ScientificBeta
An SGX and EDHEC Venture

Overview

Understanding Net-Zero Investment Frameworks and their Implications for Investment Management

February 2022

Executive Summary

At the beginning of 2021, the Paris Aligned Investment Initiative (PAII) Net Zero Investment Framework Implementation Guide (the "Framework") and the inaugural version of the Target Setting Protocol of the United Nations-convened Net-Zero Asset Owner Alliance (the "Protocol") were published.

These landmark Net-Zero investment frameworks aim to assist investors in defining investment management strategies that may be presented as in line with the most ambitious goals of the Paris Agreement on Climate Change and to encourage investors to implement portfolio alignment in a manner that promotes progress in the real economy.

These frameworks identify capital allocation, issuer engagement, and third-party engagement as portfolio alignment tools and channels that investors may use to try and alter activity in the real economy. Capital allocation is primarily approached as a tool to direct capital towards climate leaders and limit exposure to downside transition risks. Issuer engagement is regarded as the tool of choice to influence issuers to improve their climate performance and adopt and implement transition plans. Although not grounded in theoretical models or supported by empirical evidence, this stance on investor impact channels is consistent with conventional wisdom in the sustainable investment industry. Meanwhile, the frameworks correctly identify engagement of other stakeholders, and notably policy makers, as key to promoting an environment facilitating portfolio and economic alignment, but do not grant it a central role.

The Framework provides a top-down approach to alignment from defining a strategy and setting portfolio-level objectives for decarbonisation and investment in climate solutions, to defining an optimal asset allocation and specifying how it should be implemented, down to assessing alignment at the asset-class level on the basis of asset-level criteria and improving alignment by portfolio construction and issuer engagement. The Protocol is concerned with five-year goals and calls on investors to set engagement targets as well as targets in at least two of the three areas it covers, i.e., emissions at the asset-class or portfolio level, emissions at the sector level, and activities enlarging the availability and financing of climate solutions.

Both frameworks call for the definition of top-level emissions reduction targets to guide portfolio alignment. Investors implementing the Framework must set <10-year targets for emissions (intensity) reduction and allocation to climate solutions that are consistent with conservative 1.5°C scenarios; these are also encouraged to set five-year targets. Investors implementing the Protocol are invited to reduce emissions by 22% to 32% by 2025 and 49% to 65% by 2030, which also aligns with ambitious emissions mitigation pathways. Both frameworks underline that alignment should be approached at the sector level to avoid greenwashing whereby portfolio alignment is performed by cross-sector reallocations that are not called for by the transition pathway and do little to incentivise alignment by issuers. To endeavour to link portfolio alignment to real world progress, the Framework requires that investors set a five-year goal for increasing the percentage of their assets – in material sectors from a climate change perspective – that may be considered net zero or aligned or aligning to a relevant net zero pathway; and ensure that 70% of the financed emissions in these sectors are either pathway-compatible or subjected to engagement. Asset-level alignment assessment in the Framework is central and ambitious in scope as it covers all companies in broadly defined material sectors. Alignment is assessed according to detailed criteria

balancing current climate performance metrics with forward-looking decarbonisation indicators. The Protocol calls for (but does not require) the setting of five-year efficiency gain targets at the sector level. These must be informed by sector-specific pathways, starting with the most material sectors for investors within key high-emitting sectors. Targets may be achieved through capital allocation and/or engagement. With regards to the latter, the Protocol requires investors to either identify 20 large emitters or those responsible for 65% of their financed emissions and to set action targets with a focus on emitters without Paris-alignment commitments or "concrete" mid-term emissions reduction targets.

The frameworks envisage two main ways to incentivise alignment at the level of issuers. The first is capital allocation, whereby the investor allocates its funds in relation to issuer alignment to try to alter issuers' access to capital and send market signals to promote issuer alignment. The second is engagement, whereby the investor attempts to influence issuers towards adopting and following through plans for alignment through dialogue–conducted directly or through collective initiatives–voting policy and shareholder proposals. As part of capital allocation, exclusions (or "selective divestment") are viewed as an appropriate alignment tool for activities that are fundamentally misaligned with credible net-zero pathways or when engagement fails. Considering that capital allocation contributes to incentivising alignment, the Framework mandates that portfolio construction for passive solutions implement positive weighting in relation to each issuer's degree of alignment relative to its sector and climate solutions revenues. It also recommends a transparent, alignment-criteria based issuer engagement strategy with clear milestones and an escalation process feeding back to capital allocation. Thus, it aligns capital allocation and issuer engagement and creates synergies between investor impact channels as alignment-based capital allocation provides credibility and leverage to engagement activities. The Protocol also recognises that in-sector best-in-class strategies and investment in climate solutions can contribute to decarbonising the economy but downplays capital allocation as an investor channel and does not make explicit portfolio construction recommendations. While making engagement its sole recommended investor impact channel, the Protocol offers a high degree of flexibility in engagement modalities, lets each investor define the ambition of its engagement targets, and does not require setting targets in respect of the end result sought by engagement, i.e., issuer-level alignment.

The Framework provides a top-down model to translate net-zero commitments into portfolio-level goals and plans in respect of decarbonisation and climate solutions, and coherent, synergistic, use of investor impact channels linked to well-defined alignment criteria and monitoring metrics. However, it does not offer much guidance for the setting of targets, especially medium-term targets or much colouring on engagement activities in practice. The Protocol offers guidance for the setting of five-year targets down to the sector level and in respect of engagement activities and provides an alternative perspective on climate solutions. However, it eschews capital allocation as potential investor impact tool and is not particularly demanding when it comes to engagement activities and outcomes. As a stand-alone framework, the Protocol might thus come across as excessively accommodating of net zero investor commitments lacking in impact ambition and potential. However, it may be viewed as particularly useful in combination with the Framework's investor-impact maximisation coherent architecture in that it helps translate medium-to-long-term portfolio-level targets into five-year targets down to the level of key transition sectors and offers guidance on engagement activities.

Given the limited scientific evidence linking investor impact tools, and notably shareholder engagement, to substantial real-world progress, investors wishing to link their net-zero investment commitments to impact should not only consider opting for frameworks and approaches that maximise potential investor impact, but also document the implementation of their impact strategies and endeavour to measure their real-world outcomes.

Introduction

Responding to the threat of climate change is the most pressing and important challenge of our era. The Earth has warmed by 0.95-1.20°C[1] relative to the period 1850–1900[2] and the resulting changes in weather patterns, sea levels and the frequency of extreme weather events are already affecting ecosystems, human communities, and economies on a global scale (IPCC, 2021).

In relation to climate change mitigation, the Paris Agreement[3] calls on its signatories to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit it to 1.5°C. This goal requires signatories to reach their greenhouse gas emissions peaks as soon as possible and undertake rapid reductions thereafter so that removals by natural and artificial greenhouse gas sinks[4] compensate for emissions that remain after mitigation efforts in the second half of this century. Achieving this ambition requires rapid transitions of unprecedented scale: dramatic decarbonisation of energy supply; massive electrification; major energy efficiency progress in the transport, industry and building sectors; decarbonisation of agriculture, forestry and other land uses; as well as the widespread adoption of low-greenhouse-gas-intensity consumption and lifestyles. Adapting to changing climate also requires considerable investments.

Institutional investors have started integrated climate change into their investment management processes and a substantial number of institutional investors have pledged to "align" their portfolios with the goals of the 2015 Paris Agreement on Climate Change. In the wake of the 2018 special report from the Intergovernmental Panel on Climate Change (IPCC) showing how containing global warming to 1.5°C rather than 2°C would materially reduce the challenging impacts of further climate change, many investors have made "net-zero investment" pledges to match the most ambitious objectives in the Paris Agreement. According to the authoritative work of the IPCC, transition pathways[5] limiting global warming to 1.5°C "with no or limited overshoot"[6] require carbon dioxide emissions from human activities to reach neutrality, on a net-zero basis, by 2050.[7] Efforts are ongoing to break the global "net-zero" pathways described by the IPCC down to national and sector levels. These higher granularity pathways can then be used to determine targets for economic units. In this regard, some 1,100 companies worldwide have set emissions reductions targets that

1 - This is the global surface temperature, the figure for land only is much higher at 1.34 to 1.83°C (IPCC, 2021).
2 - This is often referred to as pre-industrial times, which is obviously wrong, but the period offered reasonably widespread temperature observations and in practice it has been found to be a "reasonable pragmatic surrogate for preindustrial global mean temperature" (Hawkins et al., 2017).
3 - The 2015 Paris Agreement on Climate Change, reached at the twenty-first Conference of the Parties to the United Nations Framework Convention on Climate Change, is a universal and legally binding agreement whereby 195 nations agree to work jointly to (i) limit global temperature rise this century below 2°C, and pursue efforts to target 1.5°C of warming; (ii) increase climate change adaptation ability, foster climate resilience and low greenhouse gas growth (without endangering food production); and (iii) make finance flows consistent with a pathway to low emissions and climate-resilient development.
4 - Focused on Carbon Dioxide and also known as Carbon Dioxide Removal (CDR), these may include such measures as afforestation and reforestation (AR), land restoration and soil carbon sequestration, bioenergy with carbon dioxide capture and Storage (BECCS), direct air carbon capture and storage (DACCS), and enhanced weathering and ocean alkalinisation. Large-scale deployment of BECCS and/or AR would (require economic incentives and) have material land and water footprint and possible adverse impacts on biodiversity or food production. Commercial carbon capture has been experimented for close to fifty years but, owing to technological and economic challenges, has been a failure (except for gas processing plants that monetise the captured carbon for enhanced oil recovery, see Abdulla et at., 2021). DACCS requires a significant amount of energy and remains exploratory while enhanced weathering is still a theoretical proposition. Soil carbon sequestration has proven to be beneficial and profitable without subsidies but does not necessarily scale up. Large reliance on sinks to achieve a scenario is thus a major risk factor, especially if the technologies are unproven and/or challenging to implement at scale. Meanwhile, natural sinks have been negatively impacted by climate change (e.g., Le Quéré et al., 2009) and their continued loss of efficiency as CO2 accumulates in the atmosphere is part of climate modelling (IPCC, 2021) with some authors warning that land and forestry could become sources (e.g., Duffy et al., 2021).
5 - These correspond to scenarios with no or limited overshoot, i.e., temporary global warming above the objective.
6 -These are scenarios for which the IPCC expects at most a temporary exceedance of 0.1°C above the objective.
7 - According to IPCC (2018), model 1.5°C pathways with no or limited overshoot require net carbon dioxide emissions from human activities to fall by about 45% (inter-quantile range of [40%, 60%]) from 2010 levels by 2030 and to reach net zero by mid-century ([2045-2055]); deep reductions in emissions of other greenhouse gases, notably methane and sulphur dioxide, are also required. The extent of reliance on Negative Emission Technologies (NET) varies across pathways. To limit global warming to 2°C, CO2 emissions should fall circa 25% by 2030 ([10-30%]) and reach net zero around 2070 ([2065–2080]).

have been independently reviewed as being in line with the Paris Agreement, including close to 800 companies with objectives consistent with 1.5°C of warming.[8] While the Paris Agreement recognises a central role for finance,[9] climate science cannot be used directly to steer or assess Paris- or net-zero investment commitments since financial portfolios do not emit or capture greenhouse gases. Against this backdrop, researchers and practitioners have contributed to a discussion on the meaning of alignment for investors. Thanks to collaborative work hosted by investor coalitions, guidance on how investor climate scenario alignment pledges could be translated into portfolio and stakeholder management practices started to emerge in 2021 with the publications of the "Net Zero Investment Framework Implementation Guide" of the Paris Aligned Investment Initiative (PAII) and the "Inaugural 2025 Target Setting Protocol" of the United Nations-convened Net-Zero Asset Owner Alliance (UNZAOA). Work continued throughout 2021, notably leading to guidance on target setting for the PAII framework and an update to the UNZAOA protocol at the turn of 2022. In this note, we discuss the philosophy and practical recommendations of these Net-Zero investment frameworks with a focus on equity portfolio management.

