

# FTSE EPRA Nareit Green Index Series

v3.4



**FTSE  
RUSSELL**  
An LSEG Business



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## Section 1

# Introduction

## 1. Introduction

- 1.1 This document sets out the Ground Rules for the construction and management of the FTSE EPRA Nareit Green Index Series. Copies of the Ground Rules are available from [www.lseg.com/en/ftse-russell/](http://www.lseg.com/en/ftse-russell/).
- 1.2 The FTSE EPRA Nareit Green Index Series is an extension of the FTSE EPRA Nareit Global Real Estate Index Series. It is designed to provide exposure to listed real estate while incorporating a tilting methodology that adjusts index weights according to green building certification and energy usage.
- 1.3 Certain indices within the FTSE EPRA Nareit Green Index Series are designed to align with the applicable minimum requirements of the Paris-aligned Benchmarks (PAB) and climate transition benchmarks (CTB) set out in the EU Benchmark Regulation and the UK Benchmark Regulation<sup>1</sup>.
- 1.4 The FTSE EPRA Nareit Green Indices takes account of ESG factors in its index design. Please see further details in sections 4 and 5.

If a tilting approach is used for 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 investment activity or sector.

- 1.5 These Ground Rules should be read in conjunction with the FTSE EPRA Nareit Global Real Estate Index Series Ground Rules, the Corporate Actions and Events Guide for Non-Market Capitalisation Weighted Indices, and the FTSE Global Factor Index Series Ground Rules, which are available at [www.lseg.com/en/ftse-russell/](http://www.lseg.com/en/ftse-russell/).
- 1.6 Price and total return indices will be calculated on an end-of-day basis.
- Total return indices include income based on ex-dividend adjustments. All dividends are applied as declared in the FTSE Total Return Index.
- The base currency of all indices is US Dollars (USD) and the indices may also be published in other currencies.

### 1.7 FTSE Russell

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.

<sup>1</sup> The requirements are set out 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 [Commission Delegated Regulation \(EU\) 2020/1818 of 17 July 2020 supplementing Regulation 2016/1011 of the European Parliament and of the Council as regards minimum standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks](#). The European Benchmark Regulation is retained EU law in the UK under [The Benchmarks \(Amendment and Transitional Provision\) \(EU Exit\) Regulations 2019](#) (the UK Benchmark Regulation).

- 1.8 FTSE Russell hereby notifies users of the indices 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 series.
- 1.9 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 series 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 (or any person concerned with the preparation or publication of these Ground Rules) 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 series or any constituent data.

## Section 2

# Management responsibilities

## 2. Management responsibilities

### 2.1 FTSE International Limited (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 periodic index reviews of the index series and apply the changes resulting from the reviews as required by the Ground Rules;
- maintain the exclusion list based on the UN Controversies principles;
- publish changes to the constituent weightings resulting from their ongoing maintenance and the periodic reviews; and
- 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 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 Ground 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).

## 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 Corporate Actions and Events Guide

Full details of changes to constituent companies due to corporate actions and events can be accessed in the Corporate Actions and Events Guide for Non-Market Cap Weighted Indices using the following link:

[Corporate Actions and Events Guide for Non Market Cap Weighted Indices.pdf](#)

### 3.2 Statement of Principles for FTSE Russell Equity Indices (the Statement of Principles)

Indices need to keep abreast of changing markets and the Ground Rules cannot anticipate every eventuality. Where the Ground Rules do not fully cover a specific event or development, FTSE Russell will determine the appropriate treatment by reference to the Statement of Principles, 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 FTSE Russell's Index Governance Board.

The Statement of Principles can be accessed using the following link:

[Statement of Principles.pdf](#)

### 3.3 Queries and complaints

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

[FTSE Russell Benchmark Determination Complaints-Handling Policy.pdf \(ftserussell.com\)](#)

### 3.4 Index Policy for Trading Halts and Market Closures

Guidance for the treatment of index changes in the event of trading halts or market closures can be found using the following link:

[Index Policy for Trading Halts and Market Closures.pdf](#)

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

3.5.1 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 Recalculation Policy and Guidelines

3.6.1 The FTSE EPRA Nareit Green Indices are recalculated whenever inaccuracies occur that are deemed to be significant. Users of the FTSE EPRA Nareit Green Indices are notified through appropriate media.

For further information, please refer to the FTSE Russell Recalculation Policy and Guidelines document which is available on the FTSE Russell website using the link below:

[Recalculation Policy and Guidelines Equity Indices.pdf](#)

### **3.7 Recalculation Policy and Guidelines – ESG Data and Scores**

Where an inaccuracy in ESG data is identified, FTSE Russell will follow the guidelines set out in this document when determining if a ESG Data Product should be recalculated.

