

# FTSE ESG Government Bond Index Series

v1.9



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## Section 1

# Introduction

## 1. Introduction

### 1.1 Overview

The FTSE ESG Government Bond Index Series is designed to quantitatively capture Environmental, Social and Governance (ESG) factors in government bond indices by reweighting security market values based on the Beyond Ratings Sovereign Risk Monitor (SRM).

1.1.1 The FTSE ESG Government Bond Index Series takes account of ESG factors in its design.

If a tilting approach is used for an ESG data input, the objective is for the index methodology to overweight and/or underweight constituents according to specific ESG criteria. This approach will not remove all companies with exposure to a specific ESG activity or sector.

### 1.2 FTSE ESG Government Bond Index Series

1.2.1 The FTSE ESG Government Bond Index Series incorporates a tilting methodology to adjust the index weights of government bonds according to each country's relative Environmental, Social and Governance (ESG) score. The weight of each country is based on the market capitalisation of its index-eligible debt and its relative ESG performance, measured across three distinct and quantitative Environmental, Social and Governance pillars (E, S and G pillars).

1.2.2 The Index Series follows the monthly rebalancing mechanics of standard FTSE global government bond indices with respect to universe membership. The rebalanced market value weights for each country are then re-tilted each month-end by their respective country Index ESG score. These Index ESG scores are re-calculated on a monthly basis using quarterly updated E, S and G pillar scores, which are available the month following each quarter-end<sup>1</sup>.

1.2.3 The E, S and G pillar scores assess a country's exposure to and management of ESG risk factors and are taken from the Sustainability Profile of the Beyond Ratings Sovereign Risk Monitor. Scores are derived by evaluating each country's performance across three pillars (each with multiple sub-indicators):

- **Environmental performance:** considers Energy, Climate, and Resources;
- **Social performance:** considers Inequality, Employment, Human Capital, Health, and Societal Wellbeing;
- **Governance performance:** considers Corruption, Government Effectiveness, Political Stability, Regulatory Quality, Rule of Law, and Voice & Accountability.

1.2.4 Countries' quarterly pillar scores are compared on a relative basis across the cohort of countries that will be index-eligible for the following month. Relative pillar scores are combined to derive a single combined index ESG score for each country for the following month. The combined country ESG scores are used to reweight each country's exposure in the index to provide larger exposures to countries that have a higher index ESG score, and smaller exposures to countries that have a lower index ESG score.

1.2.5 The FTSE ESG Government Bond Index Series comprises:

<sup>1</sup> E, S and G pillar scores are published each January, April, July and October, and are applied to the February, May, August and November index profiles, respectively. For example, scores published in January reflect the previous year's final quarter, and remain static as E, S and G pillar inputs for the February, March and April index profiles.

- FTSE ESG World Government Bond Index (“ESG WGBI”);
- FTSE ESG World Government Bond Index Ex-Japan (“ESG WGBI Ex-Japan”);
- FTSE ESG European Monetary Union (EMU) Government Bond Index (“ESG EGBI”);
- FTSE ESG Emerging Markets US Dollar Government Bond Index (“ESG EMUSDGBI”);
- FTSE ESG Emerging Markets Government Bond Capped Index (“ESG EMGBI-Capped”).

### **1.3 FTSE Russell**

1.3.1 FTSE Russell is a trading name of FTSE International Limited, Frank Russell Company, FTSE Global Debt Capital Markets Limited (and its subsidiaries FTSE Global Debt Capital Markets Inc. and FTSE Fixed Income Europe Limited), FTSE Fixed Income LLC, FTSE (Beijing) Consulting Limited, Refinitiv Benchmark Services (UK) Limited, Refinitiv Limited and Beyond Ratings.

### **1.4 Index objective and intended use**

1.4.1 FTSE Russell hereby notifies users of the index series that it is possible that circumstances, including external events beyond the control of FTSE Russell, may necessitate changes to, or the cessation of, the index series and therefore, any financial contracts or other financial instruments that reference the index series or investment funds which use the index series to measure their performance should be able to withstand, or otherwise address the possibility of changes to, or cessation of, the index.

1.4.2 Index users who choose to follow this index series or to buy products that claim to follow this index series should assess the merits of the index’s rules-based methodology and take independent investment advice before investing their own or client funds. No liability whether as a result of negligence or otherwise is accepted by FTSE Russell for any losses, damages, claims and expenses suffered by any person as a result of:

- any reliance on these Ground Rules, and/or
- any inaccuracies in these Ground Rules, and/or
- any non-application or misapplication of the policies or procedures described in these Ground Rules, and/or
- any inaccuracies in the compilation of the index or any constituent data.

