.varma.fi/globalassets/muut-sivut/yhtiotietoa/uutishuone/carbon-footprint-of-varmas-investments-130217.pdf>
- **Local Government Super:**  
<https://www.lgsuper.com.au/assets/Documents/LGS-carbon-emissions-report-Listed-equities-Developed-markets-June-2017.pdf>
- **Catholic Super:**  
<https://csf.com.au/investments/responsible-investing>

## SET TARGETS

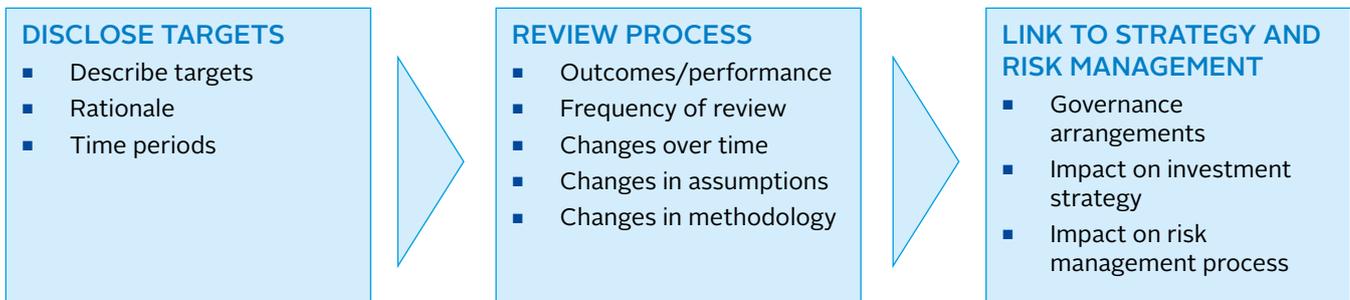
While target setting in relation to climate change is becoming a more widely adopted practice amongst companies through initiatives such as the Science Based Targets efforts, in comparison it is still in its infancy for the institutional investment community. Nevertheless, there are some investors that are making a firm commitment to specific actions (Figure 33), as well as collaborative initiatives (such as the Climate Action 100+ initiative) that provide the opportunity for investors to solidify their commitments into measureable outcomes. Setting targets can not only help to consolidate and solidify internal processes to focus on achieving a certain goal or outcome, it can also send a strong message to external agents, including companies, fund managers, governments and end-beneficiaries on the prioritisation that has been given to managing climate-related risks and opportunities.

As Figure 31 summarises, as part of this process, asset owners could consider what targets would be the most suitable for their organisation, describe the rationale and the time period in which performance will be measured. Importantly, as for the utilisation of climate-related metrics, these targets need to be joined up to an asset owner's governance structures, investment strategy and risk management processes with some measureable outcomes that can be disclosed over time.

<sup>47</sup> PRI / Novethic (2016) [Montreal Carbon Pledge: Accelerating investor climate disclosure](https://www.pri.org/~/media/2016/06/Montreal_Carbon_Pledge_Accelerating_investor_climate_disclosure.pdf)

<sup>48</sup> See for example: <http://sciencebasedtargets.org/companies-taking-action/> and <https://www.wri.org/our-work/top-outcome/more-300-companies-commit-set-science-based-emissions-reduction-targets>

**Figure 31: Actions for asset owners related to setting climate-related targets**



**DISCLOSE TARGETS**

Asset owners could start off by considering the targets that best fit with its overarching climate change investment strategy, to ensure that the strategy can be effectively implemented and measured over time. As part of these deliberations, asset owners might consider one or all of the areas set out in Figure 32.

Some of these might be based on quantitative metrics, others may be more qualitative in nature<sup>49</sup>.

Some examples of how different asset owners are setting targets as part of their efforts to manage climate-related risks and opportunities are provided in Figure 33.

**Figure 32: Possible areas where asset owners could set targets**

<b>Measure</b>	<ul style="list-style-type: none"> <li>Set a goal to measure and reduce the carbon intensity of a portfolio by a future date</li> </ul>
<b>Reduce</b>	<ul style="list-style-type: none"> <li>Set a goal to reduce exposure to coal and fossil fuel reserves and exploration by a future date</li> </ul>
<b>Invest</b>	<ul style="list-style-type: none"> <li>Integrate climate-related risks and opportunities into investment decisions and valuations</li> <li>Set a strategic priority to identify and evaluate investment opportunities into low carbon, energy efficient and climate resilient assets on an ongoing basis</li> <li>Invest a portion of the fund's assets into low carbon, energy efficient and climate adaptation opportunities across different asset classes</li> </ul>
<b>Engage</b>	<ul style="list-style-type: none"> <li>Set a goal to engage with the 'high risk' companies, fund managers and/or mandates to achieve specific improvements in the carbon exposure and preparedness of the underlying companies and entities, by a future date</li> <li>Set targets for all high carbon intensive companies to disclose their climate-related risks and opportunities in line with the TCFD recommendations, by a future date</li> <li>Set targets for high carbon intensive companies to achieve specific carbon reductions and energy efficiency improvements, by a future date</li> </ul>
<b>Vote</b>	<ul style="list-style-type: none"> <li>Set a goal to file climate-related resolutions and exercise voting rights on climate change proxies 100% of the time</li> </ul>

