UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Sustainability integration by public pension and sovereign wealth funds, 2022

United Nations

This publication has not been formally edited.

United Nations publication issued by the United Nations Conference on Trade and Development.

UNCTAD/DIAE/2023/3

eISBN: 978-92-1-002718-2

Executive summary

Institutional investors can exert significant influence over their investees and the sustainable investment market through both the size of their holdings and the active nature of their ownership. This study examines ESG and sustainability integration in the investment practices of the world's 100 largest public pension funds (PPFs) and sovereign wealth funds (SWFs), accounting for $22 trillion in assets under management (AUM).

PPFs and SWFs have long-term obligations and investment horizons. This puts them in a unique position to contribute to the Sustainable Development Goals (SDGs) and take action on sustainability risks, especially climate change. Despite this potential, more than half of the world's 100 largest public pension and sovereign wealth funds do not disclose or report on sustainability issues, and institutional investors as a group can do more to mainstream sustainability.

Key findings of the report

- Of the 100 funds in the report's sample, 53 per cent did not report on ESG integration in 2021. Non-reporting funds include 21 SWFs (70 per cent of the SWFs in the sample) and 32 PPFs (43 per cent of the PPFs in the sample).
- However, 47 per cent of the 100 funds did publish meaningful reporting on their sustainability performance and ESG integration strategies (38 PPFs and 9 SWFs). This number is slightly up from 2020, when 40 per cent of funds reported.
- Geographical origin, related to the sustainability regulatory framework, has an impact on ESG reporting and reporting quality: Europe performs better than other regions; SWFs are relatively less transparent than pension funds. The highest-ranking funds are on average almost three times larger than the lowest ranking funds.
- Many reporting funds acknowledge the material risks posed by ESG issues and associated regulatory measures, with a majority of these funds changing their investment strategies and policies accordingly, anticipating transition risks and targeting net zero in their portfolios.
- Reporting funds use at least one of seven sustainable investment strategies to integrate an ESG and SDG perspective into their investment decisions. These range from relatively simple exclusion strategies to more positive screening approaches. The SDGs were explicitly referenced by half of reporting funds in their investment strategy.
- Reporting funds are active asset owners, signaling the importance that funds assign to engagement and voting, and the ability of large institutional investors to affect change on ESG and SDG-related issues along the investment value chain. As a general rule, funds favour engagement with asset managers and investees as a first resort to improve ESG performance, and divestment as a last resort if performance does not improve.
- Reporting funds are increasingly sensitive to climate-related risk, with more than four out of five funds having designed a climate or CO2 reduction strategy and the same number reporting the use of an international reporting framework on sustainability, such as TCFD. However, there remains a large variance in reporting with no single, widely accepted framework.
- Reporting funds are also defining climate related targets for their investment decisions and sustainability integration strategies, with more than two thirds of frontrunner funds using a specific climate target, such as net zero. However, only one in five funds uses an auditing or certification process to evaluate their sustainability reporting and ESG integration.

By reviewing the sustainability reporting of 47 'frontrunner' funds, this study identifies a rich pool of good practices for sustainability integration in six strategic areas: governance, corporate sustainable investment policies, sustainability integration strategies, ESG integration along the investment chain, climate action, and evaluation and reporting. The findings of the report and best practice cases will also contribute to UNCTAD guidance (UNCTAD, forthcoming) on sustainability integration for institutional investors, with a particular relevance for developing countries.

Acknowledgements

This paper was prepared by Malou Celander, Joseph Clements, Yongfu Ouyang and Samuel Ringier, under the direction of James Zhan, Director of the Division on Investment and Enterprise, UNCTAD. The paper benefitted from research support and substantive inputs from Eman Javaid. Comments were provided by Alina Nazarova-Durindel.

Abbreviations

AUM	Assets under management
CDP	Carbon Disclosure Project
DEI	Diversity, equity and inclusion
ESG	Environmental, Social and Governance
EU	European Union
FTSE	Financial Times Stock Exchange
GHG	Greenhouse gas
GHP	Greenhouse Gaz Protocol
GRESB	Global Real Estate Sustainability Benchmark
GRI	Global Reporting Initiative
KPI	Key performance indicator
ISSB	International Sustainability Standards Board
MSCI	Morgan Stanley Capital International
OECD	Organization for Economic Cooperation and Development
PPF	Public pension fund
PRI	Principles for Responsible Investment
SASB	Sustainability Accounting Standards Board
SDGs	Sustainable Development Goals
SDI-AOP	Sustainable Development Investments-Asset Owner Platform
SWF	Sovereign wealth fund
TCFD	Task Force on Climate-related Financial Disclosures
tCO2e	Tons of carbon dioxide equivalent (i.e. all greenhouse gas emissions)
UNCTAD	United Nations Conference on Trade and Development
VBDO	The Dutch Association of Investors for Sustainable Development

A full list of pension and sovereign wealth fund names and abbreviations referred to in this report can be found in appendix 1.

Table of contents

1. Introduction

The accelerating and cascading impacts of climate change, pollution and biodiversity loss are rapidly revealing the physical and transition risks of non-sustainable investments. In 2022 - one of the warmest years on record - incidents of catastrophic flooding, heatwaves, drought, and fires, sharpened the attention of investors. An environment of higher inflation and tighter monetary conditions, as well as supply chain weaknesses, for example in energy, added another dimension to investors' concerns about sustainability and expected long-term returns. At the same time, the regulatory response to environmental and other sustainability-related issues, including corporate governance, has been gathering pace, supporting moves towards more sustainable financial markets in both developed and developing countries.

Consequently, an increasing number of investors and asset owners are taking actions to support more sustainable investments and to mitigate sustainability-related risks. This report shows that institutional investors, such as public pension and sovereign wealth funds, are becoming more active in their assessment of sustainability risks and the responsiveness of their investment strategies to these risks. However, many investors still fail to disclose or report on sustainability-related risks and are not moving quickly enough to reorient portfolios, especially with regard to climate-related action.

Pension and sovereign wealth funds, as asset owners and investors, are at the very upstream end of the investment value chain. Their large holdings in publicly listed companies, the huge magnitude of their total assets and their long-term investment horizon puts them in a strong position to drive sustainability integration and provide additional financing to achieve the Sustainable Development Goals (SDGs). In 2021, the AUM of the global pension industry grew to almost $57 trillion, up from $52 trillion the year before.[1] Public pension funds (PPFs) account for over $22 trillion, or roughly 40 per cent, of global pension assets.[2] The AUM of sovereign wealth funds (SWFs) in 2021 grew to nearly $11 trillion, up from over $9 trillion the year before.[3]

UNCTAD's analysis of the sustainability integration practices of the world's top 100 PPFs and SWFs, by AUM, shows that although the number of institutional investors reporting on sustainability performance has increased since 2020, a majority (53 funds) still fails to report. SWFs remain relatively less transparent than PPFs. Many non-reporting funds are based in China, Japan, Saudi Arabia, the United Arab Emirates, and the United States. Progress on ESG reporting by these funds will require the strengthening of national regulations.

Among the 47 funds that do publish information on sustainability integration – referred to as "frontrunners" – many acknowledge the material risks posed by ESG issues, with funds changing their investment strategies and policies accordingly. A majority of these funds have made efforts to introduce internal policies and guidelines to support the integration of an ESG or SDG perspective in their investment strategies, often anticipating transition risks and targeting net zero in their portfolios by 2050, at the latest.

As the world moves forward from the impact of the Covid pandemic, while confronting emerging challenges related to inflation, supply chain disruptions and war, investors, governments and international organizations must remain focused on the physical and transition risks of climate change. Recent reports (UNEP, 2022; IEA, 2021) have highlighted the urgency of achieving net zero along a 1.5-degree Celsius pathway and that this goal risks becoming potentially unachievable. This report examines actions by frontrunner pension and sovereign wealth funds on climate change and how institutional investors and financial markets can play a crucial role in driving climate change mitigation and adaptation.

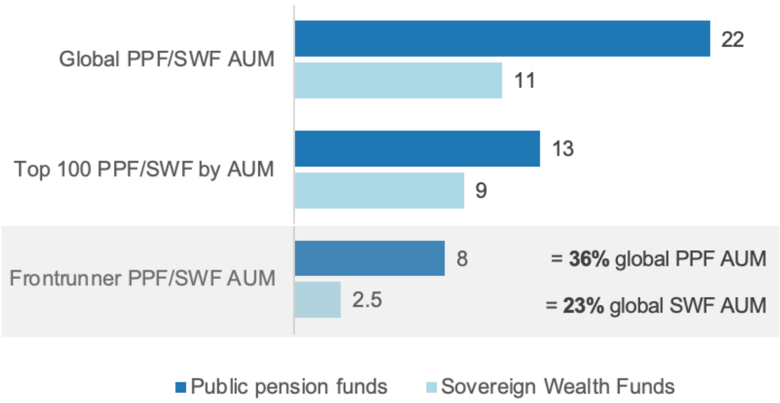
[1] Thinking Ahead Institute 2022: https://www.thinkingaheadinstitute.org/research-papers/global-pension-assets-study-2022/.
[2] According to data from the Global SWF data platform, 2022: https://globalswf.com/.
[3] According to data from the Global SWF data platform, 2022: https://globalswf.com/.

