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Marketing material

A strategic appraisal of climate index investing

Investing in a 'brave' new world


Lukas Ahnert
Senior Product Specialist


Murray Birt
Senior ESG Strategist


Frederike Bauer
Product Specialist


Jay Joshi
Senior Research Analyst

IN A NUTSHELL

– ESG investing in general and climate investing in particular have not had an easy time. Following years of increasing sophistication in data sets and indexing solutions, growing codification into investment policies and resulting inflows into ESG investment solutions, new geopolitical realties and strong equity market performance have dampened some investors' enthusiasm for ESG and climate-orientated solutions.

– However, despite slower growth in ESG fund flows and, in some instances outflows, global sustainable fund assets still hit an all-time high of USD 3.2 trillion at the end of 2024, an 8% increase from the previous year and more than 4x the size in 2018.

– Europe remains the leading sustainable funds' market, with 84% of assets. One technical factor driving recent outflows is a reclassification of ESG terms in European fund names due to European regulations.[1]

– While the performance of ESG and climate strategies has held up well overall, financial risk drivers have become more nuanced. Our report demonstrates why and how investors should undertake closer monitoring and robust due diligence when allocating to ESG strategies.

– On the decarbonisation front, portfolio and real-world emissions have increasingly decoupled such that portfolios are showing much higher decarbonisation rates than in the real economy.

– The regulatory standards for CTB and PAB are therefore a starting point for investors, but it is likely that we will see investors expanding upon these minimum requirements. One area which is gaining traction among forward-looking investors is influencing change through stewardship.

– This report therefore explores developments in climate investing from different angles, including fund flows, performance, and regulatory changes. We show how climate investing, but also ESG investing more broadly, has become more of an active decision.

Contents

[1] - Morningstar (May 2025); 2 - Climate Action Tracker 2025; 3 - IIGCC (May 2025); 4 - NZAOA 2023; Peoples Pension (2025); 5 –Morningstar (Jan 2025) Voting on ESG: A gap becomes a gulf.

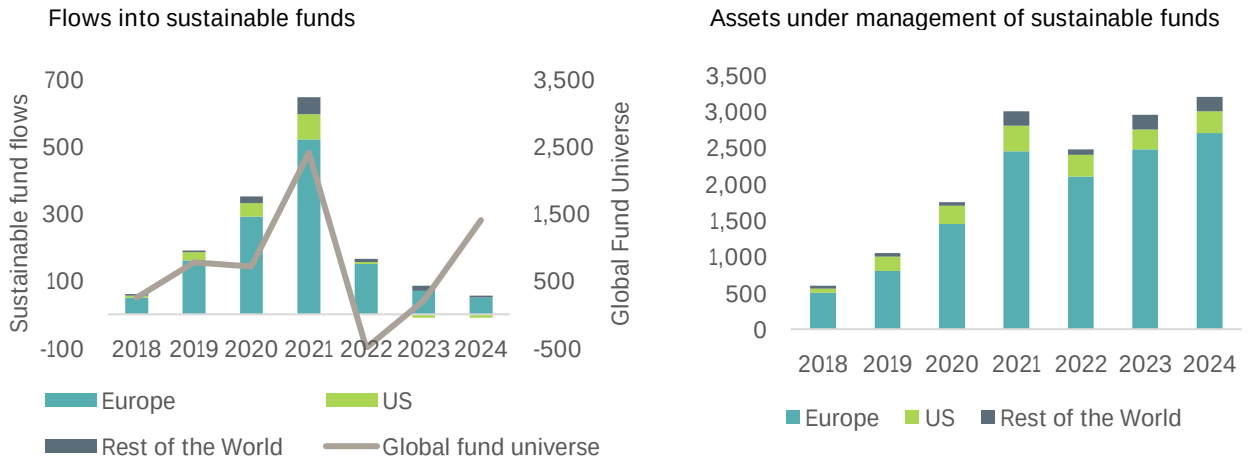
1 / The sustainable investing landscape

Our September 2023 report[2] stated that "Climate indexes have come of age". This observation could not have been any more timely. The annual net flows into sustainable funds saw a solid growth in the years between 2019 and 2021, faster than the global fund universe. In fact, during the Covid-19 pandemic year (2020), sustainable funds, across active and passive vehicles, accounted for almost half of all the net flows into the global fund universe.

2022 was a difficult year for the markets overall, characterised by significant draw-downs and net outflows in global funds. Notwithstanding the headwinds, 2022 was a year of net inflows into global sustainable funds, although about 75% lower than the peak of 2021. While the net flows into sustainable funds remained postive in 2023 and 2024, their pace has declined as shown in Figure 1. The first quarter of 2025 saw the first quarter of European net outflows (USD 1.2bn) since 2018.

Despite a total USD 8.6bn of outflows in Q1 2025, global sustainable fund assets are USD 3.16 trn, a small decline since the all-time high of USD 3.2 trn at the end of 2024. Last year witnessed a reported 8% increase from the previous year and more than quadruple the size in 2018. Europe remains the leading market, housing 84% of the assets. The U.S. share fell to 11% in 2024, down from 15% in 2018. The market share of sustainable funds in the rest-of-world increased to 2.3% in 2024, up from a negligible 0.7% in 2018. As a result, Europe continues to remain the mainstay of the global sustainable funds, with Europe accounting for more than four euros of every five euros of investment in sustainability funds. In fact, every third fund out of four sustainable funds is based in Europe.

Figure 1: Global sustainable flows and assets under management in active and passive strategies (USD bn)



Source: Morningstar, DWS Investment GmbH (June 2025), Bloomberg Finance LP. The global sustainable fund universe encompasses open-end funds and ETFs that, by prospectus or other regulatory filings, claim to focus on sustainability, impact, or environmental, social, and governance factors. Morningstar definition differs from the EU's Sustainable Finance Disclosure Regulation, which defines "sustainable investments" at a holdings level. Morningstar definition isn't based on any regulatory framework, nor does it meet the criteria of any particular regulatory framework.

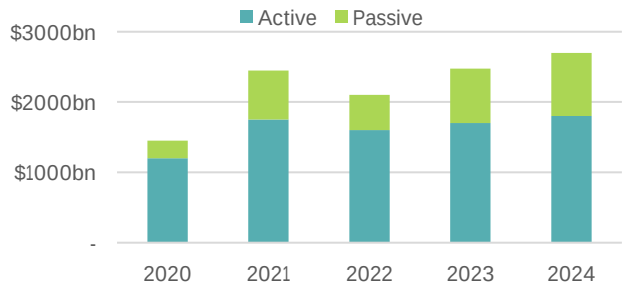
European sustainable fund assets expanded to reach a new record of USD 2.7 trn at the end of 2024, 8% higher than a year earlier and representing a 9% growth since late 2021. Assets in active sustainable funds have remained around USD 1.8 trn, while their passive counterparts saw their market share climb to 33% from under 28% three years ago, underscoring the continuous shift in investor preferences from active management to more cost-efficient strategies.

As the right part of Figure 2 shows, investors have also developed a preference for lower-tracking error solutions, which oftentimes are strategies with fewer exclusions and less stringent requirements on ESG improvements. Section 3 of this paper will discuss some of the drivers behind this trend.