After providing some background on the investor coalitions involved, we underline that both frameworks share a concern for aligning investment management towards net-zero in a manner that contributes to the transition. We present the three channels that investors may use to try and alter activity in the real economy and explain the importance given to each of these channels by the frameworks. We then give a high-level description of the components of each framework before discussing how top-level portfolio targets are to be defined in relation to IPCC scenarios and how the frameworks require the setting of investment management targets in relation to investor impact channels to promote real-world outcomes. Finally, we look at the frameworks' recommendations for equity investment management, reviewing requirements and recommendations in relation to portfolio construction approaches and engagement activities and the roles they may play for portfolio alignment and the promotion of investor impact.

1. Investor Coalitions and the Genesis of Net-Zero Investment Frameworks

Paris Aligned Investment Initiative Net Zero Investment Framework Implementation Guide (PAII, 2021) and related guidance

The Paris Aligned Investment Initiative (PAII) brings together investor network organisations from four continents to examine how investors can align their portfolios and activities to the goals of the Paris Agreement. Joining its founder, the Europe-dominated Institutional Investors Group on Climate Change (IIGCC), are the North American sustainability pioneer Ceres, the Asia Investment Group on Climate Change (AIGCC) and Australasia's Investor Group on Climate Change (IGCC).[10]

IIGCC established the PAII in May 2019 and a significant share of its members contributed to the development of a draft net zero investment framework that was released in August 2020 and subjected to a consultation that attracted some ninety contributions.[11] In March 2021, the enlarged PAII unveiled the first version of the finalised framework as the "Net Zero Investment Framework Implementation Guide" ("the Framework"). The four investor network organisations intend to work

8 - We refer here to targets approved by the Science Based Targets initiative (SBTi) as at the end of January 2022. SBTi is a partnership between CDP (a not-for-profit organisation running the reference environmental disclosure framework for public and private entities), the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF). In October 2021, SBTi released a framework for the validation of corporate net zero targets that requires companies to set 5-10 year emission reduction targets and net-zero targets across all scopes in a manner consistent with the relevant 1.5°C-aligned pathway(s) and to commit to neutralising any residual emissions by removals from the net-zero target year (i.e., by 2050 or earlier).

9 - As it calls on nations not only to make climate change mitigation and adaptation efforts, but also to make "finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development."

10 - As of January 2022, the 370+ IIGCC membership is made mainly of large pension funds and asset managers that collectively manage EUR50 trillion in assets; the CERES investor network welcomes over 200 institutional investors managing over USD47 trillion in assets; AIGCC has over 50 asset owner and financial institution members with over USD26 trillion assets under management and IGCC federates close to 80 institutional investors, advisors and business groups, managing over USD2 trillion in assets in Australia and New Zealand.

11 - Scientific Beta is an associate member of IIGCC and contributed to the stakeholder consultation on the draft PAII Framework.

jointly to further develop it and assist investors with implementation.[12] In December 2021, the IIGCC released supplementary guidance on target setting for users of the Framework (IIGCC, 2021b).

As of January 2022, 117 investors and advisers (including 53 asset owners with close to USD3 trillion in assets) were using (or had committed to use) the Framework.

UN-convened Net-Zero Asset Owner Alliance Target Setting Protocol (NZAOA, 2021 and UNEP, 2022)

Founded at the UN Secretary General's Climate Action Summit by a small group of large European and North-American asset owners[13] in September 2019 and convened by the United Nations Environment Programme Finance Initiative (UNEP FI) and the Principles for Responsible Investment (PRI), the Net-Zero Asset Owner Alliance ("the Alliance") has grown into a group of 69 institutional investors straddling four continents and representing over to USD10 trillion assets under management (as at January 2022)[14]. Membership is narrower than that of the PAII as it is limited to insurance and reinsurance companies, pension funds and pension fund providers. Its members are committed to transitioning their investment portfolios to net-zero emissions by 2050 (consistent with a 1.5°C scenario), and regularly reporting on progress, including by establishing intermediate targets every five years (the frequency is aligned with that applying to signatories of the Paris Agreement).

Members of the Alliance worked on an approach to setting the first five-yearly targets for individual members. After a brief public consultation on the draft framework, issued in October 2020, the Alliance released the finalised work in January 2021 as the "Inaugural 2025 Target Setting Protocol" (hereafter the "inaugural Protocol"). The framework was updated a year later as the "Target Setting Protocol – second edition" (hereafter the "updated Protocol" or the "Protocol").

The Framework and the Protocol should be seen as complementary rather than competing. The Protocol builds on the work of the Framework and underlines that the PAII work on assessing assetlevel alignment, or potential to transition, is aligned with its own criteria and encourages Alliance members to rely on the work of the PAII. Meanwhile, the Framework recognises that the Protocol's portfolio level target setting methodology can be used to assist investors in the setting of their near-term emissions reduction targets.

2. A Strong Concern for the Real-World Impact of Portfolio Alignment

Investor impact and its potential channels

There are many ways to decarbonise portfolios or otherwise reduce investment exposure to climate risks but not all ways contribute equally to changes in the real economy.

In this regard, both frameworks are concerned with aligning investment portfolios towards net-zero in a manner that contributes to reducing global greenhouse gas emissions.

"Impact" is defined as the reduction of emissions in the real economy and was the first of five principles that guided the work of the PAII[15] and the Framework; it is meant to "encourage investors to maximise their efforts to achieve the greatest impact possible", defined as emissions reductions

12 - The first version of the PAII framework leaves some issues (e.g., Scope 3 emissions) unresolved and does not cover all asset classes. In further work, the new, global PAII has ambitions to expand coverage to infrastructure and private equity, incorporate the adaptation and resilience goals of the Paris Agreement, and address some analytical and data gaps, including investment trajectories for climate solutions, assessment of Scope 3 emissions, and use of offsets. An update of the framework had been promised ahead of the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in November 2021 but has yet to materialise.

13 - Allianz, Caisse des Dépôts, La Caisse de dépôt et placement du Québec (CDPQ), Folksam Group, PensionDanmark, and SwissRe.

14 - New protocol binds Net-Zero Asset Owner Alliance to halve portfolio emissions by 2030, Press Release, UN-NZAOA, 25 January 2022.

15 - The other principles defined in IIGCC (2020) are: Rigour (basing alignment on sound evidence and data in a manner consistent with the best available science); Practicality (being feasible for a range of investors, building on existing work, and being compatible with existing processes or requirements of investors); Accessibility (definitions, methodologies and strategies should be clear and easily applied, using publicly available information and assessments where possible); and Accountability (Definitions, methodologies and strategies should stakeholders to assess alignment).

in the real economy. Likewise, the formal commitment required to join the Alliance underlines that members' commitments to transitioning their investment portfolio to net-zero "must emphasise greenhouse gas emissions reduction outcomes in the real economy".

As such, these frameworks go beyond simply requiring the integration of climate change risks and opportunities into investment management and demand evidence of investor activity consistent with the promotion of positive climate change impact. Integration of climate change into investment management may raise questions around fiduciary duties. Failure to incorporate financially material climate change considerations can qualify as a breach of fiduciary duties. At the same time, the promotion of real-world impact for its own sake may conflict with fiduciary duties. Acknowledging this tension, the frameworks are meant to encourage and assist each investor to go as far as possible in the implementation of investment strategies and investor actions that promote positive climate impact while meeting fiduciary duties and regulatory constraints (such as those pertaining to information exchange and collaborative action amongst investors).

To achieve portfolio decarbonisation and impact goals, the frameworks require investors to set concrete targets in terms of investment management, which affects portfolio construction and issuer engagement, and provide recommendations for policy advocacy and engagement with stakeholders beyond issuers. From an impact standpoint, investment management actions are aimed at directly issuer engagement while policy advocacy and engagement beyond issuers are intended to alter the regulatory and market environment in a manner that can accelerate and facilitate net-zero alignment. Together they form the three channels by which investors may attempt to impact the sources of real-world emissions, notably those linked to their investments and potential investments.[16]

When discussing climate impact in the context of investment, it is important to underline that investors do not directly control the emissions associated with their investee companies (and other portfolio assets), and that 'investor impact' is thus necessarily an indirect impact. The Protocol defines it as "the impact an investor's activity has on a company's activity, project or asset which in turns leads to measurable outcomes in the real world".

Investor impact may be quantitative, whereby activities that are negatively (positively) targeted see their expansion thwarted (accelerated) or their levels contract (increase) as the (direct or indirect) result of the investor action (Christiansen and Ducoulombier, 2018; Ducoulombier and Liu, 2019), and/or qualitative, whereby investor action results in improved ESG performance (Amenc et al., 2020). Table 1 below presents the investor impact channels[17] and the possible transmission mechanisms linking investor activity to climate performance.

Table 1: Three channels for investor impact

Investor Impact Channel	Objective and functioning
Capital allocation	Quantitively altering activity through funding conditions (access to, and cost of, capital) or (directly or indirectly) influencing issuers to improve climate performance through capital market signals
Engagement	Influencing issuers to improve climate performance through (direct/collective) public/private dialogue and/or shareholder proposals and voting strategy
Engagement of other stakeholders (e.g., by public campaigning, policy advocacy, etc.)	Altering the market and regulatory environment to impact the supply/ demand of/for products/ services, funding conditions, authorised activities, and minimum performance standards in relation to climate performance

16 - Technically, these are Scope 3 category 15 ('investments') emissions, sometimes referred to as 'portfolio' or 'financed' emissions. The Protocol also calls on Alliance members to set net-zero targets on their direct emissions (Scope 1 emissions), i.e., emissions from sources they control, as well as on the indirect emissions from the energy (in the form of electricity, steam, heating or cooling) they purchase and consume (Scope 2 emissions).

17 - The Protocol draws heavily on the work of Kölbel et al. (2019), who identify similar channels–which they label 'capital allocation', 'shareholder engagement' and 'indirect' – by which investors may seek to alter the 'level' and/or 'quality' of company activity.

Avowed Preference for Engagement as a Tool for impact

While both frameworks recognise that all three channels can produce real world impact, they primarily discuss capital allocation and engagement[18] and differ in their support for capital allocation as an independent tool to promote climate action.[19]

In the context of impact, capital allocation involves altering issuers' access to capital by allocating investor funds in relation to issuer alignment, and engagement refers to investor attempts to influence issuers towards adopting and following through plans for alignment through structured dialogue, conducted directly or through collective initiatives, and the exercise of ownership rights (shareholder proposals and voting policy).

