

In collaboration
with Mercer



Pacesetters: Setting the Tempo of Advanced Climate Investing

WHITE PAPER
APRIL 2022



Contents

Foreword	3
Preface	4
Executive summary	5
1 Introduction	7
2 Challenge 1: Defining and implementing a transition roadmap	9
3 Challenge 2: Measuring achievement and success	13
4 Challenge 3: Engaging investee companies actively and effectively	17
5 Challenge 4: Defining climate reporting metrics by asset class and manager	20
Conclusion	24
Appendix: Climate Benchmark tool	25
Contributors	26
Endnotes	27

Disclaimer

This document is published by the World Economic Forum as a contribution to a project, insight area or interaction. The findings, interpretations and conclusions expressed herein are a result of a collaborative process facilitated and endorsed by the World Economic Forum but whose results do not necessarily represent the views of the World Economic Forum, nor the entirety of its Members, Partners or other stakeholders.

© 2022 World Economic Forum. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, or by any information storage and retrieval system.

Foreword

Investors are taking steps to acknowledge, educate, act, measure, advocate and engage to deliver their global climate ambitions.



Allyson Tucker
Chief Executive Officer,
Washington State Investment
Board, USA

This White Paper builds on findings published in the 2021 World Economic Forum document “[Trendsetters: Transformational Investment Practices of Advanced Investors](#)” that addressed how asset owners adapt their decision-making processes to tackle complex global systemic trends, such as climate change and low or negative interest rates. This paper focuses on the integration of financially material climate factors into investment decision-making – climate investing – and is intended to advance asset owner community efforts in this area. By first collecting direct feedback from asset owners through a climate benchmark, the research identified the top four challenges to climate investing. The research presents solutions based on case studies to overcome the challenges, using insights from investor practices around the globe.

It is promising to see investors take steps to acknowledge, educate, act, measure, advocate and engage to deliver their global climate ambitions. These responsive actions directly and indirectly support the global effort to reduce carbon emissions to net zero by 2050. Actions defined in the Climate Benchmark used in this research affirm an effective path forward for the asset owner

community, providing an actionable snapshot into the primary steps that transform an investor’s approach to climate investing.

Transforming one’s investment decision-making to reflect climate-related considerations is complicated and requires time and dedication. Solutions to the foremost challenges require investor actions that balance climate-related risks and opportunities, fiduciary duty to stakeholders, investment beliefs and many additional pertinent considerations. This work presents activities that help in this regard. Collaboration led to the insights in this paper. Collaboration must continue to facilitate the maintenance of an economic and investment environment where investors achieve strategic objectives and deliver on obligations to beneficiaries.

I would like to express my appreciation to the World Economic Forum and Mercer for their work, and to the various contributors for their invaluable insights and guidance along the way. I hope that readers of this paper find its contents informative to the evolution of their climate-related activities, at both the organizational and portfolio level.

Preface

Transformative investment activities that allocate capital to mitigate climate change create investment opportunity and returns for leading investors.



Rich Nuzum
President, Investments and Retirement, Mercer (Marsh McLennan), USA



Matthew Blake
Head, Shaping the Future of Financial and Monetary Systems; Member of the Executive Committee, World Economic Forum LLC

This White Paper is the third in a series on transformational investment. The initial 2020 paper, “[Transformational Investment: Converting Global Systemic Risks into Sustainable Returns](#)”, identifies the important global systemic trends facing investors, such as climate investing, low or negative interest rates, geopolitical risk and technological evolution. The second, “[Trendsetters: Transformational Investment Practices of Advanced Investors](#)”, published in 2021, progresses to solutions, defining vision, governance and implementation processes that asset owners use to address these trends. This final paper, produced as part of the World Economic Forum Platform on Shaping the Future of Financial and Monetary Systems, identifies how investors overcome the challenges impeding climate investing.

Global asset owners and managers confront daily the challenges of transformational investing in pursuit of absolute and risk-adjusted returns. For the past three years, Mercer and the Forum have studied how investors address the most prevalent challenges – specifically, how they set their vision, governance and implementation activities to translate the challenges into investment opportunity. These activities also support decision-making in response to systemic risks, including their short-term manifestations. The unfolding impact of the war in Ukraine (the crisis is ongoing at the time of this paper’s publication), a manifestation of geopolitical risk, seems likely

to have major impacts on climate investing and interest rates. It underscores the complexity and interconnectedness of the systemic risks investors face when allocating capital. Advanced asset owners with well-developed vision, governance and implementation structures have a clear sense of “who they are”, allowing them to react decisively in response to systemic risks, consistent with their strategic objectives and fiduciary duties.

Based on this research and through collaboration with the Forum’s multistakeholder platform, Mercer developed the Climate Benchmark, a tool that more than three dozen global asset owners have used to measure their advancement with respect to climate investing. The tool assesses investors’ progress relative to world-class investors who have spent years addressing climate investment challenges. Findings from the Climate Benchmark results highlight the greatest challenges facing investors, which we are pleased to share along with practical protocols to overcome them.

The transformative investment activities that allocate capital more intentionally with respect to climate investing are intended not only to benefit our planet and society, but also to create investment opportunity and returns for leading investors.

We would like to thank the asset owners, investment managers, policy-makers and other experts who have contributed to this work.

Executive summary

The practices outlined in this report aim to improve investment opportunities sourced through climate investing.

Climate change impacts and risks are becoming increasingly complex and more difficult to manage.¹ Asset owners around the world are moving fast to adapt investment processes in response to the risks and opportunities related to climate change, but even the most sophisticated are struggling with the myriad of activities required. In a long-distance race such as a marathon, the pacesetters set the tempo and the standard for others to follow. Their activity ensures the group as a whole has a higher probability of achieving their goals. This paper provides actions for the investment community as a whole to set the tempo on climate investing, based on insights from these leaders. These actions help to shape a Climate Benchmark – a self-assessment benchmarking tool that includes over 80 activities integrating climate factors into investment decision-making – that allows asset owners to measure progress over time.

More specifically, this paper:

- Identifies the four most pressing challenges impeding climate investing today, based on the peer-group analysis of responses from asset owners around the globe to the Climate Benchmark
- Highlights practices and relevant frameworks of advanced investors that address these challenges and can be adopted by all investors

Key outcomes

Asset owners that completed the Climate Benchmark of investment practices identified the most pressing challenges impeding climate investing today as:

1. Defining and implementing a transition roadmap

What steps are required by investors to develop a comprehensive roadmap to position their portfolios for the climate transition, consistent with the organization's vision, beliefs and values?

Uncertainty over the pace and nature of the transition to a low- or no-carbon global economy presents challenges to investors seeking to

maximize risk-adjusted returns. Transition roadmaps translate the inherently complex interrelated challenges of decarbonizing the global economy into applicable investor steps that address their objectives and stakeholder requirements. Roadmap development often serves to unify organizational beliefs and produces a comprehensive forward-looking policy and governance action steps.

2. Measuring achievement and success

How do investors evidence achievement and success when making climate-related investment decisions?

Standard investment performance benchmarks are ineffective in measuring the results from climate investing activities. Consequently, measuring achievement and success for many investors comes from understanding the advanced climate practices of other investors, learning how they define, monitor and report climate-related investment outcomes. The Climate Benchmark captures these activities – more than 80 – that integrate climate factors into investment decision-making. A commitment to these activities leads to material adjustments in both measurement processes and how to successfully pursue climate investing practices.

3. Engaging investee companies actively and effectively

How do investors engage investee companies to mitigate climate risk and enhance long-term value creation?

Across the majority of sectors, the decision to engage or divest has become increasingly nuanced. This has led to many asset owners undertaking the full range of stewardship activities available to them in order to enhance long-term value across investee companies.

Key characteristics of successful programmes, regardless of whether these are conducted in-house or delegated to external managers, include being proactive (rather than reactive) in identifying and engaging companies on material risks, alongside a focus on quality of engagement over quantity.

4. Defining climate reporting metrics by asset class and manager

What steps are required to identify decision-useful metrics that can be rolled up to the asset class/manager level to enable comparison?

Effective climate metrics provide a holistic view of portfolio risks and opportunities on a forward-looking and point-in-time basis, and measure an investor's progress against climate-related objectives. Despite numerous challenges to metric development – a lack of standardization, disclosure, consistent data and awareness of best practice – asset owners are actively integrating available data into investment decision-making. An awareness

of the financial materiality of data, together with any associated limitations, is important to tracking progress against transition roadmaps, manager performance and commitments.

Advanced asset owners that actively address these challenges can demonstrate enhanced risk management and many believe the benefits position them competitively in their pursuit of associated return opportunities. The adoption of these practices by the wider investment community is expected to improve investment prospects by avoiding the worst physical impacts of climate change as an example, and to position investors to take advantage of the opportunities that will materialize as part of the transition to a low-carbon economy.



