Decarbonising index strategies – an overview

Index strategies can target well-defined decarbonisation pathways that may help to avoid climate risks. We explain the how, why and when.

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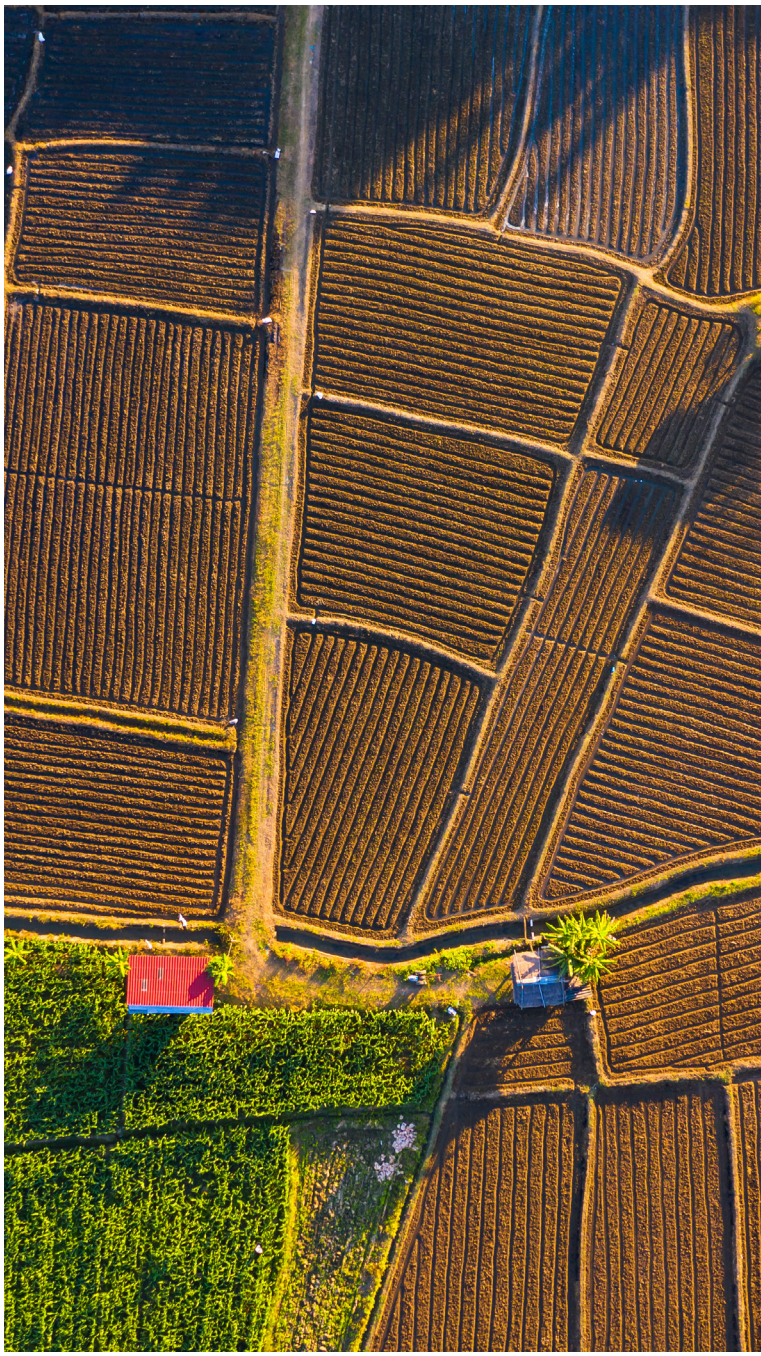


Faced with the potentially catastrophic risks posed by climate change, more and more investors worldwide are integrating climate considerations into their portfolios, with many seeking alignment to a net-zero trajectory.[1]

Reaching net-zero emissions by 2050 is considered the safest way to limit global temperature rises to 1.5°C above pre-industrial levels, avoiding some of the worst impacts of climate change.[2] As a result, many investors are looking to reduce the carbon exposure (scope 1, 2 and scope 3) within their index strategies and align with scenarios that may avert severe climate impacts. This process requires a decarbonisation pathway that could align to a 1.5°C scenario, which is central to our discussion.

