

THE NET ZERO INVESTOR PLAYBOOK

Investor Leadership Network



INVESTOR
LEADERSHIP
NETWORK

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ABOUT THE ILN

Launched at the 2018 G7, the Investor Leadership Network (ILN) champions initiatives and facilitates collaboration across leading global investors who are committed to accelerating the transition to a more inclusive and sustainable economy. As of September 2022, the ILN's membership is comprised of 13 global institutional investors across six countries, with over US\$10 trillion in assets under management. This platform encourages members to share resources, expertise and networks to develop, promote and deliver scalable initiatives and solutions on climate change, diversity and inclusion, and sustainable infrastructure.

The Investor Leadership Network (ILN) has established its Climate Change Advisory Committee to facilitate collaboration among global investors, build on existing guidance and best practices, and promote and operationalize net zero commitments.

The ILN's Climate Change initiative is dedicated to providing investors and other industry stakeholders with resources and guidance to limit and mitigate the impacts of climate change. The initiative's previously published reports have supported investors in integrating some of the most pertinent climate related initiatives and practices. Each publication has advanced the industry's understanding of climate change impacts and the urgency of investor's involvement in supporting mitigation and adaptation.



TCFD implementation: Practical insights and perspectives from behind the scenes for institutional investors

Published in 2019, ILN's inaugural climate report is intended to assist asset owners and asset managers in implementing the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD). The TCFD recommendations were released in 2017 to assist investors with understanding the material risks climate change may pose to their holdings and the opportunities the decarbonization of the global economy may bring. This report provides a behind the scenes look at ILN members' experiences in implementing the recommendations of the TCFD, sharing practical and insightful guidance.



Climate change mitigation and your portfolio: Practical tools for investors

The second report, published in 2020, focuses on decarbonization scenario analysis as an important recommendation of the TCFD. It became apparent among the investment community that in order to progress the quality and credibility of climate disclosures, scenario analysis was a significant element, however direction was largely absent. The report provides detailed guidance to support investors in assessing decarbonization pathways that align to the Paris Agreement's target of limiting the increase in average global temperature to well below 2°C, while pursuing efforts to limit warming to 1.5°C. The 1.5°C scenario, as highlighted in the report, is the most ambitious decarbonization pathway, requiring significant global emission reductions to achieve net zero carbon emissions by 2050. Investors' role in advancing emission reductions, although indirect, is crucial as they provide significant financial capital to high emitting companies across sectors and industries.

The report provides investors with a practical guide to assessing 1.5°C scenario analyses, allowing investors to strategically assess the climate related risks and opportunities within their portfolio.



Climate change physical risk toolkit

ILN's third report, published in 2021, focuses on assessing the physical risks that climate change poses to investors. While a significant amount of research and guidance is focused on transition risk, the potential adverse effects that physical risks could have on a company's operations and future prospects remain difficult to incorporate into traditional investment analysis. The toolkit was developed to assist investors with better incorporating these potential physical impacts and the corresponding financial implications of climate change into their investment decision making and asset management processes.

The physical risk toolkit is comprised of four resources:

- A scientific and macroeconomic context for physical climate change risks;
- A step-by-step scoping methodology and case study to identify physical risks and opportunities;
- A disclosure guide with criteria to assess physical risk disclosures and metrics; and
- A resource guide of credible third party resources to support investors in further researching and analyzing physical climate change.

EXECUTIVE SUMMARY

The role that institutional investors play in supporting the global economy's transition to net zero emissions by 2050 is complex, but significant. Investors as well as other financial services organizations are being strongly encouraged to not only reduce their portfolios' reported financed emissions, but to also strategically incorporate the financing of real economy emissions reductions within their net zero approaches.

A wide range of relevant net zero frameworks and methodologies have been developed by global organizations, intended to assist investors in understanding, developing, and progressing their net zero programs. However, the continuously expanding range and diversity of this guidance, and the concurrent scientific advances in underlying climate models, has required investors to apply an exceptional level of innovation and customization in developing, implementing and updating net zero approaches that align with their own mandates, as well as their clients' mandates where relevant.

Adding to this high degree of complexity, investors face a number of practical challenges. They are having to navigate the balancing act of demonstrating near term impact (e.g. against 5 and 10 year interim targets) while confronting significant data constraints, evolving definitions (e.g. of 'material' sectors) and shifting climate science (including the shift from 'below 2°C-based targets' to 'maximum 1.5°C-based targets' triggered by Intergovernmental Panel on Climate Change special reports).¹

Within each of the four themes highlighted below, the report synthesizes the current landscape of relevant investor-specific frameworks and methodologies, the related implementation challenges being experienced by investors, and anticipated enhancements to available guidance that will assist investors in moving forward. To complement the report's analysis, case studies from individual ILN members on their customized implementation approaches are featured.

Significant efforts have been made since 2020 to mobilize the world's capital providers to finance the low-carbon transition, for example through the Global Financial Alliance for Net Zero (GFANZ). The sector-specific alliances and initiatives under the GFANZ umbrella each have specified rigorous commitments for their signatories to take on. Many other asset owners and managers have made net zero commitments outside of this umbrella.

As a result, an enormous level of collective willpower has been mobilized among major financial services players. However, willpower alone won't solve for the unprecedented complexity of fundamentally transforming the global economy in the face of cascading systemic risks.

This report is organized along the four main themes that can be observed in the range of net zero approaches being taken by investors:

01

Portfolio emissions forecasting and target setting

02

Alignment with broader portfolio construction and risk parameters

03

Portfolio transition taxonomies

04

Portfolio holdings transition capacity metrics

The report concludes that the net zero transition of the global economy is still in its early stages, with a number of pressing challenges still to be addressed. In particular:

- **Significant additional collaboration and convergence of approaches will be required** among investors and other financial institutions, governments and regulators, corporates, global framework developers, ESG data providers and society at large, to better align efforts and achieve the real economy emission reductions necessary to limit average global warming to 1.5°C.
- Achieving real economy emission reductions is also dependent on the ability of transition actors to **address ongoing economic, political, social, and technological disruptions** (e.g., heightened geopolitical tensions, a renewed focus on energy security and independence, climate migration, and worsening income inequalities). If these disruptive forces are unable to be solved for, various market dislocations could occur and overtake efforts to achieve real economy decarbonization.
- Meaningful collaboration between institutional investors and government entities will be required to advance sensible and **effective policy and regulatory measures that shift financial incentives** to align with the rapid adoption of low-carbon technologies, products and services by businesses and consumers.
- Coordinated investor pressure will be necessary to drive **global convergence of the data and metrics developed by third party data providers** to achieve the comparability and consistency necessary to support investors' net zero programs.
- Conventional financial measures and GHG emissions accounting will need to become integrated within a **'dual measurement' system**. The concept of 'net zero emissions' has an unprecedented, science-based global carbon budget which is cumulative and cannot be exceeded. This type of individual and aggregate constraint on business investments and activities is a new and difficult to understand concept for the many actors within the traditional financial system.
- Investors have a longstanding obligation to meet their fiduciary duties in generating financial returns for their beneficiaries and clients. However, as the economy is further impacted by climate change, **the fiduciary duties of investors will evolve**. As it becomes increasingly clear that climate change could have a significant impact on financial returns over a range of investment horizons, investors are continuing to assess how their net zero commitments interact with and align to these fiduciary duties.
- To enable the net zero transition and increase the size of the investable universe, **new value chains may need to be created** and financed to rapidly scale the development and deployment of the low emission technologies, products and services needed to achieve decarbonization targets.
- The increased prevalence and severity of droughts, flooding, wildfires, and heat waves has highlighted the need for increased investments in climate resilience and adaptation. Investors will need to **further incorporate climate adaptation and resilience factors** when assessing and managing physical risks as part of their ongoing investment processes, including investments in sustainable infrastructure.



INTRODUCTION



ONGOING CLIMATE-RELATED INVESTOR DEVELOPMENTS

There have been many recent climate related developments within the financial sector. For instance, TCFD-based climate disclosures are being increasingly mandated within mainstream financial reports, new taxonomies are being developed to assist with asset classification and portfolio alignment, and various new initiatives, frameworks and guidance have been created to advance net zero commitments and targets. Figure 1 highlights some of the past decade's most significant climate-related developments in this regard.

The Intergovernmental Panel on Climate Change (IPCC) highlights in its most recent sixth assessment report, AR6 Climate Change 2022: Mitigation of Climate Change, that net zero emissions can only be achieved through deep decarbonization and systemic transformation. Such transformational change will necessitate “engaging multiple scales of governance, including governments and non-state actors, and in connection with substantial financing beyond sectoral approaches”.²

To further advance the transition to a low carbon economy and contribute to limiting global temperature increases, many large institutional investors have committed to achieving net zero emissions by 2050 within their investment portfolios. At the time of writing, the Net Zero Asset Managers initiative (NZAM) has garnered the support of 273 asset managers, with US\$ 61.3 trillion in assets under management³, while 74 institutional investors with over US\$ 10.6 trillion assets under management have committed to the UN-convened Net Zero Asset Owner Alliance (NZAOA).⁴

To achieve a 1.5°C warming scenario, the entire global economy must decarbonize. Investors and other financial institutions cannot simply focus on reducing their individual portfolios' financed emissions without also achieving real-world decarbonization. Such an achievement means that

high emitting sectors cannot simply be avoided, but rather will need financial and technological support to transition their business models, meaningfully lower their emissions wherever possible, and manage the responsible phaseout of those high-emitting assets inconsistent with net zero.

Building on ILN's 2020 decarbonization-based publication, this report provides practical assistance to investors in operationalizing their net zero commitments. The report is organized along the four main themes that can be observed in the range of net zero approaches being taken by investors:

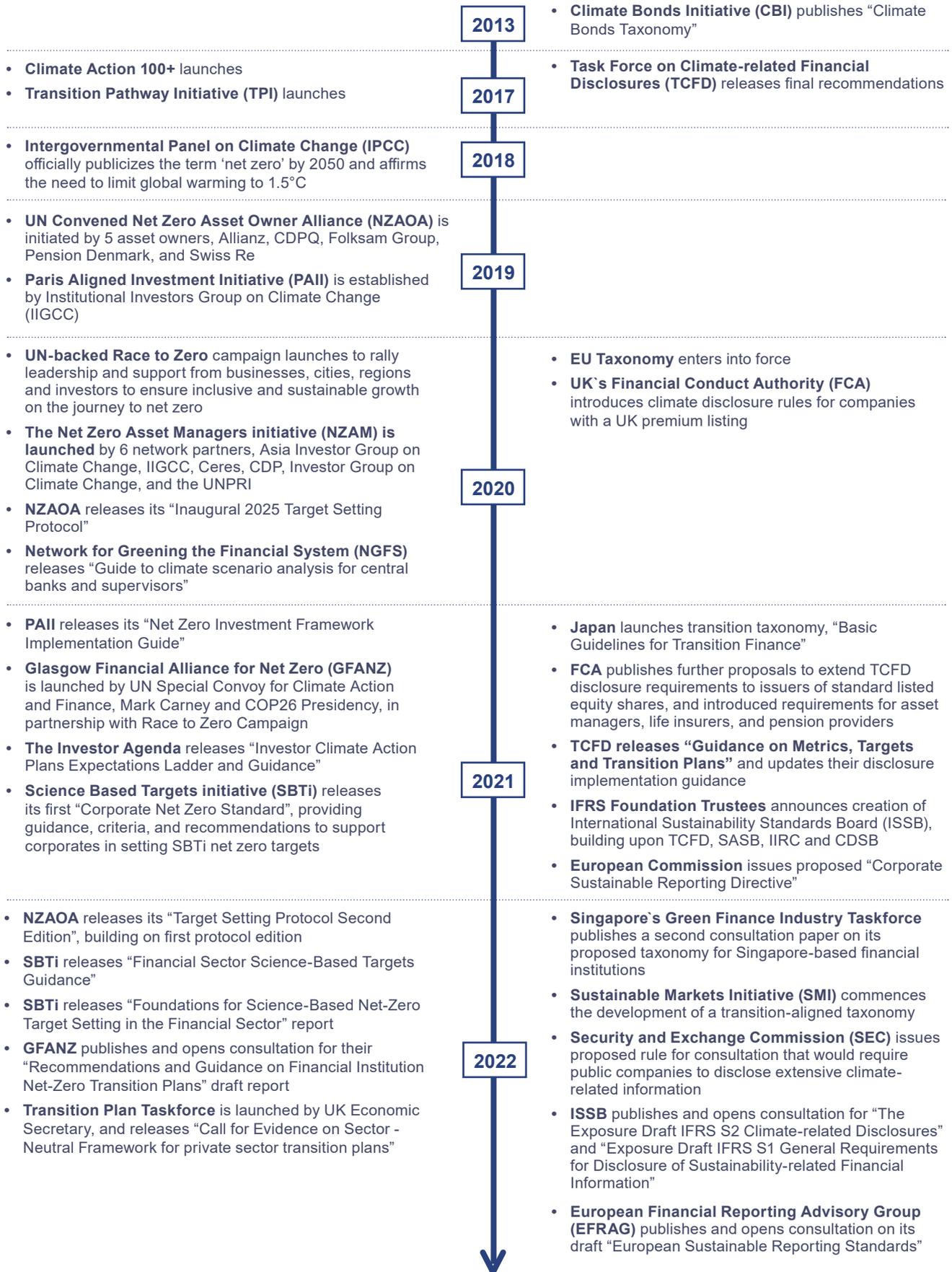
- Portfolio emissions forecasting and target setting
- Alignment with broader portfolio construction and risk parameters
- Portfolio transition taxonomies
- Portfolio holdings transition capacity metrics

Within each of the four themes, the report synthesizes the current landscape of relevant investor-specific frameworks and methodologies, the related implementation challenges being experienced by investors, and anticipated enhancements to available guidance that will assist investors in moving forward. To complement the report's analysis, case studies from individual ILN members on their customized implementation approaches are featured.

