PERSPECTIVES

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ESG investment performance: drivers and management

Contents

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01

Relative performance

Discussions around the past and possible future performance of ESG (environmental, social and governance) investment may involve comparisons with traditional (i.e. non-ESG) investment performance.

This report outlines possible ways such comparisons can be made, the inherent limits in such comparisons and the lessons that can be learned for portfolio management.

ESG investment can be done in **multiple ways**. It can involve different objectives across environmental, social and governance components. Investment can be made across multiple asset classes, both liquid and illiquid. It can be done at a project-focused level, through active selection of individual assets, or at a more passive level with portfolios via ESG-directed funds. In short, there is **no single definition** of what ESG investment is and, therefore, ESG investment performance.

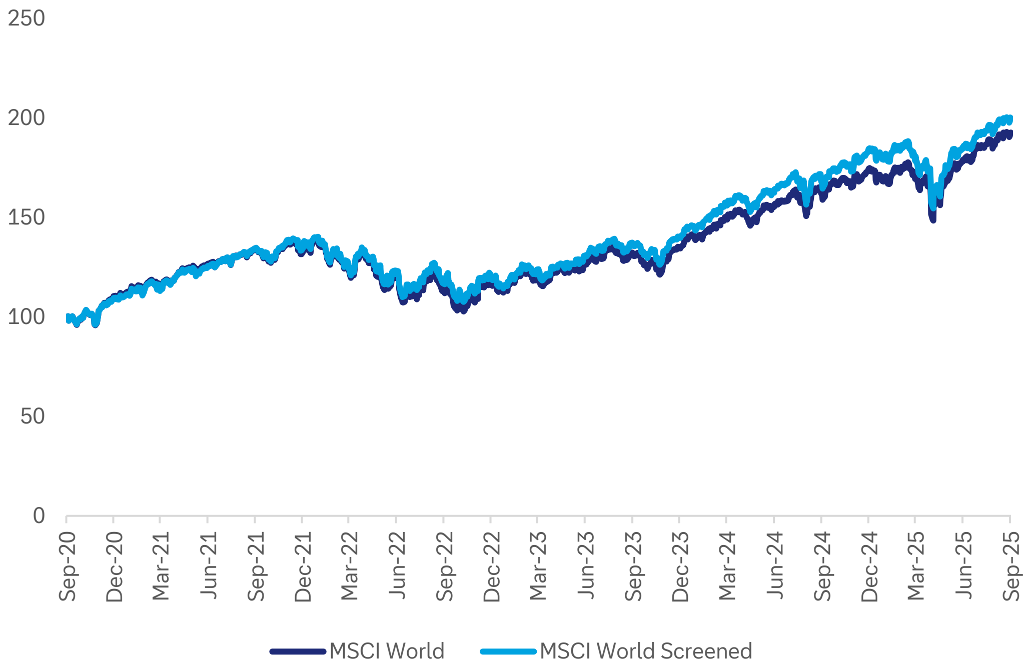
The availability of frequently updated and clearly defined equities-based ESG indices means, nonetheless, that they are often used as a **proxy** for overall ESG investment performance.

There are many such indices but their composition is unlikely to be exactly in line with an investor's actual ESG portfolio composition or portfolio goals. As we will discuss further below, **definitional issues** are also very important when comparing the investment performance of such indices with other non-ESG equivalents (see box below).

However, comparison of a frequently-used global aggregate ESG index, the MSCI World Screened with the overall MSCI World index can used as a starting point for understanding relative performance drivers.

Figure 1 shows that the MSCI World Screened has shown broadly similar performance as the MSCI World over the last five years, but with periods of divergence. (As with all performance comparisons, the indices and time frames used will affect the result.)

