

RAFI™ ESG Index Series

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This document contains the underlying principles and regulations regarding the structure and operation of the RAFI™ ESG Index Series (the “Index Series”). RAFI™ Indices, LLC (“RAFI Indices”) has engaged Solactive AG as the administrator (“Benchmark Administrator”), under the Regulation (EU) 2016/1011 (the “Benchmark Regulation” or “BMR”). Solactive AG shall make every effort to implement regulations. RAFI Indices does not offer any explicit or tacit guarantee or assurance, neither pertaining to the results from the use of any Index nor the Index value at any certain point in time nor in any other respect. The Index is calculated and published for RAFI Indices by Solactive AG and Solactive AG strives to the best of its ability to ensure the correctness of the calculation. There is no obligation for RAFI Indices—irrespective of possible obligations to issuers—to advise third parties, including investors and/or financial intermediaries, of any errors in the Index. The publication of the Index by RAFI Indices is no recommendation for capital investment and does not contain any assurance or opinion of RAFI Indices regarding a possible investment in a financial instrument based on an Index.

Introduction

This document is to be used as a guideline with regard to the composition, calculation, and management of the Index Series. Any changes made to the guideline are initiated by the Committee specified in section 1.5. The Index Series is calculated and published for RAFI Indices by Solactive AG.

1. INDEX SPECIFICATIONS

The Index Series is owned by RAFI Indices, a wholly owned subsidiary of Research Affiliates Global Holdings. Solactive AG is the index calculator and Benchmark Administrator.

The RAFI ESG Index Series aims to provide broadly diversified exposures to companies that score well along Environmental, Social, Governance, Diversity, and Financial Discipline metrics. In addition, the Index Series uses the Research Affiliates’ Fundamental Index™ methodology, which weights companies based on fundamental measures of company size (as measured by accounting variables) rather than their market capitalization.

See Appendix 5.1 for available indices and their return calculations (price, total return, and net return) and published currency. Each of the indices listed below may be referred to herein as “Index” and collectively as “Indices.”

- RAFI ESG Developed Index
- RAFI ESG Developed Index NTR EUR Hedged
- RAFI ESG US Index

1.1 Short Name and Identifier

See Appendix 5.1 for Index Series name and identifiers.

1.2 Initial Value

All indices are based on an index level of 1,000 at the close of trading on the base date. Please see Appendix 5.1 for a complete list of indices and base dates.

1.3 Distribution

The Index is published on the website of the Benchmark Administrator <https://www.solactive.com> and is, in addition, available via the price marketing services of Boerse Stuttgart GmbH and may be distributed to all of its affiliated vendors. Each vendor decides on an individual basis as to whether it will distribute or display the Index via its information systems.

1.4 Levels and Calculation Frequency

The levels of the Index Series is calculated on each Business Day during the market hours specified in Appendix 5.1 based on the Trading Prices on the Exchanges on which the Index Components are listed. Trading Prices of Index Components not listed in the Index Currency are converted using the current Intercontinental Exchange (ICE) spot foreign exchange rate. Should there be no current Trading Price for an Index Component, the later of: (i) the most recent Closing Price; or (ii) the last available Trading Price for the preceding Trading Day is used in the calculation. In addition to the intraday calculation, a closing level of the Index for each Business Day is also calculated. This closing level is based on the Closing Prices for the Index Components on the respective Exchanges on which the Index Components are listed. The Closing Prices of Index Components not listed in the Index Currency are converted using the 04:00 p.m. London time WM Fixing quoted by Reuters. If there is no 04:00 p.m. London time WM Fixing for the relevant Business Day, the last available 04:00 p.m. London time WM Fixing will be used for the closing level calculation.

1.5 Decision-Making Bodies

An oversight committee composed of staff from Solactive and its subsidiaries (the “Oversight Committee”) is responsible for decisions regarding any amendments to the rules of the Index, provided that the starting universe for the composition of the Index and its relevant specifications are established by RAFI Indices. Any such amendment, which may result in an amendment of the guideline, must be submitted to the Oversight Committee for prior approval and will be made in compliance with the Methodology Policy, which is available on the Solactive website: [Methodology Policy](#).

Internal quality controls are performed in constructing the model portfolios used by RAFI Indices. In the event that it is determined that an alternative data source is required as a result of data integrity concerns, the Oversight Committee shall be informed to determine both the appropriateness of the data source and the materiality of the change. The Oversight Committee, in this regard, shall approve all changes.

1.6 Publication

All specifications and information relevant for calculating the Index are made available on the <https://www.solactive.com> web page and sub-pages.

1.7 Historical Data

Historical data prior to the Index base date (outlined in Section 5.1) is based on simulated past performances derived using the Index rules outlined in this manual. Historical data prior to March 31, 2011, does not incorporate company Diversity Scores outlined in Section 2.5.2 due to lack of data. The backtested index levels have been calculated by reinvesting dividends paid by index components using the standard formula instead of the Laspeyres formula as stated in this Index manual (the calculation formulas are explained on the Solactive website under <https://www.solactive.com/news/documents/>). Simulated past performances rely on data by third party data vendors, which may have been adjusted, restated, or corrected ex post. The backtested index levels are not adjusted for any ex post adjustments.