## Section 2

# Management responsibilities

## 2. Management responsibilities

### 2.1 FTSE Fixed Income LLC (“FTSE”)

2.1.1 FTSE is the benchmark administrator of the index series<sup>2</sup>.

2.1.2 FTSE is responsible for the daily calculation, production and operation of the index series and will:

- maintain records of the index weightings of all constituents;
- make changes to the constituents and their weightings in accordance with the Ground Rules;
- carry out the periodic index reviews of the index series and apply the changes resulting from the reviews as required by the Ground Rules;
- disseminate the indices.

### 2.2 Amendments to these Ground Rules

2.2.1 These Ground Rules shall be subject to regular review (at least once a year) by FTSE Russell to ensure that they continue to best reflect the aims of the index series. Any proposals for significant amendments to these Ground Rules will be subject to consultation with FTSE Russell advisory committees and other stakeholders if appropriate. The feedback from these consultations will be considered by the FTSE Russell Index Governance Board before approval is granted.

2.2.2 As provided for in the statement of principles for FTSE Russell Indices, where FTSE Russell determines that the Ground Rules are silent or do not specifically and unambiguously apply to the subject matter of any decision, any decision shall be based as far as practical on the statement of principles. After making any such determination, FTSE Russell shall advise the market of its decision at the earliest opportunity. Any such treatment will not be considered as an exception or change to the Ground Rules, or to set a precedent for future action, but FTSE Russell will consider whether the Rules should subsequently be updated to provide greater clarity.

<sup>2</sup> The term administrator is used in this document in the same sense as it is defined in Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds (the European Benchmark Regulation) and [The Benchmarks \(Amendment and Transitional Provision\) \(EU Exit\) Regulations 2019](#) (the UK Benchmark Regulation). FTSE Fixed Income LLC administers the Index Series in line with the third country transitional provisions contained within Article 51(5) of the European Benchmark Regulation and the third country transitional provisions as amended by Article 42(5) of the UK Benchmark Regulation.

## Section 3

# FTSE Russell index policies

### 3. FTSE Russell index policies

These Ground Rules should be read in conjunction with the following policy documents which can be accessed using the links below:

#### 3.1 Queries and Complaints

FTSE Russell's complaints procedure can be accessed using the following link:

[FTSE Russell Benchmark Determination Complaints Handling Policy.pdf](#)

#### 3.2 Statement of Principles for FTSE Fixed Income Indices (the Statement of Principles)

Indices need to keep abreast of changing markets and the Ground Rules cannot anticipate every eventuality. Where the rules do not fully cover a specific event or development, FTSE Russell will determine the appropriate treatment by reference to the statement of principles for FTSE Fixed Income Indices which summarises the ethos underlying FTSE Russell's approach to index construction. The statement of principles is reviewed annually and any changes proposed by FTSE Russell are presented to the FTSE Russell Policy Advisory Board for discussion before approval by the FTSE Russell Index Governance Board.

The statement of principles for FTSE Fixed Income Indices can be accessed using the following link:

[Statement of Principles Fixed Income Indices.pdf](#)

#### 3.3 Recalculation Policy and Guidelines

The recalculation policy and guidelines for the FTSE Fixed Income Indices document is available from the FTSE Russell website using the link below or by contacting [fi.index@lseg.com](mailto:fi.index@lseg.com).

[Fixed Income Recalculation Policy and Guidelines.pdf](#)

#### 3.4 Policy for Benchmark Methodology Changes

Details of FTSE Russell's policy for making benchmark methodology changes can be accessed using the following link:

[Policy for Benchmark Methodology Changes.pdf](#)

#### 3.5 Index Policy in the Event Clients are Unable to Trade a Market or a Security

Details of FTSE Russell's treatment can be accessed using the following link:

[Index Policy in the Event Clients are Unable to Trade a Market or a Security.pdf](#)

### **3.6 FTSE Russell Governance Framework**

To oversee its indices, FTSE Russell employs a governance framework that encompasses product, service and technology governance. The framework incorporates the London Stock Exchange Group's three lines of defense risk management framework and is designed to meet the requirements of the IOSCO Principles for Financial Benchmarks<sup>3</sup>, the European benchmark regulation<sup>4</sup> and the UK benchmark regulation<sup>5</sup>. The FTSE Russell governance framework can be accessed using the following link:

[FTSE Russell Governance Framework.pdf](#)

### **3.7 Real Time Status Definitions**

3.7.1 Please refer to the following guide for details of real time status definitions for indices that are calculated in real time.

[Real Time Status Definitions.pdf](#)

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<sup>3</sup> IOSCO Principles for Financial Benchmarks Final Report, FR07/13 July 2013.

<sup>4</sup> Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds.