UNCTAD is mandated to support international efforts to finance climate change mitigation and adaptation and other sustainability issues, as well as monitor the sustainable finance market and efforts to enhance its impact and contribution to sustainable development.[4] Through its programmes on sustainable finance, in particular its Global Sustainable Finance Observatory, UNCTAD provides research and analysis, and support for governments, investors, regulators and other stakeholders to improve the sustainability of investment and capital markets.

Scope and methodology

By reviewing a panel of the 100 largest global public pension and sovereign wealth funds,[5] with assets under management (AUM) of $22 trillion, the study identified those funds, or their main asset managers, that published a separate ESG, responsible or sustainable investment report, or that published a chapter on the subject in their annual financial report in 2021 (see appendix 1 for a full list of reporting funds). The reporting funds – referred to as "frontrunners" – include 38 public pension funds and 9 SWFs (or 47 per cent of the funds in the original panel). These frontrunner funds, with assets of almost $8 trillion and $2.5 trillion respectively, account for 36 per cent and 23 per cent of the respective AUM of PPFs and SWFs worldwide (figure 1.1).

Figure 1.1 Value of global public pension and sovereign wealth fund assets under management, and frontrunner funds (trillions of dollars)

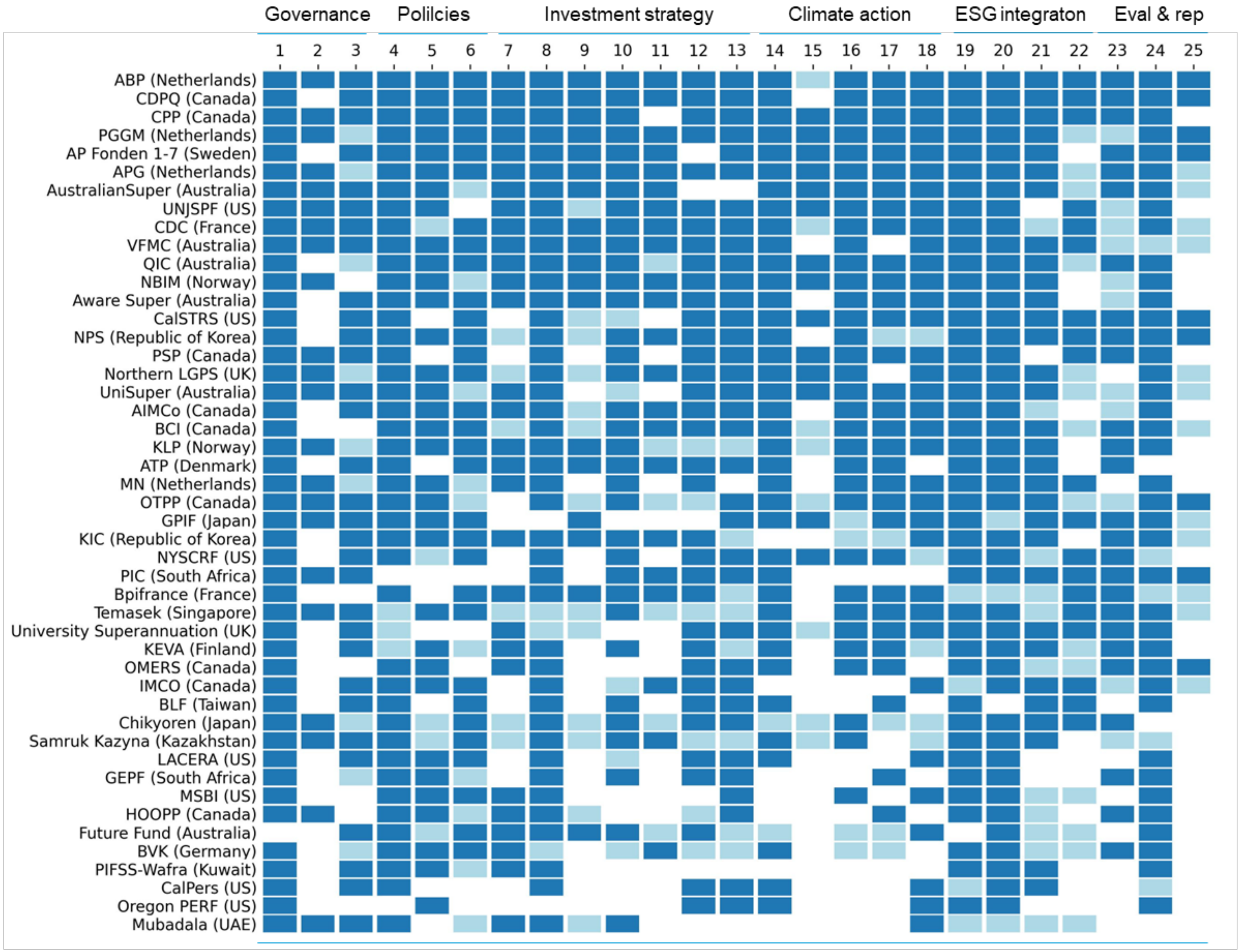


Source: UNCTAD

The analysis in this study examined 25 indicators, covering governance and resources, corporate sustainable investment policies, sustainability investment and integration strategies, ESG integration along the investment chain, climate action, and evaluation and reporting (figure 1.2). The ESG reports of the 47 funds comprise the main data sources for the analysis.[6]

[4] United Nations General Assembly resolution on "Promoting investments for sustainable investment" (A/RES/74.199) and (A/RES/75/207).
[5] The ranking of pension funds and SWFs are taken respectively from the Thinking Ahead Institute and Global SWF data platform, 2021. Additionally, one of the asset owners in the sample is the Government Pension Fund Global of Norway, managed by Norges Bank Investment Management (NBIM). It is often classed as a SWF because it receives the country's oil & gas related revenue, but this study considers it a pension fund and so it does not appear in the SWF sample.
[6] All example practices, facts and numbers with respect to ESG integration of the funds in this paper are taken from their annual sustainable or responsible investment report in 2021, unless otherwise indicated.

Figure 1.2 ESG integration by 47 public pension funds and sovereign wealth funds (ranked by sustainability performance – dark blue: reports; white: does not report; light blue: not clear)



Reporting (green >90% of funds; red <50% of funds) 98 47 66 89 70 66 62 89 38 72 49 74 74 81 32 70 66 72 91 91 66 40 55 83 19 %

Governance and resources

1. Does the fund clearly state its vision, mission, or mandate on sustainable investment?
2. Does the fund set any overall targets/goals on sustainable investment or asset allocation in its vision/mission statement on ESG?
3. Is there any dedicated team established to coordinate ESG/SDG investments? Where does the team/head of ESG report to (what level)?

Policies

4. Has the fund put in place an internal policy or guidelines regarding ESG/SDG integration?
5. Is any international ESG/SDG-related standard, taxonomy or benchmark employed in the investment decision making process?
6. Does the fund provide clarity on efforts it has made to meet relevant national/regional/international ESG-related regulations?

Investment strategy

7. Exclusion: does the fund use ESG-based negative screening/exclusions in its investment decisions?
8. General integration: does the fund incorporate ESG considerations systematically in its investment decision making process?
9. Positive Screening: does the fund use any positive or best-in-class screening related to ESG in its investment process?
10. Impact investment: does the fund target ESG-oriented sectors (e.g., renewable energy, green housing) or capital market instruments (e.g., green bonds, ESG funds) or markets (emerging and developing economies) in ESG investment?
11. SDG investment: does the fund consider SDGs in its investment decision process or asset allocation?
12. Social: Does the fund integrate the social dimension of sustainability into its sustainable investment strategy? (e.g., child labour, diversity, etc)
13. Governance: Does the fund consider governance issues in its investment decisions? (e.g., executive pay, board diversity, tax, etc)

Climate action

14. Does the fund have a specific strategy on climate or CO2 emissions?
15. Does the fund undertake climate risk reporting and publish a climate risk report?
16. Does the fund use any target or goal (carbon emissions, green investment, or asset allocation)?
17. Does the fund monitor and report with specific metrics?
18. Is the fund part of any international climate response initiative?

ESG integration

19. Does the fund have any active engagement activities (e.g., consultations, dialogue) with any stakeholder in the investment value chain?
20. Does the fund actively exercise its voting rights in its portfolio companies? Does it use a proxy or not?
21. Is there any policy, guidance, or requirements on ESG (and SDG) integration provided to asset managers and/or investees/portfolio companies?
22. Is there any training provided for asset managers/portfolio companies?

Monitoring, evaluation, and reporting

23. Does the fund monitor and evaluate its ESG/SDG performance with specific metrics?
24. Does the fund use any international reporting framework or guidelines as a framework to report on sustainability issues?
25. Is ESG/SDG impact audited or certified by an external party?