<sup>49</sup> Compiled from a number of sources based on TCFD recommendations and guidance, as well as emerging examples from corporations, asset owners and fund managers and guidance from various reports including GIC (2015) Climate Change Investment Solutions: A Guide for Asset Owners, page 10; 2Dii (2015) Climate strategies and metrics: Exploring options for institutional investors, pages 33-34; UNEP FI and GIC (2015) Financial Institutions Taking Action on Climate Change; and WRI/Science Based Targets initiative, various reports

**Figure 33: Examples of climate-related targets set by asset owners. Source: Publicly available material, various websites and newswire services; Portfolio Decarbonisation Coalition (2017) Annual Progress Report, pp. 14-16**

<b>Caisse de Depots</b>	In the short term, committed to a 50% increase in low carbon investments by 2020 and in the medium term, committed to a 25% decrease in GHG emissions per dollar invested by 2025 (supported by integration into investment decisions and engagement activities)
<b>NZ Super Fund</b>	Reduce the carbon emission intensity of the Fund by at least 20% and reduce the carbon reserves exposure of the Fund by at least 40% by 2020
<b>Environment Agency Pension Fund</b>	Invest 15% of the fund in low carbon, energy efficient and other climate mitigation opportunities by 2020, as part of the fund's wider target to invest at least 25% of the fund in clean and sustainable companies and funds, across all asset classes
<b>PFZW</b>	Increase sustainable investments 4x to at least €16bn by 2020. Within this period, also committed to reducing the carbon footprint of its entire portfolio by 50%
<b>CaISTRS</b>	Increase clean energy and technology investments from US\$1.4 billion to at least US\$3.7 billion by 2019 across all asset classes, including investing \$2.5 billion in low-carbon stock indexes
<b>APG</b>	To have EUR 5 billion of assets investment in renewable energy and reduce the carbon footprint per invested euro of its listed equity portfolio (\$139 billion) by 25 percent by 2020 (versus 2016 baseline)
<b>VARMA</b>	Reduce the carbon footprint of its listed equity investments by 25%, that of its listed corporate bond investments by 15%, and that of its real estate investments by 15% by the year 2020
<b>FRR</b>	Reduce the carbon intensity and the fossil fuel reserve exposures of passive equity investments by at least 50%
<b>AP4</b>	Decarbonise its entire listed equity portfolio of US\$20 billion
<b>ERAFP</b>	Aims to invest €50 million between now and the end of 2017 into international equity funds aimed at combating climate change
<b>Allianz</b>	To double infrastructure equity investments in photovoltaic and wind parks in the medium term
<b>Australian Ethical</b>	Net zero portfolio emissions by 2050
<b>Church of Sweden</b>	To have zero investments in coal, oil and gas
<b>Hermes</b>	To reduce the absolute and relative-to-area carbon emissions from Hermes' real estate portfolio by 40% by 2020, from a 2006 baseline

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It is highly likely that target setting will be an area that will evolve considerably over the coming years as investors continue their efforts to ensure that climate-related risks and opportunities are being appropriately managed. In some jurisdictions this may also result in new regulatory requirements, such as Article 173 of the French Energy Transition Law that introduced carbon reporting for institutional investors, including the setting of targets to measure progress over time<sup>50</sup>.

In addition to France, other jurisdictions where financial regulators are responding to the TCFD recommendations include the EU<sup>51</sup>, Sweden<sup>52</sup>, the UK<sup>53</sup>, Switzerland<sup>54</sup>, and Australia<sup>55</sup>, as well as alliances between central banks and prudential bodies<sup>56</sup>, including China and the UK<sup>57</sup>. Pressure is also building for other financial standard setting bodies and regulatory agencies to respond and get behind the TCFD recommendations<sup>58</sup>. Against this backdrop, asset owners can position themselves not only for the shifting regulatory landscape but also for the rising concern about climate-related impacts amongst beneficiaries and stakeholders. There is an opportunity for asset owners to utilise the TCFD recommendations as a framework to ensure that the climate-related risks and opportunities are being appropriately managed and disclosed, both at the portfolio/fund level and also across the wider industry.

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50 PRI (2016) [French Energy Transition Law](#)

51 The EU High Level Expert Group Final Report (2018) makes reference to the need for the EU to endorse the TCFD to encourage effective disclosure in line with the TCFD and inform further development of disclosure requirements of the Non-Financial Reporting Directive. See: [https://ec.europa.eu/info/sites/info/files/180131-sustainable-finance-final-report\\_en.pdf](https://ec.europa.eu/info/sites/info/files/180131-sustainable-finance-final-report_en.pdf)

52 <http://www.government.se/press-releases/2017/12/france-and-sweden-step-up-their-collaboration-on-green-finance-to-boost-the-transition-towards-low-carbon-and-climate-resilient-economies/>

53 The Pensions Regulator of the UK has told a parliamentary committee (2018) that it is looking at reinforcing its climate risk guidance as pension trustees fall “behind the curve” at assessing and managing climate risk at their schemes. Source: responsible-investor.com news services and Environmental Audit Committee’s Green Finance inquiry transcript: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environmental-audit-committee/green-finance/oral/78606.html>

54 Switzerland’s Federal Office of the Environment launched a public consultation inviting industry bodies, investors, NGOs and other stakeholders to give feedback on guidance aiming to help investors “actually assess the CO<sub>2</sub> relevance of assets”, alongside a wider overhaul of national climate legislation. Source: responsible-investor.com