<sup>5</sup> The Benchmarks (Amendment and Transitional Provision) (EU Exit) Regulations 2019.

## Section 4

# Base universes for the FTSE ESG Government Bond Index Series

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## 4. Base universes for the FTSE ESG Government Bond Index Series

- 4.1 The base universe for the FTSE ESG World Government Bond Index (“ESG WGBI”) and FTSE ESG World Government Bond Index Ex-Japan (“ESG WGBI Ex-Japan”) is the market capitalisation weighted FTSE World Government Bond Index (WGBI). The FTSE WGBI measures the performance of fixed-rate, local currency, investment-grade sovereign bonds and comprises sovereign debt from over 20 countries.
- 4.2 The base universe for the FTSE ESG European Monetary Union (EMU) Government Bond Index (“ESG EGBI”) is the FTSE EMU Government Bond Index (EGBI). The FTSE EGBI measures the performance of fixed-rate, local currency, investment-grade sovereign bonds issued by the EMU-participating countries that meet the WGBI inclusion criteria.
- 4.3 The base universe for the FTSE ESG Emerging Markets US Dollar Government Bond Index (“ESG EMUSDGBI”) is the market capitalisation weighted FTSE Emerging Markets US Dollar Government Bond Index (EMUSDGBI). The FTSE EMUSDGBI includes US Dollar-denominated emerging market sovereign debt issued by more than 50 countries from Latin America, Eastern Europe, Middle East, Africa, and Asia.
- 4.4 The base universe for the FTSE ESG Emerging Markets Government Bond Capped Index (“ESG EMGBI-Capped”) is the FTSE Emerging Markets Government Bond Capped Index, which imposes a maximum country weight of 10% to limit individual market exposure in the FTSE Emerging Markets Government Bond Index. The FTSE Emerging Markets Government Bond Index comprises local currency government bonds from 16 countries.
- 4.5 For full details on the design criteria and calculation assumptions for the base indices, please refer to the FTSE Fixed Income Index Guide which can be accessed using the following link: [FTSE Fixed Income Index Guide](#)



## Section 5

# ESG data inputs

## 5. ESG data inputs

5.1.1 The following ESG datasets are used in the construction of the indices.

ESG data inputs	Details	Used for selection, weighting or exclusion <sup>6</sup>
<b>Beyond Ratings Sovereign Risk Monitor (SRM)</b>	The Sovereign Risk Monitor (SRM) is designed to measure the material financial risk from ESG factors for sovereign issuers. More information can be found: <a href="https://www.beyondratings.com/sovereign-risk-monitor-methodology">sovereign-risk-monitor-methodology</a>	<b>Weighting</b>
<b>Freedom House Data</b>	Freedom House measures the level of democratic governance in countries through its annual Nations in Transit report. More information can be found: <a href="https://www.freedomhouse.org/countries/nations-transit/scores?sort=asc&amp;order=Total%20Score%20and%20Status">www.freedomhouse.org/countries/nations-transit/scores?sort=asc&amp;order=Total%20Score%20and%20Status</a>	<b>Selection</b>
<b>World Bank Indicators</b>	The World Bank World Development Indicators (WDI) provides cross-country comparable data on development. More information can be found: <a href="https://data.worldbank.org/world-development-indicators/">www.datatopics.worldbank.org/world-development-indicators/</a> The World Bank Worldwide Governance Indicators (WGI) report on six broad dimensions of governance for countries. More information can be found: <a href="https://info.worldbank.org/governance/wgi/">https://info.worldbank.org/governance/wgi/</a>	<b>Weighting</b>

5.1.2 Further information on ESG data provided by FTSE Russell and third parties used in this index (index series) can be found in the following guide:

[Guide to FTSE and Third Party ESG Data used in FTSE Russell Indices](#)

This includes information on the data and standards used for these ESG data inputs. These data sets may include estimated data.

<sup>6</sup> Definitions

Selection - ESG data is used to select or rank constituents, or calculate minimum scores or thresholds

Weighting - ESG data is used to calculate the weight of a constituent in an index