1

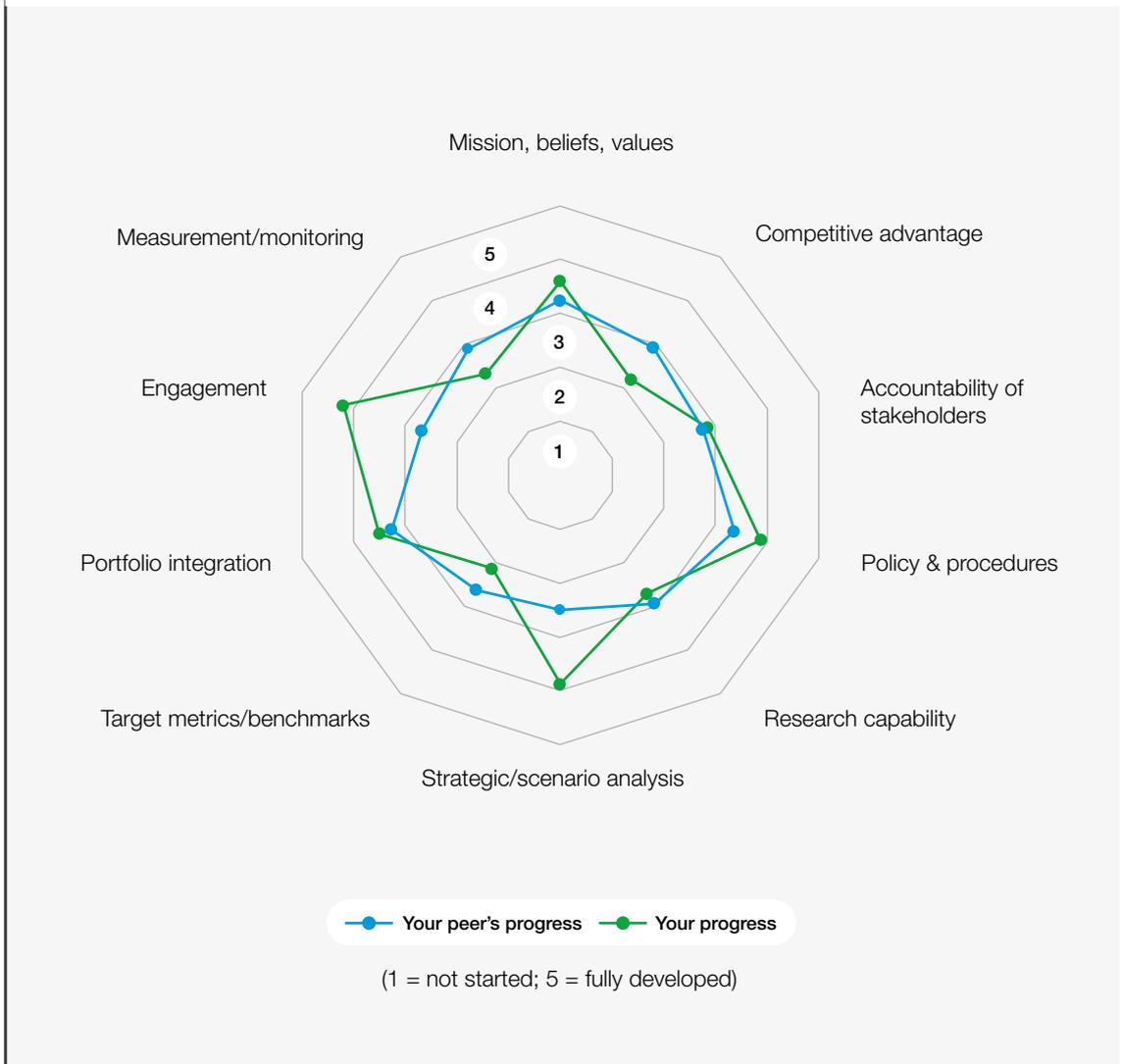
Introduction

Translating advanced practices into a Climate Benchmark identifies how the investment community can accelerate its collective pace.

Peer benchmarking across non-traditional investment risks presents a significant challenge for investors. In the case of climate change, this is particularly true given that investment practices continue to evolve. Emerging policy responses by governments and regulators redefine requirements of investors, alongside the increasing availability and breadth of company-specific and environmental data.

Through engagement with a community of leading asset owners and managers, this research identified over 80 investment-related activities across 10 categories, which support the integration of climate change into investment decision-making. By translating advanced practices into a Climate Benchmark (see Appendix for more information), the research has provided the institutional asset owner community with a tool to assess current activities against today's advanced practices and peers (Figure 1).

FIGURE 1 Illustrative peer benchmarking output of Climate Benchmark across categories of activity



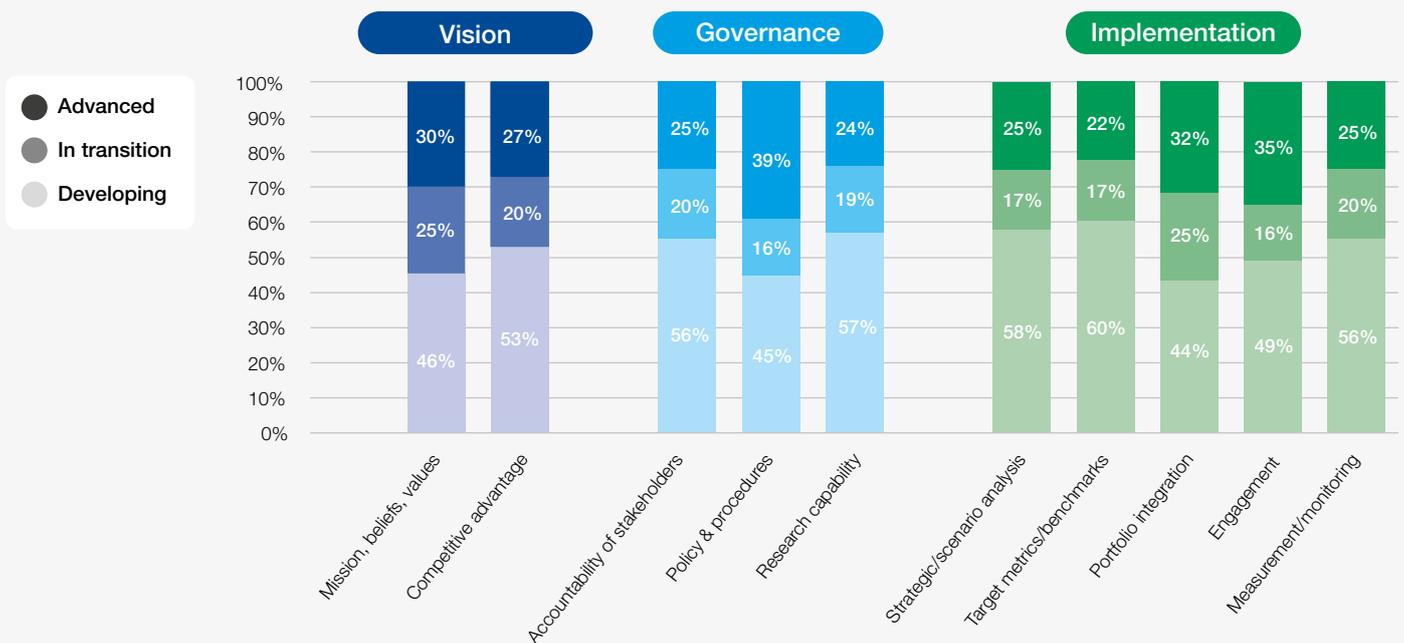
Source: Mercer Climate Benchmark tool

More than three dozen global asset owners completed the Climate Benchmark assessment, providing insights into global practices and how climate-related factors get integrated into investment decision-making. Asset owner results also provided insights into the most common challenges facing the investment community.

Across six out of the 10 categories of activity, more than 50% of the asset owners surveyed were “developing”, meaning a majority of investors were just getting started or had yet to start in these areas (Figure 2). While the progress is clear,

for example in the area of policy and procedures, much opportunity remains for further progression. Advanced practices were also observed in all categories of activities, consistent with the previous finding that advanced asset owners have put in the effort required to integrate climate-related factors into their strategic decision-making processes, adapting their vision, governance and implementation practices.² Profiling and sharing of these advanced practices through the Climate Benchmark tool creates opportunities to accelerate the development of the investment community around climate investing.

FIGURE 2 Aggregated results across vision, governance and implementation



Source: Mercer Climate Benchmark tool

A survey of asset owners helped to identify the four most pressing challenges (see Box 1), uncovered through analysis of the aggregated results of Climate Benchmark responses:

1. Defining and implementing a transition roadmap
2. Measuring achievement and success
3. Engaging investee companies actively and effectively
4. Defining climate reporting metrics by asset class and manager

BOX 1 Defining the climate-related challenges

1. Defining and implementing a transition roadmap: What steps are required by investors to develop a comprehensive roadmap to position their portfolio for the climate transition, consistent with the organization's vision, beliefs and values?
2. Measuring achievement and success: How do investors evidence achievement and success when making climate-related investment decisions?
3. Engaging investee companies actively and effectively: How do investors engage investee companies to mitigate climate risk and enhance long-term value creation?
4. Defining climate reporting metrics by asset class and manager: What steps are required to identify decision-useful metrics that can be rolled up to the asset class/manager level to enable comparison?