55 The Australian Prudential Regulation Authority, Executive Board member speech (2017) setting out its support for the TCFD recommendations and concern about climate-related risks: <http://www.apra.gov.au/Speeches/Documents/CPD%20Speech%2029Nov2017.pdf>

56 A group of eight central banks and financial supervisors formed a network to help strengthen the global response to the Paris climate accord and help the financial system to become more environmentally sustainable. <http://www.mas.gov.sg/News-and-Publications/Media-Releases/2017/Joint-statement-by-the-Founding-Members-of-the-Central-Banks-and-Supervisors-Network.aspx>

57 <http://greenfinanceinitiative.org/china-uk-tcf-d-pilot-group/>

58 <https://blogs.thomsonreuters.com/sustainability/2017/12/18/executive-perspective-time-iosco-take-climate/>

# SCENARIO ANALYSIS

Scenario analysis is the most innovative and challenging TCFD recommendation. Conventionally, disclosure has relied on reporting of historical emissions. While this establishes a baseline, since climate change is a non-linear risk that grows over time, it is not sufficient to inform companies and investors of the extent of the potential capital at risk. Scenario planning is commonly used in the finance and oil & gas sectors, yet its application to climate change, which encompasses science, policy and politics as well as technological change, is new. For asset owners this raises a number of questions about what that means for them in practice.

## WHAT ARE CLIMATE SCENARIOS?

In finance, scenarios analysis is the process of estimating the expected value of a portfolio after a period of time. Depending on the availability of the data and the maturity of the process, scenarios can be either for:

- Context exploring (narratives about the future)
- Decision making (forecasting)

Climate scenario analysis is, at present, arguably closer to the former and therefore not necessarily a forecast. The purpose of climate scenarios is to assess the potential earnings impairment of companies (as a result of transition policies, demand changes, physical impacts and other factors) and how this might translate into investment returns in a portfolio. Uncertainty exists in terms of the rate of warming, pace of technology change, future government policy – yet the uncertainty is not infinite. The value of climate scenarios is to test the extremes. Thus, it is important to avoid relying on a single reference scenario, otherwise the analysis risks becoming a prediction.

## WHAT ARE REFERENCE CLIMATE SCENARIOS?

The process of developing bespoke scenarios can be time consuming and resource intensive. Thus, most preparers will look to use off-the-shelf or reference climate scenarios that have been developed by third parties. Figure 34 illustrates the two main categories of scenarios and some of their providers.

**Figure 34: Overview of reference climate scenarios. Source TCFD Technical Supplement: the use of scenario analysis in disclosure of the climate-related risk and opportunities, 2017**

TRANSITION RISKS TO ENERGY SYSTEMS	PHYSICAL RISKS TO THE CLIMATE SYSTEM
International Energy Agency (IEA) <ul style="list-style-type: none"> <li>■ Current policy scenario (6 degrees*)</li> <li>■ New Policy scenario (4 degrees*)</li> <li>■ Sustainable Development Scenario(two degrees*)</li> <li>■ Beyond two degrees Scenario</li> </ul>	Intergovernmental Panel on Climate Change (IPCC) <ul style="list-style-type: none"> <li>■ 4 central scenarios</li> </ul>
International Renewable Energy Agency* (IRENA) 2030	National meteorological agencies
Greenpeace Advance Energy Scenario*	
Bloomberg New Energy Finance (electricity and autos sectors)	

\*50% probability of 6, 4 or 2 degrees.

There are many paths to a two degrees scenario and underlying assumptions between the various scenarios vary considerably. IRENA and Greenpeace scenarios have much higher penetration rates of renewables and electric vehicles by 2040, whereas the IEA's Sustainable Development (two degrees) scenario assumes over 390GWs of Carbon Capture and Storage, allowing for a greater use of fossil fuels, by the same date<sup>59</sup>. Seemingly small differences can have a large impact on investors exposure to financial risk. Moreover, some scenarios such as the commonly used ones provided by the IEA update their models annually, and as a result can represent a moving target.

