



HOW TO INVEST IN THE LOW-CARBON ECONOMY

AN INSTITUTIONAL INVESTORS' GUIDE



THE SIX PRINCIPLES

PREAMBLE TO THE PRINCIPLES

As institutional investors, we have a duty to act in the best long-term interests of our beneficiaries. In this fiduciary role, we believe that environmental, social, and governance (ESG) issues can affect the performance of investment portfolios (to varying degrees across companies, sectors, regions, asset classes and through time). We also recognise that applying these Principles may better align investors with broader objectives of society. Therefore, where consistent with our fiduciary responsibilities, we commit to the following:

- 1 We will incorporate ESG issues into investment analysis and decision-making processes.
- 2 We will be active owners and incorporate ESG issues into our ownership policies and practices.
- 3 We will seek appropriate disclosure on ESG issues by the entities in which we invest.
- 4 We will promote acceptance and implementation of the Principles within the investment industry.
- 5 We will work together to enhance our effectiveness in implementing the Principles.
- 6 We will each report on our activities and progress towards implementing the Principles.



PRI's MISSION

We believe that an economically efficient, sustainable global financial system is a necessity for long-term value creation. Such a system will reward long-term, responsible investment and benefit the environment and society as a whole.

The PRI will work to achieve this sustainable global financial system by encouraging adoption of the Principles and collaboration on their implementation; by fostering good governance, integrity and accountability; and by addressing obstacles to a sustainable financial system that lie within market practices, structures and regulation.

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EXECUTIVE SUMMARY

Institutional investors' responsibility to manage and protect their beneficiaries' assets must include considering the impacts of climate change. In addition, if we are all to avoid dangerous climate change outcomes, investors will play a crucial part in contributing the trillions of dollars needed to support the transition to a lower carbon economy.

Many investors are already taking action to manage the risks and capture the opportunities that climate change presents:

- reducing exposure to high-carbon assets;
- engaging with companies and policy makers¹;
- integrating climate change into investment strategies²;
- undertaking scenario analysis;
- improving disclosure and transparency;
- allocating capital to new, low-carbon, climate-resilient opportunities³.

Despite this momentum, there is a need for these actions to be more widely integrated into mainstream investment processes to ensure that investment portfolios are resilient to the financial implications of climate change – now, and in the future⁴.

This guide highlights the investment strategies available to investors in their efforts to align their investment portfolios with a lower carbon, more climate-resilient economy. It is designed for investors that have developed (or are in the process of building) their climate-related policies and processes, and are moving to implement them (particularly, the implications for investment allocations).

The guide focuses on three main areas for investor action:

1. Low-carbon, climate-aligned investment opportunities
2. Integrating climate-related risks and opportunities into investment processes
3. Phasing out investments in thermal coal

These actions can be part of investors' commitment to the Investor Agenda⁵, and to their disclosure in alignment with the Financial Stability Board's Task Force on Climate-related Financial Disclosure (TCFD) recommendations.

Allocating capital to low-carbon opportunities is not without its challenges. In particular, concerns have been expressed around scale, access, availability of opportunities and regulatory uncertainty⁶. In addition, integration into core mandates can be challenging for investors to evaluate, as the data and metrics are still evolving across asset classes. Nevertheless, as this guide highlights, there are some straightforward actions that investors can take today to invest into the low-carbon economy.

Embedding low-carbon investments into policies, processes and disclosure frameworks:

ASSET OWNER ACTIONS

- Add to investment committee agenda to identify and research opportunities.
- Ask consultants to identify and research opportunities.
- Ask fund managers what opportunities are available.
- Encourage fund manager integration efforts.

INVESTMENT MANAGER ACTIONS

- Consider developing new funds and products.
- Bolster integration into core processes.
- Engage with clients and potential investors on demand and needs.
- Build internal expertise.
- Bolster reporting metrics.

1 <http://www.climateaction100.org>

2 Mercer (2015), Investing in a time of climate change <https://www.mercer.com.au/content/dam/mercer/attachments/asia-pacific/australia/investment/sustainable-growth/mercer-climate-change-study-2015.pdf>

3 GIC (2016), Investors got the signal http://globalinvestorcoalition.org/wp-content/uploads/2014/09/InvestorsGotTheSignal_FINAL.pdf

4 <https://www.weforum.org/agenda/2018/03/climate-change-is-bad-for-business-heres-how-to-fight-it/>

5 See <https://theinvestoragenda.org>

6 See for example: IGCC (2017), Road to Return: Institutional Investors and Low-carbon Solutions <https://igcc.org.au/wp-content/uploads/2017/09/IGCC-road-to-return-final-final.pdf>

LOW-CARBON, CLIMATE-ALIGNED INVESTMENT OPPORTUNITIES

The shift towards renewable energy is building, recording its highest growth rate of any energy source recorded in 2017: wind, solar, biomass and waste, geothermal, small hydro and marine accounted for over 55% of all the gigawatts of new power generation added worldwide⁸. The rise represents a continued pattern of growth over recent decades (Figure 1).

The trend is driven by: shifting cost curves as the cost of renewable energy declines, advances in technology (including battery storage, electric vehicles), regulatory changes and shifting societal expectations⁹.

ASSET ALLOCATION PROCESSES

The low-carbon transition process not only presents investment portfolios with risks that need to be mitigated – it presents new opportunities that have the potential to diversify portfolios and improve their resilience to the effects of climate change.

These opportunities can be accessed through:

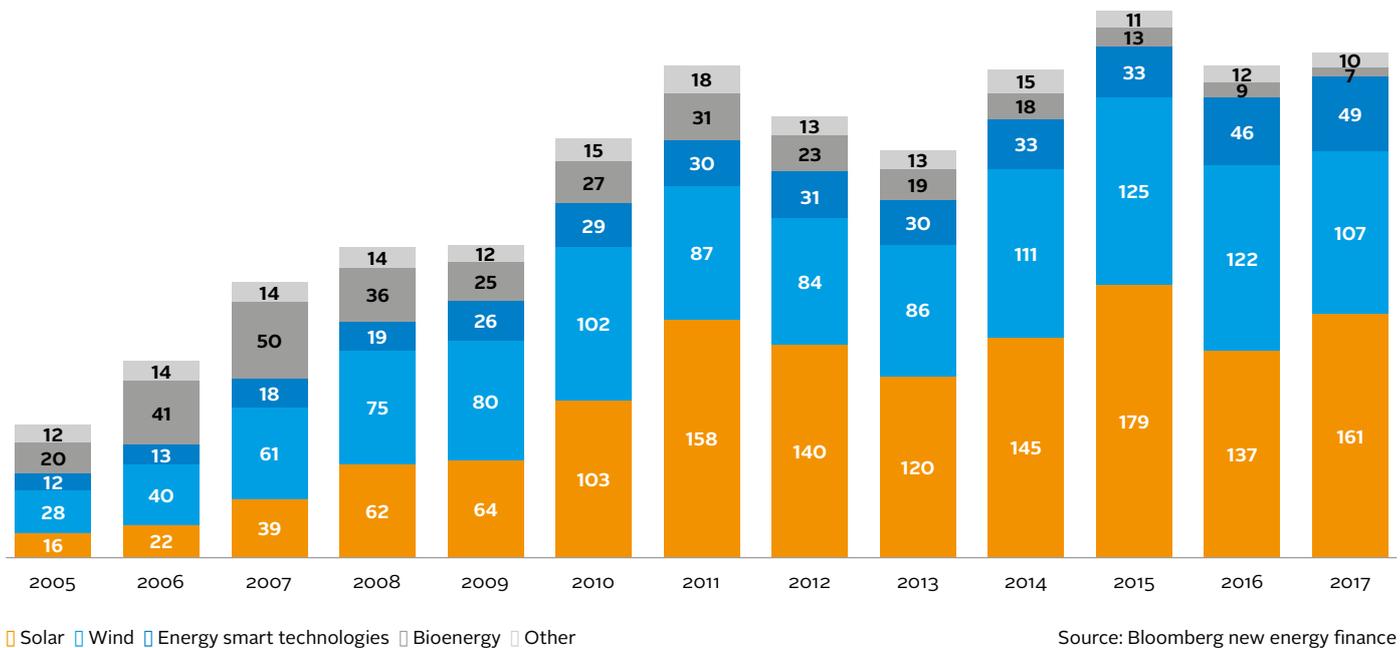
- primary financing of new low-carbon/energy-efficient projects and/or assets;
- secondary markets and vehicles, such as low-carbon passive and active equity funds.

Primary market investments are additive to financing the low-carbon transition process, and hence play a critical role in aligning portfolios to support and accelerate the transition to a lower carbon economy. Ceres (2018)¹⁰ recently examined the state of the renewable energy market and noted that it has matured considerably and now offers a diversified range of primary market investment opportunities including in clean energy infrastructure (wind and solar projects), storage infrastructure, grid technology, low-emission vehicles in the transportation sector and energy efficiency in the built environment.

These can be accessed in a number of ways, including:

- investing in infrastructure or private equity funds;
- direct project-level investment;
- buying securitised bonds or equity;
- investing in green buildings;
- funding the balance sheets of corporate developers in both debt and equity.

Figure 1. Global new investment in clean energy by sector \$bn



7 <http://www.iea.org/publications/freepublications/publication/GECO2017.pdf>

8 Frankfurt School for Climate and Sustainable Energy Finance, UNEP and BNEF (2017) Global Trends in Renewable Energy Investment

9 BNEF The Force Is With Clean Energy: 10 Predictions for 2018: The continuing plunge in costs for solar and wind energy, and for lithium-ion batteries, means that market opportunities will keep opening up for In batteries. BNEF estimate that lithium-ion pack prices fell by no less than 24% last year, opening up the prospect, with further cost improvements, of electric vehicles undercutting conventional, internal combustion engine cars on both lifetime and upfront cost by the mid-to-late 2020s.

10 Ceres (2018), In Sight of the Clean Trillion: Update on an expanding landscape of investor opportunities <https://www.ceres.org/CleanTrillionInSight>

In contrast, many of the secondary market opportunities that currently exist (particularly in regard to low-carbon indices) tend to involve re-weighting within existing capital allocations, rather than providing additional finance. This will depend on the definitions of the index construction, and on the extent to which the indices are designed to both minimise carbon emissions and capture the low-carbon companies of the future. As the private market in low-carbon opportunities continues to grow, the availability of listed companies that are actively participating in the low-carbon transition process will deepen.

As investors seek to capture these new opportunities to align portfolios with the low-carbon transition, there will inevitably be implications for asset owners' asset allocation processes and decision-making frameworks. These issues have been widely debated across the industry (including in the TCFD final report and recommendations) and the processes and tools will continue to evolve to support these efforts. Nevertheless, there are some straightforward steps that asset owners can take today, using tools and resources that are already available (Figure 2).