2. CONSTRUCTION METHODOLOGY

2.1 Starting Universe

The model portfolio construction process starts with the [RAFI Global Equity Investable Universe \(GEIU\)](#). Constituents of this universe must meet and pass minimum liquidity and investability (capacity) requirements. The GEIU consists of all common equity securities traded on primary exchanges, and preferred shares in countries where preferred shares are economically equivalent to common, issued by companies that are assigned to countries classified by RAFI Indices as developed and emerging markets. Eligible developed and emerging market countries are assigned to one of seven regions as defined in Table 1.

Table 1

DEVELOPED MARKETS					EMERGING MARKETS	
United States	Japan	United Kingdom	Developed Europe, ex UK	Other Developed Markets	China	Emerging Markets, ex China
US	Japan	UK	Austria Belgium Denmark Finland France Germany Ireland Italy Netherlands Norway Portugal Spain Sweden Switzerland	Australia Canada Asia Pacific Israel Hong Kong New Zealand Singapore	China	Brazil India South Africa South Korea Taiwan Americas Chile Colombia Mexico Peru EMEA Czech Republic Egypt Greece Hungary Kuwait Poland Qatar Saudi Arabia Turkey UAE Asia Pacific Indonesia Malaysia Philippines Thailand

As of March 2023, there are 23 developed market countries and 24 emerging market countries eligible for inclusion.

2.2 Country Assignment & Size Classification

Country assignment and size classification are determined based on the [GEIU](#) guideline. RAFI Indices assigns companies to countries and promulgates that assignment to securities. Eligible securities are assigned to one of three size classifications; large company, mid company and small company based on fundamental weight.

2.3 Fundamental Weights

Fundamental weights are calculated using four accounting measures from company financial statements:

1. Adjusted sales is calculated as company sales multiplied by company equity to assets ratio averaged over the past five years.
2. Adjusted cash flow is calculated as company operating cash flow averaged over the past five years plus company R&D expenses averaged over the past five years.
3. Dividend plus buybacks are calculated using the average dividends paid and share buybacks over the past five years.
4. Book value plus intangibles is calculated as the most recent company book value plus research capital, with research capital defined as the accumulation of depreciated R&D expenses over the past six years.

An aggregate fundamental weight is calculated for each company by averaging the normalized accounting measures for each of the four accounting measures. This is the fundamental weight of the company.

2.3.1 Free-Float Adjustment

The entire stock in any given company is not always available to equity investors. Therefore, a company free-float factor is calculated. The company free-float factor is defined as the ratio of the total market capitalization of the shares of the company in free float to the total market capitalization of the company. This measure of free float is equivalent to the aggregation of the security level free-float factors across all the security lines of the company's stock. The company level free-float factor is applied as an adjustment to the company's fundamental weight. Adjusted fundamental weight is calculated by renormalizing the free-float adjusted fundamental weight.

2.4 ESG Ratings

The Index Series uses five signals to determine a company's overall ESG score; Environment (E), Social (S), Governance (G), Diversity (D), and Financial Discipline (FD). Data used for determining E, S, G, and D signals are supplied by ISS, a third party ESG data and ratings provider. Information regarding ISS' methodology can be found here: <https://www.issgovernance.com/esg/>. The FD signal is determined by RAFI Indices.

Note: Prior to 5/14/2021 ESG data was provided by Vigeo Eiris.

2.4.1 Environmental, Social, and Governance Score Calculation

ISS assigns each company in its universe a score of A+ to D- (corresponding to a numeric scale of 1-4). Companies in the RAFI Global Equity Universe that do not have a rating as a result of being outside of ISS' ratings universe are assigned a score of zero. For the purpose of index construction, eligible companies are ranked using ISS raw scores for E, S and G respectively. Final E, S, and G scores are determined for each company based on the percentile ranking of each companies' raw score within each region.

2.4.2 Diversity Score Calculation

D scores are determined using data provided by ISS. D scores are determined by using the following criteria from ISS, each of which are rated on a scale of A+ to D- (corresponding to a numeric scale of 1-4):

- Policy on non-discrimination
- Measures to promote equal opportunities and diversity
- Gender distribution in management/executive management
- Gender parity on the board of directors

Each metric is assigned a weight of 20% except for "Gender distribution in management/executive management" which is assigned a weight of 40%. The raw D score is determined by multiplying each company's criteria score by the corresponding weight assigned to that score. Companies in the RAFI Global Equity Universe that do not have a rating as a result of being outside of ISS' ratings universe are assigned a score of zero. Final D score is determined for each company based on the percentile ranking of each companies' raw score within each region.

2.4.3 Financial Discipline Score Calculation

The FD score is the percentile rank of the FD raw score, defined below, within each region and sector. The objective of the FD score is to identify companies with high profitability, low investment, low issuance, and low accruals. A company's FD raw score is calculated as:

$$FD_raw_score_i = \frac{1}{4}(Profitability_i - Investment_i - Issuance_i - Accruals_i)$$

Each metric is defined as follows:

1. Profitability: The average of the z-scores for a company's Return on Assets (ROA), Return on Equity (ROE), and Operating Profitability, defined as follows:
 - a. ROA is calculated as the ratio of net income before extraordinary items to assets.
 - b. ROE is calculated as the ratio of net income before extraordinary items to equity book value.
 - c. Operating Profitability is the ratio of operating income minus interest to equity book value.