Figure 1: Ongoing climate-related investor developments

NET ZERO - RELATED GUIDANCE AND INVESTOR GROUPS

CLIMATE-RELATED DISCLOSURES AND TAXONOMIES



PART 1

ASSET ALLOCATION IMPLICATIONS OF NET ZERO COMMITMENTS



PORTFOLIO EMISSIONS FORECASTING AND TARGET SETTING

A. Overall objectives

Setting long-term (e.g. to 2050) and interim (e.g. to 2030) portfolio emission reduction targets is becoming a common practice among the investment community to ensure they are able to demonstrate a meaningful commitment to the low-carbon transition. The process to develop targets has varied among investors due to distinct mandates, portfolio design methodologies, investment strategies, and the variety of available net zero frameworks. Not only have target setting approaches differed, but investors' target timing and metrics have also varied. Target types include portfolio emission intensity reduction goals, percentages of portfolio holdings that have established company-level net zero targets and/or credible transition plans, green financing targets, and decarbonization-related engagement goals with investee companies.

In developing these targets, the range of activities undertaken by investors has included:

- Conducting emissions forecasting from both a top down (by asset class, region and sector) and bottom up (by individual portfolio company) perspective to understand their portfolio's current trajectories in the absence of more significant 1.5°C-aligned decarbonization efforts.
- Working with internal asset class teams and portfolio managers to address the emissions intensity impact of projected capital allocation plans, asset class weightings, investment strategies, and growth targets.
- Assessing potential decarbonization pathways by region and sector based on publicly available and proprietary models to determine the extent to which asset allocations could drive portfolio-level emissions intensities lower by the target date.
- Assessing the current alignment of portfolios to transition criteria/taxonomies, based either on published sources or developed in-house.

Although multiple third party organizations have published net zero frameworks and criteria to provide direction to investors in establishing net zero-aligned targets, unique mandates and implementation challenges at the individual investor level generally preclude a straightforward approach to adoption of these frameworks. Accordingly, through the above-noted actions and activities, investors have often developed their own bespoke approaches and methodologies to establish and track progress against their targets.⁴

B. Relevant sources

The number of frameworks available to investors for developing their net zero targets and strategies is significant and growing.

At the time of writing, three of the most prominent frameworks providing investors with methodologies to set net zero targets are:

- Paris Aligned Investment Initiative (PAII): Net Zero Investment Framework⁵
- Net Zero Asset Owner Alliance (NZAOA): Target Setting Protocol Second Edition⁶
- Science Based Targets initiative (SBTi): Financial Sector Science-Based Targets Guidance⁷

All three frameworks have been referenced as useful methodologies by other investor groups, including the Net Zero Asset Managers initiative (NZAM), the Investor Climate Action Plans (ICAPs) and the Glasgow Financial Alliance for Net Zero (GFANZ).

The NZAM requires signatories to choose one or a combination of the above methodologies to ensure targets are robust and science-based.

The ICAPs' Guidance on Using the Expectations Ladder references the use of the above-mentioned frameworks to assist investors in developing their net zero targets and strategies.

Table 1: A comparative analysis of the above-mentioned frameworks is provided below, highlighting the key features of each.

	PAII	NZAOA	SBTi
Target types	Emission reductions at portfolio level, portfolio alignment targets, engagement, and financing related targets	Emission reductions at asset class and sector level, engagement, and financing related targets	Emission reductions at asset class level and sector level engagement/portfolio alignment targets
Target timeframes	10-year for emission reductions and financing	5 years for emission reductions, engagement, and financing	5-15 years for emission reductions
Investee/issuer emission scopes included	Investee/issuer Scope 1 + 2 – Scope 3 to be phased in 2023	Investee/issuer Scope 1 + 2 – Scope 3 to only be included for certain sectors where scope 3 is relevant	Sectoral decarbonization approach (SDA) methodology: Investee/issuer scope inclusion varies by sector Temperature rating methodology: Investee/issuer Scope 1 + 2 – Scope 3 to be included only if it represents 40% or more of a company's total emissions
Asset classes to be included in emission reductions	Listed equity and corporate fixed income, and real estate	Listed equity, publicly traded corporate bonds, infrastructure (equity and debt), and real estate	Public and private equity, corporate and consumer loans, corporate debt, real estate, mortgages, electricity generation project finance
Developed for	Asset managers and asset owners	Asset owners	Financial institutions
Suggested temperature alignment	1.5°C	1.5°C	SDA methodology: Well below 2°C (minimum requirement) ¹ Temperature rating methodology: Scope 1 + 2 with a minimum well-below 2°C scenario and a minimum 2°C scenario for scope 1 + 2 + 3 by 2040 Alignment with 1.5°C is highly encouraged
Bottom up vs. top down approach	Bottom up and top down	Bottom up and top down	Bottom up and top down

¹ SBTi's Portfolio SDA targets must meet minimum ambition indicated by sector-specific methods for well-below 2°C pathways. Electricity generation project finance SDA targets can be set in alignment with 1.5°C.

	PAII	NZAOA	SBTi
Year framework/guidance was published	Net zero Investment Framework Implementation Guide: 2021	Inaugural 2025 Target Setting Protocol: 2021 ⁸ Target Setting Protocol Second Edition: 2022	Financial Sector Science Based Targets Guidance: 2022
Portfolio coverage	Portfolio alignment targets: 100% by 2040	Sub-portfolio level emission reduction targets: provides guidance on investments that should be included within the target for real estate, infrastructure, debt and equity in listed corporates Sector level emission reduction targets: cover 70% of total owned emissions by 2025	Varies by asset class and allows multiple types of targets to achieve the required portfolio coverage percentage Portfolio alignment targets: 100% by 2040
Carbon credits/offsets inclusion in target achievement	Regulated carbon credits are allowed, carbon offsets are not	Carbon credits cannot be counted towards interim target achievement	Carbon offsets cannot be counted towards target achievement ²
Types of metrics for emissions reduction target setting	Allows absolute or intensity (CO2e/\$mn invested) targets	Allows absolute or intensity targets. Provides suggested sector metrics for sector level targets	Absolute or intensity, however, provides requirements on when intensity targets can be used
Material sectors identified	Portfolio alignment target: NACE code categories A-H and J-L	Sector level emission reduction targets: Oil & gas, utilities, transport, materials, agriculture, forestry and fisheries, chemicals, construction and buildings, water utilities, textiles and leather	Sectors currently covered by SBTi's SDA: residential and service buildings, power generation, aluminum, cement, chemical, fossil fuel, iron and steel, pulp and paper, and transport

GFANZ brings together seven financial sector net zero alliances, which includes NZAM, NZAOA, Net Zero Banking Alliance and Net Zero Insurance Alliance, and highlights the SBTi's financial sector guidance as a source for emissions reduction target methodologies.

A NZAM survey of asset manager signatories that was conducted in 2021 found the PAII framework to be the most frequently referenced in the setting of net zero aligned targets.⁹

² Only allows the use of offsets to achieve emission reductions beyond target. Acknowledges financial institutions can provide proof of concept for broader credit and offsetting mechanisms to achieving net zero targets

Specified Net Zero Commitments and Targets:



Emission reductions

A variety of net zero commitments and targets are required to be set under the three frameworks and all entail ambitious financed emission reductions. All three frameworks suggest setting emissions reduction targets at the asset class level, however SBTi and NZAOA suggest that emissions reduction targets be set at the sector level as well.

There is a mutual recognition in all three frameworks that it is difficult to incorporate investee scope 3 emissions due to the lack of credible and comparable data. Therefore, all frameworks require investors to include investees' scope 1 and 2 emissions within their target setting and provide criteria for the current or future inclusion of scope 3 emissions. As data and methodologies improve, it is expected that investors will more consistently develop approaches to fully addressing emissions across their holdings' value chains.



Portfolio coverage/alignment

Both PAIL and SBTi require investors to align an increasing portion of their portfolios to investments that are progressing in line with the net zero transition. PAIL requires signatories to set asset class level targets for increasing the percentage of assets under management (AUM) invested in assets in 'material' sectors that are i) achieving net zero or meeting the criteria to be considered ii) 'aligned' or iii) 'aligning' to net zero. SBTi suggests firms commit to having a targeted percentage of their portfolio companies set their own SBTi-approved science-based targets. Furthermore, SBTi suggests that firms can also set portfolio temperature alignment targets.

PAIL provides unique additional targets that asset managers can set. These additional targets focus on the proportion of client AUM that will be managed in alignment with a net zero investment strategy, allowing asset managers to engage with their clients over time to secure net zero mandates, and develop products that enable an increasing proportion of funds to be managed in line with net zero. The framework highlights that asset managers should seek to increase the proportion of managed assets aligned with net zero strategies to 100% over time.¹⁰



Engagement

PAIL requires investors to set an asset class level engagement goal that ensures that at least 70% of financed emissions in 'material' sectors are either assessed as net zero, aligned with a net zero pathway, or the subject of direct or collective engagement and stewardship actions. NZAOA requires investors to engage with investors' highest emitting investees, either with the 20 highest emitting companies in the portfolio or those responsible for a combined 65% of owned emissions in the portfolio. SBTi highlights that in order to achieve the portfolio coverage targets that are mentioned above, engagement with portfolio companies is integral.



Climate solution/green investments

Under NZAOA-specified financing commitments, members are required to report on progress on a climate-positive trend and contribute to the Alliance's 'Financing Transition' work tracks. Members' transition financing commitments should include assessing climate solution investments e.g., blended finance vehicles and structures, carbon removal and climate solution technologies. A definition of climate solutions is provided in line with the EU Taxonomy, however alignment does not mean that the EU Taxonomy should be applied in all cases.¹¹ NZAOA states that quantitative targets regarding climate investments are optional. The NZAOA's Financing Transition work tracks include developing a digital road map for climate solution reporting and establishing relationships with other initiatives to advance financing target achievement.

PAIL requires signatories to set a <10-year portfolio level goal for allocation to climate solutions, representing a percentage of revenues or capex from AUM (based on EU taxonomy mitigation criteria), increasing over time and aligned to investment trajectories required to achieve a net zero pathway.

Methodologies to develop targets:



Emission reductions

NZAOA provides guidance in setting emissions reduction targets at the asset class level for listed equity and debt, real estate, and infrastructure. The protocol provides guidance to appropriately measure and calculate emissions, focusing on metrics to use, scopes of emissions to include, data to use, and whether targets should be absolute or intensity based. Additionally, NZAOA provides guidance on setting aggregate or independent asset class level targets, allowing investors to decide which route they would like to take. (Note that GFANZ's most recent publication cites the fact that the aggregation of individual targets across a portfolio does not in itself enable a sufficient topline view on the portfolio's net zero performance.¹²)

To develop bottom-up, sector level targets, NZAOA provides a step-by-step process, which includes the identification of the most 'material' sectors within the portfolio, carbon emission metrics/sector-specific intensity KPIs, and the use of sectoral decarbonization pathways. NZAOA provides a comparison of sector pathways and highlights that it will review for inclusion credible, scientifically derived, net zero sector pathways wherever available. SBTi also provides a step-by-step process to setting sector-based targets using its sectoral decarbonization approach (SDA) methodology. The first step to the methodology involves measuring portfolio emission intensity using the Partnership for Carbon Accounting Financials (PCAF) approach.¹³ It then provides specific guidance and case studies by asset class for setting SDA targets. SBTi provides sector specific target setting tools to assist financial institutions in setting targets within the asset classes of real estate, electricity generation project finance, corporate equity, bonds and loan, and mortgages. Unlike NZAOA, SBTi has specific requirements as to when firms should set intensity or absolute based targets.