Figure 2. Immediate steps that asset owners can take to evolve portfolios. Source: Adapted from the GIC (2015) Climate Change Investment Solutions Guide

- **Engage with investment managers** to bolster the integration of climate-related risks and opportunities into core investment processes.
- **Expand universe** of opportunities to research, explicitly incorporating climate alignment and low-carbon transition as part of the search criteria.
- **Match potential opportunities** and investment universe within the fund's existing asset allocation targets.
- **Set and agree priority areas** on the potential opportunities for further research.
- **Ask investment managers and consultants** to investigate and present opportunities in the priority areas.
- **Replace fund managers/mandates** where considered appropriate from a risk/return perspective.
- **Add new fund managers/mandates** where considered appropriate from a risk/return perspective.
- **Review and report** on these priorities and outcomes on an annual basis as part of the TCFD disclosure efforts.
- **Identify areas** where the asset allocation ranges and portfolio structure might evolve in the future, including undertaking scenario analysis and portfolio alignment with the Paris Agreement goals.
- **Discuss and identify potential trigger points** to consider altering asset allocation ranges.
- **Review and report** on these considerations on an ongoing basis as part of the TCFD disclosure efforts.

Most of the investment opportunities presented in this guide fit within existing asset allocation frameworks: the immediate challenges for investors relate more to defining processes and building familiarity with the investment universe as part of undertaking due diligence and gaining exposure.

As the internal processes and knowledge of climate-related risks and opportunities improve, investors can also look to use quantitative techniques including scenario analysis and aligning portfolios with the Paris Agreement goals. This will support further portfolio shifts and a potential review of asset allocation ranges, depending on the asset mix of an organisation and its investment strategy and constraints.

Figure 3. Useful resources on the low-carbon investment universe

Source	Description
Bloomberg New Energy Finance (BNEF)	Monitors and reports trends in renewable energy and energy efficiency investments, including clean energy investment trends on a quarterly and annual basis by region, asset class and sector.
International Energy Agency (IEA)	Monitors, reports and produces forward-looking scenarios of the investment trends in world energy markets by region, sector and technology.
Investment consultants (various)	Provide investors with manager research and ratings on funds and assets that position for the low-carbon economy, both as an explicit component of the strategy as well as integration into core strategies.
Morningstar/Sustainalytics	Sustainability ratings for global mutual and exchange-traded funds, using Sustainalytics's company-level ESG research that includes consideration of carbon intensity, stranded asset risk and fossil fuel exposure.
GRESB	Assess the sustainability performance of real estate, debt and infrastructure funds. Includes consideration of carbon management including emissions intensity, energy efficiency, risk assessments and reporting.
Climate Bonds Initiative (CBI)	Monitor and report trends in the green, climate-aligned bond market including new issuance, investment activities, market trends and outlook and certification standards through various resources, updated regularly.
Global Impact Investing Network (GIIN) ImpactBase	An online search tool with information on funds and investment opportunities that may fit with investor's impact investment objectives (social and environmental factors). Includes private equity, fixed income and real assets.
Principles for Responsible Investment 'Impact Investing Market Map'	A resource for investors to identify companies that, through their products and services, generate impact in one or more of ten thematic environmental and social areas.

DEFINING WHAT IS LOW-CARBON AND CLIMATE-ALIGNED

It is becoming increasingly important for investors to look through investment strategies and portfolio holdings to assess how aligned their climate-related investment policies and objectives are with their investment holdings. This is important for a number of reasons:

- It is fundamental for measuring exposure to the low-carbon transition/climate alignment opportunities that are embedded into existing portfolios.
- It will help to inform investment decisions around how portfolios need to evolve in the future.
- It will support clearer communication externally to beneficiaries, stakeholders, regulators and other interested parties, in line with the TCFD recommendations.
- For PRI signatories and investors seeking to commit to the Investor Agenda, it will provide the basis for reporting existing and future allocations to low-carbon investments.

A number of taxonomies and frameworks exist to support these efforts (Figure 4). The European Commission has also released an action plan for financing sustainable growth that included developing a sustainability taxonomy, in response to the recommendations of the High-Level Expert Group on Sustainable Finance¹¹.

Anticipating further evolution in the taxonomies and frameworks that exist, the PRI encourages signatories to draw on the Climate Bonds taxonomy that aims to provide common definitions across global markets, and to draw on the Low Carbon Investment Registry taxonomy developed for institutional investors.

Figure 4. Examples of taxonomies and frameworks.
Source: IGCC (2017) [Road to Return: Institutional Investors and Low Carbon Solutions](#)

- [Low Carbon Investment Registry taxonomy](#)
- [Climate Bonds Initiative Taxonomy and Standards](#)
- [IFC Definitions and Metrics for Climate-Related Activities](#)
- [Green Investment Bank definition of “green impact”](#)
- [ICMA Green Bond Principles & Projects Taxonomy](#)
- [FTSE Russell Green Revenues](#)

LOW-CARBON METRICS TO MEASURE AND DISCLOSE

For investors to be in a position to measure, monitor and disclose their investments outcomes’ in terms of mitigating climate-related risks and capturing opportunities, they will need to consider using suitable metrics as part of their monitoring and disclosure efforts.

This is important for both thematic and climate-focused/labelled funds and investments, as well as those that seek to more broadly integrate climate risks and opportunities into core processes.

Metrics

- **Carbon footprint:** Measure the carbon emissions of the investment portfolio, which can then be used to compare portfolio emissions to global benchmarks, identify priority areas for reduction (including the largest carbon emitters and the most carbon intensive companies) and engage with companies on reducing carbon emissions and improving disclosure standards.
- **Green/brown exposure:** Measure the exposure to green (low-carbon/climate positive) versus brown (high-carbon/climate negative) assets held in the investment portfolio.
- **Company engagement effectiveness:** Monitor engagement outcomes, focusing in particular on whether companies are providing satisfactory responses to investor concerns and assessing how long engagement dialogue should continue for and what investment decisions will be taken if companies provide an unsatisfactory response.
- **Ratings and research:** Use the outputs from one or more of the various climate-related data, research and ratings service providers as part of their assessment of climate-related risks and opportunities.
- **Scenario analysis:** Undertake scenario analyses to assess the resilience of their investment portfolios to a range of possible climate-related impacts, including a 2°C or lower scenario.
- **Impact metrics:** Assess the extent to which investment actions have had a positive impact on the portfolio and climate-related outcomes, including alignment with the Sustainable Development Goals (SDGs).
- **Adaptation metrics:** Assess the preparedness of investee companies and entities to the physical impact risks associated with climate change.

¹¹ https://ec.europa.eu/info/sites/info/files/180131-sustainable-finance-final-report_en.pdf

PRI (2018), The EU Commission Action Plan: Financing Sustainable Growth <https://www.unpri.org/sustainable-financial-system/explaining-the-eu-action-plan-for-financing-sustainable-growth/3000.article>

Data sources

There are three main sources of carbon data that investors can use as part of their investment decision making, monitoring and reporting:

- company-reported data (scopes 1, 2 and 3);
- service providers' estimates;
- physical asset data provided by research organisations.

Data and metrics for adaptation to climate change are under development.

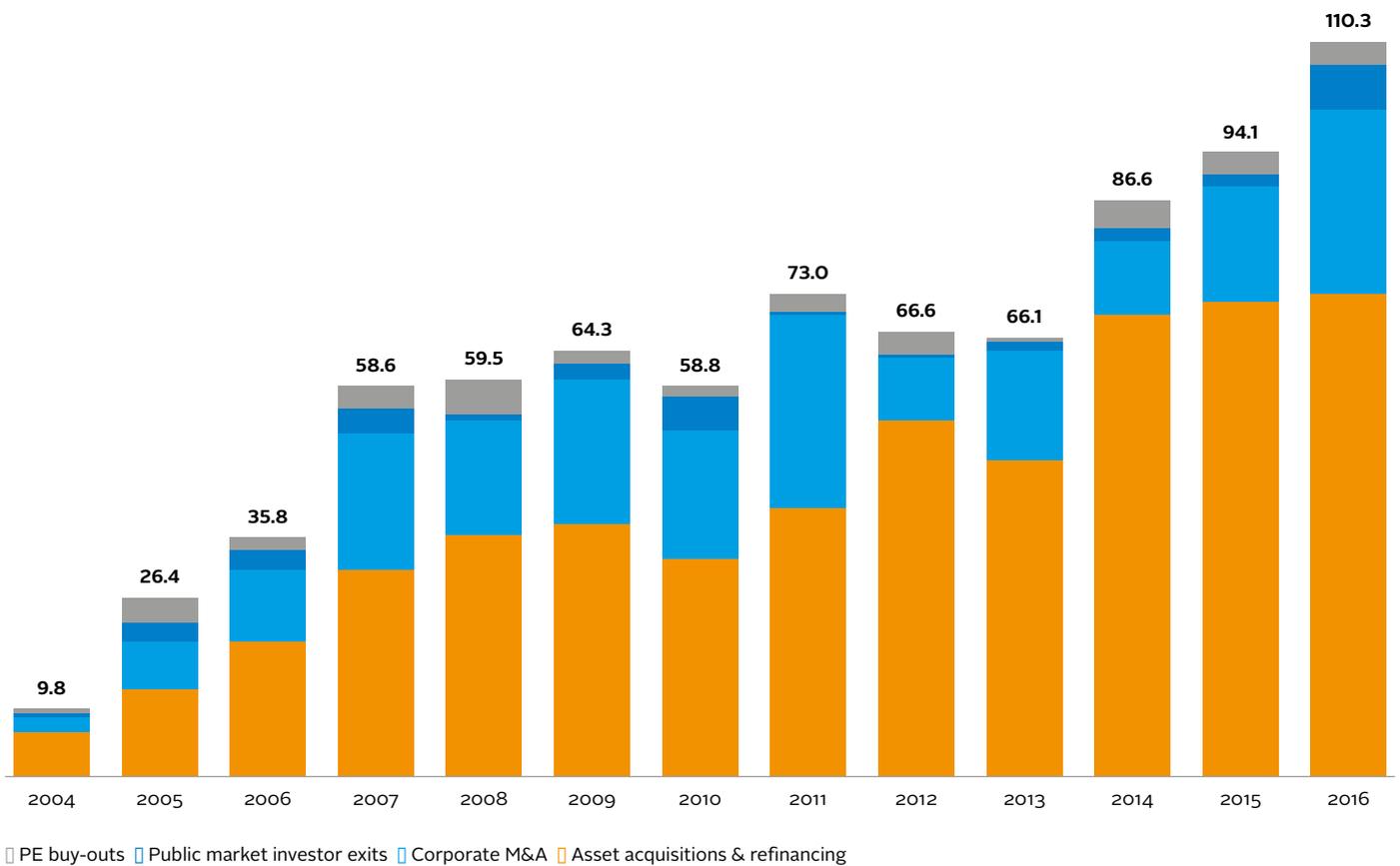
Figure 5: Useful resources for climate-related data and metrics

Company reported data including Scopes 1, 2 and (to the extent available) 3 emissions
<ul style="list-style-type: none"> ▪ Recommendations of the FSB Task Force on Climate-related Financial Disclosures ▪ PRI Guide on TCFD Recommendations for Asset Owners ▪ CDP Disclosure and Action Data Portal
Data and research sources including service providers' estimates of company emissions and physical asset data
<ul style="list-style-type: none"> ▪ WRI, UNEP FI and 2Dii Climate strategies and metrics ▪ Grantham Research Institute on Climate Change and the Environment Transition Pathway Initiative ▪ Carbon Compass: Investor Guide to carbon Footprinting ▪ Frankfurt School/UNEP Collaborating Centre: Climate Metrics for Debt and Equity Portfolios ▪ Mercer climate change study ▪ PRI Carbon Footprinting Resources ▪ Carbon Tracker Initiative ▪ 2Dii/ET Risk Project ▪ Oxford University Smith School of Enterprise: Asset level data and the Energy Transition
Adaptation analysis
<ul style="list-style-type: none"> ▪ Potsdam Institute Carbon Delta project ▪ IPCC Fifth Assessment Report ▪ University of Cambridge IPCC climate science briefings

LISTED EQUITY FUNDS

While the public markets comprise a smaller portion of the clean energy investment universe compared to asset finance and unlisted assets (including infrastructure, private equity and venture capital), activity in the acquisitions market has steadily grown over recent decades, reflecting the larger size of the renewable energy sector (Figure 6).