2. Investment: The average of the z-scores for a company's asset growth and book growth, defined as follows:
 - a. Asset growth is calculated as the ratio of current year assets minus previous year assets to previous year assets.
 - b. Book growth is calculated as the ratio of current year book value minus previous year book value to previous year book value.
3. Issuance: The average of the z-scores for a company's net share issuance and debt issuance, defined as follows:
 - a. Net share issuance is calculated as the log of the ratio of current adjusted equity share issuance to previous year adjusted equity share issuance.
 - b. Debt issuance is calculated as the log of the ratio of current year total debt to previous year total debt.
4. Accruals: The average of the z-scores for a company's net operating assets (NOA) and accruals, defined as follows:
 - a. NOA is calculated as the ratio of the net operating assets to previous year total assets.
 - b. Accruals is calculated as the difference between the current year NOA and previous year NOA.

Companies without a FD raw score are assigned a score of zero. The outliers of the fundamental variables are winsorized prior to the z-score calculation. To avoid foreign exchange impact during the security selection process, the fundamental variables are calculated using the fundamental data of the company's reporting currency.

2.5 RAFI Index Construction

2.5.1 Stock Selection

Table 2 outlines the regions and size classifications for each available index strategy. For each of the region and company size in Table 2, companies are sorted in descending order by their E, S, G, D, and FD scores, respectively. Companies which belong in the bottom 10% by fundamental weight as calculated in Section 2.3.1, for each respective E, S, G, D, and FD categorization are excluded.

Table 2

RAFI Global Universe		
RAFI Fundamental Indices	Regions	Company Size
RAFI ESG Developed	US, Japan, UK, Developed Europe excluding UK and Other Developed Markets	Large/Mid
RAFI ESG US	US	Large/Mid

Next, companies involved in the following industries, (as defined below) are excluded:

1. Tobacco
 - a. Companies with total revenue from the production of tobacco greater than 0%.
 - b. Companies with total revenue from the production, service and distribution of tobacco greater than or equal to 10%.
2. Gambling
 - a. Companies with total revenue from the production, (i.e. operation or management) of gambling is greater than 5%.
 - b. Companies with total revenue from gambling services, (i.e. software, gaming machines, marketing) greater than 10%.
3. Weapons
 - a. Any company involved in the production of anti-personnel mines, biological, chemical, incendiary or nuclear weapons, cluster munitions, depleted uranium or white phosphorus weapons.

- b. Companies with total revenue from the production, services or distribution of civilian firearms greater than 0%.
- c. Companies with total revenue from military equipment production and services greater than 5%.
- 4. Fossil Fuels
 - a. Companies with total revenue from fossil fuel activities (exploration, production and services) greater than 10%.
- 5. Coal
 - a. Companies with total revenue from coal-fired power generation greater than 0%.
 - b. Companies with total revenue from coal mining (i.e. both thermal and metallurgical coal) greater than 10%.
 - c. Companies with total revenue from thermal coal mining greater than 0%.
- 6. Oil Sands
 - a. Companies with oil sands revenues from production greater than 0%.
 - b. Companies with oil sands revenues from exploration, production and services greater than 10%.

2.5.2 Weighting

For each of the regions and company size in Table 2, the selected companies in Section 2.5.1 are weighted by their adjusted fundamental weight as calculated in Section 2.3.1. ESG tilting is applied to a company's adjusted fundamental weight as follows:

1. Calculate overall ESG score for each company, defined as:

$$ESG\ Score_i = \frac{(E\ score_i + S\ score_i + G\ score_i + D\ score_i + FD\ score_i)}{5}$$

2. Rank companies by ESG score and calculate percentile ranks to determine a company's ESG rank.
3. A company's final ESG tilted weight (TW) is defined as:

$$TW_i = Adjusted\ Fundamental\ Weight_i \times (1 + ESG\ rank_i)$$

Company weights are then renormalized and subject to the application of liquidity limit Rule 2.7, a minimum stock weight of 0.05% and maximum stock weight of 5% for all regions except for the UK region which is 10%.

For indices that include multiple regions, regions are aggregated by multiplying the regional portfolios to their region weight as determined by the RAFI Global Universe described in Section 2.5.1. Company weights are then renormalized and once again subjected to the application of liquidity limit Rule 2.7, a minimum stock weight of 0.05% and maximum stock weight of 5%.

The RAFI Indices are reconstituted annually and rebalanced on a quarterly staggered basis described in Section 2.8.

2.6 RAFI ESG Developed Index NTR EUR Hedged

The RAFI ESG Developed Index NTR EUR Hedged is designed to earn the returns of the RAFI ESG Developed Index while shielding investors from changes in the Euro exchange rate relative to other currencies in the index. Weights for the currency hedge are determined and currency exposures are hedged on a monthly basis on the last business day of each month. Foreign exchange forward contracts are sold to eliminate the risk of currency fluctuations. Forward spot rates are calculated using WM/Reuters closing spot rates from 4:00pm London time. A complete description of the hedging methodology can be found here: [RAFI Indices Hedging Methodology](#).

2.7 Application of Liquidity Limit

The following liquidity limits are applied to the eligible securities.

