



Net Zero in the Balance

Roger Urwin, FSIP

A Guide to Transformative Industry Thinking



CFA Institute
Research & Policy Center

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FOREWORD

Achieving net zero—the future state where greenhouse gas emissions and removals are balanced—requires transformational changes on a massive scale and at a swift pace. One of the key challenges is how to finance the trillions of dollars in spending needed over the next three decades to reach this goal. Policymakers and the public look to investors and the investment industry for help.

At the same time, many investors—especially asset owners with very long-term horizons—recognize the financial risks that climate change poses to their portfolios. They note the potential risks and see opportunities for returns as they seek to meet future financial needs.

Regardless of whether the motivation is financial, altruistic, or both, it is no mean feat to determine how to address net zero within a financial system strongly oriented around risk and return considerations. The financial ecosystem requires new thinking and tools to meet the unprecedented complexity and scale of the problem.

Investors are particularly interested in investment strategies and practices that can support a transition to a global state of net zero without sacrificing their risk and return objectives.

Given the level of interest in net zero among our members, investment industry clients, and the global community of policymakers and regulators, CFA Institute seeks to support those considering net-zero investing by developing more thought leadership and educational offerings in this area. In doing so, we hold fast to the notion that investment objectives are ultimately up to the end client. Specifically, CFA Institute sees a role for itself to

- fill the gap in the investment industry's education in net-zero knowledge, skills, and abilities;
- address how to build net-zero investing best practices; and
- support the development of policies that codify best practices.

CFA Institute welcomes diverse perspectives, and this guide offers one view, informed by interviews with leading thinkers and investors, about how thinking and practice might change to support net zero for those who seek to do so. We aim to contribute to a leap forward in investment practice.



Margaret Franklin, CFA

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EXECUTIVE SUMMARY

This guide provides research, practitioner insights, and tools to appreciate net-zero investing more fully. Addressing asset managers, asset owners, service providers, and regulators, it seeks to guide investment industry leaders on their net-zero ambitions.

The guide emphasizes the strategic importance and operational features of net-zero investing to a growing number of investors, policymakers, and others who are already committed to net-zero goals or climate risk management.

The Enablers of Successful Net-Zero Investing

Frameworks Needed to Adapt to the Big Shift in the Investment Ecosystem

- *Net-zero investing* is the part of sustainable finance that contributes directly to the global target of net-zero emissions.
- *Asset owners* decide on their commitment to net zero within their direct fiduciary responsibility; asset managers apply this commitment in the mandates they are given.
- Net-zero investment efforts will involve *transformational change*, placing a burden on organizational resourcing and a dependence on transformational leadership.

Innovations Necessary to Integrate Net-Zero Investing into Mainstream Investing

- *Balanced scorecards* are a critical tool to consolidate multiple measurements of progress toward net-zero goals.
- *Total portfolio thinking* and *universal ownership theory* are conducive to net-zero investing.
- An expanded version of *stewardship* plays a vital role in net-zero investing.

Investment Strategies for Successful Net-Zero Investing

- The investment strategy for asset owners in most cases must support the *dual mandate* of meeting net-zero goals without compromising on the highest possible risk-adjusted returns.
- A net-zero investment strategy must aim to achieve *alignments with government and regulators* on the net-zero pathway. Sometimes investors will follow government, and sometimes they will lead government.

- A commitment to GFANZ (*Glasgow Financial Alliance for Net Zero*) organizations may play a part in the strategy, as may engagement with other non-governmental organization (NGO) coalitions.
- Enhanced organizational capabilities will feature in the strategy. Fresh talent and new professional learnings will be needed. There will be demands to upskill. Human values will come to the fore.

Key Conclusions

- There is a very high likelihood that the performance of individual issuers and capital markets in aggregate will be affected by climate change outcomes.
- Every investor should consider climate risk in their risk management wherever there is performance materiality. But not every investor has chosen to be a net-zero investor. The choice to make a net-zero commitment will reflect an individual's or organization's circumstances and investment beliefs.
- Investors and intermediaries following a well-designed net-zero investing strategy can build their resilience to adverse climate outcomes, adhere to fiduciary duty in maximizing risk-adjusted returns, and contribute to a transition to net zero in the real economy.
- In a world with much-increased interconnectivity between economic, social, and environmental systems and systemic risk, *systems thinking* can help frame the issues more broadly and support the investment beliefs required for net-zero investing. If we seek a more sustainable financial system, we need systems change informed by systems thinking.
- All investors should keep a weather eye on the developing nature of net-zero investing, because the arc of progress is unlikely to be smooth and organizational resilience will be tested.

Recommendations for Investment Organizations

1. Build deeper organizational beliefs about climate using systems thinking to explore the likely future scenarios.
2. Grow your understanding of net-zero investing. Develop your strategy to complement your vision.
3. Pay attention to the changing regulatory environment and the governments' commitment to net zero.
4. Develop your collaborative network to support faster learning and more coordinated efforts.
5. Attract talent from diverse fields to build climate investing capability. Develop T-shaped capabilities.

1. INTRODUCTION

This guide provides the global investment community—notably asset managers, asset owners, service providers, and regulators—with research, practitioner insights, and tools to appreciate net-zero investing more fully. It is a resource and roadmap for leaders as they contemplate their net-zero ambitions, emphasizing the strategic importance and operational features of net-zero investing.

This guide focuses on the challenges of incorporating net zero into investment management. By reviewing the industry landscape through three lenses—framing, innovation, and strategy—it articulates the critical need for a mindset shift by investors, policymakers, regulators, and issuers, alongside the development of investment strategies that can contribute to a global state of net zero without compromising risk-adjusted return goals.

This guide is primarily for those investors and organizations that have already committed to various versions of net-zero investing. However, those considering joining this group may find this guide useful to better understand what such a commitment will entail.

Notably, although all investors interviewed for the guide consider climate risk in their investment management strategies, not all choose to pursue net-zero investing. The decision to pursue net-zero investing remains at the discretion of the investor, defining a clear segmentation within the investment landscape.

In summary, this guide provides a framework for understanding and implementing net-zero investing strategies. By combining insights from industry leaders with systematic analysis, it offers practical guidance for investment leaders who are navigating the transition to net-zero investing.

1.1. The Emergence of Net-Zero Investing

Net-zero investing is a set of designated investment strategies, actions, metrics, and methodologies through which investors can contribute to achieving global net-zero emissions, ideally by 2050 or sooner. It is not a simple matter of reducing portfolio emissions by selling high-emitting assets and buying low-emitting assets. It requires a nuanced and holistic approach that considers the real-economy impact of investing in different sectors and companies. An increasing number of asset owners and asset managers are embracing the idea that achieving

We have made huge progress over the last 10–20 years, but if we go at the same pace of progress in the next 10–20 years, we absolutely will not limit global temperature rise to 1.5 degrees.

—David Blood

net zero entails transformative change, requiring new investment strategies that do not compromise risk-adjusted returns.

The concept of “net zero”¹ originated in the 2014 UN Intergovernmental Panel on Climate Change’s (IPCC’s) Fifth Assessment Report, which said, “Concentrations of CO₂ in the atmosphere can only be stabilized if global [net] CO₂ emissions peak and decline toward zero in the long term.”² The 2018 IPCC special report on 1.5°C more pointedly stated, “Limiting temperature rise to around 1.5°C and preventing the worst impacts of climate change implies reaching net-zero emissions of CO₂ by mid-century along with deep reductions in non-CO₂ emissions.”³

Some individuals and organizations in the investment industry took note of these reports, especially those involved with the Institutional Investors Group on Climate Change (IIGCC), the Investor Group on Climate Change (IGCC), the Asia Investor Group on Climate Change (AIGCC), Ceres, the Principles for Responsible Investment (PRI), and CDP (formerly known as the Carbon Disclosure Project), all of which have been working on climate change issues since the 2000s. The tipping point of investment industry awareness, however, only came during the 26th Conference of the Parties (COP26),⁴ held in Glasgow, Scotland, which put a focus on the financial challenges of the net-zero transition and engaging financial-sector participants. The Net-Zero Asset Owner Alliance (NZAOA), Net-Zero Banking Alliance (NZBA), and Net-Zero Insurance Alliance (NZIA), as well as five other coalitions—the most notable of which

We are increasingly aware that the investment community has got a significant role to play. So instead of being rather passive passengers, just along for the ride, we now recognize that we need to step in and influence the environment that we are operating in.

—David Atkin

is the Net Zero Asset Managers (NZAM) initiative—fall under the umbrella of the Glasgow Financial Alliance for Net Zero (GFANZ). These organizations and coalitions, along with numerous climate-minded NGOs, have formed additional coalitions and initiatives, such as the Paris Aligned Asset Owners (PAAO),

¹Global net-zero emissions describe the state where emissions of greenhouse gases resulting from human activities and removals of these gases are in balance over a given period. It is often called simply *net zero*. In some cases, the term *emissions* refers to all greenhouse gases, and in others, it refers only to emissions of carbon dioxide (CO₂). People often use the terms *net-zero emissions*, *carbon neutrality*, and *climate neutrality* with the same meaning. In some cases, however, these terms can have different meanings, with differences mostly reflecting carbon offsets.

²IPCC, *Climate Change 2014: Mitigation of Climate Change* (New York: Cambridge University Press, 2014): 69. www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_full.pdf.

³IPCC, “Special Report: Global Warming of 1.5°C” (2018). www.ipcc.ch/sr15/chapter/spm/.

⁴The Conference of the Parties (COP) is the annual meeting of the parties to the UN Framework Convention on Climate Change (UNFCCC).

the Science Based Target initiative (STBi), the Investor Agenda, and Climate Action 100+.

Over the last three years, three net-zero investing frameworks emerged from three different groups. The most recent versions are as follows:

- *Net Zero Investment Framework (NZIF)*, Version 2.0, published March 2024, produced by IIGCC, Ceres, AIGCC, and IGCC through the Paris Aligned Investment Initiative
- *Financial Sector Science-Based Targets Guidance*, Version 1.1, published August 2022, produced by STBi, whose partners include CDP, the UN Global Compact, the We Mean Business Coalition, the World Resources Institute (WRI), and the World Wide Fund for Nature (WWF)
- *Target-Setting Protocol (TSP)*, fourth edition, published April 2024, produced by the NZAOA, which is convened by the UN Environment Programme Finance Initiative (UNEP FI) and the PRI

Although differences exist among these frameworks, they share at least five common features:

- Portfolio emission reductions over time to net zero
- Increasing share of portfolio companies that are themselves net-zero aligned
- Allocations to finance the companies and technologies essential to the net-zero transition
- Engagement actions and targets to move portfolio companies, especially among higher emitters, to net-zero alignment
- Engagement with policymakers and industry stakeholders to support net-zero alignment and commitments on ensuring aligned lobbying practices

The Investor Agenda—founded by AIGCC, Ceres, CDP, IIGCC, IGCC, the PRI, and UNEP FI—aims to promote harmonization of the three frameworks through its *Investor Climate Action Plans (ICAPs) Expectations Ladder*, issued in July 2023.

Even though climate change is a global problem, we know that the answer so far has not been globally harmonized and that we are seeing very different responses to, and acknowledgements of, the threat.

—Sonja Laud, CFA

The interest in net-zero investing reflects broader trends in asset owner thinking that were identified in the CFA Institute publication “Future State of the Investment Industry”:⁵

⁵Rhodri Preece, Ryan Munson, Roger Urwin, Andres Vinelli, Larry Cao, and Jordan Doyle, “Future State of the Investment Industry,” CFA Institute Research and Policy Center (September 2023). <https://rpc.cfainstitute.org/en/research/reports/2023/future-state-of-the-investment-industry>.

- Taking into account wider stakeholder factors
- Taking more responsibility for sustainability and the impacts of companies through stewardship on top of sustainable capital allocation
- Positively affecting systemic risks rather than accepting them
- Integrating sustainability into investment strategies by aiming to mitigate the negative influence of climate change on the system supporting future returns
- Adopting a mindset of systems thinking

Interest in net-zero investing can also be linked to the broader trend of sustainable investing. The sustainability trend has been an industry feature for more than two decades, with “environmental, social, and governance (ESG)” being the most commonly used term. Although ESG remains an umbrella term to represent a spectrum of related subjects (sustainability, responsible investing, externalities, intangible capital, and values-based investing, among others), the objective of net-zero investing is to create *long-term sustainable value*. Here, “long-term” conveys decades; “sustainable” implies not compromising the long-term returns with undue regard for the short term; and “value” accommodates benefits that can be measured in financial terms as well as those that cannot. As Alex Edmans of London Business School puts it in his paper “Rational Sustainability,” “The goal of investing sustainably is creating long-term sustainable value, not political objectives; it accommodates different definitions of value; it is based on evidence and clear-headed analysis; it sets boundaries rather than thinking that ‘anything goes.’”⁶

1.2. Current Challenges in Net-Zero Investing

Although progress so far has been impressive, we suggest in this guide that enormous work remains to integrate net-zero investing into the investment ecosystem.