It is important to note that a market capitalisation-weighted index is not reflective of the global or even regional emissions stack. The agricultural and residential property sectors are significantly underrepresented, while technology and financials are overrepresented and, in most indices today, negative-emissions technologies are not represented at all.

That is why the decarbonisation of investment strategies is one of many components that, in our view, will likely prove essential to the transition to a net-zero economy in decades to come. In this paper, we explain how active indexation could make a genuine difference to portfolios in this context.

1. For discussion on net zero and what it means to investors see "Net zero: A practical guide for investors" by Nick Stansbury
2. Intergovernmental Panel on Climate Change: Special Report on Global Warming of 1.5°C (2018)

LGIM

1. The link between defining net zero and decarbonising indices

Human activity emits a net flux of approximately 50 billion tonnes per year of greenhouse gases (GHG) measured in carbon dioxide equivalents (CO_2e) into the atmosphere.[3] One common definition of net zero describes a state of the global economy, whereby the 50 gigatonnes (GT) emitted per year is cut to zero GT emitted per year. Each incremental unit of GHG emissions is then balanced by a unit of removal, via nature-based carbon dioxide removal or negative emissions technology (e.g. direct air carbon capture and storage).[4]

Enormous reduction of GHG emissions is essential in all net-zero scenarios since carbon removals are capacity-constrained, not always additional, and not always permanent.[5] Each sector has its own specific emissions sources and technology solutions for decarbonisation, and within any one sector exist many viable pathways to net zero.

To construct net-zero aligned indices in a world where technology pathways are still unknown, we must rely on general truths, across all net-zero pathways. From these we can generate a small set of key performance indicators, which can then be used to check that decarbonisation is occurring at a rate that ensures index strategies are consistent with a transition to a net-zero world.

In our view, there are five key actions necessary to establish net-zero ambitions for portfolios:[6]

i. **Setting targets – net-zero GHGs by 2050**, subject to carbon intensity reduction targets of 50% from 2019 baseline or temperature alignment of 1.5°C by 2030. Generally, we refer to the intensity calculations based on Enterprise Value Including Cash (EVIC)

ii. **Adopting a decarbonisation mechanism** to improve a portfolio's alignment over time to make progress towards the 1.5°C trajectory

iii. **Engaging with investee companies** and policymakers on climate initiatives and outcomes.[7] This could ensure, for example, that companies included in an index strategy have science-based targets or have engaged on their net-zero activity

iv. **Excluding misaligned companies that are not making sufficient progress.** At LGIM, for example, we currently exclude companies involved in new thermal coal and new oil sands projects

v. **Growing 'green' opportunities** by increasing a portfolio's allocation to low-carbon investments where possible[8]

In the next sections we will discuss the various components of the index decarbonisation process, such as exclusion and forward-looking, net-zero pathways, as well as the practical application of the process.

3. OurWorldInData.org
4. One gigatonne or metric gigaton (unit of mass) is equal to one billion metric tons
5. Task Force on Scaling Voluntary Carbon Markets
6. See Reaching net zero: LGIM's approach.
7. For example, LGIM's longstanding engagement programme, the Climate Impact Pledge, targets companies associated with about 60% of GHG from listed businesses. See Expanding our Climate Impact Pledge.
8. Consideration of green investments or revenues (depending on data coverage) can be integrated into a climate index solution as a part of the transition to low carbon economy. In some regions and indices the application of green revenues may be limited due to lack of data.

2. The role of exclusions

Historically, the exclusion approach, also known as 'negative screening', has been used to avoid specific stocks or industries in an index. The most prominent exclusions have tended to be tobacco, alcohol, gambling, fossil fuels, and controversial weapons.

Some of these exclusions have been related to normative or ethical principles and go beyond purely carbon-related considerations. In addition, climate exclusions may come with elements of ethical and norms-based exclusions, such as the violation of international conventions; e.g. the United Nations Global Compact (UNGC). Different exclusions can resonate with different types of investors, and across different regions.