Figure 1: MSCI World vs. MSCI World Screened over the last five years (total return in USD)

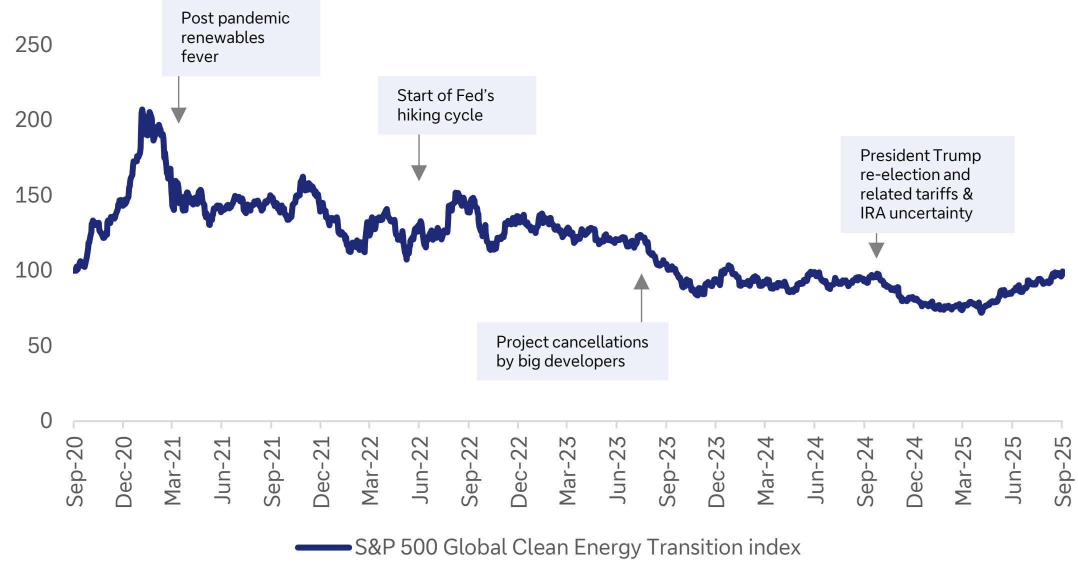


Source: Refinitiv, Deutsche Bank AG. Data as of September 8, 2025.

Digging deeper – at both a **sectoral** and **regional level** – helps identify some specific reasons for such divergence, relevant also for other investment performance comparisons.

Consider, for example, the investment performance of the **clean energy sector** over the last five years. Figure 2 illustrates using the S&P Global Clean Energy Transition index. (This is constructed by identifying companies involved in clean energy business and applying various screening methods to reduce their number to a target 100).

Figure 2: S&P Global Clean Energy Transition index performance (total return in USD): contributory factors



Source: Refinitiv, Deutsche Bank AG. Data as of September 9, 2025.

As the chart shows, the five-year period opened with clean-energy equities recovering sharply from their lows at the start of the COVID pandemic (which raised concerns about future overall **energy** demand). The start of the Russia/Ukraine war in February 2022 then boosted **oil and gas** prices with clean energy stocks also benefiting to some extent from energy supply concerns. The start of the US Federal Reserve **rate hiking cycle** in March 2022 increased the financial pressures on the many green energy projects posited on future revenue assumptions, which had then to be discounted more heavily for current accounting calculations. This, and industry stresses, contributed to the **cancellation of clean energy projects** in mid-2023, pushing clean energy stock prices down further.