The Framework mobilises three groups of investment management actions to align portfolios and achieve targets: "portfolio construction", "engagement and stewardship", and "selective divestment". The Framework states that "portfolio construction"[20] used to "weight portfolios towards assets aligned or transitioning towards net zero" is not only required for portfolio alignment but also serves as an incentive for asset-level alignment. With respect to the latter, while the draft IIGCC framework[21] (and the response of IIGCC to the feedback received)[22] appeared to treat portfolio construction at least on par with engagement, the PAII Net Zero Investment Framework Implementation Guide affirms the primacy of engagement to drive real-world change, notably for existing assets.[23] While this shift has not been justified by the PAII, it is consistent with alignment towards conventional wisdom in the investment industry and with the need to adopt a consensus position for enlarged participation in the initiative. In particular, the "Theory of Change"[24] spelled out by Ceres (2021), the organisation with the largest investor network after IIGCC, is clearly focused on dialogue and engagement.[25]

The Protocol notes that both capital allocation and engagement are required for portfolio alignment[26] and alludes to the "complex nature of leveraging ownership and financial strategies to drive real world change". However, it distinctively favours broadly defined engagement as the primary tool to promote real-world, issuer-level, change. The Theory of Change that emerges from the Protocol relies on asset owner-led engagement with corporations and asset managers, supported by policy advocacy. The primacy of engagement is in line with the Alliance's founding principle, i.e., to engage with investee companies to ensure they decarbonise their business models.[27] Drawing on the review of investor impact channels done by Kölbel et al. (2019), the Protocol asserts that

18 - The Framework states that policy advocacy should support policy and regulation relevant for achieving net-zero emissions, lists priority topics and identifies relevant delivery methods and engagement targets. The Protocol invites asset owners to set action targets on policy advocacy and details the Alliance's priorities, targeted goals, and working methods.

19 - There are also differences in activities that may qualify towards engagement targets: the Framework recognises only direct and collective issuer engagement while the Protocol allows members to also contribute to their engagement targets through engagement of asset managers on climate change policies and practices and/or contributions to Alliance position papers.

20 - In their discussion of capital allocation, both frameworks distinguish between "divestment" and other approaches. Divestment is to be understood as a synonym for exclusion. The other capital allocation approaches under the Framework are grouped under "portfolio construction" and encompass screening as well as positive and negative weighting aiming to "allocate capital to support alignment and invest in climate solutions. The Protocol has all approaches under capital allocation with "divestments", "sector weighting and best-in-class strategies", and "investing in climate solutions" as sub-headings.

21 - The draft framework reads: "Investors should use portfolio construction to increase allocation to aligned companies, which should incentivise companies to improve performance to ensure access to capital. Where companies are not aligned to net zero, investors should engage with companies to improve alignment performance over time." (IIGCC, 2020).

22 - For example, the consultation response (IIGCC, 2021a) notes that asset-level alignment assessment should "inform the strategy for actions by investors to improve the performance of companies against the criteria" and that assets failing to align "should be the immediate and urgent priority for engagement or reweighting in portfolio construction."

23 - The Framework (PAII, 2021) reads: "Overall, the PAII recommends that an investment strategy should prioritise engagement and stewardship and direct management (where relevant), particularly for existing assets, as the primary mechanism to drive alignment. Portfolio construction can also be a relevant tool to weight portfolios towards assets aligned or transitioning towards net zero as an incentive for these companies to align. Selective divestment is recommended in specific circumstances as part of the toolbox for aligning a portfolio."

24 - "Theory of Change" may be understood as the statement and justification of the activities or interventions that are chosen to produce outcomes that have been identified as conditioning the achievement of the desired change, or in the words of the author who coined the expression, "a theory of how and why" the chosen interventions are expected to work (Weiss, 1995).

25 - The Supplementary Guidance on Target Setting published by IIGCC clearly affirms that targets may be achieved by both engagement and stewardship and portfolio construction approaches (IIGCC, 2021b).

26 - The Alliance (UNEP, 2022) acknowledges that engagement may prove futile, at least in some sectors of the economy and that "sole reliance on a corporate engagement strategy might not allow (…) to achieve net-zero emissions by 2050 due to the limited to no impact of such a strategy, while at the same time exposing (…) portfolios to high transition risks."

27 - See for example the Alliance's first press release: https://www.unepfi.org/wordpress/wp-content/uploads/2019/09/Asset-Owner-Alliance-press-releaselaunch-23-September-2019.pdf

engagement is the mechanism with the strongest empirical evidence in terms of effectiveness.[28] While this represents conventional wisdom in the ESG investment industry, it does not align with a dispassionate look at the evidence or the conclusions of two other recent reviews of investor impact channels that note the lack of sound empirical evidence on whether engagement can incentivise companies to transition (Lütkehermöller et al., 2020 and Sjöström, 2020).[29]

3. Components of the Net-Zero Investment Frameworks

PAII Net Zero Investment Framework

The Framework considers that net-zero investment strategies must focus on two objectives:
(i) decarbonising portfolios in a way that is consistent with alignment, and;
(ii) increasing investment in 'climate solutions' that are needed to meet that goal (renewable energy, energy efficient technologies, etc.). It recognises that investors have a range of levers to seek achievement of these objectives and provides recommended methodologies and actions to align portfolios and maximise real-world impact.

Table 2 summarises the components of a net-zero investment strategy under the Framework.

Table 2: PAII Framework—Components of a Net-Zero Investment Strategy and their Purposes

Component	Purpose
Governance and Strategy	To set the overall net zero portfolio emissions goal and adopt a consistent investment strategy, provide direction, and a basis for action. Transparency of action plan, monitoring and accountability for delivery of strategy and achievement of targets are also included.
Setting portfolio level objectives and targets	To set objectives and targets that: • promote investor action that drives decarbonisation of assets; • increase investment in climate solutions; • define expected progress in emissions reduction and investment at the portfolio level, and measure achievement.
Strategic Asset Allocation (SAA)	To define an optimal asset allocation for the portfolio in order to help achieve alignment goals alongside standard risk/return objectives and other constraints, and specify the way in which asset allocation should be implemented–via choice of benchmarks and design of investment mandates–to achieve goals.
Asset class alignment: • Sovereign Bonds • Listed Equity and Corporate Fixed Income • Real Estate	Assess the current and future potential alignment of assets to the global net zero goal, and their contribution to climate solutions, using relevant indicators and metrics. Incentivise assets to achieve decarbonisation and contribute to climate solutions, and thereby meet portfolio level targets, by: • Using portfolio construction and investment decisions to increase capital allocation to more aligned assets and climate solutions, and withdraw investment from poor performing assets; and • Using engagement, stewardship, and management to influence assets towards greater alignment.
Advocacy and market engagement	To shift the policy environment to support decarbonisation and investment in climate solutions, and increase the ability of investors to take forward a net zero investment strategy. To encourage the market to provide the data, tools, and advice that underpins investors' investment strategy implementation.

Source: Based on IIGCC (2020) and PAII (2021).

NZAOA Target Setting Protocol

The Protocol has a four-part target setting structure that covers: engagement targets, emissions targets, sector targets and "Financing Transition" targets. Table 3 summarises the targets in each part. Members are expected to cover at least three parts, including engagement. As with the Framework, emission (intensity) targets should be consistent with alignment, but in contrast to the Framework, financing transition targets do not require quantitative investment targets. Instead, these are

28 - The undocumented assertion that engagement is the most effective investor impact channel has long been a mainstay of the engagement literature; for illustration, it is found in an early review by Sparkes and Cowton (2004).
29 - In making these remarks, we do not mean to cast doubt on the potential relevance of engagement as a tool for change or deny that some engagements have produced substantive ESG change. Our intention is to dispel the myth that there is already a compelling body of scientific evidence establishing the superior effectiveness of shareholder engagement for delivering favourable climate outcomes such as emissions reductions. Investors would benefit from further academic research on the real-world outcomes of various forms and combinations of activation of investor impact channels. Meanwhile, it would be dangerous to dismiss any of these channels or disregard their interactions and potential synergies.

defined in terms of contribution to the Alliance's work supporting climate solutions infrastructure enhancement. The Alliance requires all members to set engagement targets, which may then be met not only by direct or collaborative engagement of issuers (or other companies and stakeholders in the case of sector and value-chain engagements), but also by engagement of asset managers and even contribution to white papers.

Table 3: NZAOA Protocol Four-part Target Setting Structure

Component	Purpose
Engagement Targets	• Cover either 20 companies (focus on highest contributors to owned emissions) or companies responsible for 65% of portfolio emissions, by direct, collective, or through the engagement activities of asset managers) • Contribute to at least one asset manager engagement led by the Alliance and, where possible, participate in Alliance position paper creation • Set engagements targets for at least two of the following types of contributions: Corporate engagement, whether bilateral or collaborative 1. Sector and value chain engagement (engagement with multiple companies and stakeholders in the same sector or value chain) 2. Position paper (endorsement or publication) 3. Asset Manager engagement (requires that a structured engagement approach be set up that is integrated with the selection, appointment, and monitoring of managers)
Sub-portfolio (later Portfolio) Emission Targets	22% to 32% CO2e reduction by 2025 and 49 to 65% CO2e reduction by 2030 on equity and debt to listed corporates, infrastructure and real estate (or targets as per Carbon Risk Real Estate Monitor national pathways for the latter) Covers investee company Scope 1 & 2 emissions, tracking of Scope 3 Absolute or intensity-based performance indicators
Sector Targets	• Intensity-based reductions on all material sectors • Scope 3 to be included wherever possible • Sector specific intensity KPIs recommended • Sectoral Decarbonisation Pathways used to set targets
Financing Transition Targets	• Report on progress on climate-positive trend to the Alliance • Contribute to Alliance's financing transition work, e.g., enhance climate solution reporting

Source: UNEP (2022).

Both the Framework and the Protocol call for a "comply or explain" implementation by participants. From an asset-class point of view, both frameworks cover listed equity and publicly traded corporate debt, as well as real estate; the second edition of the Protocol extends coverage to private loans to listed companies as well as infrastructure;[30] in this review, we focus on listed equity.

4. Target-Setting in Net-Zero Investment Frameworks

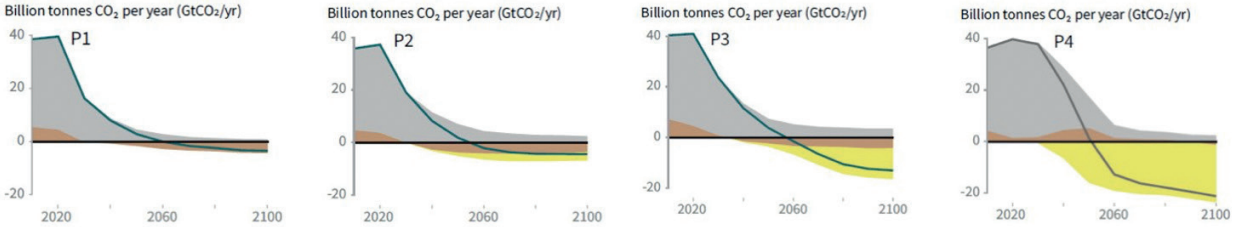
Top-Level Targets

At portfolio level, the Framework calls for (i) a Scope 1+2 emissions reduction target over up to 10 years[31] couched in absolute or intensity terms;[32] and (ii) a goal for allocation to climate solutions (as percentage of revenues or CAPEX relative to portfolio assets) that is "increasing over time, in line with investment trajectories based on a net zero pathway".[33] Consistently, the key climate change metrics supplementing standard financial indicators for strategic asset allocation are a carbon footprinting metric based on total investment[34] and the share of portfolio invested in climate solutions (as much as possible using EU Taxonomy standards). Indicators reflecting potential transition risks (e.g., exposure to fossil fuel reserves), transitioning status or potential (e.g., coverage of net zero targets; transition management score; level of capex relating to climate solutions) may also be included where data challenges (availability, coverage, quality) can be met.

30 - The updated Protocol also introduces accounting for emissions linked to Sovereign debt, but this debt remains out of scope for target setting.
31 - The draft framework had recommended a 10-year intensity target and/or a five-year absolute target. The finalised Framework only encourages the setting of five-year targets and notes that this is consistent with the UNFCCC Race to Zero criteria. The latter have since been updated and require the setting of an interim target to be achieved "in the next decade." (UNFCCC, 2021).
32 - The Framework languages shows preference for absolute targets and investors are required to (i) show how the target reflects net zero pathways producing the required reductions in emissions and is adjusted to control for variations in financial variables; and (ii) report on absolute emissions reductions achieved as well as progress towards the targets.
33 - IIGCC has commissioned analysis on solution pathways across regions and technologies and useful metrics to measure investment in climate solutions. This analysis had not yet been published at the time of writing.
34 - The Framework endorses the proposals of the Partnership for Carbon Accounting Financials (PCAF, 2020) whereby emissions are proportionally attributed to the providers of the company's total capital.

