BlackRock

Vive la Paris: Equity investing with the Paris Agreement

Achieving net zero by 2050

Summary

- Scientists have identified that the best chance of stopping the devastation caused by climate change is by achieving a significant reduction in global greenhouse gas emissions by 2030 and a net zero objective by 2050.
- The 2015 Paris Agreement aims to limit global warming to well below 2° C.
- To accomplish this objective, companies will need to reinvent their business models and the investment community will need to facilitate a reallocation of capital towards technologies, companies or countries that are fundamental in this transition.
- In this paper, we show how a systematic equity strategy can hedge against climate change risks as well as tilt into companies that may benefit from the energy transition.
- The EU Technical Expert Group on Sustainable Finance provides a framework for investors to be fully aligned with global climate goals, and we show how a systematic equity strategy can meet these standards to become Paris aligned.
- While there are many ways to incorporate climate alpha strategies, we believe corporate target setting, carbon resource efficiency and green patents, alongside a 50% reduction in carbon emissions and a further 7% decarbonization each year can demonstrate an innovative Paris-aligned approach for investors.

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An introduction to the Paris Agreement

Scientists predict “irreversible damage” to our planet from climate change if carbon emissions due to human activities are not curbed.[1] But time is limited, with the best chances of stopping the devastation caused from climate change being the significant reduction of global emissions by 2030 and aiming for net zero by 2050. International treaties signed by governments across the globe collectively aim to achieve those goals. The most important of those treaties is the 2015 Paris Agreement, which is a legally binding international treaty on climate change with an objective to limit global warming to well below 2º C, preferably to 1.5º C when compared to pre-industrial levels.[2] To achieve this long-term temperature target and a climate neutral world by 2050, countries aim to reduce a global peak of greenhouse gas (GHG) emissions as soon as possible.

The Paris Agreement recognizes that not only do governments play an important role in those efforts, but achieving net zero by 2050 requires the investment community (both asset owners and asset managers) to allocate capital towards technologies, companies or countries that are fundamental for the energy transition. A Paris-aligned portfolio that spans asset classes is one with an investment strategy that is consistent with achieving the goal of global net zero emissions by 2050. It involves considering Paris-alignment of both sovereign and corporate entities alongside traditional risk and return objectives when constructing the portfolio.

In this paper, we show how to build a Paris-aligned equity strategy and demonstrate one example of how that can form part of a broader multi-asset portfolio that also seeks to achieve alignment with the Paris requirements.

1 United Nations General Assembly, March 2019. **2** The first major international treaty on climate change is the 1997 Kyoto Protocol.

Minimum standards of Paris-aligned benchmarks

There are various approaches that investors can take to incorporate temperature and climate objectives within their portfolios. Two alternatives to the favored approach detailed in this paper are to be "temperature-aligned" or "net-zero/ carbon neutral." The merits of these are summarized below:

Temperature aligned. Sometimes with a defined specific temperature, such as "2 degrees." The goal is clear: align the portfolio with a scenario that limits the rise in global temperatures to "X" degrees. However, there are no guidelines or standards associated with "temperature aligned" portfolios. Further, we see a high degree of dispersion in how different data providers measure temperature alignment — a single portfolio may be deemed "2 degree" by one and "3.5 degree" by another.

Net-zero or carbon neutrality. Implies that a company or portfolio does not emit more carbon than it can offset. Importantly, "net zero" does not imply zero carbon emissions. In almost every case carbon offsets (either financial or technological) are assumed to be part of the solution. Additionally, "net zero" specifies neither by what year the portfolio will achieve carbon neutrality nor by which method it gets there. As a result, there can be a fair degree of dispersion within the "net zero" or "carbon-neutral" landscape.