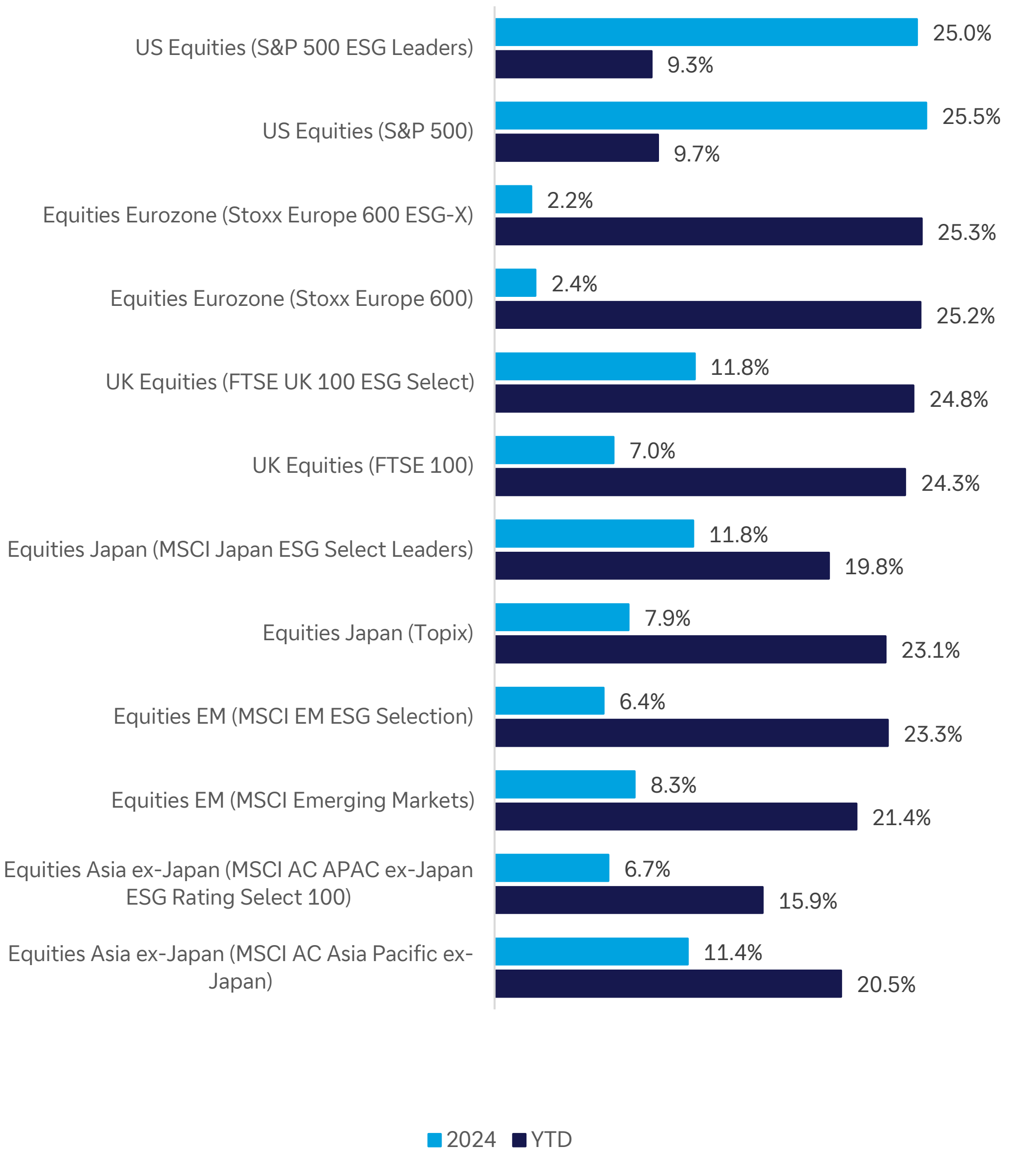
The re-election of US President Trump and **uncertainty over future policy support** for clean energy added to downward pressure in late 2024 and early 2025. In recent months, however, news that some policy support would not be fully removed in 2030 has helped support a general recovery in global clean energy stocks (but with individual stock falls as major projects were reassessed). Investment performance will also will have been impacted by other less date-specific factors such as the rising importance of China in solar and offshore wind equipment production.

What lessons can we learn from this? An obvious one is that **government policy** remains important for many sustainable sectors: if it changes, investment performance can suffer, at least in the short term. But a more subtle lesson is that many of the factors that impact the performance of an individual ESG investment may not be directly linked to it being an ESG investment. As the chart shows, over the last five years clean energy investment has be affected **geopolitical events** (Ukraine), **macroeconomic trends** (higher interest rates), **corporate/sectoral structural change** (technological shifts, rising Chinese competition and industrial consolidation).

These factors affect non-ESG investment too: the key questions for investors are whether ESG investments will be disproportionately affected such factors and over what time frame.

A detailed assessment is also useful when making comparisons of **regional level** ESG vs. non ESG indices. Figure 3 below focuses on 2024 and 2025 YTD performance in USD terms. As with the global comparison, which suggests broadly similar performance but with some more obvious variations due to region-specific factors. US ESG performance, for example, was helped in 2024 by the large weighting of AAA ESG-rated mega cap stocks but this has hindered it so far in 2025. The European ESG index's underweight in aerospace and defence has proved a drag on performance in 2025 (we return to the defence issue below).