Both NZAOA and SBTi recognize that there is limited data to construct precise sector decarbonization pathways. NZAOA suggests that firms use the One Earth Climate Model (OECM) or the International Energy Agency (IEA) model to develop targets, while SBTi uses the IEA's B2DS scenario, which comprises emissions and activity projections used to compute sectoral pathways aligned with limiting warming to well below 2°C.¹⁴ (GFANZ's most recent publication highlights that aggregating targets derived using bottom-up models could exceed a science-aligned budget, as it is sometimes assumed that there are higher emission reductions in other sectors.¹⁵)

PAIL notes that the NZAOA methodology is aligned with its own framework to inform investors' emission reduction target setting approaches at the portfolio level.¹⁶ PAIL does provide guidance on setting portfolio level emissions reduction targets.¹⁷ The methodology lays out a step-by-step process and provides guidance for each step: setting the scope of the target, setting the baseline year, portfolio metrics to use, the consideration of a portfolio starting point, the selection of science-based net zero scenarios, the calculation of decarbonization pathways and portfolio reference targets, and the re-calculation policy.



Role of offsets

SBTi's "Foundations for Science-Based Net Zero Target Setting in the Financial Sector" report highlights that financial institutions must neutralize all unabated emissions from their value chain (scope 3 emissions, categories 1 to 14) and portfolios (category 15) with permanent carbon removals to reach net zero.¹⁸

The NZAOA does not allow the use of carbon credits to achieve net zero targets, however qualified carbon removals purchased by investee companies can be counted.¹⁹

PAIL has noted that it will undertake further analysis in its Phase 2 efforts to assess the appropriate use of offsets in specific sectors.²⁰



Portfolio coverage/alignment

To develop portfolio coverage alignment targets, PAIL's framework suggests that investors assess each asset class's alignment with net zero, including listed equity and corporate fixed income, real estate and sovereign bonds. The framework provides investors with a set of criteria and metrics/KPIs to incorporate within their assessment methodologies, as well as approaches investors can use to understand transition trajectories. For example, PAIL suggests investors use the Carbon Risk Real Estate Monitor (CRREM) to benchmark their real estate asset class alignment. SBTi has two specific methodologies for firms to set science-based portfolio coverage targets, including the SBT portfolio coverage approach, and the portfolio temperature rating approach. SBTi provides guidance for setting both portfolio coverage and portfolio temperature rating targets. A step-by-step process is provided for setting temperature rating targets, which includes the calculation of base year temperature score, target setting specifics (i.e. ambition level, target timeframe and target wording), and temperature rating. SBTi also provides a quantitative methodological approach and tool to assist firms with ensuring 100% of their portfolio is covered by SBTs by 2040.

Overall, the three frameworks provide investors with numerous options for developing net zero targets and can assist investors with the initial stages of their target setting. However, to operationalize these targets, investors then need to tailor the approaches and fill methodological guidance gaps with their own bespoke methodologies and processes.

The incorporation of investors' portfolio growth targets and asset allocation plans is an integral phase in developing these tailored methodologies.

Highlighted below are example approaches that ILN members have taken to developing their own net zero-aligned targets, incorporating various elements of the above frameworks as relevant to their mandates.

C. Examples of current practices



Case Study: OMERS

With its strong focus on climate-related risk and investment opportunities, OMERS took an early and proactive approach to lowering its portfolio GHG emissions. This included first setting a preliminary 2025 reduction goal, followed in 2021 by a net zero commitment by 2050. These commitments are aligned with the initiatives of net zero framework groups for asset owners and managers. OMERS has established a comprehensive interim net zero goal setting process building on key concepts included in the above-mentioned frameworks.

Background on mandate:

- To ensure OMERS is a sustainable, affordable and meaningful defined benefit pension plan.
- Foundation of OMERS investing philosophy is focused on seeking high-quality investments globally to meet their pension promise.
- Plan holdings: 50% in private assets, including infrastructure and real estate.

Unique practices:

- OMERS announced its net zero commitment in November of 2021.
- The carbon roadmap efforts are led by a climate risk working group, chaired by the Chief Risk Officer.
- Based on two years of carbon footprint data, and an understanding of the key drivers of its footprint, OMERS felt comfortable in committing to net zero by 2050 and taking an approach of setting successive 5-year interim goals.
- Initial interim target:
 - Reduce portfolio carbon intensity by 20% by 2025.
- The target excludes derivatives, government bonds, short positions, cash, and short-term notes.
- To develop OMERS' 2030 interim target, the firm has taken a five phase approach:
 - **Phase 1:** identified key internal stakeholders across businesses and functions to be involved in the target setting process.
 - **Phase 2:** developed carbon intensity projections for 2030 under different capital allocation scenarios for each business unit. The projections were based on 2020 average carbon intensities by sector and region.
 - **Phase 3:** Once capital allocation-based carbon intensities were projected, OMERS identified emission reduction possibilities between 2020 and 2030 based on representative climate transition pathways. The pathways were developed using credible, publicly available sources of climate scenarios including NGFS, CRREM and Bank of Canada.
 - **Phase 4:** The next step involved a second phase of projecting potential 2030 carbon intensities under various decarbonization pathways by scaling down carbon intensities projected in Phase 2 using emission reduction trajectories from Phase 3.
 - **Phase 5:** Once phases 2-4 are complete, OMERS will set its overall 2030 emissions intensity reduction target.



Case Study: Ontario Teachers' Pension Plan

Ontario Teachers' has been a first mover in understanding and setting net zero targets, although it is not currently a member of or signatory to the above-mentioned net zero framework groups. Ontario Teachers interim target setting methodology first involved a top-down approach and has since been built out to include a bottom-up methodology.

Background on mandate:

- Building on its mission to deliver retirement security for its members, the Ontario Teachers' Pension Plan seeks to make a real-world impact while earning attractive investment returns.
- Ontario Teachers was one of the first Canadian pension plans to announce its 'net zero by 2050' commitment, and has subsequently announced its interim emission reduction targets.
- Plan holdings: Global investment portfolio with 80% of assets managed in-house including significant allocations to real estate, private equity, infrastructure, and natural resources.
- Interim targets:
 - Reduce portfolio carbon emissions intensity by 45% by 2025 and by 67% by 2030, based on 2019 emission levels.
 - Portfolio carbon footprint covers >70% of AUM (excludes commodities and sovereign debt).
 - 67% of emissions from companies with a significant ownership stake will be covered by net zero targets by 2025, and 90% by 2030.

Unique practices:

- Ontario Teachers has developed its interim net zero targets by taking both a top down and bottom up approach, using a three step process:
 - Expected evolution of the investment plan in terms of asset classes and geographies (top down).
 - Consideration of macro decarbonization trends both globally and regionally (top down).
 - Active decarbonization plans and initiatives at companies with a significant contribution to emissions (bottom up).

D. Limitations and challenges

Given the number of available frameworks and degree of customization required to implement them, there is a growing concern as to whether the resulting target setting approaches will collectively achieve the intended real world emission reductions.

Given the prevalent exclusion of asset classes such as sovereign bonds and cash by most investors, 100% coverage of investment portfolios within net zero targets is and will remain unrealistic for a number of years. As a result it will be difficult to fully develop investment strategies to reach net zero at the total portfolio level. These portfolios in turn are not static as investment strategies, funds and products are constantly adapted to reflect market conditions.

Investors are having to navigate the balancing act of demonstrating near term impact while also working around data constraints, evolving definitions (e.g. material sectors) and shifting climate science (including the abrupt shift from 'below 2°C-based targets' to 'maximum 1.5°C-based targets').

The most pressing immediate challenge is the issue of data availability, particularly the lack of credible and reliable data regarding scope 1, 2, and 3 emissions. Only 40% of the MSCI All Country World Investable (ACWI) Market Index constituents currently report scope 1 and 2 emissions, and only 25% report scope 3 emissions.²¹ Emerging markets, developing economies, as well as small-medium sized businesses report emissions at even lower rates.²²

Given incomplete emissions reporting by a number of corporates, investors have had to establish proxies based on broad sector averages to cover data gaps. Investors also rely extensively on proprietary estimation models used by data vendors, which can lead to widely different estimates depending on the choice of vendor.

Another ongoing challenge will be restatements of historical emissions by companies as their calculations become more robust and independently assured. Additionally, there is a concern among the investment community that emissions may be subject to multiple counting across sector value chains when scope 3 emissions become more broadly reported, resulting in an inflated portfolio emissions measurement.

Emissions intensity metrics themselves are subject to potential distortions due to the 'denominator effect'. For WACI metrics that use company revenues as the denominator, inflationary growth may result in WACI reductions with no actual emission reductions. For carbon footprint metrics that use enterprise value as the denominator, increases and decreases in a company's market value and changes in its capital structure over time can create false signals on portfolio emissions trajectories.

The development of comprehensive transition pathways, specifically, sectoral decarbonization pathways, also remains a challenge. GFANZ's most recently published guidance on the use of sectoral pathways cited several improvements that need to be made:²³

- Standardization and clarity of the definitions that pathway developers use for key assumptions (e.g., carbon price and investments) as well as the scope covered by each pathway (e.g., sector boundaries, GHG emissions included)
- Access to underlying data and assumptions in a useable format
- Additional granularity to cover all sectors, time intervals, and regional/country level breakdowns
- Understanding of where emission reductions are dependent upon assumptions of decarbonization in other sectors, to verify whether a pathway's alignment to a particular temperature increase holds when applied to the whole economy
- Information on how and if the pathways have been tested or validated:
 - With industry and other key stakeholders to assess a pathway's commercial feasibility
 - With the scientific community to test the pathway's credibility in terms of temperature alignment

Investors have also cited the difficulty of selecting methodologies for assessing portfolio alignment, whether based on emissions levels or alignment with various transition criteria. For example, methodologies that specify a top down approach to target setting make it difficult to systematically determine which companies within the portfolio

investors need to engage more extensively. The different frameworks also have varying criteria for assessing an investment's 'alignment to net zero' (e.g. PAIL sets out six alignment criteria), which are in addition to the taxonomies discussed in Part 2 of this report.

Exclusionary policies are also a source of difference between the various frameworks. For example, the SBTi requires signatories to establish a no coal policy, while the PAIL 'recommends' investors not allocate additional capital to companies which are planning or constructing new thermal coal projects and associated infrastructure.

The UN Race to Zero's new guidelines state that its public and private sector members must "Restrict the development, financing and facilitation of new fossil fuel assets in line with appropriate scenarios.... Across all scenarios, this includes no new coal projects".²⁴

Finally, as further discussed in the next section of this report, the above-mentioned net zero frameworks fail to address the potential near-term increase in portfolio emissions as investors finance the decarbonization of high emitting assets that will remain critical during the transition.

E. Approaches and enhancements moving forward

Improved data is the key to solving many of the challenges that investors face in their climate related initiatives and practices. The open-data repository for transition data that GFANZ has committed to developing will assist in addressing some of the data issues addressed, and in turn will support financial firms and the global economy in their net zero journeys.²⁵

To support investors with acquiring credible and reliable data to develop their net zero targets, enhanced emission data and streamlined transition plan disclosure from public and private firms is required. Through increasing climate disclosure regulations and standards and further demand from the investment community, the quantity and credibility of data will increase, allowing academics, the scientific community, regulators and governments to develop more accurate emissions forecasting models, allowing investors to translate this data into decision useful information.