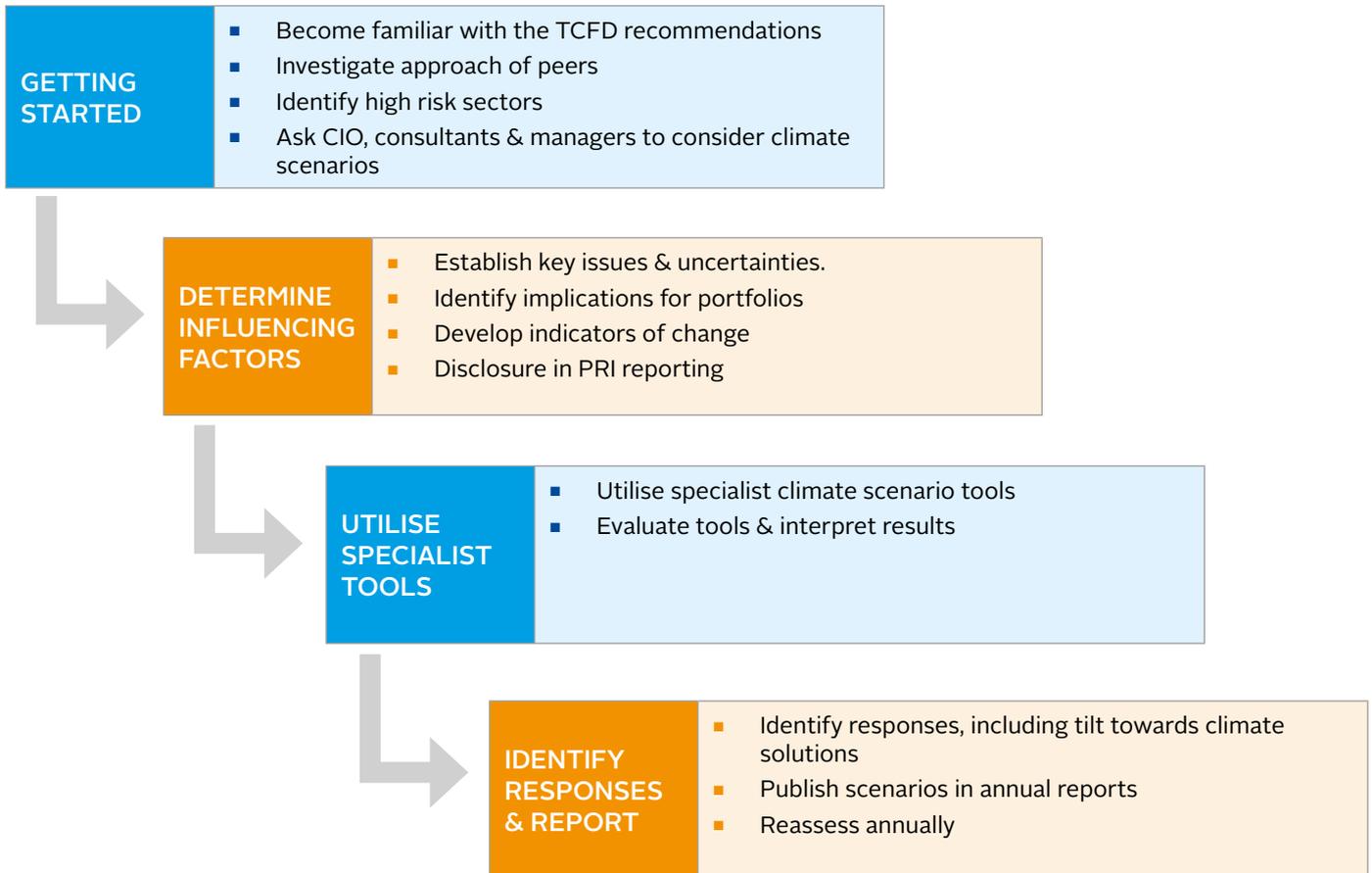
## WHAT DO ASSET OWNERS NEED TO DO?

Scenario analysis may already be a feature of an asset owner organisation's strategy and risk management process. Indeed, in many jurisdictions there is a regulatory requirement and guidance from supervisory bodies that scenario analysis be incorporated into the risk management processes of pension funds, particularly after the global financial crises that revealed existing risk models were inadequate. For those organisations already utilising a scenario framework in this context, the simplest way to get started with respect to considering climate change scenarios would be to also include a 2 degree or less outcome as part of the organisation's investment strategy and risk management considerations.

59 IEA (2017) Sustainable Development Scenario; <https://www.iea.org/weo/weomodel/>

The figure below sets out a four step process asset owners may wish to consider in implementing climate scenario analysis.

**Figure 35: Four step process to integrating climate scenario analysis**



## GETTING STARTED WITH SCENARIO ANALYSIS

For asset owners that do not currently utilise scenario analysis as part of the investment process in any way, there are some simple and straightforward steps that they can take to get started on the journey, including, but not limited to:

- Become familiar with the TCFD recommendations, including the technical guidance on scenario analysis.
- Investigate the approach taken by peers, attend workshops, conferences and participate in investor groups
- Identify in the financial fillings likely high-risk sectors, 80% of a portfolio's emissions could come from 20% of its holdings<sup>60</sup>
- Ask your CIO, actuary and/or investment consultant to look at including climate change scenarios including two degrees or less outcomes, perhaps alongside other economic and political scenarios, as part bolstering the investment strategy and risk management processes.
- Ask your fund managers to consider the resilience of their investment portfolios to two degrees or less outcomes and to report their assessment on an annual basis.

<sup>60</sup> 2° Investing Initiative (2017) Climate Alignment Pilot Tests Switzerland 2017, page 4. Available at [http://www.transitionmonitor.com/wp-content/uploads/2018/01/AlignmentReport\\_AggregiertesPortfolio\\_Versicherungen\\_EN.pdf](http://www.transitionmonitor.com/wp-content/uploads/2018/01/AlignmentReport_AggregiertesPortfolio_Versicherungen_EN.pdf)

- Keep it simple! Consider starting with a qualitative framework and build out to consider more quantitative outcomes as/when the knowledge, expertise and familiarity with the processes builds amongst the Board and management team.
- Decide on the appropriate level of management involvement and Board engagement in the process.