Figure 6. Acquisition transactions in renewable energy, by type. Source: Bloomberg new energy finance



APPROACHES

As with managing broader ESG and sustainability issues, there are a number of approaches for aligning a fund with climate-related investment objectives.

- Negative screening overlay:** The investment process generally remains the same, but the opportunity set is narrowed to remove certain (i.e. high CO₂-emitting) companies from the investment universe (similar to the approaches described in constructing lower carbon indices).

This might appeal to investors that seek to exclude fossil fuel-related companies from their portfolios and clearly demonstrate this commitment to their constituents.

- Best in class:** The active manager underweights the higher CO₂-emitting/less climate-aware companies and overweight the less CO₂-emitting/more climate-aware companies versus a standard benchmark. These funds tend to use a scoring system or proprietary model and, to varying degrees, will adopt a rules-based approach to portfolio construction to ensure that a certain outcome is achieved in terms of emissions reduction and/or climate resilience.

This might appeal to investors that want to avoid the higher emitting companies but also capture the leaders in the low-carbon transition process, and have these goals made explicit as part of the portfolio management process.

- Integration into valuations:** This involves strategies that have an investment process that incorporates climate-related risks and opportunities into the bottom-up (and top-down) assessment of companies and portfolio construction. These strategies are less likely to have an explicit label or low-carbon investment theme, but rather will seek to manage climate-related impacts as an integrated part of the valuation and engagement process.

This might appeal to investors that believe in active management and the need for unconstrained portfolio mandates, but want their values and beliefs on being broadly positioned for the low-carbon transition process to be aligned with the investment manager's actions.

- Thematic funds:** Strategies that explicitly focus on low-carbon, or climate-alignment investment sectors and themes, such as lower emissions, resource efficiency, water efficiency, waste management, renewable energy/technology and energy efficiency¹². Such approaches may be less diversified than broader equity funds that take an integrated approach, depending

on how narrowly defined the climate-related theme is and the sector exposure implications. The benchmark is likely to be more constrained and the portfolio risk more concentrated, but it will be easier to demonstrate clear and positive links to achieving specific climate-related outcomes.

This might appeal to investors that have advanced their approach towards managing climate-related risks and opportunities, and would like to explicitly focus on specific low-carbon themes as part of the low-carbon transition process. They will also seek to clearly demonstrate and report positive climate-related benefits and outcomes to their constituents.

INVESTMENT CHARACTERISTICS

While the investment characteristics of broader ESG/sustainable, climate-aligned equity strategies are largely dependent on the approach that the funds take (negative screening, best in class, integration and/or thematic), some of the typical investment characteristics of ESG/sustainable strategies that include climate-alignment elements are summarised in Figure 7.

Figure 7: Investment characteristics of sustainable, climate-aligned equity strategies*

Investment objectives	"Generate long-term investment returns that seek to capture the low-carbon transition process."
Investment horizon	5+ years
Regions	Global, reflecting country weights of global equity indices
Benchmarks	Standard benchmarks apply (negative screening likely to use excl.-fossil fuels indices)
Fees	Typical of other actively managed equity funds; may be slightly higher depending on the degree of tailoring required
Number of holdings	>60 for global funds
Sectors	Aim to minimise sector bias to a comparable (unconstrained) benchmark
Risk indicators	Most funds assess the risks at 6 on a scale of from 1 (low) to 7 (high)
Link to mitigation of climate-related risks and capturing new opportunities	Potential to reduce exposure to fossil fuels and carbon intensive businesses, while investing in companies that are less emission intensive and better positioned to benefit from the low-carbon transition. The outcome is highly dependent on the mandate definition (and approach taken) as well as the skill of the active fund managers.

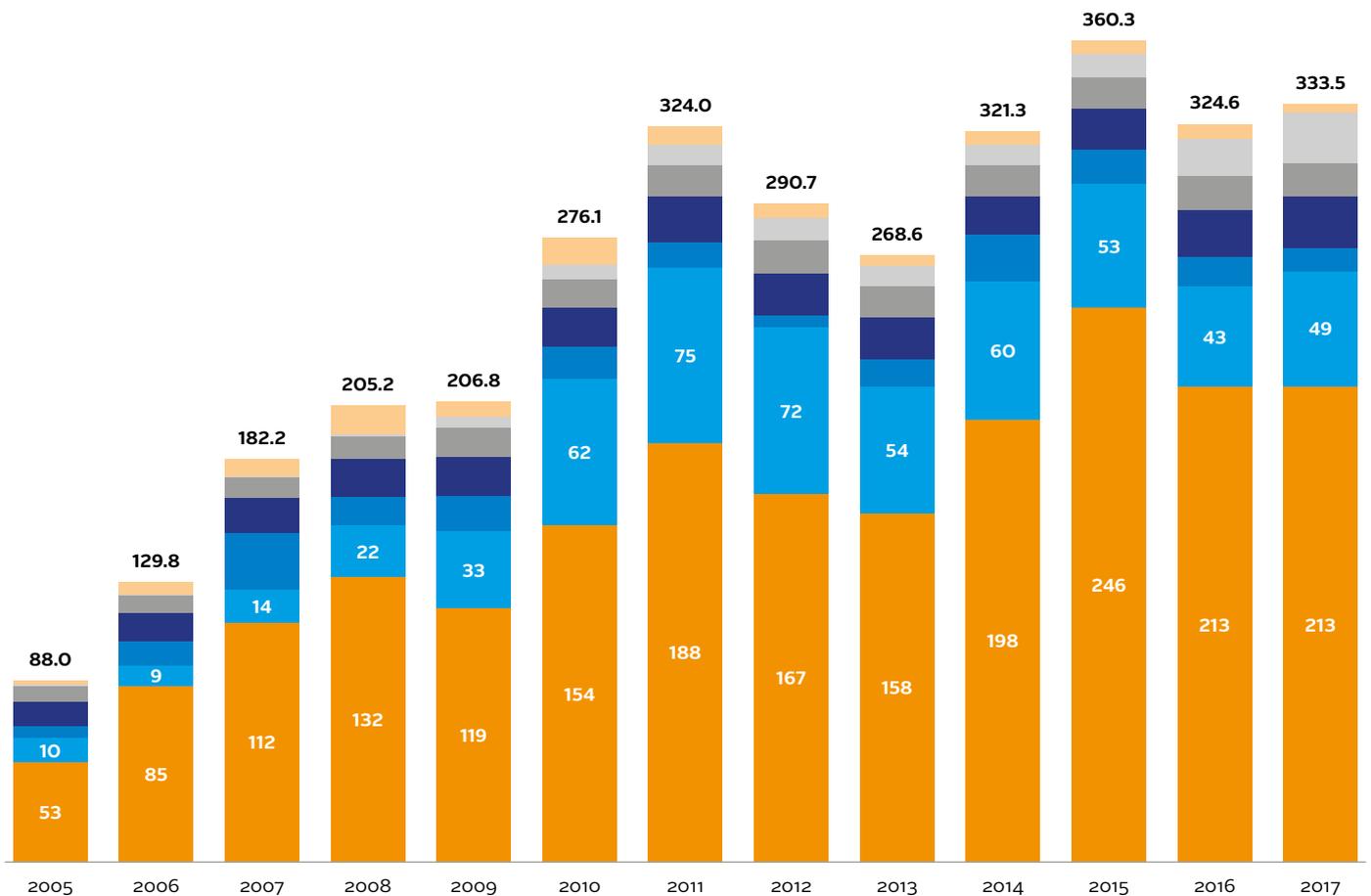
*This represents an amalgamation of the different qualities and features of ten ESG/sustainability focused listed equity funds. It is provided for illustrative purposes only. Investors would need to review the universe and evaluate the opportunity set in accordance with their regular investment due diligence processes.

12 The emergence of impact investing funds may also fall under this category in cases where the positive impacts are climate related.

EXAMPLES

- The California State Teachers' Retirement System (CalSTRS) approves equity fund managers to receive up to US\$1 billion for ESG-related mandates.** CalSTRS' ESG investment programme includes considering climate-related impacts and is likely to have positive outcomes in terms of low-carbon and energy efficiency progress, although the mandates have been defined more broadly as ESG-focused.
- French public sector pension fund ERAFP plans to invest €50 million into international equity funds aimed at combating climate change.** The fund has been using a best-in-class approach to socially responsible investment for a number of years and announced in 2017 an extension to this program, with the allocation of capital to investment solutions that "meet the challenge of combating climate change". The fund developed a virtual management platform to enable the managers to demonstrate their low-carbon management expertise.
- New York State Common Retirement Fund invests US\$3 billion in ESG and sustainable investment equity funds.** The fund allocated assets to global equity sustainability mandates that incorporate ESG and sustainability criteria as a core part of the investment process, including climate-related risks and opportunities.

Figure 8. Global new investment in clean energy by asset class. Source: Bloomberg new energy finance



Asset finance Small-scale solar Public markets Corp R&D Gov R&D EST asset finance VC/PE

UNLISTED STRATEGIES AND ASSETS

Investments in clean energy across unlisted asset classes (such as property, private equity, infrastructure, agriculture and timberland) and projects (such as renewable energy and energy efficiency projects) is clearly growing (Figure 8).

APPROACHES

As with any unlisted opportunity, when allocating capital to unlisted low-carbon opportunities, investors need to evaluate considerations such as the fit with their: investment policies (including climate change policies), investment beliefs, risk/return profile and investment constraints (size, liquidity, internal capacity, regulatory requirements in local jurisdictions).