Legend

Dark blue=reports; white=does not report; light blue=not clear

Source: UNCTAD.

Notes: Information provided in the table are based on the review of the annual sustainable or responsible report of the funds. Full names of funds can be found in appendix 6.

2. ESG integration: progress since 2020

In 2020, UNCTAD first reported on the sustainability practices of PPFs and SWFs, based on a smaller sample, and found that 25 per cent of funds reported on ESG or sustainability performance in their investment portfolios.[7] This report finds that 47 per cent of funds now report on ESG integration and sustainability performance. While some funds are going further and faster when it comes to addressing sustainability challenges and opportunities (box 1), others are lagging.

The non-reporting funds, which make up 53 per cent of the sample, include 21 SWFs, accounting for 70 per cent of the SWFs in the sample, and 32 PPFs, accounting for 43 per cent of the PPFs. As discussed in the 2020 UNCTAD report, SWFs remain relatively less transparent and have further to go in terms of sustainability performance disclosure. The non-reporting funds rarely include any information regarding ESG and sustainability on their websites and only occasionally in their annual reports.

Geographically, non-reporting funds are based mainly in China, Japan, Saudi Arabia and the United Arab Emirates, and a large share of funds in the United States also do not report on ESG. Geographical location and governance seem exert the largest influence on whether a fund publishes an ESG report, and both are likely influenced by the strength of regulations within the national framework. This highlights the importance of national or regional regulatory frameworks and the need for technical assistance in the area of sustainability disclosure and integration.

Box 1. Best practice in sustainability integration in selected top-performing funds

ABP (Netherlands) is considered the most sustainable Dutch pension fund by the Dutch Association of Investors for Sustainable Development (VBDO) and is the no.1 ranked fund in this report. Examples of the fund's efforts to integrate sustainability into its operations include the active targeting of sustainable assets (20 per cent of the fund's investments are classified as 'sustainable development investments' including significant investments in green bonds, sustainability bonds, social bonds, and 'coronabonds'); ABP is also targeting a 40 per cent reduction in the CO2 footprint of its equities investments by 2025 as compared with 2015. The fund aims for an overall investment portfolio with net zero emissions by 2050.

CPP (Canada), ranked no.3 in this report, has been innovative in developing investment products and working with its investees through active ownership. It was the first pension fund to issue a green bond and has created a green bond framework to determine which projects are eligible for green bond proceeds. The fund is a major investor in the energy transition: it established the Sustainable Energies Group (SEG) to build on existing strengths in renewables, conventional energy and innovation, and the group now has more than $20 billion in assets under management. The fund also works with companies to change behaviour and share best practices across their portfolio and has established a non-executive directors engagement series to share insights regarding best practices in asset management.

QIC (Australia) is recognized by the Responsible Investment Association Australasia (RIAA) as a leader in its field and ranks no.11 in this report. The QIC is an alternative asset investment specialist focused on real-estate, infrastructure projects and private capital: their global real estate fund is committed to achieving net zero carbon emissions by 2028. The fund is a large investor in green, social and sustainable bonds: in 2019, the fund also issued the worlds' first bond in the retail property sector aimed at creating a positive environmental impact, which was certified by the Climate Bond Initiative. The fund has been active in stakeholder mapping to align the sustainability objectives of beneficiaries with the fund's investments. It also actively engages with investees and uses a traffic light system to highlight the companies with the highest exposure to risk, and with the most need for engagement.

Source: 2021 annual responsible or sustainable investment reports of the funds.

[7] Based on a sample of 50 funds of which 20 published information on ESG performance.

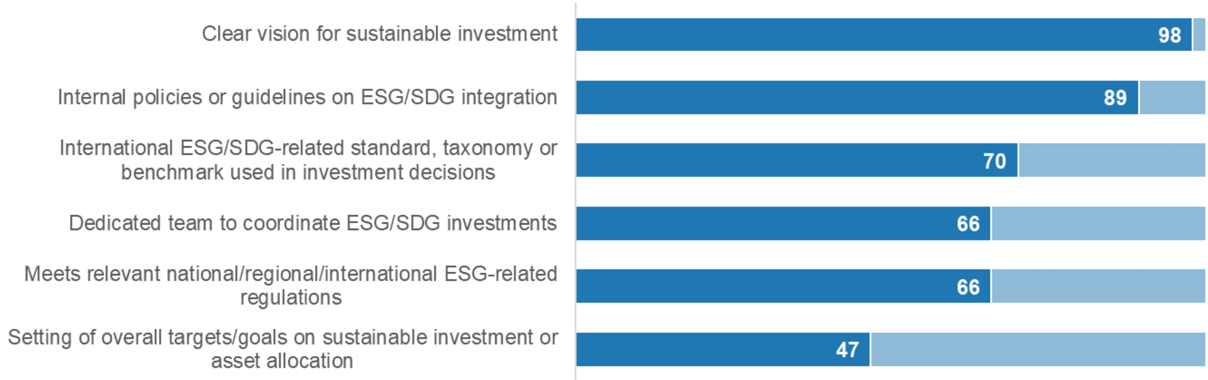
2.1 How funds respond to sustainability concerns

An increasing number of PPFs and SWFs are taking a holistic approach to sustainability at the institutional, operational and portfolio levels. Many funds are committed to the adoption of long-termism as a guiding principle of fund investments to safeguard and create sustainable value, to integrating ESG criteria in all investment decisions, and to mainstreaming ESG performance to manage risks and to pursue opportunities linked to the transition to a more sustainable economy.

Vision and policies

In 2022, 98 per cent of frontrunner funds have a clearly stated vision for sustainable investment with 89 per cent of funds putting in place internal guidelines and policies regarding ESG and sustainability integration in their investment strategy (figure 2.1).

Figure 2.1 Sustainability-related policies of reporting funds, 2022 (per cent)



Source: UNCTAD, based on fund annual reports or sustainability reports, n=47.

Over two thirds of funds used an international ESG or SDG-related standard, taxonomy or benchmark in their investment decisions, up from just over a half of funds in 2020. Some benchmarks and standards are more widely used than others, such as the Principles for Responsible Investment (PRI), used by 47 per cent of funds. However, the differences in use can be related to their sectoral or thematic specificity, such as the Global Real Estate Sustainability Benchmark (GRESB), used by 13 per cent of funds (see section 2.4). Standards, both voluntary and mandatory, are important drivers of ESG integration by public pension and sovereign wealth funds. Many best-practice funds use them as the benchmark to develop their own policies to provide internal and external asset managers with necessary guidance on sustainability issues.

Internal governance and implementation

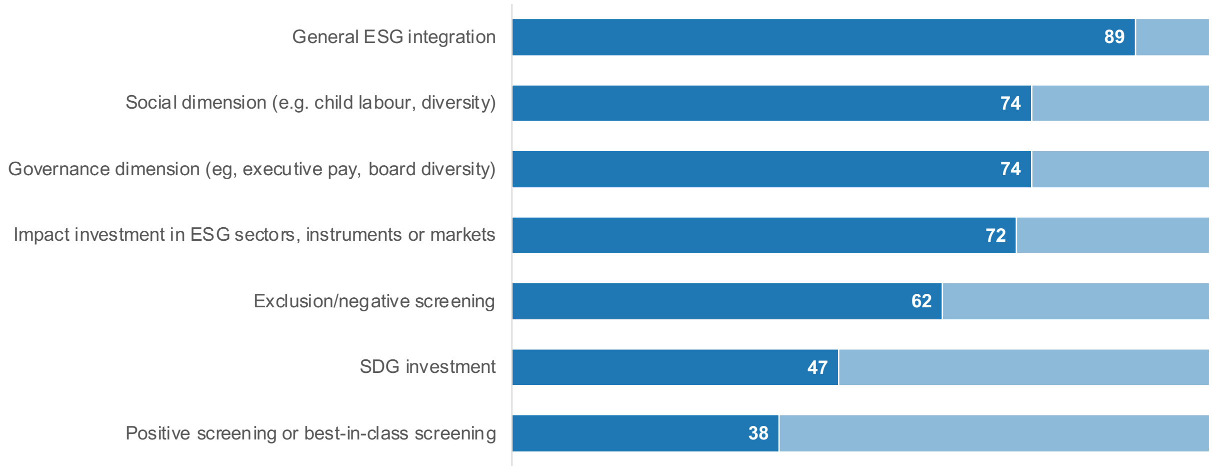
The number of funds with a team dedicated to ESG Investments and sustainability integration grew from 55 per cent in 2020 to 66 per cent of funds in 2022. However, as the 2020 report revealed, the creation of a dedicated team is not the only route to building expertise. Several funds mainstream an ESG perspective into existing investment teams, by providing training and strengthening team skills, such as CDPQ (Canada) that focuses on professional development to expand their teams' knowledge and expertise within sustainable investments.