We are gradually coming to the realization that a more holistic understanding of fiduciary duty is critical to preserving capital over the long term.

—Hiro Mizuno

Net-zero investing faces many practical challenges in today’s financial landscape, including complex supply chains, transition risk, greenwashing, policy uncertainty, lack of standardization, short-termism, and concerns about financial performance and fiduciary duty.

Another key obstacle is the lack of consistent and reliable carbon

⁶Alex Edmans, “Rational Sustainability,” working paper, London Business School, CEPR, and ECGI (February 2024). <http://dx.doi.org/10.2139/ssrn.4701143>

emissions data. The dearth of accurate data with which to judge the transition pathways of companies makes it more difficult for investors to make informed decisions about which assets truly contribute to net-zero goals.⁷

A key question is, how does an alignment to net zero—which is essentially a climate outcome—sit within a fiduciary framework? NZAOA sets out the commitment for asset owners as follows:

The members of the Alliance commit to transitioning their investment portfolios to net-zero GHG emissions by 2050 consistent with a maximum temperature rise of 1.5°C above pre-industrial temperatures, taking into account the best available scientific knowledge including the findings of the IPCC, and regularly reporting on progress, including establishing intermediate targets every five years in line with Paris Agreement Article 4.9.

In order to enable members to meet their fiduciary duty to manage risks and achieve target returns, this Commitment must be embedded in a holistic ESG approach, incorporating but not limited to climate change, and must emphasize GHG emissions reduction outcomes in the real economy.⁸

One of the trickiest progressions in net-zero investing is the mindset shift. The investment industry continues to make heavy use of narrower theoretical foundations from traditional investment theory, including modern portfolio theory (MPT) and associated theories in which climate-related considerations and systemic risks are not included.

Transformative change can be difficult—even painful—because it often means tackling longstanding

I think the big transformation is a mind shift, . . . knowing that it is transformational.

—Linda-Eling Lee

We still have this significant problem with the tragedy of the horizons with short-term profit pressure, not only for companies but also for fund managers. This is very much a “hearts and minds” issue that we need to tackle.

—Russell Picot

⁷See Andres Vinelli, Deborah Kidd, and Tyler Gellasch, “Climate Data in the Investment Process: Challenges, Resources, and Considerations,” CFA Institute Research and Policy Center (16 April 2024). <https://rpc.cfainstitute.org/en/research/reports/2024/climate-related-data-in-the-investment-process>.

⁸NZAOA Commitment Document for Participating Asset Owners.

and embedded investment industry practices, such as measuring and rewarding investment manager performance against market benchmarks over short-term time horizons. It is crucial to recognize these barriers and formulate new ideas to ensure best results are achieved for all stakeholders.

1.3. Exploring the Future of Net-Zero Investing

Successful outcomes in net-zero investing will require new and innovative thinking, such as setting absolute targets, taking a holistic portfolio management approach, enhancing modeling methods and metrics, and engaging a wide range of decision makers, experts, and stakeholders.

We actually self-organize through lots of different institutions that have very different boundaries of interest. Because of those boundaries of interest, each institution pursues changing the world a different way.

—Duncan Austin

To explore the future of net-zero investing, this guide combines desk-based research, data analysis, and insights from 23 experienced industry leaders gathered through individual interviews. It extensively references contributor comments as amplification, reinforcement, validation, and challenge of its narrative and conclusions. Although these contributions are extremely valuable, all responsibility for content lies with the author.

2. SYSTEMS THINKING: A SET OF SKILLS AND TOOLS AND AN ORGANIZING FRAMEWORK

Systems thinking offers a powerful set of skills and tools and an organizing framework for exploring the future of net-zero investing. In “A Definition of Systems Thinking: A Systems Approach,” Ross Arnold and Jon Wade define *systems thinking* as “a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviours, and devising modifications to them in order to produce desired effects.”⁹ They define a *system* as “a collection of elements that are connected and fulfil a certain purpose or function.” Systems thinking according to Peter Senge’s seminal work¹⁰ is a discipline and a framework for seeing wholes not just the parts, interrelationships rather than things, and patterns of change rather than static snapshots.

Systems thinking involves three principles. The first principle is that there is no single system; there are multiple systems of which we are a part. These systems overlap and have a hierarchy, and some systems contain other systems. The second principle is that each system has its elements, its purpose or function, and, often, associated goals. The elements in the systems and the systems themselves are linked through various interconnections, some of which are intended and some of which are not. The third principle is that systems are always changing; they add new elements, lose old elements, change their interconnections, and evolve different functions. These systems are always adapting to changing circumstances and are referred to as *complex adaptive systems*.

Systems thinking develops a view of the wider ecosystem within which the investor’s system resides. This view reflects reality more closely than the traditional framing in investment theory. Better decisions result from a clearer view of reality.

We need to see the societal implications of capital being allocated against the backdrop of income inequality, wealth inequality, environmental degradation, and greater transparency into the operations of money. This lineup of connected factors makes things really complicated; it needs a systems thinking approach to process it.

—Margaret Franklin, CFA

⁹R. D. Arnold and J. P. Wade, “A Definition of Systems Thinking: A Systems Approach,” *Procedia Computer Science* 44 (2015): 669–78. <https://doi.org/10.1016/j.procs.2015.03.050>.

¹⁰Peter Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York: Doubleday, 2006).

There are several reasons why systems thinking is particularly suited to addressing the challenges of net-zero investing. One is that systems thinking allows for the balancing of multiple objectives. Fiduciary duty requires intermediaries to balance risks and returns securely and affordably for investors. But at least in some parts of the world, the definition of fiduciary duty is evolving to incorporate “sustainably” and sometimes “net positively” or “systemically.”¹¹ The addition of “sustainably” to fiduciary duty ensures that current actions do not diminish outcomes in the longer term and align with producing intergenerational equity.

Investment theory as practiced over the last 50 years or so was fitted to a narrower framing of the investment challenge, as expressed in only risk-and-return terms. The more holistic view of the investment challenge that has emerged in recent years suggests the need for the bigger framework contained in systems thinking. This more expansive thinking has a critical place

in the widening field of investing, where investment goals have compounded. This approach is particularly important in net-zero investing, where both the aim to achieve climate goals and the investors’ reliance on climate stability need to be considered.

My view is that systems level investing includes lobbying the government for appropriate policy.

—Jon Lukomnik

Another reason systems thinking is useful is that it can explain how complex, dynamic, and unexpected

behaviors arise from what appear to be simple rules governing the behavior of individual elements or the interactions among them.

In particular, systems thinking recognizes balancing and reinforcing feedback loops. A reinforcing loop encourages the system to continue in its current direction. Balancing loops encourage the system to stay in balance.

These so-called archetypes avoid introducing oversimplifications that are typically generated by overly theoretical models. Viewing the whole ecosystem and its subsystems more closely reveals the complexity of the financial sector and the challenge in accomplishing the goal of net zero to stabilize the system. To improve performance of a system, it is usually necessary to understand its behavior.

¹¹The use of “systemically” denotes having regard to the multiple systems that are relevant to the investment ecosystem, including social, technological, economic, environmental, political, legal, and ethical systems; the mnemonic for these systems is “STEEPLE.” The “net positive” concept is one that aims to create more positive impacts than negative ones on the environment or society. See, for example, “The Net Positive Manifesto” at <https://hbr.org/2021/09/the-net-positive-manifesto>.

Furthermore, systems thinking plays an important part in universal ownership theory (also referred to as systems-level investing or 3D investing).¹² On top of mainstream investing strategies in allocation and stewardship of assets, this type of investing adds an additional layer of stewardship that is systemic. That is, it aims to mitigate systemic risks.

A final reason to adopt systems thinking is the practical tools it provides for analyzing problems and implementing solutions, such as the use of the following:

- System patterns (archetypes):¹³ Using common patterns in systems to understand what is happening now and to prepare for what might happen in the future, especially when we cannot rely on past experiences to predict what is to come
- Systemic risk models:¹⁴ Using models and scenarios that consider risks affecting entire systems, which is very helpful in managing risks and helps assess how much overall market risk is influenced by these sources
- Systems leadership models:¹⁵ Using leadership models that see problems as shared systems-related challenges, approach them with a holistic and longer-term perspective, and encourage teamwork and cooperation to find solutions

There is a vital need for us to educate and equip our young talent with a proper understanding of not only how the system functions today but also where the system may progress to over the next 30–40 years with multiple overlapping spheres of activity. And this is not simply a financial systems question.

—Russell Picot

Because of the investment ecosystem's complexity, looking at net-zero investing across all factors at once runs the risk of creating confusion; there are too many moving parts to do this satisfactorily. Thus, in the following sections, this guide separates

¹²Systems-level investing is the term used by two universal ownership initiatives—the Investment Integration Project and the Shareholder Commons. There is also increasing use of the term "3D investing," where 3D references the balancing of the three dimensions of risk, return, and real-world impact; for more details, go to the Thinking Ahead Institute's website (www.thinkingaheadinstitute.org).

¹³Systems archetypes are covered in detail in Donella Meadows's work in the book *Thinking in Systems: A Primer*, edited by Diana Wright (White River Junction, VT: Chelsea Green Publishing, 2008). The resources of systems are also described in more detail in the Donella Meadows Project Academy for Systems Change.

¹⁴The climate models area is discussed in Sandy Trust, Sanjay Joshi, Tim Lenton, and Jack Oliver, "The Emperor's New Climate Scenarios: Limitations and Assumptions of Commonly Used Climate-Change Scenarios in Financial Services," Institute and Faculty of Actuaries, University of Exeter (July 2023). https://actuaries.org.uk/media/qeydewmk/the-emperor-s-new-climate-scenarios_ifoa_23.pdf.

¹⁵Systems leadership is covered by Peter Senge, in particular in Peter Senge, Hal Hamilton, and John Kania, "The Dawn of System Leadership," *Stanford Social Innovation Review* (Winter 2015). https://ssir.org/articles/entry/the_dawn_of_system_leadership.

investment organizations and their net-zero ambitions into sub-systems or “models”: the systems model, the business model, the investment model, the operating model, and the people model. Viewing the investment ecosystem through these models enables us to study the issues at the highest level, concentrate our attention on understandable and usable chunks, and focus on best practice principles.¹⁶

Furthermore, the current state of each model may be assessed, and suggestions may be made to progress the model to a state more consistent with net-zero trajectory goals. Each model section concludes with possible future pathways for the model. The current immaturity of practice in net-zero investing is captured in the “Shift from” column in Exhibits 1–5, with an appropriate direction of travel and normative improvement presented in the “Shift to” column.

¹⁶For a similar approach to breaking down the complex asset owner challenge (in this case with respect to transformational change) into distinct models that can be analyzed more easily than tackling the whole challenge in one go, see Thinking Ahead Institute, “An Agenda for Change” (2022). www.thinkingaheadinstitute.org/research-papers/an-agenda-for-change/. This way of approaching a problem is referred to in systems theory as the use of mental models to compress the system into practical chunks.

3. WHERE DOES NET-ZERO INVESTING FIT INTO MAINSTREAM INVESTING?

3.1. Net-Zero Investing as Part of the “Right-Sizing” of the Sustainability Ambition

Sustainability ambition is when an investor decides on the scale and scope of its commitment to pursue sustainability goals that may be motivated by both financial and nonfinancial factors. In setting this commitment, investors must balance multiple considerations to determine the “right size” of commitment. In settling on this right size of climate risk influence on the investment strategy, investors should reflect on opportunities for them to contribute to climate mitigation and adaptation.¹⁷

With climate factors generally, the right size of the sustainability commitment will be a “Goldilocks style” choice—not overemphasizing climate factors and compromising returns and not underemphasizing climate factors and missing opportunities to create value.