These indicative targets should be based on the current state of the portfolio and the consideration of global, sector and regional net-zero pathways as relevant and possible given data challenges. Pathways should be net-zero by 2050 pathways consistent with limiting warming to 1.5°C with at least 50% probability and a limited volume of Negative Emissions Technologies to 2050. In other words, the PAII requires the use of 1.5°C scenarios with no overshoot that are conservative in their use of natural sinks of greenhouse gases and of carbon capture utilisation and storage technologies. The IIGCC Supplementary Guidance on Target Setting lists available 1.5°C scenarios recommended by PAII besides the IPCC (P1, P2, P3) scenarios.[35] The final Framework does not give a range for emissions reductions at the portfolio level.[36]

Figure 1: Breakdown of contributions to global net CO2 emissions in four illustrative model pathways



*P1: A scenario in which social, business and technological **innovations result in lower energy demand** up to 2050 while living standards rise, especially in the global South. A downsized energy system enables rapid decarbonisation of energy supply. **Afforestation is the only Carbon Dioxide Removal (CDR) option considered**; neither fossil fuels with Carbon Capture and Storage (CCS) nor bioenergy with CCS (BECCS) are used.*

*P2: A scenario with a **broad focus on sustainability** including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.*

*P3: A middle-of-the-road scenario in which societal as well as technological development **follows historical patterns**. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.*

*P4: A **resource- and energy intensive** scenario in which economic growth and globalisation lead to widespread adoption of greenhouse-gas-intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.*

Source: IPCC (2018).

Table 4: Indicators characterising representative IPCC pathways

Pathway classification	P1	P2	P3	P4
	No or limited overshoot	No or limited overshoot	No or limited overshoot	Higher overshoot
CO2 emissions in 2030 (vs 2010)	-58%	-47%	-41%	+4%
Final energy demand in 2030 (vs. 2010)	-15%	-5%	+17%	+39%
Share of renewables in electricity in 2030	60%	58%	48%	25%
Cumulative CCS until 2100 (GtCO2)	0	348	687	1,218

Source: IPCC (2018).

Assuming a geographically balanced portfolio, the Alliance drew on the IPCC 1.5°C illustrative scenarios (see Figure 1 and Table 4 above) to produce a range of acceptable targeted (Scope 1+2) emissions (intensity) reductions to be applied across the asset classes for which it considers credible methodologies and sufficient data coverage already exist. The medians of IPCC scenarios with no or limited overshoot (captured by IPCC representative pathways P1 to P3) produced a 24% to 29% range for the reduction. In the first version of the Protocol, the Alliance also drew on scenarios with

35 - These include the IEA NZE2050, the One Earth Climate Model, the Energy Transitions Commission (ETC) 'Mission Possible' scenarios and the Carbon Risk Real Estate Model (CRREM) scenario.

36 - The draft framework (IIGCC, 2020) noted that a straight-line approach could be reasonable for "large diversified growth portfolio", quoted the UNEP (2019) figure of a required 7.6% annual compression in emissions over 2020-2030 for alignment. It also guesstimated that a quadrupling of EU Taxonomy compliant activities would be required from 2020 to 2050.

higher overshoot (P4) that make high use of carbon removal[37], yielding a final which yielded a final wide, range of 16% to 29% for the target reduction over the first five-year period (2024 against 2019). It is thus fair to observe that while the Alliance recommends the use of scenarios with limited overshoot of global warming of 1.5°C representative of the "best available science", the inaugural Protocol did not strictly require the setting of emissions reduction targets consistent with these scenarios. Implicitly, members were allowed to make optimistic assumptions about the deployment of Negative Emissions Technologies. Following criticisms, the Alliance increased the ambition of its five-year target in the updated Protocol by excluding higher overshoot scenarios and scenarios with over 10% of growth in bioenergy use against 2020 in the computation of its target range. Members are now expected to "strive for carbon reductions" in the range of 22% to 32% by 2025 and set targets in the range of 49% to 65% to 2030.[38] While emphasising the new ambitions, the Alliance also signals that it "may need to tolerate a 'buffer' or slight lag behind the scientific pathways", should the pace of decarbonisation in the real economy continue to lag the compression required under net-zero targets.[39-40] The updated Protocol also opens the door to carbon credits being used towards target achievement (subject to these being purchased by investee companies and corresponding to "qualified removals", which have yet to be defined). This is at odds with its earlier affirmation that asset owners should not be allowed to rely on credits to meet their decarbonisation targets (NZAOA, 2021c),[41] but is consistent with the Alliance taking a softer approach to net-zero targets than the PAII.

Members may set absolute carbon emissions targets or emission intensity[42] targets against 2020 levels, which represent their commitments to decarbonising their portfolios. Intensity-based targets should use either revenues or enterprise value. The Alliance notes that the former "are more closely linked to the production output of companies and thus to the source of emissions", whereas the latter is more closely linked to a footprinting approach[43] and that the Alliance has a "slight preference" for it in the context of long-term expansion of asset-class coverage.[44]

Unlike the Framework, the Protocol does not require a quantitative approach to solutions, or even the setting of targets in the area. One concern of the Alliance is that requiring an increased share of the portfolio to be dedicated to climate solutions may heighten price bubble risks and create conflict with fiduciary duties (NZAOA, 2021a). All members are invited to report annually on progress in climate solution investments tracking[45] and those with a financing transition target

37 - The Alliance shied from using their median of -12.6% for target setting; instead, it set the floor of the five-year reduction target to in relation to the median emission reduction in the IPCC Lower 2°C Scenarios (i.e., pathways limiting peak warming to below 2°C throughout the 21st century with at least 66% probability.)

38 - Note that the Protocol allows for slower sub-portfolio reduction schedules "In cases where Alliance members hold or buy assets that are emission intense or in hard-to-abate sectors with a well-defined strategy to decarbonise these assets," where the compression of the emissions in the relevant sectors are slower than the required by the sector-agnostic portfolio-wide trajectories.

39 - The Alliance warns about an increasing disconnect between net-zero targets and the pace of decarbonisation in the real economy, including if emissions fall in line with the current pledges of governments. It observes that "eventually, if not very soon", that widening gap could "force members to divest from entire sectors" to meet their targets. The Alliance considers that this would be "highly harmful" to the speed of the transition as it would deprive certain capital-intensive sectors of the funding they require to transition.

40 - This delay clause is in keeping with the Alliance Commitment being made "in the expectation that governments will follow through on their own commitments to ensure the objectives of the Paris Agreement are met." The pursuit of the climate agenda of the Alliance is contingent on the "fiduciary duty to manage risks and achieve target returns". Under such conditions and absent a progressive climate investment mandate, ethical agency is largely externalised to governments and society at large (Ducoulombier and Liu, 2019).

41 - Decarbonisation in IPCC scenarios P3 and P4 require complementary contributions from negative emissions technologies (NETs). In its position paper on net emissions, the Alliance (NZAOA, 2021b) notes that that asset owners may not only promote emissions abatement on the part of investee companies but may also invest into activities that drive deep decarbonisation and in NETs. It considers that the development at scale of NETs can be accelerated by economic and policy mechanisms with the priority being carbon-pricing. In this context, it endorses the development of high-quality voluntary carbon markets as a complimentary role. The Alliance invites firms to compensate emissions on the path to net zero but underlines that this can only come on top of their primary obligation to decarbonise their operations and value chains. Finally, it states that: "Asset owners should not use carbon credits to meet their decarbonization targets at portfolio level and should report any offsets separately."

42 - Obviously, intensity-based targets need to be ambitious enough to counterbalance economic growth so as to produce the same absolute emissions reductions as targets couched in terms of absolute emissions; this is explicitly affirmed in the updated Protocol for the avoidance of doubt.

43 - Ducoulombier and Liu (2021) explain and illustrate the limitations of steering decarbonisation by enterprise value.

44 - We suspect that this is because the use of the total capital approach allows to sidestep the definition of what constitutes the real output linked to the financial asset; however similar issues will arise at the level of the numerator, e.g., in the context of allocation of emissions to sovereign instruments: should sovereigns be approached as economic agents or regulators? Should we look at production, consumption or both? etc.

45 - Solutions are defined as: "Investments in economic activities considered to contribute substantially to climate change mitigation (solutions substantially reducing greenhouse gases by avoiding emissions and/or by sequestering carbon dioxide already in the atmosphere), or climate change adaptation (where that activity substantially contributes to enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change)." The updated Protocol includes a climate solution reporting template which identifies solutions by theme and asks Members to report alignment by class; themes were derived from a review of regulatory and industry-accepted sustainable investment taxonomies.

must contribute to the Alliance's work in the area. This work aims to enlarge the supply side of net-zero compatible technologies (by "scale, pace, and geographic reach").

In both frameworks, top-level emissions targets cover Scope 1-2 emissions associated with the assets as both investor coalitions are well aware of the severe availability, quality and consistency issues affecting Scope 3 data and of the problem of multiple counting affecting Scope 3 aggregation (Busch et al., 2020; Ducoulombier, 2021).[46]

Asset-Alignment and Engagement Targets

While the frameworks call for the definition of top-level emissions reduction targets to guide portfolio alignment, they are careful to insist that decarbonisation should be approached at the sector level. This is in stark contrast with approaches that allow or promote portfolio decarbonisation through cross-sector reallocation.

To promote a link between emissions reduction targets and real-world outcomes, the Framework works at an asset class level and requires that investors:
(i) set a five-year goal for increasing the percentage of their assets–in material sectors from a climate change perspective–that may be considered net zero or aligned or aligning to a relevant net zero pathway;[47] and
(ii) ensure that 70% of the financed emissions[48] in these sectors are either net zero, aligned with a net zero pathway or subjected to engagement and stewardship actions.[49]

While the Framework encourages the use of sector-specific pathways, it avoids providing further guidance. This is because PAII considers that while available pathways are sufficient to determine a trajectory at the portfolio level, robust net-zero pathways broken down by sector and region are still lacking. Asset-class alignment is to be pursued by capital allocation and engagement. Both approaches are recognised as relevant not only to reach portfolio targets but also to influence companies to align towards net-zero, however the final framework recommends the prioritisation of engagement to drive alignment.[50]

The Protocol also aims to increase the share of portfolio assets whose issuers conform with the Alliance's alignment expectations (see Table 5 below). However, it only calls for reporting on this objective, i.e., no quantitative targets are required. Tracking the share of the portfolio covered by science-based targets is meant to measure the outcome of investor-influenced efforts. The Alliance readily admits that this metric is lacking in terms of granularity and outcome attribution. To link portfolio-level emissions reductions to real-world outcomes, the Protocol requires members to set sector-specific targets in priority sectors.[51] These encompass emissions and emissions intensity targets, plus a coal-phase pathway for power utilities. The insistence on intensity targets along absolute targets is meant to control for the use of asset disposal as a means to achieve targets. Ideally physical intensity targets (i.e., product/production specific targets) should be used, but where access to quality data remains a challenge, economic intensity measures are accepted. Scope 3 emissions should be included whenever data quality so allows. The Alliance provides guidance and physical intensity metric suggestions for an ambitious range of "key high-emitting sectors"[52].

