



FTSE EPRA Nareit Green Index Series

v1.3



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Section 1

Introduction

1.0 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.ftserussell.com.
- 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 with strong sustainability metrics.
- 1.3 The FTSE EPRA Nareit Green Indexes takes account of ESG factors in its index design. Please see further details in Section 4 and 5.
- 1.4 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 Indexes, and the FTSE Global Factor Index Series Ground Rules which are available at www.ftserussell.com.

- 1.5 Price and Total Return Indexes will be calculated on an end of day basis.

Total return indexes include income based on ex dividend adjustments. All dividends are applied as declared in the FTSE Total Return Index.

The base currency of all indexes is US Dollars (USD) and may also be published in other currencies.

1.6 FTSE Russell

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1.7 Statement of Principles for FTSE Russell Non Market Capitalisation Weighted Equity Indexes (the Statement of Principles)

Indexes 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 Product Governance Board.

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

[Statement of Principles Non-Market Cap Equity Indexes.pdf](#)

- 1.8 FTSE Russell hereby notifies users of the indexes 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 errors or 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 errors or inaccuracies in the compilation of the index series or any constituent data.



Section 2

Management Responsibilities

2.0 Management Responsibilities

2.1 FTSE International Limited (FTSE)

2.1.1 FTSE is the benchmark administrator of the index series¹.

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;
- disseminate the indexes.

2.1.3 Real estate sustainability metrics including energy usage and carbon emissions, are provided by a third party real estate data vendor.²

2.2 Amendments to These Ground Rules

2.2.1 These Ground Rules shall be subject to regular review 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 Product Governance Board before approval is granted.

¹ 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).

² As at December 2018 data is provided by GeoPhy.

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.



Section 3

FTSE Russell Index Policies

3.0 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:

http://www.ftse.com/products/downloads/Queries_and_Complaints_Policy.pdf

3.2 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](#)

3.3 Index Policy in the Event Clients are Unable to Trade a Market

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](#)

3.4 Recalculation Policy and Guidelines

- 3.4.1 The FTSE EPRA Nareit Green Indexes are recalculated whenever errors or distortions occur that are deemed to be significant. Users of the FTSE EPRA Nareit Green Indexes 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 Indexes.pdf](#)

3.5 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](#)

Section 4

Eligible Securities

4.0 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 Indexes

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

Table 1: FTSE EPRA Nareit Green Indexes

FTSE EPRA Nareit Green Index	Underlying Universe
FTSE EPRA Nareit Developed Green Index	FTSE EPRA Nareit Developed Index
FTSE EPRA Nareit Developed Green Focus Index	FTSE EPRA Nareit Developed Index
FTSE EPRA Nareit Developed Europe ex UK Green Index	FTSE EPRA Nareit Developed Europe ex UK ex UN Controversies Index

4.3.1 The UN Controversies exclusion list includes companies that potentially breach the United Nations Global Compact (UNGC) principles. The principles are classified into four categories; Human Rights, Labour, Environment and Anti-corruption.

Section 5

Sustainable Investment Data Inputs

5.0 SI Data Inputs

The following Sustainable Investment datasets are used in the construction of the FTSE EPRA Nareit Green Indexes

5.1 Green Certification and Energy Usage

5.1.1 Data for Green Certification and Energy Usage is sourced from GeoPhy. The data are subject to regular checks to identify discrepancies and ensure accuracy; these checks include trend analysis to assess data quality and detailed review of underlying data for significant GeoPhy score changes.

5.1.2 Further details of the use of GeoPhy and other third party data can be found in the following guide:

[Guide to Third Party Sustainable Investment Data used in FTSE Russell Indexes.pdf](#)

5.2 UN Controversies exclusions

5.2.1 Data for UNGC Controversies exclusions is sourced from Sustainalytics. The data are subject to regular quality checks to identify discrepancies and ensure accuracy; these checks include trend analysis to assess data quality and detailed review of underlying data for significant Sustainalytics score changes.