2

Challenge 1: Defining and implementing a transition roadmap

Investors who have designed and implemented a transition roadmap can demonstrate the benefits of enhanced risk management and competitive advantage.

The Climate Benchmark, completed by dozens of the largest global investors, identified “defining and

implementing a transition roadmap” (Box 2) as one of the top four hurdles in climate investing.

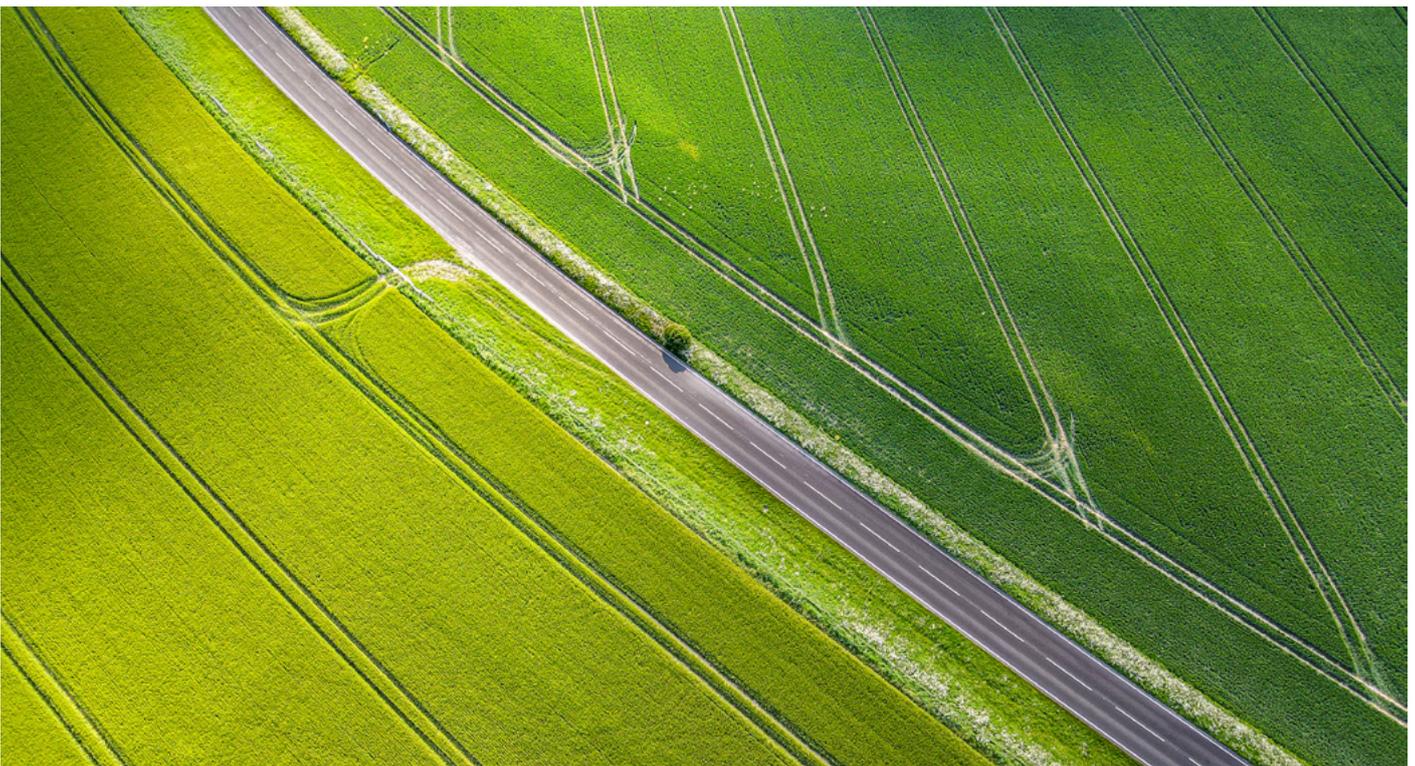
BOX 2

Investor transition roadmap

A transition roadmap defines the investment-related considerations and steps an asset owner takes in response to the transition to a low-carbon and ultimately net-zero global economy.

Transition roadmaps translate the inherently complex interrelated challenges of decarbonizing the global economy into applicable investor steps that address their objectives and stakeholder requirements. Roadmap development often serves to unify organizational beliefs and produces a comprehensive forward-looking

policy and governance action steps. Investors who have designed and implemented a transition roadmap would assert benefits of enhanced risk management and competitive advantage from having a clear understanding of climate-related investment risks and opportunities.



“ The decarbonization of a global and diversified portfolio cannot be divorced from the decarbonization of the real economy.

Net-zero commitments

As of 2 November 2021, over 140 countries had announced or were considering net-zero targets (with a range of target dates, including a number in the second half of this century) covering 90% of global emissions, compared to the 130 countries covering about 70% of emissions in May 2021.³ Advanced investors recognize that accomplishing net-zero commitments (NZCs) and global climate ambitions in general requires collective action by entire governments, industries, economies and supporting actors. In response to this environment, alongside growing awareness that a well-below-2°C scenario is in long-term investors’ best interests,⁴ asset owners are turning to NZCs of their own.⁵

A comprehensive transition roadmap, however, does not always have to lead to an NZC. Some asset owners do not yet feel able to set an NZC. This may be because current gaps in climate-related data and a constrained investable universe of climate solutions represent barriers to making such a commitment. Some asset owners do not wish to publicize an external (or internal) NZC. At times, this reflects a well-researched understanding that decarbonization of a global and diversified portfolio cannot be divorced from decarbonization of the real economy, alongside an appreciation that aspects of the required coordinated action fall outside an asset owner’s sphere of influence.

This is not to say that these investors will do nothing while the economy decarbonizes around

them. Decarbonization of the economy will lead to winners and losers, with associated investment risks and opportunities. Whether or not they have set an NZC, transformational investors, seeking to derive attractive risk-adjusted expected returns at the same time as mobilizing capital to address climate change, are conducting a number of actions, including:

- Defining the relevance of climate-related investment factors on vision, governance and implementation practices
- Committing resources and governance activities – quantitative and qualitative – to identify climate opportunities
- Integrating climate factors, such as transition and those related to physical risk, into capital market assumptions and strategic asset allocation decisions
- Setting sector and company-specific transition expectations informed by sectoral decarbonization pathways, such as those prepared by the Transition Pathway Initiative,⁶ and determining capital allocation depending on progress against these expectations
- Defining processes and metrics that integrate climate factors into investment activities and track portfolio evolution

Formulating the plan

The research has benchmarked the vision, governance and implementation practices of global asset owners, defining current state advancement across these three areas and providing insights into how various organizations set a transition roadmap. While investors often start with top-down considerations, such as vision and policy-setting, some organizations have skipped vision and governance entirely and moved into extensive implementation. They apply climate factors to all asset classes, integrating climate into ongoing decision-making and evolving portfolio exposures and engagement at accelerated rates. These organizations typically have smaller investment teams with an established consensus on climate investing. For larger organizations where divergent views exist, systematic development – starting with vision – builds consensus from senior leadership, oversight committees and boards, and supports adherence to new investment practices.

Effective roadmaps capture the interactions between the climate and financial markets, and must be tailored to organizational challenges, such as stakeholder beliefs, portfolio exposure, time horizon and country-specific regulations. Vision and governance activities, such as “achieving consensus on climate-related goals” and “having a sustainable investment policy”, are common across investors. These activities in turn set both the foundation for capital allocation through integration and screening, and the engagement activities as part of implementation.

The rest of this section defines the practices across the areas of vision, governance and implementation when defining and implementing a transition roadmap. Key activities are grouped by vision, governance and implementation (Figure 3).

FIGURE 3 | Key activities in a transition roadmap

	Vision	Governance	Implementation
	Beliefs	Policy	Process
Mission, beliefs, values	Consensus on transition roadmap		
Competitive advantage	Consistency of roadmap with strategic objective	Integration into risk management policies	
Accountability of stakeholders		Translation of roadmap into roles & responsibilities	
Policy & procedures		Translation of roadmap into policies	
Research capability (including staff)		Access to climate expertise	Understanding of climate impacts at sector level
Strategic/scenario analysis			Modelling of physical/transition risks
Target metrics/benchmarks			Portfolio-level metrics & climate indexes
Portfolio integration			Capital allocation decisions informed by analytics
Engagement			Voting & engagement with investee companies
Measurement/monitoring			Regular reporting against roadmap targets

Source: World Economic Forum and Mercer

Vision

Understanding climate science and the financial implications of portfolio integration helps to build consensus on vision. This typically requires training of both stakeholders and investment teams, alongside ongoing portfolio assessments and internal briefs regarding the current emissions, transition capacity and green exposures of the portfolio. These activities promote a collective understanding that, in turn, unifies team commitment and implementation.