The adoption to date of asset owners making net-zero investing commitments has varied across different regions. Net-zero thinking and adoption has been more prevalent in Europe and less prevalent in the United States.

This situation reflects differences of mindset in which Europe has had more cultural support for the trend to emphasize wider stakeholder interests, whereas this cultural trend is more nascent in the United States, where shareholder capitalism principles remain stronger.¹⁸ It is reasonable to expect some differences of this type to continue to apply and affect the ultimate size of the net-zero investing market.

Climate factors must be balanced with other sustainable factors, which may have both financial and nonfinancial relevance and materiality. Considerations

A growing number of asset owners secure their beneficiaries/constituencies’ input when deciding on their sustainability ambitions.

—Claudia Kruse

¹⁷IPCC in its “Sixth Assessment Report,” issued in 2021, said, “Since systematic scientific assessments began in the 1970s, the influence of human activities on the warming of the climate system has evolved from theory to established fact” (www.ipcc.ch/assessment-report/ar6/). This statement establishes the dependency of the climate on investors’ actions. Similar rigorous analysis should establish the dependency of investor returns on the climate, discussed later.

¹⁸In the Thinking Ahead Institute Asset Owner 100 (the largest 100 asset owners in the world at the end of 2022), net-zero pledges have been made by a total of

- 22 out of 43 US asset owners,
- 12 out of 13 European asset owners, and
- 17 out of 44 asset owners in the rest of the world.

such as biodiversity, nature loss, inequality, and human rights all compete for investor attention.

To address society's big challenges (including climate change and a just transition, societal inequality, and various other controversial issues), investors should recognize the potential in—but limits to—their sphere of influence and agency. This key sense of realism and pragmatism is conveyed in the Theodore Roosevelt quote, "Do what you can, with what you've got, where you are."

The finance sector is a critical industry at the heart of societal influence because virtually all economic activity starts with finance. The sector has the scale and influence to influence society and the environment more than most other sectors, but there are significant limits to its influence related to climate. To address the climate change challenge, the combined power and influence of government, industry, finance, and civil society must be drawn upon, with governments occupying the biggest seat of influence.

But regulation, in the end, is a public policy function, and therefore it is attached to the political process ultimately, and the strength of it will reflect, to some degree, the political priorities of a given government.

—Catherine Howarth

The approach is engaging for the world as you wish it to be, while investing for the world as it is.

—Tom Gosling

The power of the investment industry has potential in this combination because of its connections with civil society (through democratized finance), industry (through enlightened allocation and ownership), and governments (through effective regulation). Also, investors are often global practitioners, which suggests they are relatively well-placed to mitigate problems that are global in their span.¹⁹

It is important, however, that finance does not overstate its role with climate change.²⁰ Clearly, the full extent of the sector's influence would not solve the climate problem on its own.

¹⁹We can visualize the four sources of influence and power as a "4321 pin code" in a thought experiment that identifies and accounts for the units of power needed to address climate change at speed and scale. Governments and policymakers have four units of power, corporations three units, the finance sector two units, and people one unit. But the soft power of finance may have the potential to punch above its weight through combinations. The finance sector's two units can be multiplied by combining with people (through democratized finance), with corporations (through enlightened ownership), and with policymakers (through empowering regulation).

²⁰The majority of carbon emissions in the global economy are outside the investment industry's reach because they fall within the government sector or within the influence of the household sector.

3.2. The Industry Will Need the Support of Enablers in Its Transition

As with any other new field of study or practice, the new field of net-zero investing requires the right mindset, encouragement, and supportive systems. The supportive factors include both external conditions affecting the financial sector (e.g., regulations, policies, standards, and industry norms) and internal factors within institutions and among decision makers (e.g., their ways of thinking, beliefs, values, and biases).

The relationship between investors and governments manifests through regulation. The ideal state for investors encompasses a middle ground in which both parties are satisfied with the regulatory environment—a state that is not impossible but difficult to achieve. Striking a balance between risks and supported opportunities is critical to effective regulation. How well is that balance being implemented in net-zero investing? Given that there are individual country or regional blocks to regulation and little in the way of global policies or global convergence, the question is more one of how regulation evolves in the future. Regional alignment, for example, would be a desirable future state.

The absence of these effective enablers creates blocks to the net-zero transition. One resonant example of a current block is the hurdle that benchmarks, incentives, and short time horizons play in misaligning present investment processes and actions with achieving long-term investment goals. Today's current practices that measure and incentivize investment manager performance against market benchmarks over short-term time horizons do not support the building of long-term, climate-resilient portfolios. There are ways to overcome these hurdles with strategies that are aligned with goals rather than dependent on benchmarks and that are holistically and total-portfolio oriented. This idea is developed later in this guide.

I think what has been missing from the investor community is a realistic and honest discussion differentiating between decisions that impact financial risks within a portfolio and decisions that may also contribute to outcomes in the real world. This is foundational to surfacing constraints.

—Alison Tarditi

There is a balance on how much you want to incentivize the market to grow versus how much risk you want to control. I think in the OECD market, there is a bit too much regulation against the risks.

—Ma Jun

4. SUMMARY OF ISSUES

In the following sections, we explore net-zero investing through the five models: the systems model, business model, investment model, operating model, and people model.

In this framework, research can suggest potential answers to the following difficult challenges.

Framing Issues

- Developing a consistent language and set of terms to position net-zero investing as a particular subset of sustainable investing
- Right-sizing the net-zero commitment alongside other sustainability goals and within fiduciary duty (currently, fiduciaries must only realize win-win financial opportunities without concessions)
- Developing the positioning of investors' role vis-à-vis governments in the net-zero transition, where at times governments lead investors and at times investors lead governments
- Adopting a change of mindset in which systems thinking is a positive contributor to the framing of net-zero investing

It is about getting people to go beyond passion alone and bring their intellect and procedural set of thinking along with applying fiduciary duty.

—Elizabeth Corley

Innovation Issues

- Overcoming the blocks in the system that arise from a poorly aligned measurement and incentive model that reinforces short-termism
- Aligning management, measurement, and reporting in the net-zero field by joining up the soft and hard data that support the area using balanced-scorecard methods
- Helping ensure that net-zero investing is practiced across the total portfolio, respecting the distinct differences among asset class grouping—equities, credit, sovereigns, private equity, infrastructure, real estate, and so on
- Introducing universal ownership strategies into the net-zero investing toolbox that encompass systemic stewardship, climate solution investing in primary capital, and strategic tilting to reflect net-zero pathways and adapt to externalities becoming internalized over time

Strategy Issues

- Working coherently alongside government policy and action on net-zero implementation pathways
- Developing appropriate forms of collaboration, including actions through coalition organizations, and developing the coalitions and alignments within the organization
- Building a shared and joined-up vision about the values, goals, and strategies to make the net-zero investing story resonate: What vision do we have for the future of net-zero investing with respect to our own organizations, the investment industry, and the world ecosystem?

5. THE SYSTEMS MODEL

5.1. Assessing and Addressing Climate Risks

As noted earlier, net-zero investing—through a suite of investment strategies, tools, actions, metrics, and methodologies—aims to contribute to achieving a net-zero world and the mitigation of climate change risk. To determine how to achieve this ambitious aim, we begin by addressing the current state of understanding in the industry about climate change and climate risk.

Unlike with most other risks, we have very limited past data on climate risk.

Climate risk is a financial risk that is uncertain, pervasive, interconnected, and nonlinear, with little past and a very long future. These factors make it relatively intractable and very different from the normal risks assumed in traditional finance, where we expect past patterns to at least rhyme with future ones. The pervasiveness of climate risk makes it a systemic risk for all portfolios, and no hedging instruments exist that can adequately address it.

People are concerned about what the future looks like. . . . We need a sustainable economy to generate sustainable returns, and business as usual is not getting us there. You need to be a future maker to safeguard your long-term returns.

—Jane Ambachtsheer

When Ceres brought in the GRI [Global Reporting Initiative] in the early 2000s, it was an effort to widen the systemic scope of reporting. One cannot look at climate without considering water or equity. And water is the lifeblood; people and businesses have no future without water. I don't think we've learnt yet about how to look at the whole connected system.

—Mindy Lubber

The consequences of not acting on climate change are serious, and yet the advantages of taking action are difficult to quantify. Various biases and motivations influence decision making, and no global authority exists to address this global issue. We require innovative ideas and tools to tackle this challenge, but we must acknowledge the complexity of solving this problem.

The fact that the Earth's climate is a hugely significant system in its own right suggests it needs a systems lens to understand it.

Research on the climate system suggests a wide spectrum of possible outcomes for the future climate and environment.

The research is clear²¹ that the climate is sensitive to greenhouse gas accumulation and will respond most to the policy interventions of governments worldwide. One further significant consideration is introduced by climate tipping points.²² The triggering of certain tipping points will severely damage our planet's life-support systems and threaten the stability of our societies. There is a concern that climate change can accelerate that threat.

Our economic system has co-dependencies with the climate system. Various models have been used to connect climate scenarios to economic scenarios and financial outcomes, and these models' projected outcomes unsurprisingly also range across a spectrum. A reasonably central scenario is that climate transition risks and physical risks will negatively affect the economic system, leading to impaired growth and higher inflation that is likely to harm investment returns. Considerable modeling has been undertaken but with some degree of challenge with respect to both the reliability and interpretation of the results.²³

One of the key enablers to successful outcomes in the net-zero investing field will be for investors to develop more sophisticated, accurate, and useful modeling methods and metrics. And it is vital that key decision makers, experts, and other key stakeholders increase their engagement substantially on these critical inputs, with interdisciplinary engagement helping to ensure recognition of further interdependencies.

These interdependences are relatively tightly coupled between climate risks and certain other systemic risks—notably water and food security, biodiversity, and other forms of environmental degradation. Considering the climate system singly may be important for certain measurement and reporting purposes, but it is crucial to recognize that our broader understanding depends on placing the climate in a wider biophysical system in which the atmosphere, water, and living matter coexist.

5.2. The Policy Gap

The current policy approaches applied to the investment industry appear to be impeding the net-zero energy transition on the scale required to achieve net zero. This situation is often referred to as the "policy gap." The policy gap accounts for the difference between what is needed to transition to net zero in 2050 and what is actually happening,

We've not really grappled with the fact that these transitions are going to be costly, and that is going to lead to political pushbacks—and in both directions: those demanding a faster policy response and those against.

—Will Martindale

²¹See IPCC, "Sixth Assessment Report" (9 August 2021). www.ipcc.ch/assessment-report/ar6/.

²²The triggering of certain tipping points will severely damage our planet's life-support systems and threaten the stability of our societies. See the University of Exeter Global Systems Institute, "Global Tipping Points" (2023). <https://global-tipping-points.org/>.

²³See Trust et al., "The Emperor's New Climate Scenarios."

where currently average annual renewable energy additions are 3 times less than required for solar and two times less for wind.²⁴ According to research from NZAOA,²⁵ “As companies take steps to decarbonise and start to move up the ever-steepening cost curves, investor requests for additional emission reductions are met with increasing resistance. Companies at some point will inevitably hit a boundary where they can no longer justify going further.”

This gap also highlights such issues as technology limitations, economic challenges, lack of incentives, and gaps in policy frameworks.

Deeper policy fixes are needed, but the specific tension here is that for policy strategies to be effective at the rate required for net-zero pathways up to 2050, there may need to be a period of lower global GDP growth. Policy measures may have to be demand reducing and explicitly curtail certain market behaviors.²⁶

It is only government, as an extra-market institution, that can force the internalization of negative market externalities to move markets towards the completeness that is their claim.

—Duncan Austin

Alternative models inevitably rely on governments adopting much more significant policy interventions to the net-zero transition, very probably including a much stronger carbon pricing framework. However, policy responses have been well off the pace required for a 2050 net-zero target. Political tussles on this subject will surely continue.

The corollary to delayed action is that the sum of increased volatility, negative productivity impacts, lower corporate profitability, and some

sustained inflationary pressures could well add up to lower market returns over the next one to two decades.

5.3. Asset Owners

As with any system, we should consider the opportunities and limits of any individual entity. This raises a resonant question: What is the right-sized contribution of the investment industry and individual investors²⁷ to sustainability in general and a net-zero goal specifically? At one end of the

²⁴See LGIM, “Net Zero 2050: More Affordable than Ever, If We Act Now” (29 March 2023) <https://blog.lgim.com/categories/esg-and-long-term-themes/net-zero-2050-more-affordable-than-ever-if-we-act-now/>.