[Recalculation Policy and Guidelines ESG Products.pdf](#)

### **3.8 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](#)

### **3.9 FTSE Russell Governance Framework**

3.9.1 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 defence 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](#)

### **3.10 Real Time Status Definitions**

3.10.1 For indices which are calculated in real time, please refer to the following guide for details of real time status definitions:

[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

# Eligible securities

## 4. Eligible securities

4.1.1 Constituent securities of the underlying universe detailed in 4.3 are eligible for inclusion in the relevant FTSE EPRA Nareit Green Index.

### 4.2 Multiple lines

4.2.1 All lines of the same company that are eligible securities are eligible for inclusion in the relevant FTSE EPRA Nareit Green Index.

### 4.3 FTSE EPRA Nareit Green Indices

The FTSE EPRA Nareit Green Index Series consist of the following indices.

#### FTSE EPRA Nareit Green Indices

FTSE EPRA Nareit Green Index	Underlying universe	Exclusions
FTSE EPRA Nareit Developed Green Index	FTSE EPRA Nareit Developed Index	FTSE Minimum PAB Aligned Exclusions (See section 5)
FTSE EPRA Nareit Developed Green Focus Index	FTSE EPRA Nareit Developed Index	
FTSE EPRA Nareit Developed Green EU CTB Index	FTSE EPRA Nareit Developed Index	EU CTB/PAB exclusions (see Appendix A)
FTSE EPRA Nareit Developed Europe Green EU CTB Index	FTSE EPRA Nareit Developed Europe Index	
FTSE EPRA Nareit Developed Green EU PAB Index	FTSE EPRA Nareit Developed Index	
FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green Index	FTSE EPRA Nareit Developed REITs Index	- Minimum Set of Exclusions for ESG Indices (See Section 5)
FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green RIC Capped Index	FTSE EPRA Nareit Developed REITs Index	- FTSE Minimum PAB Aligned Exclusions (See section 5)

4.3.1 The FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green Index underlying universe is the FTSE EPRA Nareit Developed REITs Index whose constituents are then screened according to the business and financial activities as outlined in the FTSE IdealRatings Islamic Indices Screening Guidelines, available on the FTSE Russell website.



## Section 5

# ESG data inputs

### 5. ESG data inputs

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

ESG data inputs	Details	Used for selection, weighting or exclusion <sup>6</sup>
<b>TPI Management Quality (MQ)</b>	FTSE Russell's TPI Management Quality (MQ) data evaluates and tracks the quality of companies' governance/management of their greenhouse gas emissions and of risks and opportunities related to the low-carbon transition. More information can be found here: <a href="https://www.transitionpathwayinitiative.org/methodology">https://www.transitionpathwayinitiative.org/methodology</a>	Weighting
<b>Product related data- FTSE Russell</b>	FTSE exclusion lists on the activities of companies with exposure to specific products or services. More information can be found in Section 7 of the <a href="#">Guide to the Construction and Maintenance of Exclusion Lists used in FTSE Russell Indices (lseg.com)</a>	Exclusion
<b>Conduct related data- FTSE Russell</b>	FTSE exclusion lists on the activities of companies that are directly or indirectly linked to controversial conduct and diversity. More information can be found in the <a href="#">Guide to the Construction and Maintenance of Exclusion Lists used in FTSE Russell Indices (lseg.com)</a>	Exclusion
<b>Product related data- Sustainalytics</b>	Sustainalytics Product Involvement data identifies the nature and extent of a company's involvement in a range of product and business activities. More information can be found here: <a href="https://www.sustainalytics.com/investor-solutions/esg-research/esg-screening/esg-criteria">https://www.sustainalytics.com/investor-solutions/esg-research/esg-screening/esg-criteria</a>	Exclusion
<b>Conduct related data- Sustainalytics</b>	Sustainalytics Global Standards Screening (GSS) assess companies' impact on stakeholders and the extent to which a company causes, contributes or is linked to violations of international norms and standards. More information can be found: <a href="https://www.sustainalytics.com/investor-solutions/esg-research/esg-screening/global-compact-norms-based-screening">https://www.sustainalytics.com/investor-solutions/esg-research/esg-screening/global-compact-norms-based-screening</a> and <a href="#">Guide to FTSE and Third Party ESG Data used in FTSE Russell Indices.</a>	Exclusion
<b>Minimum Set of Exclusions for ESG Indices</b>	The minimum set of exclusions applied to this Index Series with effect from June 2023. Details of the minimum exclusions can be found in Section 8 of the <a href="#">Guide to the Construction and Maintenance of Exclusion Lists used in FTSE Russell Indices (lseg.com)</a>	Exclusion

<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 companies from the index.