Transition roadmaps also capture and prioritize climate-related risk and opportunities relative to wider strategic objectives. By framing climate as one factor among others within an investment programme, investors can uncover advantages unique to their circumstances (for example, combining an ability to take on illiquidity risk with private investments that deliver climate-positive outcomes and investment returns over time).

Governance

Translating vision into investment policies addresses key considerations, such as aligning with fiduciary duties, containing exposure to investments with stranded asset risk and identifying climate solutions. For instance, Washington State Investment Board's roadmap includes an education component to ensure investment staff have the ongoing knowledge and capabilities to assess climate solution strategies that fit within their respective asset classes.

Establishing accountability is essential to successful implementation. Climate-related roles and responsibilities must span leadership,

portfolio management, engagement and risk teams. Policies and procedures define responsibilities for each group, including avenues for escalation and feedback loops to sustain policy relevance as regulation and policies shift. Climate-related metrics and key performance indicators (KPIs) for sustainability reporting create relevance for employees. A select handful of advanced practitioners have linked compensation to climate-related targets. This remains uncommon in general due to challenges in defining what constitutes achievement and success as well as relevant board experience in setting such compensation arrangements.



“ A comprehensive roadmap ensures consistency with climate-related investment beliefs, the alignment of roles and responsibilities and staged targets that guide implementation.

Implementation

A bottom-up understanding of the portfolio's current and projected emissions and transition capacity provides perspective on the nature and scale of portfolio implementation challenges. Top-down scenario analysis quantifies physical and transition risks while climate-adapted capital market assumptions (CMAs) support strategic asset allocation decisions. Common activities to develop a complete picture of risks and opportunities include:

- Portfolio-level scenario analysis of physical and transition risks using various climate outcomes, balancing climate scenario comprehensiveness, plausibility and probability
- Carbon footprint and transition capacity analysis at the holdings level
- Integration of climate change impacts, both physical and transition-related, on long-term CMAs

These activities support investment decision-making and guide engagement activities in a number of ways. For example, the Canada Post Pension Plan completed a bottom-up analysis of its public equity portfolio to help shape its Climate Action Plan. The analysis involved three steps: (i) a baseline assessment; (ii) analysis of portfolio evolution; and (iii) target setting. The supporting framework classified holdings on a scale from “high carbon intensity, low transition capacity” to “low carbon intensity, high transition capacity”, against which the transition capacity of the portfolio and alternatives could be judged. This analysis resulted in an asset class-specific decarbonization programme, with implications for asset allocation, manager selection and engagement.

When implementing through external managers, those managers must have the capabilities and

research to make informed decisions on the climate transition. Indeed, the transition roadmap being developed by the Washington State Investment Board includes a tool that allows for systematic assessment of the environmental, social and governance (ESG)-related capabilities of investment partners across asset classes and over time, including an explicit assessment of partners' climate-related capabilities.

The integration of climate change into long-term CMAs is a fast-evolving area. CMAs are typically built on projections for gross domestic product (GDP) growth, inflation and interest rates. Factoring in the uncertain impact of climate change on these macroeconomic variables presents a significant challenge. To construct a base case for the climate-aware CMAs, Fidelity International assesses most likely outcomes, using the scenarios developed by the Network for Greening the Financial System. It uses equity and fixed-income research team perspectives to evaluate scenarios and identify economic and investment-related implications associated with achieving net zero by 2050. For instance, based on a recent assessment that predated recent increases in inflation driven by rising energy and commodity prices, it assessed an upside risk to inflation over the coming years with associated implications for strategic asset allocation.⁷

The effectiveness of climate-related investment decisions resulting from these actions should be assessed through an ongoing monitoring programme. As transition roadmaps span multiple decades, monitoring activities against intermediate targets is common. For example, the Environment Agency Active Pension Fund has set targets at the portfolio level, such as to halve emissions by 2030 relative to 2010 levels, and at the listed equity level (87% reduction by 2025 and 95% by 2030 relative to 2010 levels).⁸

Concluding considerations

Transition roadmaps translate the inherently complex interrelated challenges of decarbonizing the global economy into applicable investor steps that address each investor's objectives and stakeholder requirements. A comprehensive roadmap sets out steps that

span vision, governance and implementation, ensuring consistency with an asset owner's climate-related investment beliefs, alignment of roles and responsibilities and staged targets that guide implementation.

3

Challenge 2: Measuring achievement and success

For many investors, an effective means to evaluate achievements and guide future success comes from understanding the advanced climate practices of other investors.

Measuring climate investment achievement and success is challenging due to a lack of reliable data, a standardized benchmarking framework, and absolute or relative standards compared to peers. Varying approaches to integrating climate factors also undermine standardization of benchmarks and ongoing measurements.

For many investors, an effective means to evaluate achievements and guide future success comes from understanding the advanced climate practices of other investors. To help measure and compare current climate investing advancement, the World Economic Forum and Mercer spent three years creating a benchmark framework through interactions with advanced global climate investors.

The resulting Climate Benchmark was released in mid-2021 and provides self-assessment benchmarking that includes over 80 activities integrating climate factors into investment decision-making. Respondents rank their state of advancement across each activity; the resulting analytics provide the absolute and peer comparison benchmarking (recall Figure 1). This highlights the spectrum of actions that move an investor from the developing to the advanced level, thereby demonstrating achievement and success.

Based on results from more than three dozen assessments, a sample of actions (Table 1) taken by developing and advanced investors are shown across a selection of important climate investing activities.



TABLE 1 | Developing vs advanced climate investing practices

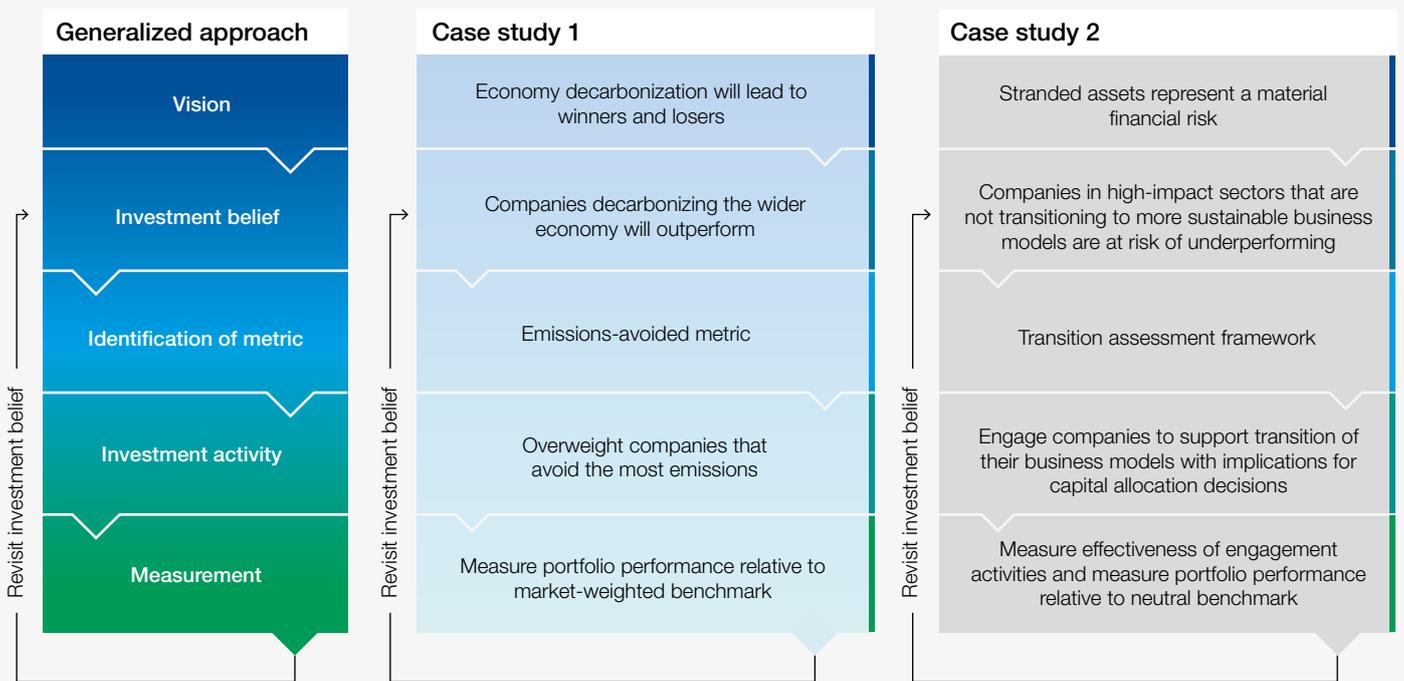
Activity	Actions of:	
	Developing investors	Advanced investors
Vision		
Consensus is reached on climate-related viewpoints.	Senior leadership's climate views and areas of disagreement are identified.	Any disagreements are confronted and informed by in-house research and analysis, leading to alignment on financially material aspects of climate change.
The team draws from climate research data providers to build intellectual capital.	The team reviews research to understand regulatory and market developments.	The team balances research perspectives to help shape an in-house view with clear implications for the investment process.
Governance		
Compensation explicitly connects individuals and/or portfolio team performance to climate-related objectives.	There is no explicit connection due to challenges in measuring climate-related success.	Variable compensation for employees is tied to the achievement of climate targets (e.g. remaining within carbon budgets assigned to each investment team).
Procedures include forums with external experts for information sharing and collaboration.	Investors participate in forums to understand emerging trends and best practice.	Investors actively contribute to collaborations that address challenges (e.g. climate disclosure and identification of climate opportunities – see case study 1).
The organization fully integrates climate-related competencies across staff.	Climate-related competency sits in a centralized function.	Staff receive regular and function-specific training on climate issues, with feedback loops to maintain competency.
Implementation		
The team uses stochastic and deterministic econometric modelling for portfolio construction and asset allocation decisions.	Deterministic portfolio climate risk assessment is undertaken to quantify financial risks.	Analysis results are embedded into the risk management process (e.g. portfolio exclusions by sub-sector) and investment decision-making (e.g. strategic asset allocation and asset class benchmarks).
The organization attempts to integrate climate change considerations across its entire portfolio.	Summary ESG factors are integrated into investment analysis across public markets; ESG ratings of external managers are monitored.	Investors integrate climate factors into investment analysis across public- and private-sector markets; external manager performance is monitored relative to climate-related objectives.
The team engages with investee company management on significant climate-related risks to the portfolio and performance.	Greater disclosure of greenhouse gas emissions and climate risks is encouraged through required reporting.	Investors proactively set decarbonization expectations with progress against expectations impacting capital allocation decisions (see case study 2).
The organization's proxy voting record reflects climate considerations.	Proxy voting is outsourced to external managers; the organization's proxy voting policy is shared.	Climate-related shareholder resolutions are supported, filed or co-filed; external managers are tracked against proxy voting policy with overrides where inconsistencies exist.
Where possible, the organization reports weighted average carbon intensity (WACI) or portfolio carbon footprint.	WACI/footprint (covering scope 1 and 2 emissions) is reported across public market holdings.	WACI/footprint (covering scope 1 and 2 emissions) is reported across public- and private-sector market holdings, including assessment of transition capacity alongside monitoring and reporting of scope 3 emissions.