The exclusions approach is transparent, clearly defined and can offer peace of mind if an investor's objective is simply to remove exposure to specific securities and sectors. A role may exist for exclusions in a net-zero approach, for example, to remove companies that are highly misaligned and have little likelihood of being willing or able to transition. On the other hand, aggressive exclusions can alter the profile of the portfolio quite significantly. As the level of exclusions increases, the adjusted index tends to stray from its parent benchmark, deviating from delivering a market-like, risk-return profile. This can result in the index incurring unintended active risk as compared to its benchmark.

An exclusionary approach on its own is potentially problematic as it may not address real-world decarbonisation requirements and may remove the possibility of the asset owner engaging with companies to change their behaviour.[9]

In general, at LGIM we apply minimum exclusion standards, such as thermal coal and other norms-based criteria, within certain funds (see our coal policy). Some strategies require a greater level of exclusions, depending on specific client objectives and expected outcomes.

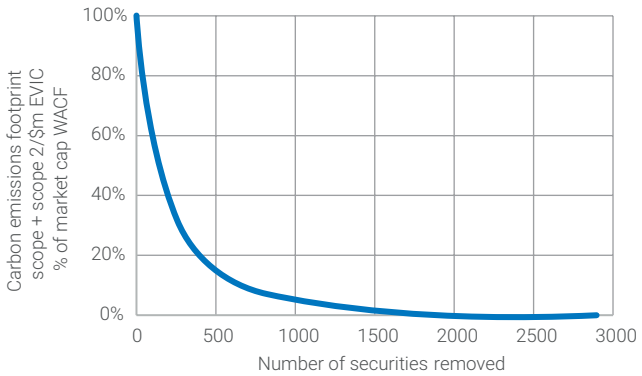
3. Global market capitalisation indices and carbon emissions

Global market capitalisation indices may offer two observations. First, a stock can have a high carbon intensity and contribute a sizable amount of carbon to the portfolio. Second, the stock may have a low intensity but if it is highly weighted in the benchmark, it can still contribute heavily to the overall emissions. For example, Figure 1 shows that by removing 30 securities (out of 2827) from an index, it is possible to achieve a 37% emissions reduction from the Q1 2022 total emissions intensity level, and a 50% emissions reduction from the base year (2019) portfolio levels. This reduction can be achieved, typically, with a tracking error of less than 0.50% for a globally diversified strategy.

We also know that sectors and geographies matter in global indices and can contribute to different investment and environmental outcomes. Figure 2 shows that carbon intensity is higher in emerging markets compared to developed regions.

There is asymmetry between the security exposure and carbon intensity contribution in different sectors and geographies. For example, removing the energy, materials and utilities sectors alone would remove a large part of the emissions intensity in the index strategies.