To support the financial industry in using sectoral decarbonization pathways, GFANZ has published a report to help financial institutions evaluate the suitability of these pathways in their transition planning process and implementation efforts. The report includes a framework to assist financial institutions in understanding and comparing sectoral pathways, facilitate engagement between financial institutions and their clients and portfolio firms, and communicate pathway needs to developers.²⁶ To further support the financial community in using sectoral pathways, GFANZ has committed to providing sector briefs with additional comparisons of sectoral pathways.²⁷

The Science-Based Target Initiative is expected to release a formal Standard for financial institutions to set net zero targets in 2023.²⁸ The current SBTi guidance described earlier in this section assists financial institutions with setting science-based targets, however the Standard will provide a specific framework for targets that can then be approved by SBTi.²⁹ (SBTi does not currently approve financial institution net zero targets.³⁰) A multistakeholder process is underway to provide the input for developing target validation criteria, detailed guidance, and technical resources.

As PCAF further develops methodologies to assist financial services firms with calculating portfolio emissions for all asset classes (e.g. sovereign and covered bonds), investors will be able to integrate these asset classes into their net zero targets and strategies. Greater inclusion of asset classes as well as investment strategies (e.g. derivatives) and security types within an investor's net zero commitments will improve the understanding of total portfolio emissions and tradeoffs across asset classes.

ALIGNMENT WITH PORTFOLIO CONSTRUCTION AND INVESTMENT RISK PARAMETERS

A. Overall objectives

As net zero commitments are established and targets developed, investors need to fully assess the role each asset class and portfolio will have in achieving these commitments and targets. Net zero investment strategies in turn need to be integrated into the broader portfolio construction and investment risk parameters of investment firms and their clients. Unprecedented complexity arises in strategically aligning portfolio emission reduction targets with investment return objectives, growth targets and fiduciary duties.

There are several levers that investors can incorporate within portfolio construction to help align their portfolios to their net zero commitments:

● Sector allocations

Investors have highlighted that sector allocation will be a key component in achieving net zero targets. This could include tilting investments to sectors that show strong commitments and performance in decarbonizing. It is expected that seven sectors (transport, buildings, industry, electricity, fossil fuels, low-emission fuels and AFOLU³) will likely experience the greatest directional shifts in investments as investors pursue net zero portfolios.³¹

● Regional allocations

Depending on an investor's investment strategies, regional allocation may play a significant role. Incorporating net zero objectives into region weightings requires increased attention to the Nationally Determined Contributions (NDCs) and related policies for major countries in each region.

● Investing in climate solutions

Investing in innovative climate solutions will assist companies in decarbonizing their business activities and will assist in achieving real economy emission reductions. Depending on the sector, some technologies are more commercially viable than others. Many emerging technologies face barriers to financing (e.g. due to a lack of clear regulation and supportive policy environments), and therefore will require investors' broader support to help reduce these barriers.^{32, 33}

● Specific net zero aligned investments

Investors are encouraged to develop investment strategies that pay specific attention to investing in companies that are aligned to 1.5°C or disclose credible and robust net zero transition plans that are aligned to 1.5°C.³⁴ These aligned investments could currently be high-emitting assets.

● Engagement

When climate risks and opportunities are material, investors are integrating assessments of a company's transition plans into both due diligence processes for new investees and ongoing performance monitoring of current investees. Additionally, engagement with clients is a key component for asset managers in expanding their assets under management that are net zero aligned.

● Divestment

Some investors have committed to divesting from sectors or companies with particularly large climate impacts, most typically thermal coal and sometimes other fossil fuels. Divestment is also used as a last resort if companies are unable or unwilling to commit to meaningful emissions reduction plans. It has become more evident among the investment community that divestment may not be an effective approach to lowering real economy emissions, as it could limit the capital and oversight provided to higher-emitting companies in effectively transitioning their business activities.³⁵

● Portfolio decarbonization benchmarks

There are portfolio decarbonization benchmark indices being developed (e.g. EU Climate Transition and Paris-Aligned Benchmarks), however the real world impact of this approach is not currently well understood in the market.

● New products and services

The development of new 1.5°C-aligned investment products and services by asset managers will help assist their clients in making and progressing towards their own net zero commitments.

³ Agriculture, forestry, and other land use

Use of these levers to assist with aligning portfolios will vary by investor, including between asset managers and asset owners. Asset managers need to operationalize their net zero targets in conjunction with their clients, taking into consideration fiduciary duties and tracking error limits against benchmarks.

The incorporation of net zero into portfolio construction and risk parameters will also be affected by whether the firm primarily pursues more active vs. passive (index-based) investment strategies.

B. Relevant sources

Paris Aligned Investment Initiative (PAII)

The PAII's Net Zero Investment Framework provides strategic guidance and examples of tools asset managers and asset owners can use to assist with strategic asset allocation and asset class alignment.

To achieve alignment through strategic asset allocation (SAA), the framework provides several recommendations for both asset managers and asset owners on: relevant metrics investors can use alongside financial objectives; setting targets for specified metrics; scenario analysis and stress testing of certain portfolios to clearly understand climate risks and opportunities; consideration of different asset classes; identifying specific climate-tilted indices, benchmarks, and climate-focused variants; and including climate alignment objectives alongside standard portfolio construction indicators used in formulating SAA approaches.

PAII builds on their guidance by providing investors with further recommendations on aligning and constructing portfolios. These recommendations include tilting portfolios to higher performing issuers, screening/weighting of new investments based on alignment criteria, ensuring appropriate proportions of exposure among developing and developed markets, increased allocations to verified green bonds and/or climate solutions, and the use of benchmarks or funds focused on alignment and climate solutions.

The PAII framework recognizes that asset managers will often be constrained in their strategic asset allocation options by client requirements but can use this guidance in working with their clients to advance their own net zero commitments and strategies.

Glasgow Financial Alliance for Net Zero (GFANZ)

Recommendations and Guidance on Net Zero Transition Plans

The GFANZ's Recommendations and Guidance on Net Zero Transition Plans include suggested implementation approaches to achieving net zero targets.³⁶ These include the development of new products and services, embedding of net zero commitments into decision making and business activities and establishing and enhancing relevant policies and conditions for priority sectors and activities.

The products and services element of GFANZ's guidance suggests that firms align new and existing products to net zero pathways, educate clients, and support portfolio decarbonization. The guidance suggests that financial firms evaluate their current products and services to identify where they could be enhanced to support the transition. Aspects of how firms can structure and design new net zero products include: real economy impact, transparency and integrity, data availability, scale, and acceleration.

GFANZ suggests that financial institutions consider adjustments that can integrate transition data, information, and implications to help underpin core decision making-processes. For investors, this may include adjusting factors in risk models and expected return models, such as discount rates, and expanding transition-related due diligence questions and criteria in investment evaluation and decision-making processes. Additionally, GFANZ suggests that firms integrate net zero activities into top-down decision making tools, which could include green capital weighting, taxonomy-based ratios and internal carbon pricing.

GFANZ further highlights the need for firms to communicate their priorities and objectives for net zero through related investment policies and conditions. It is suggested that firms apply policies and conditions to high-emitting sectors and activities (e.g. thermal coal, oil and gas, and deforestation). Firms are encouraged to transparently include the following elements within their policies: a clear objective connected to net zero; a definition of the sectors and activities to which the policy applies; conditions and standards for ongoing

business engagement; details of any restrictions or exclusions that apply; and relevant timelines. The inclusion of these elements allows firms to establish parameters around their portfolio construction processes and incorporate policies and conditions into their investment and lending risk processes and assessments.

The Managed Phaseout of High Emitting Assets

In addition to their transition guidance publication, GFANZ has published The Managed Phaseout of High Emitting Assets, which proposes a net zero aligned approach for a ‘managed phaseout’ of the operations and financing of high emitting assets.³⁷ The approach discourages financial institutions from immediately divesting from high emitting assets, as the consequences of divestment could prolong decarbonization as these assets pass into the hands of less-committed owners. A managed

phaseout is defined as a stakeholder-engaged net zero aligned strategy that allows financial institutions to provide conditional financing that ensures operations of the assets are eventually terminated in alignment with the transition. A high-level approach is provided to support the identification of high emitting assets, the potential financial mechanisms that could support a managed phaseout, and initial guidance on the features of a credible phaseout plan.

Investing in high-emitting sectors or assets that have a credible transition plan could also mitigate the portfolio’s exposure to macroeconomic impacts. For example, if high-carbon production drops more quickly than the corresponding phase-in of low carbon assets, there is a possibility of shortages that would result in higher prices for traditional assets due to the economy’s near-term dependency.³⁸

C. Examples of current practices



Case Study: State Street Global Advisors

State Street Global Advisors sets three targets for their in-scope assets, based on the IIGCC Paris Aligned Investment Initiative’s Net Zero Investment Framework 1.0.

Background on mandate:

- State Street Global Advisors is a global leader in the index investment space.
- It is State Street Global Advisors’ mission to invest responsibly to enable economic prosperity and social progress. It believes that, whether clients are focused on risk management, responding to new regulations, making investments that align with their values, or seeking to enhance long-term performance, the firm’s ESG capabilities can support clients in achieving their ESG objectives and investment goals.
- As a fiduciary and long-term investor, State Street Global Advisors believes that climate risk can be relevant to a company’s long-term financial performance. As such, State Street Global Advisors has joined certain initiatives which it believes may help drive long-term value for its clients, such as the Net Zero Asset Managers Initiative.

Net zero targets:

- Seek to achieve that 70% of financed emissions are net zero, aligned with a net zero pathway, or the subject of direct or collective engagement and stewardship actions.
- Seek to increase this ratio to at least 90% by 2030.
- Seek to reduce financed Scope 1+2 carbon emissions intensity 50% by 2030 relative to 2019 baseline at the portfolio level.
- Seek to increase AUM invested in assets in material (carbon-intensive) sectors that are (i) achieving net zero or (ii) aligned to net zero to 100% by 2040.
- In scope assets include those from clients who have adopted net zero targets or similar climate commitments, or may be reasonably expected to do so. State Street Global Advisors considers portfolios invested in equities and corporate fixed income and includes index portfolios that have a climate component or may be reasonably expected to adopt a climate objective.

Range of practices:

- Utilizing industry-leading data providers and its own investment expertise, State Street Global Advisors offers a variety of ESG investment solutions to meet clients' various ESG goals. These solutions may employ the following techniques:
 - Screening: Screened portfolios enable clients to express their ESG goals and preferences in their portfolio holdings. State Street Global Advisors has access to a variety of screening data sets to implement clients' preferences.
 - Thematics: State Street Global Advisors' suite of thematic products seeks to help investors benefit from broad macro-level ESG trends. Climate investing is the primary thematic investment solution offered.
 - Integration: State Street Global Advisors' active portfolio managers may integrate ESG signals and factors, where consistent with a strategy's investment objective, in efforts to mitigate risks and identify opportunities for long-term performance potential.
 - Best in Class: This approach focuses on investment in sectors and companies that State Street Global Advisors believes are leaders in terms of meeting certain ESG criteria relative to investment universes and/ or industry peers.
 - As long-term holders of capital on behalf of clients, State Street Global Advisors utilizes its Asset Stewardship program to engage with investee companies to seek long-term value and mitigate risk to clients' portfolios.



Case Study: Generali

Generali is a member of NZAOA and emphasizes the importance of tailoring net zero strategies among different asset classes to achieve a net zero portfolio.

Background on mandate:

- At the heart of Generali's strategy is its lifetime partner commitment to customers, achieved through innovative and personalized solutions, best-in-class customer experience and digitalized global distribution capabilities.
- The Group has fully embedded sustainability into all strategic choices, with the aim of creating value for all stakeholders while building a fairer and more resilient society.
- Establishing Generali's climate framework involved an inter-functional approach which included risk, investment, and asset managers.

Net zero targets:

- Climate neutral within Generali's investment portfolio by 2050.
- 25% reduction in the carbon footprint of direct investments in listed equities and corporate bonds by 2025 (vs the YE 2019 baseline).
- Alignment of at least 30% of the real estate portfolio with a global warming trajectory of 1.5°C.
- Engagement with 20 carbon-intensive investees by 2025 to drive real world impact.
- Plans for € 8.5 - € 9.5 billion of new green and sustainable investments between 2021 and 2025.

Range of practices:

- Generali has incorporated exclusionary policies into its investment decisions, which include:
 - Exclusion of investments in issuers operating in the unconventional oil & gas sectors (fossil fuels from tar sands, Oil and Gas extracted by fracking, Oil and Gas from the Arctic Circle).
 - Exclusion of new investments and gradual divestment from coal-related companies according to strict criteria. The strategy aims to fully phase out issuers which operate in the thermal coal sector in OECD countries by 2030 and 2040 in the rest of the world.
- Allowing each asset class to manage the decarbonization pathway according to their specific

investment strategy is viewed as fundamental to achieving net zero emissions. For example:

- Investments in listed corporate (equity-fixed income): Generali is gradually integrating climate-metrics (carbon footprint) in its investment choices.
- Investments in Real Estate: an improvement plan for each building is defined and considers the main levers to reduce CO2 emission such as renovations, upgrading systems, changes to the energy mix, and engaging with tenants (through Green Leases).