Source: World Economic Forum and Mercer

The benefit of benchmarking climate investing is to identify the value additive activities that improve risk/return outcomes. While actions will evolve as standardization and climate data disclosures improve, many of the benchmarked activities support and maintain the strategic framework that guides an investor's approach to climate investing.

Advanced investors can work through these activities systematically, using currently available data to measure outcomes. The construction and testing of investment beliefs provide an illustrative and common example, synthesizing multiple organizational viewpoints into a unified belief. Figure 4 frames how to validate investment beliefs.

FIGURE 4 How to measure and validate investment beliefs



Source: World Economic Forum and Mercer; case studies adapted from GIC Private Limited and New York State Common Retirement Fund

“The benefit of benchmarking climate investing is to identify the value additive activities that improve risk/return outcomes.”

Investment beliefs define how asset owners create value in the context of future climate-related uncertainty, risk and opportunity. Through the development of metrics, beliefs can be translated into investment activities which, once measured, enable investors to validate and refine the original belief over time.

Case study 1 reflects the prototype “avoided emissions” framework developed by GIC Private Limited in partnership with Schroders.⁹ It captures the belief that leaders in decarbonization do more than reduce their own emissions; they also develop products and services that drive economy-wide reductions. The framework attributes emissions avoided (i.e. emissions saved through the substitution of high-carbon activities with low-carbon alternatives) to individual companies. For a given company, this metric can then be compared against the company’s own scope 1, 2 and 3 emissions, enabling a more holistic evaluation of its contribution to global emissions. Back-

testing substantiated that companies with positive avoided emissions experienced 7% annualized revenue growth during a recent three-year period, or 20% faster than the MSCI All Country Investable Market Index (MSCI ACWI IMI) stock universe as a whole. This research was conducted on a portfolio focused on decarbonization opportunities and strengthened the belief that investing in companies that contribute to reducing emissions in the real economy is expected to deliver better risk-adjusted returns over the long term. Research continues to further develop this metric, including extending it to private market assets, for it to be fully integrated into GIC Private Limited’s investment processes.

Case study 2 reflects the transition assessment framework developed by the New York State Common Retirement Fund.¹⁰ It recognizes that portfolio companies in the high-impact sectors identified by the Task Force on Climate-related Financial Disclosures (TCFD) create risk to long-

term value. Transition assessments and minimum standards determine whether steps taken by companies in these high-impact sectors will lead to sustainable business models. Sector-specific KPIs, including progress relative to sectoral decarbonization pathways, support these risk appraisals. Failure or success to demonstrate

improvement in transition readiness after engagement can result in exposure adjustments, new investment restrictions or divestment. Thermal coal company reviews, for instance, led to restrictions and divestment in over 20 companies, thereby reducing transition risk within the portfolio.



Concluding considerations

Despite the challenges to measurement, strong progress by advanced practitioners, supported by global frameworks such as the TCFD, illustrates how a commitment to action and awareness of climate investment risk and opportunities leads to material adjustments in both measurement processes and how

to evaluate a successful evolution in climate investment practices. Complexity can be reduced by decomposing activities across vision, governance and implementation, and measuring the current state against organizations that have completed these activities.

4

Challenge 3: Engaging investee companies actively and effectively

Effective engagement programmes follow a sequential process with triggers for escalation.

Asset owners committed to enhancing long-term value across investee companies undertake the full range of stewardship

activities available to them (Box 3). Successful programmes are proactive, rather than reactive, and focus on quality over quantity.

BOX 3

Engagement activities available to asset owners

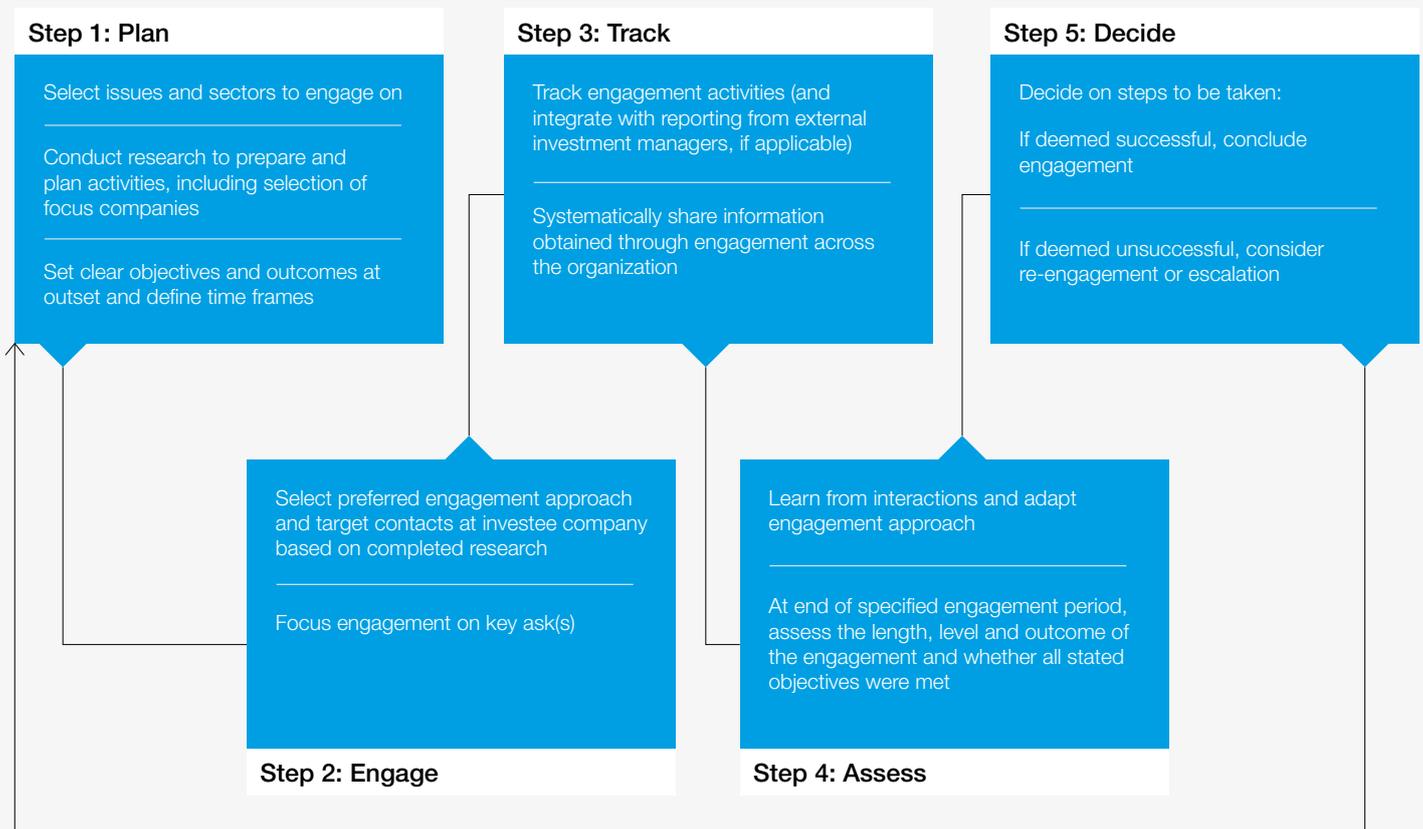
Engagement activities differ by asset class and include proxy voting, writing letters, teleconferences, in-person meetings, shareholder proposals, regulator communications, collaborative initiatives, and direct or targeted intervention.