ESG data inputs	Details	Used for selection, weighting or exclusion <sup>6</sup>
<b>FTSE Minimum PAB Aligned Exclusions</b>	FTSE Minimum PAB Aligned Exclusions list was introduced to specific indices given ESMA fund naming guidelines. Details of the minimum exclusions can be found using the following link: <a href="#">Notice</a>	Exclusion
<b>Measurabl</b>	Measurabl provide metrics for REIT carbon emissions, energy usage and green certification. The methodology is published here: <a href="#">Whole Building Estimates Model Methodology.pdf (measurabl.com)</a> .	Weighting

5.1.1 Further information on ESG data provided by FTSE Russell and third parties used in this 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.

## 5.2 ESG Metrics

5.2.1 The FTSE Russell [ESG Metrics](#) website publishes the environmental, social and governance (ESG) factors listed in Annex II to Delegated Regulation (EU) 2020/1816 for each index which uses ESG data within this family.

Further details on the metrics methodology and calculation are available using the following link:

[ESG Disclosures Methodology and Calculation Guide](#)

## Section 6

# Index construction

## 6. Index construction

### 6.1 Scores and missing data treatment

- 6.1.1 Green certification (GC) is defined as the share of total net leasable area owned and/or managed by a constituent that is certified as part of an eligible green certification scheme.
- 6.1.2 Energy usage (EU) is the average modelled energy consumption per square foot of net leasable area owned and/or managed by a constituent.
- 6.1.3 TPI management quality (MQ) is a measure of the quality of companies' management of their greenhouse gas emissions and of risks and opportunities related to the low-carbon transition.
- 6.1.4 Carbon emission intensity (EM) is the carbon intensity divided by the total operational emissions scaled by enterprise value including cash (EVIC).
- 6.1.5 GC, EU, MQ and carbon emission intensity data are normalised cross-sectionally to create Z-scores within each eligible universe according to:

$$Z_{F,i} = \frac{F_i - \mu}{\sigma} \quad \text{where} \quad F \in \{GC, EU, MQ, EM\}$$

where  $F_i$  is the F-quantity value of the  $i^{th}$  stock and  $\mu$  and  $\sigma$  are the cross-sectional mean and standard deviation respectively. Z-scores that are greater (less) than three (minus three) are truncated to a value of three (minus three). Post-truncation, individual Z-scores are renormalised by the re-application of equation (1). All Z-scores, including truncated ones are included in this re-application. This process is repeated until all Z-scores lie in a range between plus and minus three.

- 6.1.6 Companies with missing data are excluded from this process. Stocks with missing GC or EU data are allocated a neutral Z-score of zero after the application of the normalisation procedure detailed in rule 6.1.5. Stocks with missing EM scores are allocated the average score of its REIT sector or zero if the sector average score is not available.
- 6.1.7 Stocks with missing TPI management quality (MQ) scores are assigned the average Z-score of their country. The average is taken across non-missing Z-scores of MQ scores in the country at the process described in rule 6.1.5. A Z-score of zero is assigned when there are less than three stocks with Z-scores in the country.
- 6.1.8 For fixed tilt FTSE EPRA Nareit Green Indices (see rule 6.2), stocks with zero GC information will receive a Z-score of -3, unless GC is not considered a widely adopted practice in the stock's country sector. Adoption is deemed not wide if the average GC within a country sector is less than the global sector mean, in which case a Z-score of zero is assigned.

## 6.2 Index construction methodology

6.2.1 FTSE EPRA Nareit Green Indices use a **fixed tilt** or **target exposure** methodology. These are addressed separately below.

FTSE EPRA Nareit Green Index	Index type
FTSE EPRA Nareit Developed Green Index	Fixed tilt
FTSE EPRA Nareit Developed Green Focus Index	Fixed tilt
FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green Index	Fixed tilt
FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green RIC Capped Index	Fixed tilt

FTSE EPRA Nareit Green EU PAB Index and FTSE EPRA Nareit Green EU CTB Index	Index type
FTSE EPRA Nareit Developed Europe Green EU CTB Index	Target exposure
FTSE EPRA Nareit Developed Green EU CTB Index	Target exposure
FTSE EPRA Nareit Developed Green EU PAB Index	Target exposure

## 6.3 Fixed tilt index construction

6.3.1 Normalised Z-scores are mapped to a score  $S_i^{GC} \in [0,1]$  and  $S_i^{EU} \in [0,1]$  using the cumulative normal distribution with mean zero and standard deviation one, using GC and EU respectively.

6.3.2 The creation of S-scores and the application of consecutive tilts towards individual characteristics follows the process described in the FTSE Global Factor Index Series rules.