Let FV_i be the RAFI fundamental value of the i^{th} company. The fundamental weight FW_i for company i is:

$$FW_i = FV_i / \sum_{i=1}^N FV_i$$

Let $ADTV_i$ be the maximum of the 30-day and 90-day median daily traded value in USD at each quarterly rebalance. The liquidity weight LW_i for company i is:

$$LW_i = ADTV_i / \sum_{i=1}^N ADTV_i$$

The 30-day median traded value will be used where there is less than 90 days of historical data. Where there is less than 30 days of historical data, the stock will have a RAFI fundamental value of zero. Where there are multiple lines of equity capital in a company, the traded value will be the aggregation of all lines in the aforementioned company.

The liquidity ratio (LR) is defined as the ratio of fundamental weight to liquidity weight. The liquidity ratio for company i is:

$$LR_i = FW_i / LW_i$$

Where the liquidity ratio is more than four, the new fundamental value is calculated as:

$$\widehat{FV}_i = 4 \times LW_i \times \sum_{i=1}^N FV_i$$

After the fundamental values are updated for all companies using the above formula, new fundamental weights and liquidity ratios are calculated. The process is repeated until all liquidity ratios attain a value not exceeding four. Note that this process will only modify the fundamental values of stocks that exceed the liquidity limit.

2.8 Rebalance

The RAFI Indices are reconstituted annually and rebalanced on a quarterly staggered basis. The model portfolio is split into four equal parts (tranches) and each tranche has equal weight at the March rebalance. Each tranche is a full-fledged model portfolio and is rebalanced once a year to target weights determined for that quarter.

For example, for the RAFI US portfolio, in the initial launch, the four tranches (A, B, C, and D tranches) are identical portfolios. The headline portfolio will consist of 25% of each of the four tranches and, as such, the headline portfolio is the same as the underlying tranches in the initial launch. At the first quarter rebalance, tranche A is replaced, but tranches B, C, and D are not rebalanced and are drifted until the next rebalance. The headline portfolio will change reflecting the update to the rebalanced tranche A. Then, at the next quarter rebalance, tranche B is replaced and the other three tranches are not and are drifted until the next rebalance.

Per the schedule below, a single tranche is rebalanced at the end of the third Friday of March, June, September and December, and effective on the next corresponding trading day. The rebalance effective date is subject to change due to holidays, natural disaster, etc., in which a notice will be provided to subscribers.

In the March rebalance, the eligible securities, company size classification, country classification, and adjusted fundamental weight are determined and used in subsequent quarterly rebalances. Exceptions to the rule may be due to, for example, corporate action. In addition, the tranche weights are re-set to equal (25% each) in the March rebalance. E, S, G, D, and FD scores are updated every quarter to reflect any changes in a company's rating.

Through this method of staggered rebalance, the quarterly rebalance diversifies risk and decreases market impact. Instead of concentrating contra-trading into one single market event, staggered rebalance diversifies rebalance points and increases investment capacity in a meaningful way.

Index	Rebalance Announcement	Distribution of Preliminary Files	Rebalance Schedule	Effective Date
RAFI March Tranche	Provide to subscribers	Five trading days prior to effective date	3rd Friday of March quarterly rebalance	FTD ⁺ after 3rd Friday of March
RAFI June Tranche			3rd Friday of June quarterly rebalance	FTD ⁺ after 3rd Friday of June
RAFI September Tranche			3rd Friday of September quarterly rebalance	FTD ⁺ after 3rd Friday of September
RAFI December Tranche			3rd Friday of December quarterly rebalance	FTD ⁺ after 3rd Friday of December

*FTD=First Trading Day.

2.9 Extraordinary Adjustment

An extraordinary adjustment, if applicable, is triggered and applied in compliance with the rules set forth in the Solactive Equity Index Methodology, (except for rules outlined in Sections 3.4 and 3.5), which can be found here: [Equity Index Methodology](#).

3. CALCULATION OF THE INDEX

3.1 Index Formula

The Index Value on a Business Day at the relevant time is calculated in accordance with the following formula:

$$\text{Index}_t = \sum_{i=1}^n \frac{(x_{i,t} \times p_{i,t} \times f_{i,t})}{D_t}$$

With:

$x_{i,t}$ = Number of Index Shares of the Index Component i on Trading Day t

$p_{i,t}$ = Price of Index Component i on Trading Day t

$f_{i,t}$ = Foreign exchange rate to convert the Price of Index Component i on Trading Day t into the Index Currency

D_t = Divisor on Trading Day t

The initial Divisor on the Base Date is calculated according to the following formula:

$$D_t = \frac{\sum_{i=1}^n (p_{i,t} \times f_{i,t} \times x_{i,t})}{100}$$

After the close of trading on each Rebalancing Day t the new Divisor is calculated as follows:

$$D_{t+1} = \frac{\sum_{i=1}^n (p_{i,t} \times f_{i,t} \times x_{i,t+1})}{\text{Index}_t}$$

This Divisor is valid starting the immediately following Business Day.

3.2 Accuracy

The value of the Index will be rounded to 12 decimal places.

Trading Prices and foreign exchange rates will be rounded to 6 decimal places.

Divisors will be rounded to 6 decimal places.

3.3 Adjustments

Under certain circumstances, an adjustment of the Index may be necessary between two regular Rebalance Days. Such adjustment has to be made if a corporate action (as specified in Section 5.5 below) in relation of an Index Component occurs. Such adjustment may have to be done in relation to an Index Component and/or may also affect the number of Index Components and/or the weighting of certain Index Components.