2.2 Mainstreaming sustainability in investment strategies

PPFs and SWFs pursue at least one several investment strategies when seeking to integrate ESG considerations into their portfolios, and many funds pursue multiple approaches to sustainable investing. The 2020 report identified five main strategies and this year's report adds a further two: the specific mention of a social dimension in investment strategies (e.g. child labour, diversity) and the specific mention of governance issues (e.g. executive pay, board diversity, tax) (figure 2.2).

Eight top performing funds in terms of their sustainable investment strategies employ all seven approaches.

Figure 2.2 Sustainability investment strategies of reporting funds, 2022 (per cent)



Source: UNCTAD, based on fund annual reports or sustainability reports, n=47.

i. *Exclusion or negative screening.* Exclusion or negative screening can be a first or last resort for funds. Almost two thirds of funds (63 per cent) negatively screen their investments, up from 40 per cent of funds in the 2020 report. Common exclusions include tobacco, weapons, and thermal coal. As highlighted in the 2020 report, best practice in this area includes the exclusion of assets on the basis of aggressive tax avoidance by the investee (ATP, Denmark), labour rights violations of core ILO conventions (ABP, Netherlands), contraventions of international law (PFZW, Netherlands), and the perceived poor governance practices of companies that employ single gender boards (AustraliaSuper, Australia). Some funds describe exclusion as a last resort, following engagement with investees (see section 2.3).

ii. *General integration of ESG criteria in the investment decision making process.* More than nine out of ten reporting funds integrate a sustainability perspective across their investment activities, including equities, fixed income, alternative assets, and public and private markets. This is up from four out of five funds in 2020. Such an approach can help ensure that investments are carried out in a more responsible manner, but it may not necessarily target and contribute to specific sustainability themes. The funds, as investors and owners, are seeking discussions with investees about integration of ESG criteria. For example, PGGM (Netherlands) lists a set of instruments for ESG integration, including exclusion of (non-complying) companies and government bonds, ESG integration in the screening and monitoring of companies and external managers, engagement, voting, legal proceedings and investments for social and environmental issues.

iii. *Positive screening.* The use of a positive or best-in-class investment screen has increased since the 2020 report when only 15 per cent of funds reported using such a strategy. This year’s report found that almost two out of five funds used a positive screen for investments. Some funds use the term “leader” for companies which comply with their internal policies for risk and return and the desired engagement on ESG performance and are preferred investments for the funds ABP and QIC. Funds may also express a preference for companies and sectors which positively impact the green transition (NBIM, AP), although there are overlaps with impact investment strategies.

iv. *Impact investment.* Impact investment strategies that intentionally target ESG-oriented sectors (such as renewables or green housing), or capital market instruments (such as green bonds or ESG funds) were the most common strategy in 2020, used by 85 per cent funds. This year's report found that almost three quarters of funds use an impact strategy or thematic strategy. Such an approach illustrates a move from responsible investment to sustainability-dedicated investment, targeting sustainability-related themes or sectors specifically. Funds have also been active investors in sustainable debt instruments such as green, social or sustainability bonds, all of which saw a huge jump in issuance in 2021, according to UNCTAD's latest research (UNCTAD, 2022). Moreover, funds have continued the practice of issuing fixed income products themselves, as highlighted in the 2020 report. CPP (Canada) was the first fund to issue a green bond in 2018.

v. *SDG-aligned investment.* The SDGs are themselves becoming a benchmark for sustainability performance, and almost half of funds explicitly consider one or more SDGs in their investment decision-making process or have made attempts to align their holdings with the SDGs. This is up from 30 per cent of funds in 2020. However, reporting on SDG investment sometimes equates to mapping holdings against the 17 goals and is more of a reporting exercise than an investment strategy. UNJSPF (USA) uses an SDG impact analysis for portfolio analytics (box 2). Further research by the fund showed a possible positive correlation between ESG ratings, SDG footprint and alpha[8] (Antoncic et al., 2020). AustralianSuper (Australia) defines the SDGs as their "business plan for a sustainable long-term economy", and therefore an SDG impact analysis provides insights into how a company is positioned for the future. The fund uses the SDI-AOP framework (established by AustralianSuper, APG, British Columbia Investment Management Corporation and PGGM in July 2020) for portfolio mapping.

vi. *Social and governance dimensions.* More than three-quarters of funds specifically identify either social or governance related issues in their investment strategies. This can include respect for labour rights, gender and other diversity issues in investee companies, and questions around the governance of the investee company including board composition, executive pay and company tax policy. Funds use different sources to define their social and governance standards, including: PRI's Active Ownership Principles, UN Global Compact, the OECD's Guidelines for Multinational Enterprise, and the United Nations Guiding Principles on Business and Human Rights. NBIM, for example, evaluated 694 companies for negative human impact risk; the fund further established a network for children's rights in partnership with UNICEF. PGGM engaged companies on improving working conditions in the global agricultural supply chain. In terms of allocations, social and sustainable bonds were included in fund portfolios, including corona bonds (ABP).

Box 2. Sustainable investment strategy of the UNJSPF (US)

Among other areas, UNJSPF's (US) ESG integration policy covers ESG analytics and its investment strategy. The fund applies a 4-step process to its investment decisions and portfolio holdings, from pre-allocation to post-investment and covers global equities, fixed income, private markets, private equity, real estate and real assets. The process involves: (i) screening companies for ESG risks, (ii) portfolio analysis, including for stranded assets and an SDG impact analysis, (iii) an internal ESG dashboard and industry assessment including peer analysis, and (iv) voting and engagement. Highlighting the ESG dashboard, developed inhouse, UNJSPF uses both historical and forecast values to consolidate ESG datapoints for valuation analysis.

Source: 2021 annual sustainable investment report of the fund.

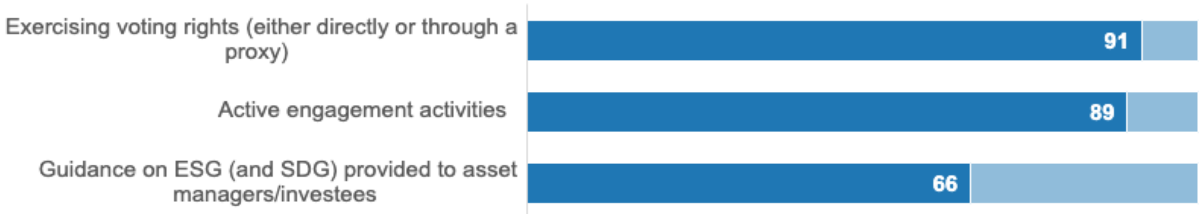
[8] Alpha refers to the generation of excess returns without additional risk from a security or investment.

2.3 Integrating ESG along the investment value chain

The size of the holdings of PPFs and SWFs and their position as 'universal owners' gives them influence over the assets, funds and companies they invest in. This influence is not only a function of the size of their investments but can be exercised through dialogue and engagement with their investees, voting at shareholder meetings, instructions to asset managers or, ultimately, divestment from their assets.

In general, reporting funds are particularly active asset owners, with about 9 out of 10 funds exercising their voting rights, either directly or through a proxy, and an almost equal number engaging with investees (figure 2.3). Engagement can be in the form of direct dialogue with investees on issues such as climate change or labour rights, or through instructions to asset managers. Slightly more than two thirds of funds provide guidance to their investees and to asset managers to help them integrate fund policies and meet targets on ESG and sustainability. The rates of active ownership by funds signals the importance that funds assign to active ownership, and the ability of large institutional investors to affect change on ESG and SDG-related issues along the entire investment value chain.

Figure 2.3 Active ownership of reporting funds, 2022 (per cent)

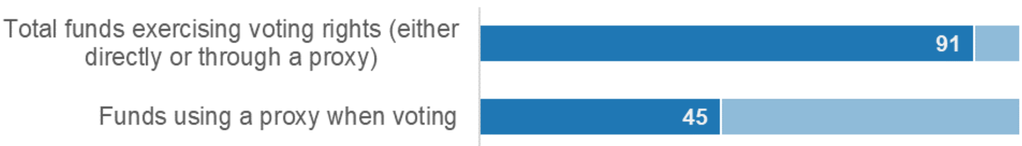


Source: UNCTAD, based on fund annual reports or sustainability reports, n=47.

Exercising voting rights

The most common way in which funds practise active ownership is through voting, which can convey their views to the board on specific issues. Almost a half of funds report the use of a proxy when voting, which is in part related to the number of votes faced by funds (figure 2.4). Frontrunner funds are increasingly supporting ESG-related resolutions, with the most common areas of action focussed on social and governance issues, including resolutions regarding executive pay, gender representation, and taxation. Other resolutions of concern to funds include those related to long-term shareholder value and, in particular, shareholder proposals that will improve the disclosure of climate-related risks.

Figure 2.4 Voting rights and proxy voting by reporting funds, 2022 (per cent)



Source: UNCTAD, based on fund annual reports or sustainability reports, n=47.

With regard to proxies, a good practice adopted by some funds is to put in place well-developed policies or guidance on voting. These can serve as custom voting instructions for proxy voting providers and enable the fund to actively vote in a large number of company meetings across different markets and sectors. Some funds also have a "voting focus" list, which allows them to focus on a selection of the largest or most strategically important companies in their portfolio.