Investors in unlisted markets need to consider their appetite for opportunities that:

- have an explicit investment focus and label on one or all of the low-carbon, energy efficiency or climate resilient themes;
- seek to integrate considerations related to the low-carbon transition, although not explicitly labelled as such (including managing, upgrading and adapting existing holdings);
- seek a combination of both explicit low-carbon focused mandates, as well as integration into core mandates.

Institutional investors can access opportunities in unlisted low-carbon assets through the usual avenues for unlisted funds or assets.

- **Fund of funds:** Investing in funds of funds (FoF) that have an explicit or integrated approach to (one or all of) low-carbon, energy efficiency and climate adaptation as part of the criteria to invest in the underlying funds. Such labelled FoF offerings are most prevalent in private equity and infrastructure, although agriculture and timberland funds with such a focus are also available.

This might appeal to investors that have an existing preference and policy to invest through fund of fund structures and are seeking to build a broadly diversified exposure to low-carbon investment opportunities.

- **Funds:** Funds that have an explicit or integrated approach to (one or all of) low-carbon, energy efficiency and climate adaptation as part of the criteria to invest in the underlying (private market) companies. Such labelled funds are most prevalent in private equity and infrastructure assets, with a particular focus on renewable energy, energy efficiency and the built environment (although timberland/land use and agriculture/resource funds are also available).

This might appeal to investors that have an existing preference and policy to invest in private markets through funds and are seeking to build a more focused, thematic exposure to better position for the low-carbon transition process.

- **Direct investments:** Direct investments into projects and assets that have an explicit or integrated approach to (one or all of) low-carbon, energy efficiency and climate adaptation. Such opportunities are most prevalent in projects related to renewable energy and energy efficiency.

This might appeal to investors that have an existing preference to invest in private markets through direct investment opportunities and are seeking to build exposure to better position for the low-carbon transition process.

- **Partnerships:** Investing in partnership with governments, development banks, international financial institutions and/or companies to position for the low-carbon transition process. Such opportunities are most prevalent in projects related to renewable energy and energy efficiency in both developed and (increasingly) developing markets.

This might appeal to investors that have an existing preference to invest in private markets in partnership with other entities, and/or those investors that are considering options to expand their investments into new regions, markets and industries, while also seeking to better position for the low-carbon transition process.

INVESTMENT CHARACTERISTICS

The broad array of funds and direct investment opportunities makes it difficult to aggregate the investment characteristics for this universe precisely, but Figure 9 sets out some of the high-level investment characteristics that are typical of low-carbon unlisted funds and assets.

Figure 9: Investment characteristics of low-carbon unlisted funds and assets*

Investment objectives	“Deliver strong investment returns while providing access to renewable energy...increasing energy efficiency...combating climate change...positioning for the low-carbon transition.”
Investment horizon	10+ years
Regions	Global
Benchmarks	Examples include absolute return and CPI+
Fees	Typical of other unlisted funds and assets (can be lower for first time funds to attract capital and investments in partnership with other entities)
Number of holdings	FoF the most diversified with direct investments the most concentrated
Sectors	Varies depending on type of mandate and degree of focus on low-carbon thematic
Risk indicators	Most funds assess the risks at 6 on a scale of from 1 (low) to 7 (high)
Link to mitigation of climate-related risks and capturing new opportunities	Potential to gain exposure to regions, markets and industries of the future that are driving the low-carbon transition process. Funds that are focused on specific low-carbon themes are likely to deliver clear and demonstrable climate-related outcomes. Funds that integrate these factors into core processes but are not explicitly labelled funds may need to consider suitable metrics to measure climate-related impacts and outcomes (in line with the TCFD recommendations). The financial and climate-related outcomes will be highly dependent on the skill of the underlying investment manager(s) and/or the project teams.

*This represents an amalgamation of the different qualities and features of ten low-carbon focused unlisted funds, fund of funds and direct investments. It is provided for illustrative purposes only. Investors would need to review the universe and evaluate the opportunity set in accordance with their regular investment due diligence processes.

EXAMPLES

- **Finance institutions invest €112 million into European Investment Bank's Global Energy Efficiency and Renewable Energy Fund (GEEREF).** The European Investment Bank (EIB) GEEREF is a developing market fund of funds, started in 2008 with public funding of €112 million from Germany, Norway and the European Union. It was established to catalyse private investment into its target markets. GEEREF raised an additional €112 million from institutional investors.
- **The Dutch pension fund manager APG sets out to double its investments in sustainable energy generation from €1 billion to €2 billion.** APG is expanding its infrastructure portfolio to at least €9 billion and prefers sustainable energy generation, including wind power, solar, hydropower and other energy-related infrastructure assets identified as being suitable from a risk/return perspective, provided the opportunities have visible cash flows, a strong sustainability profile and comparatively low exposure to government policy changes.
- **Australian investment manager QIC enters into an A\$800 million strategic renewable energy partnership with AGL Energy.** The Powering Australian Renewables Fund (PARF) will be a A\$2 billion to A\$3 billion investor in more than 1,000 MW of large scale renewable energy projects in Australia. QIC and AGL will partner to develop, own and manage existing (brownfield) and new (greenfield) renewable assets under a governance framework to de-risk the investment.
- **The Danish pension fund PKA increases its new and existing offshore wind farm investments to more than €1 billion.** PKA believes that offshore wind investments align with its goal to generate a solid investment return, with long-term stable cash flows whilst also having a positive impact on the climate.
- **US pension fund CalPERS exceeds its energy reduction goal of 20% in its core real estate portfolio.** In 2004, the CalPERS Investment Committee established a goal of reducing the energy consumption of the underlying assets in its Core Real Estate portfolio by 20% by 2009. At the end of this five-year program, the investment managers exceeded this target, reporting a total energy reduction of 22.8%. CalPERS continue to work with its real estate managers on improving the efficiency of its real estate portfolio.
- **Australian superannuation fund Cbus invests over A\$2 billion in building projects that reflect a strong commitment to sustainable development.** Cbus Property is an in-house capability with a mandate to achieve at least a 5-star NABERS Green Star rating on all new commercial development as well as retro-fitting existing properties to improve sustainability. In 2017, it reported a 10% reduction in energy across its commercial portfolio, 14% increase in waste diversion and a 15% reduction in carbon intensity.

BATTERY PACK PRICES CONTINUE TO FALL

According to Bloomberg New Energy Finance research, lithium-ion battery pack prices will continue to drop in 2018, but at a slower pace than in previous years.

Cobalt and lithium carbonate prices reportedly rose 129% and 29% respectively in 2017. This will start to increase average cell prices in 2018, leading to many headlines about how the electric vehicle revolution and the rise of energy storage are under threat.

Despite this, BNEF expects average pack prices to decline by 10%-15%, driven by economies of scale, larger average pack sizes and energy density improvements of 5%-7% per year.

Falling capex costs, an increasing need for flexible resources and greater confidence in the underlying technology will continue to drive energy storage uptake.

Source: BNEF, 10 Predictions for 2018

ELECTRIC VEHICLE SALES GROWTH

According to Bloomberg New Energy Finance research, global electric vehicle (EV) sales will be close to 1.5 million in 2018, with China representing more than half of the global market. This will represent a rise of around 40% from 2017.

Europe is expected to hold its spot as the number two EV market globally. Urban air quality concerns are mounting in European capitals, and diesel's demise will benefit the EV market. German EV sales doubled in 2017 and could double again in 2018.

North America should finish 2018 with EV sales of around 300,000.

Source: BNEF, 10 Predictions for 2018

GREEN AND CLIMATE-ALIGNED BONDS

Climate (or climate-aligned) bonds refer to labelled and unlabelled bonds for which proceeds are intended to finance projects and activities that contribute to a low-carbon and climate-resilient economy.

Green bonds refers to explicitly labelled bonds for which the proceeds will be exclusively used to finance, or re-finance (in part or in full) new and/or existing eligible green projects within four core components (use of proceeds; process for project evaluation and selection; management of proceeds; reporting)¹³.

According to the Climate Bonds Initiative (CBI) State of the Market Report 2017, more than 3,000 bonds have been issued across seven climate themes (transport, energy, multi-sector, water, buildings and industry, waste and pollution, agriculture and forestry). A few facts about the universe:

- The climate-aligned bond universe featured US\$895 billion outstanding at the end of 2017, representing an increase of US\$201 billion from the 2016 figure. This total is comprised of unlabelled climate-aligned bonds at US\$674 billion and labelled green bonds at US\$221 billion.
- Low-carbon transport was the largest single sector, accounting for US\$544 billion (61%), followed by clean energy at US\$173.4 billion (19%).

ISSUERS

As well as development banks and corporate issuers, sovereign issuers have also entered the fray over recent years (including France, Belgium, Hong Kong, Indonesia, Poland, Nigeria and Fiji), contributing to a general widening and deepening in the opportunity set available for fixed income investors across developed and developing markets (Figure 10).

GREEN AND CLIMATE-ALIGNED – WHAT’S THE DIFFERENCE?

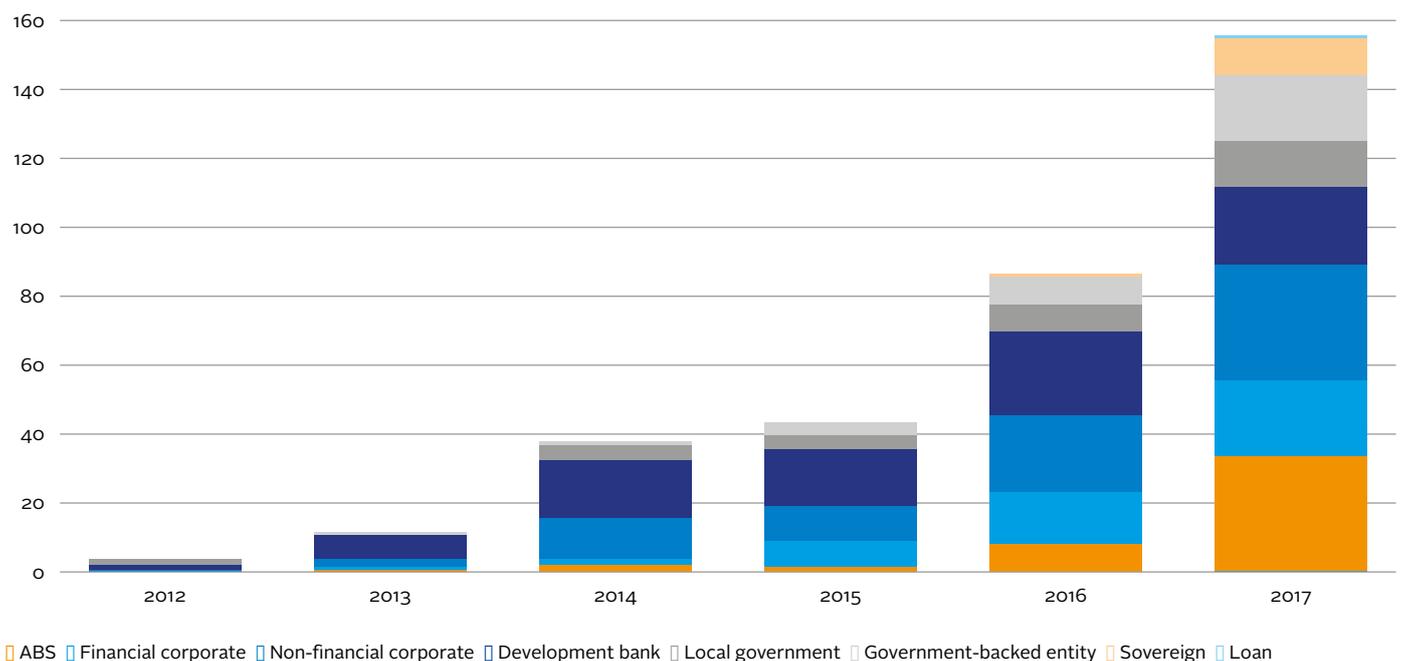
Labelled green bonds: Bonds labelled as green by the issuer and are financing green assets and projects and form the basis of green indices.