6.3.3 A set of index weights  $w_i$ , is calculated for each index:

$$w_i = \frac{v_i}{\sum_j v_j}$$

Where:

$$v_i = w_i' \times A_i^{RSN}$$

and

- $w_i'$  is the investable market capitalisation weight of stock  $i$  in the underlying universe. Weights in the FTSE EPRA Nareit Developed Europe ex UK ex UN Controversies Index are capped at 10%;
- $A_i^{RSN}$  is the geographic sector (either country sector or regional sector) tilt for stock  $i$  (see rule 5.2.7). The FTSE EPRA Nareit Green Indices employ a regional sector split, whilst the FTSE EPRA Nareit Green Focus Indices employ a country sector split.

6.3.4 The FTSE EPRA Nareit Developed Green Index splits the eligible universe into the following regions: North America, Developed Europe, Japan and Developed Asia-Pacific ex Japan.

6.3.5 The FTSE EPRA Nareit Developed Green Focus Index splits the eligible universe into countries.

6.3.6 The FTSE EPRA Nareit Green Index Series employs the following 11 property sectors: health care, self storage, industrial, office, industrial/office mixed, residential, retail, lodging/resorts, data centres, speciality and diversified. The property sector definition follows the FTSE EPRA Nareit Global Real Estate Index Series.

6.3.7 The geographic sector tilt for stock  $i$  is defined as:

$$A_i^{RSN} = (S_i^{GC})^{P_{GC}} \times (S_i^{EU})^{P_{EU}} \times \frac{w_k^*}{w_k}$$

where  $k$  is the EPRA Nareit geographic sector of stock  $i$ ,  $P_{GC}$  and  $P_{EU}$  are the tilt strength (see table below),  $w_k^*$  is the maximum geographic sector weight, determined in rule 5.2.8 and  $w_k$  is the geographic sector weight resulting from the application of consecutive tilts using the S-scores  $S_i^{GC}$  and  $S_i^{EU}$  to the underlying investable market capitalisation stock weights:

$$w_k = \sum_{i \in k} w'_i \times (S_i^{GC})^{P_{GC}} \times (S_i^{EU})^{P_{EU}}$$

**Tilt strength**

FTSE EPRA Nareit Green Index	P_GC	P_EU
FTSE EPRA Nareit Developed Green Index	1	1
FTSE EPRA Nareit Developed Green Focus Index	2	2
FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green Index	1	1
FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green RIC Capped Index	1	1

6.3.8 Let  $w'_k$  be the total weight of a geographic sector in the underlying universe. Then the country or regional sector weight is bounded by:

$$\text{Max}(w'_k - \text{Bound}, 0) \text{ and } \text{Min}(w'_k + \text{Bound}, 100)$$

Where the bounds are defined in the table below for each index.

**Geographic sector bound (%)**

FTSE EPRA Nareit Green Index	Bound
FTSE EPRA Nareit Developed Green Index	0
FTSE EPRA Nareit Developed Green Focus Index	2
FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green Index	0
FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green RIC Capped Index	0

Any geographic sector that breaches the lower or upper bound is set to the relevant lower and upper bound. The weight is then re-assigned proportionately to the remaining geographic sectors. This process repeats iteratively until the weights for all geographic sectors lie between their lower and upper bounds. The resulting set of weights for each geographic sector constitutes the maximum geographic sector weights,  $w_k^*$ .  
 6.3.9 A maximum stock level capacity ratio of 20x is applied. Any stock level capacity ratio that is greater than 20 will be set to 20. The resulting excess weight will be redistributed pro rata amongst the remaining constituents. Stock level capacity ratios are recalculated and those over 20 are set to 20. This process repeats iteratively until all stocks have a capacity ratio less than or equal to 20. This process may cause breaches to regional and sector neutrality.

6.3.10 The capacity ratio of stock  $i$  is defined as  $CR_i = w_i / w'_i$  where  $w_i$  and  $w'_i$  are the FTSE EPRA Nareit Green Index weights after the application of geographic sector tilt and the investable market capitalisation weights of the underlying eligible universe respectively.

6.3.11 A minimum security level weight of 0.5 basis points is applied to each index. Any security level index weight that is less than the minimum weight threshold is treated as having a zero weight in the relevant FTSE EPRA Nareit Green Index. Any resulting excess weight will be redistributed amongst the remaining constituents and may cause breaches of the constraints in rules 6.3.8-6.3.10.

**6.4 FTSE EPRA Nareit Green EU PAB and CTB Index construction**

6.4.1 FTSE EPRA Nareit Developed Green EU PAB and CTB Indices are constructed using the target exposure framework in line with the [FTSE Global Factor Index Series Ground Rules](#). For FTSE EPRA Nareit Green EU PAB and CTB indices only factors shown in rules 6.4.2 to 6.4.4 are applied.