²⁵NZAOA, “The Future of Investor Engagement: A Call for Systematic Stewardship to Address Systemic Climate Risk” (April 2022). www.unepfi.org/wordpress/wp-content/uploads/2022/03/NZAOA_The-future-of-investor-engagement.pdf.

²⁶This issue overlaps with the concepts of “degrowth.” See *Financial Times*, “‘Degrowth’ Starts to Move in from Europe’s Policy Fringes” (30 May 2023). <https://www.ft.com/content/e2f96618-081f-41de-b7a0-a682017c8d11>.

²⁷“Right-sizing” refers to balancing the trade-offs of doing too much in sustainability (and not aligning with financial goals) or doing too little (and missing financial opportunities and other, nonfinancial considerations).

spectrum will be those who do the minimum that law or regulation demands. At the other end will be the universal owners that seek to work on the more ambitious goal of contributing to the wider system (social, environmental, and economic) to support better long-term performance.

Asset owners have a fiduciary responsibility to manage other people's money. In most jurisdictions, this responsibility is interpreted to mean that financial factors should take primacy. And although other, nonfinancial factors can be legitimate considerations and goals, they should not produce any concession in the risk-return balance. Essentially, this means that nonfinancial goals should not be considered as an ultimate end, but they can play a role in the system as a means to the primary (financial) end as well as a legitimate ancillary goal.²⁸

5.4. Universal Owners

This discussion on goal setting introduces a different branch of investment theory called universal ownership. Although this theory is relatively lightly covered in investment texts, the earliest ideas on universal ownership date back two decades.²⁹

The principal arguments involve an alternative mindset by large asset owners, whose portfolios own a slice of the world market and with it, a slice of the world economy. Issues such as climate change and social disruption caused by inequality pose long-term systemic risks that could ultimately determine a significant proportion of a fund's performance. Importantly, these risks cannot be hedged away through traditional portfolio diversification.

The universal ownership strategy considers company externalities on a portfolio-wide basis and how these contribute to system-wide risks

Many open defined benefit and defined contribution schemes and sovereign wealth funds have a long-term investment horizon, and their investment returns will be significantly influenced by market performance. This long-term performance is likely to be influenced by a number of systemic risks, potentially quite significantly. The industry is in the foothills of really getting to grips with this.

—Russell Picot

²⁸Freshfields refers to this in its "A Legal Framework for Impact" research in partnership with the PRI (see www.freshfields.us/insights/campaigns/a-legal-framework-for-impact/). The work looks at investing for sustainability impact (FSI) and distinguishes between strategies that are instrumental to improving financial outcomes, where fiduciary duty is supportive, and strategies that have nonfinancial factors as ultimate ends in their own right, where fiduciary duty is generally unsupportive.

²⁹See James P. Hawley and Andrew T. Williams, *The Rise of Fiduciary Capitalism: How Institutional Investors Can Make Corporate America More Democratic* (Philadelphia: University of Pennsylvania Press, 2000); Roger Urwin, "Pension Funds as Universal Owners: Opportunity Beckons and Leadership Calls," *Rotman International Journal of Pension Management* 4 (2011): 26–33; and Ellen Quigley, "Universal Ownership in Practice: A Practical Investment Framework for Asset Owners" (2020), available at <http://dx.doi.org/10.2139/ssrn.3638217>.

and costs. The universal owner's mindset considers these risks at the whole-fund level, and they are managed at that level. This universal investor can use sustainability impact strategies to reduce the current and future hidden costs of external factors by focusing on improving parts of the investment system that contribute to generating returns.

This thinking aligns with fiduciary duty, as the sustainability impact is instrumental to achieving the best risk-adjusted returns. We should acknowledge, however, that fiduciary duty varies by jurisdiction and can even be interpreted differently within a single jurisdiction. For example, the Employee Retirement Income Security Act (ERISA) fiduciary standard in the United States is particularly stringent in requiring fiduciaries "to act solely in the interest of participants and beneficiaries" and "for the exclusive purpose" of providing financial benefits to them. More commonly, standards call for best interests or best financial interests.

Fiduciary duty is a dynamic concept that should take into account the long-term interests of the beneficiaries and the system. It must deal with the challenges of balancing the interests of different stakeholders and the trade-offs involved. This will require evolution. Universal ownership has a future within this evolution.

—Will Martindale

The returns that funds need can only come from a viable financial system, and funds can help secure that outcome of the system through achieving certain real-world outcomes, like through net zero.

—Jon Lukomnik

Universal owner thinking shifts the investment approach to a systems-led approach. In particular, universal owners emphasize systemic stewardship in which engagement on public policy aims to improve the system that supports future returns.

Asset owners occupy a particularly influential place in the investment industry because of their position in the value chain closest to end investors. By contrast, asset managers are agents in the value chain and must align with their clients' mandates and preferences. This dependency suggests that asset managers generally do not have the same incentives to pursue nonfinancial motivations relative to asset owners. But they should be able to apply universal ownership thinking because it has a primary financial goal.

Leading asset owners view universal ownership as a concept that is still in its infancy but an investment approach whose time may be coming. There is certainly recent movement toward this mindset

among large asset owners.³⁰ Also, some asset managers are applying this thinking in their stewardship work and, to an extent, in investing in climate solutions.

5.5. Governments, Regulators, and NGOs

Governments, regulators, and NGOs are all significant investor stakeholders that play a crucial and growing part in the investment ecosystem. Their roles are distinct but overlapping.

Governments are responsible for the policy issues in investments (e.g., pension and sustainability policy), high-level laws, and fiscal oversight. Governments have a significant role in sustainable finance, particularly where some of the finance models are public-private partnerships. Here government will have the key role of scaling up the key transition finance models by building the finance industry's capacity.

Regulators exercise asset owner and asset manager oversight through rules and principles. Investor-relevant NGOs, including intergovernmental organizations such as the World Bank, the PRI, GFANZ, and Climate Action 100+ (an investor-led initiative to ensure the world's largest corporate greenhouse gas emitters take necessary action on climate change), have specific roles to play in supporting a healthy ecosystem and helping individual participants execute on their respective missions.

Laws and regulations are generally held to a standard of improving the system net of all consequences, but unintended consequences grow in significance as complexity increases. Industry regulation of sustainability may be preventing productive actions from occurring at the desirable pace, not least because different regional

Capacity building is the key to helping global sustainability. There has been a consensus in the G20 discussions over the last couple of years that the G20 should mobilize and support efforts for capacity building in sustainable finance.

—Ma Jun

There are 250 taxonomies in the world. About 30 of them were drafted by the regulators, and the other 220 or so were drafted by the private sector, either an institution or an industrial association. Most of these are not official, and they are competing for recognition by the private sector.

—Ma Jun

³⁰A total of 65% of the asset owners in a recent study (large global pension funds and sovereign wealth funds with total assets under management above \$40 billion) self-declared as universal owners; see Thinking Ahead Institute, "Global Asset Owner Peer Study" (2024). www.thinkingaheadinstitute.org/content/uploads/2024/03/FF-TAI_AOPS24_Summit-Showdeck_Website.pdf.

jurisdictions have not converged—which results in a costly overhead for the global industry.

Regional differences are particularly evident when considering standards and taxonomies. There are numerous definitions of sustainability categories and standards of practice, which often compete against each other for recognition. Because the net-zero investing field is immature, convergence in standards and taxonomies is likely over time.

Notwithstanding this burden, net-zero investing has so far developed within certain voluntary and largely self-regulated guardrails, with NGOs providing the guidance on good practice. Carbon metrics and climate mitigation action disclosures have become regulated, but beyond this, investment industry organizations have been able to decide the right sizes of net-zero investing on their merits. ESG factors in investing, which are further forward in the maturity cycle, have received more regulatory attention. It is quite possible that this trend will catch up with net-zero investing as it matures.

In the meantime, NGOs are making significant contributions to net-zero investing. The PRI, GFANZ, SBTi, Climate Action 100+, and ICGN are large transnational influencers, with dozens more NGOs supporting net-zero investing.

5.6. Examples of Systems Thinking Being Used in Sustainability and Net-Zero Investing

Using Systems Thinking to Help Prevent Negative Patterns or Cycles Developing

Example of Coalition Stewardship—Sector Level

In light of the tragic collapse of a Vale dam in Brazil in 2019, a \$1.3 trillion coalition of asset owners, led by the Church of England Pensions Board, along with Church Commissioners for England and the Swedish National Pension Funds Council on Ethics, collaborated to demand stringent safety policies in the mining industry. This coalition proposed a new global safety classification system independent of companies, focusing on ensuring the security of mining companies' tailings dams—structures that contain hazardous byproducts from mining operations. The coalition's efforts to improve mining industry safety standards were successful, exemplifying the power of collaborative stewardship and demonstrating how investors can achieve significant progress through collective action.

Adam Matthews from the Church of England Pensions Board summarized it as follows: "The collective realization that waste has been managed as an externality was alarming, and despite the good practice that existed within

some companies, this was a sector-wide systemic challenge that needed serious focus from investors.”

Although this Vale dam example is not directly in the sphere of net-zero investing, the Climate Action 100+ initiatives on methane flares offer a direct example.³¹

Using Systemic Risk Models and Systemic Risk Scenarios to Develop More Resilient Strategies

Example of Climate Modeling and Scenarios

The “No Time To Lose”³² report released by the Universities Superannuation Scheme and the University of Exeter outlines four new climate scenarios that “better reflect the real-world risks and opportunities that frame investment decision-making over the short and medium term,” such as extreme weather, geopolitics, financial markets, and technology. The new scenarios range from optimistic, with politics and economics working in harmony to drive rapid decarbonization, to pessimistic, wherein a toxic political climate compounded by dysfunctional markets frustrates progress. The report notes that the industry had a “false sense of security” with current climate scenario analysis. It calls for a “radical and urgent shift” in the way these analyses are conducted.

Other research has pointed to the limitations of existing models and the likelihood that most models have been underestimating risks. Systems thinking should help bridge the gap between economic models and climate models.³³

Using Systems Leadership Models to Improve Outcomes

Example of Coalition Stewardship—Invested Company

Engine No. 1, an activist hedge fund, successfully campaigned in 2022 to replace two of ExxonMobil’s directors with those that have experience in climate transition. This coalition-building approach was joined by a number of influential asset owners, including the California State Teachers’ Retirement System (CalSTRS), Church Commissioners for England, and New York State Common Retirement Fund.

³¹PRI, “An Investor’s Guide to Methane: Engaging with Oil and Gas Companies to Manage a Rising Risk” (1 February 2017). www.unpri.org/environmental-issues/an-investors-guide-to-methane-engaging-with-oil-and-gas-companies-to-manage-a-rising-risk/576.article.

³²A. Morrison, “USS and University of Exeter Develop New Climate Scenarios to Help Tackle Climate Change,” University of Exeter (7 September 2023). <https://news.exeter.ac.uk/faculty-of-environment-science-and-economy/uss-and-university-of-exeter-develop-new-climate-scenarios-to-help-tackle-climate-change/>.

³³Nicola Ranger of the Environmental Change Institute described it this way: “We’ve long known that integrated assessment models do a poor job at representing the wide-ranging implications of climate change and severely underestimate the risks. Yet, in the past few years, we’ve seen these become a mainstay in financial scenario analysis for climate change analysis.”

The success of Engine No. 1’s campaign demonstrates the power of collaborative engagement in influencing corporate behavior and highlights the growing influence of activist investors.

5.7. Future Pathways for the Systems Model

The change required for the success of net-zero adoption at the industry level is identified in **Exhibit 1**. The current immaturity of net-zero investing practice is captured in the “Shift from” column. An appropriate direction of travel and normative improvement is presented in the “Shift to” column.