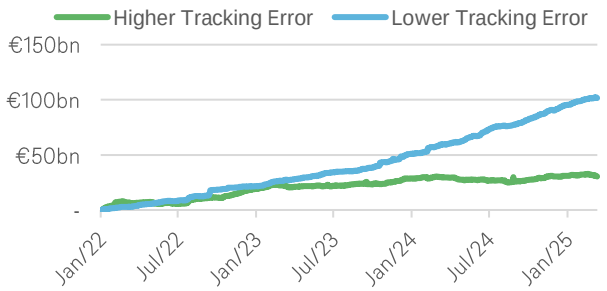
[2] DWS (September 2023) Navigating the climate index jungle

Figure 2: Sustainable flows & AuM (USD bn)

European sustainable funds – Active and passive split



Cumulative European sustainable ETF inflow by tracking error since January 2022



Source: LHS: Morningstar, DWS Investment GmbH (December 2024), Bloomberg Finance LP. The global sustainable fund universe encompasses open-end funds and ETFs that, by prospectus or other regulatory filings, claim to focus on sustainability, impact, or environmental, social, and governance factors. Morningstar definition differs from the EU's Sustainable Finance Disclosure Regulation, which defines "sustainable investments" at a holdings level. Morningstar definition isn't based on any regulatory framework, nor does it meet the criteria of any particular regulatory framework. RHS: ETF Book data as of March 2025, based on DWS classifications.

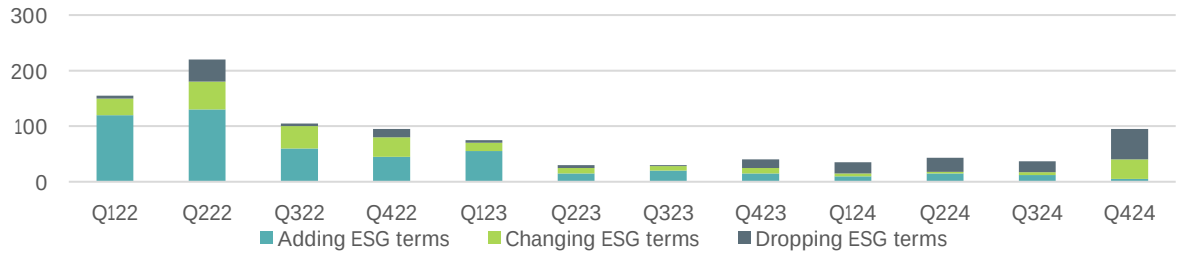
European regulatory changes have changed ESG and climate investing

With the publication of the final ESMA fund naming guidelines[3] in May 2024, the clock started for asset managers and index providers to ensure compliance by May 21, 2025. These guidelines mark the latest change in a regulatory regime that will continue to shape investor ESG and climate allocation choices.

For the first time the guidelines establish minimum requirements for all European funds with certain ESG-related terms in their name. The guidelines also pave the way for broader adoption of elements of the EU Paris-aligned Benchmark (PAB) regulation[4] so they become a lasting feature of the overall sustainable investment landscape. PAB exclusions[5] now form a baseline for all funds with an environmentally focused name, including "ESG" and the popular "SRI" acronym that may funds carry, essentially cementing climate exclusions as the starting point for ESG funds. This led to a significant number of funds changing their name and strategy as shown in **Figure 3**. This trend has accelerated in Q1 2025.

In doing so, regulators have effectively introduced a mandatory "one-off" decarbonisation given the quasi exclusion of the energy sector, even without a specified "hard-wired" decarbonisation trajectory (the other main pillar of the PAB approach). By declaring PAB exclusions as the foundation of environmentally focused ESG investing, ESMA has helped strengthen the role of climate investing.

Figure 3: Number of funds with name changes has increased due to the EU sustainable fund name regulation



Source: Morningstar, DWS Research Institute. The global sustainable fund universe encompasses open-end funds and ETFs that, by prospectus or other regulatory filings, claim to focus on sustainability, impact, or environmental, social, and governance factors. Morningstar's definition differs from the EU's Sustainable Finance Disclosure Regulation, which defines "sustainable investments" at a holdings level. Morningstar definition isn't based on any regulatory framework, nor does it meet the criteria of any particular regulatory framework.

[3] ESMA 2024 www.esma.europa.eu/press-news/esma-news/esma-publishes-translations-its-guidelines-funds-names
[4] Commission Delegated Regulation (EU) 2020/1818, eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1818&from=EN
[5] Paris Aligned Benchmark (PAB) exclusions include companies involved in any activities related to controversial weapons, production of tobacco, violations of UN Global Compact and OECD Guidelines and activities relating to production and distribution of and electricity generation from fossil fuels. The tobacco and fossil fuel exclusions are based on revenue thresholds.

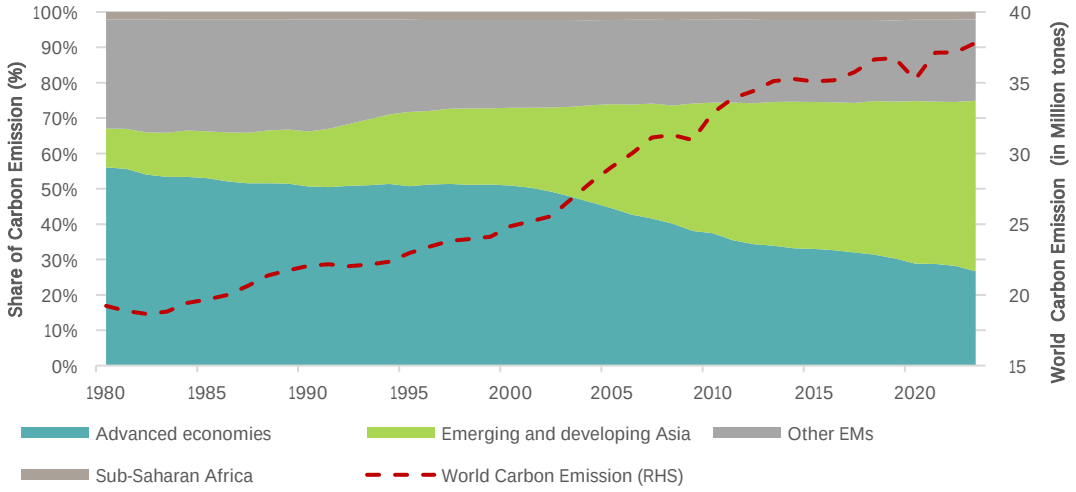
2 / Portfolio versus real world decarbonisation

Investors may have a host of reasons for investing in a climate benchmark: from mitigating financial climate risks, seeking financial performance from climate opportunities, excluding certain companies which are viewed as climate laggards, seeking financial performance from the transition of companies from 'brown to green' and/or selecting companies where investor stewardship could help accelerate corporate climate policies and capex. The ultimate goal for many could be to support the transition to a low-carbon economy, yet the connection between investment and impact is far from direct.

In this section, we explore the implications of the divergence between the rate of decarbonisation of the economy and portfolios. One popular measure for the non-financial success of climate investing strategies is their ability to align portfolios with decarbonization pathways, such as the 7% annual decline in portfolio carbon emissions, prescribed by the minimum requirements for EU Climate Transition (CTB) and Paris-Aligned Benchmarks (PAB).

These trajectories aim to mimic the real-world decarbonisation necessary to curb global warming and achieve the targets set out by international climate agreements. Yet, portfolio emissions and real-word emissions have increasingly decoupled with portfolios showing much higher decarbonisation rates than what the real economy accomplished. Global carbon emissions reached a new high of 41.4bn tonnes of CO2 in 2023[6], Figure 4. We see that annual carbon emission increased by approximately 45% since start of the century and that the share of emissions from Asia has increased to almost 50% of the total over the last 20 years.