Exclusion - ESG data is used to exclude securities from the index

## Section 6

# Index methodology

## 6. Index methodology

### 6.1 ESG country weights

- 6.1.1 The FTSE ESG Government Bond Index Series incorporates country-level ESG scores derived from the three E, S and G pillars to the market value weight of each country. The index weights are a function of the base index market value weights and country-level ESG scores.
- 6.1.2 The Index Series follows the monthly rebalancing mechanics of each base universe index with respect to security-level membership. The market value weight for each security is tilted by its respective country's ESG score. The index ESG scores assess a country's exposure to and management of ESG risk factors and are derived from the Sustainability Profile of the Beyond Ratings Sovereign Risk Monitor.
- 6.1.3 ESG scores for each country in the index are derived by evaluating each country's performance across three pillars (each with multiple sub-indicators):
- **Environmental performance:** considers Energy, Climate, and Resources;
  - **Social performance:** considers Inequality, Employment, Human Capital, Health, and Societal Wellbeing;
  - **Governance performance:** considers Corruption, Government Effectiveness, Political Stability, Regulatory Quality, Rule of Law, and Voice & Accountability.
- 6.1.4 A score for each country is assigned across each of the pillars on a quarterly basis<sup>7</sup>. At each month-end, pillar scores are compared on a relative basis against the cohort of countries that will be index-eligible for the following month. Relative pillar scores are combined to derive a single combined ESG score for each country for the following month. Country combined ESG scores are used to reweight each country's index exposure to provide larger exposures to countries that have a higher ESG score, and smaller exposures to countries that have a lower ESG score.
- 6.1.5 If a new country becomes eligible for the base universe index, it will be included in the cohort of countries for relative pillar scoring as of the month-end prior to it entering the index, using E, S and G pillar scores from the most recent quarter. For example, a country entering the base universe index for the March profile will use the E, S and G pillar scores available as of January. At February month-end, the new country will be included in the cohort of countries used to calculate relative E, S and G pillar scores. These pillar scores are combined to assign a country ESG scores, which is used to reweight countries for the following month's March profile.

<sup>7</sup> E, S and G pillar scores are published in January, April, July and October, and are applied to the February, May, August and November profiles respectively. For example, scores published in January relate to the previous year's final quarter, and remain static as E, S and G pillar inputs for February, March and April profiles.

## 6.2 ESG WGBI design criteria and calculation methodology

6.2.1 The base universe for the FTSE ESG WGBI is the FTSE WGBI. The same logic applies to the FTSE ESG WGBI Index Ex-Japan. As of November 2022, index countries include:

Americas		Asia Pacific and Japan
Canada		Australia
Mexico		China <sup>8</sup>
		Japan
United States		Malaysia
		New Zealand
		Singapore
EMEA		
Austria	Ireland	Denmark
Belgium	Italy	Israel
Finland	Netherlands	Norway
France	Spain	Poland
Germany		Sweden
		United Kingdom

6.2.2 The ESG tilting of index weights is designed reweight countries based on their relative ESG score in the cohort outlined below:

<b>Weighting</b>	Alternatively weighted
<b>Country ESG Scores</b>	Updated quarterly and applied with a one-month lag for the following three months
<b>Country ESG Score Assessment Cohort</b>	Local currency sovereign bond markets eligible for the WGBI
<b>ESG Pillars and tilt calibration</b>	Geometric tilt – Environmental Performance: 0.5; – Social Performance: 0.5; – Governance Performance: 0.5
<b>Rebalancing</b>	Once a month at the end of the month
<b>Calculation frequency</b>	Daily
<b>Fixing date</b>	Each month, the upcoming month's index constituents are "fixed" on the profile fixing date. Each year's scheduled fixing dates are published on the <a href="https://www.yieldbook.com">yieldbook.com</a> website
<b>Base date</b>	December 31 2001

<sup>8</sup> Inclusion of China phased in over a 36-month period starting in November 2021.

### 6.3 FTSE ESG EGBI design criteria and calculation methodology

6.3.1 The base universe for the FTSE ESG EGBI is the FTSE EGBI, which consists of the Eurozone-participating countries that meet the WGBI criteria. As of September 2021, eligible countries include:

EMEA	
Austria	Ireland
Belgium	Italy
Finland	Netherlands
France	Spain
Germany	

6.3.2 The ESG tilting of index weights is designed to reweight countries based on their relative ESG score in the cohort outlined below:

<b>Weighting</b>	Alternatively weighted
<b>Country ESG Scores</b>	Updated quarterly and applied with a one-month lag for the following three months
<b>Country ESG Score Assessment Cohort</b>	Local currency sovereign bond markets eligible for the EGBI
<b>ESG Pillars and tilt calibration</b>	Geometric tilt – Environmental Performance: 0.5; – Social Performance: 0.5; – Governance Performance: 0.5
<b>Rebalancing</b>	Once a month at the end of the month
<b>Calculation frequency</b>	Daily
<b>Fixing date</b>	Each month, the upcoming month's index constituents are "fixed" on the profile fixing date. Each year's scheduled fixing dates are published on the website
<b>Base date</b>	December 31 2001

### 6.4 FTSE ESG EMUSDGBI design criteria and calculation methodology

6.4.1 The base universe for the FTSE ESG EMUSDGBI is the FTSE EMUSDGBI which includes US Dollar-denominated emerging market sovereign debt from more than 50 countries from Latin America, Eastern Europe, Middle East, Africa, and Asia.