Case Study: Natixis Investment Managers

Background on mandate:

- Natixis Investment Managers' mandate is to consult and partner with its clients, and continually evaluate markets and assumptions to ensure the client's strategy delivers on long-term goals.

Unique practices:

- Natixis Investment Managers has developed a comprehensive climate tool for client reporting that is used to assess various transition and physical risks within a client's portfolio. Data is used from Trucost to generate carbon footprint, WACI, transition risk (weighted unpriced cost of carbon price as % of EBITDA), and physical risks. Each metric is assessed against a benchmark.
- Natixis Investment Managers monitors climate related impacts of its aggregated portfolios using 4 indicators:
 - Investment carbon intensity
 - Implied temperature rise
 - Total investments in green and sustainable bonds
 - Fossil fuel sector exposure



D. Limitations and challenges

In order to reduce the carbon footprint of a diversified investment portfolio, applying meaningful sector allocation is needed due to the wide range of sectoral carbon intensities and how they could evolve over time. However, for asset managers this would require clients to change policy benchmarks and investment guidelines. Furthermore, the complexity of this approach will increase as new sectors and value chains emerge and new technology develops. The evolution of such value chains is still in its early stages, making it difficult for investors to strategically integrate these trends into asset allocation plans and risk-return analyses.

As portfolio emissions will be impacted by different sector weightings and investee selection over time, detailed attribution analysis is becoming important to understanding the sources and maintainability of portfolio emission reductions in the future. Sector weightings in turn can be influenced by market conditions e.g. large near-term rises in energy share prices can send a false signal as to an investor's commitment to the transition based on portfolio weightings, even if the actual holdings haven't changed.

A recently published MSCI report highlighted the constraints investors could currently face in developing a net zero aligned portfolio.³⁹ Using its Implied Temperature Rise metric, MSCI assessed what a 2°C or lower and a 1.5°C portfolio would look like based on today's investable universe. They found that both the 2°C or lower and 1.5°C portfolio would omit a significant percentage of constituents in the MSCI ACWI Index (61% and 89% respectively) and would heavily favour certain sectors. In addition, they saw that a 1.5°C portfolio would shift country weights significantly, and 80% of the portfolio would be comprised of three

sectors – information technology, financials, and communication services. This further emphasizes the investment risk investors could encounter in implementing net zero strategies, including loss of diversification and increased tracking error against the relevant benchmark index.

Another challenge the investment community will likely encounter is the growing emphasis on achieving interim emission reduction targets as the decade unfolds, potentially leading to a lack of investment in hard to abate assets.⁴⁰ The lack of investment in high emitting sectors could impact the progression of decarbonization needed within these sectors to globally achieve net zero emissions by 2050. Investors' portfolio carbon footprints may in fact need to initially increase to support ultimate real world decarbonization. However, the above mentioned net zero frameworks do not directly account for this potential interim increase in emissions. Further, some climate solutions that enable emission reductions throughout the value chain may have their own significant footprint (e.g. mining operations for cobalt or other significant transition metals and minerals). To this end, investors will need to manage the tension between 'financing emission reductions' and 'reducing financed emissions'.

From an engagement perspective, portfolio managers may be less motivated to engage with portfolio companies with shorter planned hold periods based on a perception that engagement would not have a significant impact on the company's valuation. This dynamic will hopefully shift as markets develop and further price in decarbonization capacity, with assets that are aligned with 1.5°C or have committed to net zero increasingly experiencing premium valuations.

E. Approaches and enhancements moving forward

Net zero committed investors are currently experiencing a multitude of risks, ranging from implementation and reputational risks, to liquidity and market impact risks.⁴¹ To this end, investors are working to understand how they can align their portfolios to net zero while still maintaining their diversified market exposure and staying within tracking error limits against market benchmarks.

A recent publication by the CFA Institute illustrates a conceptual approach to integrating net zero footprint constraints into large-scale portfolios using various economically plausible scenarios.⁴² Their approach consists of beginning with a reference market index, and then systematically decarbonizing it based on an overall carbon budget constraint that is consistent with 1.5°C and updated annually. Their approach to a net zero constructed portfolio highlights some key findings, including:

- Tracking error is dependent on investor expectations regarding changes in the carbon emissions regulatory environment.

- As the available carbon budget shrinks over time, portfolio construction quickly becomes problematic such that time is of the essence in solving the climate crisis.
- There is a need for mainstream net zero carbon benchmarks based on straightforward methodologies.

SBTi highlights that financed emission-based mitigation strategies are most credible on a sector-by-sector basis, as sector-based decarbonization helps to better ensure transition financing for companies in all sectors.⁴³ Taking a sector-based approach can encourage engagement and transition financing of all sectors, as it steers away from the specific focus of ensuring the reduction of reported portfolio emissions.⁴⁴ However, the likelihood of this strategy contributing to real economy impacts depends on the number of investors applying the same strategy and the cost investee companies will incur to improve decarbonization performance.⁴⁵ SBTi guidance is also not yet available for all sectors (e.g. oil and gas).



PART 2

ASSESSING PORTFOLIO TRANSITION CAPACITY



The sophistication of accepted methods and approaches to track portfolio alignment and measure progress of individual portfolio holdings is still developing within the investment community. This section of the report will summarize relevant sources of guidance and explore the unique methods and approaches employed by ILN members to assess overall portfolio alignment and the transition capacity of their portfolio companies.

PORTFOLIO TRANSITION TAXONOMIES

A. Overall objectives

In assessing the climate-related characteristics of investment portfolios, a growing number of investors are developing proprietary climate transition taxonomies. These tend to first consider standardized methodologies (e.g., EU, CBI) but are then significantly customized to the individual investor's climate investing mandate, commitments, and strategic approach.

Taxonomies serve as classification systems that define and identify criteria for assets, projects and activities with environmental benefits or costs.⁴⁶ By codifying and formalizing the definition of sustainability, taxonomies aim to mitigate greenwashing risks. Taxonomies have more recently been used to assist investors in developing their net zero strategies and transition plans, including current portfolio transition assessments, net zero target development, engagement strategies, and investment department guidance.

B. Relevant sources

European Union

At the time of writing, there is no universal Paris-aligned, net zero finance taxonomy that investors can apply and report against. The EU has provided some important leadership in this area via its EU Taxonomy Regulation.⁴ The EU Sustainable Finance Taxonomy was initially developed to increase financial flows to sustainable activities through science-based criteria, while mitigating greenwashing risks. In its current iteration, the EU Taxonomy defines transition activities as “contributing substantially to climate change mitigation” in sectors that do not currently have technologically and economically

feasible low-carbon alternatives. In the case of hard-to-abate or carbon intensive sectors, financed activities must allow sector participants to outperform their peers from a sustainability perspective while not impeding the flow of capital to the development of green alternatives. The current EU taxonomy does not explicitly include net zero transition activities, but the EU Platform on Sustainable Finance has conducted consultations to extend the EU Taxonomy to ensure better inclusion of transition financing. As part of this consultation, the Platform released its final report in March 2022, detailing the requirements needed to extend the taxonomy, including the use of a traffic light system for the sustainable finance taxonomy (i.e., green, red, and amber).⁴⁷

Singapore

Similar to the EU Taxonomy's proposed approach, the Singapore Green Finance Industry Taskforce (GFIT) Taxonomy would employ a traffic light-based methodology to categorize corporate activities. Its environmental objectives are similar to the ones articulated by the EU Taxonomy in that it aims to uphold climate change mitigation and adaptation, protect biodiversity, and promote resource resilience. Singapore is expected to release its finalized iteration of its taxonomy in 2023, as it is still undertaking consultations at the time of this report.⁴⁸

⁴ Expected to come into force in January 2023 for large publicly listed EU corporates and in January 2024 for investment firms.

Japan

Japan's transition taxonomy, 'Basic Guidelines on Transition Finance' which launched in May 2021, goes beyond the labeling of activities and assets to outline technology and science-based roadmaps for hard-to-abate sectors, including chemical, oil and gas, pulp and paper, and cement, in order to better enable an orderly transition. The guidelines include timeframes for the adoption of various low-carbon or zero-carbon technologies, serving as a baseline for companies to develop their climate strategies and to inform their decision-making. The Ministry of Economy, Trade and Industry has noted that they expect an increase in transition loans and bonds as the roadmaps are further refined.⁴⁹

Climate Bonds Taxonomy

The Climate Bonds Taxonomy developed by the Climate Bonds Initiative (CBI) seeks to identify the assets, activities and projects needed to deliver a low carbon economy. The Taxonomy has been developed based on climate science including research from the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA), and draws on the input of hundreds of technical experts from around the world. It can be used by any entity looking to identify which assets and activities, and associated financial instruments, are compatible with a trajectory to net zero by 2050. First released in 2013, the Climate Bonds Taxonomy is regularly updated based on the latest climate science, emergence of new technologies and sector specific criteria. The CBI Taxonomy has been referenced in other jurisdictions including France's sustainable finance taxonomy, where labels for its investment funds (Green Fin Label) are CBI-aligned.⁵⁰

Sustainable Markets Initiative

The Sustainable Markets Initiative (SMI), a CEO-led global forum launched in 2020 by King Charles III, is developing a framework to guide investors on transition-aligned investment opportunities. The framework provides a methodology to assist investors in defining transition assets using six different transition maturity categories:

- **Transitioning:** the asset has a Paris-aligned pathway (target and plan) and contributes significantly to carbon mitigation through its output. The asset's emission intensity will be close to or at net zero.
- **Committed to transition:** the asset is committed to net zero but requires transition technology investment and/or a pivot in its business model to achieve Paris-aligned pathways.
- **Transition enabler:** the asset will be required to enable the transition to net zero by 2050 in other sectors (e.g. by supplying new technologies or raw materials) but may or may not have a Paris-aligned pathway. The asset is committed to net zero.
- **Interim and phase out:** the asset's products are currently needed but should be phased out by 2050. Asset has an accelerated phase-out timeline for its current products that makes it Paris aligned. The asset is committed to net zero.
- **Aiming to transition:** the asset is taking action to reduce emissions but has no pathway to net zero. The asset is committed to net zero.
- **Stranded asset:** an asset that cannot be Paris-aligned and has no plan to pursue this objective is at risk of becoming a stranded asset.

Paris Aligned Investment Initiative (PAII)

The PAII's Net Zero Investment Framework highlights a net zero alignment maturity scale investors can use to classify portfolio holdings. Companies can be classified as i) achieving net zero, ii) aligned to a net zero pathway, iii) aligning towards a net zero pathway, iv) committed to aligning, or v) not aligned.⁵¹ To assess Paris-alignment of portfolio holdings within listed equity and corporate fixed income, 10 different criteria are provided, which are used to assess the thresholds of each of the above classifications. Criteria to assess alignment of real estate and sovereign bonds asset classes is also provided.

Within GFANZ's "Concept Note on Portfolio Alignment Measurement" publication, it recognizes PAII's alignment classification as an example for 'maturity scale alignment metrics'.⁵²

C. Examples of current practices



Case Study: PSP Investments

As part of its inaugural Climate Strategy Roadmap, PSP Investments has developed a bespoke Green Asset Taxonomy to support its portfolio decarbonization efforts and the global transition to net-zero emissions by 2050. This classification system allows the firm to measure and manage its exposure to green assets, transition assets and carbon-intensive assets over time. Further, the taxonomy has a transition maturity dimension which will support PSP Investments' engagement strategy with partners and portfolio companies on the implementation of science-based climate targets.