Figure 4: **Share of carbon emissions by region**



Source: DWS Research Institute estimate based on data from Emissions Database for Global Atmospheric Research 2024.

[6] Hannah Ritchie and Max Roser (2020) - "CO_2 emissions" Published online at OurWorldinData.org. Retrieved from: https://ourworldindata.org/co2-emissions [Online Resource] last revised in January 2024.

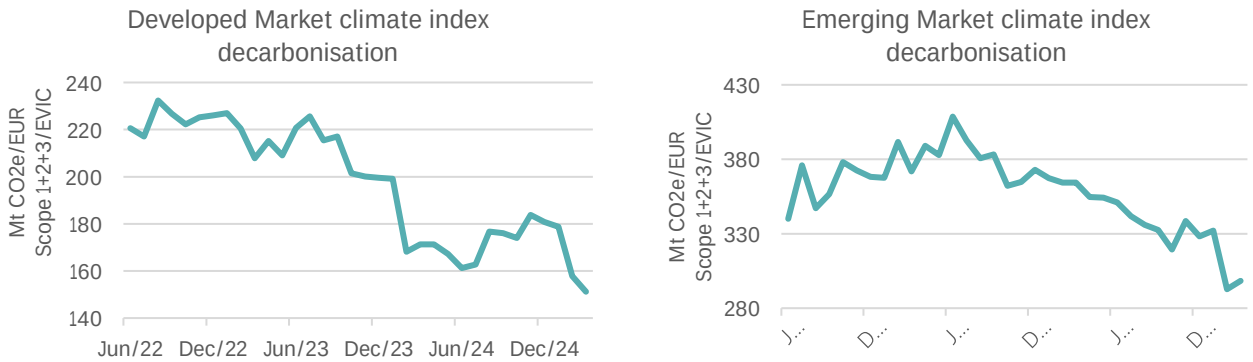
What is not so clear is that there are also vast differences in the rate of change in countries' emissions. In 2023, emission changes were roughly in balance with emissions rising in 102 countries and falling in 94 countries.[7]

There are three reasons why real-world carbon emissions are not necessarily reflected in climate indices:

1. Asset valuations and equity price inflation is a major determinant given that company carbon emissions are generally normalised using market-based metrics such as enterprise value including cash (EVIC).
2. Index governance plays an important role as it dictates especially in emerging markets if and to what extent countries are included in indices. Chinese A-shares make up 65% of the Chinese market but due to access restrictions they are only included in the MSCI Emerging Markets indices with an inclusion factor of 20%. Chinese equities currently account for around 30% weight in the MSCI EM index. A full China A-shares inclusion would likely increase portfolio carbon emissions. More broadly speaking, the cutoff point for inclusion in indices (often stemming from liquidity concerns for broad index replication) means that many unlisted companies that contribute to real-world emissions are unaccounted for in climate index investing.
3. Climate strategies such as CTB or PAB are simply hardwired to decarbonise themselves and are hence more or less agnostic to changes in the real world.

Figure 5 shows that portfolio decarbonisation for climate indices is happening as we would expect it, clearly trending downwards. However, when we compare this to the real-world data in Figure 6, we see that portfolios and the real economy have not necessarily moved in tandem. Global emissions overall have risen, with emerging countries now take up a larger share of global CO2 output, meaning that the decoupling of emission measures is especially pronounced for emerging markets.

Figure 5: World and EM climate equity index portfolio decarbonisation is faster than real-world decarbonisation.
Paris-aligned indices show stronger decarbonisation rate than what data for global emissions suggests, see Figure 4.



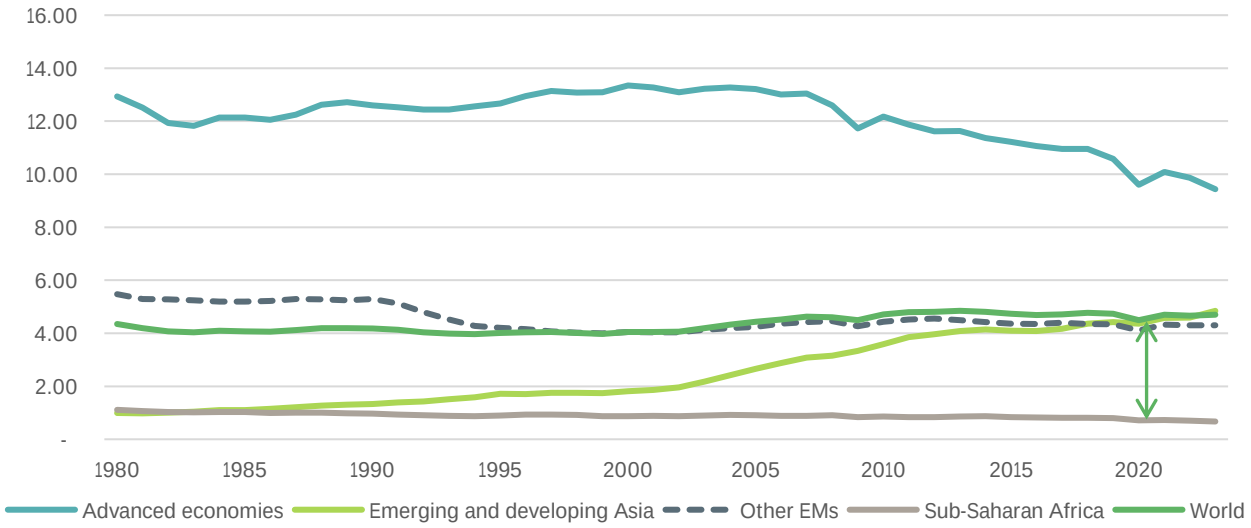
Sources: DWS analysis 2025. Emerging Markets refers to Solactive ISS ESG Emerging Markets Net Zero Pathway Index, Developed Markets refers to Solactive ISS ESG Developed Markets Net Zero Pathway Index. For illustrative purposes.

Per-capita emission figures vary greatly among regions, as shown in Figure 6, and are often higher for developed than for emerging markets as income and per-capita emissions tend to be positively correlated. Increases in carbon emissions are a byproduct of improvements in a country's standard of living and as such it is no surprise that the global rise today is led by economies such as China or India even though their historical share of emissions is smaller compared to the U.S. or Europe.

[7] Global Carbon Budget (2024), with processing by Our World in Data.

Figure 6: 'Per-Capita' carbon emission

´Per-Capita' Carbon emission for the planet overall remained fairly constant up to 2000 and since then it **is** up by ~16%. The gap in ´per-capita' emission between Asia and Africa has emerged entirely in last thirty years. The global carbon emission will be 13% higher, if only Africa's 'Per-Capita' carbon emission were to rise up to the world average.



Sources: DWS Research Institute estimate based on data from Emissions Database for Global Atmospheric Research 2024, United Nations Population Division. World Population Prospects: 2024 Revision.

Academic literature supports the positive contribution that shareholder engagement can play a role in encouraging companies to change corporate practices and capex. Evidence for the link between public equity capital allocation and real-world impact is not very strong.[8] Hence, investments in publicly listed equity climate strategies alone will not solve climate change in isolation. Investors should therefore use the available tools at hand, not only looking to achieve ESG improvements on paper but also seek to play a role in influencing change through stewardship.

