

**S&P Low Carbon Low Volatility
High Dividend Indices
*Methodology***

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Introduction

Index Objective

The S&P Low Carbon Low Volatility High Dividend Indices measure equally weighted performance of stocks meeting specific criteria for low carbon footprint, high dividend yield, and low volatility.

Each company's Carbon Footprint is calculated by S&P Trucost Limited, a subsidiary of S&P Dow Jones Indices LLC ("S&P Trucost Ltd.") and is defined as the company's annual greenhouse gas (GHG) emissions, expressed as tons of carbon dioxide equivalent (CO₂e), divided by annual revenues.

Collaboration

This index is generated and published under agreements between S&P Dow Jones Indices and S&P Trucost Ltd.

Index Family

S&P Europe 350 Low Carbon Low Volatility High Dividend Index. The index measures the performance of the 40 least volatile, high yielding companies in the S&P Europe 350 that also have a low carbon footprint.

S&P Global 1200 Low Carbon Low Volatility High Dividend Index. The index measures the performance of the least volatile, high yielding companies in the S&P Global 1200 that also have a low carbon footprint, while meeting regional diversification criteria.

S&P 500 Low Carbon Low Volatility High Dividend Index. The index measures the performance of the 60 least volatile, high yielding companies in the S&P 500 that also have a low carbon footprint.

Supporting Documents

This methodology is meant to be read in conjunction with supporting documents providing greater detail with respect to the policies, procedures and calculations described herein. References throughout the methodology direct the reader to the relevant supporting document for further information on a specific topic. The list of the main supplemental documents for this methodology and the hyperlinks to those documents is as follows:

Supporting Document	URL
S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology	Equity Indices Policies & Practices
S&P Dow Jones Indices' Index Mathematics Methodology	Index Mathematics Methodology
S&P Dow Jones Indices' Global Industry Classification Standard (GICS) Methodology	GICS Methodology

This methodology was created by S&P Dow Jones Indices to achieve the aforementioned objective of measuring the underlying interest of each index governed by this methodology document. Any changes to or deviations from this methodology are made in the sole judgment and discretion of S&P Dow Jones Indices so that the indices continue to achieve their objectives.

Eligibility Criteria

Index Eligibility

To qualify for index inclusion, a stock must satisfy the following criteria as of the rebalancing reference date:

1. Be a member of the respective underlying index as detailed in the table below.

Index	Underlying Index
S&P Europe 350 Low Carbon Low Volatility High Dividend Index	S&P Europe 350
S&P Global 1200 Low Carbon Low Volatility High Dividend Index	S&P Global 1200
S&P 500 Low Carbon Low Volatility High Dividend Index	S&P 500

2. Have a Carbon Footprint, as calculated by S&P Trucost Ltd.
3. Meet the following additional criteria:

Index	Additional Criteria
S&P Europe 350 Low Carbon Low Volatility High Dividend Index	Each stock must have been issued and trading for at least six months prior to becoming an index constituent. However, there is no minimum number of days that each stock must have actually traded.
S&P Global 1200 Low Carbon Low Volatility High Dividend Index	
S&P 500 Low Carbon Low Volatility High Dividend Index	Each stock must have been issued and trading for at least six months leading up to the rebalancing reference date. Generally, a stock must have traded on all trading days in the six months leading up to the rebalancing reference date. However, Index Committee discretion may be used in situations where a stock was subject to a temporary trading halt during that period.

Stocks meeting the eligibility criteria above form the selection universe.

For information on stock eligibility criteria and index management rules of an underlying index, please refer to its methodology document available at www.spdji.com.

Index Construction

Approaches

The methodology employs an equal weighting scheme

There are two steps in the creation of an index. The first is the selection of the index constituents; the second is the weighting of the constituents within the index.

Constituent Selection

The selection of index constituents is done as follows:

1. All stocks in the selection universe are ranked in ascending order by their Carbon Normalized Score. The Carbon Normalized Score is derived from the Carbon Footprint, which is calculated by S&P Trucost Ltd. and is defined as the company's annual greenhouse gas (GHG) emissions, expressed as tons of carbon dioxide equivalent (CO₂e), divided by annual revenues. The Carbon Normalized Score of each company is a product of the winsorized Carbon Footprint and Carbon Z-scores within its GICS sector.

For the **S&P Europe 350 Low Carbon Low Volatility High Dividend Index** the 200 stocks with the lowest Carbon Normalized Scores are selected.

For the **S&P Global 1200 Low Carbon Low Volatility High Dividend Index** the 700 stocks with the lowest Carbon Normalized Scores are selected.

