

Providing Index Solutions to EU SFDR Article 9 Requirements with the S&P Paris-Aligned Indices

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Executive Summary

Guidance published by the European Supervisory Authorities (ESAs) in May 2023,¹ has clarified the position for active and passive Article 9 financial products using an EU Paris-aligned Benchmark (PAB) or an EU Climate Transition Benchmark (CTB). The pertinent regulatory guidance in the Q&As relating to Article 9 financial products was twofold.

- On Nov. 17, 2022, the ESAs clarified that when an Article 9 financial product has sustainable investment as its objective, the designated index that has been selected as a reference benchmark cannot be a broad market index.² As of March 2023, there were nearly 900 Article 9 funds.³ If these funds are benchmarked against a broad market-cap-weighted index, they will need to take action and identify an “objective-aligned” benchmark (9.1) or a PAB (9.3), if they are to maintain their Article 9 status.
- On May 17, 2023, the ESAs stated that passive financial products that track a PAB or CTB are deemed to have a sustainable investment objective; therefore, such financial products can be categorized as Article 9.¹

¹ [Consolidated questions and answers \(Q&As\) on the SFDR \(Regulation \(EU\) 2019/2088\) and the SFDR Delegated Regulation \(Commission Delegated Regulation \(EU\) 2022/1288\)](#). May 17, 2023. EBA, EIOPA, ESMA, Joint Committee of the European Supervisory Authorities.

² [Questions and answers \(Q&A\) on the SFDR Delegated Regulation \(Commission Delegated Regulation \(EU\) 2022/1288\)](#). Nov. 17, 2022. EBA, EIOPA, ESMA, Joint Committee of the European Supervisory.

³ Bioy, Wang and Carabia. [SFDR Article 8 and Article 9 Funds: Q1 2023 in Review](#). Morningstar. 2023. "Article 9 fund downgrades dwindle to a trickle and are likely over."

The [S&P PACT™ Indices \(S&P Paris-Aligned & Climate Transition Indices\)](#) offer a broad, diversified, beta-like exposure. Importantly, the indices seek to eliminate exposure to significant fossil-fuel-based energy (as defined by the EU's minimum standards for PABs in the Low Carbon Benchmark Regulation (LCBR)),⁴ overcoming the “tracking error lock”⁵ to fossil fuel energy and broad benchmarks if the broad market does not transition. In order to comply with the LCBR, the S&P Paris-Aligned Indices aim to incorporate the following climate objectives:

- To underweight or remove the Energy sector;
- To have defined net zero pathways;
- To reduce forward-looking transition and physical risks; and
- To address climate objectives and get ahead of emerging sustainability trends.

A similar framework is also utilized in our [iBoxx EUR Corporates Net Zero 2050 Paris-Aligned ESG Index](#), with appropriate features for fixed income indices.⁶

This paper provides an overview of the Article 9 fund market as it stands, insight into how the S&P Paris-Aligned Indices work and the exposures they exhibit from both climate and more traditional risk factor perspectives.

Article 9: Defined Inflows and Organic Growth

“Dark green” Article 9 funds have fared well relative to their “light green” Article 8 counterparts with respect to assets under management and growth. In 2022, Article 8 funds saw net outflows over the year, while Article 9 funds saw consistent inflows for each quarter, with EUR 5.1 billion of inflows in Q4 alone.³ When considering growth of flows relative to assets, Article 9 funds have seen greater growth compared with Article 8 funds month-over-month since the introduction of the Sustainable Finance Disclosure Regulation (SFDR) in March 2021.³ Combined, these seem to evidence investor preference for the dark green Article 9 products over their Article 8 counterparts.

As of March 2023, there were 887 European Article 9 funds (3.6% of all funds by count), down from 1,080 in September 2022, largely due to the number of downgrades to Article 8 observed in Q4 2022.³

⁴ [Regulation \(EU\) 2019/2089 of the European Parliament and of the Council of 27 November 2019](#) and [Commission Delegated Regulation \(EU\) 2020/1818 of 17 July 2020](#)

⁵ As defined by Andreas Hoepner in Verney, Paul, "[EU regulators: Article 9 funds cannot be benchmarked to 'broad market' indices](#)," *Responsible Investor*, Nov. 18, 2022.

⁶ Please see Shulman, Smadar, [How to Bring Paris Agreement Goals to Fixed Income Indices](#), Indexology® Blog, Sept. 27, 2022, for more information.

S&P Paris-Aligned Indices Go beyond the EU's Minimum Standards for PABs

The S&P Paris-Aligned Indices meet the EU's minimum requirements for PABs, as per the LCBR (see Exhibit 1). Among the criteria is the 7% year-over-year decarbonization pathway starting from a 50% initial carbon intensity reduction relative to the underlying benchmark in the base year, in alignment with the Intergovernmental Panel on Climate Change (IPCC) 1.5°C scenario with no or limited overshoot. Exhibit 2 visualizes this pathway in different Network for Greening the Financial System (NGFS) climate scenarios⁷ overlaid, highlighting that an EU PAB-aligned framework appears to be well aligned with even the most ambitious scenarios. The S&P Paris-Aligned Indices are also subject to an exposure constraint in order to prevent heavy overweighting toward the least carbon intensive sectors, hence mitigating potential greenwashing.

The S&P Paris-Aligned Indices also integrate the LCBR minimum standards by excluding coal, oil and natural gas companies using revenue thresholds of 1%, 10% and 50%,⁸ respectively—a threshold standard that no S&P 500[®] Energy company meets as of June 30, 2023. These exclusions are consistent with the lower end of the expected drops in use for coal, oil and gas to meet the IPCC 1.5°C scenario with no or limited overshoot (see Exhibit 10).