46 - The PAII nevertheless recommends phasing in the direct consideration of Scope 3 emissions in line with the EU Sustainable Finance Disclosure Regulation but underlines that Scope 3 targets and reporting should be done separately given measurement and aggregation challenges. For the Alliance, it is premature to set Scope 3 emissions targets at the (sub-)portfolio level, but these emissions should nonetheless be tracked.
47 - By 2040, 100% of the assets should be net zero or aligned to net zero.
48 - Financed emissions are emissions from activities financed by loans and investments allocated to the financial institution in proportion to its share of lending or investment in the borrower or investee. They thus represent the indirect responsibility of the financial institution in respect of these emissions. The computation of financed emissions across asset classes is being standardised by the investor-led Partnership for Carbon Accounting Financials ("PCAF").
49 - Investors are expected to disclose the proportion that is considered net zero or aligned.
50 - The draft framework (IIGCC, 2020) was more balanced in its assessment of the "range of levers" at the disposal of investors to align portfolios and promote progress in the real economy. The finalised framework upgraded engagement from "a key component of a Paris aligned investment strategy," to "the primary mechanism to drive alignment."
51 - A member may ignore a sector if it can justify that it is insignificant relative to its portfolio size and emissions.
52 - Specifically: Utilities; Oil and Gas; Transport (Aviation, Shipping, Road transport); Materials (Steel, Cement, Aluminium); Agriculture, forestry, and fisheries; Construction and buildings; Water utilities; and Textiles and leather.

This guidance is meant to assist investors in target setting and to inform their engagement activity and capital allocation decisions. The Alliance commissioned work (Teske et al., 2020) that derived five-year sectoral targets consistent with an ambitious 1.5°C scenario modelled using the One Earth Climate Model ("OECM")[53] developed by the University of Technology of Sydney; these can be used as references in target setting. An alternative reference introduced by the updated Protocol is the new International Energy Agency ("IEA") Net Zero by 2050 scenario (although it does not offer full coverage of the key high-emitting sectors identified by the Alliance). To complement this top-down approach to sector targets, the Alliance will review and may include sector-specific pathways as references (i.e., where they are found to be compatible with carbon budgets and assumptions derived from scientific assessments and macro modelling). Members are allowed to phase sector targets in, starting with their most material sectors (by financed emissions) and increasing in breadth to cover at least 70% of financed emissions by 2025 (for 2030 targets). Sector targets can be met by capital allocation and engagement. However, engagement is viewed as the tool by which investors "may drive change at the company and sector-level in the real economy" (UNZAOA, 2021a). Alliance members are thus required to "identify either 20 emitters with focus given to those generating the most emissions or those responsible for 65% of their (…) 'owned-emissions' (…) and set (…) action targets with a focus on non-aligned emitters."

Table 5: Net-zero alignment expectations for corporates under the NZAOA Protocol (UNEP, 2022)

To immediately put into place policies and transition plans that commit to net-zero emissions by 2050 across their value chains and be supportive of the transition to a net-zero world by 2050;
To accelerate progress towards full 'green' on the CA100+ Net Zero Company Benchmark indicators,[54] or, if not a CA100+ target company, to still meet all of its expectations;
To set science-based near-term greenhouse gas reduction targets in line with reaching net zero by 2050, and consistent with maximum 1.5°C of warming;
To develop and implement plans for their businesses to remain viable in a climate-neutral economy, with meaningful consideration of associated social impacts;
To support adoption and implementation of governmental policies facilitating the transition to net-zero emissions;
To support, prepare for and not disrupt price mechanisms on greenhouse gas emissions;
To take action and make progress on efforts to lower the emissions intensity of their operations and products;
To disclose their efforts and progress on decarbonisation in line with the four core elements of disclosures recommended by the Taskforce on Climate-related Financial Disclosures (i.e., governance, strategy risk management, metrics and targets)[55];
To enter direct time-bound engagement dialogue with Alliance members and/or other investor initiatives to discuss efforts to decarbonise their business by 2050.

Source: UNEP (2022).

Asset-level alignment assessment in the Framework is central and rather ambitious in scope as it covers all companies in material sectors.[56] Assessment covers current climate performance and forward-looking alignment indicators. The "high-level" list of criteria the PAII recommends for the alignment assessment of listed equity and corporate debt (see Box 1) covers emissions disclosure, current emissions intensity[57], net zero ambition and short- and medium emissions reduction targets, and their credibility as informed by quantified business and investment plans ("decarbonisation

53 - The OECM assumes a rapid transition to 100% renewables by 2050 (56% of the mix by 2030) and energy electrification, high-energy efficiency across all sectors, a moratorium on land conversions by 2030 and massive emissions removal by afforestation and land restoration.
54 - Launched in December 2017, Climate Action 100+ ("CA100+") is the largest investor engagement initiative on climate change. Supported by PRI and the organisations behind the PAII, it facilitates collective engagement of systemic carbon emitters around three core asks: (i) setting up a strong governance framework; (ii) taking action to reduce emissions across the value chain in a manner consistent with Paris Agreement goals; and (iii) providing enhanced disclosures in alignment with TCFD recommendations (and sector-specific guidelines where applicable). Signatories are required to engage at least one of the focus-list companies to seek commitments with respect to these core asks. Launched in 2021, the CA100+ Net-Zero Company Benchmark assesses the performance of focus companies against the initiative's three high-level goals. The assessment considers ten disclosure indicators and for select sub-sectors (currently upstream oil & gas companies, coal and gas electric utilities, and automotive companies) is complemented by an analysis of capital expenditures and output relative to a range of future climate change scenarios.
55 - The reader may refer to our Overview Paper on the recent update to the TCFD recommendations and guidance for a description of this framework (Scientific Beta, 2021).
56 - NACE Sections A-H and J-L, i.e., Agriculture, forestry and fishing; Mining and quarrying; Manufacturing; Electricity, gas, steam and air conditioning supply; Water supply, sewerage, waste management and remediation activities; Construction; Wholesale and retail trade - repair of motor vehicles and motorcycles; Transportation and storage; Information and communication; and Financial and insurance activities. This adds the latter two sections to the high climate impact sectors considered in Commission Delegated Regulation (EU) 2020/2018 defining the standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks.
57 - Including against science-based targets, when set.

strategy") and consistent capital expenditures ("capital allocation alignment").[58] Lower impact companies can be assessed against disclosure, targets and current intensity only. Companies on the Climate Action 100+focus list; or in high impact sectors consistent with Transition Pathway Initiative[59] sectors[60]; or in the banking[61] and real estate sectors are to be treated as high impact. All companies should be assessed for climate mitigation revenues (or CAPEX where relevant).[62]

Asset-level alignment assessment in the Protocol supports capital allocation and engagement activities. The Protocol provides that sub-portfolio targets "enable an aggregate ambition and monitor progress, notably achieved through engagement and financing activities, against an asset class desired outcome"[63] and that engagement should prioritise high emitters that are non-aligned, meaning those "which do not already have Paris Aligned commitments, or do not have a concrete set of mid-term reduction targets." Assessment is the responsibility of each Member. Despite the forward-looking language of the Protocol in matters pertaining to alignment assessment, the Alliance encourages the use of PAII criteria (which balance current performance metrics with forward-looking decarbonisation indicators), which it considers aligned with its expectations. The Alliance sees "large potential" in temperature alignment tools "to incorporate systematically forward-looking data," but continue to regard these tools as unfit to guide investment management or inform on portfolio alignment.[64]

While both frameworks include quantified engagement requirements, these are focused on nonaligned issuers responsible for high emissions. Expectations of policy engagement by investors are limited. In this respect, the Framework requires that investors ensure that their direct and collective (e.g., through trade associations) advocacy supports policy and regulation relevant for achieving net zero emissions by 2050 but does not require that they engage in policy advocacy. The Protocol is even less demanding. This is despite the asset owner members of the Alliance having committed to seek portfolio alignment "especially through advocating for, and engaging on, corporate and industry action, as well as public policies, for a low-carbon transition of economic sectors." In practice, the Protocol does not explicitly require that policy advocacy by investors be consistent with net zero objectives and its revision no longer includes a call on Members to set action targets on policy advocacy.[65] Both frameworks identify priority topics (e.g., regulation and/or carbon pricing to deliver Paris Agreement commitments, promotion of mandatory climate disclosures in line with TCFD recommendations, development of country- and sector-specific pathways), targets and working methods for policy engagement.

Reflecting a conservative appreciation of fiduciary duty, the Protocol asserts that investors will be unable to achieve net-zero ambitions without the proper public policy in place to implement the Paris Agreement. While we do not wish to promote an excessively restrictive view of the leeway of fiduciaries, we agree that nothing is more urgent than for the parties to the Paris Agreement to introduce the regulation required to support the transition towards low greenhouse gas emissions

58 - Additional criteria to be included if feasible concern climate lobbying; climate governance; consideration of just transition issues; and disclosure of transition risks in accounts, refer to Appendix 1 for details.
59 - The Transition Pathway Initiative (TPI) is an investor-led initiative producing assessments of companies' preparedness for the low-carbon transition. The assessment has a qualitative dimension pertaining to the quality of companies' management of their emissions and transition risks and opportunities and a quantitative dimension pertaining to their carbon performance relative to Paris Agreement targets.
60 - Currently: 1. Airlines; 2. Aluminium; 3. Autos; 4. Cement; 5. Chemicals; 6. Coal Mining; 7. Consumer Goods; 8. Diversified Mining; 9. Electricity Utilities; 10. Oil & Gas; 11. Oil & Gas Distribution; 12. Other Industrials; 13. Paper; 14. Services (captures companies of relevance that cannot be classified elsewhere rather than the services sector per se); 15. Shipping and 16. Steel.
61 - For financial institutions, the alignment criteria cannot be applied in the same way, further guidance is expected.
62 - Since assessment is in relation with the EU Taxonomy, these revenues would capture not only "green" activities but also "transitional" activities that substantially reduce negative impact and "enabling" activities that allow other activities to make a substantial contribution.
63 - The inaugural Protocol had been as bold as to state: "Capital should be directed towards those companies (…) willing to transform their business models to align with a net-zero pathway."
64 - The reader may refer to our Overview Paper on the recent update to the TCFD recommendations and guidance for a short discussion of these tools (Scientific Beta, 2021).
65 - In addition, the Protocol now explicitly states that it does not require disclosure of climate policy positions and memberships in associations and organisations. In any case, engagement of and disassociation from collective entities that do not align their climate policy advocacy with the Paris Agreement and the goals of the Alliance are optional: Members are only advised to "consider taking an advocacy position" within these organisations, and to "consider" heading for the door in case voluntary engagement efforts fail.

and climate-resilient development. Drastic action is required to mitigate the consequences of the developing climate catastrophe and government officials' continued inaction combined with intensifying calls on the finance sector to rise to the challenge of climate change, whether naïve or irresponsible, bodes ill for the survival of our civilisations. Against this backdrop, it is regrettable that political actions by investors are not more forcefully advocated by the frameworks. Approaching diversified institutional investors with long-term horizons as universal owners provides a (financial) motivation for reducing externalities beyond what can be justified when investments are considered in isolation. However, calls to investor action and associated frameworks focus on the engagement of investee companies that benefit from these externalities rather than on the regulators and policy makers that can legislate the internalisation of environmental costs.[66] Research and guidance on the role that asset owners could play as ESG lobbyists remains sorely underdeveloped.[67]

Box 1: PAII framework for asset alignment assessment (listed equity and corporate debt), PAII, 2021

The Framework requires assessment of companies' net-zero transition plans and revenues from EU Taxonomy compliant activities pertaining to climate change mitigation (both for 'substantial mitigation contribution' and 'enabling activities').
It puts forward the following 10 criteria for assessment of transition plans, the first six are "core criteria" that are key to verifying whether a company has a "a credible, science-based Net Zero Transition Plan" (IIGCC, 2021b):

1. Ambition: a long-term 2050 goal consistent with global net zero;
2. Targets: short- & medium-term emissions reduction targets;
3. Emissions performance: current emissions intensity performance (Scope 1, 2, and material scope 3) relative to targets, where science-based targets exist;
4. Disclosure: disclosure of Scope 1, 2 and material Scope 3 emissions;
5. Decarbonisation Strategy: a quantified plan setting out decarbonisation measures; proportions of green revenues and where relevant their increases;
6. Capital Allocation Alignment: a clear demonstration that the capital expenditures are consistent with net zero by 2050.