In our view, the regulatory standards for CTB and PAB set a starting point for investors, but it is crucial to expand upon these minimum requirements. The second edition of the Net Zero Investment Framework (NZIF)[9] outlines possible components of an investor's net zero strategy and transition plan, encouraging investors to transition portfolios to align with the Paris Agreement's goals, focusing on real economy decarbonisation and increasing investment in climate solutions. It underlines that a narrow focus on financed emissions might have unintended consequences; inadvertently reducing investments in climate solutions, transition assets, and emerging markets and developed economies.

Lack of climate risk integration in equity valuation creates eventual risk of a Minsky moment

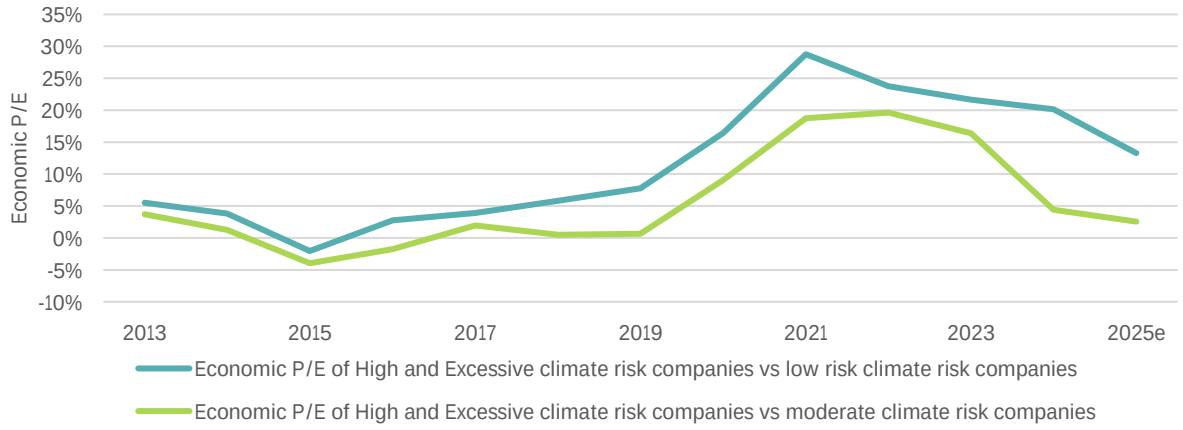
So far, our report has detailed the cracks that have appeared in the foundations of climate investing. Yet, the financial justifications at its core remain unchanged and investors may be well advised to consider how the associated risks have (not) been priced in. A 2024 DWS CROCI report[10] examined whether equity values have been pricing climate risks.

Figure 7 shows the discount in valuation multiple of companies with high/excessive climate transition risk compared to the valuation multiple of companies with low and moderate transition risk. This discount increased from 3% in 2013 to 13% in 2025E. The current discount has been receding from its peak of 25% in 2021, falling to 22% in 2022, 18% in 2023 and 20% in 2024. Due to the declining climate risk equity premia for transition risky companies, we fear a 'climate Minsky moment' and abrupt integration of climate risk at discrete points in time over the coming decades.

[8] University of Zurich, Center for Sustainable Finance and Private Wealth (2021) Investor's Guide to Impact
[9] IIGCC (2024)
[10] DWS CROCI, June 2024 The Price of Climate Risk

A climate Minsky risk may be part of an asset owner's justification for selecting an ESG or climate strategy and for a stewardship strategy to manage company level and systems level risks, while seizing opportunities.

Figure 7: Equity climate risk premia for transition risky companies has declined for the last three years



Sources: DWS CROCI 2025. For illustrative purposes. Past performance is not a reliable indicator of future performance. No assurance can be given that any forecast, target, or opinion will materialise.

3 / ESG & climate index financial performance: a story of many factors

Besides a complex regulatory landscape for ESG strategies, ESG and climate investors continue to face a divergent performance picture. Critics would argue that this calls into question the efficacy of ESG investing, especially when the level of exclusions and resulting active share is high. Reflecting on recent trends, 2021 emerged as a watershed year for ESG strategies–not only in terms of performance but also in shaping investor perceptions on ESG strategy selection. Earlier that year DWS published, an in-depth analysis examining the drivers behind ESG approaches' historical success. The findings, consistent with the report's title, underscored that ESG outperformance was never attributable to a single driver[11].

At the firm level, empirical studies indicate that companies with weaker ESG profiles historically faced elevated capital costs and volatility, often linked to governance failures or controversies[12]. A review of recent evidence and experience of ESG investing by Nippon Life Insurance[13] found that "*Numerous studies have been conducted on the relationship between ESG factors and corporate financial performance by the financial industry and academia, with many suggesting a positive correlation. However, the results vary depending on the time frame, country, and industry analysed, indicating that this positive relationship based on the disclosed information is not universally applicable.*"

Likewise, a PRI article[14] found that *"the links between ESG and performance are nuanced and complicated…correlations are influenced and complicated by [many factors]. While the broad conclusions about relationships between ESG attributes and corporate performance remain valid, researchers are looking more closely at what we mean by ESG investing and ESG scores and assessments."*

Our experience is that investors have struggled to disentangle ESG-driven performance from broader market dynamics, as portfolio construction introduced confounding factors. This continues to present a risk that is underappreciated by many investors but can be managed when selecting an appropriate ESG strategy.

Key structural drivers included underweights in severe ESG laggards, sector and country tilts, and selection effects[15], many of which historically favoured ESG portfolios. For instance, the combination of underweighting the energy sector and overweighting higher-performing technology stocks, driven by on average better ESG quality, fewer exclusions in that sector and favourable carbon metrics, enabled most ESG and climate strategies to deliver strong returns over the five years ending in Q1 2021. This period represented a "sweet spot" for investors, aligning climate objectives with gains from the tech rally. The post-COVID-19 recovery further accelerated these trends as market backdrop stabilised.

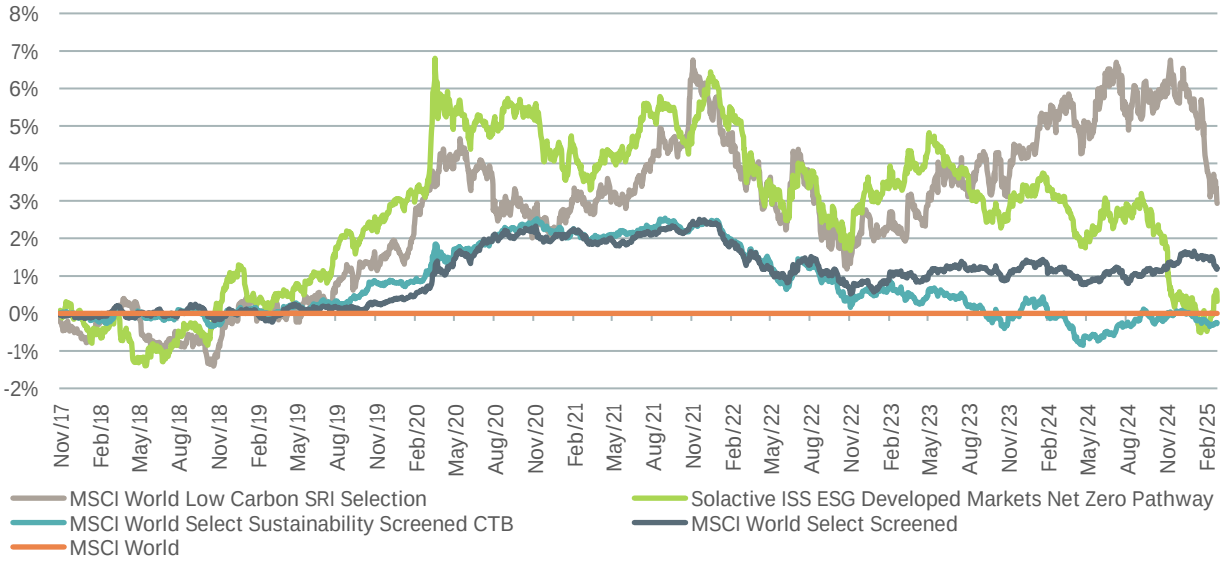
The narrative shifted markedly after 2021. The earlier performance uplift attracted broader investor interest, driving inflows into high-exclusion ESG strategies, which then exhibited higher volatility. In the years that followed investors have faced resurgent energy stocks, renewed investor appetite for defence sectors, amid wars in Ukraine and Gaza, and most importantly a multi-decade high market concentration. Notably, many ESG portfolios have been disproportionately impacted by underweights in the "Magnificent 7" equities, mirroring challenges previously seen when US equity markets were dominated by the "Magnificent 7" predecessors, the "FAANG" stocks[16].