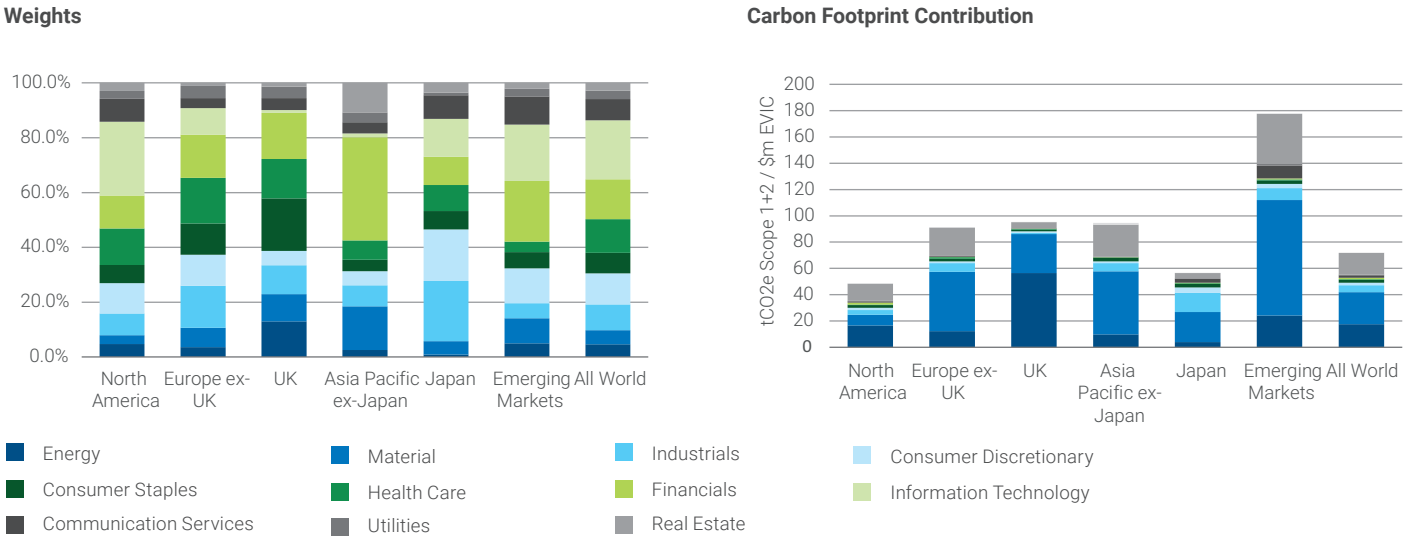
Figure 1. Carbon intensity reduction and number of securities in MSCI ACWI



Source: LGIM, ISS, Refinitiv, MSCI, Solactive as at 29 April 2022.

9. It is worth noting that in many jurisdictions utilities operate as regulated monopolies. This is an extreme example of a company that will continue to operate throughout the transition regardless of cost of equity capital, and where an engagement model could have more real-world impact.

Figure 2. Sector and geographical allocation of emissions intensity



EU Benchmarking on Climate Transition and Exclusions

The European Union has defined standards for benchmark indices linked to the Paris Agreement, often referred to as the EU Climate-Transition Benchmarks (CTB) and the EU Paris-aligned Benchmarks (PAB).[10] The purpose of these benchmark rules is to provide clarity to investors and combat "greenwashing" as the number of sustainability-related products being developed for investors grows substantially.

These European standards define a decarbonisation process aligned to 1.5°C and 2050 net-zero goals. The PAB goes further in including exclusions that limit the percentage of revenue a company can generate from various fossil fuel activities (See Table 1).

The rationale for the revenue threshold in the EU PAB guidelines is that the share of fossil fuels in energy supply is required to decrease in the Intergovernmental Panel on Climate Change's (IPCC) 1.5°C scenario. Among the fossil fuels, different energy sources can be classified depending on their contribution to global warming and their ability to be used in a transitioning phase. For example, reliance on coal, oil and gas should abate dramatically between 2020 and 2050.[11]

10. This is also known as the EU Low Carbon Benchmarks Regulation (EU BMR).
11. Intergovernmental Panel on Climate Change: Climate Change 2022 Impacts, Adaption and Vulnerability

Table 1. EU climate transition exclusions

Exclusions	EU CTB	EU PAB
Norm-based exclusion (e.g. UNGC)	x	x
Controversial Weapons	x	x
Significant harming enviornmental objectives	x	x
Tobacco	x	x
Coal exploration, mining, extraction, distribution or refining		Maximum 1% of revenues from these activities
Oil fuel exploration, mining, extraction, distribution or refining		Maximum 10% of revenues from these activities
Gas exploration, mining, extraction, distribution or refining		Maximum 50% of revenues from these activities
Electrictity generation with GHG more than 100g CO2/kWh		Maximum 50% of revenues from these activities

In a typical, developed market benchmark (market-cap weighted) the PAB exclusions could amount to about 15-20% of the total index weights, where many of the exclusions come from fossil fuel activity.

The CTB and PAB decarbonise by between 30-50% outright relative to a representative benchmark, followed by a year-on-year reduction of carbon intensity. These types of scenarios are aligned to a 1.5°C and 2050 net-zero trajectory.