And subject to data availability, the following four "complementary criteria"[68]:
7. Climate Policy Engagement: Paris-Agreement-aligned climate lobbying position and alignment of direct and indirect lobbying activities;
8. Climate Governance: clear oversight of net zero transition planning and executive remuneration linked to delivering targets and transition;
9. Just Transition: consideration of impacts from transitioning on workers and communities;
10. Climate risk and accounts: disclosures of transition risks through TCFD Reporting and incorporation of such risks into financial accounts.

Lower impact companies may be assessed on criteria 2 to 4 only.

The Framework suggests assessing companies' current climate performance and alignment potential and grouping them into five categories: i) already achieving net zero; ii) aligned to a net zero pathway; iii) aligning to net zero; iv) committed to aligning; and v) not aligned.

Table 6 presents the requirements for each of these categories.

66 - For example, the recital of the Principles for Responsible Investment (the "Principles") explains that institutional investors, as fiduciaries, have "a duty to act in the best long-term interests of (…) beneficiaries" and that "ESG issues can affect the performance of investment portfolios." It also observes that applying the Principles "may better align investors with broader objectives of society". However, policy engagement is not mentioned explicitly as a modality of investor action in the Principles: "1. We will incorporate ESG issues into investment analysis and decision-making processes; 2. We will be active owners and incorporate ESG issues into our ownership policies and practices; 3. We will seek appropriate disclosure on ESG issues by the entities in which we invest; 4. We will promote acceptance and implementation of the Principles within the investment industry; 5. We will work together to enhance our effectiveness in implementing the Principles; 6. We will each report on our activities and progress towards implementing the Principles."
67 - This makes it all the easier to represent that such activity violates fiduciary duties by heightening regulatory risk and compliance costs faced by investee companies.
68 -The IIGCC (2021b) writes that measurement of complementary criteria is recommended as part of a comprehensive approach to company assessment, and that these may also be relevant indicators "to determine companies making earlier stage progress towards alignment."

Table 6: Minimum requirements for qualification by alignment categories

achieving net zero	Current emissions intensity performance at, or close to, net zero emissions with an investment plan or business model expected to continue to achieve that goal over time.
aligned to a net zero pathway	Meeting criteria 1-6 for higher impact companies or criteria 2-4 for other companies. Adequate performance over time in relation to criterion 3, in line with targets set.
aligning towards a net zero pathway	Have set a short or medium-term target (criteria 2). Disclosure of Scope 1, 2 and material scope 3 emissions data (criteria 4). A plan relating to how the company will achieve these targets (partial criteria 5).
committed to aligning	Have set a clear goal to achieve net zero emissions by 2050 (criteria 1).

Source: PAII (2021)

5. Net-Zero Equity Investment Management

PAII Net Zero Investment Framework

The Framework considers three key elements to align portfolios and influence and incentivise companies to decarbonise:

- "Portfolio construction" based on alignment assessment with best-in-class selection or positive weighting in relation to performance along alignment criteria and climate solutions revenues;
- Engagement and stewardship including a voting policy aligned to the Framework and an engagement strategy around alignment criteria that includes clear milestones and an escalation process that feeds back to investment, weighting, and divestment.
- Selective divestment based on transition risk tolerance, failure to respond to engagement, or incompatibility with a credible net-zero pathway.

As for "portfolio construction," the Framework's language indicates preference for sector-level positive weighting in relation to decarbonisation objectives, both for passive assets and existing active assets. Screening on the basis of alignment or potential for transition is recommended for new active assets. The PAII views these portfolio construction approaches as incentivising companies to align to net zero goals. The draft framework (IIGCC, 2020) clearly underlined the importance of this investor impact channel: "Large scale investor action in this direction sends a clear market signal regarding the availability of capital for higher performing companies and the potential for increased valuation and lower cost of capital going forward. It also incentivises poorly performing companies to improve their alignment to access capital from Paris aligned investors and products."

The contribution of these portfolio construction approaches to the promotion of emissions reduction in the real economy is no longer emphasised in the final Framework. Instead, engagement and stewardship activities aimed at encouraging companies to set out and follow-up on alignment plans are given precedence, in particular for existing assets. Due to the high potential cost of engagement, the Framework recommends that it be prioritised based on weighted carbon intensity so as to target entities material to portfolio exposure and the transition and on which capital allocation affords influence; it also encourages collective action.

The Framework provides further advice to optimise the potential impact of engagement and stewardship; in particular, it recommends a transparent, alignment-criteria based engagement strategy (encompassing dialogue and voting) with clear milestones and an escalation process including voting where relevant and feeding back to capital allocation (see Table 7). The Framework shows remarkable coherence by aligning all three investor impact channels. Indeed, it also provides that policy advocacy should support policy and regulation relevant for achieving net-zero.

The Framework clearly states that exclusion is not recommended as a standalone or the primary strategy for portfolio alignment. However, it remains in "the toolbox for aligning a portfolio" to deal with specific circumstances. "Selective divestment" is notably appropriate when engagement fails to produce the desired progress or where an issuer's primary activity[69] can no longer be considered permissible in the context of a credible pathway towards global net zero emissions. As for the former justification, many respondents to the draft framework consultation, among which Scientific Beta, underlined that divestment was a modality of active ownership and that effective engagement required a genuine escalation process with the potential for divestment as the ultimate outcome; the finalised framework shows alignment with these views (which are supported by a rich academic literature, both theoretical and empirical). As for the latter justification, the Framework recommends that no additional capital, including through secondary market transactions, should go to companies with new thermal coal projects (mining, power) or developing oil/tar sands exploitation). For existing assets, engagement should ensure these goals are met and that unabated coal-fired electric production capacity be phased out in a manner consistent with net zero pathways (while taking into account 'just transition'[70] considerations).

Table 7: Paris-aligned stewardship and voting approach under the PAII Framework

Publish a voting policy that aligns to the Framework.
Set an engagement strategy with clear milestones and an escalation process with a feedback loop to investment, weighting, and divestment decisions.
Prioritise engagement efforts based on relative exposure (weighted carbon intensity)
Undertake engagement with companies to improve performance against the Framework's asset alignment assessment criteria.
Inform companies of expectations in relation to alignment criteria, including where relevant in relation to votes, to improve company performance against metrics in line with the engagement strategy.
Join collective engagement initiatives and play an active role in engagement activities.
Publish voting records, and rationale for deviating from policy and be clear how assets have been managed in alignment with clients' stewardship and investment policies.
Further specifications apply to listed equity:
Implement an escalation approach, using the full range of routine annual general meeting routes.
Where a company is not on track to achieve its transition plan or targets set for two years or more, vote against the board, remuneration policy, annual report and accounts.
Vote against M&A unless the post M&A company meets or can be expected to meet the criteria within a reasonable period.
Ensure you or your managers have voting rights to undertake the above actions.
Co-file and/or support shareholder resolutions in line with the criteria.

Source: PAII (2021).

NZAOA Target Setting Protocol

Unlike the Framework, the Protocol does not explicitly recommend capital allocation strategies to members, whether to align portfolios or promote real-world emissions reductions – each member retains explicit freedom to select the strategies and mechanisms that it considers best suited to discharge its commitment and fiduciary duties. This notwithstanding, the strategies discussed are the same as those appearing in the Framework, i.e., sector weighting and best-in-class strategies, investment in climate solutions, and divestment. The Protocol considers that capital allocation can contribute to portfolio alignment (the inaugural Protocol had also noted that it could be used to improve "the long-term risk-return characteristics of the portfolio,") but it strongly favours engagement to promote changes in the real economy.[71] While less prescriptive than the Framework in terms of portfolio construction, the language of the Protocol indicates comfort with

69 - Non-permissible activity thresholds may be used.
70 - One of the recitals of the Paris Agreement claims that it takes into account "the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities".
71 - The Financing Transition section of the inaugural Protocol had also listed "reallocation within one sector, best-in-class strategy" as one of the approaches supporting "sector decarbonization of the real economy." The other approaches were "decarbonisation of companies"; "sector weighting, reallocation across sectors" and "investing in climate solution investments."

(screening and) best-in-class, sector-level strategies as well as divestment; for example, it notes that: "Understanding a company's performance relative to its peers in the same sector allows an investor to identify the most 'carbon efficient' companies and re-allocate capital from the worst to the best performers." [72]

Engagement is the tool which the Protocol assumes can most effectively drive asset-level alignment. Engagement activities recognised by the Protocol cover bilateral and collaborative engagements targeting individual companies, and/or sectors/value chains, and/or asset managers[73] and contributions to Alliance position papers (which are meant to leverage engagement activities). Members are required to select two or more of these four contribution types and define their own outcome-based key performance indicators within the framework provided by the Protocol (see Table 8). Members must ensure their engagement activities cover either 20 companies with a focus on those with the highest contribution to financed emissions or companies that collectively account for at least 65% of their financed emissions; engaging non-aligned companies should be the priority. Members are also required to define a structured engagement approach if engaging asset managers.

Table 8: Engagement Key Performance Indicators under the NZAOA Protocol

	Collective engagement	Bilateral engagement
Corporate engagement	Support of any kind (e.g., active participation) in collaborative engagement with companies, which are in line with the ambitions of the Alliance, e.g., CA100+.	Performance of corporate engagement aligned with Alliance's net-zero corporate expectations (direct or entrusted to asset manager)
Sector (and value chain) engagement	Support of any kind, notably contribution to the creation of an engagement protocol or consistent contribution to a round table (through institutional representation or co-organisation).	Publication of expectations for specific (sub-) sectors or direct discussions with corporates
Asset manager engagement	Contribution to collective asset manager engagement or development of Alliance engagement guidelines	Engagement on climate-related stewardship activities for existing managers or weaving of Alliance guidelines into asset manager selection, appointment, and monitoring.
Position paper contribution	Material participation in the development of an Alliance position paper (e.g., written contributions and attendance at meetings)	Net-zero position paper published in line with Alliance corporate expectations

Source: UNEP (2022).

It is fair to note that, while putting engagement at the centre and recognising that it requires "significant resources and perseverance," the inaugural Protocol failed to provide guidance on how it should be conducted for maximum effectiveness. While the draft protocol was criticised on this count (e.g., by Reclaim Finance, 2020), adjustments made to the final protocol were limited to adding language to acknowledge the importance of clear objectives, timelines and escalation tactics for engagement and to recommend collective action.[74] This was in stark contrast with the Framework, which briefly but clearly lays out recommendations for engagement and stewardship (see Table 7 above),[75] The updated Protocol partially bridges that gap by adding that engagement efforts should "outline what action is taken when engagement expectations are not met." Members are not required to link engagement to investment decisions but are invited to explain how they employ proxy voting to align with their net-zero commitment. The updated Protocol strongly recommends that votes be used to hold companies accountable when they are found to be making unsatisfactory progress in matters of climate action. While one may accept that antitrust considerations justify the Alliance's reluctance to go beyond this and lay down timelines and voting instructions to respond to

72 - The inaugural Protocol had also remarked that sector targets "help limit exposure to stranded assets and direct capital towards climate change leaders within a sector." It had also clearly underlined that targets affecting portfolio construction should be reached on a sector-neutral basis ("so long as the sector activities are transformable to a net-zero economy").
73 - Asset manager engagement is meant to evaluate climate change mitigation efforts and management of climate issues, and to "ensure alignment of stewardship activities and public messaging with the long-term climate interests of the Alliance on climate change."
74 - We acknowledge that there are insider trading, antitrust, and other regulatory limitations to take into account when organising collective action but this does not prevent from providing more detailed guidance on proper escalation path, inter alia.
75 - The draft framework included further provisions on timeframes and milestones (see IIGCC, 2020).

failed engagements by way of proxy voting, the Protocol does not even explicitly require members to publish voting policies and voting records. Hence, proxy voting requirements imposed on members are far less stringent than those the Alliance suggests members apply to asset managers' proxy voting approaches. (see NZAOA, 2021b).