## DETERMINE INFLUENCING FACTORS

Preparers should avoid a jump to probabilistic analysis and start by identifying influencing factors in response to a series of questions<sup>61</sup>:

- What are the critical issues I need to explore? (e.g. how might G20 countries shift climate & energy policies by 2030)
- What are the main uncertainties?
- What are the implications and options for my investment portfolios?
- What are the signals or indicators of change I need to track? (e.g. in the transport sector, manufacturing production forecasts for electric vehicles)

Following which, asset owners could evaluate initial assessment and consider publishing key findings in line with TCFD recommendations.

## UTILISING SPECIALIST TOOLS

Asset owners may wish to develop or utilise some of the emerging tools that are available to examine the investment impacts of climate change scenarios (see tables below), this could start with a single portfolio. This will depend on a number of factors, including the resources available to an asset owner (both in terms of time, expertise and budget), as well as their internal capabilities and governance arrangements to oversee the process and integrate the outputs into the investment strategy and risk management processes.

In evaluating these tools, assets owners should identify or ask their advisors to identify the limitations and caveats of climate scenario analysis (such the completeness of market data, assumptions of underlying climate models and key uncertainties).

## IDENTIFYING RESPONSES AND REPORT RESULTS

Asset owners could use the results to identify applicable and realistic options to manage the risks and opportunities. This could include tilting the strategic portfolio allocation towards allocations in climate solutions.

In line with TCFD recommendations the results of scenario analysis should be published in the financial fillings and repeated annually with gradually increased coverage and complexity.

## EXAMPLES OF CLIMATE-RELATED SCENARIO TOOLS FOR INVESTORS

Figure 36 provides some examples of specialists that provide climate-related scenario tools for investors. It is worth noting that this is an area undergoing rapid development, with new tools and approaches likely to emerge over the coming months and years.

<sup>61</sup> Adapted from comments by Andrew Blau, Managing

**Figure 36: Examples of climate-related scenario tools for investors**

PROVIDER	DESCRIPTION AND COVERAGE	METHODOLOGY	ACCESS/ DELIVERY	OUTPUTS
<b>Mercer Investment Consulting</b>	<p>Top down, asset allocation climate scenario tool that examines risk/ return impacts at total portfolio, asset class, and sector level</p> <p><i>Transition and physical impact risks</i></p>	<p>Development of climate scenario pathways and risk/ return sensitivities of asset classes and industry sectors to 'TRIP' climate risk factors (Technology, Resource availability, Impact and Policy)</p> <p>Further details can be found here: <a href="#">Mercer climate change study</a></p>	<p>Available commercially on a project basis, client retainer agreement or through a research partner arrangement for asset owners</p>	<p>Identify priority risks and opportunities and the potential relative impacts under different climate scenarios (including 2 degree or less) to support strategic decision making on asset allocation and portfolio construction</p>
<p><b>2 Degree Investing Initiative /</b></p> <p>EU Horizon 2020 funded project</p>	<p>Bottom up, 2°C portfolio alignment tool, based on fixed income and listed equity portfolio holdings data</p> <p><i>Transition risks Only</i></p>	<p>Analyses the deviation of a portfolio from an optimally diversified portfolio in terms of energy and technologies under the 2 degree pathway as defined by the IEA, Greenpeace and Bloomberg New Energy Finance</p> <p>Further details can be found: <a href="http://et-risk.eu">http://et-risk.eu</a> and <a href="http://www.transitionmonitor.com/en/home/">http://www.transitionmonitor.com/en/home/</a></p>	<p>A free-to-use online tool (launch set for May / June 2018)</p>	<p>High-carbon / low-carbon mix over a 5 year forward-looking time horizon</p> <p>2 degree alignment of the investment and production plans of companies over a 5 year time horizon</p>
<b>ERM</b>	<p>Top down portfolio screening or bottom up asset analysis</p> <p><i>Physical and transition risks</i></p>	<p>Developed holistic or event based scenarios to identify "segments" of risk and opportunities for a focused commercial response</p> <p><a href="https://www.erm.com/en/service/all-services/energy-climate-change/">https://www.erm.com/en/service/all-services/energy-climate-change/</a></p>	<p>Available commercially</p>	<p>Identify priority risks and opportunities as well as the impacts under different climate scenarios</p>

## EXISTING PRI SUPPORTED INITIATIVES AT THE SECTOR OR COMPANY LEVEL

PRI is already supporting two sector and company level initiatives for assessing high emitting sector's exposure to transition risk.

**Figure 37: Sector and company level initiatives**

PROVIDER	RESEARCH	RELEVANCE TO SCENARIO ANALYSIS	LINKS
<b>Carbon Tracker Initiative and PRI</b>	two degrees of Separation: Transition risk for oil and gas in a low carbon world	Examines whether the supply options of the largest publicly traded oil and gas producers are aligned with demand levels consistent with a 2 degree carbon budget. It identifies which companies have the highest exposure to potential capital expenditure (capex) to 2025 in a 2 degree scenario	<a href="#">2 degree separation report</a>
<b>Transition Pathway Initiative</b>  Grantham Research Institute on Climate Change and the Environment, supported by investors	Bottom up, assessment of how listed companies are preparing for the transition to a low-carbon economy	Evaluates and tracks the quality of companies' management of their GHG emissions and of risks and opportunities related to the low-carbon transition.  Evaluates how companies' future carbon performance would compare to the international targets and national pledges made as part of the Paris Agreement.	<a href="#">Transition Pathway Initiative</a>

## EXAMPLES OF CLIMATE-RELATED INVESTMENT RESEARCH AND RESOURCES

Figure 38 provides some examples of climate-related investment research and resources in relation to scenario analysis that asset owners may wish to consider as part of their knowledge building efforts. These are delineated between those which are 'sector and company level' research and those which are broader in their focus.