Solactive will announce the Index adjustment giving a notice period of at least two Trading Days (with respect to the affected Index Component) on the Solactive website under the Section “Announcements”, which is available at <https://www.solactive.com/news/announcements/>. The Index adjustments will be implemented on the effective day specified in the respective notice.

3.4 Dividends and Other Distributions

Dividend payments and other distributions are included in the Index. They cause an adjustment of the Divisor. The new Divisor is calculated as follows:

$$D_{t+1} = D_t \times \frac{\sum_{i=1}^n (p_{i,t} \times f_{i,t} \times x_{i,t}) - (x_{i,t} \times y_{i,t} \times g_{i,t})}{\sum_{i=1}^n (p_{i,t} \times f_{i,t} \times x_{i,t})}$$

With:

$p_{i,t}$ = Price of Index Component i on Trading Day t

$f_{i,t}$ = Foreign exchange rate to convert the Price of Index Component i on Trading Day t into the Index Currency

$x_{i,t}$ = Number of Index Shares of the Index Component i on Trading Day t

$y_{i,t}$ = Distribution of Index Component i with ex-date $t+1$ multiplied by the Dividend Correction Factor

$g_{i,t}$ = Foreign exchange rate to convert the amount of the distribution of Index Component i on Trading Day t into the Index Currency

D_t = Divisor on Trading Day t

D_{t+1} = Divisor on Trading Day $t+1$

3.5 Corporate Actions

3.5.1 Principles

As part of the Index maintenance Solactive will consider various events – also referred to as corporate actions – which result in an adjustment to the Index between two regular Rebalance Days. Such events have a material impact on the price, weighting or overall integrity of Index Components. Therefore, they need to be accounted for in the calculation of the Index. Corporate actions will be implemented from the cum-day to the ex-day of the corporate action, so that the adjustment to the Index coincides with the occurrence of the price effect of the respective corporate action.

Adjustments to the Index to account for corporate actions are outlined in this section. Additional corporate action events not outlined below will be made in compliance with the [Equity Index Methodology](#), which is available on the Solactive website. This document contains for each corporate action a brief definition and specifies the relevant adjustment to the Index variables.

While Solactive aims at creating and maintaining its methodology for treatment of corporate actions as generic and transparent as possible and in line with regulatory requirements, it retains the right in accordance with the Equity Index Methodology to deviate from these standard procedures in case of any unusual or complex corporate action or if such a deviation is made to preserve the comparability and representativeness of the Index over time.

3.5.2 Capital Increases

In the case of capital increases with ex-date $t+1$, the Index is adjusted as follows:

$$x_{i,t+1} = x_{i,t} \times \frac{p_{i,t}}{p_{i,t+1}}$$

With:

$x_{i,t+1}$ = Number of Index Shares of Index Component i on Trading Day $t+1$

$x_{i,t}$ = Number of Index Shares of Index Component i on Trading Day t

$$p_{i,t+1} = \frac{p_{i,t} + s \times B}{1 + B}$$

With:

$p_{i,t+1}$ = Hypothetical Price of Index Component i on Trading Day $t+1$

$p_{i,t}$ = Price of Index Component i on Trading Day t

s = Subscription Price in the Index Component currency

B = Shares received for every share held

$$D_{t+1} = D_t \times \frac{\sum_{i=1}^n (p_{i,t} \times f_{i,t} \times x_{i,t}) + \sum_{i=1}^n [(x_{i,t+1} \times p_{i,t+1} \times f_{i,t}) - (x_{i,t} \times p_{i,t} \times f_{i,t})]}{\sum_{i=1}^n (p_{i,t} \times f_{i,t} \times x_{i,t})}$$

With:

D_{t+1} = Divisor on Trading Day $t+1$

D_t = Divisor on Trading Day t

$p_{i,t}$ = Price of Index Component i on Trading Day t

$f_{i,t}$ = Foreign exchange rate to convert the Price of Index Component i on Trading Day t into the Index Currency

$x_{i,t}$ = Number of Index Shares of the Index Component i on Trading Day t

$p_{i,t+1}$ = Hypothetical Price of Index Component i on Trading Day $t+1$

$x_{i,t+1}$ = Number of Index Shares of the Index Component i on Trading Day $t+1$

3.5.3 Share Splits

In the case of share splits with ex-date on Trading Day $t+1$, it is assumed that the prices change in ratio of the terms of the split. The new Number of Index Shares is calculated as follows:

$$x_{i,t+1} = x_{i,t} \times B$$

With:

$x_{i,t+1}$ = Number of Index Shares of the affected Index Component on Trading Day $t+1$

$x_{i,t}$ = Number of Index Shares of the affected Index Component on Trading Day t

B = Shares after the share split for every share held before the split

3.5.4 Stock Distributions

In the case of stock distributions with ex-date on Trading Day $t+1$ it is assumed that the prices change according to the terms of the distribution. The new Number of Index Shares is calculated as follows:

$$x_{i,t+1} = x_{i,t} \times (1 + B)$$

With:

$x_{i,t+1}$ = Number of Index Shares of the affected Index Component on Trading Day $t+1$

$x_{i,t}$ = Number of Index Shares of the affected Index Component on Trading Day t

B = Shares received for every share held

3.5.5 Spin-Off

A spun-off company is eligible for inclusion if its security line is traded on an exchange of any country that is currently in the index, (for example, in a Developed Index, a spin-off of a UK company that is traded on a US exchange would be eligible for the index). The spun-off company is added, the market will adjust the price of the parent company such that the sum of the parent and spun-off company's weight is approximately equal to the weight of the parent prior to spin-off. Based on the transaction terms on the ex-date, the shares of the spun-off company is calculated as follows:

$$\text{Shares of Spun-off Company} = \text{Shares of Parent Company} * \text{Transaction Terms}$$

The parent company and spun-off company will remain in the Index with unchanged calculation parameters.