Figure 3: Regional ESG vs. non-ESG performance in 2024 and YTD 2025
(USD terms)



Source: Bloomberg Finance LP, Deutsche Bank AG. Data as of September 8, 2025.

Index comparisons: the devil is in the detail

The relative performance of ESG vs. non-ESG indices will be affected by these indices' composition. ESG indices, for example, tend to **overweight large and mega-cap companies** as these are more highly ESG-rated. Note also that **European firms tend to receive higher ESG ratings** than those in other regions. As of April 1, 2025, 88% of European companies were rated at "A" or above (according to MSCI ratings), compared to 70% of US companies and only 37% of Asian companies.

Other **index selection issues** include whether or not the share of any individual equity in an index is **capped** (i.e. limited to a stated upper level), something that has been particularly important in 2025 due to higher market **concentration** (the extent to which a small number of stocks dominate a market). There is still also a **notable divergence in ESG ratings** between rating providers: despite some convergence in recent years, correlation is lower than, for example, ratings from credit rating firms.

Both **ESG and non-ESG indices also change over time** and this has an impact on both long and shorter-term investment performance comparisons. The US **S&P 500**, for example, has changed over the decades from being an industrials-dominated index to being at one stage energy-driven and is now lead by technology companies. The composition of these indices may well not reflect the existing structure of the underlying national economies: stock prices and thus sectoral market capitalisation may be driven largely by expectations about future developments. Tech firms' current dominance of the S&P 500 provides a good example of this: the tech sector is expected to grow further in importance, but is not as dominant yet in the existing "real" US economy as its stock valuations would suggest.

Index change is an ongoing and natural process and investors should expect continued change in ESG investment indices too. These indices may, for example, take a less benign view on technology companies given the environmental, social and governance implications of **artificial intelligence**.

02

Portfolio management

As noted at the start of this report, sustainable investment can be done in many different ways, across a broad spectrum from public financial markets to project-specific direct investment. We focus here on the performance of portfolio-level sustainable strategies largely implemented through public markets.

Ultimately, the financial performance of an ESG-driven investment portfolio depends – just like a traditional non-ESG portfolio – on individual **asset selection, strategic asset allocation (SAA)** and **risk management**. An ESG portfolio also has to comply with ongoing self-imposed environmental, social or governance constraints – and may also be judged in terms of how well it meets these stated **non-financial long-term objectives** (for example on decarbonisation).

Asset selection. New data and methodologies have allowed detailed assessment of individual investments on the basis of a range of ESG-related criteria. These make it possible for investors to take a **selective** approach within sectors or asset classes, investing in firms or other assets that are seen as **best in class** within individual sectors. This selective approach may in some cases also extend to encouraging investment in firms in problematic sectors (e.g. mining) if they are seen as sector leaders in leading the **transition** to more sustainable operating models.

However, most ESG portfolios will also still involve explicit or implicit **portfolio exclusions** of certain industries or sectors on the basis of investor wishes. Common such exclusions include nuclear, hydrocarbons or defence stocks. ESG indices (and funds) may reflect these exclusions: see, for example, the composition of the MSCI World Screened index referred to above. Investors may also want specific **inclusions** of individual stocks or activities in a portfolio.

Getting the mix right between these two asset selection approaches – ratings-based and exclusion/inclusion – will be important to meet the interests and requirements of investors. These may well vary between countries (consider for example different national consensus views about nuclear power) or for reasons of religious belief. Selection factors, and the appropriate combination of approaches, are also likely to change over time.

One long-standing concern is that exclusions, by restricting the available i**nvestment universe**, will have a negative impact on performance through excluding individual higher-performing investments from portfolios. Generally, at an individual corporate investment level, this does not seem to have a major impact on portfolios. But the **sectoral exclusions** (rather than individual firms) can certainly result in overall performance divergence from the overall market. In 2022, for example, a rise in hydrocarbons prices at the start of the Russia/Ukraine war resulted in underperformance of ESG portfolios that excluded **hydrocarbons** investments. More recently, gains in European **defence** stocks, in anticipation of further rises in European defence spending, have hurt the relative performance of ESG portfolios that exclude defence spending.