However, the S&P Paris-Aligned Indices implement features that go beyond the EU's minimum standards (see Exhibit 11). These features include integrating recommendations from the Task Force on Climate-Related Financial Disclosure (TCFD) and incorporating transition risk, physical risk and climate opportunities. Forward-looking S&P Global Trucost climate data are also incorporated,⁹ and are strongly linked to constituent weighting in the indices (see Exhibit 12).

⁷ As defined by the [NGFS Scenarios](#).

⁸ [EU Technical Expert Group \(TEG\) Final Report on Climate Benchmarks and Benchmarks' ESG Disclosures](#). September 2019

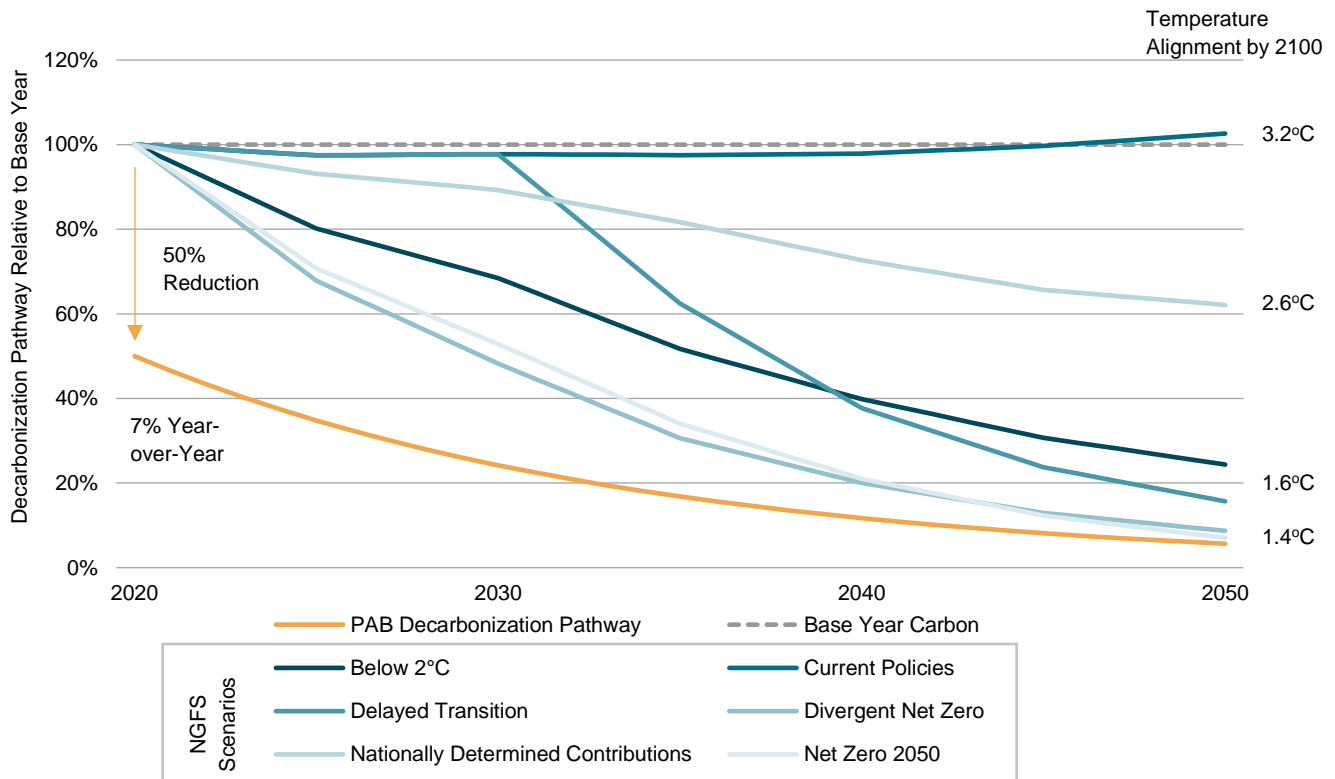
⁹ S&P Global Trucost has a long history of modeling climate risks, launching the first portfolio carbon audit for asset managers in 1999.

Exhibit 1: Minimum Standards for EU PAB

IPCC 1.5°C Aligned, with No or Limited Overshoot	Exposure Constraints	Exclusions
<ul style="list-style-type: none"> 7% year-over-year greenhouse (GHG) intensity reduction 50% GHG intensity reduction (including Scopes 1, 2 and 3 for GHG emissions) relative to the underlying benchmark 	<ul style="list-style-type: none"> Minimum exposure to high climate impact sectors at least equivalent to underlying benchmark (equity indices only) 	<ul style="list-style-type: none"> Controversial weapons Tobacco Fossil fuels: <ul style="list-style-type: none"> Coal (>1% revenues) Oil (>10% revenues) Natural gas (>50% revenues) Highly GHG-intensive electricity production Violations of the UN Global Compact and the Organisation for Economic Co-operation and Development

Source: S&P Dow Jones Indices LLC, [EU TEG Final Report](#) and LCBR. Data as of July 17, 2020. Chart is provided for illustrative purposes.