However, the EU Technical Expert Group's (TEG) Paris-aligned guidelines are emerging as the global standard for what defines portfolio alignment with the goals of the Paris Agreement. The EU-TEG for Paris Aligned Benchmarks is part of a broader group of alignment standards that are designed to achieve net zero outcomes. Other standards may involve different carbon measurement metrics including implied temperature rise metrics, different dates to achieve the net zero target, sector-specific requirements, other decarbonatization pathways, or disclosure standards, among others.[3] For our purposes, the EU-TEG guidelines are what we are focused on. Portfolios are held to specific minimum standards in which a 1.5º C temperature target is embedded, and decarbonization goals are explicit. In particular, the TEG specifies: the criteria for the choice of the underlying assets including, where applicable, any exclusion criteria; the criteria and method for the weighting of the underlying assets in the benchmark; and the determination of the decarbonization trajectory for the benchmarks. While the focus has been on benchmarks, those guidelines are relevant for active portfolio managers as minimum guidelines to benchmark themselves against.[4]

These guidelines can be applied to equity markets in the following ways:

Significantly decrease the overall GHG emissions intensity compared to the underlying investment universes. Reduce emissions intensity by 50% versus MSCI World, MSCI World Small Cap and MSCI Emerging Markets indices, covering both Scope 1 and 2 emissions (direct and company-owned indirect emissions) with Scope 3 (indirect emissions in a company's value chain that are not owned or controlled by the company itself) which are gradually phased in over the next few years.

Remain sufficiently exposed to sectors relevant to the fight against climate change. Not just divesting from various high risk industries or underweight high impact sectors to achieve the portfolio's goals — keep the exposure to these sectors at least equal to that of the benchmark.

Further reduce GHG emissions intensity on an annual basis. Commit to ensuring that our equity exposure will become less carbon intensive over time by applying a 7% self-decarbonization reduction on average per annum, in accordance with the guidelines.

Exclude companies with exposure to controversial activities. In line with BlackRock's EMEA baseline screens and in accordance with the TEG guidelines, we apply exclusionary screens related to:

- Controversial weapons, nuclear weapons, civilian firearms, thermal coal, tar/oil sands, tobacco, UN Global Compact violators.[5]
- Involvement in environmental controversies; oil, coal and gas exploration/processing; and, high intensity electricity generation.

Upweight companies based upon forward-looking alignment metrics. Increase exposure to companies using metrics such as industry-adjusted ESG score, emissions-to-sales, green patents-to-assets and corporate target setting using science-based targets, to capture opportunities for companies when transitioning to a net zero world.

3 See the Glasgow Financial Alliance for Net Zero (GFANZ) and the Transition Plan Taskforce (TPT). In this paper, we focus only on constructing portfolios satisfying the EU-TEG requirements which have been adopted by the EU Commission Delegated Regulation and are emerging as a leading international standard for achieving net zero by 2050, in line with the goal of limiting the average temperature increase to 1.5º C by 2100. **4** These are examples of guidelines that can be applied and should not be relied upon as research, investment advice, or a recommendation regarding any products, strategies, or any security in particular. This is for illustrative and informational purposes and is subject to change. **5** For more information on BlackRock's commitment to sustainability please visit https://www.blackrock.com/corporate/sustainability.

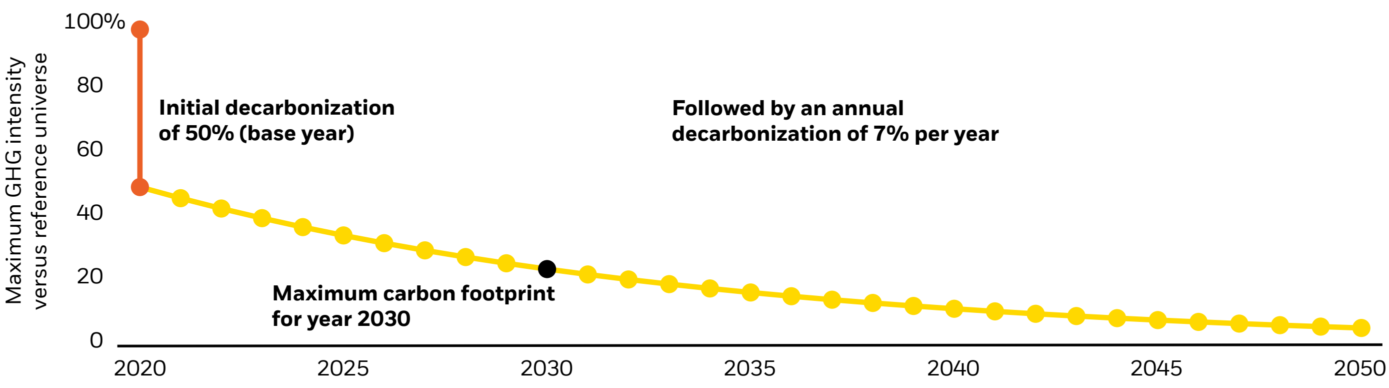
A critical step to net zero: Decarbonization