It is also fair to say that the flexibility of the Protocol with respect to engagement targets allows for relatively modest contributions to clear its compliance bar. Since compliance with the Protocol does not require the use of capital allocation to incentivise decarbonisation (or even the setting of sector decarbonisation targets) and the Alliance no longer calls on asset owners to set action targets on policy advocacy, it would be difficult to claim that an investor commitment to implement the Protocol necessarily translates into a significant effort to incentivise the transition in the real economy. From the point of view of climate change mitigation, it is to be hoped that the Protocol will be used as a base on which to build ambitious voluntary investor action, or for medium-term target setting in connection with the Framework.

The Protocol acknowledges that divestment may be used to promote real-world change but is most comfortable with it being used as a last resort escalation tactic in an engagement strategy or if proceeds are used to change "the financing cost or liquidity for activities considered to yield positive impacts on the real economy." It is fair to say that the Protocol considers divestment primarily as a one of the tools to discharge fiduciary duties, e.g., to adjust exposure to transition risks, and to align the portfolio with net-zero commitments to the extent possible. In the latter regard, the inaugural Protocol required that all targets be in line with the findings of the IPCC Special Report on Global Warming of 1.5°C in respect of coal (IPCC, 2018). As such, target setting on power utilities should include a net-zero consistent coal phase out pathway; guidance given by the Alliance is in-line with phasing out unabated coal-fired power generation by 2040 globally and by 2030 for industrialised countries.[76] The Alliance also expects investee companies to exclude new coal power plants from their activities, defined broadly,[77] and cancel all new thermal coal projects (other than those already under active construction), including coal mines and related infrastructure. Coal divestment is probably the area in which the inaugural Protocol was stricter than the Framework.[78]

Conclusion

Both the Paris Aligned Investment Initiative Net Zero Investment Framework Implementation Guide (the "Framework") and the UN-convened Net Zero Asset Owner Alliance 2025 Inaugural Target Setting Protocol (the "Protocol") are frameworks whose ambition is to assist investors define investment management goals that are consistent with science-based net-zero pathways and encourage them to implement portfolio alignment in a manner that promotes progress in the real economy.

These frameworks identify capital allocation, issuer engagement, and third-party engagement as portfolio alignment tools and channels that investors may use to try and alter activity in the real economy. Capital allocation is primarily approached as a tool to direct capital towards climate leaders and limit exposure to downside transition risks. Consistent with conventional wisdom in the sustainable investment industry, issuer engagement is regarded as the tool of choice to influence issuers to improve their climate performance and adopt and implement transition plans. While engagement of other stakeholders, and notably policy makers, is identified as key to promoting an environment facilitating portfolio and economic alignment, it is not given a central role in the frameworks.

76 - Coal thresholds may be expressed in relation to either 'energy generated' or 'installed capacity'.
77 - The Alliance (NZAOA, 2020) calls for no further thermal coal power plants to be "financed, insured, built, developed or planned."
78 - As for other fossil fuels, the updated Protocol clarifies that "sector targets for utilities and energy sectors should reflect the scientific consensus, as derived from the IPCC no/low overshoot pathways, IEA NZE2050 and OECM," to also withdraw financing from new oil and gas fields and "refrain from investing in, or providing finance to," assets that support the expansion of oil or gas production (and to scale down production as indicated in the scenarios). The target setting guidance for the newly introduced infrastructure asset class makes it clear that members are expected not to finance upstream greenfield oil projects beyond those already committed by the end of 2021. Further guidance is expected in a forthcoming position paper on oil and gas.

The Framework provides a top-down approach to alignment from defining a strategy and setting portfolio-level objectives for decarbonisation and investment in climate solutions, to defining an optimal asset allocation and specifying how it should be implemented, down to assessing alignment at the asset-class level on the basis of asset-level criteria and improving alignment by portfolio construction and issuer engagement. It also calls upon investors to ensure that their advocacy initiatives support policy and regulation relevant for achieving net-zero. The Protocol is concerned with five-year goals and calls on investors to set engagement targets as well as targets in at least two of the three areas it covers, i.e., emissions at asset-class or portfolio level, emissions at sector level, and activities supporting the financing of climate solutions. The Protocol encourages investors to contribute to policy work but does not require asset owners to set targets on policy advocacy as part as their engagement targets.

Both frameworks call for the definition of top-level emissions reduction targets to guide portfolio alignment: investors implementing the Framework must set <10-year targets for emissions (intensity) reduction and allocation to climate solutions that are consistent with conservative 1.5°C scenarios while the updated Protocol has upped emissions reduction targets to match the ambitions of these scenarios (target reductions are 22% to 32% by 2025 and 49% to 65% by 2030). Both frameworks underline that alignment should be approached at the sector level to avoid greenwashing whereby portfolio alignment is performed by cross-sector reallocations that are not called for by the transition pathway and do little to incentivise alignment by issuers. To try and link portfolio alignment to real world progress, the Framework requires that investors set a five-year goal for increasing the percentage of their assets – in material sectors from a climate change perspective – that may be considered net zero or aligned or aligning to a relevant net zero pathway; and ensure that 70% of the financed emissions in these sectors are either pathway-compatible or subjected to engagement. Asset-level alignment assessment in the Framework is central and ambitious in scope as it covers all companies in broadly defined material sectors. Alignment is assessed according to detailed criteria balancing current climate performance metrics with forward-looking decarbonisation indicators; all companies are assessed against short- and medium-term emissions reduction targets, current emissions intensity, and emissions disclosure and higher impact companies are also judged by their net zero ambitions and the credibility of ambitions and targets informed by quantified business and investment plans and capital expenditures. All companies also need to be assessed in relation to their revenues from climate mitigation activities (or their related CAPEX). The Protocol calls for (but does not require) the setting of five-year efficiency gain targets at sector level informed by sector-specific pathways, starting with key high emitting sectors. Sector targets may be achieved through capital allocation and/or engagement. In the latter regard, the Protocol requires investors to either identify 20 large emitters or those responsible for 65% of their financed emissions and to set action targets with a focus on emitters without Paris-alignment commitments or "concrete" mid-term emissions reduction targets. This forward-looking orientation notwithstanding, the Protocol encourages the use of the Framework's asset alignment criteria.

The frameworks envisage two main ways to incentivise alignment at the level of issuers: capital allocation, whereby the investor allocates its funds in relation to issuer alignment to try to alter issuers' access to capital and send market signals to promote issuer alignment, and engagement, whereby the investor attempts to influence issuers towards adopting and following through plans for alignment through dialogue–conducted directly or through collective initiatives–voting policy and shareholder proposals. As part of capital allocation, exclusions (or "selective divestment") are

viewed as appropriate alignment tool for activities that are fundamentally misaligned with credible net-zero pathways or when engagement fails. Considering that capital allocation contributes to incentivising alignment, the Framework mandates that portfolio construction for passive solutions implement positive weighting in relation to each issuer's degree of alignment relative to its sector and climate solutions revenues. It also recommends a transparent, alignment-criteria based issuer engagement strategy with clear milestones and an escalation process feeding back to capital allocation. Thus, it aligns capital allocation and issuer engagement and creates synergies between investor impact channels as alignment-based capital allocation provides credibility and leverage to engagement activities. The Protocol also recognises that in-sector best-in-class strategies and investment in climate solutions can contribute to decarbonising the economy but downplays capital allocation as an investor impact channel. It does not make explicit portfolio construction recommendations (and does not require quantitative targets for investment into climate solutions as it considers such investment opportunities are currently too scarce and investor efforts should be targeted at enhancing supply). While making engagement its sole recommended investor impact channel, the Protocol offers a high degree of flexibility in engagement modalities, lets each investor define the ambition of its engagement targets, and does not require setting targets in respect of the end-result sought by engagement, i.e., issuer-level alignment. However, engagement that is not associated with an escalation process linking to proxy voting and capital allocation may not be very effective as an investor impact tool.

The Framework provides a top-down model to translate net-zero commitments into portfolio-level goals and plans in respect of decarbonisation and climate solutions, and coherent, synergistic, use of investor impact channels linked to well-defined alignment criteria and monitoring metrics. However, it does not offer much guidance for the setting of medium-term targets or much colouring on engagement activities in practice. The Protocol offers guidance for the setting of five-year targets down to the sector level and in respect of engagement activities and provides an alternative perspective on climate solutions. However, it eschews capital allocation as potential investor impact tool and is not particularly demanding in respect of engagement activities and outcomes. As a stand-alone framework, the Protocol might thus come across as excessively accommodating of net-zero investor commitments lacking in impact ambition and potential. There is no doubt however that it may be viewed as particularly useful in combination with the Framework's investor-impact maximisation coherent architecture in that it helps translate medium-to-long-term portfolio-level targets into five-year targets down to the level of key transition sectors and also offers guidance on engagement activities.

Given the limited scientific evidence linking investor impact tools, in particular shareholder engagement, to substantial real-world progress, investors wishing to link their net-zero investment commitments to impact should not only consider opting for frameworks and approaches that maximise potential investor impact, but also document the implementation of their impact strategies and endeavour to measure their real-world outcomes.