Exhibit 2: 7% Year-over-Year Paris-Aligned Benchmark GHG Intensity Reduction Pathway Appears Compatible with NGFS Scenarios



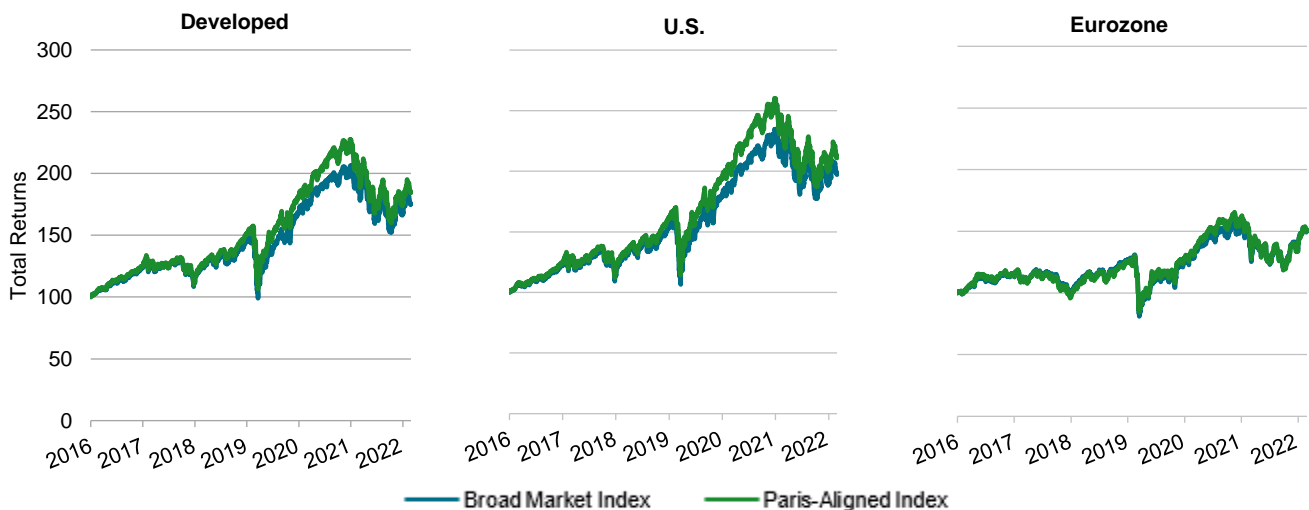
Source: S&P Dow Jones Indices LLC and [NGFS Scenarios Portal](#). Data as of June 30, 2023. Chart is provided for illustrative purposes.

S&P Paris-Aligned Indices Weights and Historical Performance Characteristics

The index design for the S&P Paris-Aligned Indices allows for broad and diversified exposure, with performance that has historically not been too dissimilar from the broad market. The S&P Paris-Aligned Indices for developed markets, eurozone and the U.S. have all historically slightly outperformed their broad market peers (see Exhibits 3 and 4).

Exhibit 3: Financial Metrics of S&P Paris-Aligned Indices versus Their Underlying Broad Market Indices

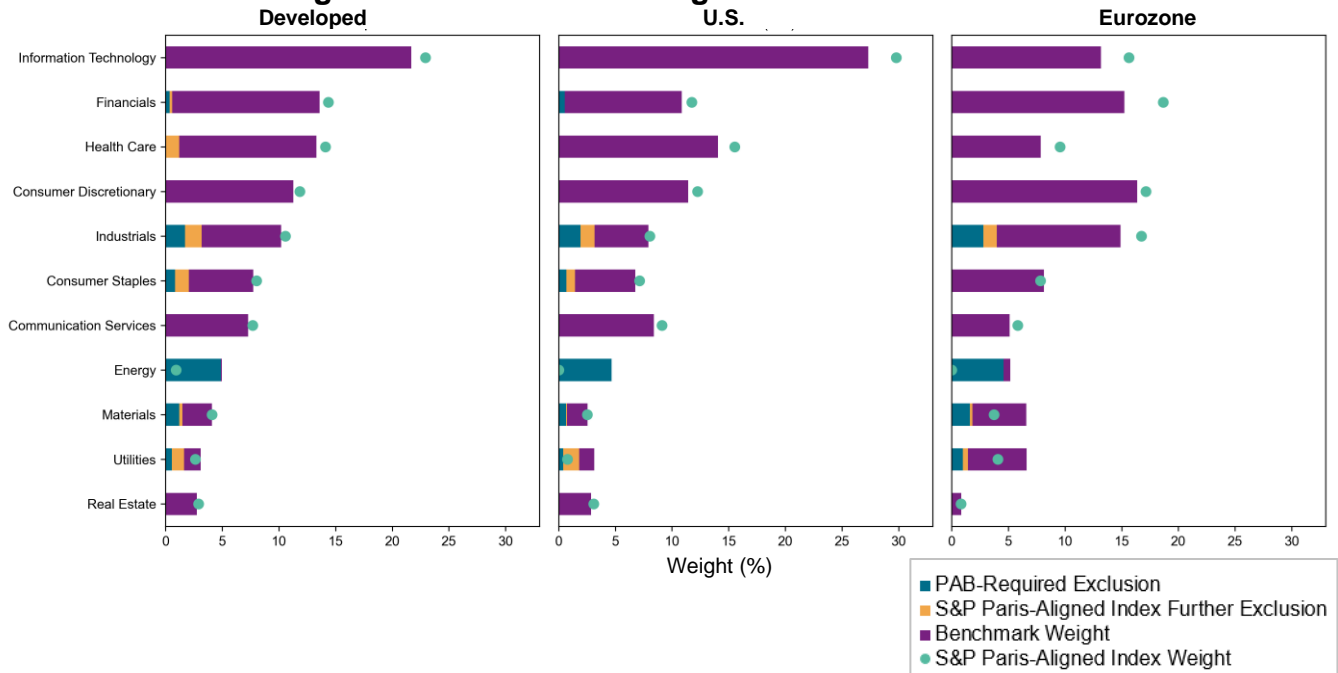
Metric	Developed		U.S.		Eurozone	
	Broad Market	Paris-Aligned	Broad Market	Paris-Aligned	Broad Market	Paris-Aligned
Return Since Inception (%)	9.63	10.51	12.06	12.97	6.91	6.99
Volatility Since Inception (%)	15.06	16.74	14.92	17.59	16.20	17.17
Tracking Error Since Inception (%)	-	1.88	-	1.71	-	2.05
Information Ratio Since Inception (%)	-	0.47	-	0.72	-	0.04
Active Share (%)	-	35.32	-	32.63	-	46.94
Sector Active Share (%)	-	6.56	-	7.91	-	14.10
Country Active Share (%)	-	1.55	-	-	-	2.68
Stock Count	1,600	703	503	314	222	108
Effective Number of Shares	172.72	109.08	78.94	64.92	74.40	45.52