Engagement with stakeholders along the investment chain

As a general rule, funds favour engagement with asset managers and investees as a first resort to improve ESG performance. If engagement fails, and performance does not improve, a last resort is divestment. Some funds take a thematic approach, engaging companies across their portfolio on specific issues, such as child labour, the preservation of marine life, or the circular economy, and develop engagement programmes that focus on specific components, such as climate change and CO2 emissions. Engagement can also be focussed on corporate governance practices within companies, such as management diversity.

Collective engagement through international initiatives and collaboration with other investors is an effective and timesaving means for investors to lobby and engage on sustainability issues. For example, in 2022, 23 out of 47 reporting funds participated in the Climate 100+, an investor initiative to ensure the world's largest corporate greenhouse gas emitters take action on climate change. This share of funds remains almost unchanged from that reported in the 2020 report.

ESG guidance along the investment chain

In 2022, 66 per cent of frontrunner funds reported that they used multiple mechanisms for mainstreaming ESG guidance into asset manager or investee decisions. These mechanisms included: ESG benchmarking – using TCFD guidelines, CDP, or the Paris Agreement on Climate Change – sharing ESG resources and best practices with partners and external asset managers and following up on progress, continuous assessment of external asset managers' ESG policies and processes, and requesting reports from asset managers on stewardship activities and monitoring and evaluating asset managers' ESG strategies.

2.4 Measuring and reporting on sustainability

The rise of sustainability-themed investment products has been accompanied by the uptake and use of principals and standards for the measurement and reporting of sustainability performance. Many of these standards are voluntary, developed by international initiatives such as the International Sustainability Standards Board (ISSB) or the private sector. More recently, the trend has been towards non-voluntary regulations to support the growth of sustainable finance and sustainable products. For pension funds there is no commonly agreed template for sustainability reporting. There remain large discrepancies regarding the structure of fund reports, the weight devoted to each of the environmental, social or governance components, and the level of detail of the information provided.

This year's report finds that 81 per cent of funds used an international reporting framework or guidelines on sustainability, up from 65 per cent in 2020. The increase includes nearly all non-reporting PPFs and SWFs in 2020. As a share of the top 100 funds, the number of funds using an international reporting framework or guidelines on sustainability has jumped to 39 per cent from 16 per cent in 2020, indicating accelerating progress after a decade of slow uptake.[9]

Key performance indicators (KPIs)

More than half of funds (55 per cent) used KPIs to monitor and evaluate the sustainability performance of their investments in 2022. The most common KPIs are focussed on climate reporting and GHG emissions using metrics such as carbon footprint, carbon intensity and other GHG emissions indicators. Some funds used industry benchmarks (such as green indices of the FTSE and MSCI or industry standards such as GRESB) to evaluate their performance. These issues are discussed in more detail in chapter 3.

[9] An UNCTAD study, published in 2010, found that 13 per cent of the top 100 pension funds (public and private) reported on ESG issues (UNCTAD, 2010).

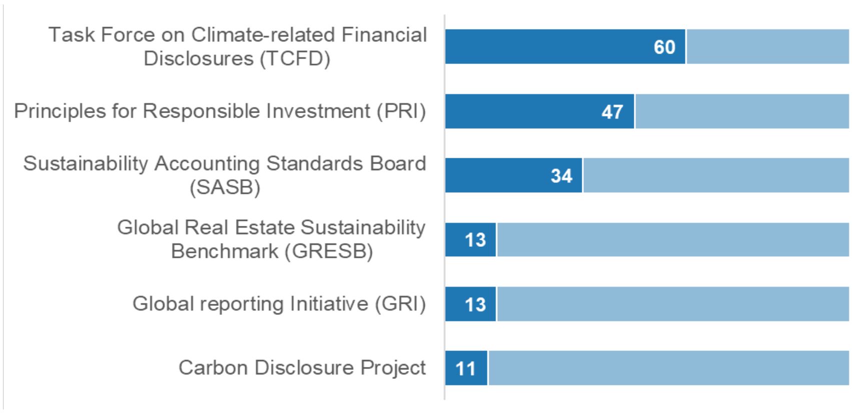
Whereas in 2020, the setting of carbon emissions targets or ceilings was limited to a few funds, this has radically changed in the two years since, with 70 per cent of funds reporting the use of a climate target or goal. As reported by UNCTAD (UNCTAD, 2022), last year saw the impact of the net zero movement with investors committing to net zero by 2050 or before, and this is one of the most common targets used by almost a quarter of funds.

Utilization of international sustainability reporting guidelines

Another best practice to bring more objectivity, comparability and coherence to sustainability reporting is to utilize internationally recognized standards and frameworks. More than four out of five funds used such a standard or framework in 2021. Funds reported the use of a total of 66 standards, initiatives and partnerships, and many funds used multiple international guidelines/standards in their disclosure and reporting (figure 2.5).

The most common reporting framework used by funds is the Task Force on Climate-Related Financial Disclosures (TCFD) framework reporting; many funds also use the Principles of Responsible Investment (PRI) Scorecard and Transparency Report to evaluate and improve their sustainability performance. A universally accepted sustainability reporting framework for institutional investors would help to avoid the complexity associated with using multiple frameworks. As UNCTAD has argued elsewhere (UNCTAD, 2022), any convergence among the leading international reporting guidelines will enhance the consistency, credibility and transparency of reporting. The establishment of the ISSB and collaboration between the ISSB and the GRI is promising in this regard.

Figure 2.5 Most commonly used sustainability disclosure standards and initiatives by reporting funds, 2022 (per cent)



Source: UNCTAD, based on fund annual reports or sustainability reports, n=47.
Notes: A total of 66 standards, frameworks and initiatives are used by the funds; median number of standards, frameworks and initiatives =4.

External auditing

In 2022, only 19 per cent of reporting funds used external auditing of their sustainability performance and reporting. This leaves more than four out of five funds without external validation of the credibility and quality of their reporting. As is the case for financial reporting, external auditing should be regarded as essential for sustainability reporting. It can ensure quality and reliability, while helping reporters to enhance their reporting skills and capacities through best practice sharing.

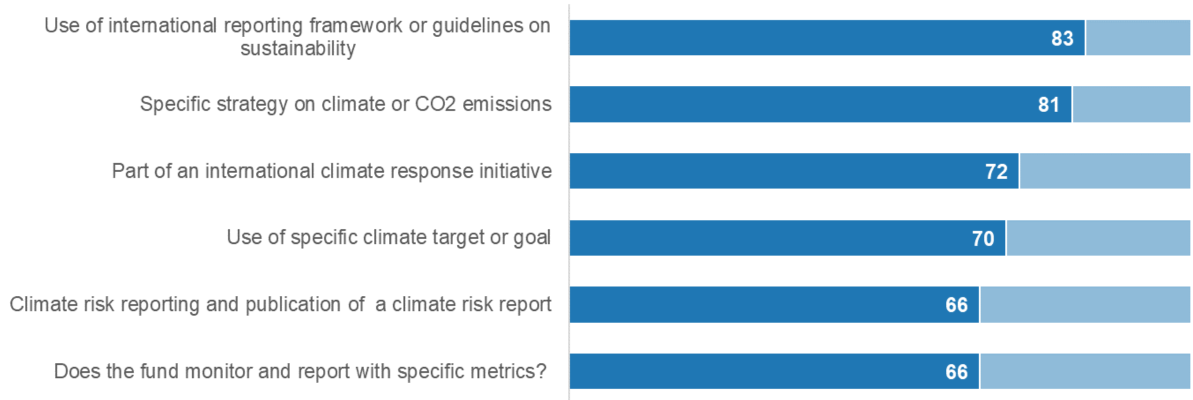
3. Climate-related investment policies and actions of frontrunner funds

Among the ESG-related issues of material concern to investors, climate change and, in the past year, a focus on net zero in particular have come to dominate attention. This year's report examines in depth what actions leading public pension and sovereign wealth funds are taking on climate, with respect to their portfolio holdings and investment strategies. The analysis in this chapter draws on the climate action section of the mapping framework and highlights some key trends and best practice cases.

The report finds that climate action by the funds is principally focussed on four areas: (i) risk identification and mitigation related to transition and physical risks; (ii) the use of targets and benchmarks to reorient portfolio holdings and investment strategies, and the application of metrics in the disclosure and reporting of climate-related risks; (iii) the institutional response to climate-related risks – and ESG integration more broadly – through resource mobilisation and organisational change; and, (iv) increasingly active ownership on climate risk, through engagement, voting and exclusion/divestment. It is also important to note that fund strategies on climate action aren't just about mitigating ESG risk but also about seizing and benefiting from the opportunities presented by new markets and products, such as renewables.

In 2022, four out of five reporting funds used international frameworks and guidelines, as well as outlining a specific strategy regarding climate risk mitigation (figure 3.1). Many funds choose to take internal policies on ESG further, for example by developing specific climate-related tools such as green bond frameworks (PGGM, Netherlands). Internal policies related to climate change are significantly more prevalent in public pension funds than in sovereign wealth funds.