A framework (Figure 5) illustrates processes and the activities that improve engagement. Effective engagement programmes, whether

implemented in-house or delegated to external asset managers, follow a sequential process with triggers for escalation.

FIGURE 5

Engagement framework



1. Plan

Defining engagement priorities (i.e. the company and focus area) is the first step and requires an appraisal of three key areas:

- a. Vision – A clear climate vision prioritizes engagement on relevant climate issues in the context of other financially material issues (for example, focusing on sectors and geographies most exposed to transition or physical risks, where the associated financial impact is material relative to other actively managed portfolio risks, such as market or credit risk).
- b. Materiality – A materiality assessment considers the size of the holding within the overall portfolio and the financial risk posed. For instance, some asset owners use climate scenario modelling and transition analysis to quantify the climate-related risks and opportunities facing an investee company's business model.
- c. Influence – Asset owner influence determines the extent to which the financial risk can be mitigated or avoided through asset owner activities. For engagement activities managed in-house, the level of influence is weighed against the cost of staff time and resources.

After identifying target companies and engagement topics, asset owners prepare for company interaction by understanding company activities and climate-related exposures, such as carbon footprint and transition risks. By developing company-specific KPIs linked to financial implications, they create a forward-looking roadmap that guides ongoing engagement, escalation and reporting.

2. Engage

Interactions with companies take many forms (Box 3), with prior research helping to shape the appropriate starting approach and target contacts at the investee company.

Specifically in relation to climate investing, investors have recently made considerable progress in the area of collaborative engagements. Climate-focused industry initiatives, such as Climate Action 100+ (Box 4), unify and direct clear messages from multiple investment organizations to corporate managers, enabling greater influence. These initiatives seek commitments from high-risk companies to improve disclosures, set net-zero targets and develop decarbonization strategies.

BOX 4

Climate Action 100+

An investor-led initiative, Climate Action 100+ is supported by 615 investor members representing \$65 trillion of assets as of the end of 2021.¹¹ It is aimed at ensuring significant corporate greenhouse gas emitters take necessary action on climate change. The initiative has a defined engagement process, whereby “engagement with focus company executives and board members is spearheaded by a lead investor or investors, who work cooperatively with a number of collaborating investors”.¹² Investors focus on three asks, alongside a central message that “inaction by companies following engagement may result in investors taking further action”.¹³

The three asks of Climate Action 100+ focus on seeking commitments from boards and senior management of significant corporate greenhouse gas emitters to:¹⁴

- i. Implement a strong governance framework that clearly articulates the board's accountability and oversight of climate change risk
- ii. Take action to reduce greenhouse gas emissions across the value chain,

consistent with the Paris Agreement's goal of limiting global average temperature increase to well below 2°C above pre-industrial levels, aiming for 1.5°C; notably, this implies the need to move towards net-zero emissions by 2050 or sooner

- iii. Provide enhanced corporate disclosure in line with the final recommendations of the TCFD and sector-specific Global Investor Coalition on Climate Change (GIC) Investor Expectations on Climate Change guidelines (when applicable), to enable investors to assess the robustness of companies' business plans against a range of climate scenarios, including well below 2°C, and to improve investment decision-making

The initiative “tracks the progress of focus companies against a number of key indicators through regular progress reporting and benchmarking”.¹⁵ For example, 17 of the 22 companies that the California Public Employees' Retirement System, a co-founder and steering committee member of the initiative, is engaging have now set a target or ambition of achieving net-zero by 2050.

“ Asset owners undertake the full range of stewardship activities, deployed in a sequential process with triggers for escalation.

Collaborative initiatives also flag key shareholder proposals related to the initiative’s goals and circulate information from members that are filing or co-filing resolutions at target companies. Shareholder resolutions can include requests for target companies to report in line with TCFD recommendations and disclose climate lobbying activities.

Where equity holdings are managed in-house, advanced asset owners vote their own proxies or at the very least exercise discretion on how their proxies are being voted if using a proxy adviser. Where holdings are externally managed and proxy voting is delegated, managers are tracked against an internal proxy voting policy, with overrides in place where inconsistencies exist. These activities ensure that the asset owner’s vision is integrated throughout the portfolio. For the largest owners with material equity allocations, there is scope for further activity in this area. For example, the California Public Employees’ Retirement System retains the rights and conducts all the proxy voting for the shares it owns, regardless of whether that capital is being managed internally or through an external investment manager.

3. Track

Interactions with companies can take place over a multi-year period, such as through discussions of corporate targets to reduce greenhouse gas emissions across the entire value chain and realized transition activity against sectoral decarbonization pathways. Therefore, asset owners that track and document the outcomes of engagement interactions on an ongoing basis ensure their actions in a given focus area are internally consistent and self-reinforcing, and that they create accountability both internally and at investee companies.

Interim engagement outcomes, such as investee company announcements to adopt an NZC, are systematically shared with the wider investment team and factored into investment analysis. Asset owners using external managers track voting and engagement activities and monitor them for consistency with in-house policy and portfolio decision-making.

Concluding considerations

Across the majority of sectors, the decision to engage or divest has become increasingly nuanced. This has led to asset owners undertaking the full range of stewardship activities available to them, deployed in a sequential process with triggers

Long-term investors, holding assets over time and engaging over multi-year periods, are positioned to benefit from the value generated when investing in climate solutions in hard-to-abate yet economically critical sectors. An example of this is providing finance to support the integration and scaling of low-carbon technologies in sectors such as steel, aviation and shipping. Investors’ actions are elevated in importance when investing in these sectors, as concerted efforts are required to drive the decarbonization of underlying operations.

4. Assess

Asset owners refine their engagement approach with companies through ongoing outcome assessments, amplifying messages that resonate with management and developing those messages that do not, such as through additional supporting analysis. At the end of the specified engagement period, they assess the level of internal resources committed throughout the engagement process alongside the outcomes achieved against stated objectives.

5. Decide

Asset owners typically establish decision-making criteria in advance, for example a company promise to adopt a net-zero commitment, to determine the success of an engagement activity. When successful, the asset owner concludes engagement on that topic. If unsuccessful, the asset owner weighs up the merits of re-engaging or escalation.

Where a series of escalations are completed without a successful outcome, asset owners review their influence over the company, either individually or as a collection of asset owners. Capital allocation decisions may be impacted if influence is insufficient, including the restriction of additional investment or, potentially, divestment. The majority of asset owners see divestment as an action of last resort, limiting their ability to shape corporate behaviour with the potential that subsequent buyers will not share the same level of climate ambition.

for escalation. Key characteristics of successful programmes, regardless of whether these are conducted in-house or delegated to external managers, include being proactive (rather than reactive) alongside a focus on quality over quantity.

5

Challenge 4: Defining climate reporting metrics by asset class and manager

Climate metrics at the asset class and manager level form the building blocks for a portfolio-wide assessment, thereby guiding portfolio actions and tracking climate commitments.

Effective climate reporting metrics provide a holistic view of portfolio risks and opportunities, and measure an investor's progress against climate-related objectives. This section outlines how asset owners identify useful (such as financially material) metrics, apply them to portfolios and use dashboards to track progress against climate commitments.

Despite numerous challenges to climate metric development – a lack of standardization, limited disclosures, lack of consistent data and lack of best practice awareness – asset owners today are actively integrating climate metrics into their investment analysis. These metrics allow asset owners to track progress against transition roadmaps and net-zero commitments alongside an evaluation of investment performance.