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 2016, to Feb. 28, 2023. Index performance based on total return in USD for the U.S. and developed indices and in EUR for the eurozone indices. Past performance is no guarantee of future results. The developed, U.S. and eurozone broad market indices are represented by the S&P Developed Ex-Korea LargeMidCap, S&P 500 and S&P Eurozone LargeMidCap, respectively. The developed and U.S. Paris-aligned indices are represented by the S&P Developed Ex-Korea LargeMidCap Net Zero 2050 Paris-Aligned ESG Index and S&P 500 Net Zero 2050 Paris-Aligned ESG Index, respectively, which were launched June 1, 2020, and the eurozone Paris-aligned index is represented by the S&P Eurozone LargeMidCap Net Zero 2050 Paris-Aligned ESG Index, which was launched May 4, 2020. All data prior to index launch date is back-tested hypothetical data. Charts and table are provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Turning to sector weights, those of the S&P Paris-Aligned Indices have historically been roughly in line with those of traditional benchmarks, with the Energy sector as the consistent exception to the rule. Much of the Energy sector is excluded globally given the EU’s PAB minimum standards that lead to the removal of fossil fuel-heavy companies (100% of Energy companies are removed in the U.S. and eurozone versions of the S&P Paris-Aligned Indices, and 98% of Energy companies in the developed markets version).

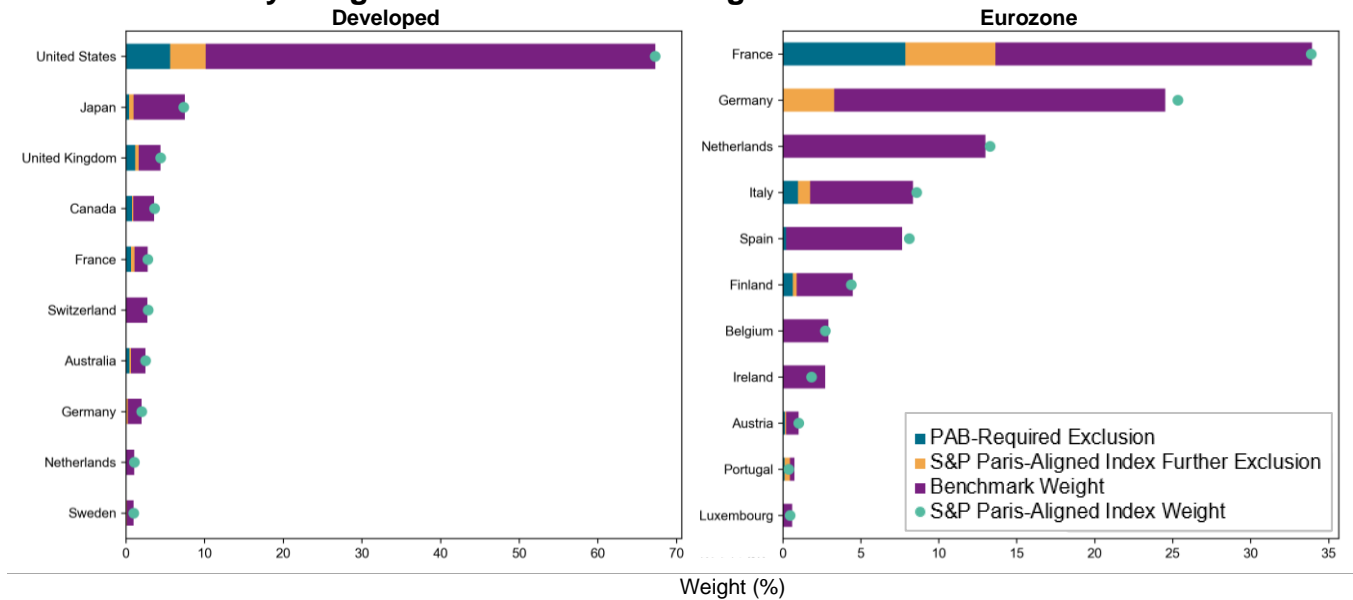
Exhibit 4: Sector Weights of the S&P Paris-Aligned Indices



Source: S&P Dow Jones Indices LLC and S&P Global Sustainable1. Data as of Sept. 30, 2022. The developed, U.S. and eurozone Paris-aligned indices are represented by the S&P Developed Ex-Korea LargeMidCap Net Zero 2050 Paris-Aligned ESG Index, S&P 500 Net Zero 2050 Paris-Aligned ESG Index and S&P Eurozone LargeMidCap Net Zero 2050 ESG Index, respectively. Charts are provided for illustrative purposes.