Exhibit 1. Systems Model: Summary of Present and Desirable Future Position

	Shift from: Industry Current Position	Shift to: Industry Desirable Future Position
The value in systems thinking	Systems thinking in the industry is limited, uneven, and relatively shallow and is absent in professional curricula and practice	→ Systems thinking is prevalent, consistent, often deep, and supported by professional curricula and accreditation
The difficult features of managing climate risks	Climate change has intractable features that make understanding the issues problematic Investment stakeholders are essentially “takers” of the future climate outcome	→ Climate change becomes more widely recognized and modeled, making the issues better understood Investment stakeholders are essentially “takers” of the future climate outcome, but they have been “makers” as <i>contributors</i> to climate mitigation
The policy gap	The energy transition moves too slowly for a net-zero 2050 trajectory Blockages arise from various mindset, incentive, scientific, and bottleneck challenges	→ The energy transition accelerates and comes to align with net-zero 2050 Blockages are gradually diminished and produce more deliberate and coordinated movement in the net-zero transition
Asset owners and universal owners	Very limited universal owner adoption—predominantly large asset owners	→ Broad adoption of universal ownership strategies across asset owners and asset managers
Regulators	Regulations in the net-zero area carry mixed impacts Compliance is taxing on time and energy, limiting more productive action elsewhere	→ Regulation on net zero guides a more robust and resilient investment industry Regulations are globally harmonized and are effective

6. THE BUSINESS MODEL

6.1. Fiduciary Responsibility

Fiduciary responsibility is a longstanding concept that essentially requires institutional investors to work for the end investor's best interests.

Fiduciary Duty

There is no single globally consistent interpretation of fiduciary duty, but most versions include the following:

- *Loyalty*: acting in accordance with the specific power of investment by putting the interests of beneficiaries first and avoiding conflicts of interest
- *Prudence and care*: investing prudently, exercising good judgment and reasonable care, diversifying according to accepted investment theory

The issue has a complicated history, with national differences playing a significant role in the varying approaches among asset owners—which themselves vary across pensions, insurance companies, and other investor types. The complexity is highlighted in Freshfields' research on "A Legal Framework for Impact," which examines fiduciary duty in 10 different countries.

In the context of ESG and sustainability issues, there is a range of investor behaviors and policies that are considered appropriate. The "fiduciary window" concept is helpful in this discussion. The fiduciary window captures the set of investment policies acceptable from a fiduciary duty perspective, given current interpretations. The fiduciary window—in capturing acceptable financial and nonfinancial guardrails for pension investing practice—mirrors the Overton window,³⁴ which does something similar in political practice.

Investors should not have the responsibility of replacing the government. You need policy and regulation to drive the system changes. There is a virtuous circle to be fostered by investors who, while delivering our fiduciary duties, can help manage those systemic risks, but ultimately you cannot step into the role that governments need to play.

—Daisy Streatfeild

³⁴According to the Mackinac Center for Public Policy, the Overton window is the range of policies politically acceptable to the mainstream population at a point in time, which is shaped by ideas, social movements, and shared norms and values within society.

We currently have a fiduciary window that is dominated by financial considerations but allows a light touch to nonfinancial factors, provided there is essentially no concession in the risk-adjusted return. This window is not fixed and can change over time. Although the window aligns with current regulations and laws, it is open to interpretation and can adapt as practices evolve.

A key factor in the business model is the tightness of the fiduciary constraints tying the investor to financial goals. Considering the financial impact of ESG risks and opportunities on investments, simply integrating consideration of ESG issues into investment practices and processes of listed markets is within fiduciary duty but only mildly helpful in producing sustainability impacts. Fiduciary duty requires consideration of how material sustainability issues may affect investment performance but not how the investment decision affects sustainability issues.

The key question is whether fiduciary duty is a constraint with respect to net-zero investing. Data from the Thinking Ahead Institute (TAI) Peer Study³⁵ suggest that in some cases it is. The majority of funds in the study with no net-zero commitment explained their reasoning in terms of not being reconciled with fiduciary duty.

Finally, net zero is a matter of government policy in most countries. Governments may, in due course, provide a safe harbor for net-zero commitments.³⁶

At present, however, fiduciary duty is a hindrance to many funds in adopting and implementing net-zero commitments and strategies.

6.2. The Asset Owner Business Model

So, I think we've got to start with the end investors and the duties of the asset owner. Then that shows up in the mandates for the managers who don't independently have a role separate from being servants to the fiduciary duty of the asset owners.

—Anne Simpson

An investor's business model includes why the organization exists (its purpose), which is reflected in its motivations and goals, as well as how it achieves those goals through its strategy, considering its fiduciary duties. Congruence among strategy, motivations, and goals is achieved when there are opportunities to provide value to customers and stakeholders while leveraging the organization's resources and strengths effectively.

³⁵TAI, "Global Asset Owner Peer Study" (2024).

³⁶A safe harbor is a legal provision to sidestep or eliminate legal or regulatory liability in certain situations, provided that certain conditions are met.

As noted earlier, asset owners are prime actors in net-zero investing because they have the fiduciary investment responsibility for the *end investors*. Asset managers, by contrast, tend to reflect net-zero opportunities via the investment mandates provided by their asset owner *clients* and so are unlikely to be as influential when it comes to sustainability.

Each asset owner will evaluate the capacity to develop the sustainability ambitions in their business model as shaped by their motivations and characteristics. Asset owners must balance their motivations for producing particular impacts. There are two distinct categories of asset owners with respect to net-zero motivation: those motivated to pursue sustainability impact such as net zero as an opportunity to improve financial outcomes and those motivated to attain net zero as a goal in its own right.

Most asset owners fall into the first category. Indeed, most of these investors—pension funds in particular—bear a fiduciary responsibility to produce the highest risk-adjusted returns without any concession to return that might be introduced by the additional goal of investing for sustainability impact.³⁷ This statement does not suggest that asset owners do not have nonfinancial motivations. It simply indicates that those motivations do not have primacy.

When building their business model, asset owners should think about their sustainability goals and how committed they are to achieving them. This process involves considering the organization's mindset and skill set and assessing how much value they can add to sustainable opportunities—how feasible the opportunity is for investment. This concept can be seen as a form of right-sizing—that is, setting a sustainability commitment that is not too large to compromise legitimacy and fiduciary limits and not too small to miss the opportunity for creating financial and nonfinancial value within fiduciary duty limits.³⁸

I think there is a best practice for asset owners that will produce better outcomes and support and facilitate and enable the transition. We are takers of the climate, but we are also an enabler to help companies finance their transition.

—Mark Konyon

³⁷In the 2024 TAI "Global Asset Owner Peer Study," only 1 of the 26 large funds included was prepared to accept a (limited) concession in return in respect of sustainability commitments.

³⁸Freshfields' "A Legal Framework for Impact" covers the fiduciary duty considerations in respect of 11 jurisdictions worldwide (go to www.freshfields.com/en-gb/our-thinking/campaigns/a-legal-framework-for-impact/).

6.3. The Net-Zero Business Model

There are two different business models for net zero. In one, net-zero policies are instrumental to better risk-adjusted returns. In the other, they are a means to the ultimate end of positive impact on the climate. The differences come down to interpretation, intentions, and goals.

Business models aim to identify goals and the best high-level strategy that is congruent with those goals. The net-zero business strategy will try to maximize the combination of financial goals (risk and return) and net-zero goals, such as the decarbonization pathway with short-term and long-term targets, commitment to transition finance and other climate solutions, engagement strategy, and policy advocacy. The overarching goal is to contribute to real-world emissions reduction and not simply portfolio decarbonization. In a nutshell, this is financing reduced emissions rather than reducing financed emissions.

These decisions on strategy and congruent goals need a set of beliefs and connected thinking to support the credibility of the actions taken.³⁹ There also needs to be accurate and informative reporting and accountability suitable for each type of stakeholder. For example, GFANZ requires its members to provide disclosures on their net-zero policies, practices, actions, and outcomes. This requirement is usually met through preparation of a climate action plan.

In sum, the business model for net-zero investing is clearly resource intensive in multiple areas—notably strategic decisions, effective implementation, and accurate and timely reporting.

Effective sustainability resourcing starts with building internal skills and methods. It also involves using those internal strengths by collaborating and forming strategic partnerships. These skills and strengths allow organizations to engage in broader areas, such as climate science, data management, distribution, and working with index providers.

6.4. Greenwashing and Other Challenges

The business model for net-zero investors must accommodate wider stakeholder communications. To comply with regulations and avoid greenwashing, it has become essential for asset owners and asset managers to give clear and accurate reports on their sustainability ambitions, strategies, and actions. In the complex field of sustainability and net-zero investing, there are challenges to achieving the right balance in communications and in staying within regulatory guidelines. Greenwashing is an example of failing to do so.

³⁹The use of “theory of change” models provides important building blocks to beliefs. This process is building scenarios that accomplish stated goals by adapting over time to difficult-to-anticipate factors that affect the ultimate pathway to accomplishing net-zero targets.

Greenwashing occurs when a company or organization falsely presents its products or services as environmentally friendly or beneficial to society. In the investment sector, it can also involve misleading claims about social and governance practices aligning with ESG criteria.

Investment organizations have often used a combination of rhetoric and strong claims in their investment narrative to position themselves and their products and services in a positive light. It is difficult to precisely determine when such practices overshoot the mark and become “greenwashing.” Indeed, recent CFA Institute research⁴⁰ found that for regulated funds, most instances of greenwashing were unintentional.

There is evidence that greenwashing has resulted from both deliberate and accidental misrepresentation. Several high-profile cases have been publicized, and the greenwashing issue has escalated even in the face of cases in which penalties have been imposed. This situation has attracted significant and growing regulatory attention. The various taxonomies or classifications of ESG and sustainability products (of which the EU Sustainable Finance Disclosures Regulation [SFDR] is a significant early example) provide the baseline for defining acceptable and unacceptable presentation.⁴¹

In the net-zero business model, there should be a clear objective goal to report accurately and to ensure the culture, process, and practices combine to avoid all greenwashing.

Regulators will increasingly address greenwashing, and it is necessary. We are also going to see more litigation on this. But then I have some sympathy with investors here, because the terminology is inevitably confusing, and many instances of noncompliance are not deliberate.

—Will Martindale

6.5. Future Pathways for Business Models

In the “Shift from” and “Shift to” columns in **Exhibit 2**, we identify the industry-level and organization-level change required for future success in net-zero adoption.

⁴⁰Nicole Gehrig and Alex Moreno, “An Exploration of Greenwashing Risks in Investment Fund Disclosures: An Investor Perspective,” CFA Institute Research and Policy Center (13 September 2023). <https://rpc.cfainstitute.org/en/research/reports/2023/greenwashing-risks-in-investment-fund-disclosures>.

⁴¹In January 2023, the EU enforced the Corporate Sustainability Reporting Directive, which requires companies to disclose risks and opportunities arising from social and environmental issues. For the debt markets, the European Council adopted a green bond standard in October 2023 that specifies where proceeds will be invested and which activities are aligned with the EU taxonomy. On March 6, 2024, the US SEC issued a rule that requires companies to report their greenhouse gas emissions and other climate matters. On March 18, 2024, a federal appellate court imposed a temporary stay pending judicial review of the new rules.

Exhibit 2. Business Model: Summary of Present and Desirable Future Position

	Shift from: Industry Current Position	Shift to: Industry Desirable Future Position
Asset owner business model	<p>Asset owners take a deliberately limited profile in addressing wider societal challenges</p> <p>Asset owners do not specify nonfinancial goals</p>	<p>Asset owners, motivated by financial factors, are more influential in certain wider societal challenges and climate change in particular</p> <p>Asset owners explicitly identify certain nonfinancial goals within fiduciary duties</p>
Fiduciary responsibility	<p>Fiduciary responsibility is seen as a constraining factor to net-zero action</p>	<p>Net-zero investing is seen as consistent with fiduciary duty with appropriate safe harbor provisions</p>
The net-zero business model	<p>There are multiple approaches to net-zero investing in which action plans vary widely in scope and style</p> <p>Asset owners see themselves as single actors in their strategy and do not work much in collaboration</p>	<p>There are more convergent practices within net zero with action plans that fully inform stakeholders and support comparisons</p> <p>Asset owners work together on shared objectives, where possible, while retaining their independence</p>
Dealing with greenwashing	<p>Greenwashing is hard to define</p>	<p>Greenwashing is quite tightly defined by regulators</p>

7. THE INVESTMENT MODEL

7.1. Investment Process and Portfolio Construction

Creating investment portfolios usually involves several steps. It begins with setting goals and beliefs, then moves on to constructing and implementing the portfolio, and ends with reviewing its performance. Throughout this process, information about the future is considered and used to support a competition for capital, aiming to build the best-quality portfolio in terms of risk-adjusted returns and other objectives, such as liquidity, resilience, and sustainability.