The ESG tilting of index weights is designed to reweight countries based on their relative ESG score in the cohort outlined below:

<b>Weighting</b>	Alternatively weighted
<b>Country ESG Scores</b>	Updated quarterly and applied with a one-month lag for the following three months
<b>Country ESG Score Assessment Cohort</b>	Government bond markets eligible for the EMUSDGBI in any given month.
<b>ESG Pillars and tilt calibration</b>	Geometric tilt – Environmental Performance: 0.5; – Social Performance: 0.5; – Governance Performance: 2.0
<b>Rebalancing</b>	Once a month at the end of the month
<b>Calculation frequency</b>	Daily
<b>Fixing date</b>	Each month, the upcoming month's index constituents are "fixed" on the profile fixing date. Each year's scheduled fixing dates are published on the website
<b>Base date</b>	December 31 2009

6.4.2 Countries designated as “Consolidated Authoritarian Regime” or “Semi-Consolidated Authoritarian Regime” by the Freedom House are not eligible for the ESG EMUSDGBI. Freedom House classifies countries as such as part of its ‘Nations in Transit’ report<sup>9</sup>. Freedom House designations are updated on an annual basis in April. Any changes are applied for June index profiles if changes to country designations occur.

6.4.3 Each month, the cohort of countries that relative scores are assigned for may change if the universe of countries with index-eligible bonds for the underlying FTSE EMUSDGBI changes.

6.4.4 In the event that a new country becomes eligible for the FTSE EMUSDGBI and does not have quarterly E, S and G pillar scores available at the time of inclusion or at subsequent monthly index rebalances, the country will not be included in the relative country cohort scoring. The country will be assigned a neutral E, S and G score relative to the other countries, such that it is neither under- or over-weighted versus its market capitalisation index weight in the FTSE EMUSDGBI. This neutral scoring will be applied until the month-end of the next quarterly publishing of E, S and G pillar scores, at which point the country will be included in the relative country cohort scoring as normal.

6.4.5 The longest time period for which a neutral score can be applied will be four months, which occurs when a country without scores enters the underlying index the month before a quarterly score is published. For example, a country entering the index for April profiles as of March month-end will have E, S and G scores published in July, and will be included in the relative scoring calculation effective for August profiles as of July month-end. However, if the country without scores enters the index in February or March, the scores will be published in April, and reflected in the relative scoring calculation for May index profiles.

## 6.5 FTSE ESG Emerging Markets Government Bond Capped Index design criteria and calculation methodology

6.5.1 The base universe for the FTSE ESG Emerging Markets Government Bond Capped Index is the FTSE Emerging Markets Government Bond Capped Index. The FTSE EMGBI-Capped includes local currency government bonds from 16 countries and imposes a maximum country weight of 10% to limit individual market exposure. Index weights exceeding 10% are re-allocated to other countries on a market value weighted basis. ESG tilting is then applied to these capped country weights, without re-capping.

The ESG tilting of index weights is designed to reweight countries based on their relative ESG score in the cohort outlined below:

<b>Weighting</b>	Alternatively weighted
<b>Country ESG Scores</b>	Updated quarterly and applied with a one-month lag for the following three months
<b>Country ESG Score Assessment Cohort</b>	Government bond markets eligible for the EMGBI in any given month.
<b>ESG Pillars and tilt calibration</b>	Geometric tilt – Environmental Performance: 0.5; – Social Performance: 0.5; – Governance Performance: 2.0
<b>Rebalancing</b>	Once a month at the end of the month
<b>Calculation frequency</b>	Daily
<b>Fixing date</b>	Each month, the upcoming month’s index constituents are “fixed” on the profile fixing date. Each year’s scheduled fixing dates are published on the website
<b>Base date</b>	March 31 2011

6.5.2 Countries designated as “Consolidated Authoritarian Regime” or “Semi-Consolidated Authoritarian Regime” by the Freedom House are not eligible for the ESG EMGBI-Capped. Freedom House classifies countries as such as part of its ‘Nations in Transit’ report<sup>10</sup>. Freedom House designations are updated on an annual basis in April. Any changes are applied for June index profiles if changes to country designations occur.

<sup>9</sup> The Freedom House [Nations in Transit Report](#).

<sup>10</sup> The Freedom House [Nations in Transit Report](#).

## 6.6 ESG pillars and underlying indicators

6.6.1 ESG pillar scores assess a country's exposure to and management of ESG risk factors and are taken from the Sustainability Profile of the Beyond Ratings Sovereign Risk Monitor. This includes quantitative assessments across Environmental, Social and Governance performance pillars. Each pillar contains multiple underlying indicators. Raw data inputs are typically normalised to ensure countries are scored between 0 and 100 for each indicator.