Background on mandate:

- PSP Investments manages the amounts that are transferred to it by the Government of Canada for the funding of benefits earned from April 1, 2000 by members of the public sector pension plans of the federal Public Service, the Canadian Forces, the Royal Canadian Mounted Police and, since March 1, 2007, the Reserve Force. PSP Investments' statutory mandate is to manage such amounts in the best interests of the contributors and beneficiaries, and to invest its assets with a view to achieving a maximum rate of return, without undue risk of loss, having regard to the funding, policies and requirements of the pension plans and the ability of those plans to meet their financial obligations.
- The firm has a longstanding history of integrating ESG factors – including climate change – into decision making. In recent years, PSP Investments has accelerated its efforts to measure portfolio level exposure to physical risks, transition risks, and climate-related opportunities.
- The Climate Strategy Roadmap highlights PSP Investments' long-term commitment to use its capital and influence to support the transition to global net zero emissions by 2050. To achieve positive real-world outcomes, PSP has established short-term investment and engagement targets to track its progress, including aiming to:
 - Increase green assets under management to C\$70B by 2026 from C\$40.3B in September 2021.
 - Increase investments in transition assets under management to C\$7.5B by 2026 from C\$5.1B in September 2021.
 - Ensure that assets representing 50% of PSP Investments' carbon footprint will have commitments to implement mature science-based transition plans by 2026.
 - Aim to reduce PSP Investments' holdings of carbon intensive assets that lack transition plans by 50%, from C\$7.8 billion in September 2021 to C\$3.9 billion by 2026.
 - By striving to implement its climate strategy, PSP Investments expects to reduce its portfolio carbon emissions by 20-25% relative to its fiscal year 2021 baseline.

Unique practices:

- To assist with progressing PSP Investments' commitment and further understanding the GHG emissions exposure across the firm's investment portfolio, PSP Investments developed a bespoke Green Asset Taxonomy in 2021. The Taxonomy has been used in the development of the above-mentioned near-term targets.
- The taxonomy is visualized in the form of a spectrum that includes four main categories:
 - **Carbon intensive assets:** investments in hard-to-abate sectors or investments that fail to show quantifiable low emission performance.
 - **Transition assets:** investments that have committed to make a substantial contribution to the low-carbon transition through the establishment of public targets and disclosure practices.
 - **Green assets:** investments in low carbon activities that are expected to lead to positive environmental impacts.
 - **Other assets:** investments in activities in which carbon emissions are not a relevant consideration or where reported GHG data is unavailable.
- Green assets can be further categorized as dark green (investments with low GHG performance, aligned to third-party low carbon taxonomies and/or PSP's Green Bond Framework); light green

(beating a relevant sector GHG benchmark by at least 30%); and enabling (product and services which enable climate mitigation and adaptation). Transition assets can be further categorized as early (assets that have some short or long term targets but are not aligned to a science-based approach) and mature (assets that have publicly disclosed short- and long-term emissions reductions objectives aligned to science-based targets and/or Paris-aligned transition plans). Carbon-intensive assets could be considered high carbon (investments in any sector that are material in the context of PSP Investments' Total Fund Weighted Average Carbon Intensity) or hard to abate (from a specific list of sensitive high carbon sectors with large absolute emissions or above a higher GHG threshold).

- Initial asset classes in scope for application of the taxonomy included: long-only public equities (active and passive), real assets (direct and indirect), and private equity (direct and indirect).
- To develop the targets mentioned above and assess its portfolio baseline exposure, PSP Investments mapped in-scope assets via the two-dimensional axes of the Taxonomy that measures GHG intensity against transition plan maturity.
- Over time, PSP Investments will track progress and the Green Asset Taxonomy will likely continue to evolve to reflect innovation, climate science and best disclosure practices and standards like TCFD.



Case Study: Caisse de dépôt et placement du Québec (CDPQ)

To support their comprehensive climate strategy, CDPQ launched a transition envelope to invest in companies in hard-to-abate sectors that are able to demonstrate capacity to transition to net zero.

Background on mandate:

- Global investor that manages the funds of 46 depositor groups, with C\$390 billion Canadian in assets and offices in ten countries. The mandate is to invest constructive capital—in private equity, equity markets, private credit, infrastructure and real estate—to create opportunities and position enterprises to succeed.
- CDPQ adopted its first climate strategy in 2017 that integrates climate into each investment decision and captures data on its portfolio emissions.
- In 2021, CDPQ announced its commitment to achieve a net zero portfolio by 2050, supported by a new climate strategy that is based on four pillars:
 - Hold \$54 billion in green assets by 2025, tripling the value of CDPQ's low carbon asset portfolio compared with 2017.
 - Achieve a 60% reduction in the carbon intensity of the total portfolio by 2030.
 - Create a \$10 billion transition envelope to decarbonize hard to abate sectors.
 - Complete CDPQ's exit from oil production by the end of 2022.

Unique practices:

- The aim of the transition envelope is to invest in companies in hard-to-abate sectors that are committed to a net zero objective. CDPQ has developed specific classification criteria for these investments. The criteria adhere to the Climate Bond Initiative taxonomy. Eligible companies are expected to have a transition plan which incorporates CBI principles and a 1.5°C trajectory. A strong governance framework has been established to ensure credibility of target companies' transition capacity.
- Applicable sectors are ones that are essential to the transition but need to meaningfully reduce their GHG emissions. Sectors included within the envelope are power generation, materials (i.e. steel, cement, metals), transportation (i.e. train, freight, rail, passenger ship, and cargo ship), and agriculture.
- External expertise is applied when reviewing a potential investee's decarbonization strategy and alignment with sectoral decarbonization pathways. This in-depth analysis and assessment is intended to provide further credibility to the investment process.
- Once targeted investments have been selected, progress of each company's transition plan will be continuously monitored including through external assurance.

D. Limitations and challenges

There is a lack of comparability and interoperability of currently available taxonomies, which in turn hinders cross-border investments and risk management for transition financing. While a one-size-fits-all approach to transition taxonomies may not be feasible, particularly in natural resource dependent economies as well as developing and emerging economies, taxonomies should be based on globally agreed standards. The Common Ground Taxonomy, a joint initiative between the EU and China, could serve as a foundation to potentially reduce the current fragmentation of sustainable finance taxonomies, as well as provide a template for other jurisdictions that are in the process of developing taxonomies.⁵³

For financial reporting purposes, investors use industry classification systems such as the Global Industry Classification Standard (GICS) and Industrial Classification Benchmark (ICB), however these do not align with climate/transition classifications. The creation of a new system or the integration of climate/transition asset dimensions into existing industry classification systems will become increasingly critical.

Application of currently available taxonomies is limited by a lack of sufficient and credible data on investees' Scope 3 emissions. This is particularly salient for portfolio companies where a major share of their emissions can be found in their value chain.

There is limited methodological guidance for the agricultural sector, which may limit asset owners and asset managers when providing transition financing (efforts to address this issue are being undertaken by SBTi and the GHG Protocol).

Further, the emphasis on an activity-based lens in some taxonomies may produce possible discrepancies between activity-level alignment and entity-level performance. This may create loopholes for corporates to apply the environmental objectives of a given taxonomy to a small subsection of the entity's activities and assets, as opposed to applying the principles across the company.

E. Approaches and enhancements moving forward

In their most recent report on transition finance, NGFS has cited that advancing mandatory reporting of green asset ratios, sustainable asset ratios, and similar taxonomy-based ratios, as well as the inclusion of other safeguards, could help address misalignment and discrepancies and provide a more transparent view of a portfolio's transition to net zero.⁵⁴ This is under consideration by the European Banking Authority, which has recommended disclosures of green asset ratios to the European Commission, serving as a key performance indicator to measure the alignment between the EU Taxonomy and credit institutions' balance sheets.⁵⁵ However, as mentioned in the preceding section, data availability continues to hinder efforts to achieve comparable, complete, and consistent entity-level disclosures (e.g., level of ambition of transition strategies and capital budget allocations to green and carbon-intensive activities) that would allow investors to measure and track taxonomy-based ratios.⁵⁶

Moreover, the abovementioned challenges may warrant the use of third-party audits and assurance of taxonomy-based reporting to mitigate ongoing concerns of greenwashing risks and thus ensure the credibility of transition taxonomies.



PORTFOLIO HOLDINGS TRANSITION CAPACITY METRICS

A. Overall objectives

When developed credibly and strategically, transition-related metrics can enable asset managers and asset owners to measure their holdings' progress towards interim and long-term targets and broader net zero transition strategy. Metrics can be applied at the total portfolio level (top down) or at the individual issuer level (bottom up) to measure net zero progress and capabilities. Quantitative and qualitative metrics can measure various aspects of net zero investing, including GHG emission reductions, alignment with a 1.5°C trajectory, engagement activities, progress on transition plan implementation, and real-economy transition support.⁵⁷

Issuer/company level metrics:

Company level transition capacity is essential for investors to understand as they progress their net zero programs, develop investment strategies, and update asset allocations. To measure an individual portfolio holding's transition progress, metrics can include capacity-based metrics (i.e., assessing a company's emission abatement capabilities including the percentage of emissions that can be economically abated), and benchmark-related metrics (i.e., assessing company performance against normative benchmarks).

Portfolio level metrics:

Portfolio alignment metrics can assist investors in understanding their portfolio's Paris alignment baseline, allowing them to develop targets and engagement strategies. To measure a portfolio's overall progress to net zero, examples of metrics include binary target measurement metrics (e.g. measuring the percentage of portfolio companies with net zero or Paris-aligned targets), implied temperature rise metrics (e.g. assigning the portfolio a temperature score based on the portfolio's level of ambition), and engagement-related metrics.

B. Relevant sources

As illustrated in SBTi's latest guidance for the financial services sector, the current landscape of metrics adopted to track and measure progress can be framed in terms of emissions-based (i.e., financed emissions), alignment-based, and contribution-based.

Below are a number of sources of portfolio alignment and issuer level metrics intended to help investors with assessing net zero progress.

TCFD Portfolio Alignment Team

In response to the perceived lack of available and coherent portfolio alignment methodologies, the TCFD's Portfolio Alignment Team (PAT) published technical guidance in 2021, 'Measuring Portfolio Alignment', that introduces portfolio level and individual issuer level metrics. The metrics are intended to serve as forward-looking portfolio management tools to measure a given portfolio or company's transition progress. This in turn would enable financial institutions to better ensure their lending and investment portfolios are aligned with net zero commitments.

The publication highlights three main metrics to assess a portfolio's alignment to net zero:

- **Binary target measurements:** measure the alignment of a portfolio with specific targets based on the percentage of holdings that have net zero, Paris-aligned targets.
- **Benchmark divergence models:** assess portfolio alignment by constructing normative benchmarks from forward-looking climate scenarios and comparing individual company emissions against them.
- **Implied temperature rise (ITR) models:** assign temperature scores that represent the most likely global warming outcome if the global economy were to exhibit the same level of ambition as the asset or portfolio being measured.

Aside from binary target measurement, the above portfolio alignment metrics share the same

methodological approach: translate scenario-based carbon budgets into normative benchmarks; assess company-level transition performance and compare emissions to the benchmark; and translate performance into company-level scores and aggregate them into a portfolio-level score.⁵⁸ Although portfolio alignment metrics have been met with barriers to adoption, further enhancements to the metrics could inform decisions about engagement, portfolio allocation and optimization for asset managers and owners alike.⁵⁹

TCFD Metrics and Targets

In addition to the PAT's technical guidance, the TCFD published new guidance on climate-related metrics in October 2021. Of note, it recommends the disclosure of the following seven cross-industry, climate-related metrics at the individual reporter level:

- GHG emissions (absolute Scope 1, Scope 2, and relevant, material categories of Scope 3 emissions, as well as carbon intensity);
- Carbon price (external and shadow/internal);
- Proportion of assets and/or operating, investing, or financing activities materially exposed to physical risks, based on key categories of commonly accepted risks;
- Proportion of assets and/or operating, investing, or financing activities materially exposed to transition risks based on key categories of commonly accepted risks;
- Proportion of assets and/or operating, investing, or financing activities aligned toward climate-related opportunities, based on key categories of commonly accepted opportunities;
- Amount of senior management remuneration impacted by climate considerations; and
- Amount of expenditures or capital investment deployed toward climate risks and opportunities.⁶⁰

In their commentary, the TCFD notes that forward-looking disclosures are intended to provide a range of plausible risks and opportunities based on currently available information, and are not intended to predict outcomes.

GFANZ

GFANZ's recently published 'Concept Note on Portfolio Alignment Measurement' highlights the TCFD PAT's methodological process to measuring overall portfolio alignment and builds on the PAT's research and findings.⁶¹ The consultation paper also details methodology and implementation-related barriers that practitioners have identified, which are highlighted in the paper's subsequent sections.

Furthermore, GFANZ's recent report titled 'Transition Plan Guidance and Recommendations' proposes a range of metrics for the financial sector, including:⁶²

- Real-economy transition metrics that firms can use to track their involvement in supporting, scaling, and accelerating the transition in the real economy (e.g., proportion of GHG portfolio emission reductions allocated between those driven by changes in portfolio composition, and those driven by reductions achieved by the underlying companies),
- Net zero transition plan implementation metrics that can be used to assess FI's net zero progress (e.g., engagement metrics, internal implementation metrics, metrics to monitor changing portfolio composition).