Climate risk has quite naturally been integrated into this process on the belief that it is financially material. In short, investors put climate risk alongside all other risks in considering both the individual investment's and investment portfolio's risk and return balance. However, there are challenges in assessing, integrating, and optimizing climate risk that raise at least three important questions.

First, how well do investors understand climate risk, and how accurately is it priced by market participants? Climate risk is difficult to assess because of its nonlinear features, which include the likelihood of tipping points, long-term impacts, and high model uncertainty. Many analysts suggest these risks may be insufficiently understood by investors to be priced accurately.⁴² Consequently, investors may be limited in their ability to measure climate risk. And given the mantra "what gets measured gets managed," there is a danger that investors underestimate the materiality of this risk.

Second, how does a net-zero investor balance the desire to meet net-zero goals with optimizing the risk-adjusted return? At its core, allocation decisions involve a competition for capital among the investment team's best ideas. Traditional investment methodology has used the optimization of risk and return to support decision making. But it is difficult to extend this process to accommodate net-zero goals. In response, many investors are assessing portfolios by reference to various forms of "portfolio quality"⁴³ and by using dashboard and balanced scorecard methodologies.⁴⁴ These methodologies are tools to collect the multiple factors that must be combined by applying weighting factors to summarize the overall attractiveness of a portfolio.

Third, how should net-zero investors optimize the balance between divesting from high-emissions companies and engagement or other approaches? Net-zero investing is not a simple matter of reducing portfolio emissions but,

⁴²See Trust et al., "The Emperor's New Climate Scenarios."

⁴³Portfolio quality is described in TAI, "An Agenda for Change" (2022). www.thinkingaheadinstitute.org/research-papers/an-agenda-for-change/.

⁴⁴Balanced scorecards were developed by Kaplan and Norton in 1992. See Robert S. Kaplan and David P. Norton, "The Balanced Scorecard: Measures That Drive Performance," *Harvard Business Review* (January-February 1992). <https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2>.

rather, requires a more nuanced and holistic approach that considers the real-economy impact of investing in different sectors and companies. An emphasis on portfolio emissions reductions can be misleading and ineffective. Investors should focus on financing reduced emissions and engaging with companies to help them transition to a low-carbon economy.

7.2. Multi-Asset-Class Frameworks

To determine whether a climate integration strategy is working, each asset in the portfolio should be evaluated in terms of its progress toward keeping global warming well below 2 degrees Celsius. This process involves using various metrics, which may differ depending on the type of asset. Investors will need to set specific targets for each asset class. Overall progress can be measured by using a balanced scorecard and not relying on just one metric.

While every asset class has a dedicated climate approach, we also seek to measure the footprint of the entire portfolio and address the inherent data issues.

—Claudia Kruse

Each asset class has distinctly different opportunities and considerations regarding its impact on climate change. To date, IIGCC has completed work to develop frameworks for six asset classes: listed equities, listed credit, sovereign bonds, real estate, infrastructure, and private equity, as documented in the Net Zero Investment Framework 2.0.⁴⁵

7.3. Benchmark Thinking and Whole-Fund Thinking

Benchmarks are commonly used in investing both as comparators that are used to judge performance and as inputs to start the portfolio construction process. There are two climate-related benchmark categories in the EU SFDR framework for listed equities—Paris Aligned Benchmarks and Climate Transition Benchmarks. Both incorporate decarbonization pathways and make allowances for other environmental factors. The key challenge is whether the process of adapting traditional cap-weighted benchmarks to accommodate multiple goals can be sufficiently effective.

As a long-term, growth-focused investor, many of our targets and performance expectations are based on 20-year rolling averages, so we've always looked forward to being able to report against that yardstick.

—Matt Whineray

⁴⁵At the time of writing, the Net Zero Investment Framework 2.0 is subject to consultation.

Time horizons and incentives are critical factors in effective use of benchmarks. With investor time horizons that are naturally long term, benchmark comparisons should not be focused on short periods, such as one or three years. In practice, for a pension fund with 30-year liabilities, it is likely that this fund invests with an asset manager that has been given a 3-year mandate and reports results every three months. The asset owner and the asset manager will say that they “think” long term, but such an approach is hard when subject to short-term performance pressures.

Benchmarks are not essential to investment methods. The alternative method is whole-fund approaches, also referred to as total portfolio approaches, which are based on clear primary goals that construct a portfolio in a best-ideas competition for capital based on those goals. This approach reduces undue reliance on benchmarks.

7.4. Incentives

Wherever there are measurements, there will be incentives—either explicit or implicit. The incentives that tend to drive management decisions and reinforce management practices have an annual focus because compensation is set annually and many organizations’ business plans, budgets, and key performance indicators (KPIs) are set on annual basis. Annual measures, however, may not align with the investment organization’s longer-term key goals.

Annual incentives often encourage short-termism and an asset class perspective rather than a whole-fund perspective. Alternative approaches that emphasize the whole fund and a competition for capital to achieve a particular fund’s long-term goals are gaining in attraction.

Sustainability has always been most resonant to long-term investors. Not all invested capital has a long time horizon, but a majority does,

I feel that there is an opportunity for globally significant asset owners to be a bit punchier together, more coordinated and more ambitious, collectively and collaboratively.

—Catherine Howarth

It is a threat to us as an insurer if our asset program gets caught with stranded assets. You know they’ll trade up in the near term because there’s still a need for whatever they’re doing. But maybe what they’re doing is worth more only short term; on the 20-year view, you don’t want to get caught on the wrong side of it.

—Mark Konyn

and the opportunities to exploit this framing are evident in particular to long-term pension and insurance funds.

In this formulation, investors can align incentives to reinforce the benefits of a long time horizon and the integration of net-zero goals, which are very long-term in nature.

7.5. Universal Ownership as a Step Forward in Net-Zero Investing

To align investment strategies with sustainability realities requires making a real-world impact directly or via investee companies. To be effective, some combination of sustainability, impacts, total portfolio thinking, and longer time horizons is helpful, and this approach would constitute a step beyond ESG integration. This combination involves adopting a new way of thinking, a new model, and a new system for measuring success, and it aligns with the theory and principles of universal ownership.

Stewardship activities will need to change, and we need to start addressing policymakers and regulators much more effectively to protect the long-term interests of our beneficiaries. Macro stewardship activities are critical universal owner activities.

—Matt Whineray

The framework involves viewing company impacts on the environment and society as systemic risks and costs that affect entire portfolios. Recognizing systemic risks in this way is crucial because sustainable returns can be achieved only from a financial system that remains effective in supporting those returns.

This shift of thinking and practice entails employing a “3D” (three-dimensional) approach⁴⁶ that integrates risk, return, and real-world impact. In this model, the real-world

impacts sought, particularly the net-zero intentions, are instrumental to the financial goals and align with fiduciary duty.

There are three principal ways that universal ownership can achieve real-world impacts such as net zero to produce better long-term financial outcomes:

- In listed markets, moving capital away from the backward-facing market-cap benchmarks and toward portfolios that face forward and anticipate developments in the transitioning economy.

⁴⁶See TAI, “Systemic Risk: Adapting Our Practices” (2024). www.thinkingaheadinstitute.org/research-papers/systemic-risk-adapting-our-practices/.

- In unlisted markets, providing primary capital and transition finance to support the climate transition and climate solutions.
- Deepening the stewardship practices with respect to individual investments and industries and in public policy engagement through a systemic approach to stewardship.

Each of these strategies has an investment thesis to support its fit with achieving long-term goals. Universal investors, by adopting similar beliefs in their investment strategies, provide the assurance that investing in this manner falls within the bounds of fiduciary responsibility.

Universal ownership will likely need to evolve over time with maturing capabilities, understanding, methodology, and application. It will also need to become more safely positioned within the fiduciary window. This evolution will depend on the leadership of the largest asset owners that see the merits of this investment model and work on developing and communicating beliefs to support the movement.

When people talk about sustainability in universal ownership, they tend to generalize that it is going to be good for society and for the planet and, therefore, it is going to be good for the portfolio.

I think it is much more complicated than that. When you dig into it, you can get big misalignments. Isn't that the whole point of externalities? People often want to reframe this challenge into a time horizon problem only. But it is not just a time horizon problem; it is an externalities problem, and some externalities cannot be internalized even if you are a universal owner.

Another problem is that people overestimate investor power to being about action that is not aligned with the long-term value motive. I think that the investor tools are weak and limited.

If you acknowledge these two premises, it will potentially cause you to take some different actions.

—Tom Gosling

TAI's "Global Asset Owner Peer Study" suggests a majority of very large asset owners are describing themselves as universal owners and adopting strategies consistent with this identification.⁴⁷

⁴⁷In the TAI "Global Asset Owner Peer Study," 65% of funds are self-reported universal owners.

Universal ownership is difficult to implement because it requires a new mindset, and any performance gains and sustainability impacts may be hard to observe. The new mindset should involve setting an investment thesis with clarity of beliefs around the theory of change involved (requiring effective collaborative action in stewardship), the expectations for returns, and the time horizons needed (often longer than investors' comfort zones).

The investment thesis for universal ownership depends to some extent on externalities becoming internalized over time. And it also depends on investors' power to influence companies to align behind changes in strategy that are value accretive to investors' aggregate portfolios. Both dependencies can only be relied on so far, as Tom Gosling points out. These points affect the strength of the performance case but do not challenge the validity of the underlying thesis.

Although universal ownership theory is most relevant to asset owners, the financial case makes it highly relevant to asset managers too. While early focus has seen it as in the domain of the asset owner, asset managers can adopt universal owner strategies given the financial proposition involved.

7.6. Transition Finance

Transition finance is capital raised or deployed by corporates to support their net-zero transition. It is usually seen as any form of financial support that helps high-carbon companies implement long-term changes to become greener. It bridges the gap between traditional and sustainable financing as businesses begin the journey to net zero.

Discussions on transition finance include considering how to achieve the most rapid and effective energy transition for the economy. The focus is often on emerging economies and the Global South.

Net-zero investing calls for allocations to climate solutions, including transition finance, to be a key part of a strategy. Often this finance will be primary sources of capital, and most often it will be in private equity and private debt instruments. This includes green bonds bought in the primary market earmarked as capital for green projects. The use of primary markets suggests that this investing can have impact by its intentionality and, depending on context, also its additionality; that is, the impact would not have occurred without the finance.

Alternative and innovative new forms of finance can unlock marriage value between different state and private entities. For example, the *blended finance* model uses concessionary finance from multilateral institutions within a public-private partnership and can build an attractive profile for the investor for funding development finance. Blended finance is likely to play a growing part in the transition and, in particular, in financing the reduced emissions of emerging markets.

The unique features of the net-zero trajectory require the energy transformation to occur in enormous scale at unprecedented speed. Innovative financing of the transition economy represents a particular opportunity for the investment industry to play an influential role in the transformation.

7.7. Future Pathways for Investment Models

The “Shift from” and “Shift to” columns in **Exhibit 3** identify industry-level and organization-level change required for future success in the investment model net-zero adoption.

Exhibit 3. Investment Model: Summary of Present and Desirable Future Position

	Shift from: Industry Current Position	Shift to: Industry Desirable Future Position
Portfolio construction	Portfolio creation has gaps in its approach to systemic risk and climate risk Limited appreciation of systemic risks in a market (systematic) risk paradigm	Portfolio creation is more robust and adaptable to change → Integration of systemic risk into the risk management paradigm
The problems with benchmarks, incentives, and time horizons	Benchmarks and incentives that produce ineffective practice	→ Long-term incentives and actions that are effective and aligned to goals
Universal ownership	Universal ownership is small scale Weakly resourced stewardship	→ Universal ownership becomes large scale Strongly resourced and focused stewardship
Transition finance	Traditional financing models Blended finance early in its maturity	→ Alternative and innovative financing models Blended finance develops in maturity and impact

8. THE OPERATING MODEL

8.1. Governance and Board Challenges

Investor governance has always played a critical role in investor best practice.⁴⁸ Governance provides the framework for decision making, accountability, and transparency. It ensures that investments are managed responsibly and ethically, aligning with the interests of stakeholders. Strong governance practices help mitigate risks, build trust, and enhance long-term value creation for investors. Here, we address the governance of investment organizations, where the peak governing body, usually the board, plays a central role in the effective governance of the investor. The board's responsibility is substantially related to determining

the highest-level policies, including organizational purpose and strategy. Making a commitment to align to a net-zero pathway is likely to be a board decision after considerable discussion and consultation.