For the **S&P 500 Low Carbon Low Volatility High Dividend Index** the 300 stocks with the lowest Carbon Normalized Scores are selected.

Please refer to Appendix I for details on the Carbon Normalized Score computation.

2. The stocks selected in step 1 are then ranked in descending order by indicated annual dividend yield, defined as a stock's indicated annual dividend (not including any special dividends) divided by its price. In the event that there is no indicated dividend yield for a particular company, the dividend yield is then calculated using a company's trailing 12 month dividends per share divided by the stock price as of the rebalancing reference date.

For the **S&P Europe 350 Low Carbon Low Volatility High Dividend Index** the 100 stocks with the highest dividend yields are selected.

For the **S&P Global 1200 Low Carbon Low Volatility High Dividend Index** the 350 stocks with the highest dividend yields are selected.

For the **S&P 500 Low Carbon Low Volatility High Dividend Index** the 150 stocks with the highest dividend yields are selected.

3. The stocks selected in step 2 are then ranked in ascending order by realized volatility. Realized volatility for each stock is calculated using available price return data for the trailing six months of trading days leading up to the rebalancing reference date. Volatility is defined as the standard deviation of the security's daily price returns in local currency over the last six months.

For the **S&P Europe 350 Low Carbon Low Volatility High Dividend Index** the 40 stocks with the lowest realized volatilities are then selected and form the index.

For the **S&P Global 1200 Low Carbon Low Volatility High Dividend Index** the number of stocks selection varies by region as detailed in the table below, and together they form the index.

Regions	Number of Stocks Selected
Europe	60
North America	60
Asia Pacific and Australia	25
South America	All eligible securities up to a maximum of 25.

For the **S&P 500 Low Carbon Low Volatility High Dividend Index** the 60 stocks with the lowest realized volatilities are then selected and form the index.

Buffer Rule. For each index, a 20% buffer rule based on realized volatility is applied to the security selection process at each rebalancing in order to reduce turnover. Securities are selected as follow:

1. All securities ranked within the top 80% of the target stock count are automatically selected for index inclusion.
2. Current index constituents not already selected in Step 1 that are within the top 120% of the target stock count are added to the index in rank order until the target stock count has been reached.
3. If, following Step 2, the target stock count has not been reached, non-constituent securities not already selected in Step 1 that are ranked from 80% to 100% of the target stock count are added to the index in rank order until the target stock count has been reached.

S&P Dow Jones Indices believes turnover in index membership should be avoided when possible. At times a company may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to an index, not for continued membership. As a result, an index constituent that appears to violate criteria for addition to that index is not deleted unless ongoing conditions warrant an index change.

At the discretion of S&P Dow Jones Indices, a company may be excluded from an index, or not considered for membership, at an index rebalancing if S&P Dow Jones Indices determines the company's 12-month indicated dividend yield to be unsustainable.

Media and Stakeholder Analysis Overlay

Environmental sustainability assessments are provided by RobecoSAM. RobecoSAM uses RepRisk, a leading provider of business intelligence on environmental, social, and governance risks, for daily filtering, screening and analysis of controversies related to companies within the indices.

In cases where risks are presented, RobecoSAM releases a Media and Stakeholder Analysis (MSA) which includes a range of issues such as economic crime and corruption, fraud, illegal commercial practices, human rights issues, labor disputes, workplace safety, catastrophic accidents, and environmental disasters.

The Index Committee will review constituents that have been flagged by RobecoSAM's MSA to evaluate the potential impact of controversial company activities on the composition of the indices.

For more information on RepRisk, please refer to www.reprisk.com. This service is provided for most of S&P Dow Jones Indices' Sustainability Indices and is not considered a direct contribution to the index construction process.

Dividend Payment Types

S&P Dow Jones Indices only considers cash dividend payments declared as regular by the paying company for index eligibility, selection, and weighting purposes. Cash dividend payments declared as special by the paying company, including recurring special cash dividends, are not considered. For both eligibility and weighting purposes, annualized cash dividend amounts, before withholding tax, are used.

Multiple Share Classes

All publicly listed multiple share class lines are eligible for index inclusion, subject to meeting the eligibility criteria.

For more information regarding the treatment of multiple share classes, please refer to Approach A within the Multiple Share Classes section of the S&P Dow Jones Indices' Equity Indices Policies & Practices document.

Dual Listed Companies

Each company is represented once by the Designated Listing.