Country weights show less deviation compared with traditional benchmarks than sectors, with no country excluded due to EU PAB requirements, illustrating that fossil fuel operations are driven by sector, rather than country.

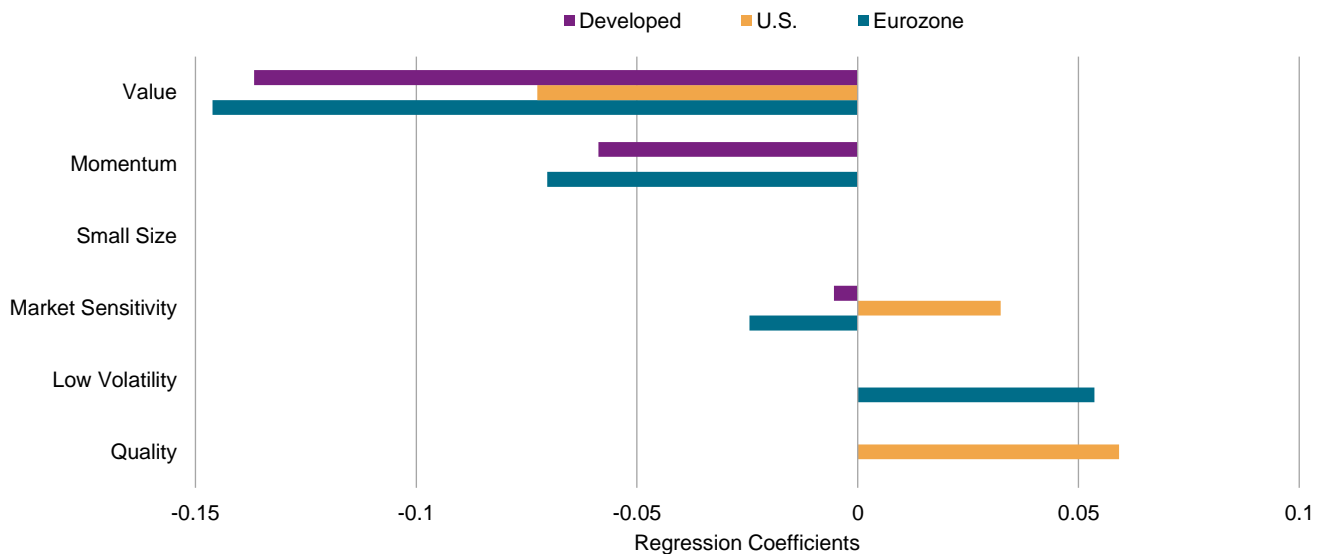
Exhibit 5: Country Weights of the S&P Paris-Aligned Indices



Source: S&P Dow Jones Indices LLC and S&P Global Sustainable1. Data as of Sept. 30, 2022. The developed, U.S. and eurozone Paris-aligned indices are represented by the S&P Developed Ex-Korea LargeMidCap Net Zero 2050 Paris-Aligned ESG Index, S&P 500 Net Zero 2050 Paris-Aligned ESG Index and S&P Eurozone LargeMidCap Net Zero 2050 ESG Index, respectively. Charts are provided for illustrative purposes.

With respect to factor exposures, the only consistent pattern across regions is a tilt away from value, but even that is relatively small in magnitude.