**Figure 38: Examples of climate-related research and resources for investors\***

PROVIDER	RESEARCH	RELEVANCE TO SCENARIO ANALYSIS	LINKS
<b>SECTOR AND COMPANY LEVEL RESEARCH</b>			
<b>Moody's Investor Services</b>  (various reports)	Sovereign credit exposure to climate-related transition and physical risks, including 2 degree scenario	Assesses carbon transition risk in four main categories: direct financial effects, new technologies that lead to reduced fossil fuel use, regulatory uncertainty and consumer behaviour.  Incorporated into sovereign credit risk ratings used by investors.	<a href="#">moody's research example</a>
<b>University of Oxford, Smith School of Enterprise and the Environment</b>  (various reports)	Revolution not evolution: Marginal change and the transformation of the fossil fuel industry	Examines the transformation that is needed in the fossil fuel industry as part of the transition to a low carbon economy. Identifies a number of indicators of marginal change that is taking place, including shifts in energy supply towards renewables, changing cost curves, advances in emerging markets fuelling renewable energy, the prospect of peak fossil fuels and the potential for stranded fossil fuel assets as competition intensifies between fuel sources.	<a href="#">fossil fuels and stranded assets</a>
<b>BROADER FOCUSED RESEARCH</b>			
<b>Ceres</b>	A Framework for two degrees scenario analysis: A guide for oil and gas companies and investors for navigating the energy transition	Proposes the basis for two degrees scenario analysis, the key components for a two degrees scenario analysis framework, examples of best practices to date, the basics for meaningful climate disclosures, and key questions for investors to ask when engaging with companies on the analysis. Focus in particular on the oil and gas sectors.	<a href="#">ceres scenario analysis framework</a>
<b>Potsdam Institute for Climate Impact Research (PIK) and Carbon Delta</b>  (forthcoming)	Translate climate policy and physical climate impact risks into company risk assessments	The project will develop a global assessment on the economic impacts of climate change on corporate activities, tailored specifically towards the needs of investors in managing climate change risks within investment portfolios.	<a href="#">Potsdam Institute Carbon Delta project</a>

\* Further resources on scenario analysis are provided in TCFD Technical Supplement, pages 35-40

PROVIDER	RESEARCH	RELEVANCE TO SCENARIO ANALYSIS	LINKS
<b>BROADER FOCUSED RESEARCH (CONTINUE)</b>			
<b>Global Investor Coalition on Climate Change</b>  (various reports)	Climate change investment solutions: A guide for asset owners  Various sector level reports, guides and research, including transition risk	Provides asset owners with a range of investment strategies and solutions to address the risks and opportunities associated with climate change, including a discussion of 2 degree outcomes and potential portfolio impacts.  Various sector level reports that examine the climate-related risks and opportunities from an investor perspective in the transition to a 2 degree or less outcome. Include recommended actions in terms of corporate engagement and company analysis.	<a href="#">climate change solutions</a>  <a href="#">GIC report utilities</a>  <a href="#">Oil and gas</a>  <a href="#">Property and construction</a>  <a href="#">industrials manufacturing and materials</a>
<b>University of Cambridge, Institute for Sustainability Leadership</b>  (various reports)	Unhedgeable risks: How climate change sentiment impacts investment	Examines the economic and investment impacts of a range of climate scenarios in the short to medium term, including a 2 degree scenario. Concluded that the perception of climate change represents an aggregate risk driver that must be taken into consideration when assessing the performance of asset portfolios.  Useful framework for investors as part of their engagement with governments and policy makers on climate-related issues.	<a href="#">Cambridge unhedgeable risk</a>
<b>CICERO Climate Finance</b>	Climate scenarios demystified: A climate scenario guide for investors	The guide aims to establish a common understanding of climate scenarios. As companies begin to implement the TCFD recommendations for scenario analysis, the guide provides sample questions to help investors engage with companies and provide some considerations for future reporting requirements.	<a href="#">Cicero climate scenarios guide</a>

## EXAMPLES OF ASSET OWNER ACTIONS

### HIGHLIGHT 4

#### SCENARIO ANALYSIS – EXAMPLES OF ASSET OWNER ACTIONS

##### **CalSTRS (US public pension fund):**

Participated in the 2011 and 2016 Mercer-led climate change scenario analysis projects. Publicly released its tailored report, setting out the risks and opportunities particular to the CalSTRS portfolio.

1. Collaborated with Mercer and 17 other participants in a research study, Investing in a Time of Climate Change. The study highlights estimated portfolio return implications under four climate change scenarios and recommends appropriate actions to mitigate investment risk and maximize value within the portfolio.
2. Climate change risk is viewed as a material risk assessed across the entire portfolio that could impact current and future investment value.
3. CalSTRS believes that the underlying risk of climate change should be addressed now to capture economic growth opportunities and mitigate long-term risks for the benefit of California's educators.
4. The Fund incorporated the scenario analysis into its consideration of environmental risks during the asset allocation process as announced a \$2.5 billion commitment to a low-carbon public equities index.