Figure 3.1 Climate actions by reporting funds (per cent)



Source: UNCTAD, based on fund annual reports or sustainability reports, n=47.

3.1 Identifying and mitigating risks

Next to inflation and market risk, long-term investors, like pension and sovereign wealth funds, see climate change as a key strategic risk for investment planning and decision making. In this regard, over 80 per cent of reporting funds implemented a specific strategy on climate risk or CO2 emissions reduction. Although the definition of climate risk varies, the most common risks cited by funds are physical and transition risks (box 3).

To evaluate the impact of climate risks on portfolios, funds use a range of approaches, including the use of climate models and scenario analysis, their own mapping of physical and transition risks, and stress testing. In general, scenario analysis methods were able to estimate the average impact of climate change on annual returns, resulting in divestment strategies as well as the identification of new investment opportunities.

Box 3. Physical and transition risks

Physical risks include the outcome of longer-term shifts in climate, more severe weather events, extended dry spells or rising sea levels. Such events can lead to disruption of supply chains, damaged facilities and increased insurance premiums. Physical risks can therefore affect portfolio performance. Industries or sectors which are impacted by physical risks include agriculture, transportation and building infrastructure, insurance and tourism. Funds need to apply a more in-depth climate risk analysis to these sectors.

Transition risks refer to climate protection policies, regulations and emerging disruptive technologies. They have the potential to result in write-offs or stranded assets, early retirement of assets, increased research and development expenditures as well as exposure to litigation. In addition, the effects of changing consumer behaviour and reputational risks are also becoming potential transition risks. Transition risk scenarios are particularly relevant for investors exposed to resource-intensive activities with high GHG emissions within their value chains, where policy actions, technology, market adaptations, subsidies, taxes, or other constraints and incentives may have a particularly direct effect.

Source: UNCTAD.

Climate models and scenario analysis

Climate scenarios define different future outcomes for climate risk over the long term. Scenario analysis can deliver deeper insights into both physical and transition risks related to climate change, which have major implications on portfolio value. Generally, climate scenarios are built on science-based forecasts of greenhouse gas emissions, their climate change impacts and macroeconomic conditions. Models focusing on transition risks include the impact of regulatory measures, such as carbon pricing or caps, and technological changes that might impact a firm's future development, such as a shift to electric vehicles.

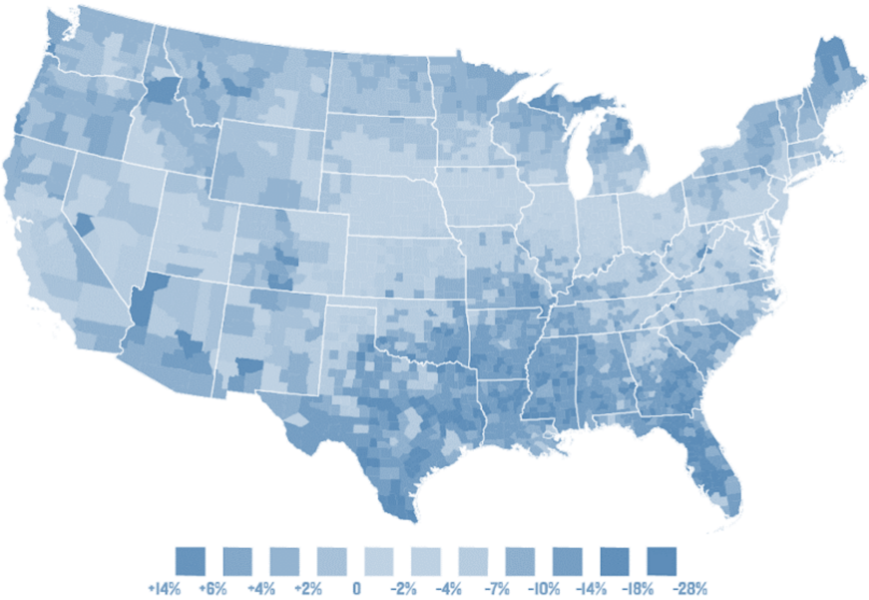
There are a number of challenges inherent in climate modelling, such as uncertainty and complexity, differentiated regional impacts and transparency of assumptions. Addressing these challenges requires added skills and resources on the part of funds. Nevertheless, funds have found ways of conducting such analysis and global frameworks can provide a useful methodology. The TCFD, for example, recommends using a range of scenarios against which to test portfolios, based on a 2˚C or lower scenario, as well as two to three further scenarios for portfolio analysis. QIC (Australia) evaluated the exposure and vulnerability of its portfolio companies to the physical risks of temperature, extreme drought, flooding, fire and sea level rise based on three climate scenarios. Other funds went beyond TCFD recommendations. ABP (Netherlands) evaluated 44 climate change scenarios, based on three categories: policy and regulatory risks, technology, market and reputational risks and physical impact risks.

Climate risk mapping

Real estate and infrastructure are significant alternative assets for public pension and sovereign wealth funds, and which are highly susceptible to climate change impacts. Funds, such as ABP (Netherlands), CalSTR (US) and UniSuper (Australia) are therefore actively researching the physical impacts of climate change on their real estate and infrastructure portfolios. One such risk is sea level rise and flooding, which PGGM (Netherlands) mapped for its assets in the United States.

With regard to transition risks, funds are responding to national and international policy developments, such as for carbon pricing, as well as emerging technologies. AP Fonden (Sweden) considers transition risks as the primary portfolio risk in the near future, which has informed their divestments from fossil fuels. For their transition risk management, GIPF (Japan) uses the Climate Value at Risk (CVaR) model which evaluates the impact on GDP from the measures taken to keep global temperature rises under 2˚C by 2050. Within this model, they established that for most countries, it is financially beneficial to decarbonise the economy early due to better economic outcomes in the long run. CalSTR (USA) mapped the transition risks of climatic changes on economic output in the US showing both zones of economic decline and zones of opportunity due to climate change (figure 3.2).

Figure 3.2. CalSTR (US) modelling of the impact of climate change on economic output in the US



Source: CalSTR

In addition to its scenario analysis for physical risk, Australian Super (Australia) is evaluating the risks of different carbon price pathways on their investments. Other funds are introducing an internal price for carbon emissions to evaluate their assets – a notional price that seeks to anticipate an eventual real-world price for carbon. Examples of internal emissions pricing come from Temasek (Singapore), which is using a carbon price of $42 per ton of CO2, and UniSuper (Australia), which is building an internal carbon price framework based on $50 per ton of CO2. The framework groups portfolio companies into low, medium and high impact cases, referring to the impact a carbon emissions tax would have on company values.

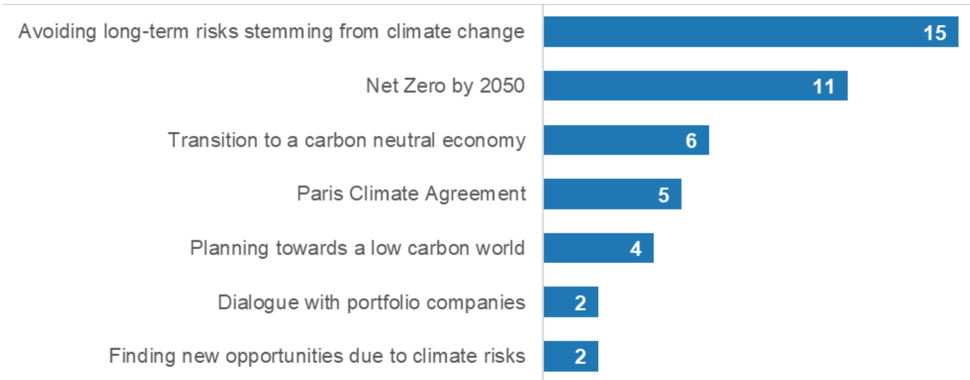
Stress testing

Stress testing is used by some funds to analyze the impact on financial results from abnormally large movements in risk factors. The normal function of stress testing is to guarantee sufficient liquidity for operational needs in times of market stress. Stress testing was reported by UniSuper (Australia), using the Capital Transition Tool of the 2-degree initiative (PACTA) where they applied the "Inevitable Policy Response Forecast" to evaluate their portfolio.

3.2 Disclosing climate risk: strategies and metrics

While 81 per cent of funds report having a specific climate strategy, 70 per cent report using a specific climate target or goal, and 66 per cent monitor and report with specific metrics (figure 3.1 above), suggesting that implementation of climate disclosure lags behind policy. Funds' climate strategies are split between generic statements on climate, such as "avoiding long-term risks posed by climate change" referenced by 15 funds, and more specific references, for example to carbon reductions, such as "net zero by 2050" cited by 11 funds, and "transitioning to a carbon neutral economy" mentioned by six funds (figure 3.3).