For more information regarding the treatment of multiple share classes, please refer to Approach B within the Multiple Share Classes section of the S&P Dow Jones Indices' Equity Indices Policies & Practices document.

Constituent Weightings

At each rebalancing the selected stocks are equally weighted within each index.

Index Calculations

The indices are calculated by means of the divisor methodology used for all S&P Dow Jones equity indices.

For more information on the index calculation methodology, please refer to the Equal Weighted Indices section of S&P Dow Jones Indices' Index Mathematics Methodology.

Index Maintenance

Rebalancing

Index rebalancings occur as detailed in the table below.

Index	Rebalancing Frequency	Effective Dates (after close)	Reference Dates (after close)
S&P Europe 350 Low Carbon Low Volatility High Dividend Index	Quarterly	last business day of January, April, July and October	last business day of December, March, June and September, respectively
S&P Global 1200 Low Carbon Low Volatility High Dividend Index	Semi-annually	last business day of January and July	last business day of December and June, respectively
S&P 500 Low Carbon Low Volatility High Dividend Index			

Constituents' shares for the S&P Europe 350 Low Carbon Low Volatility High Dividend Index are calculated using closing prices seven business days prior to the rebalancing effective date as the reference price.

Additions and Deletions. Except for major corporate actions, such as mergers and spin-offs, additions and deletions of companies generally only take place at the index rebalancings. In addition, constituents removed from an underlying index are also removed from the respective S&P Low Carbon Low Volatility High Dividend Index simultaneously.

Corporate Actions

Corporate Action	Adjustment Made to Index	Divisor Adjustment?
Spin-off	See below for more information.	
Rights Offering	The price is adjusted to the Price of the Parent Company minus (the Price of the Rights Offering/Rights Ratio). Index shares change so that the company's weight remains the same as its weight before the rights offering.	No
Stock Dividend, Stock Split, Reverse Stock Split	Index shares are multiplied by and price is divided by the split factor.	No
Share Issuance, Share Repurchase, Equity Offering or Warrant Conversion	None.	No
Special Dividends	Price of the stock making the special dividend payment is reduced by the per share special dividend amount after the close of trading on the day before the dividend ex-date.	Yes
Constituent Change	There are no intra-rebalancing additions.	-
	Deletions due to de-listings, acquisition or any other corporate event resulting in the deletion of the stock from the index causes the weights of the rest of the stocks in the index to change. Relative weights stay the same.	Yes

Spin-offs. The spun-off company is added to all the indices of which the parent is a constituent, at a zero price at the market close of the day before the ex-date (no divisor adjustment). The spun-off company is removed after at least one day of regular way trading with the weight reinvested back into the parent

stock (no divisor adjustment). For further information, please refer to the Treatment of Spin-offs in S&P Dow Jones Indices' Equity Indices Policies & Practices document.

For more information on Corporate Actions, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document located on our Web site, www.spdji.com.

Currency, Currency Hedged, and Risk Control Indices

The indices are calculated in U.S. dollars and euros.

WM/Reuters foreign exchange rates are taken daily at 4:00 PM London Time and used in the end-of-day calculation of the indices. These mid-market fixings are calculated by The WM Company based on Reuters data and appear on Reuters pages WMRA.

Additional currency, currency hedged, and risk control versions of the indices may be available. For a list of available currency, currency hedged, and risk control indices, please contact Client Services at index_services@spglobal.com.

For more information on currency, currency hedged, and risk control indices, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

Other Adjustments

In cases where there is no achievable market price for a stock being deleted, it may be removed at a zero or minimal price at the Index Committee's discretion, in recognition of the constraints faced by investors in trading bankrupt or suspended stocks.

Base Dates and History Availability

Index history availability, base dates and base values are shown in the table below.

Index	Launch Date	First Value Date	Base Date	Base Value
S&P Europe 350 Low Carbon Low Volatility High Dividend Index	02/22/2016	01/30/2009	01/30/2009	100
S&P Global 1200 Low Carbon Low Volatility High Dividend Index	03/28/2016	01/30/2009	01/30/2009	100
S&P 500 Low Carbon Low Volatility High Dividend Index	05/12/2016	01/30/2009	01/30/2009	100

Index Data

Calculation Return Types

S&P Dow Jones Indices calculates multiple return types which vary based on the treatment of regular cash dividends. The classification of regular cash dividends is determined by S&P Dow Jones Indices.

- Price Return (PR) versions are calculated without adjustments for regular cash dividends.
- Gross Total Return (TR) versions reinvest regular cash dividends at the close on the ex-date without consideration for withholding taxes.
- Net Total Return (NTR) versions, if available, reinvest regular cash dividends at the close on the ex-date after the deduction of applicable withholding taxes.