Risk-mitigating	Opportunity-oriented	
Lower GHG intensity	**Self decarbonization**	**Corporate target setting**
Relative decrease in GHG intensity by 50% (using Scope 1+2+(3))	At least 7% GHG intensity reduction on average per year	Weight increase for evidence-based targets
Required exclusions	**Exposure constraints**	**Green-to-brown share**
Baselines and climate-related activities	Minimum exposure to ‘high impact’ sectors	Significant relative increase (voluntary)

Source: BlackRock, February 2024. For illustrative purposes only. This image shows the risk-mitigating and opportunity-oriented guidelines as defined by the EU TEG’s Paris-aligned guidelines, described in detail earlier.

With the aim of becoming net zero by 2050 at a portfolio level, the aspect of decarbonization is a key component of any Paris-aligned strategy. As described in the earlier section, two types of decarbonization matter: relative versus a benchmark and self-decarbonization. The minimum requirements demand a 50% relative reduction alongside a 7% per year decarbonization rate. An illustrative schematic of the resulting pathway is shown in the chart below. The base year, which is the year the portfolio starts its decarbonization trajectory is 2020 and the portfolio will gradually reduce its carbon emissions (as measured by carbon emission intensity) in each subsequent year. In year 0, the portfolio’s carbon emission intensity is 50% lower than its benchmark, but in year 1 the portfolio needs to be an additional 7% lower, resulting in a reduction of 53.5% (7% of 50% plus the original 50%) versus the benchmark, and so on. The chart shows the resulting pathway as a maximum upper bound versus the portfolio’s benchmark. As shown in an earlier paper (Chan et al. 2020) incorporating carbon reduction targets into diversified systematic equity portfolios does not mean changing their desired outcomes. In fact, the addition of climate aware alphas as we detail on the next page also helps to achieve meeting those targets, while further adding to returns.

Decarbonization path of a portfolio



Source: BlackRock, as of February 2024. For illustrative purposes only. The graph shows an illustrative decarbonization path of a Paris-aligned portfolio.
These are examples of guidelines that can be applied and should not be relied upon as research, investment advice, or a recommendation regarding any products, strategies, or any security in particular. This is for illustrative and informational purposes and is subject to change.

Climate-aware alpha drivers

Embedding a sustainable philosophy and transitioning to a net zero world presents opportunities to various entities both in the public and private sectors. In our view, companies that 'do good' as defined by the United Nation's Sustainable Development Goals (UN SDGs), and in particular, those that also meet the ambitions as set out in the Paris Agreement, will benefit in firm value as their products and services benefit from higher demand. To capture these characteristics, we integrate climate aware alphas into our equity portfolios. These are defined as 'quality factor' insights and therefore stem from the same underlying economic rationale as classical factor premiums: rewards for bearing risk, structural or market impediments and investors' behavioural biases. Three examples of climate aware alphas include carbon resource efficiency, green patents and corporate target setting.

Green patents

Patents are an important form of creative output and companies focusing on innovation tend to enjoy a competitive advantage versus their peers. Green patents play a crucial role in meeting the UN SDGs and include developments focused on water and waste treatment, lifesaving devices and clean energy. We collect data on global patents via Google Patents Data and then create sub-sets utilising International Patent Classification (IPC) codes relevant to a 'greener' economy. Given the inherent uncertainty of Research and Development (R&D), in that not all investments result in commercial success, the innovative output captured in patents is risky. If we interpret patents as the capitalization of certain investments, with R&D devoted to patents being a form of investment (following Cochrane 1991), then investors should earn a return premium for bearing these additional risks in new, unproven inventions. The special focus on green patents in a portfolio reflects not only that the SDGs are important to society, as recognized by the UN, but also that efforts to solve for these goals should naturally result in profitable opportunities for firms.