This indicates that ESG and climate investing choices can also entail measurable opportunity costs depending on the market environment. For example, the recent rise of concentration of benchmarks and resulting idiosyncratic forces have demonstrated to investors the active risks associated with sizable active share allocations away from benchmarks. Figure 8 provides

[11] DWS (2021) ESG outperformance: Not about one factor https://download.dws.com/download?elib-asset-guid=ed668368aa5c45d39ebbbb6bda59c9dd
[12] ESG and the cost of capital - MSCI
[13] Nippon Life Insurance April 2025. https://www.nissay.co.jp/kaisha/csr/management/communication/pdf/esgparadox_en.pdf
[14] PRI September 2024. https://www.unpri.org/pri-blog/part-iii-esg-factors-and-returns-a-review-of-recent-research/12728.article
[15] Selection refers to a residual component in a multifactor analysis and closely resembles idiosyncratic risk
[16] FAANG is an acronym representing five major American technology companies: Facebook (Meta), Apple, Amazon, Netflix, and Google (Alphabet). The Magnificent 7 refers to seven dominant technology companies: Apple, Microsoft, Amazon, Alphabet (Google), Meta (Facebook), NVIDIA, and Tesla.

an overview of how popular ESG and climate strategies that all use global equities as their starting universe have fared relative to the MSCI World. For experienced ESG investors, the recent performance should not come as a surprise. Nevertheless, it has promoted a re-evaluation of ESG portfolio positioning among investors. This paper therefore also serves as an updated guide for navigating ESG strategy selection in this evolving landscape.

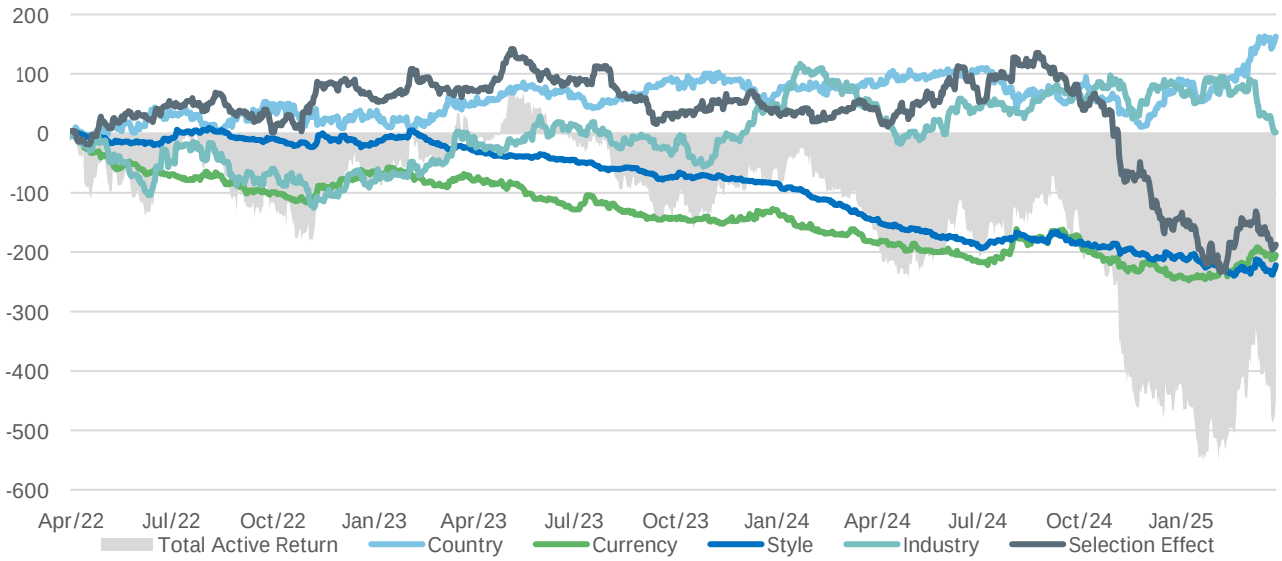
Figure 8: Performance comparison – popular ESG indices vs. MSCI World



Sources: DWS International GmbH, Bloomberg, MSCI, March 2025. Past performance is not a reliable indicator of future performance.

Analysing the performance drivers of ESG strategies is a natural starting point for understanding the underlying performance mechanics at work in ESG strategies. To illustrate these, we will focus on a popular climate investment strategy from Solactive's ISS ESG Net Zero Pathway PAB index series and assess relative return drivers against the MSCI World benchmark, Figure 9. Due to a wide number of shifts across sector, country and currency, we prefer a multi-factor lens to identify the range of effects. Similar to our observations we have previously made on high-exclusion ESG strategies in the SRI range, we find evidence of several important performance drivers at work.

Figure 9: 3Y multi-factor attribution (in bps) - Solactive ISS ESG Developed Markets Net Zero Pathway vs. MSCI World