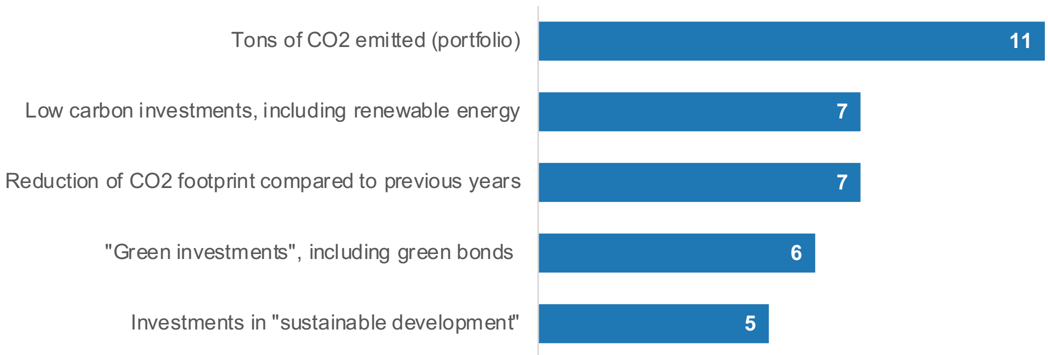
Figure 3.3. Main climate risk strategies of reporting funds (number of funds)



Source: UNCTAD, based on fund annual reports or sustainability reports, n=47.

The most widely used climate-related metric is carbon emissions by metric ton of CO_2 at the portfolio level, commonly referred to as carbon footprint (figure 3.4). For this, funds report their CO_2 emission data at the scope 1 and scope 2 levels. Sources for the evaluation of emissions are: (i) direct reporting by the portfolio company, (ii) estimations from credible sources, or comparisons with similar entities, and (iii) estimations based on proxies for an industry or a geographic region. Measuring and reporting at the scope 3 level is currently challenging, although it would be of significant interest to funds in terms of comprehensively capturing climate-related risks.[10] Some funds imposed internal allocations for CO_2 emissions (scope 1 and 2) per $100 invested, commonly referred to as carbon intensity. For an investor, this means that if a fund owns one percent of a company, it is responsible for one per cent of the emissions of the company (MN, the Netherlands), and the impact needs to be measured and reflected in the sustainability assessment of its portfolio.

Figure 3.4 Main climate risk metrics employed by reporting funds (number of funds)



Source: UNCTAD, based on fund annual reports or sustainability reports, n=47.

Other metrics employed by funds include the use of surveys, such as the percentage of companies responding to the CDP questionnaire and the results, the percentage of companies with reduction

[10] For example, many fossil fuel companies do not report on scope 3 emissions, which consequently underestimates their principle contribution to climate change.

targets, and the percentage of companies that have adopted an internal price on carbon emissions. Funds also reported on the allocation of their assets to sustainable sectors, such as renewables, and to sustainable products, such as green bonds.

3.3 Institutional changes by funds related to climate risk

Institutional changes by funds refer to organisational restructuring and resource mobilisation dedicated to climate risk. As described in chapter two, 66 per cent of reporting funds have a team dedicated to ESG integration. A small number of funds have put in place a team solely dedicated to tackling climate risks: CalSTRS (US) has created the Green Initiative Task Force that focuses on managing sustainability-related risks and CDPQ (Canada) has appointed a climate ambassador for each specialized portfolio.

A minority of funds (40 per cent) report providing training for their employees, asset managers, or portfolio companies on ESG integration. This is predominantly focussed on diversity, equity and inclusion (DEI) rather than related to climate risk. However, a few funds do report providing specific training on climate risk, mainly for internal employees to advance the funds' own climate strategy. Examples included: NYSCRF (US) and University Superannuation (UK) that invited guest speakers on climate risks and environmental technologies, and PSP (Canada) that organised workshops on their proprietary climate change toolkit.

Funds also increasingly report on the mobilization of resources and asset allocation to climate-related investments. Of the 34 funds that reported having implemented an impact investment strategy, the use of green and sustainable bonds were the preferred method of instituting strategic changes towards reaching their climate goals. The market for sustainable and green bonds is growing significantly (UNCTAD, 2022) and many funds report not only their investments in green and sustainable bonds but their own issuance of such products (box 4).

Box 4. Green bond investment and issuance by reporting funds

ATP (Denmark) started investing in green bonds in 2017 and quickly discovered that they were both financially attractive and well aligned with the fund's sustainability vision. ATP has invested approximately 20 billion DKK ($2.8 billion) in green bonds to date. To combat greenwashing, the fund engages with the issuer to ensure the product is credible and meets the fund's sustainability criteria. This is an important area for ATP when investing in green bonds to ensure its investments contribute to the green transition and avoid greenwashing.

CPP (Canada) became the first pension fund to issue a green bond in 2018, contributing to the fund's commitment to sustainability integration and the transition to a low-carbon economy, and compliments its other investments in renewable energy. According to their 2021 report on responsible investing, the fund raised $948 million through the issuance of three green bonds. CPP's Green Bond Program is overseen by their Sustainable Investing Committee, which determines which projects proceed and are eligible for the Green Bond Program in accordance with their Green Bond Framework.

Source: 2021 annual responsible or sustainable investment reports of the funds.

3.4 Active ownership: from engagement to exclusion/divestment

As described in chapter two, 62 per cent of funds report using an exclusion strategy in their initial investment decisions. Most funds exclude tobacco, weapons, and thermal coal and others go further (box 5). APG (Netherlands) and MN (Netherlands) state the only reason they will invest in companies lagging on climate action is when there are reasonable grounds to believe that companies are improving their performance and will exclude the company if no significant progress on climate has been made. This approach to exclusion is seen in most funds.

Box 5. Exclusion strategies: selected examples

CDPQ (Canada) has pledged with members of the UN-Convened Net-Zero Asset Owner Alliance to eradicate financing of new thermal coal projects, ultimately eliminating them worldwide between now and 2040. In addition, the fund has also committed to eliminate its exposure to coal and oil assets and, in 2020, the fund's investment team decided to divest its direct holdings in Exxon Mobil Corp. This transaction represented a reduction of around 190,000 tCO2e in the fund's portfolio.

ATP (Denmark) divested from a Canadian oil company, in 2019, because the company did not adequately manage its climate risk and responsibilities. ATP (Denmark) also divests from companies that extract oil from shale deposits with an open pit method since this is in breach of the UN's biodiversity convention. In 2020, the fund decided to stop its illiquid investments in fossil fuel extraction, since this would be incompatible with a sustainable future.

Source: 2021 annual responsible or sustainable investment reports of the funds.

Funds that have chosen not to exclude companies and assets argue that their divestment would lead to a loss of leverage over investees and prevent funds from influencing company behaviour and pushing for effective change. In recognition of this argument, the majority of funds (89 per cent) have implemented various engagement strategies. Most funds agree that engagement and dialogue with companies is essential not only to preserve investment returns but to effectively improve sustainability performance of the investee and the wider market (box 6).

Nine out of 10 funds report actively voting on investee resolutions. Most funds are mandated to vote to increase the long-term value for their beneficiaries while aligning their voting decisions with their own values and ambitions. Few funds specifically mention voting on environmental resolutions regarding climate action and climate-related risks. Voting on climate-related resolutions was primarily found within PPFs. For example, CPP (Canada) requires boards to provide evidence of a viable energy transition strategy; OTPP (Canada) reports that it will vote against boards that do not display significant progress towards net-zero; while CDC (France) reports its support for resolutions of a general environmental nature, such as those requiring companies to report on pesticide-use, deforestation, food waste, plastic pollution, and responsible packaging. SWFs either did not report any information regarding voting procedures, or the information referred solely to general ESG integration in voting procedures.

Box 6. Engagement strategies: selected examples

OTPP (Canada) helps portfolio companies in their transition to net zero through engagement. One example is their advocacy and assistance to portfolio companies on climate emissions disclosure and target setting. In the fund's direct private portfolio, it reports having increased reporting on carbon emissions from 37 per cent of portfolio companies in 2019 to 56 per cent in 2020.

AustralianSuper (Australia) believes that it is more effective using its influence as an investor to encourage better performance on ESG themes and alignment between the fund's investments and its ESG policies. The fund reports that "engagement with companies promotes corporate behaviour that improves investment performance. The Fund's engagement with companies is conducted on an ongoing basis, but it also engages with companies on specific ESG themes on an ad hoc basis to resolve concerns as they arise." Additionally, the fund believes that stewardship (often used synonymously with active ownership) is complemented by voting and class action participation.

AIMCo (Canada) privileges a "voice over exit" philosophy and prefers to leverage their position as an investor rather than divest, which would result in the loss of their ability to influence corporate behaviour. The fund states: "By engaging with companies, individually or through collaborative initiatives, we are able to promote and encourage best ESG practices and influence corporate behaviour."

Source: 2021 annual responsible or sustainable investment reports of the funds.

4. Conclusion and way forward

There is now a clear recognition that institutional investors with a longer-term investment horizon, such as pension and sovereign wealth funds, need to pivot rapidly to a more sustainable investment portfolio. Such a reorientation can mitigate a range of sustainability-related risks and help contribute to sustainable financing through, for example, investment in renewable energy or clean technologies.