Climate-aligned bonds: This label is increasingly used to refer to bonds that are financing green/climate assets that help enable a low-carbon economy but have not been labelled as green by the issuing entity.

Labelled green bonds are primarily issued by diversified companies, whereas the unlabelled portion of the climate-aligned universe is mostly pure-play issuers.

Source: Climate Bonds Initiative, [State of the Market, 2017](#)

Figure 10. Size of green bond market \$bn. Source: Climate Bonds Initiative, [Green Bond Highlights 2017](#)



¹³ ICMA Green Bond Principles (2017), <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/GreenBondsBrochure-JUNE2017.pdf>

INVESTMENT CHARACTERISTICS

While the issuance size is still small compared to broader market issuance¹⁴, the market is deep enough to have supported the emergence of a number of dedicated green bond funds. While it is too early to assess the return performance and climate-related impacts of these funds, rating agency Fitch observed that nine of the first green bond funds will reach a three-year track record in 2018¹⁵. Some of the typical characteristics of these funds are summarised in Figure 11.

Figure 11. Investment characteristics of green bond funds*

Investment objectives	“Return on investment, through a combination of capital growth and income...where the proceeds are used to fund projects with direct environmental benefits.”
Investment horizon	5+ years
Regions	Global, typically around 10% allocated to developing markets
Benchmarks	Examples include Barclays Global Green Bond 100%, Barclays MSCI Green Bond Index, BofA Green Bond Index
Fees	Typical of other bond funds
Credit rating	Predominantly investment grade, average AA2
Number of holdings	>50
Maturity	5-7 years
Sectors	Dominated by agencies, supranational, utilities, financial institutions
Risk indicators	Most funds assess the risks at 3 on a scale of from 1 (low) to 7 (high)
Link to mitigation of climate-related risks and capturing new opportunities	In accordance with the ICMA Green Bond Principles, green bond funds do not need to demonstrate a specific link to climate mitigation, although there is a commitment to demonstrate direct environmental benefits. Some funds provide a breakdown on environmental projects as part of their reporting at a high level ¹⁶ . This highlights the need for investors to support the labelling of green bonds to evaluate alignment with the low-carbon transition in a way that can more precisely be linked to climate mitigation outcomes. This would also support investors in their efforts to seek transparency and disclosure in line with the TCFD recommendations

*This represents an amalgamation of the different qualities and features of seven green bond funds that have been launched by large, international investment managers. It is provided for illustrative purposes only. Investors would need to review the universe and evaluate the opportunity set in accordance with their regular investment due diligence processes.

¹⁴ The rating agency Fitch estimate there are around 100 issuers of green bonds, compared with 3,000 names in broader market indices: www.fitch.com

¹⁵ <https://portfolio-adviser.com/insight-calls-green-bond-issuance/>

¹⁶ Climate Bonds Initiative, Green Bond Principles & Climate Bonds Standard <https://www.climatebonds.net/market/best-practice-guidelines>

EXAMPLES

- **World Bank/International Finance Corporation and Amundi green bond fund attracts institutional investment.** The largest green bond fund to date raised US\$1.4 billion, including investments from development banks, investment managers, insurance companies and pension funds (Alecta, AP3, AP4, APK Pensionkasse and Vorsorgekasse, ERAFP and Credit Agricole Assurances).
- **Public pension funds CalSTRS, AP2, AP3, UNJSPF and California State Treasurer were early supporters of green bond market.** The 2008 World Bank (IBRD) green bond of US\$130 million attracted public sector pension funds including the US pension fund CalSTRS, Swedish pension funds AP2 and AP3 and the United Nations Joint Staff Pension Fund. Since the first bond, these and other investors have participated in purchasing green bonds from other issuers as the market has grown.
- **Zurich Insurance Group invests more than US\$2 billion in green bonds.** Nearly 30% of the group's investment portfolio is in government or supranational bonds. Zurich hopes that its contribution can have the additional benefit of developing scale and liquidity in the green bond market and encourage new issuers to come to market, while promoting robust and transparent project selection and the reporting standards for impact.
- **US firm Bank of America Merrill Lynch joins in corporate green bond issuance and sets ten-year goal to reach US\$50 billion of environmental business.** The proceeds are used to finance renewable and energy efficiency projects via loans and credit lines. Investors include State Street Global Advisors, TIAA-CREF, CalSTRS and AP4.

LOW-CARBON INDICES

For off-the-shelf fund solutions, investing against low-carbon indices is a potentially lower-cost option than actively managed strategies. It might also present the opportunity for some investors to develop a tailored, bespoke benchmark to shift the equity portfolio towards a lower carbon, more climate-resilient future in a way that best aligns with an organisation's climate-related investment policies and objectives.

Passive investment against low-carbon indices is not without its challenges, however. Investors might wish to consider:

- how effective the indices are in changing the cost of capital for higher CO₂ emitting companies (versus lower emitting companies);
- the absence of Scope 3 emissions in reported data and index construction;
- the balance between focusing on minimising risk and avoidance versus allocating to new opportunities;
- the potential investment performance implications associated with the design of a constrained benchmark;
- the need to balance backward-looking versus forward-looking assessments into building portfolio resilience¹⁷;
- the impact that the growing attention on the need for suitable taxonomies and definitions to validate labels might have on product offerings¹⁸.

APPROACHES

A number of climate-related indices have emerged in response to rising demand from investors¹⁹.

Figure 12. Examples of climate-related indices

S&P: Carbon Efficient indexes, various
FTSE: Carbon Strategy Optimised, FTSE ex fossil fuels, ex coal, various
MSCI: Low-carbon Leaders, Low-carbon Targets, MSCI ex fossil fuels, ex coal, various
Environmental Tracking: ET Carbon Indexes, various
HSBC: Low-carbon Energy Production Index
UBS: Europe Carbon Optimised Index
BofA Merrill Lynch: Carbon Leaders Europe Index
NYSE Euronext: Low-carbon 100 Europe Index
China Securities Index: China Mainland Low-carbon Economy Index

¹⁷ Mercer (2016) How Low Can You Go? Introducing Low-carbon and Fossil-free Passive Equity Options

¹⁸ See for example the HLEG Final Report (2018) on Indices and Benchmarks, page 53-55: https://ec.europa.eu/info/sites/info/files/180131-sustainable-finance-final-report_en.pdf

¹⁹ See for example the actions taken by investors as part of their commitment to the Portfolio Decarbonisation Coalition, including shifting passive equity investments towards lower carbon indices: <http://unepfi.org/pdc/>

As with all passive funds, the investment exposure to climate-related passive funds is determined by the methodology underpinning the index construction and the resulting index weightings that this produces. In terms of low-carbon or climate-related indices, three broad approaches have emerged (Figure 13).

Figure 13. Approaches to low-carbon indices. Source: Mercer (2016) How Low Can You Go? Introducing Low-carbon and Fossil-free Passive Equity Options, April 2016

1. **Broad market optimised:** Likely to be suitable for an investor that does not have an exclusion policy, but is seeking a reduction in the exposure to carbon emissions/reserves and fossil-fuel-related carbon emissions.
2. **Best in class:** Likely to be suitable for an investor that wants to consider carbon efficiency across sectors and is able to accommodate negative exclusions (typically excluding the worst carbon emissions/reserves performers from each sector and re-weighting across the sector).
3. **Fossil-free:** Likely to be suitable for an investor that is able to accommodate negative exclusions (typically excluding fossil fuel companies).

INVESTMENT CHARACTERISTICS

While there are some off-the-shelf indices and funds that are readily available for investors to allocate to, there are also emerging examples of investors developing a bespoke benchmark solution to fit with their risk/return objectives and strategic goals in mitigating the climate-related risks and capturing the new opportunities.

Some of the typical investment characteristics of low-carbon index solutions that have been launched to date are summarised in Figure 14.

Figure 14. Investment characteristics of low-carbon index funds*

Investment objectives	“Provide enhanced return by replicating the performance of a [specified] equity market index with reduced carbon risk...positive tilt towards the low-carbon transition...and minimal tracking error.”
Investment horizon	5+ years
Regions	Global, reflects country weights of global equity indices
Benchmarks	Examples include MSCI World Low-carbon Leaders, S&P500 Carbon Efficient Index, FTSE Global Climate index series
Fees	Typical of other passive enhanced equity funds (on average, higher than core passive funds)
Number of holdings	>1,000 for global funds
Sectors	Aim to minimise sector bias to a comparable (unconstrained) benchmark
Risk indicators	Most funds assess the risks at 5 on a scale of from 1 (low) to 7 (high)
Link to mitigation of climate-related risks and capturing new opportunities	Potential to reduce exposure to fossil fuels and carbon-intensive businesses, while tilting towards companies that are less emission-intensive and more exposed to generating revenues linked to the low-carbon transition. The outcome is highly dependent on the methodology underpinning the index construction.

*This represents an amalgamation of the different qualities and features of 8 low-carbon, passive equity funds. It is provided for illustrative purposes only. Investors would need to review the universe and evaluate the opportunity set in accordance with their regular investment due diligence processes.