Exhibit 6: Active Factor Exposures of the S&P Paris-Aligned Indices

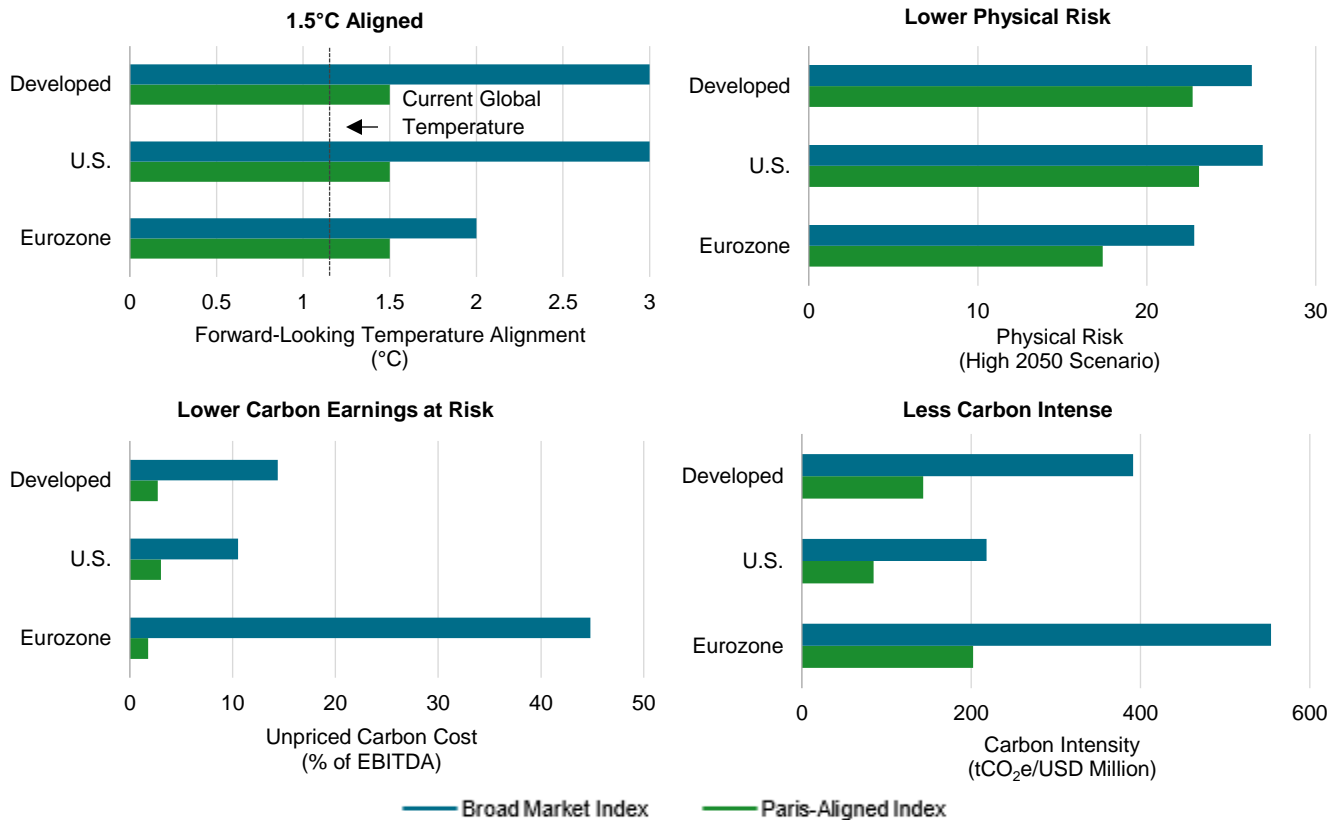


Source: S&P Dow Jones Indices LLC, Kenneth French and AQR. Data as of Feb. 28, 2023. The developed, U.S. and eurozone Paris-aligned indices are represented by the S&P Developed Ex-Korea LargeMidCap Net Zero 2050 Paris-Aligned ESG Index, S&P 500 Net Zero 2050 Paris-Aligned ESG Index and S&P Eurozone LargeMidCap Net Zero 2050 ESG Index, respectively. Chart is provided for illustrative purposes.

S&P Paris-Aligned Indices Sustainability Characteristics

The S&P Paris-Aligned Indices have historically achieved significant improvements across a range of climate metrics. The temperature alignment of the S&P Paris-Aligned Indices is controlled to be below 1.5°C on a forward-looking basis, which is more ambitious than the 2°C or 3°C temperature alignments of the broader markets.¹⁰ The S&P Paris-Aligned Indices also showed high reductions in the potential earnings at risk due to carbon prices, exposure to physical risk and carbon intensity, according to S&P Global Trucost models.

Exhibit 7: S&P Paris-Aligned Indices Show Significant Improvements on Various Climate Metrics Relative to Their Underlying Broad Market Indices



Source: S&P Dow Jones Indices LLC and S&P Global Sustainable1. Data as of Feb. 28, 2023. The developed, U.S. and eurozone broad market indices are represented by the S&P Developed Ex-Korea LargeMidCap, S&P 500 and S&P Eurozone LargeMidCap, respectively. The developed, U.S. and eurozone Paris-aligned indices are represented by the S&P Developed Ex-Korea LargeMidCap Net Zero 2050 Paris-Aligned ESG Index, S&P 500 Net Zero 2050 Paris-Aligned ESG Index and S&P Eurozone LargeMidCap Net Zero 2050 ESG Index, respectively. Charts are provided for illustrative purposes.

¹⁰ According to the [World Meteorological Organization](#), the global mean surface temperature in 2022 was 1.15 ± 0.13°C warmer than pre-industrial levels (1850-1900).

Conclusion

As highlighted by the Q&As from the ESAs,¹¹ Article 9 products must not be benchmarked to broad market indices but should instead be benchmarked to objective-aligned benchmarks, including the EU PABs. Consequently, benchmark switches may be required for active funds to maintain the appropriate SFDR classification.¹² Additionally, the guidance in the Q&As makes it clear that passive funds tracking EU PABs and CTBs may now be classified as Article 9.

The S&P Paris-Aligned Indices may provide a solution; historically, they have offered a broad and diversified beta-like exposure. They have also overcome the “tracking error lock” to fossil fuel energy and broad benchmarks if the broad market does not transition. The S&P PACT Indices have defined net zero pathways and have historically reduced forward-looking transition and physical risks associated with climate change.

¹¹ [Consolidated questions and answers \(Q&As\) on the SFDR \(Regulation \(EU\) 2019/2088\) and the SFDR Delegated Regulation \(Commission Delegated Regulation \(EU\) 2022/1288\)](#). May 17, 2023. EBA, EIOPA, ESMA, Joint Committee of the European Supervisory Authorities.

¹² Funds using an EU PAB as a reference benchmark will still need to demonstrate how the investments are sustainable investments, as defined in [Article 2.17 of the SFDR Regulation 2019/2088](#).

Appendix

Exhibit 8: Factor Sources and Attribution Model

Factor	Factor Exposure	Source
High Minus Low (HML)	Value	Kenneth French Data Library
Small Minus Big (SMB)	Size	Kenneth French Data Library
Winners Minus Losers (WML)	Momentum	Kenneth French Data Library
Quality Minus Junk (QMJ)	Quality	AQR Factor Library
Betting Against Beta (BAB)	Low Volatility	AQR Factor Library

Source: Kenneth French Data Library, AQR Factor Library. Table is provided for illustrative purposes.