The spun-off company will be added to the Index file with a price of zero prior to the ex-date. If the spun-off company does not start to trade on the ex-date, a theoretical price for the spun-off company will be implemented as a fixed price until it commences trading, from which time official prices will be used. The price of the spun-off company is calculated as follows:

$$\text{Price of Spun-off Company} = [(\text{Close Price Parent Company Prior to Ex-Date}) - (\text{Open Price Parent Company on Ex-Date})] * \text{Transaction Terms}$$

If the first trading day of the spun-off company is unknown on the ordinary rebalancing date, the spun-off company will be removed from the Index with a price of zero.

In case the spun-off company is already an index constituent, the additional shares demerged from the parent company will be added to the spun-off company (share increase of the index member) on the ex-date.

If a spun-off company is not eligible (for example, the spun-off company is traded OTC or on an ineligible country's exchange), that company's shares are not added to the Index but instead, the weight of the spun-off company is redistributed as a special cash distribution on the ex-date.

3.5.6 Mergers and Acquisitions

In case of an Index Component subject to mergers and acquisitions, the acquired entity will be removed from the Index on the ex-date. The Index is subject to further adjustments in accordance with the following cases:

1. Merger or Acquisition of an Index Component with/by another Index Component.

- Cash Terms: The weight of the target company based on its last close price will be distributed pro-rata across the remaining Index Components.
- Stock Terms: The shares of the acquiring/surviving company will be increased according to the stock terms.
- Cash and Stock Terms: The cash portion will be reinvested pro-rata across the remaining Index Components. The shares of the acquiring/surviving company will be increased according to the stock terms.

2. Merger or Acquisition of an Index Component with/by a non-Index Component.

- Cash Terms: The weight of the target company based on its last close price will be distributed pro-rata across the remaining Index Components.
- Stock Terms: The weight of the target company based on its last close price will be distributed pro-rata across the remaining Index Components.
- Cash and Stock Terms: The weight of the target company based on its last close price will be distributed pro-rata across the remaining Index Components.

3.6 Calculation of the Index in the Event of a Market Disruption

3.6.1 Recalculation

Solactive makes the greatest possible efforts to accurately calculate and maintain the indices. However, errors in the determination process may occur from time to time for variety reasons (internal or external) and therefore, cannot be completely ruled out. Solactive endeavors to correct all errors that have been identified within a reasonable period of time. The understanding of “a reasonable period of time” as well as the general measures to be taken are generally depending on the underlying and is specified in the [Correction Policy](#).

3.6.2 Changes in Calculation Method

The application by the Benchmark Administrator of the method described in this document is final and binding. The Benchmark Administrator shall apply the method described above for the composition and calculation of the Index. However, it cannot be excluded that the market environment, supervisory, legal and financial or tax reasons may require changes to be made to this method. The Benchmark Administrator may also make changes to the terms and conditions of the Index and the method applied to calculate the Index that it deems to be necessary and desirable in order to prevent obvious or demonstrable error or to remedy, correct or supplement incorrect terms and conditions. The Benchmark Administrator is not obliged to provide information on any such modifications or changes. Despite the modifications and changes, the Benchmark Administrator will take the appropriate steps to ensure a calculation method is applied that is consistent with the method described above.

3.6.3 Termination

Solactive makes the greatest possible efforts to ensure the resilience and continued integrity of the indices over time. Where necessary, Solactive follows a clearly defined and transparent procedure to adapt Index methodologies to changing underlying markets in order to maintain continued reliability and comparability of the indices. The methodology of the Index Series is subject to regular review, at least annually. In case a need of a change of the methodology has been identified within such review (e.g. if the underlying market or economic reality has changed since the launch of the Index Series, i.e. if the present methodology is based on obsolete assumptions and factors and no longer reflects the reality as accurately, reliably and appropriately as before), such change will be made in accordance with the Solactive Methodology Policy, which is incorporated by reference and available on the Solactive website: [Methodology Policy](#).

Such change in the methodology will be announced on the Solactive website under the Section “Announcement”, which is available at <https://www.solactive.com/news/announcements/>. The date of the last amendment of this Index Series is contained in this guideline.

Nevertheless, if no other options are available the orderly cessation of the Index may be indicated. This is usually the case when the underlying market or economic reality, which an index is set to measure or to reflect, changes substantially and in a way not foreseeable at the time of inception of the index, the index rules, and particularly the

selection criteria, can no longer be applied coherently or the index is no longer used as the underlying value for financial instruments, investment funds and financial contracts. Solactive has established and maintains clear guidelines on how to identify situations in which the cessation of an index is unavoidable, how stakeholders are to be informed and consulted and the procedures to be followed for a termination or the transition to an alternative index. Details are specified in the Solactive [Termination Policy](#).