A copy of the scenario analysis tailored report can be found here: [https://www.calstrs.com/sites/main/files/file-attachments/climate\\_change\\_report.pdf](https://www.calstrs.com/sites/main/files/file-attachments/climate_change_report.pdf) and the Green Initiative Task Force Annual Report 2016-17 can be found here: [https://www.calstrs.com/sites/main/files/file-attachments/green\\_report\\_2017.pdf](https://www.calstrs.com/sites/main/files/file-attachments/green_report_2017.pdf)

##### **ERAFP (French pension scheme for civil servants):**

As part of the Fund's efforts to better understand of the portfolio's degree of exposure to the transitional risks associated with climate change and its alignment with the Paris Agreement objectives, ERAFP undertook a range of actions, including the Fund's energy mix alignment with a 2°C scenario. The Fund analysed its contribution to the energy transition and the 2°C alignment for the equity portfolios (including green share, intensity of contribution to the climate transition and emissions avoided). The key findings of this work to date was reported in the ERAFP 2016 Annual Report (released in Sept 2017), the highlights of which include:

1. Measurement of alignment of the Fund's equity portfolio's energy mix with the International Energy Agency's 2°C scenarios for 2030 and 2050 revealed that the proportion of renewable energies will have to almost double to reach the target level for 2030.
2. The proportion of nuclear energy will have to be significantly reduced between now and 2030.
3. The transition to much less carbon-dependent methods of power generation will need to accelerate from 2030 on order to achieve alignment with the 2050 target energy mix.
4. Over the coming years, the gradual rebalancing of ERAFP's portfolio for better alignment with the most favourable climate scenarios will be implemented through several approaches: - changes to the energy strategies and mixes of the electricity generating companies already in ERAFP's portfolio. As part of these efforts, ERAFP is involved in an IIGCC shareholder engagement initiative aimed at promoting strategies to European utility companies that enable them to significantly reduce their greenhouse gas emissions. In addition, the Fund supports the RE100 initiative (businesses committed to 100% renewable electricity, <http://there100.org/re100>). ERAFP is also encouraging listed companies to obtain all of their energy from renewable sources over the long term and thereby increase demand in this sector. Finally, continual dialogue with the scheme's delegated fund managers is also expected to ensure they duly factor climate considerations into their management decisions to promote greater alignment with a 2 degree or less climate scenario.

A copy of the Fund's Annual Report (2016) with further details can be found here: <https://www.rafp.fr/en/public-report-2016>

**FRR (Fonds De Reserve) Pension Fund:**

The Fund notes that although not bound by the Energy Transition for Green Growth act, the FRR has adopted the framework set out in the new disclosure requirement for institutional investors regarding the incorporation of ESG criteria into their investment policy and practices, and specifically the management of climate-related financial risks (paragraph 6 of article 173 of the Energy Transition for Green Growth act). The FRR detailed its ESG externalities in a separate document which can be accessed here: <http://www.fondsdereserve.fr/documents/Report-2016-article-173-lte.pdf>. The key insights from the climate scenarios analysis include:

1. Utilised a carbon trajectory methodology and the power generation sector's 2 degree alignment (supported by Trucost and Grizzly Responsible Investment).
2. Relative to its theoretical trajectory (portfolio made up of the same companies but behaving in line with the sector trajectories as per the IPCC/IEA/SDA 2 degree scenarios), the 'actual' equity portfolio trajectory has higher forecast emissions than the theoretical portfolio, with the level of emissions declining over time but the gap fairly constant. The same results were true when considered at the developed, developing and
3. Analysis of the power generation sector estimated the change needed in the world energy mix to reduce fossil fuels and increase renewable energy to align with a 2-degree scenario, specifically a 2050 world energy mix of 55% to renewables (up from 20% of the existing equity composite) with coal down to 8% (from 29% presently).
4. Recognition of the methodology limitations including assumptions about future carbon revenue trajectories, corporate data reporting gaps, uncertainty around future goods/services and revenue mix, amongst others.

**Norges Bank Investment Management (Asset manager responsible for the asset management of the Government Pension Fund of Norway):**

Developing an in-house framework to incorporate climate change scenarios into its investment process and valuation models as part of the way it manages assets. The aim of the work is "eventually to be able to model the effects of a carbon price on the return of the portfolio under individual forward-looking scenarios". The key features of the process include:

1. Developing an in-house model for analysing the potential impacts of mainstream climate scenarios on individual companies and on the portfolio as a whole.
2. Modelling future cash flows and GHG emissions at a company level, incorporating estimates of future carbon price under different scenarios.
3. Recognition of the gaps, for example, the analysis is a point in time analysis and does not take account of companies' strategies, industry structure and other factors.
4. Recognition of the data limitations where "carbon emissions calculations do not provide a complete picture of the climate risk that companies may be exposed to." The analysis of carbon emissions is therefore assessed in combination with other relevant information, such as water intensity, air pollution, age of generation units emitting CO<sub>2</sub>, and, where applicable, carbon capture and storage options.