In the event there are no regular cash dividends on the ex-date, the daily performance of all three indices will be identical.

For a complete list of indices available, please refer to the daily index levels file (“SDL”).

For more information on the classification of regular versus special cash dividends as well as the tax rates used in the calculation of net return, please refer to S&P Dow Jones Indices’ Equity Indices Policies & Practices document.

For more information on the calculation of return types, please refer to S&P Dow Jones Indices’ Index Mathematics Methodology.

Index Governance

Index Committee

The indices are maintained by an Index Committee. The Index Committee meets regularly. All committee members are full-time professional members of S&P Dow Jones Indices' staff. At each meeting, the Index Committee may review pending corporate actions that may affect index constituents, statistics comparing the composition of an index to the market, companies that are being considered as candidates for addition to an index, and any significant market events. In addition, the Index Committee may revise index policy covering rules for selecting companies, treatment of dividends, share counts or other matters.

S&P Dow Jones Indices considers information about changes to its indices and related matters to be potentially market moving and material. Therefore, all Index Committee discussions are confidential.

S&P Dow Jones Indices' Index Committees reserve the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules stated in this document or supplemental documents, clients will receive sufficient notice, whenever possible.

In addition to the daily governance of indices and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure the indices continue to achieve the stated objectives, and that the data and methodology remain effective. In certain instances, S&P Dow Jones Indices may publish a consultation inviting comments from external parties.

For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document.

Index Policy

Announcements

All index constituents are evaluated daily for data needed to calculate index levels and returns. All events affecting the daily index calculation are typically announced in advance via the Index Corporate Events report (.SDE), delivered daily via ftp to all clients. Any unusual treatment of a corporate action or short notice of an event may be communicated via email to clients.

Index methodology is constantly under review for best practices, and any changes are announced well ahead of time via the Web site and email to all clients.

For more information, please refer to the Announcements section of S&P Dow Jones Indices' Equity Indices Policies & Practices document.

Pro-forma Files

In addition to the corporate events file (.SDE), S&P Dow Jones Indices provides constituent pro-forma files each time the indices rebalance. The pro-forma file is typically provided daily in advance of the rebalancing date and contains all constituents and their corresponding weights and index shares effective for the upcoming rebalancing. Since index shares are assigned based on prices prior to the rebalancing, the actual weight of each stock at the rebalancing differs from these weights due to market movements.

Please visit www.spdji.com for a complete schedule of rebalancing timelines and pro-forma delivery times.

Holiday Schedule

The indices are calculated daily, throughout the year, except on days when all exchanges where an index's constituents are listed are officially closed.

A complete holiday schedule for the year is available at www.spdji.com.

Rebalancing

The Index Committee may change the date of a given rebalancing for reasons including market holidays occurring on or around the scheduled rebalancing date. Any such change will be announced with proper advance notice where possible.

Unexpected Exchange Closures

For information on Unexpected Exchange Closures, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document.

Recalculation Policy

For information on the recalculation policy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document.

For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document.

Contact Information

For questions regarding an index, please contact: index_services@spglobal.com.

Index Dissemination

Index levels are available through S&P Dow Jones Indices' Web site at www.spdji.com, major quote vendors (see codes below), numerous investment-oriented Web sites, and various print and electronic media.

Tickers

The table below lists headline indices covered by this document. All currency, currency hedged, risk control, and return type versions of the below indices that may exist are also covered by this document. Please contact index_services@spglobal.com for a complete list of indices covered by this document.

Index (Currency)	Return Type	Bloomberg
S&P Europe 350 Low Carbon Low Volatility High Dividend Index (USD)	Price Return Total Return Net Total Return	SPECLDUP SPECLDUT SPECLDUN
S&P Europe 350 Low Carbon Low Volatility High Dividend Index (EUR)	Price Return Total Return Net Total Return	SPECLDEP SPECLDET SPECLDEN
S&P Global 1200 Low Carbon Low Volatility High Dividend Index (USD)	Price Return Total Return Net Total Return	SPGCLDUP SPGCLDUT SPGCLDUN
S&P Global 1200 Low Carbon Low Volatility High Dividend Index (EUR)	Price Return Total Return Net Total Return	SPGCLDEP SPGCLDET SPGCLDEN
S&P 500 Low Carbon Low Volatility High Dividend Index (EUR)	Price Return Total Return Net Total Return	SPXCLDEP SPXCLDET SPXCLDEN

FTP

Daily constituent and index level data are available via FTP subscription.