Identifying useful climate metrics

Asset owners tend to start with global disclosure frameworks, such as the TCFD, which characterize effective metrics as:

- Decision-useful: Relevant to the organization's climate-related vision and investment beliefs
- Clear and understandable: Understood by the audience with articulation of any limitations
- Reliable, verifiable and objective: Free from bias and value judgement
- Consistent over time: Consistent methodology to facilitate comparative and trend analysis¹⁶

Consolidating and transforming climate-related raw data into financially material metrics that allow asset owners to measure climate risk and provide context for investment decision-making is progressing around the world,

supported by global data providers. Metrics most widely reported against include transition risk, physical risk, portfolio decarbonization, transition finance and engagement.

Common drivers that determine metric inclusion are:

- Relevance, i.e. the "what" and "why" for measuring a certain climate factor
- Costs and benefits of preparing such information
- Linkages to the investor's vision, objectives and regulatory environment

Climate-related metrics can be summarized as what asset owners adopt or measure, why they do so and how the metrics are used within the investment process (Table 2).

TABLE 2 | Climate-related metrics

Category	What to measure?	Why measure?	How used?
Transition risk	<ul style="list-style-type: none"> Anticipated financial impacts of climate transition on portfolios, based on scenario analysis Exposure to carbon-related assets by sector (as % of portfolio) Transition risk exposure (e.g. heatmap) by sector/technology/geography 	<ul style="list-style-type: none"> Assess exposure to transition risks (e.g. changes in policy, regulation) and potential impact on asset valuations 	<ul style="list-style-type: none"> Size portfolio exposures Inform limits in risk management policy Prioritize companies for engagement
Physical risk	<ul style="list-style-type: none"> Anticipated financial impacts of physical risks on portfolios, based on scenario analysis Stranded asset risk as a result of physical damages Physical risk exposure (e.g. heatmap) by sector/geography 	<ul style="list-style-type: none"> Assess exposure to physical risks (e.g. flooding, wildfires, resource scarcity) and potential impact on asset valuations 	
Portfolio decarbonization	<ul style="list-style-type: none"> Portfolio emissions – current/historical/future (absolute and intensity) Portfolio alignment metrics (e.g. Paris Agreement-aligned or implied temperature rise) 	<ul style="list-style-type: none"> Monitor progress against decarbonization pathways or portfolio commitments 	<ul style="list-style-type: none"> Track progress against portfolio decarbonization targets Prioritize companies for engagement
Transition finance	<ul style="list-style-type: none"> Exposure to climate-related opportunities (as % of overall portfolio) Carbon-related metrics (e.g. avoided emissions, noting that these should not be offset against other portfolio emissions) Climate-related capex intensity (capex on climate solutions as % of total capex) 	<ul style="list-style-type: none"> Monitor capital allocated to climate solutions to support adaptation and resilience as well as economy decarbonization 	<ul style="list-style-type: none"> Track investment into climate solutions
Engagement	<ul style="list-style-type: none"> Proportion of engagement meetings (total and by portfolio) on climate risk/opportunity, by theme Number/% of engagements where positive progress achieved against objectives Number/% of advanced interventions 	<ul style="list-style-type: none"> Monitor effectiveness of climate-related engagement activity upon long-term value creation 	<ul style="list-style-type: none"> Assess and refine engagement approach

Source: Adapted from Climate Financial Risk Forum¹⁷

To equip asset owner senior leadership with the information to monitor the climate impacts of investment decisions requires an understanding of each climate metric and its limitations. For instance, calculating certain metrics in Table 2 remains a challenge due to a lack of standardization. Common obstacles exist due to differences in:

- Taxonomies used to categorize assets and activities
- Assumptions underlying scenario analysis (e.g. damage functions within integrated assessment models)
- Approach by asset class (e.g. different denominators when calculating carbon footprint across equities, corporate bonds and sovereign bonds)
- Approach to dealing with data coverage gaps
- Assumptions underlying portfolio alignment metrics (e.g. implied temperature rise)

Regardless, advanced asset owners typically adopt at least one metric from each category to capture climate-related impacts across their portfolios. They balance progress relative to long-term targets or commitments against short-term tactical decisions, such as through a decarbonization-at-the-right-price framework. The choice depends on individual circumstances, including portfolio asset mix, availability of resources and the nature of climate-related commitments (for example, emission reductions based on an absolute or intensity-based measure). Due to evolving climate science and associated financially material metrics, investors must also periodically revisit their approach, adapting as necessary to new data and standards.

To successfully manage and monitor climate metrics usually requires experienced team members with expertise to interpret and apply climate metrics to both the total programme and asset manager portfolios.

“ Advanced asset owners identify useful metrics guided by an assessment of financial materiality, any inherent limitations and portfolio relevance.

Developing a portfolio view

Climate metrics at the asset class and manager level form the building blocks for a portfolio wide assessment, thereby guiding portfolio actions. For example, carbon footprinting analytics indicate emission concentration by manager portfolio and asset class. Coupled with an analysis of portfolio transition capacity, asset owners prioritize sources of portfolio emission reductions and determine where to concentrate stewardship efforts. Tools for investors to assess physical risks are limited, with advanced asset owners focused on resilience. For example, they assess whether the investment case for long-term infrastructure remains intact in the face of considerable physical impacts.

To support a portfolio-wide view, a preferred set of metrics should be agreed for each asset class, with expectations set for managers to provide the required information – either the raw data or the metrics calculated using an agreed method. If managers cannot provide the required data, further

stewardship efforts should explore why the data are not financially material to their investment process.

Lack of disclosure across all investee companies and assets, especially across emerging and private markets, can impede portfolio assessments. The merits of proxies or qualitative assessments can be assessed to supplement the quantitative analysis in these situations. It is also common to state the level of coverage underlying an analysis, with targets to increase that coverage over time. Several initiatives, such as the TCFD and CDP, address this challenge with asset owners often playing prominent roles. For instance, in their response to the U.S. Securities and Exchange Commission’s request for public input on climate-related financial disclosures, the Washington State Investment Board noted that general partners are increasingly asking private companies to report scope 1 and 2 emissions, and that disclosure is becoming more accepted as a standard business practice for new investments.¹⁸

Developing a dashboard

Investors use dashboards to capture applicable metrics, specifically ones that align with an organization’s climate vision and that equip leadership to make investment decisions and monitor climate impacts from those decisions. Dashboards are developed for climate-

related purposes, such as to track portfolio decarbonization, allocation to climate solutions and voting activity. Table 3 illustrates a Mercer-recommended sample dashboard that tracks progress against NZCs.

TABLE 3 Sample NZC dashboard

		Baseline	2025	2030
Weighted average carbon intensity (Tonnes CO ₂ /\$ million sales)				
Weighted average carbon intensity (Tonnes CO ₂ /\$ million sales) reduction from baseline				
Absolute emissions contribution (Tonnes CO ₂ /\$ million funds under management)				
Absolute emissions contribution (Tonnes CO ₂ /\$ million funds under management) reduction from baseline				
Integration	% of portfolio covered by credible NZCs			
	Number of managers agreeing to support target implementation			
Engagement	Number of votes/engagements undertaken linked to net zero			
Transition finance	% of portfolio invested in climate solutions			
Screening	Fossil fuel reserves (tonnes CO ₂)			
	Fossil fuel producers			

Source: Mercer

The primary focus of this dashboard is a staged and strategic reduction in portfolio emissions, measured through both intensity and absolute-based measures. Similar to improvements in portfolio metrics and analytics, dashboards are evolving to reflect what constitutes a credible NZC. For example, it is common to set targets against other metrics, such as a target allocation to climate solutions, to use all levers that achieve the NZC.

As part of its Climate Action Plan, the New York State Common Retirement Fund made an explicit

\$20 billion commitment over the next decade to a multi-asset-class Sustainable Investment and Climate Solutions Program.¹⁹ Progress against such targets gets measured periodically to ensure the portfolio remains on track, recognizing that short-term deviations can occur. For example, investment in climate solutions in hard-to-abate sectors can lead to short-term increases in carbon emissions, with a potential time lag for engagement outcomes to materialize.

Concluding considerations

Advanced asset owners identify useful metrics guided by an assessment of financial materiality, any inherent limitations, and portfolio relevance. Consistency in climate metrics at the asset class and manager level form the building

blocks for a portfolio wide assessment. This guides portfolio actions that enable tracking of progress against transition roadmaps, manager performance and commitments.



Conclusion

The Climate Benchmark tool underpinning this research identifies where the investment community needs support to accelerate its collective pace on climate investing. The project started with the identification of the four most pressing challenges, followed by collaboration across the investment community to share associated advanced

practices, i.e. the pacesetters defining the tempo and setting the standard for others to follow. It led to case study findings, Climate Benchmark activities and the development of frameworks that investors can adopt (Table 4) to integrate the financially material aspects of climate change at the organizational and portfolio level.