5.2.2 Further details of the use of Sustainalytics and other third party data can be found in the following guide:

[Guide to Third Party Sustainable Investment Data used in FTSE Russell Indexes.pdf](#)

Section 6

Index Construction

6.0 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 modeled energy consumption per square metre of net leasable area owned and/or managed by a constituent.
- 6.1.3 The data cut-off date for the availability of GC and EU is the close of business on the last business day of the month prior to the review month.
- 6.1.4 GC and EU data are normalised cross-sectionally to create Z-Scores within each eligible universe according to:

$$Z_i = (F_i - \mu) / \sigma \tag{1}$$

where F_i is natural logarithm value of the i^{th} stock and μ and σ 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 renormalized 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.

- 6.1.5 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 5.1.4.
- 6.1.6 Stocks with zero GC information will receive a Z-Score of -3, unless GC is not a widely adopted practice. Adoption is deemed not wide if the average GC within a country sector is less than the global sector mean and a Z-Score of zero is awarded.

6.2 Index Construction

- 6.2.1 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.
- 6.2.2 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.
- 6.2.3 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 Indexes employ a regional sector split, whilst the FTSE EPRA Nareit Green Focus Indexes employ a country sector split.

6.2.4 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.

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

6.2.6 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 Centers, Specialty and Diversified. The property sector definition follows the FTSE EPRA Nareit Global Real Estate Index Series.

6.2.7 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} is the tilt strength (see Table 2), 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:

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

Table 2: Tilt Strength

FTSE EPRA Nareit Green Index	P_{GC}	P_{EU}
FTSE EPRA Nareit Developed Green Index	1	1
FTSE EPRA Nareit Developed Europe ex UK Green Index	0.5	1
FTSE EPRA Nareit Developed Green Focus Index	2	2

6.2.8 Let the weight of a geographic sector for a given index be w_k' of 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 Table 3 for each index.

Table 3: Geographic Sector Bound (%)

FTSE EPRA Nareit Green Index	Bound
FTSE EPRA Nareit Developed Green Index	0
FTSE EPRA Nareit Developed Europe ex UK Green Index	0
FTSE EPRA Nareit Developed Green Focus Index	2

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 Maximum Stock Level Capacity Ratio

6.3.1 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.

6.3.2 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.

6.4 Minimum Stock Weight

6.4.1 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 5.2.8-5.3.2.

6.5 Index Back-Histories

6.5.1 GC and EU data prior to September 2018 are lagged by six months for the FTSE EPRA Nareit Developed Green Indexes.



Section 7

Periodic Review of Constituents

7.0 Periodic Review of Constituents

7.1 Review Dates

- 7.1.1 The FTSE EPRA Nareit Green Index Series will be reviewed annually in September.
- 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 The UN Controversies exclusion list applied to the FTSE EPRA Nareit Developed Europe ex UK Green Index at the annual review in September and will be determined on the last business day of August.
- 7.1.5 A maximum stock (company level) weight of 10% is applied to the FTSE EPRA Nareit Developed Europe ex UK Green 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.



Section 8

Changes to Constituent Companies

8.0 Changes to Constituent Companies

8.1 Intra-review Additions

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

8.3 Intra-review Deletions

- 8.3.1 A constituent will be removed from the relevant FTSE EPRA Nareit Green Index 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 FTSE EPRA Nareit Green Index.
- 8.3.2 A constituent will be removed from the FTSE EPRA Nareit Developed Europe ex UK Green Index if it is added to the UN Controversies exclusion list. The deletion will be concurrent with its addition to the exclusion list.
- 8.3.3 A stock that is removed from the UN Controversies exclusion list between periodic reviews will be applied to the FTSE EPRA Nareit Developed Europe ex UK Green Index at the next annual review.

Section 9

Corporate Actions and Events

9.0 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, 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 Indexes 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)
- 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 Indexes.

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 Indexes.

Section 10

Indexes Algorithm and Calculation Method

10.0 Indexes 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.

- 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: Further Information

A Glossary of Terms used in FTSE Russell's Ground Rules documents can be found using the following link:
[Glossary.pdf](#)

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.

Website: www.ftserussell.com

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