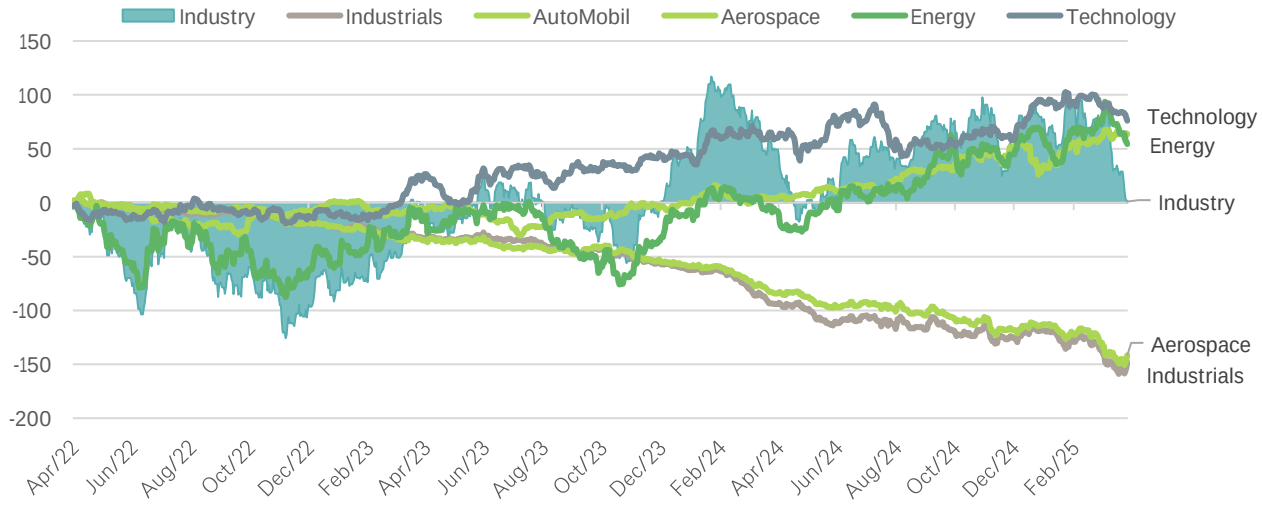


Sources: DWS International GmbH, Bloomberg, MSCI, March 2025. Past performance is not a reliable indicator of future performance.

What stands out is that the industry effects, which measure the role that underweighting or overweighting certain sectors relative against the non-ESG reference benchmark, were significant recently but also near zero over the medium term. This might come as a surprise given that over the three-year period, structural sector tilts remained consistent (underweights did not become overweight and vice versa), but it illustrates, a general feature of sector investing: over a longer timeframe many sectors display an element of mean reversion.

Figure 10 examines industry drivers further. A positive performance contribution from the exclusion of the energy sector is a good example for such a turnaround in performance, as performance contribution turned from negative to positive in mid-2023. Missing out on the defence trade, particularly in the form of industrials and aerospace underexposures, was a clear and persistent performance detractor, for now.

Figure 10: 3Y multi-factor attribution (in bps) – Solactive ISS ESG Developed Markets Net Zero Pathway vs. MSCI World – Sector deep dive



Sources: DWS International GmbH, Bloomberg, MSCI, March 2025. Past performance is not a reliable indicator of future performance.

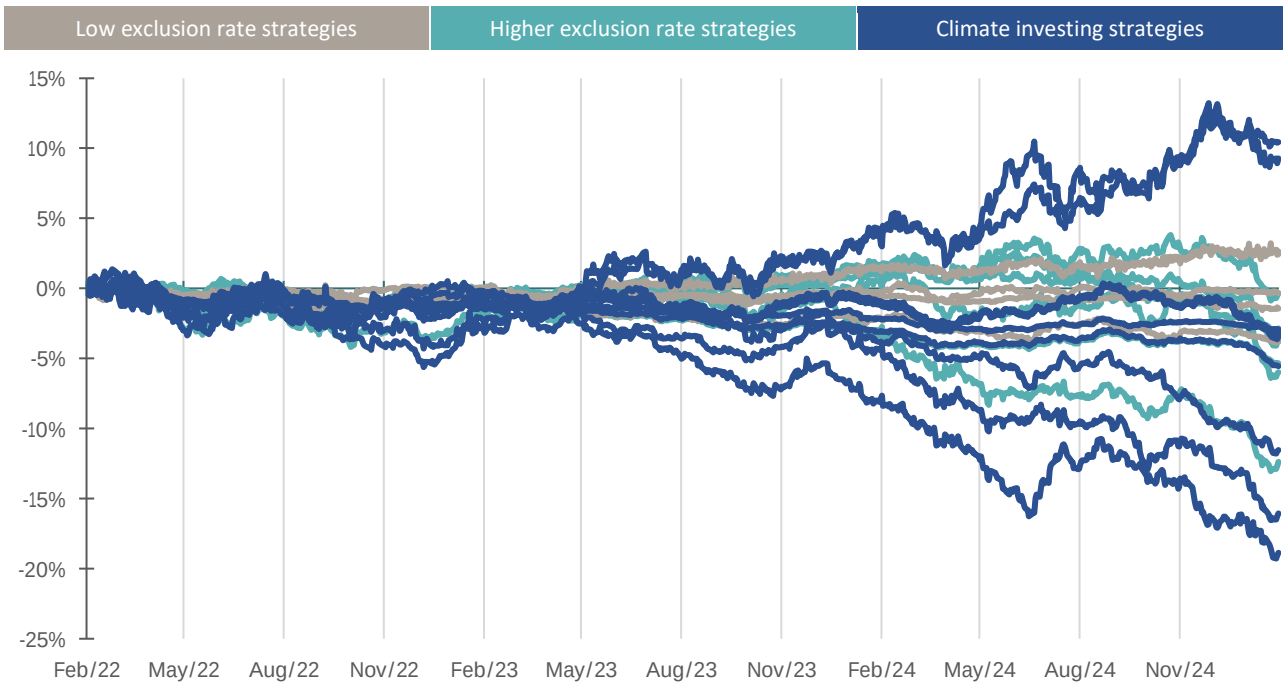
Country and currency effects, which are closely connected, appear also significant. While sector performance has mean-reverted recently, the stronger U.S. dollar and the rising U.S. market—where the strategy was underweighted between 4% to 14% over the observation period—had a negative impact on performance.

Figure 10 also confirms that especially for ESG and climate investing strategies with a high level of active share, the "known unknown" remains the selection component, which not only exhibits the highest level of volatility but has also contributed negatively to performance recently. A selection component, which captures residual and idiosyncratic effects, is mostly unavailable for investors. Excluding several hundred stocks from a global universe also exposes investors to single stock performance risks. The absence of selected mega-tech stocks—due to controversies such as data privacy, labour practices, or carbon footprints – is a good example of such drivers. Such structural gaps create performance divergence relative to traditional benchmarks, forcing investors to confront a dilemma: Should these selection effects be viewed as drawbacks?

We argue they should not. Instead, these effects highlight the necessity of aligning portfolio construction with sustainability objectives. For instance, excluding a carbon-intensive conglomerate may temporarily reduce returns but aligns the portfolio with decarbonization goals.

Ultimately, not all investors might be willing to take such active performance risks. This underscores why investors must prioritize rigorous selection criteria. Looking at the ESG and climate investment landscape clear categories have developed, including "Screened", "CTB", "PAB" and "SRI" investing. The grouping of these approaches is often done on the basis of exclusion characteristics. This can serve as a starting point for investors, but analysis on the strategy is typically required. Figure 11 illustrates the significant dispersion that related strategies have experienced in Europe.

Figure 11: Relative performance of popular UCITS World ESG strategies – 3Y net total return relative to MSCI World



Sources: DWS March 2025, Bloomberg, strategy assessment is based on predominant market categories, Low exclusion includes among others "ESG Screened" approaches, Higher exclusion includes among other "ESG SRI" approaches, Climate investing combined Climate Transition and Paris-aligned Benchmarks, as well as those that blend SRI with climate elements. Past performance is not indicative of future returns As of February 2025

Understanding the drivers behind this demands a more detailed assessment of selection effects. Ultimately, selection effects are not only concerned with the exclusion of selected names that but also with the stocks that are included in the index. Figure 12, which looks at the top and bottom contributors to selection effects is a good reminder of this.

Particularly for highly exclusionary strategies, questions around the "rescaling" of the remaining weight remain essential. Putting in place single stock caps, optimising on active share or doing nothing about arising concentration risk are all valid options – as long as they align with the investors willingness to accept the respective risk profile.