### FTSE ESG pillars and indicators: sovereign assessment

ESG Pillar	Theme	Indicator	Indicator description	Source(s) <sup>11</sup>	Lag <sup>12</sup>	History <sup>13</sup>
Environmental	Energy Policy	Electricity Access	The electricity access measures the percentage of population with largely uninterrupted access to decentralised or grid power	Datastream/WB WDI		1999
		Energy Consumption	The energy consumption measures the degree of energy over- or under- consumption against a standard determined by the country's level of income based on an extensive geographical coverage of about 200 countries	Proprietary		1999
	Fossil Fuel Risks	Oil Composite Indicator	The oil composite indicator measures the level of security of oil supply, integrating both short-term and long-term components. Short-term considerations include the level of independence based on total primary production and consumption and the share of oil in total primary consumption. The long-term component is based on an estimate of the depletion of oil ultimate domestic reserves	Proprietary		1999
		Coal Composite Indicator	The coal composite indicator measures the level of security of coal supply, integrating both short-term and long-term components. Short-term considerations include the level of independence based on total primary production and consumption and the share of coal in total primary consumption. The long-term component is based on an estimate of the depletion of coal ultimate domestic reserves	Proprietary		1999
		Gas Composite Indicator	The gas composite indicator measures the level of security of gas supply, integrating both short-term and long-term components. Short-term considerations include the level of independence based on total primary production and consumption and the share of gas in total primary consumption. The long-term component is based on an estimate of the depletion of gas ultimate domestic reserves	Proprietary		1999
	Energy Independence	Electricity Independence	The electricity independence measures the extent to which the country is self-sufficient in terms of electricity supply, aggregating electricity net trade and the degree of independence of supply of primary thermal fuels used in the domestic power sector for electricity generation	Proprietary	2-3 years	1999
	Water & Air	Water Sector Vulnerability	The water sector vulnerability captures the country's vulnerability of fresh water supplies to climate change	Datastream/ND-GAIN	2-3 years	1999

<sup>11</sup> "WB WDI" stands for World Bank World Development Indicators. "WB WGI" stands for World Bank Worldwide Governance Indicators. "Proprietary" refers to proprietary data developed by Beyond Ratings.

<sup>12</sup> Time period between indicator measurement and indicator publication.

<sup>13</sup> First available publication date for each indicator.

ESG Pillar	Theme	Indicator	Indicator description	Source(s) <sup>11</sup>	Lag <sup>12</sup>	History <sup>13</sup>
		Air Pollution	The air pollution corresponds to the average level of exposure of a nation's population to concentrations of suspended particles measuring less than 2.5 microns in aerodynamic diameter, which are capable of penetrating deep into the respiratory tract and causing severe health damage	Datastream/WB WDI	2-3 years	1999
	Natural Resources	Natural Resource Sector Growth	The natural resource sector growth is a measurement of the added value growth rate in percentage of various natural resource-related economic sectors, including agriculture, forestry, hunting and fishing	Datastream/WB WDI	2-3 years	1999
		Ecosystem Services Sector Vulnerability	The ecosystem services sector vulnerability captures the country's vulnerability of natural capital to climate change. Its importance comes from the human reliance upon ecological resources to support lives and livelihoods	Datastream/ND-GAIN	2-3 years	1999
	Physical Risks	Health Sector Vulnerability	The health sector vulnerability captures the country's vulnerability of public health to climate change, in terms of the spread of contagious diseases and provision of health services	Datastream/ND-GAIN	2-3 years	1999
		Food Sector Vulnerability	The food sector vulnerability captures the country's vulnerability to climate change, in terms of food demand and production, nutrition trends and rural population	Datastream/ND-GAIN	2-3 years	1999
		Human Habitat Sector Vulnerability	The human habitat sector vulnerability captures the country's vulnerability of human living conditions to climate change, in terms of weather extremes, urban development, demography, and transport infrastructure	Datastream/ND-GAIN	2-3 years	1999
		Temperature Trend	The temperature trend aims to capture the country's geographic specificity when quantifying climate change through national variables. Temperature trends are assumed to be most representative of climate change within a country and susceptible to generate a physical risk and a potential stress on sovereign risk. This indicator estimates the deviation from the long-term evolution of temperatures	Proprietary	1-2 years	1999
	Transition Risks	GHG Emissions vs International Benchmark	The GHG (Green House Gases) emissions vs international benchmark measure the deviation of actual GHG emissions from the standard defined by the country's level of income	Proprietary	2-3 years	1999
		Imported GHG Emissions	The imported GHG emissions measure the volume of GHG emissions which do not originate from domestic economic activity but are embedded in external trade. The imported GHG emissions capture the extent to which the country is exposed to the adverse risk of transition to a lower-carbon economy due to its dependence on imports of carbon intensive materials, products and services	Proprietary	2-3 years	1999
		Decarbonised Electricity Mix	Decarbonised sources of electricity are the main available options to improve the energy system's climate impact. The decarbonised electricity mix indicator calculates the percentage of decarbonised primary sources, nuclear, hydro, solar, wind, geothermal and biomass, in total electricity production	Proprietary	2-3 years	1999