EXAMPLES

- **New York State Common Retirement Fund doubles its passive equity investments against a low emissions index to US\$4 billion.** The benchmark represents an internally managed, bespoke solution that excludes or reduces holdings in higher CO₂ emitting companies, while increasing investments to the lower CO₂ emitting companies. The footprint is 75% lower than the Russell 1000 index. The index is also used as a lever for engagement to encourage companies.
- **The Fourth Swedish national fund AP4 benchmarks 24% of its global equity investments (US\$3.8 billion) against low-carbon indices.** Since 2014, AP4 announced its intention to decarbonise its equity portfolio by 2020. It started by allocating €1 billion to track the MSCI Low-carbon Leaders index as the benchmark for its low-carbon equity strategies. AP4 has since extended this benchmark to its regional equity portfolios against MSCI Low-carbon Leaders Indexes in Europe, Emerging Markets, North America and Pacific.
- **New Zealand Superannuation Fund shifts its global passive equity portfolio (NZ\$14 billion) to be managed against a low-carbon benchmark.** NZ Super approved a target to reduce the carbon-emission intensity of the fund by at least 20% and reduce the carbon reserves exposure of the Fund by at least 40% by 2020.
- **US Public Pension Fund CalSTRS commits US\$2.5 Billion to low-carbon index in U.S., non-U.S. developed and emerging equity markets.** The passively managed equity portfolio is invested in an index designed to have significantly lower exposure to carbon emissions than the broad market and nearly complete reduction in exposure to fossil fuel reserves.
- **French Reserve Fund (FRR) adopts new equity benchmarks to halve its CO₂ emissions from standard indices.** The fund mandated its passive managers to implement a process to reduce the portfolio's carbon footprint and fossil fuel reserve exposure by 50%. FRR also adopted a policy to exclude companies whose thermal coal mining or electricity generation business exceeds 20% of their revenue.
- **The UK Environment Agency Pension Fund (EAPF) transitions its portfolio of passively managed global equities to a fund run against the MSCI low-carbon target index.** The index aims to reduce exposure to GHG emission by 75%-80% and cut exposure to fossil fuel reserves by 85%-90%. The benchmark is also used to support engagement efforts with companies.
- **The Second Swedish national fund AP2 benchmarks almost one third of its assets (SEK 350 billion) against a bespoke ESG-focused index.** The in-house benchmarks represent a quantitative, multi-factor equity index solution. The assessment and benchmark construction are broader than climate change and include factors such as climate alignment, water and waste management, diversity, human rights and involvement in other controversies and accounting practices.
- **French public sector pension fund ERAFP invests €750 million of its passively managed equity investments into a bespoke, low-carbon benchmark solution.** This has reportedly reduced the carbon footprint of its listed equity portfolio by around 40% with low tracking error.

INTEGRATING CLIMATE-RELATED RISKS AND OPPORTUNITIES INTO INVESTMENT PROCESSES

The PRI defines integration as “the explicit and systematic inclusion of [climate change] issues in investment analysis and investment decisions.”²⁰ It means investors making investment decisions that include considerations of all material factors, including climate-related risks and opportunities.

The PRI has released a series of guides on integrating ESG considerations into portfolio analysis and decision making across asset classes, which investors may find useful when considering integrating climate-related risks and opportunities into core processes²¹. The recommendations and guidance for investors on implementing the TCFD recommendations is also a useful framework to consider when integrating climate change into investment processes²².

EXAMPLES OF INTEGRATION IN PRACTICE

Active equity: Standard Life Investments – Valuing the impact of increasingly stringent environmental regulation <https://www.unpri.org/listed-equity/valuing-the-impact-of-increasingly-stringent-environmental-regulation/21.article>

Private equity: KKR – Green portfolio programme <https://www.unpri.org/private-equity/integrating-esg-factors-within-a-gps-organisation/92.article#KKR>

Infrastructure: Australian Super – ESG and the long-term ownership of infrastructure assets <https://www.unpri.org/infrastructure/esg-and-the-long-term-ownership-of-infrastructure-assets/129.article>

Fixed income: Royal London Asset Management – Resilience to climate change in the UK water sector <https://www.unpri.org/fixed-income/resilience-to-climate-change-in-the-uk-water-sector/67.article>

Passive equity: MSCI - Weighting vs exclusion in low-carbon indexes <https://www.unpri.org/listed-equity/weighting-vs-exclusion-in-low-carbon-indexes/172.article>

ASSESSING INTEGRATION OF EXTERNAL FUND MANAGERS

Asset owners using external managers need to assess the extent to which those managers are integrating climate change risks and opportunities into their core processes. Likewise, investment managers that are seeking to demonstrate leadership, including through launching low-carbon or climate-aligned products and services to the industry, benefit from ensuring that these issues are integrated into the core processes, across the entire organisation and product offering.

Asset owners could use the TCFD framework and recommendations to engage in dialogue with existing and potential managers to encourage actions in the following areas:

- **Intention to disclose:** Whether they support the TCFD recommendations and if they intend to report in line with the key pillars of the framework.
- **Governance:** The oversight and management arrangements of climate-related risks and opportunities, and how this has changed (or will change in the future) in light of the TCFD recommendations.
- **Strategy:** The strategy for identifying the risks and opportunities related to climate change, and how these are delineated over the short, medium and long term.

ACTIONS

- As part of the strategy disclosure, fund managers could explain the impact that it has had on product development and mandate design.
- Explain whether the impact of climate-related scenarios on future outcomes has been considered as part of the investment process, both in terms of expected risk and return and the identification of new opportunities (see “Scenario analysis” box below).
- Describe the process and outcomes from engaging with companies and other investee entities on climate-related risks and opportunities.
- Provide details of voting records on climate-related resolutions (if applicable).

²⁰ <https://www.unpri.org/investor-tools/what-is-esg-integration/3052.article>

²¹ PRI (2016), A practical guide to ESG integration for equity investing <https://www.unpri.org/listed-equity/a-practical-guide-to-esg-integration-for-equity-investing/10.article>

²² PRI (2018), An asset owner's guide to the TCFD recommendations <https://www.unpri.org/climate-change/an-asset-owners-guide-to-the-tcf-recommendations/3109.article>

- **Risk management:** The process for assessing and integrating climate-related investment risks (physical and transition) into investment decisions.

ACTIONS

- As part of risk management disclosure, managers should report on the higher risk companies that do not intend to report on climate-related risks and opportunities in line with the TCFD recommendations (to highlight the need to escalate engagement efforts).
- If scenario analysis is undertaken, disclose the process, assumptions, conclusions and actions that arose from the analysis, including the overall resilience of the portfolio to a 2°C or less scenario.
- Related to the above, describe the assessment of the companies and/or assets most at risk from transition and physical impact risks, under what climate scenario, and over what timeframe.
- Explain how these risks are being managed, monitored and mitigated.

- **Metrics and targets:** The use of climate-related metrics as part of the investment process. These metrics are important for both low-carbon or climate-aligned labelled/focused mandates, as well as for broader, unlabelled/integrated mandates.

ACTIONS

- Provide, at a minimum, GHG emissions on an annual basis, in line with the TCFD recommendations.
- Describe any additional metrics or standards that have been applied to the investment process and reporting frameworks.
- Explain the chosen methodology and rationale, including any assumptions and shortcomings.
- Describe how these metrics have affected investment decisions and internal processes (including engagement activities and valuations of investee entities).
- Disclose any climate-related goals or targets that the organisation has adopted.
- Explain how progress against these goals is being monitored and reported over time.

USEFUL RESOURCES FOR INTEGRATING CLIMATE CHANGE INTO INVESTMENT PROCESSES:

[PRI resources on ESG integration across asset classes including:](#)

- [listed equity](#)
- [fixed income](#)
- [private equity](#)
- [infrastructure](#)
- [property](#)

[PRI resources on selecting, appointing and monitoring managers](#)

[PRI resources on climate change](#)

[World Bank and GPF \(2018\) Incorporating ESG into Fixed Income Investment](#)

[FSB TCFD \(2017\) Final Report: Recommendations on Climate-related financial disclosure](#)

[IGCC, ClimateWorks and RIAA, Assessing Climate Change Risks and Opportunities for Investors: Property and Construction Sectors](#)

[QIC \(2017\) Climate Change: Building Resilience in Infrastructure Assets](#)

[OECD \(2018\) Integrating Climate-related factors in Institutional Investment](#)

[Acclimatise \(2018\) Lenders Guide for Considering Climate Risk in Infrastructure Investments](#)

SCENARIO ANALYSIS

Scenario analysis featured in the TCFD recommendations, raising a number of questions for investors about how this can be embedded into investment processes.

What is scenario analysis?

As the TCFD report noted, scenario analysis is “a process for identifying and assessing the potential implications of a range of plausible future states under conditions of uncertainty”. The TCFD noted that scenarios are not designed to deliver precise outcomes or forecasts; rather, in the case of climate change, it is a process that “allows an organisation to explore and develop an understanding of how various combinations of climate-related risks, both transition and physical risks, may affect its businesses, strategies, and financial performance over time.”

Why is this relevant for investors?

As with other investment issues, there is a high degree of uncertainty about how future climate change scenarios could play out and their likely investment impact. For those companies and assets with high exposure to the transition and physical risks of climate change, the impact on future expected earnings could be significant, depending on how the transition plays out. In aggregate, this could have a meaningful impact on financial returns at the asset and portfolio level.

Investors need to adopt a systematic approach to analyse these potential impacts, drawing on the latest evidence and future possible scenarios to support a well-informed and considered assessment, including (but not limited to) the 2°C or less outcome that governments around the world have committed to achieving via the Paris Agreement.

What do investors need to do?

Scenario analysis will already be a feature of some investors' strategy and risk management processes, particularly in regard to considering economic and political scenarios, whereas other investors may not currently use scenario analysis or stress testing as part of the investment process at all.

There are some simple and straightforward steps that investors can take to get started on the journey, including:

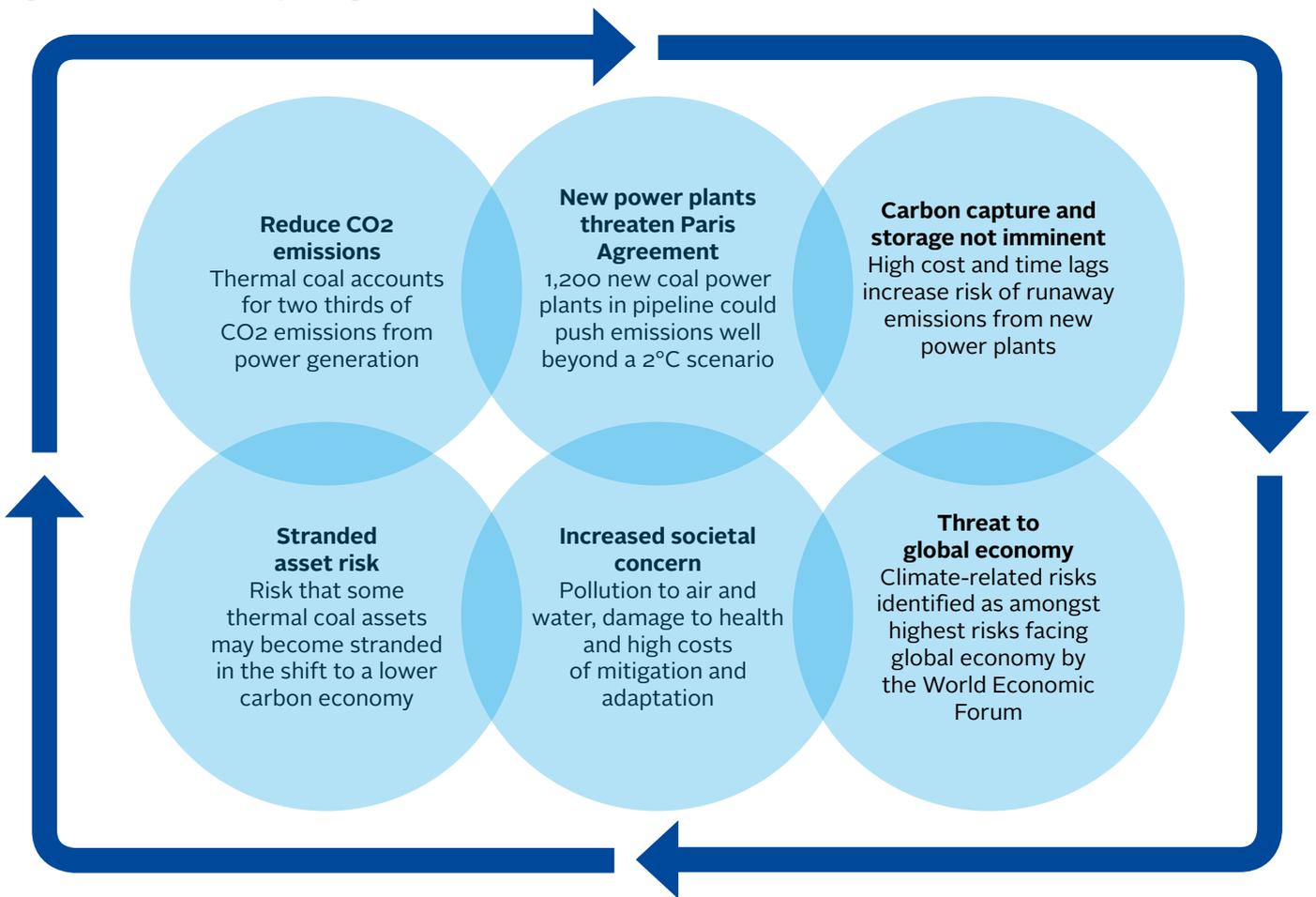
- Become familiar with the TCFD climate-related recommendations, including the technical guidance on scenario analysis.
- Keep it simple! Consider starting with a qualitative framework and build out to consider more quantitative outcomes when the knowledge, expertise and familiarity with the processes builds amongst the board and management team.
- Become familiar with the tools and research around how climate scenarios can be used in practice.
- Have a clear game-plan agreed in terms of how the scenario analysis process will be overseen (governance arrangements), and how it will feed into investment strategy and risk management processes on an ongoing basis.

Further information, examples and resources on utilising scenario analysis as part of investment processes are provided in the [PRI's An asset owner's guide to the TCFD recommendations](#).

PHASING OUT INVESTMENTS IN THERMAL COAL

While many investors may consider phasing out thermal coal²³ alongside reductions to other fossil fuel assets (such as oil sands, crude oil, natural gas and metallurgical coal), this section focuses on thermal coal assets as a starting point due to their high CO₂ content (and potential for carbon reduction), the high risk that some assets may become stranded and the relatively low weighting of the assets in global equity portfolios. Investors may, however, also use this framework for reducing exposure to a wider array of fossil fuel assets, in addition to thermal coal. Investors should also explore their role in ensuring an economic transition away from coal delivers an inclusive economy, for example, through engagement with companies on workplace and community implications. The PRI is working with the Grantham Research Institute and Initiative on Responsible Investment as well as with the International Trade Union Confederation to explore this more in depth.

Figure 15. Drivers behind phasing out investments in thermal coal



²³ Thermal coal refers to coal that is burned for heat or energy, in contrast to metallurgical coal, which is used in steel production.

STRANDED ASSET RISK

Various research reports (by [IEA](#), the [Carbon Tracker Initiative and PRI](#) and the [University of Oxford's Stranded Assets Programme](#), to name a few), have studied the risk of fossil fuel assets becoming stranded in a strong climate change mitigation scenario. These reports have produced varying estimates based on different future scenarios, some of which could have detrimental impacts on investment portfolios. As noted by [Towers Watson](#), it is in the interest of investors with a medium- to long-term investment horizon to explore the stranded assets argument in the context of their own portfolios, defining their beliefs and assessing current portfolio exposure.

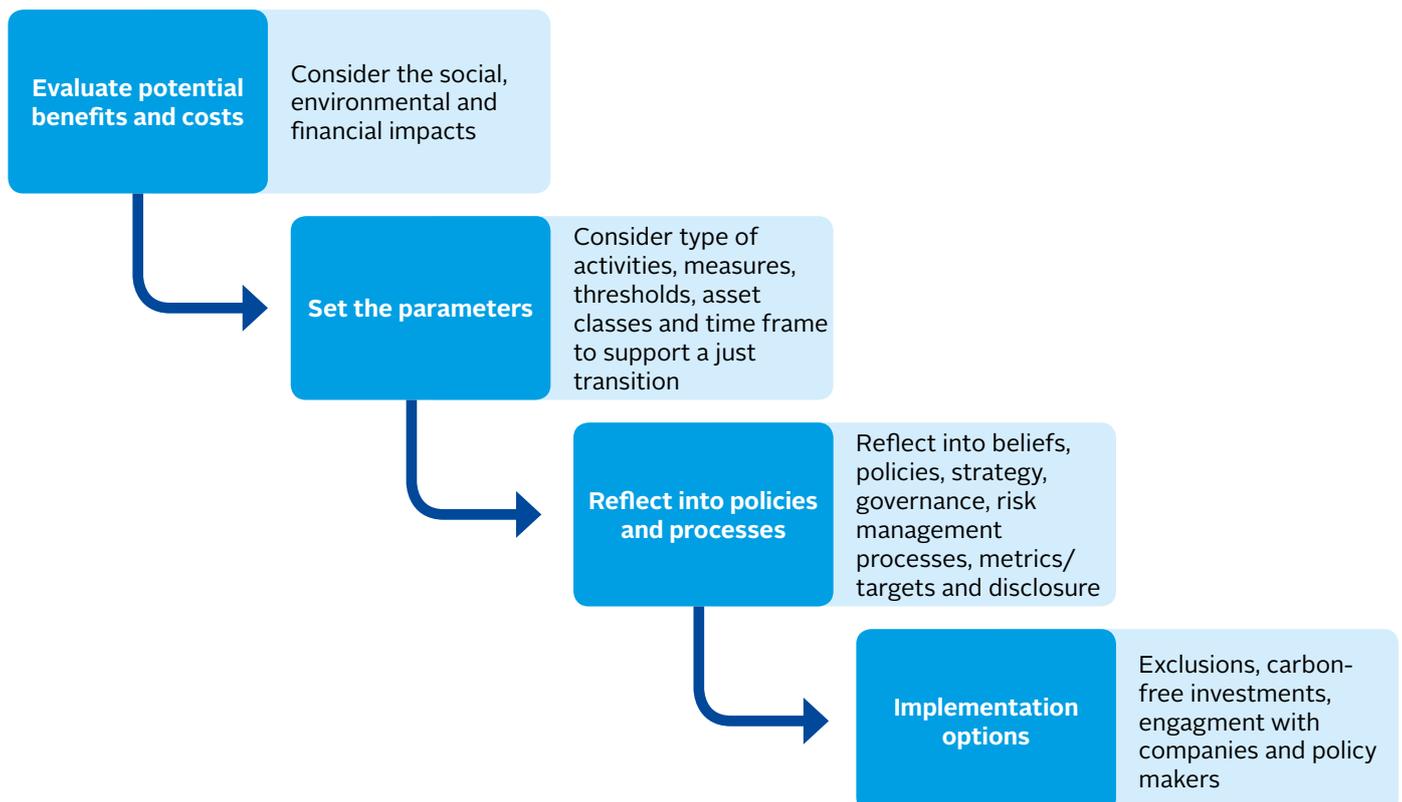
Some of the issues that investors need to take into account when considering the risk of stranded assets include:

- the extent to which climate policy and technology adjusts, placing fossil fuel assets at risk;
- consumer trends that may impact on fossil fuel demand;
- the role of geopolitics and the commensurate variation in fossil fuel asset re-pricing;
- measuring the extent to which the market has priced in these uncertainties;
- the timing of when any further asset re-pricing may occur;
- assumptions around the use of negative abatement technologies such as carbon capture and storage;
- the role and interplay of asset values with commodity price movements.

Source: Global Investor Coalition (2015) [Climate Change Investment Solutions Guide](#)

There are a number of factors that investors need to take into account as part of their fiduciary duty to beneficiaries when considering the possibility of phasing out investments in thermal coal, as outlined in Figure 16.

Figure 16. Process for phasing out investments in thermal coal



EVALUATE POTENTIAL BENEFITS AND COSTS

This list is not intended to be exhaustive but aims to provide a prompt for investors to help undertake their own assessment:

Figure 17. Potential benefits and costs of phasing out investments in thermal coal

POTENTIAL BENEFITS	
	Reinforce and mobilise climate-related investment goals and beliefs.
	Support the attainment of a 2°C or less scenario.
	Reduce the social and environmental physical impact risks.
	Reinforce investor engagement efforts with governments to support climate-related policy actions consistent with 2°C or less scenario.
	Align investment portfolios with 2°C or less scenario
	Reinforce engagement efforts with (less coal-intensive) fossil fuel companies to reduce emissions and diversify into lower carbon assets.
	Reduce portfolio emissions in absolute and relative terms.
	Mitigate portfolio risk of future coal-related assets becoming stranded.
	Better align with beneficiary and stakeholder values and preferences.
POTENTIAL COSTS	
	Reduce investment universe and potential portfolio diversification benefits (particularly where some emerging economies are still heavily investing in coal assets).
	Create/increase investment risk from selling existing coal-based holdings at depressed valuations.
	Reduce potential influence over companies to phase out and/or diversify their energy generation into lower carbon options.
	Support commercialisation of carbon capture and storage (CCS) and other carbon sequestration technologies that could sustain the ongoing existence of coal-based assets as part of the global energy mix.
	Increase implementation costs for investors in pooled funds and structures where coal-free based options may not be readily available.
	Create/increase socio-economic impacts such as job losses in communities that are heavily dependent on coal-related activities.

SET THE PARAMETERS

Setting the parameters includes considering the type of thermal coal activities to phase out, the measures and thresholds that will be used to frame the investment constraint, the asset classes and investments affected and the timeframe for implementation.²⁴ Figure 18 provides examples of how some investors have set these parameters in practice.