Figure 12: Company level drivers of selection effects from 3Y multi-factor attribution for Solactive ISS ESG Developed Markets Net Zero Pathway vs. MSCI World

	Average % Weight Climate Portfolio	Average % Weight Benchmark	Contribution to Selection Effect (in bps)
NVIDIA CORP	2.7	2.4	80
APPLE INC	6.7	4.8	42
ELI LILLY & CO	0.9	0.8	15
BOEING CO/THE		0.2	14
HONEYWELL INTERNATIONAL INC		0.2	11
EXXON MOBIL CORP		0.8	-25
PALANTIR TECHNOLOGIES INC-A	0.0	0.1	-26
COSTCO WHOLESALE CORP		0.5	-28
TESLA INC		1.1	-83
AMAZON.COM INC	0.3	2.3	-93

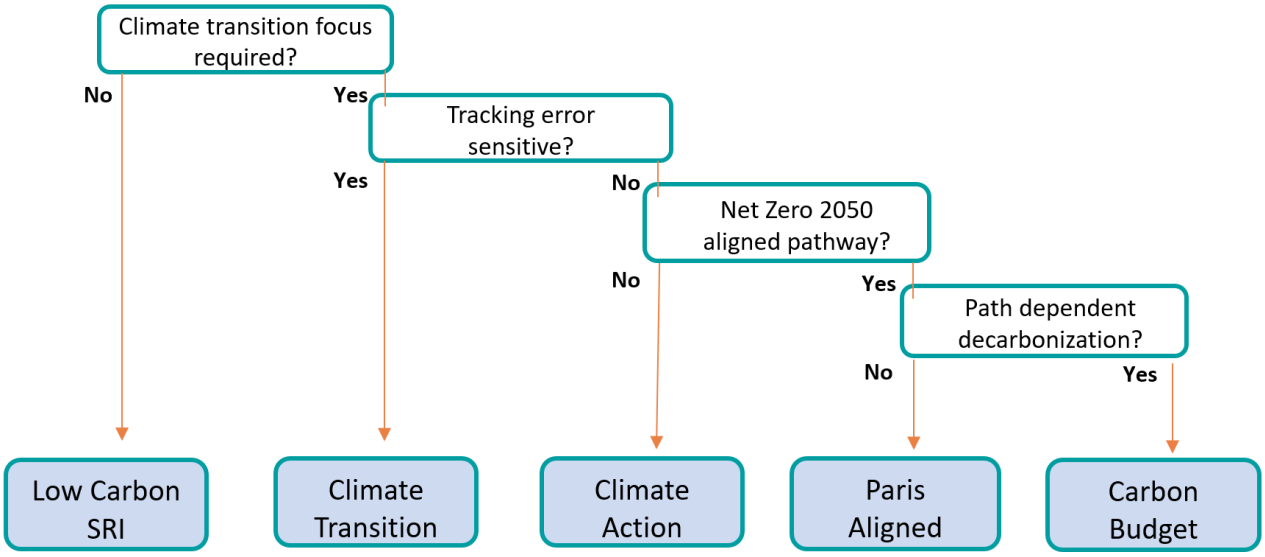
Sources: DWS International GmbH, Bloomberg, MSCI, March 2025. Past performance is not a reliable indicator of future performance. This information is intended for informational purposes only and does not constitute investment advice, a recommendation, an offer or solicitation.

4 / Key conclusions: Investor implications for climate strategy implementation

With diverging performance patterns, evolving public opinion on certain ESG topics and the realities of changing benchmarks, we need to examine the key factors when it comes to ESG and climate index construction. In our 2023 paper *Navigating the Climate Index Jungle*[17], we introduced a decision tree with guiding questions towards which type of climate strategy may be appropriate depending on an individual investor's goals.

Almost two years later, this decision tree is still relevant. Given the increase in the number and complexity of climate solutions, it has even become more important to systematically analyse the components of a climate investment strategy.

Figure 13: Climate investing decision tree



Sources: DWS 2023

Key considerations for core ESG / climate index construction

1) Representativeness is key

Index concentration has probably been one of the most discussed topics in 2024 owing to the strong performance of U.S. equities in general and tech stocks and the Magnificent 7 in particular. As discussed in the previous section on performance, throwing ESG in the mix can lead to exacerbated idiosyncratic risks. Consequently, while ESG investing is supposed to decrease exposure to some financial risk, its application can actually introduce new, and likely unintended, risks. This is at least the case where ESG considerations are translated into high-exclusion, high-tracking error solutions that significantly increase ESG metrics but also reduce the portfolio holdings. Aggressive best-in-class strategies may remove up to 75% of the portfolio, which combined with other reweighting e.g. due to decarbonization targets, can lead to significant active weights.

This raises the question to what extent such indices can still be compared to broad benchmarks. PAB indices are, by regulation, supposed to be a representative image of the real economy, hence while some deviations are to be expected a general tracking error budget of 2-3% should be a reasonable guide. As we have shown above, not all climate investing is equal and the particularities of how a PAB or other climate strategy is executed can make a big difference in portfolio outcomes.

[17] DWS (2023) Navigating the Climate Index Jungle

2) Portfolio implementation of ESG can be subjective

As we have noted above, the ESMA fund naming guidelines have cemented PAB filters as the cornerstones of ESG strategies. Beyond that, however, there may be little consensus as to what ESG alignment means.

Let's take alcohol as an example, which many SRI strategies would remove using revenues from production and/or distribution. Some may regard it as a non-ESG activity due to the addiction risk and health impacts while others may see alcohol as an integral part of their culture.

Linking this to performance, it is unclear what the long-term market reaction will be: if the consensus moves towards a non-ESG verdict and capital is withdrawn from alcohol stocks, portfolios excluding them should benefit. If the reverse is true, these portfolios run the risk of losing out. In any case, the exclusion changes the risk profile of the portfolio and poses tracking error risks.

We could make many similar cases: Defence and nuclear power are potentially the most divisive topics, the bottom line remains that in the absence of broad and strong regulatory and political agendas, a long-run consensus market reaction is difficult to anticipate and ESG decisions can become trade-offs between specific client beliefs/convictions and active risk.

Let us be clear – we are not arguing that the best ESG strategy is one that introduces little tracking error and follows regulatory minimum standards only. In an age where the realities of benchmark construction have led to more concentrated portfolios and seemingly reliable return drivers have become more unpredictable, it is essential that investors make conscious choices. Investors simply need to be aware of how different market scenarios may affect different ESG portfolios.

To this end, Figure 14 shows some of the different shades of ESG and climate indices for developed market equities. The improvement of any specific ESG indicator could be measured by various datapoints. On the ESG ratings side, it is interesting to note that to bring about a visible improvement, a high-exclusion and high-tracking error strategy like the MSCI Low Carbon SRI Selection methodology is necessary. For context, this methodology follows a 50% best-in-class selection, applies SRI exclusions and targets a 50% decarbonization against the parent benchmark. Out of the selection of indices, the Low Carbon SRI carries the highest five-year tracking error and removes the largest number of securities from its non-ESG parent. Yet, it not only achieves the most noticeable improvement in ESG rating but also the largest decline in carbon intensity.

