Climate Bond Investing — Reduce the Carbon, Fund the Transition

STATE STREET GLOBAL ADVISORS

Reduce the Carbon, Fund the Transition

We believe climate change is one of the biggest risks in investment portfolios today. In our view, these risks impact a vast number of segments and industries — not just the obvious polluters.

But we believe with climate risk also comes tremendous investment opportunity, as the economy reworks against the impact of climate change.

We have developed a range of highly effective solutions to help investors who seek to make a material improvement to their carbon profile, while benefiting from our state-of-the art indexing portfolio management approach which balances diversification, turnover and tracking error objectives.

For investors seeking to align portfolios with the Paris Agreement goals and the transition to a low-carbon economy, we offer a variety of options.

Meeting the Climate Challenge

To construct a robust and future-proof climate strategy, looking at headline carbon footprint numbers alone is not enough. In order to assess the real exposure to climate-related risks, including those further along the value chain, we believe climate solutions should take a number of factors into account.

Carbon Intensity	A relative measure that considers a company's carbon emissions in relation to its output.
Fossil Fuel Reserves	Connecting a company's operations to the risks of stranded assets and associated potential write offs.
Brown Revenues	Exposure to activities associated with the extraction of non-renewable energy sources.
Norms-Screening	Combining multiple data sources and applying norms-based ESG screening related to controversial product and conduct involvement.
Green Bonds	Bonds issued specifically to fund projects and activities that have environmental or climate benefits.
Preparedness	Assessment of climate change preparedness.

When these factors are integrated, the portfolio composition can be changed to be aligned with increasingly important standards, such as the Paris Accord.

Solutions That Deliver

Whether driven by regulation, a desire to reduce risk or by stakeholder pressure, investors around the world are increasingly looking to adopt solutions that enable them to mitigate the carbon risk profile of their portfolio.

But we know that carbon reduction alone is not sufficient. Investors are looking for solutions that not only deliver on carbon but also give them the returns they need.

With these requirements in mind, we've developed a range of solutions that give investors the tools they need to help them meet their objectives, whatever the stage of their ESG journey and with the goal of not jeopardizing the return objectives.

Sustainable Climate Bond Strategy

This breakthrough strategy offers the opportunity to effectively target climate change. Aims to achieve results through a powerful mix of mitigation of current climate risks and adaptation to future opportunities.

The State Street Sustainable Climate Bond Strategy uses a mitigation + adaptation methodology to build climate change thematically into fixed income portfolios while tracking the performance of the index as closely as possible using a Stratified Sampling approach, and holding a subset of securities included in the index which adhere to certain ESG criteria. Designed from the ground up to be flexible, the customizable framework allows us to create client portfolios that target reductions in current and future carbon emissions, increase exposure to green revenues and increase resiliency to the physical risks posed by climate change.

The Strategy is designed to capture the goals stemming from the landmark 2015 Paris Accord aims of limiting global warming to well below 2 degrees Celsius above pre-industrial levels, and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius. It's designed for investors who wish to prepare their portfolios for the transition to a low-carbon economy, in a scalable and risk-aware way.

The State Street Sustainable Climate Bond Strategy applies a framework that is also flexible, meaning that those investors seeking a customized portfolio can do so, subject to other investability considerations also being met (e.g. diversification, turnover and tracking error objectives). For example, an investor may seek to apply alternative data sources and targets than those applied in the standard framework. We have extensive experience in partnering with our client's to design tailored solutions and will be happy to share additional case study examples should this be of interest.

Addresses Climate Risk on Multiple Fronts

To target net carbon emission reductions in the portfolio, the Strategy uses both mitigation and adaptation, reallocating capital away from companies with high current carbon emission intensity, embedded fossil fuel reserves and brown revenues, and direct capital towards green bonds, climate-aligned issuers and companies that are positioned to benefit from the transition to the low-carbon economy based on their ratings for climate adaptation. In addition, the strategy applies a screen to securities based on an assessment of their adherence to ESG criteria (i.e. international norms in relation to environmental protection, human rights, labour standards, anti-corruption, controversial weapons and tobacco).