Appendix: PAII Framework – Components of a Net-Zero Investment Strategy

Component	Purpose
Governance and Strategy	**To set the overall net zero portfolio emissions goal and adopt a consistent investment strategy**, provide direction, and a basis for action. Transparency of action plan, monitoring and accountability for delivery of strategy and achievement of targets are also included
Setting portfolio level objectives and targets	**Lay out <10 year targets for reduction in (Scope 1+2) emissions (intensity) and allocation to climate solutions (% of revenues of CAPEX), consistent with conservative 1.5°C scenarios in terms of removals**, review and revise at least every five years. No quantitative guidance given
Strategic Asset Allocation (SAA)	To define an **optimal asset allocation** for the portfolio in order to help achieve alignment goals alongside standard risk/return objectives and other constraints, and specify the way in which asset allocation should be implemented – **via choice of benchmarks and design of investment mandates** – to achieve goals
Asset class alignment: • Sovereign Bonds • Listed Equity and Corporate Fixed Income • Real Estate	To **assess asset alignment relative to relevant**, e.g., sector, **pathways** and contributions to solutions using current (emissions performance, disclosure) & forward-looking criteria (decarbonisation targets, plans, CAPEX) to set targets defined as: • **a five-year increase in share of (material sectors) assets qualifying as i. net zero, ii. net-zero aligned, or iii. aligning to a net zero pathway** (in 2040, 100% should be under i. or ii.); • **an engagement goal, whereby 70% of the financed emissions in material sectors are either net zero (aligned) or subjected to engagement.** Investment management and investor impact tools to achieve these targets are: • **Portfolio construction to increase allocation to more aligned assets and solutions revenues** [via screening and weighting in active management and positive weighting in passive management] • **Engagement with feedback to capital allocation to influence assets towards greater alignment** • **Exclusions for inconsistency with net-zero pathways, engagement failure, and risk management**
Advocacy and market engagement	To **shift the policy environment to support decarbonisation and investment in climate solutions**, and increase the ability of investors to take forward a net zero investment strategy. To encourage the market to provide the data, tools, and advice that underpins investors' investment strategy implementation

Appendix: NZAOA Protocol Four-part Target Setting Structure

Component	Purpose / implementation
Engagement Targets (non waivable)	• **To increase the share of investees aligned with the Alliance's expectations** (net-zero commitment, consistent interim GHG reduction targets, transition plans, policy support, GHG intensity reduction efforts and reporting, acceptance of engagement). Success measured by uptake of **science-based targets** • **Engagement with either 20 companies amongst the highest emitters or those responsible for 65% of financed emissions without Paris-aligned transition commitments** (assessment as per PAII/CA100+ benchmarking criteria encouraged). KPIs set in relation to: direct or collective (i) bilateral engagement, (ii) sector/value chain engagement; (iii) publication of or contribution to position papers, or (iv) asset manager engagement.
(Sub-)portfolio Emission Targets • Listed Equity • Listed Corp. Debt • Real Estate • Infrastructure	• **To achieve CO_2e (Scope 1+2) (intensity) reduction of 22%-32% by 2025** and 49%-65% by 2030 (vs 2020) at asset-class level or across classes (for real estate, Carbon Risk Real Estate Monitor national pathways are also accepted) • To be pursued by **engagement** and **capital allocation**, as much as possible on a sector-neutral basis. Capital should be directed to those willing to align with net-zero pathway (investor assessment, PAII criteria relevant). Exclusions as investor impact tools are appropriate in relation to the Alliance's coal-exit pathway, in the context of a divest/invest impact approach, or in support of the engagement strategy
Sector Targets	• **To promote GHG efficiency gains in key high emitting sectors** and inform capital allocation (i.e., limit exposure to stranded assets and direct capital towards leaders) and engagement. • Sectoral Decarbonisation Pathways should be used to set targets – sector-specific GHG intensity KPIs are recommended - Scope 3 to be included wherever possible
Financing Transition Targets	• **To contribute to the Alliance's financing transition work, e.g., supporting activities to provide greater transparency, build solutions or enhance climate solution reporting** • Report on progress on climate-positive investments (no quantitative target required).

References

• Abdulla A., R. Hanna, K. R. Schell, O. Babacan and D. G. Victor (2021). Explaining successful and failed investments in U.S. carbon capture and storage using empirical and expert assessments, *Environmental Research Letters* 16(1).

• Amenc, N., E. Christiansen, M. Esekia and F. Goltz (2020). ESG Engagement and Divestment: Mutually Exclusive or Mutually Reinforcing? Scientific Beta (May).
Available at: https://www.scientificbeta.com/factor/download/file/esg-engagement-and-divestment

• Busch, T., M. Johnson, T. Pioch and M. Kopp (2020). Corporate carbon performance data: Quo vadis? Forthcoming in *The Journal of Industrial Ecology*.
Available at: https://doi.org/10.1111/jiec.13008

• Ceres (2021). About Us, website page, https://www.ceres.org/about-us, accessed on 15 April 2021.

• Christiansen, E. and F. Ducoulombier (2018). ESG Incorporation – A Review of Scientific Beta's Philosophy and Capabilities, White Paper, Scientific Beta (September).

• Ducoulombier, F. (2021). Understanding the Importance of Scope 3 Emissions and the Implications of Data Limitations, *The Journal of Impact & ESG Investing* 1(4) 63–71.
Available at: https://eprints.pm-research.com/17511/55152/index.html?84641

• Ducoulombier, F. and V. Liu (2019). Scientific Beta ESG Option – Upholding Global Norms and Protecting Multifactor Indices against ESG Risks, White Paper, Scientific Beta (July).

• Ducoulombier, F. and V. Liu (2021). Carbon intensity bumps on the way to net zero, *The Journal of Impact & ESG Investing* 1(3) 59–73.
Available at: https://eprints.pm-research.com/17511/51361/index.html?53073

• Duffy K.A., C. R. Schwalm, V. L. Arcus, G. W. Koch, L. L. Liang, and L. A. Schipper (2021). How close are we to the temperature tipping point of the terrestrial biosphere? *Science Advances* (7)3.

• Hawkins E., P. Ortega, E. Suckling, A. Schurer, G. Hegerl, P. Jones, M. Joshi, T. J. Osborn, V. MassonDelmotte, J. Mignot, P. Thorne, and G. Jan van Oldenborgh (2017). Estimating Changes in Global Temperature since the Preindustrial Period, *Bulletin of the American Meteorological Society* 98(9) 1841–1856.

• IIGCC (2020). Paris Aligned Investment Initiative: Net Zero Investment Framework for Consultation, White Paper, The Institutional Investors Group on Climate Change.
Available at: https://www.iigcc.org/download/net-zero-investment-framework-consultation/?wpdmdl=3602&masterkey=5f270ef146677

• IIGCC (2021a). IIGCC Net Zero Investment Framework: Consultation Response, White Paper, The Institutional Investors Group on Climate Change.
Available at: https://www.iigcc.org/download/consultation-response-net-zero-investment-framework/?wpdmdl=4339&refresh=60f8d6ea296001626920682

• IIGCC (2021b). Net Zero Investment Framework: IIGCC Supplementary Guidance on Target Setting, White Paper, The Institutional Investors Group on Climate Change.
Available at: https://www.iigcc.org/download/net-zero-investment-framework-iigcc-supplementary-target-setting-guidance/?wpdmdl=5224&refresh=61f2199d026c61643256221

• IPCC (2018). Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, Maycock, M. Tignor, and T. Waterfield (eds.)], Intergovernmental Panel on Climate Change, World Meteorological Organisation, Geneva, Switzerland.
Available at: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_Low_Res.pdf

• IPCC (2021). Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis – Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)], Intergovernmental Panel on Climate Change, Cambridge University Press, in Press.

• Kölbel, J., F. Heeb, F. Paetzold, and T. Busch (2019). Can Sustainable Investing Save the World? Reviewing the Mechanisms of Investor Impact, White Paper.
Available at SSRN: https://ssrn.com/abstract=3289544 Forthcoming in *Organization & Environment*.

• Le Quéré, C., M. R. Raupach, J. G. Canadell, G. Marland, L. Bopp, P. Ciais, T. J. Conway, S. C. Doney, R. Feely, P. Foster, P. Friedlingstein, K. Gurney, R. A. Houghton, J. I. House, C. Huntingford, P. E. Levy, M. R. Lomas, J. Majkut, N. Metzl, J. P. Ometto, G. P. Peter, I. C. Prentice, J. T. Randerson, S. W. Running, J. L. Sarmiento, U. Schuster, S. Sitch, T. Takahashi, N. Viovy, G. R. van der Werf, F. I. Woodward (2009). Trends in the sources and sinks of carbon dioxide. *Nature Geoscience* 2 831–836.

• Lütkehermöller, K., S. Mooldijk, M. Roelfsema, N. Höhne,and T. Kuramochi (2020). Unpacking the finance sector's climate-related Investment commitments, White Paper, NewClimate Institute, Utrecht University.
Available at: https://newclimate.org/2020/09/04/unpacking-the-finance-sectors-climate-related-investment-commitments/

• NZAOA (2020). Thermal Coal Position, Position Paper, UN-convened Net-Zero Asset Owner Alliance.
Available at: https://www.unepfi.org/publications/aoapublication/alliance-thermal-coal-position/

• NZAOA (2021a). Inaugural 2025 Target Setting Protocol, UN-convened Net-Zero Asset Owner Alliance.
Available at: https://www.unepfi.org/publications/aoapublication/inaugural-2025-target-setting-protocol/

• NZAOA (2021b). Elevating Climate Diligence on Proxy Voting Approaches: A Foundation for Asset Owner Engagement of Asset Managers, UN-convened Net-Zero Asset Owner Alliance.
Available at: https://www.unepfi.org/wordpress/wp-content/uploads/2021/04/16-Elevating-Climate-Diligence-2.pdf

• NZAOA (2021c). The Net in Net Zero: The Role of Negative Emissions in Achieving Climate Alignment for Asset Owners, Position Paper, UN-convened Net-Zero Asset Owner Alliance.
Available at: https://www.unepfi.org/publications/the-role-of-negative-emissions-in-achieving-climate-alignment-for-asset-owners/

• PAII (2021). Net Zero Investment Framework: Implementation Guide, Paris Aligned Investment Initiative (The Institutional Investors Group on Climate Change, Ceres, Asia Investor Group on Climate Change, Investor Group on Climate Change).
Available at: https://www.iigcc.org/download/net-zero-investment-framework-implementation-guide/?wpdmdl=4425&refresh=60f8caa79150a1626917543

• PCAF (2020). The Global GHG Accounting and Reporting Standard for the Financial Industry, First edition, Partnership for Carbon Accounting Financials.
Available at: https://www.carbonaccountingfinancials.com/files/downloads/PCAF-Global-GHG-Standard.pdf

• Reclaim Finance (2020). Answer to the Consultation on NZAOA's draft setting protocol 2025, White Paper, Reclaim Finance.
Available at: https://reclaimfinance.org/site/wp-content/uploads/2020/11/NZAOA-consulation-RF-answers.pdf

• Scientific Beta (2021). TCFD Recommendations and 2021 Guidance, Overview Paper, Scientific Beta. Available at: https://www.scientificbeta.com/factor/download/file/tcfd-recommendations-and-2021-guidance

• Sjöström, E. (2020). Active ownership on environmental and social issues: What works? A summary of the recent academic literature, Misum, White Paper, Stockholm School of Economics & Stockholm Sustainable Finance Centre.
Available at: https://www.mistra.org/wp-content/uploads/2020/02/sjocc88strocc88m_active-owership_report-2020.pdf

• Sparkes, R. and C.J. Cowton (2004). The Maturing of Socially Responsible Investment: A Review of the Developing Link with Corporate Social Responsibility, *Journal of Business Ethics* 52: 45–57.

• UNEP (2019). Emissions Gap Report 2019, United Nations Environment Programme, Nairobi.
Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/30797/EGR2019.pdf?sequence=1&isAllowed=y

• UNEP (2019). Emissions Gap Report 2019, United Nations Environment Programme, Nairobi. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/30797/EGR2019.pdf?sequence=1&isAllowed=y

• UNEP (2022). UN-convened Net-Zero Asset Owner Alliance: Target Setting Protocol—Second edition, United Nations Environment Programme.
Available at: https://www.unepfi.org/net-zero-alliance/resources/target-setting-protocol-second-edition/

• Teske, S., S. Niklas, A. Atherton, S. Kelly and J. Herring (2020). Sectoral pathways to net zero emissions, Report prepared by the University of Technology Sydney for the Net Zero Asset Owners Alliance
Available at: https://www.unepfi.org/publications/aoapublication/sectoral-pathways-to-net-zero-emissions/

• UNFCCC (2021). Race to Zero – Starting Line and Leadership Practices 2.0, Technical Note, United Nations Framework Convention on Climate Change.
Available at: https://racetozero.unfccc.int/wp-content/uploads/2021/04/Race-to-Zero-Criteria-2.0.pdf

• Weiss, C. H. (1995). Nothing as Practical as Good Theory: Exploring Theory-based Evaluation for Comprehensive Community Initiatives for Children and Families, in New Approaches to Evaluating Community Initiatives: Concepts, Methods, and Contexts, ed. James Connell et al. Washington, DC: Aspen Institute.

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