Carbon resource efficiency

A main source of systematic risk under the Paris Agreement is a firm's carbon emissions (total and intensity). Our portfolio level constraint which aims to achieve a carbon emission reduction relative to the benchmark, hedges the exposure to climate risk. However, we go a step further and demonstrate that firms with lower carbon emission intensity also exhibit higher excess returns. This is due to the fact that firms with lower carbon emissions also have a lower cost of capital and higher productivity. To measure carbon emission intensity, we use the MSCI dataset, which collates company-specific direct (Scope 1) and indirect (Scope 2) GHG emissions data from the company's public documents and the Carbon Disclosure Project (CDP).

We further find that companies with low carbon emission intensity also exhibit other traditional quality factor characteristics based on earnings and earnings forecasts. Economically, lower carbon emissions are positively related to productivity measures. Companies need to manage their resources and the efficient management of these can lead to higher productivity — and carbon is simply another resource.

Corporate target setting

As part of the transition to a low-carbon economy, an ever increasing number of companies have publicly disclosed their temperature targets. One initiative that publicly collects company-level information is the Science Based Targets initiative (SBTi) which aims to "mobilize companies to set science-based targets and boost their competitive advantage in the transition to the low-carbon economy." It is a collaboration between Carbon Disclosure Project (CDP), the United Nations Global Compact, World Resources Institute (WRI), the World Wide Fund for Nature (WWF) and one of the We Mean Business Coalition commitments. The initiative defines and promotes best practices in science-based target settings, offers resources and guidance to reduce barriers to adoption, and independently assesses and approves companies' targets. As of early 2024, 7,478 companies have committed to science-based targets — which means they joined the SBTi and pledged to reduce their emissions in line with climate science.[6] Companies can go one step further and not just commit to a reduction, but also set a target ranging from 1.5º C, well-below 2º C, 1.5º C/well-below 2º C or 2º C. Of this group, half of the companies are from Europe, 36% are from Asia and 10% are from North America. Over 750 companies in Japan have signed up, followed by the UK (470 companies) and the U.S. (279 companies). Furthermore, it's not just companies within the high emitting sectors that are signing up, but rather a broad mix across sectors. With an increased focus on climate change over the past twelve months, coupled with governmental recovery packages linked to 'green' policies, we assume the number of sign-ups will further accelerate in the next 24 months.

Companies that commit to these targets tend to have higher gross profitability, which in itself is a sign of quality. Comparing the standardized gross profitability score of a global equity universe and then de-constructing it into companies that have made the commitment we find that committed companies almost entirely exhibit higher gross profitability (with a few outliers being the exception). Committed companies also have lower carbon emissions than their peers and empirical evidence shows that they also have lower carbon emissions one year and two years into the future, suggesting that making the commitment helps to achieve the goals.

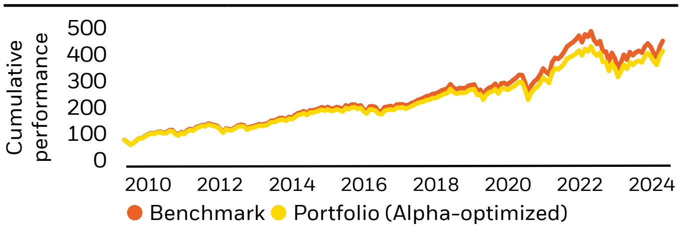
6 The Science Based Targets initiative (SBTi) 2024. https://sciencebasedtargets.org/target-dashboard.