Transition Pathways Initiative (TPI)

TPI is an asset owner-led global initiative that provides assessments on companies' readiness or preparedness to transition to a low-carbon economy. The data informing transition readiness by sector is derived from publicly available company information, as well as FTSE Russell for data points on management quality (i.e., climate governance). TPI's assessments are largely focused on high-emitting or hard-to-abate sectors, which includes 400 publicly listed companies across 16 high carbon sectors such as coal mining, electric utilities, oil and gas, and aviation.⁶³ In terms of use cases, investors have used TPI's open-source data as part of their ESG integration and portfolio construction processes in order to further their understanding of their portfolio holdings and alignment with Paris-aligned transition pathways.⁶⁴

Transition Plan Taskforce (TPT)

To support the UK Government's Sustainability Disclosure Requirements (SDR), the Transition Plan Taskforce (TPT) was launched with a two-year mandate to develop granular transition planning standards, good practices, 'cutting edge' metrics, and templates. The publicly available terms of reference cites that the TPT will coordinate with current international efforts and their foundational work, including GFANZ, TCFD, and ISSB. In addition to defining high caliber transition plans via 'sectoral transition plan templates' for FIs and real economy sectors, the TPT will provide detailed guidance on metrics and targets that will be predicated on current international standards to ensure compatibility. The TPT is slated to report its initial findings by the end of 2022.⁶⁵

SBTi

SBTi has co-developed an open-source temperature rating methodology with WWF and CDP and subsequently developed a codebase to calculate temperature scores.⁶⁶ The temperature rating tool was designed for financial institutions to assess the temperature alignment of their investees' publicly disclosed GHG emission reduction targets, and can be done at a target, company, and portfolio level. The online open-source platform also provides analytics on target setting and company emission reduction ambitions, as well as providing end-users with what-if analysis in order to inform investment decisions.⁶⁷

Climate Action 100+

Climate Action 100+ is an investor-led engagement initiative with an objective to advance decarbonization activities among companies that are the largest contributors of GHG emissions. This is accomplished in part via the Climate Action 100+ Net Zero Company Benchmark, which measures and tracks company progress to address climate risks and alignment to net zero business models in terms of three focus areas: emission reductions, governance, and disclosure. Investors can use the results of the Benchmark to inform their engagement activities with portfolio companies (e.g., decisions on voting), as well as to assess alignment between companies' net zero commitments and actual decarbonization investments and activities.⁶⁸

ESG Rating Providers

Due to the absence of readily available corporate data from investees, many asset owners and managers rely in part on ESG rating providers, such as Bloomberg, MSCI, Moody's and S&P, to support the data collection and performance measurement of several climate transition-related metrics. The methodologies applied and metrics provided by these data providers can vary significantly, giving rise to investor concerns over transparency and comparability.

Company-specific metrics available, based primarily on reported information, include GHG emissions, carbon policy, carbon intensity, climate and/or environmental strategy, investment in renewable energy, green buildings, and green products and services.⁶⁹

Forward-looking metrics and ratings include implied temperature rise scores; climate value-at-risk (based on how future climate-related costs could impact current valuation of securities); and low carbon transition scores (based on current and potential exposure to transition risks and opportunities based on a given company's operational and business model).^{70, 71, 72} Sector specific forward-looking metrics are available for utilities (e.g. energy mix, green-to-brown ratio over time, and stranded asset risks) and oil and gas (e.g., low-carbon transition business profile; medium-term exposure to technology, market, and policy risk; medium-term response activities; and long-term exposure to rapid low-carbon transition scenarios).^{73, 74}

C. Examples of current practices



Case Study: CPP Investments

CPP Investments has developed an Abatement Capacity Framework to support the assessment of a company's commitment and ability to abate projected emissions.

Background on mandate:

- CPP Investments is the professional investment management organization that invests Canada Pension Plan (CPP) funds not needed to pay benefits. Its mandate is to maximize returns without undue risk of loss, taking into account the factors that may affect the funding of the CPP and its ability to meet their financial obligations.
- CPP Investments believes that the performance of their portfolio will be influenced by how well it adapts alongside the global economy on the path to net zero, and in February 2022 committed its portfolio and operations to being net zero of GHG emissions across all scopes by 2050.

Unique practices:

- To contribute to the real economy progressing to net zero by 2050, CPP Investments has developed a standardized Abatement Capacity Assessment (ACA) framework. The framework is intended to help investors, directors and management teams with measuring the capacity of a given company to remove or abate its GHG emissions today and in the future, as well as assess emissions that will need to be addressed via offsets due to abatement being otherwise uneconomic. The ambition is that the framework will evolve to become a reporting standard, allowing stakeholders to effectively decarbonize our economy.
- The framework has been developed to be applied across industries and geographies with common assumptions, and assist boards and executives in assessing the highest impact opportunities to transition.
- The framework provides a three-step process to assess an organization's abatement capacity:
 1. Create a clear, standardized assessment of each organization's emissions across scope 1, 2, and 3.
 2. Conduct an Abatement Capacity Assessment (ACA) to project its capacity to abate these.
 3. Report Projected Abatement Capacity (PAC).
- To define an organization's overall transition capacity, the framework highlights three categories of PAC:
 - Current (proven) abatement capacity: assess current emissions and develop an estimate of what portion of these is currently economic to abate using existing technologies.
 - Long-term (probable) abatement capacity: to control for the complexities of forecasting falling technology costs and changes in regulation, the framework proposes that companies assume no change to today's technology costs and regulation but instead use two standardized carbon price assumptions that meaningfully exceed current levels to assess when abatement initiatives would become economic.
 - Uneconomic abatement capacity: residual sources of emissions that are uneconomic or physically not feasible to abate with current technologies even at higher carbon prices (i.e. those that will require ceasing the business activity, further technology development or offsets through carbon removal technology).
- To pilot the implementation of this framework, CPP Investments has begun applying this framework within its private portfolio, including a real estate company. In this example, it was concluded that the portfolio company could achieve at least 64% reductions of Scope 1 and Scope 2 GHG emissions with currently economically viable measures that exist today.
- CPP Investments will also apply this framework to its own operations and disclose the findings by the end of this fiscal year.



Case Study: Nordea Asset Management (NAM)

Nordea is operationalizing the Paris Aligned Investment Initiative Net Zero Investment Framework, and has developed an in-house alignment assessment tool.

Background on mandate:

- As the largest asset manager in the Nordics, and an active owner that engages with investee companies, NAM offers a broad range of investment solutions covering all major asset classes including listed and private equity and corporate bonds, green bonds, sovereign bonds, covered bonds, structured products and others. For many of these asset classes, the investment community is still working on methodologies for measuring contribution to financed emissions, fair share emissions reduction pathways and net zero alignment. In pursuit of NAM's net zero commitment, efforts to date have therefore been focused on setting carbon footprint reduction targets for listed equity portfolios as well as driving Paris alignment amongst investee companies.

Unique practices:

- As an active owner, NAM prioritizes engagement as the primary mechanism to drive Paris alignment amongst investee companies, and has therefore set a 2025 target to ensure 80% of its top 200 largest carbon footprint contributors to be on a Paris-aligned trajectory or else subject to engagement. This target will increase to 100% by 2030.
- To assess the alignment profile of companies, NAM evaluates six current and forward looking alignment criteria as defined by the PAII Net Zero Investment Framework:
 - A long term 2050 goal consistent with global net zero;
 - Short & medium term emission reduction targets;
 - Current emissions intensity performance (scope 1, 2, and material scope 3);
 - Disclosure of scope 1, 2 and material scope 3 emissions;
 - A quantified plan to deliver targets; and
 - Capital allocation alignment.
- The criteria are used to categorize companies into four alignment categories: aligned, aligning, committed to aligning or not committed.
- NAM has developed an in-house alignment assessment tool to identify the alignment status of each of its largest carbon footprint contributors which is then complimented by individualized research and engagement with companies to conclusively determine the degree of alignment.
- Priority is to engage high-emitting companies that have yet to achieve alignment objectives, but where, through firm-wide engagement efforts and collaborative engagements, Nordea believes it can influence real world emission reductions.
- Going forward NAM will continue to enhance its capacity to assess alignment status of investee companies, set out expectations, track progress and be prepared to escalate where progress stalls.

D. Limitations and challenges

The range of guidance from the multiple sources cited in B) above highlights the major challenges that investors face in selecting and implementing an approach to assessing transition capacity.

A frequently cited pain point for investors is the limited information for use in key forward-looking metrics. A recent TCFD public consultation found that three-quarters of the participants use forward-looking metrics (e.g., implied temperature rise, climate value-at-risk) as well as broader metrics such as carbon intensity, screening criteria, and emissions. However, the respondents expressed concerns with the reliance on and lack of transparency of assumptions applied to ascertain projected emissions, as well as concerns with future uncertainty (e.g., future carbon price), and the use of opaque or difficult methodologies.⁷⁵

As mentioned in the preceding section, GFANZ's more recent concept note on portfolio alignment also underscored the uncertainty of assumptions underpinning portfolio alignment metrics. The paper noted that many practitioners have concerns pertaining to the lack of sectoral and regional granularity in scenarios for portfolio alignment benchmarking.⁷⁶

Furthermore, the varying temperature alignment methodologies are known to produce significantly different temperature scores, creating a lack of reliability in the use of these indicators. Additional work would be required to align the temperature alignment methodologies and inputs used therein to produce more consistent and comparable results.⁷⁷

Finally, the limited transparency of and consistency in marginal abatement cost curves required to assess the economics of emissions abatement technologies is a significant challenge in evaluating corporate transition plans.

E. Approaches and enhancements moving forward

Methodological convergence and transparency are both necessary to address some of the key challenges when developing transition-related metrics, including portfolio alignment metrics. A rigorous multistakeholder process that includes data providers would be necessary to drive such convergence and standardization of the currently available methodologies.

In their latest publication, SBTi notes that additional research is required to better understand the use of alignment metrics to assess all types of companies.⁷⁸ As well, further research is required to develop a target setting framework that sufficiently accounts for key approaches for climate solutions, incentives to drive real-world decarbonization, and managed phaseouts of high-emitting assets.⁷⁹

Overall, Parts 1 and 2 of this report demonstrate that the diversity of net zero target setting and portfolio transition capacity assessment approaches risks becoming untenable in the face of unprecedented complexities in the frameworks, methodologies and guidance available and the underlying global economic and client science models underpinning these frameworks. Key factors in overcoming this complexity challenge are explored in Part 3 of this report.

PART 3

CONVERGENCE AND
COLLABORATION
REQUIRED TO
ACHIEVE NET ZERO



Convergence and collaboration among investors and other financial institutions, governments and regulators, corporates, global framework developers, data providers and society at large will be crucial to achieve the real economy emission reductions necessary to achieve a 1.5°C scenario. This section of the report will explore priority areas that emerged from the Part 1 and 2 analysis where such convergence and collaboration is most critical.

REAL ECONOMY EMISSION REDUCTIONS AND A JUST TRANSITION

Integrating ‘real economy’ emission reductions into an investor’s net zero targets and strategies is a key objective of the various net zero target setting frameworks and methodologies. Multiple key stakeholders have acknowledged that achieving real economy decarbonization cannot be solved by simply rebalancing listed equity portfolios away from high emitting assets.⁸⁰

In addition to investing in low-carbon alternatives, engagement with corporates and policy makers is an important driver to ensuring real economy emission reductions. NZAOA, PAII, and SBTi all highlight the importance of engagement-related targets and strategies to ensure investors don’t automatically divest from high emitting assets, but rather support them if possible through the transition. By doing so, the investable universe is not unduly restricted and systemic decarbonization is achievable.⁸¹ The NZAOA’s guidance stresses the importance of engagement with corporates, policy makers, asset managers and others to ensure that alliance members have an impact on the real economy.⁸²

Furthermore, to achieve a net zero transition, investors will recognize that a net zero portfolio is simply an instrument and not the overall objective or end goal. The underlying objective is some combination of facilitating a net zero world, achieving superior financial performance, and maintaining a strong reputation.