Making these key decisions requires extensive examination of relevant factors—not only of economic factors but also social, technological, environmental, political, legal, and ethical factors.⁴⁹ Many boards are well suited to situations where decision making occurs across the full spectrum of stakeholders and subject matters. With climate change and net-zero investing, expertise on climate matters and these other factors will be important for effective governance.

Investment beliefs⁵⁰ role in governance is critical. In net-zero investing, investment beliefs are fundamental in aligning purpose and strategy, and they provide most asset owners with the logical underpinning for decisions relating to net-zero factors.

The boards of organizations with fiduciary obligations are more challenged and less likely to make concessionary investments. Allocating capital without these constraints may be the more practical way to finance some of the investments which would be viewed as concessionary. We need to be pragmatic.

—Linda-Eling Lee

We've had 25 years looking at corporate governance, but the next stage really needs to be a focus on investor governance.

—Anne Simpson

⁴⁸Gordon L. Clark and Roger Urwin, "Best-Practice Investment Management: Lessons for Asset Owners from the Oxford-Watson Wyatt Project on Governance," working paper (October 2007). <http://dx.doi.org/10.2139/ssrn.1019212>.

⁴⁹This full range of factors in net-zero decisions follows the acronym "STEEPLE"—social, technological, economic, environmental, political, legal, and ethical factors.

⁵⁰Kees G. Koedijk and Alfred Slager, "Do Institutional Investors Have Sensible Investment Beliefs?" *Rotman International Journal of Pension Management* 2 (2009).

Boards hold significant strategic responsibilities concerning climate risk; they are responsible for all risks within the organization. This means they need to understand all investment and enterprise risks, including climate and other systemic risks, and assess how they align with the organization's mission. Risk appetite statements are increasingly being used to determine which risks best align with the fund's mission and for the reporting of risk policies and guidelines.

Boards will also play a part in critical stakeholder relationships, including decisions to join GFANZ organizations, such as the NZAOA and the NZAM initiative.

Boards also have responsibility for significant changes in policy and strategy, identifying turning points and moments when the status quo is no longer desirable. The time may come when the asset owner finds their pathway not aligning with broader policy-setting and nation-state transition pathways. Boards will have to determine whether these are reasons to adjust their emissions trajectory.

Overall, investment organization boards have a highly significant role in setting net-zero investing policies given these multiple strategic challenges.

8.2. Gaps in Key Infrastructure

Net-zero investing needs a range of marketplace systems to work well, such as sustainability accounting, detailed disclosures of emissions (including those affecting other organizations), ways to manage and report emissions across different types of investments, a reliable and transparent market for offsets, and connected carbon markets. How well are these systems doing? Overall,

Our board [the Guardians of the New Zealand Super Fund] played a key part in our climate decisions . . . in respect of positioning the portfolio in its policy on risk and aligning it to net zero.

—Matt Whineray

Even if governments are hanging back, that doesn't change our belief that achieving net zero is the right thing for the economy and our clients. Navigating a timely transition is what's key: Investors need to use both stewardship and capital allocation in the process.

—Jane Ambachtsheer

We are seeing a more patchy response from investors as they are waiting to see governments focus on credible policies and incentive systems to support the transition before establishing the right way forward.

—Sonja Laud, CFA

they are moving in the right direction but still have some way to go before they are fully effective.

A central element of enabling infrastructure is for company accounts to incorporate emissions and climate risk data that are reliable and consistent and to improve trust and confidence in company disclosures about sustainability. The newly formed International Sustainability Standards Board issued inaugural standards in 2023 (IFRS S1 for climate disclosures and IFRS S2 covering broader sustainability scope). These standards foreshadow a new era of sustainability-related disclosures that should apply to capital markets worldwide. Over time, they should also contribute to creating a common language for disclosing the effect of climate-related risks and opportunities on a company's prospects. This contribution will support data on both material company risks from climate and material company impacts on climate. Both are relevant to investors as sources of longer-term financial risks.

8.3. Data Challenges with New Measures

Investors face two challenges with the climate data they receive from investee companies. The first is receiving data that are consistent and comparable.

The second is using those data and deriving decision-useful metrics. In an ideal world, we can derive forward-pointing metrics that identify the most likely climate outcomes from various company business models. We can already point to implied temperature rise metrics⁵¹ that are being calculated, but there are hazards if too much reliance is placed on these metrics given their sensitivity to numerous underlying assumptions.

I suspect that building better data across multiple aspects will be a steep task over the next couple of years, but we must do it. When I think of the challenges, data seems to be at the top of the list.

—David Blood

The subject of “soft data” (data that lack objectivity) is relevant to this narrative. In many instances, data are relatively subjective and could be viewed as lacking the quality sought by investors. This situation may result from issues born from using estimates, proxies, modeled figures, opinions, and judgments. In many instances, this is an inevitable byproduct of the intrinsic difficulty in obtaining an accurate measure. This situation may improve over time, but it will not be possible to measure accurately everything that matters.

Most users of implied temperature rise metrics would say that these data are relatively soft. The question then becomes whether the data have high

⁵¹Implied temperature rise figures are intuitive, forward-looking metrics, expressed in degrees Celsius, designed to show the temperature alignment of companies, portfolios, and funds with global temperature goals. These metrics are designed to support Task Force on Climate-Related Financial Disclosures (TCFD) reporting.

materiality overall and, net of all considerations, are useful. In the case of implied temperature rise metrics, investors' views differ.

Investment professionals have long worked with imperfect data, needing to consider the data's provenance and the limits to accurate measurement. Climate risk and net-zero data present significant challenges in this regard. Better governance, better data processing, and improved primary data sources can help address these issues. CFA Institute extensively covers this topic in a recent climate data report.⁵²

8.4. Reporting Challenges

The progress with TCFD (Task Force on Climate-Related Financial Disclosures) standards has been positive. Like all standards, voluntary and mandatory, there were early challenges, but gradually, the investment world has adapted to delivering this reporting in a timely and decision-useful way. TCFD standards and reporting have had the added benefit of being largely globally applicable and have received global support.

Regulators have become more focused on additional disclosures beyond financial disclosures over time, with the EU SFDR as an example of more onerous reporting. This regulation has severely stretched the current industry resourcing.

Climate action plans have added to this workload challenge. These plans are scoped to cover investment, corporate engagement, public policy advocacy, and reporting, with governance disclosures cutting across all areas. As part of the package of multiple net-zero actions, these plans support the aligning of investments with climate goals, fostering positive change and the harmonization of reporting.

We're less keen on target setting based on temperature metrics, as we feel there are so many assumptions that go into implied temperature rise metrics. You can make a temperature metric tell you anything you want. So, it doesn't act as a good steering mechanism for portfolio decision making.

—Daisy Streatfeild

There are multiple and inconsistent regulatory interventions in the UK, Europe, and the US that require different disclosure frameworks and taxonomies for sustainability. That's creating big usability and interoperability issues for investors, and the lack of global alignment simply increases costs without any obvious benefits.

—Will Martindale

⁵²Vinelli et al., "Climate Data in the Investment Process."

Sustainability and climate action measures that have been developed include KPIs that summarize organization-level progress with sustainability factors generally and net-zero investment in particular. These measures act as progress indicators and have uses in terms of high-level management reporting and incentivization. Some investors and most companies put ESG targets into senior executive pay.⁵³

Reporting on emissions reductions and other net-zero goals is early in its maturity cycle. The industry has increasingly seen reporting as a necessary enabler to support appropriate actions and behaviors. Organizations will likely need to show their commitment in the coming years to work through the myriad challenges involved with understanding and communicating these complex issues.

8.5. Future Pathways for Operating Models

The “Shift from” and “Shift to” columns in **Exhibit 4** identify changes required for future success with the operating model with respect to net-zero investing.

Exhibit 4. Operating Model: Summary of Present and Desirable Future Position

	Shift from: Industry Current Position	→	Shift to: Industry Desirable Future Position
Governance challenge with boards	Boards’ activities act as a brake on dealing with the complex issues and desirable changes	→	Boards’ activities act to support the incremental changes needed
Gaps in soft infrastructure	The lack of soft infrastructure acts as a constraint on industry progress with net-zero investing	→	Soft infrastructure develops over time to support industry progress on net-zero investing
Data challenges	Net-zero investors have an insufficiently holistic view about the value of data and its overall decision-usefulness given its materiality and overall quality	→	Net-zero investors are realistic and holistic in assessing data for its decision-useful status by reference to its materiality and overall quality
Reporting challenges	Both asset owners and asset managers are overburdened by reporting	→	Asset owners and asset managers get on top of reporting
	Transparency is limited		Transparency is strong
	KPIs are used unevenly		KPIs become a key alignment of interest
	Climate action plans vary widely in content		Climate action plans become a central tool for accountability

⁵³Lucian A. Bebchuk and Roberto Tallarita, “The Perils and Questionable Promise of ESG-Based Compensation,” *Iowa Journal of Corporation Law* 48 (2023): 37-75. <https://jcl.law.uiowa.edu/articles/2023/01/perils-and-questionable-promise-esg-based-compensation>.

9. THE PEOPLE MODEL

9.1. Shifts of Mindset

The investment landscape has become more challenging due to the increased focus on sustainability, ESG factors, and the expanded responsibility of stewardship. Investors now must deal with complex issues such as climate investing, which involves managing both physical risks and transition risks related to climate change. In addition, some investors are pursuing the goal of achieving net-zero carbon emissions, adding another layer of complexity to their investment decisions.

The scope of the requisite technical skills for investors now encompasses a wider domain than ever before. First, practitioners must now seek to understand the larger ecosystem, which includes social, environmental, and economic issues, and appreciate the relevance of technology, politics, and legal factors. Second, practitioners must develop the T-shaped skills discussed in the next subsection. Practitioners need a growth mindset to learn, develop, and adapt, because the speed of change is fast, and there are new ethical challenges to consider and to integrate into decision making. Finally, there are new leadership challenges, including becoming conversant with the alternative leadership styles that can be applied to manage complex problems.

The scale of conceptual change necessary to navigate this more complex investment landscape requires more than an incremental change in thinking. It is, more accurately, a change of mindset. The pathways to these new mindsets demand changing certain conditioned beliefs and the integration of sustainability into investment practitioners' thinking.

The mindset change involves investment professionals incorporating systems thinking into

Sustainability and ESG . . . definitely have good flows of talent into our industry now. It seems to be the area where a lot of professionals put their hand up to be on that team, but when I started in this field it was hands down, so you know that's changed. Especially to the younger generation, which is fantastic—they are full of energy and new ideas, and they're not weighed down by the conventions of the industry.

—Danyelle Guyatt

We need an adaptive learning style and to reconfigure our thinking behaviors and habits.

—Elizabeth Corley

their cognitive skills. Systems thinking helps us better grasp the larger industry context in which we operate, as well as understand our own organizations as part of a complex adaptive system. This shift involves moving away from a narrow focus on investment frameworks to recognizing broader societal connections and purposes that are best understood within a systems framework and context.

9.2. T-Shaped and Critical Thinking

Net-zero investing requires investment professionals to develop new knowledge, skills, and abilities. To be effective, practitioners must build their understanding of climate science and climate metrics; adjacent environmental factors, such as biodiversity and natural capital; adjacent social factors, including the just transition (which refers to the idea of transitioning from an economy heavily reliant on fossil fuels to one that is more sustainable and environmentally friendly in a fair and equitable manner); legal and regulatory

framing; and new technologies in the areas of renewable energy and climate technology. This long list of extra disciplines that are relevant to the investment context suggests that investors with T-shaped skills have an edge over professionals with more traditional training.

I think the industry is working very hard to build the knowledge base through reporting standards, disclosures, and taxonomies—and beyond. But we have not really turned our minds to the human elements of the investment process, particularly how we make decisions.

—Danyelle Guyatt

T-shaped skills combine specialized subject matter depth (the vertical bar of the capital letter T) with wider content subject breadth (the horizontal bar of the T). In other words, people with those skills “connect dots” well. They are adept at reconciling deep-level knowledge and understanding in one field, one

discipline, and one organization with a wide perspective across many fields, disciplines, and organizations.

T-shaped skills are derived in part from talent and in part from training and development. This attribute helps with the increasing need to apply accurate judgment in complex situations.