From a longer-term portfolio perspective, however, the question is really how quickly and fully this divergence in portfolio performance is likely to be **reversed**. ESG strategies that excluded hydrocarbons investment in fact recovered quite quickly after the Russian invasion of Ukraine: the initial rises in hydrocarbons stocks (on expectations of energy supply shortages leading to prolonged high energy prices and thus high profits for these firms) were fairly soon reversed, reducing the disadvantage for portfolios excluding them.

The rise in defence spending across Europe, and thus in European defence stocks, could however prove to be a **longer-lived trend** (given the long-term nature of much defence spending). If this is so, it will have implications for the performance of ESG European equities strategies. This has prompted a discussion about the extent to which **defence should or should not be included in ESG funds and other investment**. Attitudes to the exclusion of defence from ESG investment appear to be changing as a result: Morningstar reckons that 43% of European ESG equities funds now have some aerospace and defence (A&D) exposure, not that far short of the 56% share they calculate for non-ESG funds.

This is a reminder that while our planet faces hard physical environmental limits (with scientific agreement on many of these limits, for example future carbon emissions), ultimately ESG is a **social construct**, influenced by the prevailing social consensus on what is acceptable or desirable in addressing environmental or social concerns, a consensus which will in turn will influence individual investors' beliefs and investment preferences. Different views can coexist within ESG and it may be advisable from an investment perspective to avoid a simple **"black and white"** approach to what is or is not acceptable within a portfolio: the important thing is to use ESG as a way to better understand financial assets and how they can interact with portfolio objectives in future.

ESG scoring (see above) cannot on its own capture the **specific investment opportunities** that "real world" transition is creating both within sectors (e.g. energy transition) and also via new investment vehicles (e.g. nature credits). However, our view is still that such ESG data provides an **extra level of information** that can help investors (individual or institutional) to assess which firms are likely to be best able to manoeuvre through the **sustainability transition**. Our own **client surveys** also to suggest that most investors continue to believe that ESG knowledge can help reduce risk in a portfolio. Surveys of companies, for example Morgan Stanley's *Sustainable Signals: Corporates 2025*, also suggest that a high proportion of firms still see a sustainability strategy as supporting future value creation.

ESG scores and corporate adaptability

Companies perform processes and solve problems that individuals or smaller groups cannot efficiently address on their own. At their core, they are mechanisms for delivering supply in response to demand, with value creation is often rooted in specialization, efficiency, and the ability to coordinate complex activities across markets. Corporate strategy should ensure that companies can continue to deliver this value over time and provide a framework for aligning internal capabilities with external opportunities, as well as managing dependencies (e.g. with suppliers, partners, customers, and regulators) As challenges arise, companies must solve problems quickly and effectively: identifying which companies can do this, though strategic foresight, agility, and adaptability becomes very important. ESG scoring can help us not only identify which companies are best placed now, but also are likely to stay ahead in future

Asset allocation and risk management. Performance management of ESG portfolios will also depend on how they are constructed and to what extent they are intended to meet specific ESG aims. ESG portfolios with limited sector restrictions and less specific environmental, social or governance targets can often be managed through more standardised asset allocation and risk management approaches, which may be more cost-effective.

However, ESG portfolios with extensive sector restrictions and specific targets may need a more customized approach to portfolio management, asset allocation and risk management. Last year we published a special report on **decarbonizing portfolios** which identifies several factors relevant to this and other specific ESG targets. These include the potential impact of different definitions of the portfolio **performance target**, the **time horizon**, the availability of relevant **asset class data**, potential compromises in **investment vehicles**, restrictions on the investment universe, risks, **portfolio optimization** over time and **regulation**. **Diversification** within ESG portfolios is as important as it is for non-ESG portfolios.

03 Summary and Outlook

ESG equity indices are often used as a proxy measure for overall **investment performance**. At a global level, these suggest broadly similar performance of ESG vs. non-ESG investment over the last five years, but with periods of divergence.