TABLE 4 Summary of key challenges and frameworks for addressing them

Challenge	How the challenge manifests?	Generalized framework
Defining and implementing a transition roadmap	Uncertainty over the pace and nature of the transition to a low- or no-carbon global economy presents challenges to investors seeking to maximize risk-adjusted returns.	Transition roadmaps translate the inherently complex interrelated challenges of decarbonizing the global economy into applicable investor steps that address their objectives and stakeholder requirements. Roadmap development often serves to unify organizational beliefs and produces forward-looking policy and governance action steps.
Measuring achievement and success	Standard investment performance benchmarks are ineffective in measuring the results from climate investing activities.	Measuring achievement and success comes from understanding the advanced climate practices of other investors, learning how they define, monitor and report climate-related investment outcomes. The Climate Benchmark captures the activities that integrate climate investing factors into investment decision-making. A commitment to these activities leads to material adjustments in both measurement processes and how to successfully pursue climate investing practices.
Engaging investee companies actively and effectively	Across the majority of sectors, the decision to engage or divest has become increasingly nuanced.	Asset owners, committed to enhancing long-term value across investee companies, undertake the full range of stewardship activities available to them. Key characteristics of successful programmes, regardless of whether these are conducted in-house or delegated to external managers, include being proactive (rather than reactive) in identifying and engaging companies on material risks, alongside a focus on quality of engagement over quantity.
Defining climate reporting metrics by asset class and manager	Challenges to metric development include a lack of standardization, disclosure and awareness of best practice.	Asset owners today are actively integrating available data into investment decision-making. An awareness of the financial materiality of data, together with any associated limitations, is important to tracking progress against transition roadmaps, manager performance and commitments.

Source: World Economic Forum and Mercer

Asset owners can use the Climate Benchmark tool to assess their current activities against advanced practices and peers, which prioritizes development of areas that drive strong risk-adjusted returns and address the impacts of climate change. For instance, by understanding relative strengths and weaknesses, asset owners determine where to dedicate resources and when to outsource activities. By adapting their vision,

governance and implementation practices, they improve decision-making responsiveness to emerging climate-related risks and opportunities. Collective advancement of the investment community supports the delivery of enhanced risk-adjusted returns while mobilizing the capital required to transition the global economy towards net zero, in line with global climate ambitions.

Appendix: Climate Benchmark tool

This research identified over 80 investment-related activities, which support the integration of climate change into investment decision-making. By translating advanced practices into the Climate Benchmark, the research provides the institutional asset owner community with a tool to assess their

current activities against advanced practices and peers. Constructed as a self-assessment, the tool allows asset owners to indicate their state of advancement for each activity on a scale from 1 (“not started”) to 5 (“fully developed”). Table A1 provides a sample of illustrative activities.

TABLE A1 **Sample of illustrative activities from the Climate Benchmark tool**

Vision

Senior leadership understands climate science and financial implications of portfolio integration.

The organization has a transition roadmap to fulfil its climate-related objectives.

Senior leadership understands climate change linkages to valuations and economic opportunities due to industry changes (e.g. policies and regulations).

Senior leadership optimizes internal and external resources to educate, train and develop stakeholders.

Governance

The organization’s climate change-related vision and beliefs are translated into relevant roles and responsibilities.

The organization has a dedicated team and process to capture the implications of changing regulations in a timely fashion and to adapt processes accordingly.

Procedures include forums with external experts for information sharing and collaboration.

Established investment procedures support integration, ongoing policy adoption and climate-related financial disclosures.

Implementation

The team uses stochastic and deterministic modelling to quantify physical and transition risks of the current portfolio, such as the transition capacity of holdings.

Relevant benchmarks to achieve climate-related strategic objectives are defined, for example the EU Paris-Aligned Benchmark.

The team tracks external managers’ decisions relative to the organization’s climate policy parameters.

The team regularly measures and tracks material ESG factors for all investments, such as via the Sustainability Accounting Standards Board.

Sources: World Economic Forum and Mercer

Contributors

Lead author

Jonathan Cross

Project Fellow, Shaping the Future of Financial and Monetary Systems, World Economic Forum (on secondment from Mercer)

World Economic Forum

Matthew Blake

Head, Shaping the Future of Financial and Monetary Systems; Member of the Executive Committee, World Economic Forum LLC

Katerina Labrousse

Project Lead, Shaping the Future of Financial and Monetary Systems, World Economic Forum

Project chair

Allyson Tucker

Chief Executive Officer, Washington State Investment Board, USA

Mercer (Marsh McLennan)

Helga Birgden

Partner, Global Chair, Sustainable Investment, Australia

Fiona Dunsire

Senior Partner, Investments and Retirement Leader AMEA and LatAM, UK

Peter Grant

Partner, Senior Investment Consultant, USA

Rich Nuzum

President, Investments and Retirement, USA

Endnotes

1. Intergovernmental Panel on Climate Change, “Climate Change 2022: Impacts, Adaptation and Vulnerability, Summary for Policymakers”, 27 February 2022, https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_SummaryForPolicymakers.pdf (accessed 17 March 2022).
2. World Economic Forum, “Trendsetters: Transformational Investment Practices of Advanced Investors”, White Paper, 23 March 2021, <https://www.weforum.org/whitepapers/trendsetters-transformational-investment-practices-of-advanced-investors> (accessed 17 March 2022).
3. Climate Action Tracker, “CAT net zero target evaluations”, 9 November 2021, <https://climateactiontracker.org/global/cat-net-zero-target-evaluations> (accessed 25 March 2022).
4. Mercer, “Investing in a Time of Climate Change – The Sequel 2019”, 2019, <https://www.mercer.com/our-thinking/wealth/climate-change-the-sequel.html> (accessed 17 March 2022).
5. UN-convened Net-Zero Asset Owner Alliance, *Progress Report 2021: Credible Ambition, Immediate Action*, October 2021, <https://www.unepfi.org/publications/credible-ambition-immediate-action> (accessed 17 March 2022).
6. Dietz, Simon, et al., “TPI Sectoral Decarbonisation Pathways”, Transition Pathway Initiative, February 2022, <https://www.transitionpathwayinitiative.org/publications/100.pdf?type=Publication> (accessed 17 March 2022).
7. Ahmed, Salman, and Anna Stupnytska, “Planetary risk: mapping climate pathways to macro and strategic asset allocation”, Fidelity International, 13 July 2021, https://www.fidelityinstitutional.com/static/master/media/pdf/esg/planetary_risks_white_paper_final.pdf (accessed 21 March 2022).
8. Environment Agency Pension Fund, “Getting to net zero and building resilience”, https://www.eapf.org.uk/-/media/document-libraries/eapf2/climate-change/2021/eapf_net_zero_interactive_pdf_aw.pdf?la=en&hash=0D6261789BDE110FD9EE77E6EB1FE337F170D21C (accessed 17 March 2022).
9. Howard, Andrew, et al., “A Framework for Avoided Emissions Analysis: Uncovering Climate Opportunities Not Captured by Conventional Metrics”, GIC and Schroders, November 2021, <https://www.gic.com.sg/thinkspace/long-term-investing/a-framework-for-avoided-emissions-analysis> (accessed 17 March 2022).
10. Di Napoli, Thomas P., “Progress Report on the New York State Common Retirement Fund’s Climate Action Plan”, April 2021, <https://www.osc.state.ny.us/files/reports/special-topics/pdf/progress-report-climate-action.pdf> (accessed 17 March 2022).
11. Climate Action 100+, “2021 Year in Review: A Progress Update”, January 2022, <https://www.climateaction100.org/wp-content/uploads/2022/01/Climate-Action-100-2021-Progress-Update-Final.pdf> (accessed 21 March 2022).
12. Climate Action 100+, “Engagement Process”, <https://www.climateaction100.org/approach/engagement-process> (accessed 28 March 2022).
13. Ibid.
14. Climate Action 100+, “The Three Asks”, <https://www.climateaction100.org/approach/the-three-asks> (accessed 28 March 2022).
15. Climate Action 100+, “Progress Update”, <https://www.climateaction100.org/progress/progress-update> (accessed 14 April 2022).
16. Task Force on Climate-related Financial Disclosures, “Guidance on Metrics, Targets, and Transition Plans”, October 2021, https://assets.bbhub.io/company/sites/60/2021/07/2021-Metrics_Targets_Guidance-1.pdf (accessed 17 March 2022).
17. Climate Financial Risk Forum, “Climate Financial Risk Forum Guide 2021: Climate Data and Metrics”, October 2021, <https://www.fca.org.uk/publication/corporate/climate-financial-risk-forum-guide-2021-data-metrics.pdf> (accessed 17 March 2022).
18. Whitmarsh, Theresa, Washington State Investment Board’s response to the U.S. Securities and Exchange Commission’s request for public input on climate-related financial disclosures, 2 June 2021, <https://www.sec.gov/comments/climate-disclosure/cli12-8880643-240113.pdf> (accessed 21 March 2022).
19. Di Napoli, Thomas P., “Progress Report on the New York State Common Retirement Fund’s Climate Action Plan”, April 2021, <https://www.osc.state.ny.us/files/reports/special-topics/pdf/progress-report-climate-action.pdf> (accessed 17 March 2022).



COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744
contact@weforum.org
www.weforum.org