The results of UNCTAD's study on the sustainability practices and investment strategies of the world's largest PPFs and SWFs provide a mixed picture. While there is much good practice to be applauded and shared, there is also room for improvement, especially on disclosure and reporting where there is great variance among reporting funds in terms of what and how to report. Meanwhile, the use of key performance indicators is lagging, making sustainability disclosure highly subjective in some cases. What is needed is greater harmonization of standards and regulations to promote more widespread action on sustainability integration and performance.

In the last decade, funds have been increasingly subject to regulatory measures at the national or regional levels, increasing the probability of transition risks for institutional investors. With the growth of the sustainable investment market, government regulations have proliferated. According to UNCTAD, sustainable finance-related regulations have increased by 40 per cent in the last five years, and by 13 per cent in 2021 alone. There are now more than 300 national and regional regulations affecting sustainable finance used in 35 economies, that together account for 93 per cent of global GDP (UNCTAD, 2022). In 2022, the number of frontrunner funds reporting that they met national, regional or international ESG-related regulations was 66 per cent. This figure is lower than 2020 but comprises all funds in the 2020 report, including the two non-reporting funds that now report on regulatory compliance.

With regard to climate risk, the special focus of this report, the latest instalment of the sixth assessment report of the Intergovernmental Panel on Climate Change (IPCC) makes clear that global CO2 emissions have to peak before 2025 if the world is to remain on track to achieve net zero along a 1.5-degree Celsius warming pathway by 2050 (IPCC, 2022). The report notes that, while investors may understand and report on climate risks through, for example, the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD), they in fact have a long way to go on taking action on fossil fuels.[11] The examples in this report show that several PPFs and, to a lesser extent SWFs, have been among the first movers on climate risk and are going further and faster than other investors. But the IPCC's warning means investors, including those in this report need to do more, especially those specifically linked to hydrocarbons. Even among frontrunner funds, there are areas for improvement. For example, as highlighted in this report, carbon emissions reporting by funds currently does not extend to scope 3 emissions, which might lead to an underestimation of climate risks in fund portfolios. Similarly, this report noted as best practice the use of climate scenarios by frontrunner funds, but the scenarios are sometimes based on a 2° Celsius pathway, not the 1.5° Celsius pathway recommended by the IPCC and the Paris Agreement, again potentially underestimating climate risks.

More than ever before, institutional investors need to integrate development objectives, especially the SDGs, into their investments. This will bring more credibility to their claims to be sustainable investors, while helping them to mitigate relevant risks. The SDGs provide a useful framework for sustainability integration and broaden the sustainable investment agenda. As indicated by this study and others (OECD, 2019), pension funds are increasingly going beyond ESG and building investment strategies around broader environmental or developmental objectives such as the SDGs. However, SDG integration remains at an early stage. Most pension funds and SWFs have

[11] About 30 per cent of oil, 50 per cent of gas and 80 per cent of coal reserves will remain unburnable if warming is limited to 2°C (IPCC, 2022).

not yet integrated the SDGs in their investment decision making in a systematic manner. For funds that may be unable to undertake more complex analysis in this regard, there are other, less complex options. For example, UNCTAD has created its SDG alignment index and SDG Indicators that could be a starting point for funds to report on their contribution to the SDGs and sustainable development in general.

Sustainability is not a goal or practice that can be undertaken by asset owners alone. The support and engagement of other stakeholders such as governments, international organizations and academia will be critical. In particular, more efforts will be needed in the development and harmonization of industry standards and benchmarks, building on progress that has been made in relevant areas. Practical tools to assess ESG risks and sustainability at portfolio levels (not only climate risks but also risks related to natural disasters and pandemics such as COVID-19) are also much needed.

UNCTAD’s SDG Investors Partnership will continue working closely with institutional investors, government agencies and other international organizations to address the issues and challenges of sustainable investment faced by institutional investors.

5. References

Antoncic, M., Bekaert, G., Rothenberg, R. V., & Noguer, M. (2020). Sustainable investment - exploring the linkage between alpha, ESG, and SDG's. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3623459

IEA (2021). *Net Zero by 2050: A Roadmap for the Global Energy Sector*. Paris: International Energy Agency.

OECD (2019). *Annual Survey of Large Pension Funds and Public Pension Reserve Funds*. Paris: Organisation for Economic Cooperation and Development.

Thinking Ahead Institute (2021). *Pensions & Investments World 300*. www.thinkingaheadinstitute.org/

UNCTAD (2010). *Investment and Enterprise Responsibility Review: Analysis of investor and enterprise policies on corporate social responsibility.* New York and Geneva: United Nations.

UNCTAD (2014). *World Investment Report: Investing in the SDGs: An Action Plan*. New York and Geneva: United Nations.

UNCTAD (2022). *World Investment Report: World Investment Report: International Tax Reforms and Sustainable Investment*. New York and Geneva: United Nations.

UNCTAD (forthcoming). *Model guidance on sustainability integration for public pension and sovereign wealth funds.* New York and Geneva: United Nations.

UNEP (2022). *Emissions Gap Report 2022: The Closing Window — Climate crisis calls for rapid transformation of societies*. Nairobi: United Nations Environment Programme

6. Appendix 1. The 47 frontrunner funds in the study (ranked by AUM)

#	Acronym	Fund name	Country	SWF /PPF	AuM ($bn)*
1	GPIF	The Government Pension Investment Fund	Japan	PPF	1'747
2	NBIM	Norges Bank Investment Management	Norway	SWF	1'332
3	NPS	National Pension Service	South Korea	PPF	776
4	APG	APG	Netherlands	PPF	727
5	ABP	Stichting Pensioenfonds	Netherlands	PPF	607
6	CalPERS	California Public Employees' Retirement System	USA	PPF	490
7	CPP	Canada Pension Plan Investments	Canada	PPF	427
8	PGGM	Pensioenfonds voor Gezondheidszorg Geestelijke en Maatschappelijke	Netherlands	PPF	330
9	CalSTRS	California State Teachers' Retirement System	USA	PPF	322
10	CDPQ	La Caisse de Dépôt e Placement du Québec	Canada	PPF	315
11	AP 1-7	AP Fonden 1-7	Sweden	PPF	306
12	Temasek	Temasek Holdings	Singapore	SWF	283
13	NYSCRF	The New York State Common Retirement Fund	USA	PPF	268
14	-	Local Government Officials Pension Fund	Japan	PPF	248
15	Mubadala	Mubadala Investment Company PJSC	UAE	SWF	243
16	MN	MN	Netherlands	PPF	208
17	KIC	The Korea Investment Corporation	South Korea	SWF	201
18	BLF	The Bureau of Labor Funds	Taiwan	PPF	198
19	OTPP	Ontario Teachers' Pension Plan	Canada	PPF	184
20	CDC	Caisse des Depots et Consignations	France	PPF	181
21	-	Future Fund	Australia	SWF	178
22	-	AustralianSuper	Australia	PPF	176
23	PSP	Public Sector Pension Investment Board	Canada	PPF	162
24	BCI	British Columbia Investment	Canada	PPF	158
25	PIC	The Public Investment Corporation	South Africa	PPF	157
26	ATP	Arbejdsmarkedets Tillægspension	Denmark	PPF	148
27	-	PIFSS-Wafra	Kuwait	PPF	134
28	MSBI	Minnesota State Board of Investment	USA	PPF	129
29	BVK	Bayerische Versorgungskammer	Germany	PPF	120
30	-	Aware Super	Australia	PPF	112
31	GEPF	Government Employees Pension Fund	South Africa	PPF	109
32	AIMCo	Alberta Investment Management Corporation	Canada	PPF	103
33	KPL	Kommunal Landspensjonskasse	Norway	PPF	100
34	PAL	Pension Fund Association for Local Government Officials (Chikyoren)	Japan	PPF	96
35	OMERS	Ontario Municipal Employees Retirement System	Canada	PPF	92
36	USS	University Superannuation	U.K.	PPF	90
37	OPERF	The Oregon PERS Fund	USA	PPF	82
38	HOPP	Healthcare of Ontario Pension Plan	Canada	PPF	82
39	KEVA	Kuntien Eläkevakuutus	Finland	PPF	75
40	-	UniSuper	Australia	PPF	75

41	UNJSPF	United Nations Joint Staff Pension Fund	USA	PPF	73
42	-	Northern LGPS	UK	PPF	73
43	QIC	The Queensland Investment Corporation	Australia	SWF	69
44	-	Samruk-Kazyna	Kazakhstan	SWF	69
45	LACERA	Los Angeles County Employees Retirement Association	USA	PPF	58
46	VFMC	The Victorian Funds Management Corporation	Australia	SWF	53
47	BPI	Banque publique d'investissement	France	SWF	51

Note: *AUM figures are taken from the Thinking Ahead Institute's *Pensions & Investments World 300* for 2021 and the GSWF, 2022: https://globalswf.com/reports/2022annual#appendices-12