Mitigation + Adaptation

Objectives	**Minimize** Carbon Emissions	**Minimize** Fossil Fuel Reserves	**Minimize** Brown Revenues	**Minimize** ESG Risks	**Build** Resilient Portfolio	**Maximize** Green Bonds & Green Proceeds
Metrics	CO_2 Emissions per $M Revenues	Embedded CO_2 per $M Revenues	% Revenues from Extractive Activities	Screens on Multiple Dimensions: UN Global Compact Principles, Controversial Weapons, Swedish Ethical Council, Severe Controversies, R-Factor™ Laggards, Thermal Coal, Artic Oil & Gas, Oil Sands and Tobacco	Score on Climate Change Preparedness	Securities that are present in the Climate Bonds Initiative Labelled Green Bonds and Climate-Aligned Database.

Source: State Street Global Advisors, as of May 2023. For illustrative purposes only.

Delivers Across the Board

Designed to capture the goals of the Paris Agreement in a fixed income framework by constructing a portfolio (relative to the index) that aims to lower current and future emissions, maximise investment in green bonds, and target companies that are positioned to benefit from the transition to the low-carbon economy based on their ratings for climate adaptation.

Screening out companies that do not meet international norms in relation to environmental protection, human rights, labour standards, anti-corruption, controversial weapons and tobacco.

Leverages Multiple Data Sources Given the multifaceted objectives of the Strategy, our framework integrates data from leading providers: S&P Trucost (carbon emission intensity, fossil fuel reserves and brown revenues), Sustainalytics and MSCI (for product and controversy involvement screening), Climate Bonds Initiative (green bonds and climate-aligned issuers), ISS ESG (adaptation) and R-Factor™ (for identified ESG laggards using an ESG rating based on the SASB ESG risk materiality framework). The selected data helps isolate with precision the climate parameters we target.

Meets Client Objectives Flexibly We designed the Strategy framework so that it could be customized to meet each investor's needs in terms of climate priorities, desired benchmark, tracking-error budget and exclusions.

2.5x

or greater increase in green bonds aligning to the green bond standards and taxonomy defined by the Climate Bonds Initiative.

-95%

decreased Brown Revenue exposure and Embedded Fossil Fuel Reserves. Metric tons.

70%+

or greater reduction of direct and first-tier indirect emissions. Metric tons CO_2e/$M revenues.

Source: SSGA, as of May 2023. The above targets are estimates based on certain assumptions and analysis made by SSGA. There is no guarantee that the estimates will be achieved. These are examples of the constraints applied to a World equity portfolio. These constraints are applied at the quarterly rebalance.

Climate Indexes

There is an ever-growing array of ESG indexes, providing greater choice for investors to target the type of sustainable outcome that optimally aligns with their objectives across asset classes and asset managers. ESG indices offer systematic rules that define the eligible investment universe therefore ensuring greater consistency on what securities are eligible for inclusion in both the portfolio and benchmark based on both market and ESG criteria.

State Street Global Advisors is experienced in managing portfolios to a broad range of low-carbon and climate thematic indices, including the EU Paris-Aligned Benchmarks (PABs) and Climate Transition Benchmarks (CTBs). The establishment of these benchmarks within the EU regulation is also an acknowledgement of the importance of redirecting index-invested assets in addressing the climate challenge. With strict minimum requirements they deliver a comprehensive and structured index approach to addressing climate change.

EU CTBs and PABs are investment benchmarks that incorporate specific objectives aimed at the reduction of Greenhouse Gas (GHG) emissions and the transition to a lower-carbon economy. They were first introduced in 2019 as tools to accompany the transition to a low-carbon economy by the Technical Expert Group of the European Commission. The recommendations in the TEG Report for PABs and CTBs was then incorporated into the EU Low Carbon Benchmark Regulation in December 2020. PABs are more stringent than their CTB counterpart in both their opening decarbonisation requirements and the baseline exclusions of oil and gas exploration, coal and fossil fuel energy production. CTBs are typically more aligned to their parent index in terms of eligible constituents and may be better suited for investors who do not wish to extend as far as committing to a PAB now, but who are willing to commit to a more measured climate thematic index-replacement strategy.