Systematic equity strategies

The next step is to combine all the minimum guidelines into an equity portfolio while maximising climate aware alphas alongside the ESG score. Incorporating Social and Governance aspects alongside Environmental issues is in accordance with the spirit of the Paris Agreement in terms of preserving the planet for all global citizens. Failing good governance or creating social injustice would harm poorer countries more than affluent nations and by achieving a better aggregated ESG score our portfolio would avoid this potential inequality. A systematic equity strategy can be constructed using an optimisation approach with a low tracking error (of 1%) on three universes: MSCI World, MSCI World Small Cap and MSCI Emerging Markets. The goal is to spend the tracking error budget on maximising the portfolio level ESG score (60% weighting) alongside the three climate-aware alphas: 20% into carbon resource efficiency, 10% into green patents to assets and 10% into corporate target setting. The portfolios additionally incorporate exclusionary screens, the decarbonization rates and a zero underweighting of high impact sectors as described earlier. The charts to the right show the simulated performance of Paris-aligned equity exposures versus the underlying benchmarks. All three outperform their respective benchmarks, driven by the addition of the climate-aware alphas with information ratios ("IRs") of 0.54 (MSCI World), 0.23 (MSCI World Small Cap) and 0.58 (MSCI Emerging Markets) shown in the table on page 8.

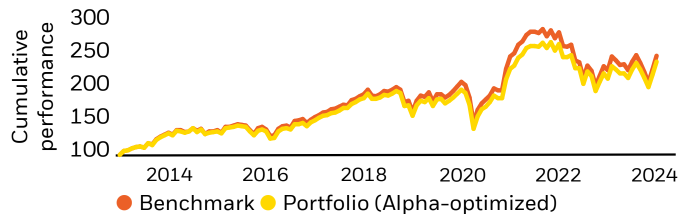
Cumulative performance – Large cap equities[7]

	BM	Portfolio
2019	26.50%	29.15%
2020	16.16%	18.72%
2021	22.50%	24.55%
2022	-18.75%	-21.10%
2023	18.67%	17.67%



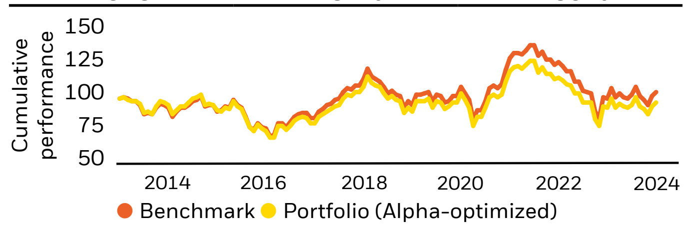
Cumulative performance – Small cap equities[7]

	BM	Portfolio
2019	25.18%	27.74%
2020	15.88%	18.29%
2021	16.25%	14.94%
2022	-19.54%	-20.26%
2023	11.68%	9.45%



Cumulative performance – Emerging equities[7]

	BM	Portfolio
2019	15.18%	14.69%
2020	16.04%	20.14%
2021	-3.48%	-2.76%
2022	-20.33%	-21.67%
2023	4.31%	4.89%



The figures shown relate to simulated past performance. Past performance is not a reliable indicator of current or future results and should not be the sole factor of consideration when selecting a product or strategy. Index performance returns do not reflect any management fees, transaction costs or expenses. Indices are unmanaged and one cannot invest directly in an index.

7 The model is shown for informational purposes only. It is not meant to represent actual returns of, or to be a prediction or projection, of a Paris-aligned equity strategy. It is provided to illustrate how a Paris-aligned equity strategy may provide a similar level of risk and return as a market cap weighted benchmark, while aligning with the Paris Agreement. Actual returns may vary. The model is based purely on assumptions using available data, based on past and current market conditions, and assumptions relating to available investment opportunities, each of which are subject to change. The underlying assumptions in the model do not include all assumptions that may have been applied to a particular model, and the model itself does not factor in every performance factor that can have a significant impact on Paris-aligned equity strategies. Since many potential scenarios exist, it is impossible to show all the potential circumstances that could yield similar results. Actual events will vary and may differ materially from those assumed.

The model is subject to significant limitations. It cannot account for the impact that economic, market, and other factors may have on the implementation of an actual investment. In addition to the variables identified above, the return of any portfolio will vary materially from the return shown based on numerous factors including, but not limited to, market conditions, the specific securities in the portfolio, and any unforeseen events, among others.