Constituent weightings of stock  $i$  are determined as:

$$w_i = \frac{v_i}{\sum_j v_j}$$

Where

$$v_i = w_i' \times S_{GC,i}^a \times S_{EC,i}^b \times S_{EM,i}^c \times S_{MQ,i}^d \times S_{\beta,i}^e \times C_i \times I_i \times \Phi_i$$

where

- $w_i'$  is the market capitalisation weight of stock  $i$  in the underlying eligible universe.
- $S_{GC,i}, S_{EC,i}, S_{MQ,i}, S_{EM,i}$  are natural exponents of the corresponding Z-scores of stock  $i$  for GC, EU, MQ and carbon emission intensity respectively.
- $S_{\beta,i}$  is natural exponents of the stock beta Z-score of stock  $i$
- $a, b, c, d$  and  $e$  are the tilt-strengths. A solver is used to set these at the required strengths in order to satisfy all the index targets and constraints defined in 6.4.2 to 6.4.4 simultaneously.
- $C_i$  and  $I_i$  are Country and Industrial ICB tilts respectively.
- $\Phi_i$  is the maximum stock capacity/maximum weight tilt.

6.4.2 FTSE EPRA Nareit Developed Green EU PAB and CTB Indices apply green certificate, energy consumption as listed.

Index	Green exposure targets	
	Green certificate increase	Energy consumption reduction
FTSE EPRA Nareit Developed Green EU CTB Index	30%	10%
FTSE EPRA Nareit Developed Europe Green EU CTB Index	30%	10%
FTSE EPRA Nareit Developed EU PAB Index	30%	10%

6.4.3 FTSE EPRA Nareit Green EU PAB and CTB Indices apply EU Paris-aligned Benchmark (EU PAB) minimum requirements and the FTSE Climate Transition Benchmark (CTB) indices are set to meet the EU Climate Transition Benchmark (CTB) minimum requirements. The following PAB and CTB indexes are included in the FTSE EPRA Nareit Green Index Series:

EU Paris-aligned Benchmarks	EU Climate Transition Benchmarks
FTSE EPRA Nareit Developed Green EU PAB Index	FTSE EPRA Nareit Developed Green EU CTB Index FTSE EPRA Nareit Developed Europe Green EU CTB Index

The table below summarises the constraints applied to the FTSE EPRA Nareit Green EU PAB and CTB Indices. Further details on the construction of these metrics can be found in appendix B.

EU low carbon BMR minimum requirements	Index targets and constraints
Minimum scope 1+2 GHG emissions intensity reduction relative to underlying index.	30% for CTB*, 50% for PAB
Minimum average annual GHG emissions intensity reduction relative to base year after inception in accordance with the global decarbonisation trajectory implied by the IPCC's 1.5°C scenario with limited or no overshoot.	7%

Active weight in high climate impact sector relative to underlying index.	0 – all constituents of the FTSE EPRA Nareit Index universe are in high climate impact sectors.
Corporates Target Setting: TPI MQ Score	0.1 $\sigma$ for CTB, NA for PAB

\* $\sigma$  is the weighted standard deviation of the score in the underlying universe.

6.4.3.1 FTSE EPRA Nareit Green EU PAB and CTB Indices employ a base year of 2020 for the application of the minimum average carbon emissions intensity reduction relative to the index base year.

The first assessment period to meet the Paris-aligned (PAB) and climate transition (CTB) index minimum requirements is measured on an annual basis starting from the first index review in the calendar year following the launch of the index. Should a significant change in the calculation methodology of GHG intensity or absolute GHG emissions occur, a new base year may be selected.

6.4.4 The table below summaries the constraints applied to FTSE EPRA Nareit Green EU PAB and CTB Indices (in addition to rules 6.4.2 – 6.4.3).

Index	Constraints					
	Beta banding	Country*	Industry*	Max capacity ratio	Max stock weight (%)	Min stock weight (bp)
FTSE EPRA Nareit Developed Green EU CTB Index	0.7 – 1.3	Banded	Banded	20x	10	0.5
FTSE EPRA Nareit Developed Europe Green EU CTB Index	0.7 – 1.3	Banded	Banded	20x	10	0.5
FTSE EPRA Nareit Developed EU PAB Index	0.7 – 1.3	Banded	Banded	20x	10	0.5

\*Country/industry bands =: +/-20% of benchmark country/industry weight +/- 5%

At each index review, constraints and targets may be relaxed if delivering all constraints and targets are not achievable. EU PAB and CTB minimum requirements will not be relaxed.