Achieving real economy emission reductions is also dependent on the ability of transition actors to address ongoing economic, political, social, and technological disruptions (e.g., heightened geopolitical tensions and the resulting focus on energy security and independence, unethical applications of technology, climate migration, and worsening income inequalities). If these disruptive forces are unable to be solved for, various market dislocations could occur and overtake efforts to achieve real economy decarbonization.⁸³

The concepts of a ‘just transition’ and ‘real economy decarbonization’ go hand in hand. Asset managers and asset owners are increasingly acknowledging the role of underlying financial incentives and systems structures that indirectly influence financial returns, as well as the increasing need for alignment of these incentives and structures with achieving social welfare.⁸⁴ Adopting sensible and highly effective policy and regulatory measures to shift financial incentives will require meaningful collaboration between institutional investors and government entities. This could come to fruition via investor-driven advocacy and responsible lobbying for global harmonization of key elements such as price signals (e.g., carbon price), mandatory climate reporting requirements, and legal frameworks for a just transition.

NET ZERO APPROACHES AND METHODOLOGIES

SBTi, NZAOA, and PAI have both commonalities and differentiating elements across their frameworks, guidance and target setting methodologies. Common elements such as an emphasis on engagement and real economy emission reductions highlight the frameworks' common end goal. However, the extent of differentiating elements among the three frameworks has meant that each framework's approach to achieving the end goal is different.

Such key differentiating elements include the degree of use of forward looking vs. historical metrics, the allowable use of offsets to achieve net zero commitments, the definition of 'material' sectors, and inclusion of a baseline net zero alignment assessment. From a metrics standpoint, SBTi specifies when absolute vs. intensity metrics are to be used in setting targets, while NZAOA and PAI allow investors to use either absolute or intensity metrics. PAI provides some forward-looking metrics to help investors assess an asset's transition potential, and the SBTi's temperature rating methodology uses forward-looking metrics to assess implied portfolio temperature rise.^{85, 86}

Due to these various differentiating elements, investors have had to apply an exceptional level of innovation to develop their net zero approaches and methodologies, resulting in varied approaches. The growing range of practices will present growing challenges as the transition progresses.

To increase the alignment and convergence of investor best practices, substantial collaboration will be needed among the investment community. This effort would in turn help corporates clarify expectations and allow them to enhance their efforts for the transition.⁸⁷ The current efforts of GFANZ, specifically their Recommendations and Guidance on Financial Net Zero Transition Plans, highlights their preliminary attempts at convergence of net zero best practice for all financial institutions.⁸⁸ Similarly, convergence is being established in climate reporting – for example, the International Sustainability Standard Board's climate reporting proposals build upon the TCFD recommendations and incorporate industry based disclosure requirements derived from the SASB Standards.⁸⁹



CONVERGENCE REQUIRED AMONG THIRD PARTY DATA PROVIDERS

With climate science models shifting at a rapid rate, it is difficult for investors and stakeholders to adjust their investment strategies in real time. The relatively recent shift in objectives from ensuring global warming stays below 2°C, to achieving net zero emissions so that warming does not exceed 1.5°C, has required rapid changes to data collection, scenario development, financing and regulations.⁹⁰ Data providers are still in the midst of developing and updating their forward-looking metrics and revising methodologies to align with 1.5°C. Additionally, providers are regularly updating their sector and region-based carbon footprint proxies, in part due to revisions or restatements of reported emissions by corporates. These continuous revisions to models and data make it difficult for investors to accurately assess their portfolios' current net zero alignment and operationalize strategies to achieve their targets.

In addition, data providers' methodologies, data inputs, and assumptions differ in developing forward-looking metrics for assessing portfolio alignment, making it challenging for investors to understand which will best meet their objectives. A study completed by Binger et al. (2021), highlights that a considerable degree of divergence exists across various providers of transition risk metrics, thereby creating diverse results.⁹¹ Reports from the PAT of the TCFD⁹⁴ and the Institut Louis Bachelier⁹² highlight that methodologies to estimate implied temperature rise metrics rely on differing judgements and data inputs that may make the outputs difficult to compare.⁹³ Methodologies also tend to differ in asset coverage levels, further driving the inability to effectively compare metrics.⁹⁴ To this end, coordinated investor pressure will be necessary to achieve the comparability and consistency necessary to support investors' net zero programs.



ESTABLISHING A ‘DUAL MEASUREMENT’ SYSTEM

The need for a ‘dual measurement’ system is growing, where conventional financial measures and GHG emissions accounting will need to be supported by integrated systems and processes.

Our economy has operated for over a century on a solely finance-based system, where consistent global rules and regulations have been established for financial measurement and reporting. An expanded infrastructure capable of producing emissions accounting and disclosure suitable for decision-making by investors and other financial stakeholders is still in its formative stages across various capital markets.

The concept of ‘net zero emissions’ has an unprecedented, science-based global carbon budget notionally allocated to individual actors, which is cumulative and cannot be exceeded. This type of individual and aggregate constraint on business investments and activities is a new and difficult to understand concept for the many actors within the traditional financial system, who generally operate on a foundational assumption of unlimited financial and natural resources being available to pursue economic growth. It remains unclear how the global carbon budget can be fully incorporated into the current financial model.

NAVIGATING THE CURRENT AND FUTURE INVESTABLE UNIVERSE

Investors have a longstanding obligation to meet their fiduciary duties in generating financial returns for their beneficiaries and clients. The PAII’s guidance acknowledges that investors’ efforts to achieve real economy emissions and increase allocations to climate solutions are subject to fiduciary and regulatory constraints.⁹⁵ However, as the economy is further impacted by climate change, the fiduciary duties of investors and corporates will evolve.⁹⁶ It has become increasingly clear that climate change could have a significant impact on financial returns over a range of investment horizons, therefore investors are continuing to assess how their net zero commitments interact with and align to these fiduciary duties.

To enable the net zero economic transition and increase the size of the investable universe, new sectors, activities, and value chains may need to be created to rapidly scale the development and deployment of the low emission technologies, products and services needed to achieve decarbonization targets.⁹⁷

INVESTMENTS IN CLIMATE RESILIENCE AND ADAPTATION

The increased prevalence and severity of droughts, flooding, wildfires, and heat waves, affecting both the Global South and Global North, has prompted greater awareness of the economic impacts of climate change and the need for immediate action to support investments in climate resilience and adaptation. A recent report by the Climate Policy Initiative indicated that, in 2019–2020, adaptation financing accounted for only 7 percent of the total share of climate finance (USD \$46 billion), a fraction of the financing needed to adequately respond to existing and foreseeable climate change. The majority of this adaptation financing is attributable to public finance, namely multilateral and national development finance institutions, and even then only represents 14 percent of total public finance.⁹⁸

The current tracking of private sector investments in climate adaptation is minimal and, in turn, creates and reinforces barriers to demonstrate the bankability of climate adaptation activities. However, according to a recent Bank of America analysis, the climate adaptation market's expected value could be \$2 trillion per year within the next five years.⁹⁹ From an investor's perspective, this creates significant opportunities such as investing in corporates that upgrade electricity grids and transmission lines to enhance climate resilience; developing erosion control and drainage systems; producing weather-resistant building materials; developing highly efficient air conditioners and insulation systems; and creating coastal barriers, among many other climate adaptation-aligned businesses.^{100, 101}

Key to creating targets for adaptation and resilience financing will be collaborating in multi-stakeholder coalitions and initiatives, such as the Coalition for Climate Resilient Investment (CCRI) and Global Innovation Lab for Climate Finance. Further work will be necessary to (1) introduce structured price signals for physical climate risks to improve market efficiencies in allocating capital; (2) develop

metrics and methodologies to systematically track and monitor adaptation-aligned financing; and (3) establish a framework that government entities could adopt to create an enabling environment for private investments in climate adaptation and resilience.^{102, 103}

Ultimately, adaptation financing requires a longer-term outlook that promotes financial flows to support society's ability to adapt to the inevitable and potentially devastating impacts of climate change.¹⁰⁴ Investors today need to better incorporate climate adaptation and resilience factors when assessing and managing physical risks as part of their ongoing investment processes, and assess opportunities for investment in sustainable infrastructure. A greater awareness of intersecting issues, including a just transition, inclusive financing, and human rights, could better prepare investors to incorporate these dimensions in their investment strategies.

The following ILN publications further explore these intersecting themes:

- **Physical risk toolkit:** ILN's [Climate Change Physical Risk Toolkit](#) helps asset owners and managers better understand and manage the potential physical impacts of climate change on their investments.
- **Diversity, equity and inclusion:** ILN's [Inclusive Finance Playbook](#) helps institutional investors apply an inclusion lens to their portfolio assessments by providing the business case for assessing and engaging on inclusion, inclusion metric examples, and case studies on how ILN members are using these metrics in practice.
- **Blended finance:** [ILN's Blended Finance Blueprint](#) and subsequent [Recommendations for Policymakers](#) propose specific actions the development finance community can take to mobilize private capital into sustainable investments in emerging and frontier economies.

GLOSSARY OF TERMS

Carbon Risk Real Estate Monitor (CRREM): aims to develop a tool that allows investors and property owners to assess the exposure of their assets to stranding risks based on energy and emission data and the analysis of regulatory requirements.¹⁰⁵

Glasgow Financial Alliance for Net Zero (GFANZ): is a global coalition of leading financial institutions, currently made up of 450 member firms representing more than \$130 trillion in assets under management and advice who are committed to accelerating the decarbonization of the economy.¹⁰⁶

Greenhouse gas emissions (GHG): gases (such as methane, carbon dioxide, nitrous oxide) that are released by certain human and natural activities, which trap heat in the atmosphere and warm the planet.

International Energy Agency (IEA): was originally established to help with coordinating a collective response to the oil supply chain disruptions in 1974, however their work has evolved to be a source of energy transition models and provide authoritative analysis, data, policy recommendations, and real-world solutions to help countries provide secure and sustainable energy for all.¹⁰⁷

Intergovernmental Panel on Climate Change (IPCC): is the United Nations body for assessing the science related to climate change and is the leading source of authoritative climate science models and analysis.¹⁰⁸

Just Transition: a people-centered framework to net zero that calls for maximizing social and economic opportunities of climate action in the real economy, while minimizing the impacts of labour market transitions.

Net zero: cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere by oceans, forests, and/or carbon capture technologies.¹⁰⁹

Net Zero Asset Managers initiative (NZAM): is an international group of asset managers, currently made up of 273 signatories with US\$61.3 trillion assets under management, who have committed to supporting the goal of net zero greenhouse gas emissions by 2050 or sooner, in line with global efforts to limit warming to 1.5 degrees Celsius; and to supporting investing aligned with net zero emissions by 2050 or sooner.¹¹⁰

Net Zero Asset Owner Alliance (NZAOA): UN-convened Alliance that is currently made up of 74 institutional investors with US\$10.6 trillion in assets

under management, delivering on a bold commitment to transition investment portfolios to net zero GHG emissions by 2050.¹¹¹

Paris Aligned Investment Initiative (PAII): is a collaborative investor-led global forum, currently made up of 118 investors representing \$34 trillion in assets with the mandate of enabling investors to align their portfolios and activities to the goal of the Paris Agreement.¹¹²

Partnership for Carbon Accounting (PCAF): a global partnership of financial institutions that work together to develop and implement a harmonized approach to measure, assess and disclose the greenhouse gas (GHG) emissions associated with their loans and investments.¹¹³

Portfolio alignment: actions and tools that assess net zero transition progress within a portfolio and determine whether, at an aggregate level, holdings of individual companies are Paris-aligned.

Race to Zero: is the UN-backed global campaign to rally leadership and support from businesses, cities, regions, and investors. The Race to Zero is an umbrella campaign that gathers a diverse set of partner initiatives, including GFANZ, NZAOA, PAII, and NZAM.¹¹⁴

Real economy decarbonization: the reduction of GHG emissions throughout the entire global economy

Science-based target (SBT): targets are considered 'science-based' if they are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement.¹¹⁵

Science Based Targets initiative (SBTi): is a partnership between CDP, the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF). SBTi supports ambitious climate action in the private sector by assessing and validating the private sector's science-based emission reduction targets.¹¹⁶

Taskforce on Climate Related Financial Disclosures (TCFD): was created by The Financial Stability Board to improve and increase reporting of climate-related financial information.¹¹⁷

Transition capacity: the ability of an organization to reduce its GHG emissions and achieve net zero emissions by 2050.

Transition pathways: the term used to describe emissions, technologies, and investment trajectories at the global, regional and sectoral level that will be needed to achieve net zero.¹¹⁸

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