The factor model is specified as:

$$r_{it} - r_{ft} = \alpha_{it} + \beta_{im}(r_{mt} - r_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \beta_{iw}WML_t + \beta_{iq}QMJ_t + \beta_{iB}BAB_t + \varepsilon_{it}$$

Where $r_{it} - r_{ft}$ is the excess return over the risk-free rate for index i at time t , α_{it} is alpha, $\beta_{im}(r_{mt} - r_{ft})$ is the index sensitivity to the market minus the risk-free rate, $\beta_{is}SMB_t$ is the index sensitivity to the small size factor, $\beta_{ih}HML_t$ is the index sensitivity to the value factor, $\beta_{iw}WML_t$ is the index sensitivity to the momentum factor, $\beta_{iq}QMJ_t$ is the index sensitivity to the quality factor, $\beta_{iB}BAB_t$ is the index sensitivity to the low volatility factor and ε_{it} is the model error.

Exhibit 9: Factor Regression Model Output – S&P Underlying Indices as Market Factor

Data Point	S&P Developed Ex-Korea Net Zero 2050 Paris-Aligned ESG Index	S&P 500 Net Zero 2050 Paris-Aligned ESG Index	S&P Eurozone LargeMidCap Net Zero 2050 Paris-Aligned ESG Index
Alpha	0.0000	0.0000	-0.0001
Beta	0.9804***	1.0075***	0.9470***
Small Size	-0.0445***	0.0064	-0.0936**
Value	-0.1059***	-0.0576***	-0.1226***
Momentum	-0.1027***	-0.0920***	-0.1176***
Low Volatility	0.0977***	0.0441***	0.0065
Quality	0.0038	0.0781***	-0.0117
Number of Observations	126	126	126
Adjusted R-Squared	0.9980	0.9963	0.9885

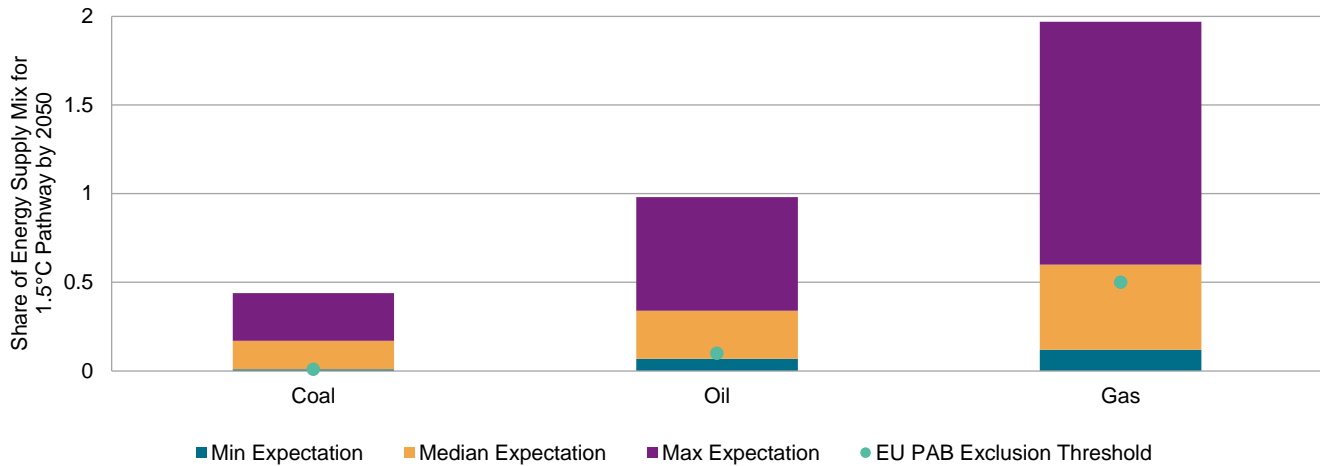
* p value < 0.10

** p-value <0.05

*** p-value <0.01

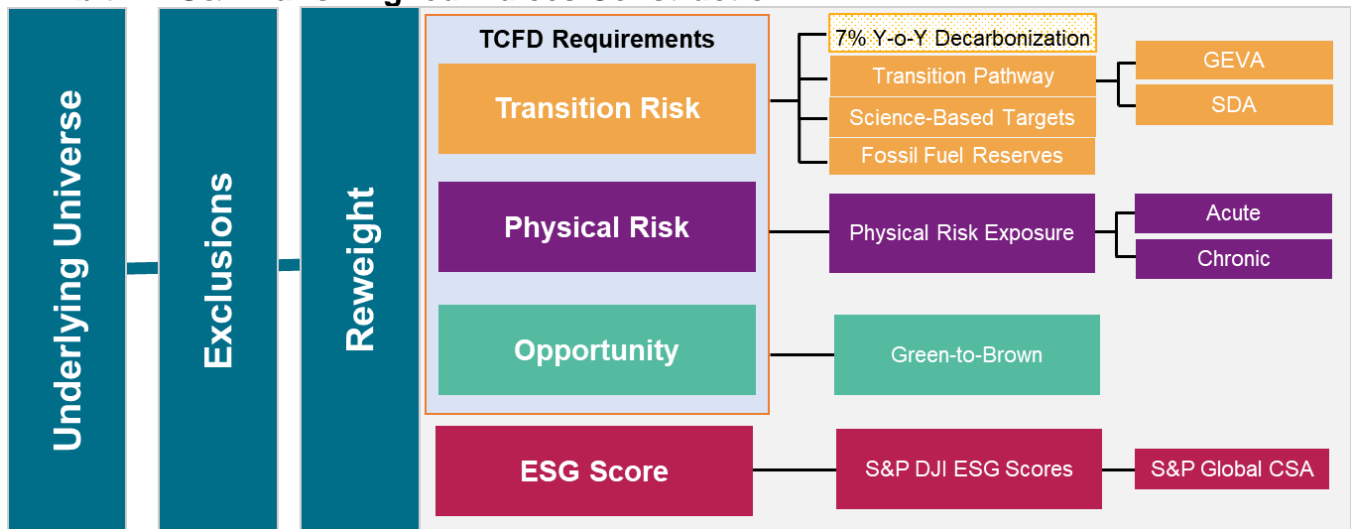
Source: S&P Dow Jones Indices LLC. Data as of Feb. 28, 2023. Table is provided for illustrative purposes.