Relaxation of exposure and turnover targets: If after 100 iterations any of equations (27), (28) and (29) are not satisfied, all targeted active exposures are reduced by 2.5% and the whole process is attempted again. If this continues to be the case after 10 reductions (i.e. after the exposure targets have been reduced by 25%), then the turnover target is increased by 50% and the whole process is repeated using the original active exposure targets. Finally, if no solution is reached by this point the turnover target is relaxed completely and a solution with the original exposure targets is attempted. In the event that a solution remains infeasible the active exposure targets are reduced by 2.5% up to a maximum of 40 times.

6.4.5 If there is still no feasible solution after rule 6.4.5, EU PAB and CTB minimum requirements may be relaxed at an index review, adjustments will be applied to the targets at the next index review.

## 6.5 Index back-histories

6.5.1 Green certificate and energy usage data prior to September 2018 are lagged by six months for the FTSE EPRA Nareit Developed Index Series.

## Section 7

# Periodic review of constituents

## 7. Periodic review of constituents

### 7.1 Review dates

- 7.1.1 The FTSE EPRA Nareit Green Index Series will be reviewed annually in September. FTSE Russell uses Measurabl green certificate, energy usage and carbon emissions data as of Q1 of the current year. The calculations described in Appendix B will be recalculated at the annual review using this data cut-off date. The data cut-off dates for other ESG data inputs are in the Guide to FTSE and Third Party ESG Data used in FTSE Russell Indices.
- 7.1.2 The FTSE EPRA Nareit Green Index Series is reviewed using stock prices available at the close of Wednesday before the first Friday of the review month (price cut-off date) incorporating underlying index constituent changes.
- 7.1.3 Changes arising from the annual review will be implemented after the close of business on the third Friday of the review month.
- 7.1.4 Constituents of the FTSE EPRA Nareit Developed REITs Index are also screened for business and financial activities outside of the annual review in March, June and December as outlined in the FTSE IdealRatings Islamic Indices Screening Guidelines, available on the FTSE Russell website. Any constituents that fail the business or financial screens will be removed from the FTSE EPRA Nareit Custom IdealRatings Developed REITs Index effective after the close of business on the third Friday of the review month.
- 7.1.5 A maximum stock (company level) weight of 10% is applied to the FTSE EPRA Nareit Developed Green EU CTB Index and the FTSE EPRA Nareit Developed Europe Green EU CTB Index. The capping will be calculated using the second Friday's closing prices adjusted for corporate actions, with the constituent shares and investability weightings from the start of trading on the review implementation date (i.e. the next working day following the third Friday) on a quarterly basis in March, June, September and December.
- 7.1.6 Corporate actions/events announced after the second Friday of the review month that become effective up and including the review effective date will not result in any further adjustment.

### 7.2 Capping

- 7.2.1 US RIC capping is applied to FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green RIC Capped Index quarterly using prices at the close of business on the second Friday in March, June, September and December.

Further details can be found at the [FTSE Russell Capping Methodology guide](#)

### 7.3 IdealRatings Islamic REITs screening

- 7.3.1 Constituents of the FTSE EPRA Nareit IdealRatings Developed REITs Islamic Green Index and underlying universe are screened for business and financial activities on a quarterly basis, effective after the close of business on the third Friday of March, June, September and December. Further details on the IdealRatings methodology can be found in the following guide:

[FTSE\\_IdealRatings\\_Islamic\\_Indices\\_Screening\\_Guide.pdf](#)



## Section 8

# Changes to constituent companies

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## 8. Changes to constituent companies

### 8.1 Intra-review additions

8.2 The FTSE EPRA Nareit Green Index Series will not accept intra-review additions.

8.2.1 Constituents that pass the quarterly business and financial screens in the underlying universe of the FTSE EPRA Nareit Developed REITs Index will be considered for index inclusion at the next annual review.

### 8.3 Intra-review deletions

8.3.1 A constituent will be removed from the relevant index in FTSE EPRA Nareit Green Index Series if it is removed from the corresponding underlying universe. The deletion will be concurrent with the deletion from the underlying universe and its weight will be distributed pro-rata amongst the remaining constituents in the relevant index in FTSE EPRA Nareit Green Index Series.

8.3.2 A constituent will be removed from the relevant index in FTSE EPRA Nareit Green Index Series if it is in their exclusion lists. The deletion will be concurrent with its addition to the exclusion lists.

8.3.3 A stock that is removed from the exclusion list between periodic reviews will be considered for inclusion to the corresponding index in FTSE EPRA Nareit Green Index Series at the next annual review.

8.3.4 A constituent of the FTSE EPRA Nareit Custom IdealRatings Developed REITs Index that fails the quarterly business or financial screens will be removed from the index, effective after the close of business on the third Friday in March, June and December.