For product information, please contact S&P Dow Jones Indices, www.spdji.com/contact-us.

Web site

For further information, please refer to S&P Dow Jones Indices' Web site at www.spdji.com.

Appendix I

Carbon Normalized Score Computation

The first step to determine the overall Carbon Normalized Scores is to rank each company based on its Carbon Footprints which is calculated by S&P Trucost Ltd. and is defined as the company's annual greenhouse gas (GHG) emissions, expressed as tons of carbon dioxide equivalent (CO₂e), divided by annual revenues, within their respective GICS[®] sector as of the rebalancing reference date.

Outlier Handling and Winsorization. Outlier Carbon Footprints are winsorized to ensure that the values used to calculate the overall Carbon Normalized Scores are less distorted by extreme values. The Carbon Footprints for all stocks are first ranked in ascending order. Then, for stocks that lie above the 97.5 percentile rank or below the 2.5 percentile rank within their respective GICS sector, their values are set as equal to the value of the 97.5 percentile ranked or the 2.5 percentile ranked stock within that sector, whichever is applicable.

The second step is to standardize the Carbon Footprints of the companies within the underlying index. This is achieved by computing a Carbon Z-score for each company within its respective GICS sector as of the rebalancing reference date.

Carbon Z-score Computation. Computing a Z-score is a widely adopted method of standardizing a variable that may have a different scale or unit of measurement. After winsorizing the Carbon Footprint, the Carbon Z-score for each stock is calculated using the mean and standard deviation of the winsorized Carbon Footprint within each of the index's GICS sectors.

The Carbon Z-score is calculated as follows:

$$z_{\alpha} = \frac{(x_{\alpha} - \mu_{\alpha})}{\sigma_{\alpha}}$$

where:

z_{α} = Carbon Z-score for a given stock

x_{α} = Winsorized Carbon Footprint for a given stock

μ_{α} = Arithmetic mean of the winsorized Carbon Footprint in the underlying index, excluding any missing values

σ_{α} = Standard deviation of the winsorized Carbon Footprint in the underlying index

Outlier Handling, Winsorization and Carbon Normalized Scores. Outlier Carbon Z-scores are also winsorized to ensure that the overall Carbon Normalized Scores are less distorted by extreme values. To do this, for a given Z-score, the values for all securities are first ranked in ascending order. Then, for securities that lie above 4 or below -4, their value is set as equal to 4 or -4, whichever is applicable. The winsorized Z-scores are the Carbon Normalized Scores within the underlying index.

Appendix II

Methodology Changes

Methodology changes since January 1, 2015 are as follows:

Change	Effective Date (After Close)	Methodology	
		Previous	Updated
Consideration of recurring special cash dividends for eligibility, selection, and weighting purposes	1/31/2018	Recurring special cash dividends that S&P Dow Jones Indices considers to be part of the normal payment pattern established by the company are considered regular for eligibility, selection, and weighting purposes	S&P Dow Jones Indices only considers cash dividend payments declared as regular by the paying company for index eligibility, selection, and weighting purposes. Cash dividend payments declared as special by the paying company, including recurring special cash dividends, are not considered.
Index Family Name Change	11/06/2017	Previously the family was named the S&P Climate Change Low Volatility High Dividend Indices.	The family is named the S&P Low Carbon Low Volatility High Dividend Indices.
Dual Listed Companies	06/19/2017	--	Some companies may have more than one listing in the respective benchmark index. In the S&P Low Carbon Low Volatility High Dividend Indices, each company is represented once by the primary listing, which is generally the most liquid listing.
Intra-rebalancing Drop Treatment	09/16/2016	Companies involved in environmental crisis situations are not dropped from the indices between rebalancings.	Any constituent raised as an environmental Media and Stakeholder Analysis (MSA) case by RobecoSAM will be brought to the governing Index Committee for possible immediate removal. In the event of removal, the constituent in question would not be eligible for re-entry into the indices for one year beginning with the subsequent rebalancing.
Treatment of Spin-offs	05/11/2016	For additions due to spin-offs, the indices follow their respective parent index's treatment of the action. In general, both the parent and spun-off stocks remain in the index and are reevaluated at the next index rebalancing.	The spun-off company is added to all the indices of which the parent is a constituent, at a zero price at the market close of the day before the ex-date (no divisor adjustment). The spun-off company is removed after at least one day of regular way trading with the weight reinvested back into the parent stock (no divisor adjustment).

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