Figure 14: ESG indicators for several major ESG and climate indices

	Non-ESG indices	MSCI Select Screened	MSI Low Carbon SRI Selection	MSCI Select Sustainability Screened CTB	Solactive ISS ESG Net Zero Pathway
	Broad benchmark exposure	Basic ESG Risk Mitigation with low Active Share	Distinct ESG integration and risk reduction	Reduced exposure to transition risks	Hard-wired Net Zero Pathway commitment
MSCI ESG Rating	A	A	AA	A	A
MSCI ESG Quality Score	6.8	6.9	7.8	6.9	6.9
E Score	5.2	5.3	5.4	5.3	5.4
S Score	5	5	5.5	5	5.1
G Score	5.2	5.2	5.6	5.2	5.3
% holding of companies with low CCC ESG Quality Score	2%	0%	0%	0%	0%
GHGe / EVIC	355.2	251.3	121.6	144.1	159.4
GHGe / Sales	92.3	71	27.9	53.7	47.4
% Fossil fuel exposure	12.3	11.5	1.1	9.1	2.9
# Constituents	1396	1281	659	1068	1057
5Y Tracking error vs. MSCI World		0.65%	2.49%	0.75%	1.99%

Source: DWS International GmbH, MSCI ESG Research, as of 10/02/2025. Past performance is not a reliable indicator of future performance.

Attentive readers might also notice that the CTB index achieves a slightly lower emission intensity than the stricter PAB strategy. This is a good example of how additional indexing goals and optimisation constraints can act on the portfolio outcomes. In this case, the methodology not only targets CTB exclusions and decarbonisation requirements but also improvements in other areas, inspired by the principal adverse impacts (PAIs) as defined in the Sustainable Finance Disclosure Regulation (SFDR). A side effect of these additional objectives is a further reduction in carbon intensity.

So far, we have only considered equities. It is worth briefly discussing the role of fixed income and the main differences to the equity world. First, it is now possible to create climate-focused fixed income strategies as data availability has improved.

Yet, especially for decarbonization-focused approaches, investors should note that there might be some missing values where issuers do not have publicly traded equity and therefore no market-based valuation metrics for normalization such as EVIC. Given that most issuers tend to have several bonds outstanding and the sheer size of global bond markets, concentration in single issues or issuers is not as much of a concern as it is for equity portfolios. Additionally, the portfolio impacts tend to differ little between ESG and climate strategies, meaning an additional climate overlay still comes at a very low cost.

What now?

This report covers recent developments in climate investing from different angles, including fund flows, performance, and regulatory changes. It is clear that climate investing, but also ESG investing more broadly, has become more of an active decision.

ESG in its purest form is a risk mitigation strategy, trying to anticipate how corporate activities might affect the bottom line and equity market risk. Over the recent past, this had worked out well regarding financial performance as some sectors were often underweighted in ESG indices and displayed financial underperformance. Other sectors that were often overweighted in ESG indices such as technology and healthcare, experienced stock price rallies, such as during the Covid-19 pandemic.

Following mean reversal movements and the increasing impact of selection effects, the efficiency of delivering ESG improvements and financial outperformance from the same indexing choices has decreased.

Over the longer-term, performance has still held up well and the underlying risk factors have not changed – the CROCI analysis highlighted earlier shows that while share price discounts for climate transition risky companies have decreased but are still present. Yet, investors have had to stomach more volatility, which extends from the volatility of markets to public opinion.

In this environment, it is crucial that investors are clear about their reasons to incorporate ESG and/or climate factors in their decision making – and which factors to focus on.

In a second step, investors should choose an appropriate method to include these factors in their indexing choices, be that via exclusions, optimised improvements or tilting.

The third choice is benchmark design – how to steer benchmark deviations and potentially constrain active risk.

Another consideration is the investor should provide their expectations for the time period after the assets are invested: how the asset manager exercises the asset owner's shareholder rights and how investor influence is used with companies, policymakers and other stakeholders. With the recommended steps outline in this paper, we believe asset owners with climate goals can then adopt a strategic appraisal of climate index investing.

5 / Glossary

Figure 15: Climate terminology and definitions

Carbon budget: the estimated cumulative amount of global carbon dioxide emissions that is estimated to limit global surface temperature to a given level

Carbon footprint: the total set of greenhouse gas (GHG) emissions caused by a company, service or product. It is often expressed in terms of the amount of carbon dioxide, or its equivalent of other GHGs emitted

Carbon intensity: the amount of CO2 emissions released per unit of another variable such as revenues or GDP

Carbon offset: a reduction in GHG emissions or an increase in carbon storage that is used to compensate for emissions that occur elsewhere

Carbon removal: a process in which CO2 is removed from the atmosphere using technologies such as afforestation, agricultural practices that sequester carbon in soils or bioenergy with carbon capture and storage

Climate positive: an activity which goes beyond achieving net zero carbon emissions by removing additional carbon dioxide from the atmosphere

Double materiality: the mportance of financial information both in terms of a company's financial value and the impact on the world around it

Global warming: the estimated increase in global mean surface temperature averaged over a 30-year period and expressed relative to pre-industrial levels

Greenhouse gas emissions: gases in the earth's atmosphere that trap heat. The primary GHGs are carbon dioxide, nitrous oxide, methane and ozone

Institutional Investors Group on Climate Change (IIGCC): European association for institutional investors to work on common investment frameworks

Intergovernmental Panel on Climate Change (IPCC): is an intergovernmental body of the United Nations which advances scientific knowledge about climate change caused by human activities

Paris-Alignment Investment Initiative (PAII): IIGCC's investment framework for aligning portfolios to the goals of the Paris Agreement

Principal Adverse Impact (PAI): the negative effects, material or likely to be material on sustainability factors that are caused, aggravated by or directly linked to investment decisions and advice

Net Zero alignment: refers to a state in which the greenhouse gas emissions going into the atmosphere are balanced by removal out of the atmosphere

Net Zero Asset Owner Alliance: an institutional investor initiative committed to transitioning their investment portfolios to net zero by 2050

Net Zero Asset Managers initiative: an association of asset managers commited to supporting investing aligned with net zero emissions by 2050

Science based targets: a set of goals backed by science for an organization to reach net zero, usually aligned with the limit to keep global warming to 1.5°C

Scope emissions: Scope 1 emissions include all direct emissions from the activites of an organization. Scope 2 includes indirect emissions from the electricity bought and used by an organization. Scope 3 includes emissions are the emissions occuring that an organization does not own or control for example in its suppliers or the products its sells

Task Force on Climate-related Financial Disclosures (TCFD): published recommendations on climate-related financial risk disclosures which have become widely recognized as industry standards

Tracking error: the difference between a portfolio's returns and the benchmark or index

Source: DWS Investment GmbH (August 2023). IIGCC, IPCC

Appendix

Five year rolling performance of selected indices	MSCI World	MSCI World Select Screened	MSCI World Select Sustainability Screened CTB	Solactive ISS ESG Developed Markets Net Zero Pathway	MSCI World Low Carbon SRI Selection
02/20 - 02/21	29.34%	31.10%	30.61%	29.82%	29.09%
02/21 - 02/22	10.74%	10.19%	10.18%	11.83%	11.46%
02/22 - 02/23	-7.33%	-7.73%	-8.13%	-8.45%	-8.60%
02/23 - 02/24	24.96%	25.02%	24.01%	24.37%	28.63%
02/24 - 02/25	15.63%	15.65%	15.40%	12.64%	13.06%

Sources: DWS International GmbH, Bloomberg, MSCI, March 2025. Past performance is not a reliable indicator of future performance. Based on Net Total Returns in USD.

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