Who Uses Them?

Benchmark	Main Users
Climate Transition Benchmarks (EU CTB) The benchmark portfolio is on a decarbonization trajectory.	Intended to be institutional investors such as pension funds and (re) insurance companies with the objective of protecting a significant share of their assets against various investment risks related to climate change and the transition to a low-carbon economy, labelled as transition risks by the Task Force on Climate-Related Financial Disclosures.
Paris-Aligned Benchmarks (EU PAB) The benchmark portfolio's greenhouse gas emissions are aligned with the long-term global warming target of the Paris Climate Agreement.	Intended to be institutional investors who wish to display more urgency than CTB investors and want to be at the forefront of the immediate transition towards a +1.5°C scenario.

There are a growing range of providers offering Paris-Aligned Corporate Bond benchmarks including but not limited to Bloomberg, FTSE Russell, MSCI, S&P iBoxx, and Solactive. While the indices may be similar in their overall objectives, the indexes differ quite materially in terms of not only their construction methodologies but also very importantly in terms of the data sources and data inputs used. As such, it is important that investors look deeply at these so they can understand the impact they have on the resulting benchmark exposures, its characteristics and also performance. For further information on examples of options that exist in the market for fixed income investors to allocate towards CTBs and PABs, please see understanding-paris-aligned-indexes-fi-insights (ssga.com).

Low-Carbon Corporate Bond Strategy

Fully customizable corporate bond exposure with client-selected carbon reduction target range. Seeks to maintain benchmark characteristics while transforming the carbon profile of corporate bond portfolios.

We are helping investors understand, control and benefit from the quantifiable trade-offs between carbon reduction and tracking error in their fixed income portfolios. Most importantly, we are demonstrating that significant improvements in carbon profile can be achieved with minimal impact to credit quality or interest-rate risk relative to corporate bond benchmarks.

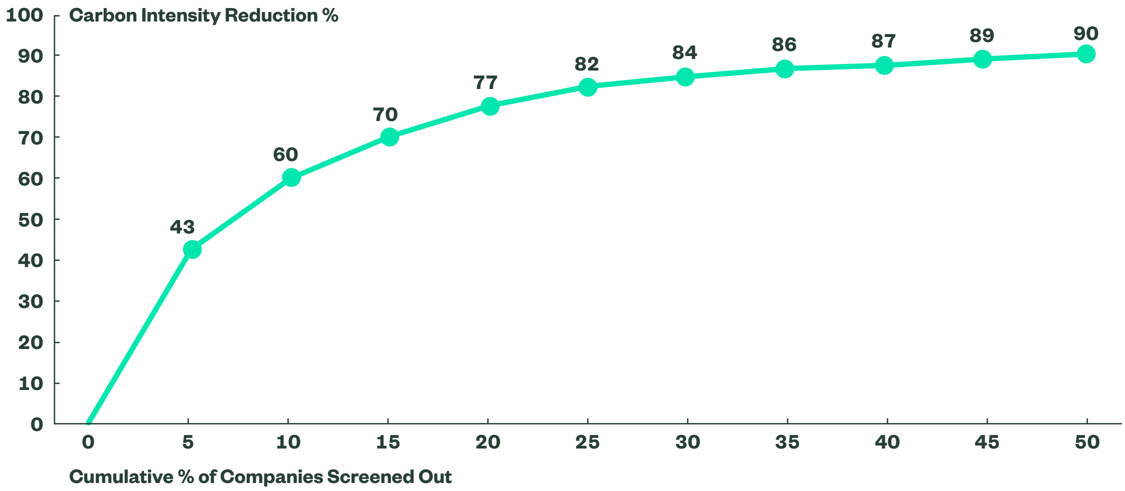
The State Street Low-Carbon Corporate Bond Strategy seeks to create customized portfolios with a lower carbon footprint and similar returns to the performance of the client's selected fixed income benchmark. The strategy is available now to help investors reach their goals for reducing carbon emissions without compromising their investment objectives.