3.6.4 Market Disruption

In periods of market stress Solactive calculates the indices following predefined and exhaustive arrangements as described in the [Disruption Policy](#). Such market stress can arise due to a variety of reasons, but generally results in inaccurate or delayed prices for one or more Index Components. The determination of the Index may be limited or impaired at times of illiquid or fragmented markets and market stress.

4. DEFINITIONS

“Index Universe” in respect of a Selection Day are companies that fulfill the criteria in Section 2, Construction Methodology.

“Index Component” is each share currently included in an Index.

“Number of Shares” is in respect of an Index Component and any given Business Day the number or fraction of shares included in the Index. It is calculated for any Index Component as the ratio of (A) the Percentage Weight of an Index Component multiplied by the Index value and the Divisor, and (B) its Trading Price (converted into the index currency according to the principles laid out in Section 1.4 of this document).

“Percentage Weight” of an Index Component is the ratio of its Trading Price multiplied by its Number of Shares divided by the Index value.

“Dividend Correction Factor” is calculated as 1 minus the applicable withholding tax rate and/or other applicable tax rate currently prevalent in the respective country.

In particular an **“Extraordinary Event”** is

- a merger
- a takeover bid
- a delisting
- the nationalisation of a company
- insolvency

The Trading Price for this Index Component on the day the event came into effect is the last available market price for this Index Component quoted on the Exchange on the day the event came into effect (or, if a market price is not available for the day the event came into effect, the last available market price quoted on the Exchange on a day specified as appropriate by the Index Calculator), as determined by the Index Calculator, and this price is used as the Trading Price of the particular Index Component until the end of the day on which the composition of the Index is next set.

In the event of the insolvency of an issuer of an Index Component the Index Component shall remain in the Index until the next Rebalancing Day. As long as a market price for the affected Index Component is available on a Business Day, this shall be applied as the Trading Price for this Index Component on the relevant Business Day, as determined in each case by the Index Calculator. If a market price is not available on a Business Day the Trading Price for this Index Component is set to zero. The Committee may also decide to eliminate the respective Index Component at an earlier point in time prior to the next Rebalancing Day. The procedure in this case is identical to an elimination due to and Extraordinary Event.

An Index Component is **“delisted”** if the Exchange announces pursuant to the Exchange regulations that the listing of, the trading in, or the issuing of public quotes on the Index Component at the Exchange has ceased immediately or will cease at a later date, for whatever reason (provided delisting is not because of a Merger or a Takeover bid), and the Index Component is not immediately listed, traded, or quoted again on an exchange, trading, or listing system acceptable to the Index Calculator.

“Insolvency” occurs with regard to an Index Component if (A) all shares of the respective issuer must be transferred to a trustee, liquidator, insolvency administrator, or a similar public officer as result of a voluntary or compulsory liquidation, insolvency or winding-up proceedings, or comparable proceedings

affecting the issuer of the Index Components, or (B) the holders of the shares of this issuer are legally enjoined from transferring the shares.

A “Takeover Bid” is a bid to acquire an exchange offer or any other offer or act of a legal person that results in the related legal person acquiring as part of an exchange or otherwise more than 10% and less than 100% of the voting shares in circulation from the issuer of the Index Component or the right to acquire these shares, as determined by the Index Calculator based on notices submitted to public or self-regulatory authorities or other information considered by the Index Calculator to be relevant.

With regard to an Index Component a “**Merger**” is

1. a change in the security class or a conversion of this share class that results in a transfer or an ultimate definite obligation to transfer all the shares in circulation to another legal person;
2. a merger (either by acquisition or through forming a new structure) or a binding obligation on the part of the issuer to exchange shares with another legal person (except in a merger or share exchange under which the issuer of this Index Component is the acquiring or remaining company and which does not involve a change in security class or a conversion of all the shares in circulation);
3. a takeover offer, exchange offer, other offer, or another act of a legal person for the purposes of acquiring or otherwise obtaining from the issuer 100% of the shares issued that entails a transfer or the irrevocable obligation to transfer all shares (with the exception of shares which are held and controlled by the legal person); or
4. a merger (either by acquisition or through forming a new structure) or a binding obligation on the part of the issuer of the share or its subsidiaries to exchange shares with another legal person, whereby the issuer of the share is the acquiring or remaining company and it does not involve a change in the class or a conversion of the all shares issued, but the shares in circulation directly prior to such an event (except for shares held and controlled by the legal person) represent in total less than 50% of the shares in circulation directly subsequent to such an event.

The “**Merger Date**” is the date on which a Merger is concluded or the date specified by the Index Calculator if such a date cannot be determined under the law applicable to the Merger.

“**Nationalisation**” is a process whereby all shares or the majority of the assets of the issuer of the shares are nationalised or are expropriated or otherwise must be transferred to public bodies, authorities, or institutions.

“**Exchange**” is, in respect of Index and every Index Component, the respective primary exchange where the Index Component has its primary listing. The Committee may decide to declare a different stock exchange the “Exchange” for trading reasons, even if the company is only listed there via a Stock Substitute.

“**Stock Substitute**” includes in particular American Depository Receipts (ADR) and Global Depository Receipts (GDR).