Exhibit 10: Estimated Energy Mix for 1.5°C Pathway by 2050 and EU PAB Coal, Oil and Gas Exclusions



Source: S&P Dow Jones Indices LLC, NGFS Scenario Portal and IPCC. Data as of Feb. 28, 2023. The NGFS scenarios are indexed at 100% in 2020 to be compared to the PAB decarbonization pathway. Chart is provided for illustrative purposes.

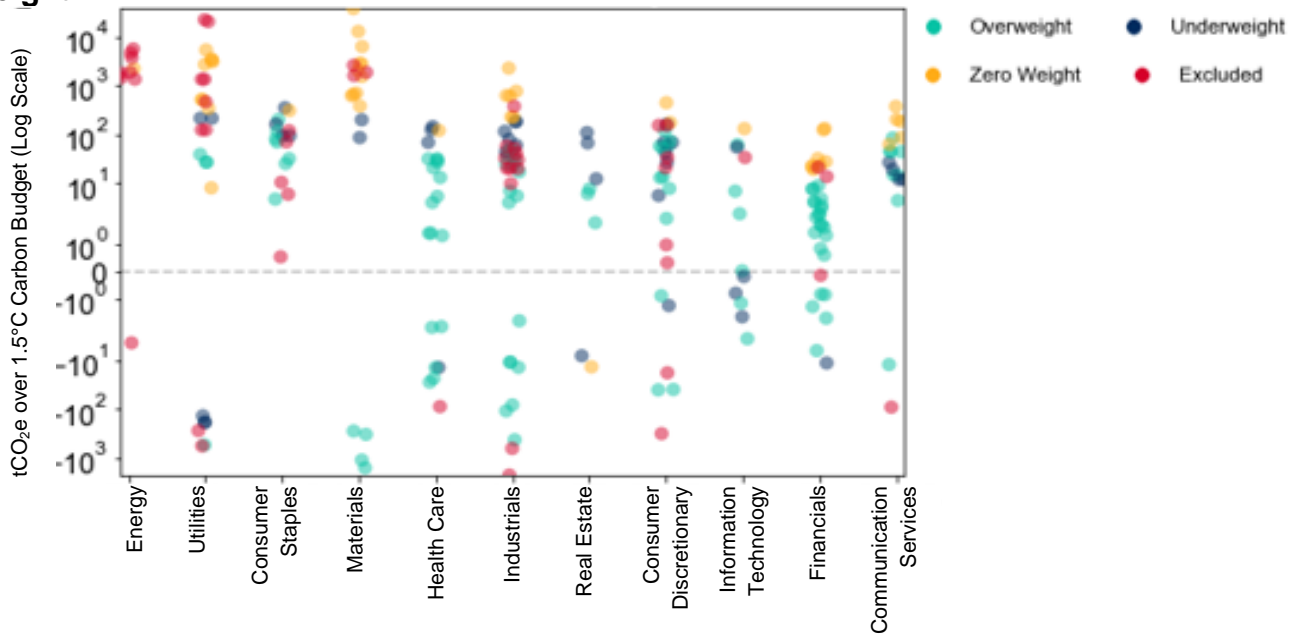
Exhibit 11: S&P Paris-Aligned Indices Construction



Source: S&P Dow Jones Indices LLC. Data as of Feb. 28, 2023. Chart is provided for illustrative purposes.

The S&P PACT Index Series methodology utilizes the S&P DJI glass box optimization technique. Our research shows this method approximately doubles the correlation between the ESG or climate data that has been input and the resultant constituent reweighting. Simultaneously, the optimization maintains its precision and significant ability to minimize active risk.

Exhibit 12: Strong Link between the Temperature Alignment of Companies and Their Weight



Source: S&P Dow Jones Indices LLC and S&P Global Sustainable1. Data as of Sept. 30, 2022. Chart is provided for illustrative purposes.

By providing a strong link between constituent weights and the input climate data, this approach aims to be consistent with real-world impact levels of shareholder engagement, capital allocation and indirect impacts, as outlined by Kölbel, Heeb, Paetzold and Busch.¹³

¹³ Kölbel, Julian F., Florian Heeb, Falko Paetzold, and Timo Busch, "[Can Sustainable Investing Save the World? Reviewing the Mechanisms of Investor Impact](#)," *Organization & Environment*, Sept. 10, 2020.

Performance Disclosure/Back-Tested Data

The S&P Developed Ex-Korea LargeMidCap Net Zero 2050 Paris-Aligned ESG Index and S&P 500 Net Zero 2050 Paris-Aligned ESG Index were launched June 1, 2020. The S&P Eurozone LargeMidCap Net Zero 2050 Paris-Aligned ESG Index was launched May 4, 2020. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at www.spglobal.com/spdji/. Past performance of the Index is not an indication of future results. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results. Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations. Back-tested performance is for use with institutions only; not for use with retail investors.

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