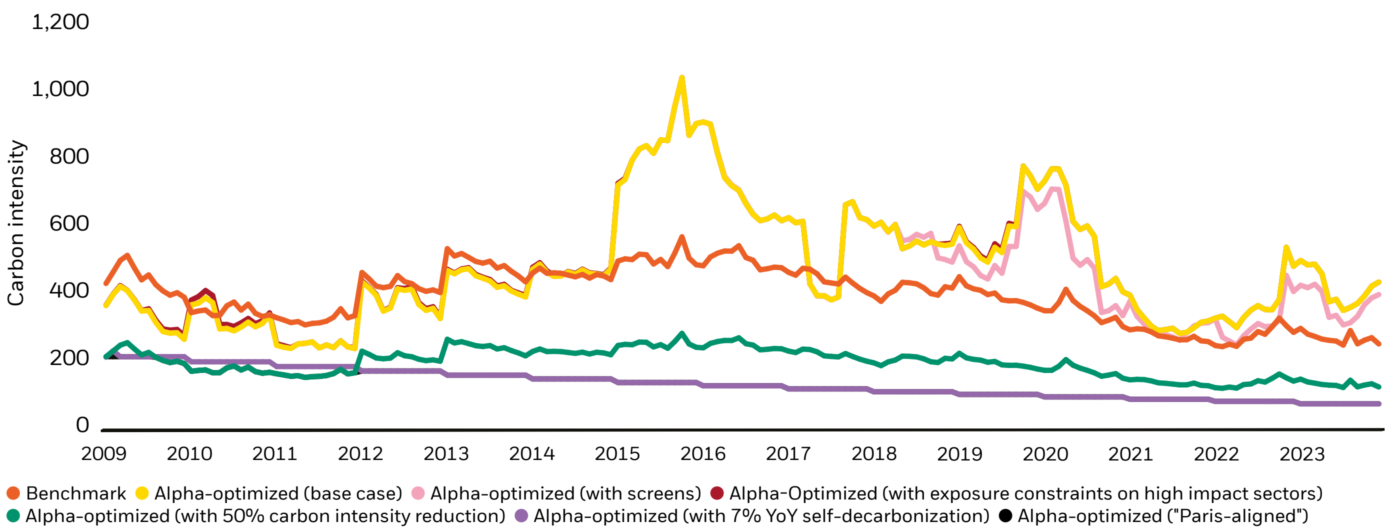
The model's simulated performance also has inherent limitations. The results do not represent actual trading, and thus may not reflect material economic and market factors such as corporate actions, liquidity constraints or risk management processes that may have had an impact on our actual decision-making. No representation is made that a client account will achieve results similar to those shown, and performance of actual client accounts may vary significantly from the hypothetical results due to the customization of advice to each client and other factors.

Paris-aligned equities simulation summary

	Tracking error (ex-ante)	Tracking error (ex-post)	Excess return (net of fees)			IR (since inception)
			3-year (annualized)	5-year (annualized)	Since inception (annualized)	
MSCI World	1%	1.24%	-0.57%	0.54%	0.62%	**0.50**
MSCI World small cap	1%	1.46%	-1.31%	0.05%	0.36%	**0.25**
MSCI EM	1%	1.33%	-0.12%	0.57%	0.75%	**0.56**

Source: BlackRock, MSCI as of 12/31/2023.
The figures shown relate to simulated past performance. Past performance is not a reliable indicator of current or future results and should not be the sole factor of consideration when selecting a product or strategy. Index performance returns do not reflect any management fees, transaction costs or expenses. Indices are unmanaged and one cannot invest directly in an index.
Net of fee returns represent a portfolio with a management fee of 0.11% per annum — a typical fee for a large institutional separate account. Performance for the MSCI World simulation covers the period 12/31/2008-12/31/2023. Performance for the MSCI World Small Cap and MSCI EM simulations cover the period 12/31/2012-12/31/2023.