## Section 9

# Corporate actions and events

## 9. Corporate actions and events

9.1 If a constituent in the underlying index has a stock split, stock consolidation, rights issue, bonus issue, a change in the number of shares in issue or a change in free float (with the exception of tender offers), the constituent's weighting in the corresponding FTSE EPRA Nareit Green Index will remain unchanged pre and post such an event.

9.2 Full details of changes to constituent companies due to corporate actions and events can be accessed in the Corporate Actions and Events Guide for Non-Market Cap Weighted Indices using the following link:

[Corporate Actions and Events Guide for Non Market Cap Weighted Indices.pdf](#)

A corporate 'action' is an action on shareholders with a prescribed ex-date. The share price will be subject to an adjustment on the ex-date. The index will be adjusted in line with the ex-date.

These include the following:

- capital repayments;
- rights issues/entitlement offers;
- stock conversion;
- splits (sub-division)/reverse splits (consolidation); and
- scrip issues (capitalisation or bonus issue).

A corporate 'event' is a reaction to company news (event) that may impact the index depending on the index rules. For example, a company announces a strategic shareholder is offering to sell their shares (secondary share offer) – this could result in a free float weighting change in the index. Where an index adjustment is required FTSE Russell will provide notice advising of the timing of the change.

### 9.3 Suspension of dealing

Suspension of dealing rules can be found within the Corporate Actions and Events Guide for Non-Market Cap Weighted Indices.

### 9.4 Takeovers, mergers and demergers

The treatment of takeovers, mergers and demergers can be found within the Corporate Actions and Events Guide for Non-Market Cap Weighted Indices.

## Section 10

# Indices algorithm and calculation method

## 10. Indices algorithm and calculation method

### 10.1 Prices

10.1.1 The FTSE EPRA Nareit Green Index Series uses actual closing mid-market or last trade prices, where available, for securities with local market quotations. Further details can be accessed using the following link:

[Closing Prices Used For Index Calculation.pdf](#)

### 10.2 Calculation frequency

10.2.1 The FTSE EPRA Nareit Green Index Series will be calculated on an end-of-day basis and displayed to eight decimal points.

### 10.3 Index calculation

10.3.1 The FTSE EPRA Nareit Green Index Series calculated using the algorithm described below:

$$\sum_{i=1}^N \frac{(p_i \times e_i \times s_i \times f_i \times c_i)}{d}$$

Where:

- $i=1,2,\dots,N$
- $N$  is the number of securities in the index;
- $p_i$  is the latest trade price of the component security (or the price at the close of the index on the previous day);
- $e_i$  is the exchange rate required to convert the security's currency into the index's base currency;
- $s_i$  is the number of shares in issue used by FTSE Russell for the security, as defined in these Ground Rules;
- $f_i$  is the Investability Weighting Factor to be applied to a security to allow amendments to its weighting, expressed as a number between 0 and 1, where 1 represents a 100% free float. This factor is published by FTSE Russell for each security in the underlying index;
- $c_i$  is the Weight Adjustment Factor to be applied to a security to correctly weight that security in the index. This factor maps the investable market capitalisation of each stock to a notional market capitalisation for inclusion in the index; and
- $d$  is the divisor, a figure that represents the total issued share capital of the Index at the base date. The divisor can be adjusted to allow changes in the issued share capital of individual securities to be made without distorting the index.

## Appendix A

# EU Paris-aligned Benchmark (PAB) exclusions and Climate Transition Benchmark (CTB) exclusions

## EU Paris-aligned (PAB) exclusions

This appendix details the EU BMR exclusions applied to the FTSE EPRA Nareit CTB and PAB Indices.

At each index review date, companies with the activities and conduct listed in the table below are excluded from the eligible universe. Data for the Paris-aligned (PAB) and climate transition (CTB) index exclusions are sourced from Sustainalytics. Paris-aligned (PAB) exclusions are applied to both EU PAB and EU CTB indices.

The exclusion list is reviewed on an annual basis in September, with exception of the UNGC violations exclusions which are applied quarterly in March, June, September and December.

Paris-aligned Benchmark (PAB) minimum standards	FTSE EU CTB/PAB exclusions	
Baseline exclusions	Definition	Revenue threshold applied
<b>Controversial weapons</b>  BMR Minimum Requirement	Companies providing core weapon systems or components/services of the core weapon system for these weapons.	Greater than 0% of revenues.
<b>Tobacco activities</b>  BMR Minimum Requirement	Companies manufacturing tobacco products.	Greater than 0% of revenues.
<b>Climate activity exclusions</b>		
<b>Coal:</b> 1% or more of revenues from exploration, mining, extraction, distribution or refining of hard coal and lignite.  BMR Minimum Requirement	<b>Thermal coal extraction</b> The company extracts thermal coal.  <b>Thermal coal supporting services</b> The company provides tailor-made products and services that support thermal coal extraction. This includes companies that provide storage and transportation, mining and coal-refining services.	Greater than 0% of revenues.