ESG Pillar	Theme	Indicator	Indicator description	Source(s) <sup>11</sup>	Lag <sup>12</sup>	History <sup>13</sup>
Social	Human Capital	Research and Development	Expenditures for research and development are current and capital expenditures (both public and private) on creative work undertaken systematically to increase knowledge, culture, and society improvement, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development. It is expressed as a share of GDP	Datastream/WB WDI	2-3 years	1999
		Size of High-Technology Sector	High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery. Expressed as share of manufactured exports	Datastream/WB WDI	2-3 years	1999
		Education Expenditures	General government expenditures on education (current, capital, and transfers) are expressed as a percentage of GDP. It includes expenditures funded by transfers from international sources to government. General government refers to local, regional and central governments	Datastream/WB WDI	2-3 years	1999
	Health	Life Expectancy	Life expectancy at birth indicates the number of years a new born infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life	Datastream/WB WDI	2-3 years	1999
		Health Expenditures	Total health expenditure is the sum of public and private health expenditure. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation	Datastream/WB WDI	2-3 years	1999
		Hospital Beds	Hospital beds include in-patient beds available in public, private, general, and specialised hospitals and rehabilitation centres. In most cases beds for both acute and chronic care are included	Datastream/WB WDI	2-3 years	1999
		Physicians	Physicians include generalist and specialist medical practitioners. It is expressed per 1,000 people	Datastream/WB WDI	2-3 years	1999
	Societal	Internet Access	Internet users are individuals who have used the Internet (from any location) in the last 12 months. Internet can be used via a computer, mobile phone, personal digital assistant, games machine, digital TV etc. It is expressed per 1,000 people	Datastream/WB WDI	2-3 years	1999
		Female Labour Force Participation	The female to male labour force participation rate (from national sources) is a good proxy of the place of women in the society. Labour force participation rate is the proportion of the population aged 15 and older that is economically active: all people who supply labour for the production of goods and services during a specified period	Datastream/WB WDI	2-3 years	1999
		Urbanisation Rate	Urban population refers to people living in urban areas as defined by national statistical offices. The data are collected and smoothed by the United Nations Population Division	Datastream/WB WDI	2-3 years	1999
	Inequality	GINI Index	Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution	Datastream/WB WDI	2-3 years	1999



ESG Pillar	Theme	Indicator	Indicator description	Source(s) <sup>11</sup>	Lag <sup>12</sup>	History <sup>13</sup>
		Poverty Rate	Poverty headcount ratio at USD 1.90 a day is the percentage of the population living on less than USD 1.90 a day at 2011 international prices	Datastream/WB WDI	2-3 years	1999
		Social Contributions	Social contributions include social security contributions by employees, employers, and self-employed individuals. They also include actual or imputed contributions to social insurance schemes operated by governments. It is expressed as a share of government revenue	Datastream/WB WDI	2-3 years	1999
		Income Distortion Index	The income distortion index corresponds to the share of income held by the top 10% richest households in a country	Datastream/WB WDI	2-3 years	1999
	Employment	Unemployment Rate	The unemployment rate is calculated as the number of persons who are unemployed during the reference period given as a percent of the total number of employed and unemployed persons ( <i>i.e.</i> the labour force) in the same reference period	Datastream/Oxford Economics	1-2 years	1999
		Youth Unemployment Rate	The youth unemployment rate refers to the share of the labour force ages between 15 and 24 without work but available for and seeking employment	Datastream/WB WDI	2-3 years	1999
		Total Labour Force Participation Rate	The labour force participation rate is the proportion of the population ages 15 and older that is economically active: all people who supply labour for the production of goods and services during a specified period	Datastream/WB WDI	2-3 years	1999
<b>Governance</b>	Control of Corruption		Control of corruption is built as a measurement of the extent to which public power is exercised for private gain	Datastream/WB WGI	1-2 years	1999
	Government Effectiveness		Government effectiveness is built as a measurement of the quality of public services	Datastream/WB WGI	1-2 years	1999
	Rule of Law		Rule of law is built as a measurement of the extent to which agents have confidence in and abide by the rules of society	Datastream/WB WGI	1-2 years	1999
	Regulatory Quality		Regulatory quality is built as a measurement of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development	Datastream/WB WGI	1-2 years	1999
	Voice and Accountability		Finally, voice & accountability is built as a measurement of the extent to which a country's citizens are able to participate in selecting their government	Datastream/WB WGI	1-2 years	1999
	Political Stability and Absence of Violence		Political stability & absence of violence is built as a measurement of the likelihood that the government will be destabilised	Datastream/WB WGI	1-2 years	1999