Sector-level analysis helps identify possible reasons for this performance divergence, which can include **government policy**, **geopolitical events**, **macroeconomic trends** and **corporate/sectoral consolidation**. However, in both sectoral and regional comparisons, the **devil is always in the detail**: the composition of the indices chosen can impact relative investment performance acutely and the indices themselves will change over time.

At a **portfolio level**, investment performance (ESG and non-ESG) will depend on how individual assets are selected, strategic asset allocation (SAA) within a portfolio, and risk management. An ESG portfolio may also have to meet specific **non-financial performance objectives**.

ESG **scoring systems** allow individual assets to be selected on a **best in class** basis but sectoral exclusions are also likely to play a part in many portfolios. The performance of ESG portfolios that exclude sectors can diverge from the overall market: the key issue for investors is how quickly and fully any such **performance divergence** is reversed.

Our view is that ESG portfolios with limited sector restrictions and less-specific ESG targets can often be managed cost-effectively through more **standardised** asset allocation and risk management approaches. Portfolios with more specific non-financial ESG targets are likely to need a more customized approach.

Any **outlook** for ESG investment and investment performance must start by acknowledging that that the global economy will continue to change and sustainable/ESG investing will change in response. This **change** will be evident in the range of **investment opportunities, markets** and **methods** available to ESG investors: increasing use, for example, of private markets or new financial assets such as carbon, will require changes to portfolio management approaches.

Over time, consensus views on what sectors or activities **can or cannot be included** in an ESG portfolio are likely change. There could also be a reassessment of what exactly ESG investment is for: the focus could shift, for example, from sector restrictions to using ESG as a way of predicting future **corporate adaptability** to economic transition – and thus companies' **investment performance.** Some investors may see start to see ESG investment as not an all-encompassing "either/or" but as just one of several long-term themes to be pursued within a portfolio.

In summary, ESG is a **social construct** and this means that investing approaches will continue to evolve as societies' beliefs, aims and desires change over time. For this and the more immediate reasons discussed above, investment performance assessment will continue to require considerable attention to detail. But ESG investing will continue to provide multiple ways to make both investment returns and a positive impact on the world around us.

Appendix

Historical performance

	9.9.2020 - 9.9.2021	9.9.2021 - 9.9.2022	9.9.2022 - 9.9.2023	9.9.2023 - 9.9.2024	9.9.2024 - 9.9.2025
S&P500	32%	-9%	10%	23%	19%
DAX	18%	-16%	20%	17%	29%
EUROSTOXX50	26%	-15%	19%	13%	12%
STOXX 600	27%	-24%	15%	16%	15%
MSCI Japan	30%	-5%	20%	10%	20%
SMI index	16%	-10%	0%	9%	3%
FTSE 100	24%	-12%	9%	16%	15%
MSCI EM	20%	-25%	0%	9%	22%
MSCI AC Asia Pacific ex Japan	17%	-25%	0%	10%	25%
MSCI Australien	25%	-6%	5%	13%	7%
Topix	25%	-27%	16%	13%	17%
MOEX	8%	-18%	-9%	-15%	39%
CSI 300	31%	-15%	28%	19%	25%
FTSE MIB	25%	-9%	17%	20%	33%
IBEX	39%	-39%	30%	-1%	0%
Hang Seng	5%	-25%	-6%	-6%	51%
STI	23%	6%	-2%	9%	23%
Nifty 50	54%	3%	11%	26%	0%
IBOVESPA	14%	-3%	3%	17%	5%
MEXBOL	42%	-8%	12%	-3%	19%
MSCI U.S. ESG Leaders	35%	-11%	13%	22%	18%
MSCI Europe ESG Leaders	24%	-24%	16%	16%	7%
S&P500 Scored & Screened Leaders Index (USD) NTR	33%	-8%	16%	24%	18%
Stoxx Europe 600 ESG-X	27%	-24%	15%	16%	12%
FTSE UK 100 ESG Select	29%	-6%	12%	20%	22%
MSCI Japan ESG Select Leaders	25%	-27%	15%	15%	18%
MSCI EM ESG Selection	26%	-26%	1%	9%	27%
MSCI AC APAC ex-Japan ESG Rating Select 100	34%	-17%	2%	17%	15%
S&P Global Clean Energy Transition Index (USD)	39%	0%	-33%	-10%	4%
MSCI World	31%	-14%	10%	20%	19%
MSCI World Screened Net USD Index	33%	-14%	13%	23%	21%
10y US-Treasuries	-2%	-12%	-2%	9%	3%

Source: Deutsche Bank AG, Bloomberg Finance L.P., LSEG Datastream; Data as of September 9, 2025.