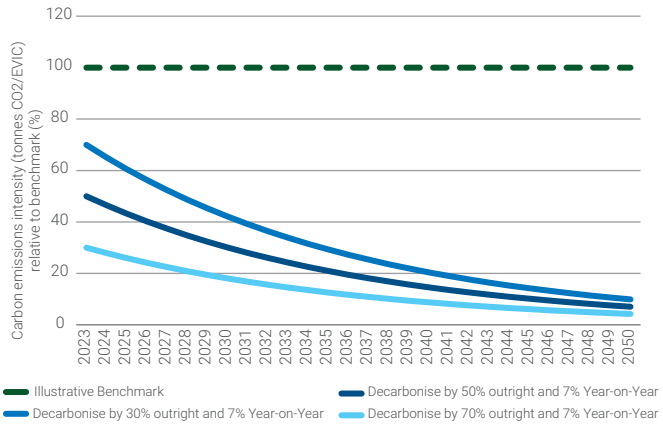
4. The decarbonisation trajectory of index strategies

Net zero is an end state of the energy transition. The temperature outcome associated with this final state is a function of the cumulative emissions on the pathway taken to get there.

A common decarbonisation pathway (based on IPCC and PAB guidelines) for index strategies is to reduce carbon emissions intensity by a fixed percentage relative to a parent benchmark and then continue to decarbonise the portfolio by additional percentage points year-on-year. Index fund investors may select different levels of decarbonisation objectives to embark on a net-zero pathway (see Figure 3). Either the outright decarbonisation relative to a benchmark or the annual decarbonisation targets, or a combination of these, are closely linked to net-zero objectives. It is a question as to whether the decarbonisation is sufficient and meets the carbon-reduction target when employing these strategies.

We reflect the net-zero targets by decarbonising index portfolios by 50% carbon intensity reduction by 2030, and combining it with a carbon reduction trajectory of 7% year-on-year by 2050. Figure 3 illustrates various decarbonisation trajectories that cater for outright decarbonisation rates relative to a market benchmark. Depending on the starting decarbonisation rate, the integration of the yearly carbon-reduction mechanism should bring convergence between the different portfolios by 2050.

Figure 3. Decarbonisation / net-zero pathways



Note: For illustrative purposes only. The illustrated baseline assumes no changes to the level of carbon emissions in aggregate. Assumptions, opinions and estimates are provided for illustrative purposes only. There is no guarantee that any forecasts made will come to pass. The future emissions intensity of the underlying benchmark is unknown (dashed line).

Moreover, there is no universal application of the IPCC's 1.5°C trajectory to achieve net zero. Hence, we may see variations of the initial decarbonisation levels applied in aggregate to indices. The concept of 7% annual emissions intensity reduction in an index is based on the EU's Technical Expert Group on Climate Transition Benchmark and is consistent with the IPCC's 1.5°C trajectory.[12] The decarbonisation rate is similar to that mentioned in the United Nations' Emissions Gap report,[13] which advocates for countries to reduce their GHG by

12. For example, the UN Intergovernmental Panel on Climate Change (IPCC) 1.5°C scenario is modelled as "no or limited overshoot" of carbon emission. AR6 Climate Change 2021: The Physical Science Basis — IPCC. Although, index strategies of listed companies do not fully reflect the world's total emissions since a large share of global emissions are often from governments, individuals, and private companies.
13. Rogelj,J.; den Elzen, M., Huppmann, D. & Luderer, G. (2019) 'The emissions gap'. In: Emissions Gap Report 2019 [Chapter 3]. Nairobi: United Nations Environmental Program.

7.6% per annum. So, for an index to adhere to Paris agreement goals, we believe an index portfolio needs to match these decarbonisation rates, both in outright and annual reductions.

In practice, the future emissions intensity of the underlying benchmark is unknown. Hence, the future required decarbonisation relative to the underlying benchmark is also unknown, since we do not know how much a parent benchmark may decarbonise in the years ahead. However, these uncertainties around the benchmark can be addressed by ensuring that the total emissions are reduced at the inception of the strategy between a base year and the 2030 and 2050 targets. For example, an index with a base year from December 2019, would need to decarbonise at least by 50% by 2030, then decarbonise 7% year-on-year relative to itself.