Paris-aligned Benchmark (PAB) minimum standards	FTSE EU CTB/PAB exclusions	
<p><b>Oil &amp; Gas:</b></p> <ul style="list-style-type: none"> <li>– 10% or more of revenues from the exploration, extraction, distribution or refining oil fuels; and</li> <li>– 50% or more of revenues from the exploration, extraction, manufacturing or distribution of hydrocarbons, hydrogen and carbon monoxide mixtures present in gaseous state.</li> </ul> <p>BMR Minimum Requirement</p>	<p><b>Oil and gas production</b></p> <p>Companies involved in oil and gas exploration, production, refining, transportation and/or storage.</p> <p><b>Oil and Gas Supporting Products and Services</b></p> <p>Companies providing tailor-made products and services that support oil and gas exploration, production, refining, transportation and storage.</p>	<p>Greater than 0% of revenues.</p>
<p><b>Electricity producers:</b> carbon intensity of lifecycle GHG emissions &gt; 100 gCO<sub>2</sub>e/kWh (50%+ revenues)</p> <p>BMR Minimum Requirement</p>	<p><b>Oil and gas generation</b></p> <p><b>Thermal coal power generation</b></p> <p>Companies generating electricity from oil and/or gas and/or thermal coal.</p>	<p>Greater than 0% of revenues.</p>
<b>Conduct-related exclusions</b>		
<p><b>UN Global Compact (UNGC) violations</b></p> <p>BMR Minimum Requirement</p>	<p>Companies involved in controversies related to the UNGC principles. The principles are classified into four categories: human rights, labour, environment and anti-corruption.</p>	<p>All companies deemed to be non-compliant.</p>
<p><b>Do No Significant Harm</b></p> <p>BMR Minimum Requirement</p>	<p>Companies at risk of contributing to severe or systemic and/or systematic violations of international norms and standards relating to UNGC principles 7, 8, 9.</p>	<p>All companies assigned watchlist status.</p>

For further details on Sustainalytics data, please refer to section 5. Companies not covered by Sustainalytics are excluded from the EU PAB- or EU CTB-aligned indices.

## Appendix B

# EU Paris-aligned Benchmark and EU Climate Transition Benchmark Carbon Emissions Definitions

### GHG emissions

The FTSE EPRA Nareit Developed Green EU CTB and PAB Indices use operational carbon emissions (scope 1, 2 and 3) as a proxy for GHG emissions.

Operational carbon emission reduction is measured as the reduction of operational carbon emissions intensity.

Operational carbon emissions intensity is defined as: company total operational carbon emissions in metric tonnes CO<sub>2</sub> scales by enterprise value including cash (USD).

### Average annual GHG emissions reduction relative to base year of the index

The FTSE EPRA Nareit Green EU CTB and PAB Indices require an average annual GHG intensity reduction relative to base year of the index.

The average operational carbon emissions intensity reduction relative to base year of the index is calculated as the weighted average operational emission ( $WA\_EM$ ) over the previous year's level, adjusted for inflation by the average of stock enterprise value including cash ( $AVG\_EVIC$ ). That is:

$$1 - \left( \frac{WA\_EM_t}{WA\_EM_{t_0}} \div \frac{AVG\_EVIC_{t_0}}{AVG\_EVIC_t} \right)^{\frac{1}{t-t_0}}$$

where  $t_0$  is the base year and  $t$  is current review year.

### Index GHG emissions targets

At review, the index emission intensity target is set as the lower of (1) operational emission reduction relative to benchmark and (2) operational emission trajectory target, where:

*Operational emission reduction relative to benchmark* =  $(1 - r - b) \times \text{benchmark operational emission}$

$$\text{Operational emission trajectory target} = [(1 - 7\%)^{t-t_0} - b] \times WA\_EM_{t_0} \div \frac{AVG\_EVIC_t}{AVG\_EVIC_{t_0}}$$

where  $b = 0.5\%$  is the buffer to allow for drift between targeted and realised targets and  $r$  is the minimum carbon emission intensity reduction relative to underlying index as set out in section 6.

## Appendix C

# Further information

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A Glossary of Terms used in FTSE Russell's Ground Rules documents can be found using the following link:

[Glossary.pdf](#)

[Glossary - ESG.pdf](#)

The FTSE EPRA Nareit Green Indices webpage can be accessed using the following link: [epra-nareit-green](#)

The FTSE Russell ESG Metrics website can be found using the following link: [ESG Metrics](#)

Further information on the FTSE EPRA Nareit Green Index Series is available from FTSE Russell.

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

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