Sources

[CIO Special - ESG & investment performance: think strategically | Market Data & Analysis]
[ESG Survey 2024 / Sustainability]
[MS_Institute_for_Sustainable_Investing_Sustainable_Signals_Corporate_report_2025.pdf]
[CIO Special – Decarbonizing portfolios: 10 key factors | Investing Themes]
[How ESG Funds Learned to Love Weapons]
[The Performance of ESG Indexes: Year in Review | MSCI]

Glossary

Best in class is something that is the best of its kind, on a given measure.

Diversification refers to the dispersal of investments across industries, asset types, regions and so on with the aim of reducing portfolio risk or boosting risk-adjusted returns.

Exclusion, in an investment context, refers to excluding certain sorts of investment from a portfolio, often for non-financial reasons.

The **FTSE 100 Index** tracks the performance of the 100 major companies trading on the London Stock Exchange.

The **FTSE UK 100 ESG Select index** measures the performance of the top 100 companies in terms of ESG practices, selected from the FTSE All Share index. Selection is based on their FTSE Russell overall ESG score and models. Companies are then weighted by market capitalisation.

Investment universe refers to the range of investments that can be included in a portfolio.

MSCI is an independent financial services provider of market indices and other analytical tools.

The **MSCI AC Asia Pacific ex Japan Index** tracks the performance of large- and mid-cap stocks across four of five developed-market countries (excluding Japan) and eight emerging-market countries in Asia.

The **MSCI AC APAC ex-Japan ESG Index** selects from the MSCI AC Asia Pacific ex Japan index with on the basis of maximising exposure to positive ESG characteristics.

The **MSCI EM (Emerging Markets)** index includes large and mid-cap stocks across 24 emerging market countries.

The **MSCI EM ESG Selection** includes companies from the MSCI EM index selected on the basis of ESG criteria.

The **MSCI World** Index captures large and mid-cap representation across 23 developed markets countries.

The **MSCI World Screened** index is constructed by excluding companies from its parent index (the MSCI World) that are "associated with controversial, civilian and nuclear weapons and tobacco, palm oil and arctic oil & gas or that derive revenues from thermal coal and oil sands extraction and that are not compliant with the United Nations Global Compact principles". The index also excludes "companies that are involved in very severe controversies and/or in certain biodiversity-related controversies and targets a minimum 30% reduction in carbon emission intensity relative to the underlying parent index.

Proxy in this context refers to a substitute measure used to represent something that is difficult to measure directly.

A **strategic asset allocation process** involves setting preferred allocations for asset classes on a medium to long-term horizon.

The **S&P Global Clean Energy Transition** index is constructed by identifying companies involved in clean energy business and applying various screening methods to reduce their number to a target 100).

The **S&P 500 index** is a market-capitalization weighted index including about 500 leading U.S. companies capturing approximately 80% coverage of available U.S. market capitalization.

The **S&P 500 ESG Leaders** index (now known as the **S&P 500 Scored and Screened Leaders** index) includes companies from the S&P 500 with better-than-average ESG metrics, also excluding some controversial sectors.

The **Stoxx Europe 600** is a broad-based index looking at large, mid and small-capitalization sizes of companies across 17 European countries.

The Stoxx **Europe 600 ESG-X** applies standardised exclusion screens to the Stoxx Europe 600, e.g. on controversial weapons, tobacco, coal etc. Screens are in alignment with ESMA (European Securities and Market Authority) guidelines of fund names.

TOPIX refers to the Tokyo Stock Price Index and is a market capitalization-weighted index covering a large proportion of the Japanese equity market.

Weighting is adjusting the contribution of individual data points to a data set (e.g. index) to account for specific other factors.

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