Carbon intensity – MSCI World universe



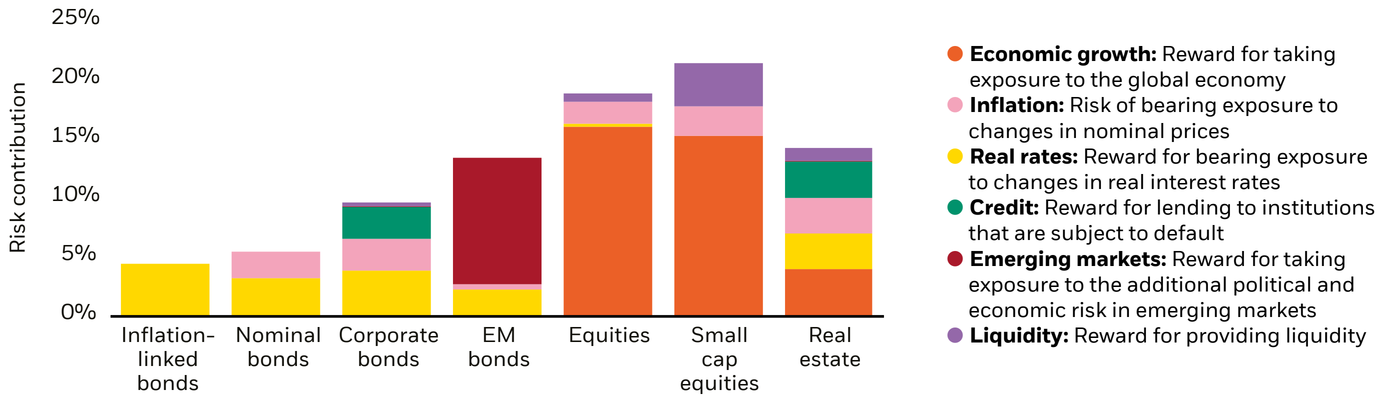
Source: BlackRock, MSCI, as of 12/31/2023. Charts show the average carbon intensity (measured as total emissions to enterprise value) of simulated portfolios over time. The benchmark is the MSCI World Index. Portfolios are long-only, target 1% annualized tracking error, and enforce constraints on security, country and industry exposure. The "Base Case" portfolio does not include any additional constraints. The "With Screens" portfolio excludes securities based on a custom Paris-aligned exclusion list (see below for additional details). The "50% reduction" portfolio applies a constant 50% reduction relative to the benchmark with the "7% self-decarbonization" portfolio just decarbonizes 7% year-on-year from inception. Finally, the "Paris-aligned" portfolio, includes all of these concepts (discussed in length throughout the paper). Analysis period: Jan 2009–December 2023.

At the same time, a clear pathway in reducing carbon emissions is required. While our base year of starting that pathway is 2020, we can look at a back-tested pathway to better understand the effects of exclusionary screens, decarbonization rates and climate-aware alphas in their contribution to reducing portfolio level carbon emissions. In the chart above, we plot the carbon emission intensity of a global equity portfolio versus its benchmark.

There is no guarantee that the carbon emission intensity will be lower than the benchmark just by optimising ESG scores and actually, as demonstrated above, it is indeed higher over the past several years. Adding exclusions does reduce the carbon intensity but again does not guarantee a reduction versus the benchmark at all times. The starting reduction in carbon emissions is significant, but lacks the effect of a pathway which is demonstrated in the previous charts by comparing it to the year-over-year self-decarbonization. Each minimum standard contributes to achieving a Paris-aligned portfolio but leaving out any of the components would result in the portfolio failing in its Paris-alignment goal.

Next steps for Paris-aligned multi-asset investing

Sample risk factor decomposition



Source: BlackRock, December 2023. This information demonstrates, in part, the firm's hypothetical risk/return analysis. This material is provided for illustrative purposes only and is not intended to be investment advice or a recommendation to take any particular investment action.

The movements of global asset class returns can be summarized by macro factors. These macro factors have three fundamental characteristics: (1) they help explain the majority of the variability in asset class returns; (2) historically, they have been rewarded over long-term investment horizons due to an undiversifiable risk premium; and (3) they are economically intuitive. Research shows that, across multiple asset classes, six fundamental macro-economic factors explain the majority of asset class variability: economic, inflation, real rates, credit, emerging markets and liquidity.

Isolating risk premia

To construct a factor-led multi-asset portfolio, each macro factor can be modelled by identifying an intuitive, investable, factor-mimicking portfolio that provides relatively isolated exposure to the macro factor. To do this, highly liquid, market beta investment instruments can be used across multiple asset classes. For example, emerging markets can be modelled by taking a basket of emerging market securities and stripping away the equivalent developed market exposure.