USEFUL RESOURCES FOR SETTING PARAMETERS AROUND COAL-RELATED INVESTMENTS:

[MSCI Research](#)

[Divest Invest Guide](#)

[Carbon Underground 200](#)

[Mercer Research](#)

[Portfolio Decarbonization Initiative](#)

[Novethic Research](#)

²⁴ MSCI (2016), Fossil Fuel Divestment: A practical introduction <https://www.msci.com/documents/10199/759575ba-929f-4d7b-b9f3-fa7cfec7e9d2> (Figure 2, page 7)

Figure 18. Examples of how parameters are being set for phasing out coal investments

Norges Bank Investment Management (on behalf of the Government Pension Fund)	<p>The criterion states that coal power companies and mining companies who themselves, or through other operations they control, base 30% or more of their activities on coal, and/or derive 30% of their revenues from coal, may be excluded from the GPFG.</p> <p><i>“In the process of considering recommendations for exclusion or observation of companies that breach the thresholds above, emphasis should also be given to the forward-looking product/fuel mix transition as well as the degree to which the company utilizes renewable energy in its activities.”</i></p>
New York City Pension Fund	<p>In response to the Fossil Fuel Divestment Act in the State Legislature related to limitations on investments of public pension funds, New York City Mayor Bill de Blasio and Comptroller Scott M. Stringer say that they will seek to divest the City's US\$189 billion pension funds from fossil fuel producers. The pension fund has begun analysing ways to divest from fossil fuel owners in a responsible way that is fully consistent with fiduciary obligations. The City's pension funds hold approx. US\$5 billion in the securities of over 190 fossil fuel companies. The City has also filed a lawsuit against the five largest investor-owned fossil fuel companies as measured by their contributions to global warming for <i>“the billions of dollars the City will spend to protect New Yorkers from the effects of climate change.”</i></p>
US Pension Funds CalPERS and CalSTRS	<p>The Californian Legislature prohibits the boards of the Public Employees' Retirement System and the State Teachers' Retirement System from making new investments or renewing existing investments of public employee retirement funds in a thermal coal company.</p> <p>A thermal coal company is defined as <i>“a publicly traded company that generates 50% or more of its revenue from the mining of thermal coal.”</i></p>
Zurich Insurance Group	<p>Zurich <i>“will divest from equity holdings in companies that derive more than half of their revenues from mining thermal coal, or utility companies that generate more than half of their energy from coal. It will not invest in new debt issued by such companies and will run off existing holdings.”</i></p>
Wespath Investment Management	<p>Wespath issued a publicly available “Climate change (thermal coal) guideline” that sets out its approach to managing the risks related to thermal coal investments, delineated by varying thresholds and activities across developed and developing countries.</p>
AXA Global Insurance and Investment Management	<p>AXA will <i>“divest €500 million from the coal industry by targeting companies which derive over 50% of their revenues from coal. Today (12th December 2017), the Group decided to increase its divestment fivefold to reach €2.4 billion, by divesting from companies which derive more than 30% of their revenues from coal, have a coal-based energy mix that exceeds 30%, actively build new coal plants, or produce more than 20 million tonnes of coal per year.”</i></p>
ING	<p><i>“By the end of 2025 ING will no longer finance clients in the utilities sector that are over 5% on coal-fired power in their energy mix – though they will continue to finance non-coal energy projects for these clients as they seek to transition away from coal. Further, and more immediately, ING will only support new clients from today onward if their reliance on coal is 10% or less and if they have a strategy to reduce their coal percentage to close to zero by 2025. ING will also phase out lending to individual coal-fired power plants by the end of 2025.”</i></p>

REFLECT INTO POLICIES AND PROCESSES

Integrating the considerations made so far into investment beliefs, policies and processes includes looking at the investment strategy, governance arrangements, risk management processes, adoption of metrics and targets and disclosure efforts. Some examples of how different investors have approached this are provided in Figure 19.

Figure 19. Examples of how investors reflect phasing out thermal coal into beliefs, policies and processes

<p>CalPERS, US Public Pension Fund</p>	<p>Response to Senate Bill 185, Public Divestiture of Thermal Coal Companies Act.</p> <p><i>“Potential consideration of divestment from coal-related assets supports Investment Belief 3 that investment decisions may reflect wider stakeholder views, provided they are consistent with its fiduciary duty to members and beneficiaries..also consistent with Investment Belief 9 in that risk is multi-faceted and not fully captured through measures such as volatility or tracking error. As a long-term investor, CalPERS must consider risk factors, for example climate change and natural resource availability, that emerge slowly over long time periods, but could have a material impact on company or portfolio returns.”</i></p>
<p>Environment Agency Pension Fund, UK</p>	<p><i>“Decarbonise the equity portfolio, reducing our exposure to “future emissions” by 90% for coal and 50% for oil and gas by 2020 compared to the exposure in our underlying benchmark as at 31 March 2015.”</i></p>
<p>Church of Sweden</p>	<p>Responsible Investment Policy and specific instructions (2017) for ethical and sustainable asset management for the national level of the Church of Sweden, including specific guidance on screening and engagement to minimise exposure to thermal coal-related companies (excludes the coal sector as well as companies with >5% of turnover from prospecting and extraction of coal). The policy specifies the need for investment managers to pay greater attention to individual equities and the risks therein, with less focus on benchmarking and tracking error risk.</p>
<p>CalSTRS, US Public Pension Fund</p>	<p><i>“Using its 21 Risk Factors, CalSTRS has a well-established policy to assess environmental, social and governance investment risks – such as climate change impacts related to coal production – in addition to a formal divestment policy. Both policies emphasize engagement first – an approach that was well received by the affected companies. In the review of CalSTRS’ portfolio of US and non-US thermal coal companies, models comparing the actual portfolio with a hypothetical coal-free portfolio, showed divestment would pose an insignificant impact on fund performance over a three-, five-, or 10-year period.”</i></p>

POSSIBLE ACTIONS FOR INVESTORS

Approaches that investors can take include negative screening, changing benchmarks, reviewing mandate design, integration into portfolio analysis and engagement with companies and policy makers.

- **Negative screening:** Remove or reduce exposure to specific thermal coal companies and assets from the investment universe based on the parameters that have been set and reflected into policies.

Asset owners: Investment policies and an exclusions list can be provided to portfolio managers of listed and unlisted assets (internally or externally managed).

Examples include [Norwegian Government Pension Fund Global](#), [CDC Group](#), [Hesta](#), [Local Government Super](#), [Storebrand](#), [KLP](#) and [AXA](#).

Investment managers: Investment policies and an exclusions list might result in the development of a new product and/or service for asset owners, or a modification of existing products.

Examples include [RobecoSAM](#), [Australian Super](#), [Mirova](#), [TIAA-CREF](#), [Calvert](#), [PAX](#), [Parnassus](#) and [Morgan Stanley](#).

- **Benchmark shift:** Shift to a fossil-free or thermal coal-restricted benchmark for listed assets.
 - For asset owners and investment managers, the benchmark underpinning existing and/or new investments could be modified to reflect a reduction in exposure to thermal coal-related companies. Examples include [MSCI](#), [S&P](#), [FTSE Russell](#) and [Thomson Reuters](#).

- **Mandate design:** Design new mandates or alter existing ones to restrict investments in thermal-based coal and to capture new opportunities related to the transition to a lower carbon economy. This might encompass a range of asset classes where thermal coal companies are present, such as listed equity, fixed income, infrastructure and private equity.

Asset owners: Review the design of investment mandates to reflect the goal of phasing out investments in thermal coal-related assets (either internally or externally managed) and replace these (where possible) with lower carbon opportunities.

Examples include [AP4](#), [FRR](#), [Vicsuper](#) and [TPT Retirement Solutions](#).

Investment managers: Work in partnership with asset owners to design and tailor investment solutions that meet their goals and investment restrictions with respect to reducing exposure to thermal coal-related assets.

Examples include [Blackrock](#), [Amundi](#), [Vanguard](#) and [TIAA-CREF](#).

- **Integration into portfolio analysis:** Reflect exposure to thermal coal-related assets into company/asset valuations, with the goal to explicitly incorporate future coal-related risks into asset values.

ACTIONS

- Consider the exposure to thermal coal-related assets as part of the due diligence process.
- Engage with investee entities about reducing their exposure to thermal coal production, distribution and consumption.
- Assess the assets in the portfolio at risk of becoming stranded in a 2°C or less scenario (as part of TCFD disclosure).
- Use various sources of information to stay abreast of developments.
- Measure and report the portfolio's exposure to thermal coal assets (as part of TCFD disclosure).
- Consider introducing targets to reduce or eliminate exposure to thermal coal assets in a manner that supports a just transition for individuals and communities.

- **Company engagement:** Engage with companies that are involved in thermal coal-related activities (non pure play), either in the production or consumption of energy, to encourage them to shift away from coal-related activities by a specified date.

For both asset owners and investment managers:

Engage with companies that pose the greatest risk in terms of exposure to thermal coal and/or that sit close to the threshold of the agreed investment parameters, both individually and in collaboration with others.

Examples include [Norges Bank Investment Management](#), [PKA](#), [Hermes](#), [Aviva](#), as well as collaborative efforts such as the [Climate Action 100+ Initiative](#).

- **Policy maker engagement:** Engage with policy makers to encourage them to implement measures (and reinforce existing efforts) that encourage a shift away from thermal coal-related assets.

For both asset owners and investment managers:

Engage with policy makers individually on a case-by-case basis as well as collaborating with other investors at the domestic and global level.

Examples at the international level include the [Global Investor Statement on Climate Change](#), engagement with G20 leaders on climate change, supporting the Financial Stability Board (FSB) [Taskforce on Climate-related Financial Disclosures recommendations](#) supporting the [Fossil Fuel Subsidy Reform Communique](#), and supporting the growing efforts amongst governments to justly phase out coal through the [Powering Past Coal Alliance](#), to name a few.

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DESIGN

Court Three

The Principles for Responsible Investment (PRI)

The PRI works with its international network of signatories to put the six Principles for Responsible Investment into practice. Its goals are to understand the investment implications of environmental, social and governance (ESG) issues and to support signatories in integrating these issues into investment and ownership decisions. The PRI acts in the long-term interests of its signatories, of the financial markets and economies in which they operate and ultimately of the environment and society as a whole.

The six Principles for Responsible Investment are a voluntary and aspirational set of investment principles that offer a menu of possible actions for incorporating ESG issues into investment practice. The Principles were developed by investors, for investors. In implementing them, signatories contribute to developing a more sustainable global financial system.

More information: www.unpri.org



The PRI is an investor initiative in partnership with **UNEP Finance Initiative** and the **UN Global Compact**.

United Nations Environment Programme Finance Initiative (UNEP FI)

UNEP FI is a unique partnership between the United Nations Environment Programme (UNEP) and the global financial sector. UNEP FI works closely with over 200 financial institutions that are signatories to the UNEP FI Statement on Sustainable Development, and a range of partner organisations, to develop and promote linkages between sustainability and financial performance. Through peer-to-peer networks, research and training, UNEP FI carries out its mission to identify, promote, and realise the adoption of best environmental and sustainability practice at all levels of financial institution operations.

More information: www.unepfi.org



United Nations Global Compact

The United Nations Global Compact is a call to companies everywhere to align their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption, and to take action in support of UN goals and issues embodied in the Sustainable Development Goals. The UN Global Compact is a leadership platform for the development, implementation and disclosure of responsible corporate practices. Launched in 2000, it is the largest corporate sustainability initiative in the world, with more than 8,800 companies and 4,000 non-business signatories based in over 160 countries, and more than 80 Local Networks.

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