With regard to an Index component (subject to the provisions given above under “Extraordinary Events”) the “**Trading Price**” in respect of a Trading Day is the closing price on this Trading Day determined in accordance with the Exchange regulations. If the Exchange has no closing price for an Index Component, the Index Calculator shall determine the Trading Price and the time of the quote for the share in question in a manner that appears reasonable to him.

A “**Trading Day**” is in relation to the Index or an Index Component a Trading Day on the Exchange (or a day that would have been such a day if a market disruption had not occurred), excluding days on which trading may be ceased prior to the normal Exchange closing time. The Index Calculator is ultimately responsible as to whether a certain day is a Trading Day with regard to the Index or an Index Component or in any other connection relating to this document.

The “**Closing Price**” in respect of an Index Component and a Trading Day is a security's final regular-hours Trading Price published by the Exchange and determined in accordance with the Exchange regulations. If the Exchange has no or has not published a Closing Price in accordance with the Exchange rules for an Index Component, the last Trading Price will be used.

A “**Business Day**” is defined as Monday through Friday, including holidays.

The **“Index Calculator”** is Solactive AG or any other appropriately appointed successor in this function.

The **“Benchmark Administrator”** is Solactive AG or any other appropriately appointed successor in this function.

The **“Index Currency”** is in USD.

“Market Capitalization” is with regard to each of the shares in the Index Universe on a Selection Day or Rebalancing Day the value published as the Market Capitalization for this day.

As of the date of this document, Market Capitalization is defined as the value of a company calculated by multiplying the number of shares outstanding of the company by its share price.

“Rebalancing Day” is provided by the Index Sponsor (see Section 2, Construction Methodology).

“Selection Day” is the second Friday of February, May, August, and November where the Index Sponsor provides the new constituents and weights of the Index (see Section 2, Construction Methodology).

“Index Sponsor” is RAFI Indices, LLC.

An **“Affiliated Exchange”** is with regard to an Index Component an exchange, a trading or quotation system on which options and futures contracts on the Index Component in question are traded, as specified by the Index Calculator.

A **“Market Disruption Event”** occurs if

1. one of the following events occurs or exists on a Trading Day prior to the opening quotation time for an Index Component:
 - a. Trading is suspended or restricted (due to price movements that exceed the limits allowed by the Exchange or an Affiliated Exchange, or for other reasons):
 - i. across the whole Exchange; or
 - ii. in options or futures contracts on or with regard to an Index Component or an Index Component that is quoted on an Affiliated Exchange; or
 - iii. on an Exchange or in a trading or quotation system (as determined by the Index Calculator) in which an Index Component is listed or quoted.
 - b. An event that (in the assessment of the Index Calculator) generally disrupts and affects the opportunities of market participants to execute on the Exchange transactions in respect of a share included in the Index or to determine market values for a share included in the Index or to execute on an Affiliated Exchange transaction with regard to options and futures contracts on these shares or to determine market values for such options or futures contracts.
2. trading on the Exchange or an Affiliated Exchange is ceased prior to the usual closing time (as defined below), unless the early cessation of trading is announced by the Exchange or Affiliated Exchange on this Trading Day at least one hour before
 - a. the actual closing time for normal trading on the Exchange or Affiliated Exchange on the Trading Day in question or, if earlier.
 - b. the closing time (if given) of the Exchange or Affiliated Exchange for the execution of orders at the time the quote is given.

“Normal Exchange Closing Time” is the time at which the Exchange or an Affiliated Exchange is normally closed on working days without taking into account after-hours trading or other trading activities carried out outside the normal trading hours; or

3. a general moratorium is imposed on banking transactions in the country in which the Exchange is resident if the above-mentioned events are material in the assessment of the Index

Calculator, whereby the Index Calculator makes his decision based on those circumstances that he considers reasonable and appropriate.

5. APPENDIX

5.1 RAFI ESG Index Series Information

Index Name	Total Return Ticker	Price Return Ticker	Net Return Ticker	Market Hours	Currency	Base Date	Launch Date
RAFI ESG Developed Index	RAESGDVT	RAESGDVP	RAESGDVN	US	USD	3/30/2018	3/30/2018
RAFI ESG Developed Index (EUR)	N/A	RAESGDPE	RAESGDNE	EUR	EUR	3/30/2018	3/30/2018
RAFI ESG Developed Index NTR EUR Hedged	N/A	N/A	RAESGDVH	EUR	EUR	3/30/2018	6/24/2019
RAFI ESG US Index	RAESGUST	RAESGUSP	RAESGUSN	US	USD	3/30/2018	3/30/2018

5.2 Contact Data

For all questions relating to methodology and licensing and access, please contact RAFI Indices at info@rafi.com or call 1-866-695-9900 or 949-325-8700.

5.3 Calculation of the Index—Change in Calculation Method

The application by the Index Calculator of the method described in this document is final and binding. The Index Calculator shall apply the method described above for the composition and calculation of the Index. However, it cannot be excluded that the market environment, supervisory, legal, financial, or tax reasons may require changes to be made to this method. The Index Calculator may also make changes to the terms and conditions of the Index and the method applied to calculate the Index, which they deem to be necessary and desirable in order to prevent obvious or demonstrable error or to remedy, correct, or supplement incorrect terms and conditions. The Index Calculator is not obliged to provide information on any such modifications or changes. Despite the modifications and changes the Index Calculator will take the appropriate steps to ensure a calculation method is applied that is consistent with the method described above.

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