Economic growth

DM equities, listed estate, commodities

Inflation

Nominal bonds vs. inflation-linked bonds

Real rates

Inflation-linked bonds

Credit

Investment grade and high yield bonds vs. nominal bonds

Emerging markets

EM equity vs. DM equity, EM debt vs. DM debt

Liquidity

Small cap vs. large cap equity, VIX futures, commodity volatility

Source: BlackRock, December 2023. This chart displays the asset classes used to gain factor exposures. This material is provided for illustrative purposes only and is not intended to be investment advice or a recommendation to take any particular investment action.

Implementation

Having established the macro factor informed framework and the target asset classes for each individual factor mimicking portfolio, the final step is to determine the most efficient way to implement the portfolio. The criteria we utilize when selecting investable instruments include cost, liquidity, market beta, return characteristics and diversification benefits. Traditionally, this has led us to gain exposure to the various asset classes using derivative instruments on widely recognized market-cap weighted indices which offer the optimal beta characteristics and are transparent, liquid and cost-effective. Ultimately, the chosen instruments ensure maximum portfolio efficiency and allow us to deliver our macro factor insights with precision.

The big challenge when building a Paris-aligned multi-asset strategy is how to move from traditional market-cap weighted exposures to Paris-aligned equivalents, while staying true to an investment philosophy of maximizing return in tandem with high liquidity and low cost? One solution is a blended approach which uses the equity methodology detailed in this paper for select asset classes, in combination with leveraging derivative instruments on third party indices for other asset classes where that is the most liquid and cost-effective method.

The table below is an illustrative example of how various asset classes can be Paris-aligned.

The alignment imperative

We believe the aim of alignment with the Paris Agreement is critical not only to companies, countries and society, but also to investors who are looking to build sustainable portfolios. We have demonstrated how equity strategies can be futureproofed by aligning with the Paris Agreement, thus mitigating climate risk and benefitting from climate aware opportunities that can generate excess returns.

The focus of this paper has been on equities, but other asset classes also need to be addressed. For a truly Paris-aligned multi-asset portfolio transitioning one or two asset classes is not enough.

Research shows that a similar approach can be applied to corporate bond and listed real estate exposures with an equivalent outcome. For sovereign bond exposures, alignment can be achieved by tilting into countries that have made more substantial progress towards their nationally determined contributions (NDCs) and finally in commodities to invest in those that are deemed essential for the transition to a greener economy and have lower emissions per unit of output.

An illustrative example of a Paris-aligned multi-asset portfolio

Asset class	Instrument	Paris-aligned approach
Equity		
Developed equity	Physical equities	Custom strategy using the approach discussed in this paper (meeting the EU Technical Expert Group's Paris-aligned guidelines)
Developed small cap equity	Physical equities	
Emerging equity	Physical equities	
Fixed income		
Inflation linked debt	Physical bonds	Custom strategy using guidelines set out by the Institutional Investors Group on Climate Change Net Zero Investment Framework and incorporate green bonds
Developed sovereign debt	Bond futures	
Emerging sovereign debt (Rates)	Interest rate swaps	
Emerging sovereign debt (Credit)	Credit default swaps	
Investment grade credit	Physical bonds and/or total return swaps	Custom strategy using the EU Technical Expert Group's Paris-aligned guidelines and/or third-party Paris-aligned indices which follow the same guidelines and incorporate green bonds
High yield credit		
Alternatives		
Property	Total return swaps	Third party Paris-aligned indices which follow the same guidelines
Commodities	Total return swaps/Futures	Custom strategy using guidelines set out by the Institutional Investors Group on Climate Change Net Zero Investment Framework
Volatility Strategies	Total return swaps/Futures	N/A

Source: BlackRock, as of December 2023. The table shows approaches that could be taken across asset classes by an investor when building a Paris-aligned, multi-asset portfolio. This information should not be relied upon as research, investment advice, or a recommendation regarding any products, strategies, or any security in particular. This is for illustrative and informational purposes and is subject to change. It has not been approved by any regulatory authority or securities regulator. The environmental, social and governance ("ESG") considerations discussed herein may affect an investment team's decision to invest in certain companies or industries from time to time. Results may differ from portfolios that do not apply similar ESG considerations to their investment process.

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