Reducing Carbon Without Compromises

The Low-Carbon Corporate Bond Strategy is the product of our extensive research into creating reliable, high-quality data about the carbon intensity of the corporate bond universe. We've taken the best of our research and our new data framework to develop our Strategy into an effective tool for investors looking to transform the carbon profiles of their fixed income portfolio.

Our Strategy can create customized portfolios that have significantly lower carbon footprints but nonetheless produce similar returns to their selected fixed income benchmarks.

Hitting the Sweet Spot



Source: Sustainalytics, Trucost, POINT and State Street Global Advisors, as of May 2023. Baseline universe: Bloomberg Euro Corporate Bond Index. For illustrative purposes only.

Carbon emissions are concentrated among a relatively small percentage of bond issuers. This means that a corporate bond portfolio's carbon footprint can be reduced by more than 80% by excluding the top quartile of the heaviest polluters.

Based on our data, many investors have expressed interest in 15% screening, which results in a 70% reduction in carbon intensity with only minimal deviation from the Bloomberg Euro Corporate Bond Index. Within this range, there is also relatively low impact on credit quality and interest-rate risk exposure.

A Practical Approach

Customizable Based on the targeted carbon reduction, climate resilience objectives and the index used as the benchmark.

Bespoke Constraints We work with clients to add additional screens, such as non-compliance with the UN Global Compact.

Keeps Costs Down Liquidity, turnover and transaction costs are paramount. The Low-Carbon Corporate Bond Strategy aligns well with these concerns.

Low Administration Achieved with low levels of exclusions, investors don't need to renormalize and rebalance large portions of the portfolio.

New Issuances We look to minimize transaction costs by participating in new bond issuances where possible.

Climate Bond Investing and State Street Global Advisors

Our Investment Philosophy

As part of State Street Corporation, whose mission is to create better outcomes for the world's investors and the people they serve, we invest responsibly to enable economic prosperity and social progress. As a fiduciary, we have an obligation to put our clients' long-term interests first.

To be effective in fulfilling this obligation, we need to consider all factors that have a material impact on long-term value creation. This includes material ESG factors, which we believe can affect the performance of investments to varying degrees across companies, sectors, regions, asset classes, and through time.

Capabilities

State Street's Fixed Income Platform has the infrastructure, tools and capabilities to help investors to implement their ESG preferences and values in a variety of ways — either through the index itself (e.g. a third-party provided ESG index) or as part of complete portfolio construction through screens, tilts or optimized approaches. We build both index and active fixed income portfolios for clients with ESG-values-based or outcome-oriented objectives. We also have a strong track record in the design and management of fully bespoke indexed and active solutions for institutions within their separately managed accounts.

Trusted

20+

dedicated specialists for ESG data and research

10+

ESG rating and data providers

45+

Fixed Income Responsible Investment Solutions. Including: Climate Thematic, Negative ESG Risk Screening, Best-in-Class, Green Bonds, and Bespoke ESG Strategies.

Further Information

We're now one of the world's largest ESG managers.*. Our research is leading the way in developing effective climate solutions for the industry and we're a recognized leader in asset stewardship and corporate governance.

To learn more about how our climate-focused strategies could help you meet your investment goals please contact your State Street Global Advisors representative or email us at **ssga_insightsemea@ssga.com.**

To discover more on our range of Fixed Income Solutions please visit **Fixed Income Reimagined**.

* Source: Opimas, January 2023.

About State Street Global Advisors

For four decades, State Street Global Advisors has served the world's governments, institutions and financial advisors. With a rigorous, risk-aware approach built on research, analysis and market-tested experience, we build from a breadth of index and active strategies to create cost-effective solutions. And, as pioneers in index, ETF, and ESG investing, we are always inventing new ways to invest. As a result, we have become the world's fourth-largest asset manager* with US $3.62 trillion† under our care.

* Pensions & Investments Research Center, as of December 31, 2021.
† This figure is presented as of March 31, 2023 and includes approximately $65.03 billion USD of assets with respect to SPDR products for which State Street Global Advisors Funds Distributors, LLC (SSGA FD) acts solely as the marketing agent. SSGA FD and State Street Global Advisors are affiliated. Please note all AUM is unaudited.

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