Decarbonisation at inception requires the reweighting of positions based on company carbon intensity data in the base year. Carbon intensity is volatile for each issuer and economic conditions or random variations can skew the comparison between companies. The occurrence of estimates in the carbon data set can have the same effect. However, it is still a valid exercise.

By targeting decarbonisation at inception, the weights of high-carbon issuers in the strategy are reduced, giving investors confidence that the 7% decarbonisation thereafter is not just an optical exercise but is actually driven by companies in the portfolio decarbonising at the required rate. A synthetic decarbonisation pathway can be achieved by selling small amounts of the most carbon-intense issuers (which can have carbon intensity that exceeds the average level in an index) each year. Our preference is to exclude these companies on day one and track a real decarbonisation trend, rather than create a synthetic one through trading.

An alternative approach involves a dynamic target where the total portfolio decarbonisation depends on the projections of the carbon intensity of individual index constituents or temperature alignment at portfolio level.

Temperature alignment is a metric that projects forward carbon emissions intensity of companies, based on trends and forward-looking targets. This is then compared to temperature-aligned benchmarks for each sector.

The goal in either approach is to reallocate and adjust the exposure from high-carbon intensive to low-carbon intensive stocks subject to various investment constraints such as tracking error, security, or sector deviations from the parent benchmark. As a result, a decarbonised index may have different constituents and/or a different number of holdings than the parent benchmark.

5. Integrating decarbonisation into indices strategies

A large part of climate transition risk tends to be attributed to companies where carbon intensity is greatest, in sectors like industrials, mining, energy and utilities (see Figure 2). In most cases, investors are seeking to decarbonise to a certain carbon intensity reduction target without altering their risk-return profile or compromising their desired financial outcomes.

To align an index strategy to the required pathway the portfolio can exclude securities from a reference benchmark or apply a rules-based reallocation of capital from high emitters to low emitters to embark on a 1.5°C trajectory as described earlier.

However, the decarbonisation steps can introduce over- or under-representation of the exposure to a security, sector or region in the climate-friendly index. As such, the index construction process needs to address these issues by introducing security, sector and regional constraints to maintain the desired tracking error to the parent benchmark.

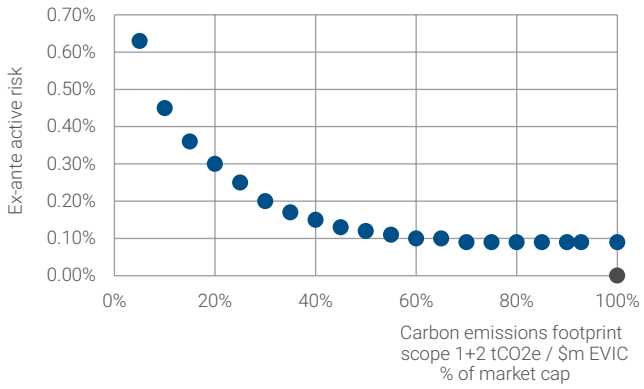
A further consideration when it comes to exclusion is the need to maintain some degree of exposure to sectors that could be part of the climate transition.[14] This mean that sectors such as forestry, agriculture, transportation and even energy cannot be excluded indiscriminately. Some index strategies maintain these sectors' relative weight to their parent benchmark. This is typically applied as an equity exposure constraint in the investment strategy to retain exposure, thereby influencing the sector that will be an integral part of the climate transition.

In some regions, investors have different representations of these sectors in their indices that better represent their long-term climate strategy. For example, some approaches may allow for an underweight allocation to a sector such as energy to reflect their policies in indices, while aiming to reward sectors and companies that are decarbonising more successfully with capital allocation. Some investors in various regions outside the EU define their own thresholds and minimum exclusions.

We provide below an example of the first approach to create a holistic index solution for transitioning to a 1.5°C environment, aimed at reducing potential climate risks. The starting stock universe is based on market capitalisation for developed and emerging markets. We will simply illustrate the tracking error implications for various degrees of decarbonisation rates subject to a range of investment constraints.