In the investment industry, being connected professionally with others is extremely important. This connection means working together and sharing ideas among individuals, teams, and organizations. Being able to collaborate effectively in teams is now a crucial skill, just as important as having expertise in a particular area. This T-shaped quality helps investment professionals connect with others beyond their own specialized areas of knowledge.

9.3. The Case for Stronger Ethical Orientation

The vast majority of investment professionals have always followed ethical guidelines and standards in their work while situated within clients' best financial interests. This dynamic is at the core of a fiduciary culture, where the client's needs are given the highest priority.

The prevailing business and investment culture in certain regions has shifted toward paying greater regard to wider stakeholders. This wider-lens approach applies particularly to the climate challenge because climate change affects the whole of society.

Some might argue that a strong ethical orientation is necessary to accomplish the industry's net-zero pathway because for many, it applies altruistic thinking. The argument for investment organizations to be more principled and ethically driven may be backed by a business case based on the belief that organizations that prioritize their purpose and pursue actions that benefit society can often, over time, achieve better and more sustainable outcomes for themselves.

The current business case for sustainability produces too weak a force to promote enough change fast enough. There is a need for morality to take more of the load, because our voluntary market-led approach is falling short.

—Duncan Austin

9.4. A Stronger Culture and Purpose

Many investment organizations were established during an era of shareholder capitalism, when profit for shareholders was the primary goal. However, many organizations now balance their focus on clients and customers with a broader purpose and vision that consider the interests of multiple stakeholders.⁵⁴ Having a strong underlying purpose sets organizations apart and allows them to be more inclusive, serving the needs of various stakeholders, including clients, employees, suppliers, and communities. It is of note, however, that many investment organizations operate under fiduciary duty principles that spell out the importance of placing clients first.

The cultural features of organizations that attract high levels of client confidence are likely to have the following characteristics:⁵⁵

⁵⁴The fiduciary principle puts clients first, but wider purpose can be seen as instrumental to support that principle.

⁵⁵Thinking Ahead Institute <https://www.thinkingaheadinstitute.org/research-papers/culture-the-organisational-superpower/>.

- A strong commitment to prioritizing clients, guided by firm fiduciary principles
- A people-focused approach to managing employees, emphasizing trust and inclusion as core principles
- Leadership that prioritizes serving others before themselves
- A clear sense of purpose driving a focus on ethical and effective ways of operating

These cultural features align to channel energy and focus to the net-zero investing pathway, with strong leadership coming to the fore supported by new levels of personal responsibility and vocation.

The skills required of investment professionals have actually not changed much, though some of them seem harder to find today. Investors need curiosity and a genuine capacity for critical thinking (that capacity to start with a blank sheet of paper and think fundamentally, something I do think is in shorter supply today); system awareness to contextualize decision making and horizons (the ability to connect well with other disciplines); ethical restraint; and perhaps most important of all, humility.

—Alison Tarditi

Leadership styles have evolved over time. Notably, transformative leadership, servant leadership, and systems leadership have emerged. In the context of net-zero investment, there is a need for more transformative change, which often requires transformative leadership styles.

This challenge brings to the fore systems leadership, which begins with the belief that an organization's success relies on promoting well-being within the larger system in which it operates. Systems leadership applied to the investment system reflects on the complexities of the system, by applying systems thinking over a long time horizon in a coalition for greater-good outcomes to develop solutions that produce benefits to the system as a whole and private benefits individually to those that are part of the system.

9.5. Future Pathways for the People Model

The “Shift from” and “Shift to” columns in **Exhibit 5** identify the changes required for future success with the people model in net-zero adoption.

Exhibit 5. People Model: Summary of Present and Desirable Future Position

	Shift from: Industry Current Position		Shift to: Industry Desirable Future Position
Shifts of mindset	Professionals employing largely fixed mindsets	→	Professionals employing growth mindsets
T-shaped and critical thinking	Professionals have their greatest strengths in specialized technical content	→	Professionals have a balance of strengths between specialized technical content and T-shaped skills
The case for stronger ethical orientation	Organizations and professionals that are often motivated most by achieving financial success	→	Organizations and professionals that are motivated by strong values and enlightened self-interest considerations
A stronger culture and governance	Culture reinforcing the status quo	→	Culture supporting significant change

10. CONCLUSIONS AND RECOMMENDATIONS

The future holds many uncertainties. The future climate outcome is unknowable in large part because there is a spectrum of scenarios—some positive, some less so. Investment performance is also unknowable. *Despite these uncertainties, there is a very high likelihood that the performance of individual issuers and capital markets in aggregate will be affected by climate outcomes.*

This likelihood supports investors' consideration of climate factors in their investment processes. There is a choice of how to do this—simply treating climate risks as part of the portfolio challenge or choosing the more complicated net-zero investing pathway. In either case, investors cannot control climate outcomes or investment outcomes. *But if investors undertake net-zero investing in an appropriate way, they can avoid fiduciary challenges, build their resilience to adverse outcomes, and apply their agency in a manner consistent with their influence and opportunity.*

I would say that over time, societal expectation of what is acceptable has changed. Change is inevitable.

—Jon Lukomnik

The research and interviews undertaken for this guide indicate that the pathway to global net-zero emissions and the development of net-zero investing will be arduous, eventful, and uneven. Issues will arise with data, regulatory overload, stakeholder pressures, the impacts

of governments and governance, the interconnections of systems, and the climate trajectory.

The arc of progress will not be smooth, and organizational resilience will be tested.

10.1. Net-Zero Investing's Three Critical Components

Three critical components of successful net-zero investing emerge from this guide's exploration into the future of net-zero investing.

- 1. There is a significant shift in the investment ecosystem coming from governments, companies, and investors, with their mindsets adapting to net-zero frameworks.**

Net-zero investing is part of sustainable finance and is defined as a set of designated investment strategies, actions, metrics, and methodologies through which investors can contribute to achieving global net-zero emissions by 2050 or sooner. It is investing to create long-term sustainable value.

Asset owners decide their commitment to net zero based on their fiduciary responsibility, their capabilities, and their view of the opportunities in their agency to act. Although most, if not all, asset owners will have strategies for managing climate risks, only some asset owners will decide to be net-zero investors.

Past net-zero efforts have been—and future net-zero efforts will be—a *transformational change* process. Such a process requires an emphasis on articulating and socializing the net-zero vision and strategy. To achieve and implement these goals, transformational leadership is needed.

There are differences in developing a mindset shift that pertain to *different regions*. Net-zero thinking and adoption are more prevalent in Europe and less prevalent in the United States, reflecting cultural support for the trend to emphasize wider stakeholder interests in Europe, whereas this cultural trend is more nascent in the United States.

In a world with much increased interconnectivity between economic, social, and environmental systems and systemic risk, *systems thinking* will help frame the issues more broadly and support the beliefs and theory of change required to support net-zero policies.

2. Integrating net-zero investing into mainstream investing will require significant *innovations*.

Balanced scorecards are a critical tool to aggregate multiple factors and bring congruence to measures and reporting alongside management and strategy. In combination, these factors forge a path for how to successfully report net-zero progress.

Total portfolio thinking is another useful tool in net-zero investing. Such thinking is based on clear primary goals and is applied to strategy in a “best ideas” competition for capital allocation based on those goals. This approach also reduces undue reliance on traditional asset class and market benchmarks.

The application of *universal ownership* theory is another new development in this field. It begins with a shift in mindset, recognizing that investment returns depend on a healthy ecosystem. This approach evolves into investment policies that are designed to positively influence the financial system.

A broader approach to *stewardship* is crucial for net-zero policies. This includes systemic stewardship, where organizations advocate for public

The message of a burning platform needs to be out there in the industry. Change needs to be approached with a well-orchestrated change management program.

—David Atkin

policies to support a financial system that thrives alongside a healthy climate, environment, and society.

Net zero should follow both an *asset-class- and industry-specific methodology*, with each asset class considered using various net-zero methodologies and metrics, all brought together in a multi-asset-class total portfolio consolidation.

3. To be effective with net-zero investing, the investment strategy must shift to achieve net-zero goals without compromising risk-adjusted return goals.

The strategy for asset owners in most cases must support the *dual mandate* of meeting net-zero goals without compromising on the highest possible risk-adjusted returns, as validated *ex ante* through a robust belief system and *ex post* through both the results and the narrative.

The application of *universal ownership theory* can support a strong belief that net-zero investing can be value accretive through a combination of (1) systemic stewardship and (2) allocation tilts that position the portfolio ahead of and to benefit from the energy transition and the internalization of externalities.

As we think about the economics and the risk of climate-related investments, given what we know . . . given the potential for stranded assets, . . . if one does not consider them, it is a breach of fiduciary duty—so one should consider them and act on them within fiduciary duty.

—Mindy Lubber

A net-zero investment strategy must aim to achieve *alignments with government and regulators* on the net-zero pathway and policy. The vision is that this alignment enables the investor to be both a follower and a leader when it comes to net-zero advocacy and action.

Investors should shape their *beliefs and strategies* to adjust to the evolving pathway of the renewable energy transition. There may be reasons to accelerate or decelerate the investor's path toward achieving net-zero emissions depending on the energy transition pathway.

A commitment to *GFANZ organizations*, including NZAOA, and similar bodies may well play a part in the strategy by contributing to the investor networks that can support industry momentum. Engagement with other NGO coalitions may also play a part.

Enhanced and extended *organizational capabilities* will feature in the strategy. Fresh talent and new professional learnings will be needed. There

will be demand for investment professionals to upskill in data science and technology. There will be greater reliance on T-shaped skills. Human values will come to the fore.

10.2. A High-Level Net-Zero Roadmap

For net-zero investors, their organizations need to develop a *net-zero roadmap* in line with the foregoing outline, in which these high-level objectives should act as a guide. The roadmap should help with planning and informing stakeholders, help identify and communicate the key priorities and goals in net-zero-related areas, and be useful in reflecting on what success looks like and building clarity on the ultimate destination.

Based on research and extensive interviews with experts in net-zero investing, a high-level net-zero roadmap should accommodate the following five navigational points:

1. Investors and intermediaries should shape their beliefs and strategies to adapt to the evolving pathway that materializes in the renewable energy transition
2. Asset owners in most cases need to develop a strategy that achieves the dual mandate of reaching net-zero goals without sacrificing returns. This strategy should be validated both beforehand through investment beliefs and afterward through the results and outcomes.
3. Implementing net zero requires alignment with government and regulators. Investors and intermediaries may take on the roles of both followers and leaders in advocating for and taking action toward net zero.
4. Engaging with other like-minded market participants plays a part in the strategy through contributing to the collaborative network supporting the industry's collective efforts. Such engagement may involve joining one of the GFANZ organizations and/or other NGOs in the field.
5. Enhancing and expanding human capital are essential. This process includes attracting fresh talent and fostering new professional skills. T-shaped skills, whereby individuals possess both depth and breadth of expertise, will become increasingly important.

10.3. Recommendations

Recommendations for Investment Organizations	Recommendations for Investment Professionals
<ul style="list-style-type: none"> ● Build deeper organizational beliefs about climate using systems thinking to understand the likely future scenarios. ● Grow your understanding of net zero investing. Develop your strategy on the back of this to complement your vision. ● Pay attention to the changing regulatory environment and the governments' developing commitment to net zero. ● Develop your collaborative network to support faster learning and greater coordinated efforts. ● Attract talent from diverse fields to build climate investing capability. Develop T-shaped capabilities. 	<ul style="list-style-type: none"> ● Build deeper personal beliefs about climate using systems thinking to understand the likely future scenarios. ● Grow your understanding of net-zero investing. Develop your career plan to complement your capabilities. ● Pay regard to the changing regulatory environment and the government's developing commitment to net zero. ● Deepen your connections with professional sources of intelligence and discourse on climate investing. ● Broaden your thinking and horizons. Develop your T-shaped skills. Strengthen your network.

APPENDIX: CONTRIBUTORS

The following experts participated in extensive discussions on the content of this research. The author owes a considerable debt of gratitude to these individuals who brought insight, validation, and challenge to the research process.

Any errors or omissions are the author's alone

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Matt Whineray is the chair of First Cape, a newly formed wealth and asset management firm based in New Zealand. Matt finished at the Guardians of New Zealand Superannuation in December 2023, after 15 years at the fund, including the last five years as CEO. New Zealand Super was announced as the top-performing sovereign wealth fund over 10 years by international sovereign wealth fund experts at Global SWF.