A copy of the Responsible Investment Annual 2017 report with further details can be found here: <https://www.nbim.no/contentassets/67c692a171fa450ca6e3e1e3a7793311/responsible-investment-2017---government-pension-fund-global.pdf>

**AXA Group (Global insurance, asset management and investment):**

AXA outlined its approach to portfolio alignment with decarbonisation objectives as two-fold (AXA climate change strategy):

1. Testing the alignment of its investments with the International Energy Agency's "2°C" scenario.
2. Testing the contribution of its investments to the energy and ecological transition measured by the percent of companies' revenues derived from "eco-activities", or so-called "green share".
3. The analysis utilised the zii methodology and focused on three sectors for which "energy transition" as well as "stranded assets" scenarios can be applied with reasonable relevance and data availability: Oil & Gas, Automotive and Electric Utilities, and also taking into account national/regional scenarios and constraints. The approach matched securities with their current and planned physical underlying assets and production levels by technology, then compared to the energy mix outlined under the IEA 2°C scenario for utilities.
4. The results have been publicly reported as part of the French Energy Transition Law, Article 173 (AXA article 173 response). The analysis concluded (inter alia) that to improve portfolios energy mix for utilities, a process of investment reallocation from utilities with least exposure to renewables, to those with higher exposure, would be beneficial. Likewise, a process of investment reallocation from automotive makers with least exposure to electric and hybrid models renewables, to those with higher exposure, would be beneficial.
5. A back-test on AXA's fixed income portfolio tested how to best improve its 2°C alignment via a quantitative approach, concluded that with only a 1% portfolio turnover, AXA could (nearly) meet the 2°C benchmark without altering the sector allocation.
6. To meet subsequent potential climate goals, AXA uses three methodologies for improving investment decisions, namely (1) assessing transition risk in high-carbon sectors; (2) back-testing portfolios to identify a plan for stock reallocation to meet the 2°C benchmark; and (3) maximizing energy and ecology transition impact by increasing "green share".

**AP2 (Swedish Pension Fund):**

The Fund is one of the first asset owner investors to publicly respond to the TCFD recommendations by issuing a report that addresses each of the recommendations, including scenario analysis. In regard to scenario analysis, the report notes that:

1. AP2 notes that it has not yet evaluated its investment strategy on the basis of various climate scenarios.
2. It also notes that in 2018, it intends to further investigate what opportunities there are to conduct some form of scenario analysis. As part of these efforts, it is participating in an IIGCC (Institutional Investors Group on Climate Change) programme that is focused on the implementation of the TCFD.

A copy of AP2's climate report based on the TCFD's recommendations can be found here: <http://www.ap2.se/globalassets/hallbarhet-agarstyrning/klimat/tcf/ap2s-climate-report-based-on-tcfds-recommendations.pdf>

**TPT Retirement Solutions (UK based DC scheme):**

Undertook climate scenario analysis using both the Mercer and 2Dii tools, produced a public report including the key findings, discussed climate change at the Board level and set out the priorities for the fund going forward, including:

1. Continuing to manage and monitor carbon risk within its global equity portfolio, and in particular consider how it might address carbon risk in passive equities by creating an index or smart beta fund that incorporates the carbon factor;
2. Continuing to work with investment managers and specialist advisors to understand climate risk within alternative asset classes; and
3. Seeking to find ways that will better align our portfolio with the two degrees pathway. This may be from increasing our allocation to real assets that specifically deliver positive social and environmental benefits.

A copy of the report can be found here: <http://www.tpt.org.uk/docs/default-source/investments/responsible-investment/tpt-climate-change-report>

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## The Principles for Responsible Investment (PRI)

The PRI works with its international network of signatories to put the six Principles for Responsible Investment into practice. Its goals are to understand the investment implications of environmental, social and governance (ESG) issues and to support signatories in integrating these issues into investment and ownership decisions. The PRI acts in the long-term interests of its signatories, of the financial markets and economies in which they operate and ultimately of the environment and society as a whole.

The six Principles for Responsible Investment are a voluntary and aspirational set of investment principles that offer a menu of possible actions for incorporating ESG issues into investment practice. The Principles were developed by investors, for investors. In implementing them, signatories contribute to developing a more sustainable global financial system.

More information: [www.unpri.org](http://www.unpri.org)



## The PRI is an investor initiative in partnership with **UNEP Finance Initiative** and the **UN Global Compact**.

### United Nations Environment Programme Finance Initiative (UNEP FI)

UNEP FI is a unique partnership between the United Nations Environment Programme (UNEP) and the global financial sector. UNEP FI works closely with over 200 financial institutions that are signatories to the UNEP FI Statement on Sustainable Development, and a range of partner organisations, to develop and promote linkages between sustainability and financial performance. Through peer-to-peer networks, research and training, UNEP FI carries out its mission to identify, promote, and realise the adoption of best environmental and sustainability practice at all levels of financial institution operations.

More information: [www.unepfi.org](http://www.unepfi.org)



### United Nations Global Compact

The United Nations Global Compact is a call to companies everywhere to align their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption, and to take action in support of UN goals and issues embodied in the Sustainable Development Goals. The UN Global Compact is a leadership platform for the development, implementation and disclosure of responsible corporate practices. Launched in 2000, it is the largest corporate sustainability initiative in the world, with more than 8,800 companies and 4,000 non-business signatories based in over 160 countries, and more than 80 Local Networks.

More information: [www.unglobalcompact.org](http://www.unglobalcompact.org)