Figure 4 shows that it could be possible to decarbonise a global index with a low tracking error. While a 50% carbon intensity reduction can be achieved with about 15 basis points of tracking error, the tracking error tends to increase sharply as the decarbonisation increases beyond 50%.

Figure 4. Decarbonisation rates versus tracking error



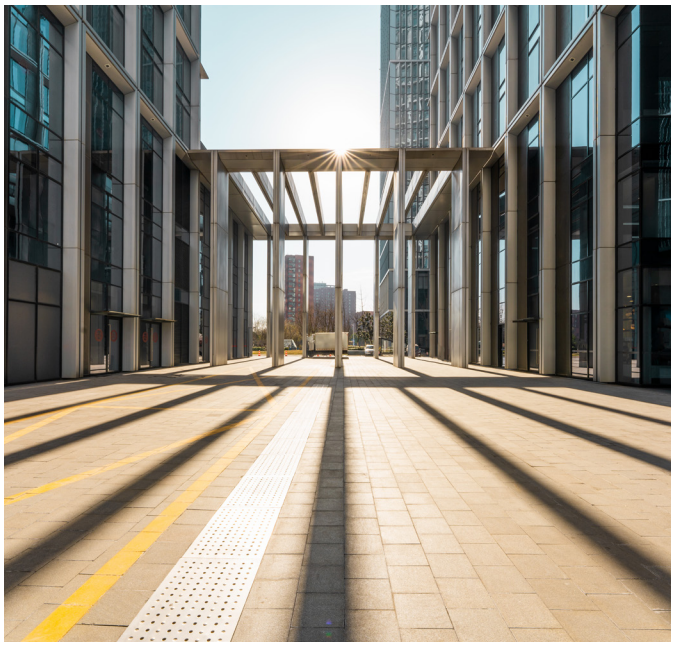
Notes: Constraints on security +/-3%, sector +/- 3% and regional neutral. Minimal exclusions applied: thermal coal, UNGC violators, which represent 1.2% of the total weight of a global market universe (developed and emerging markets). Calculations based on: Quontigo portfolio holdings and risk model as at 29/04/2022. Broad market capitalisation global equity Index is based on MSCI ACWI, Solactive. Data source: LGIM, Solactive, MSCI, ISS, Refinitiv. Carbon footprint measured as tCO2e scope 1 + scope 2 /$m EVIC.

The results may vary for specific regions and more concentrated indices. Furthermore, the construction of the example aims to mimic the market risk and return profile by applying various security, sector and geographical constraints.

While, this example provides an illustration of carbon reduction approach, some investors prefer to include social and governance elements to the portfolio along the environmental objectives. This will typically involve integrating environmental, social and governance (ESG) scores into the index construction process (for more, see our paper). Investors can target improvement on green revenues, social and governance attributes in an index strategy. However, additional ESG factor integrations in the index example above could increase the tracking error. The increase will depend on the level of the impact on the overall ESG scores or specific metrics.

A long-term reallocation of capital

The decarbonisation process of index portfolios could involve a combination of minimum exclusion standards and reallocation of capital between winners and laggards. We expect to see continued demand from investors seeking to align portfolios with a net-zero pathway, who recognise the potential financial and climate risks in different regions. We also expect to see increasing investor attention to climate themes such as biodiversity as well as social and governance factors, all of which will complement a net-zero index strategy.



14. The EU guidelines for carbon transition benchmarks outline nine climate high impact sectors, typically applied in Paris-aligned benchmarks. These sectors are categorised using NACE Sectors: (1) Agriculture, forestry, and fishing; (2) Mining and quarrying; (3) Manufacturing; (4) Electricity, gas, steam, and air conditioning supply; (5) Water supply; sewerage, waste management, and remediation activities; (6) Construction; (7) Wholesale and retail trade, repair of motor vehicles and motorcycles; (8) Transportation and storage; and (9) Real estate activities.

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Key risks

Past performance is not a guide to the future. The value of an investment and any income taken from it is not guaranteed and can go down as well as up, you may not get back the amount you originally invested.

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