## 6.7 ESG pillar scoring

6.7.1 For each E, S and G pillar, scores are converted into z-scores relative to the cohort of countries in the base index.

$$Z_i = (F_i - \mu) / \sigma$$

where  $F_i$  is Country E, S, G Score of the  $i^{th}$  country and  $\mu$  and  $\sigma$  are the cross-sectional mean and standard deviation respectively. Z-Scores are mapped to a score  $E_i \in [0, 1]$ ,  $S_i \in [0, 1]$ ,  $G_i \in [0, 1]$ , using the cumulative normal distribution with mean zero and standard deviation one. An additional linearisation process is applied to the s-score between 0.1 and 1 to introduce a floor for any given pillar.

## 6.8 ESG score assessment cohort

6.8.1 To compute the z-scores, pillar values are evaluated relative to the current index assessment cohort.

6.8.2 For each index in the Series, the country cohort assessed in order to generate z-scores from ESG pillar scores is based on the universe of countries eligible for the Base Index. Countries without ESG pillar scores are excluded from the relative scoring.

## 6.9 Tilting methodology

6.9.1 A single Index ESG score is calculated for each country and applied to the market value weight of each security in the underlying index to derive the adjusted weights<sup>14</sup>.

6.9.2 First, the three E, S and G pillars are combined to derive an Index ESG score for each country:

$$ESG = E^\alpha \times S^\beta \times G^\gamma$$

where,

- $E$ , is the county's Environment Performance value;
- $S$ , is the county's Social Performance value;
- $G$ , is the county's Governance Performance value;
- $\alpha$ , is the E tilt power;
- $\beta$ , is the S tilt power;
- $\gamma$ , is the G tilt power;
- $ESG$ , is the final country index ESG score.

6.9.3 For each ESG Government Bond Index in the Series, the tilts have been calibrated to:

- Achieve meaningful ESG benefit for sensible deviations from the underlying index characteristics and minimal tracking error, and
- Ensure other index characteristics (e.g. index yield, duration, turnover and market value weights) do not deviate significantly from the standard index characteristics.

6.9.4 The Index ESG scores are applied to each country's market value weight in the underlying index to derive the adjusted weights:

$$\theta_i = \frac{\omega_i ESG_i}{\sum_{i=0}^n (\omega_i ESG_i)}$$

where,

- $\omega$ , is the county's market value weight in the underlying index;
- $\theta$ , is the county's weight in the ESG Index.

<sup>14</sup> A similar tilting methodology to that employed in the FTSE Global Factor Index Series is used with some modifications to cater for the differences between equity and fixed income indices.

**6.10 Exchange rates**

6.10.1 The closing WMR Spot Rates and the WMR Forward Rates are used. WMRref takes several snapshots at regular intervals centered on the fixing time of 4:00 p.m. London time and selects the median rate for each currency. All rates are mid-market quotations.

**6.11 Chronological summary of events**

FTSE ESG Government Bond Index Series Event Summary

In addition to the following events, the constructions of ESG WGBI, ESG WGBI Ex-Japan, ESG EGBI, ESG EMUSDBBI and ESG EMGBI-Capped are driven by the same events that mark the WGBI, EGBI, EMUSDBBI and EMGBI-Capped respectively.

Year	Highlights
2022	<p><b>February:</b> FTSE ESG Emerging Markets US Dollar Government Bond Index is launched</p> <p><b>March:</b> FTSE ESG Emerging Markets Government Bond Capped Index is launched</p> <p><b>November:</b> New Zealand is added to the FTSE World Government Bond Index</p> <p><b>November:</b> FTSE ESG World Government Bond Index Ex-Japan is launched</p>
2021	<p><b>May:</b> FTSE ESG World Government Bond Index and FTSE ESG EMU Government Bond Index is launched</p>

Appendix

# Further information

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For contact details please visit the FTSE Russell website or contact FTSE Russell client services at [fi.index@lseg.com](mailto:fi.index@lseg.com).

**Website:** [www.lseg.com/en/ftse-russell/](http://www.lseg.com/en/ftse-russell/)

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