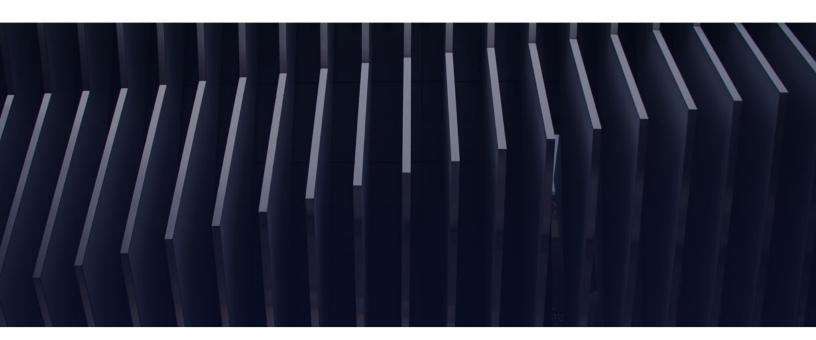# Wilshire Indexes

FT Wilshire Low Carbon
Index Series Methodology

August 2025

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Introduction

The indexes in the FT Wilshire Low Carbon Index Series are designed to minimize Scope 1, 2 & 3 Emission Intensity while controlling tracking error relative to the parent capitalization-weighted index.

While the methodology of the following index series intends to minimize scope emission intensity within tracking error constraints as later described, the benchmark is not designed to meet the requirements of a EU Paris-Aligned or Climate Transition benchmark as set out in Commission Delegated Regulation (EU) 2020/1818.

Price, total, and net return indexes are calculated for all member indexes. Indexes are calculated in USD. Conversions to GBP, EUR, JPY, and other major currencies are calculated using the WM/Reuters 16.00 London rates.

This document describes the procedures used to construct and maintain the FT Wilshire Low Carbon Index Series. The document is reviewed at least annually but more frequent updates may be made in the light of market events or as a result of feedback obtained via a consultation. It should be read in conjunction with the Wilshire Indexes Equity Index Calculation and Corporate Events Guide which describes the index treatment of corporate actions and events, and the procedures to be followed for suspended or delisted securities, and at times of market disruption. The Equity Index Calculation and Corporate Events Guide applies to all standard FT Wilshire equity indexes and to other indexes calculated or administered by Wilshire Indexes where this is stated in the methodology documentation for those indexes.

In addition to this document, the indexes will have eligibility criteria including liquidity, nationality, and minimum size thresholds based upon the rules of the underlying index.

The benchmark administrator for the indexes is Wilshire Indexes[1].

1 Index Construction

Reduction of index-level carbon intensity is achieved via portfolio optimization which minimizes Weighted Average Carbon Intensity (WACI) subject to a specified ex-ante tracking error budget vs the underlying index.

In addition to the following construction criteria, further eligibility criteria, such as liquidity, size, and nationality will be based upon the eligibility criteria contained within the methodologies for the underlying indexes, namely, the FT Wilshire Global Equity Market Series and FT Wilshire 5000 Index Series methodologies.

1.1 Input Data and Risk Model

The carbon definitions are aligned with those found in Commission Delegated Regulation (EU) 2020/1818[2]. The risk model arises from Wilshire Indexes' statistical factor model.

1.1.1 GHG Emission Intensity

A company's GHG Emission Intensity is defined as the ratio of the sum of Scope 1, Scope 2 and Scope 3 GHG emissions in metric tons of CO2e, to enterprise value including cash (EVIC), in millions of USD.

Therefore, company i's Emission Intensity is:

$$EI_i = \frac{E_{1,i} + E_{2,i} + E_{3,i}}{EVIC_i} \tag{1}$$

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[1] Wilshire Indexes is the trading name of Wilshire OpCo UK Limited (an FCA regulated benchmark administrator) and its affiliates.

[2] COMMISSION DELEGATED REGULATION (EU) 2020/1818 of 17 July 2020 supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards minimum standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks

where $E_{1,i}$, $E_{2,i}$ and $E_{3,i}$ are its Scope 1, 2 and 3 GHG emissions respectively and $EVIC_i$ is its EVIC.

Further details of reported and the modelling of un-reported carbon data are given in the Wilshire Indexes Carbon Emissions Model.

For universe constituents with neither reported nor modelled carbon emission data, their GHG emission intensity will comprise of; the second level classification average if there are at least three stocks with valid data in the same second level classification; otherwise, the first level classification average if there are at least three stocks with valid data in the same first level classification; otherwise, the universe average. For this purpose, the Scope 1 & 2 GHG emission intensity is treated separately from the Scope 3 GHG emission intensity.

1.1.2 Covariance Matrix

The covariance matrix of stock returns is estimated via a principal component analysis (PCA) applied to stock returns. Factor returns are calculated as the top 50 principal components of daily stock returns over the prior 24 months before the data cut-off date. The stock universe for the PCA comprises of the FT Wilshire Global Index constituents as of the reconstitution effective date.

To estimate the covariance matrix, daily returns of each stock in the underlying index are regressed against these factor returns in the same period to obtain a coefficient (or factor exposure) matrix and a residual (or idiosyncratic) variance series. The covariance matrix, C, is calculated as:

$$C = B \, \Sigma \, B^T + D \tag{2}$$

where B is the $N \times K$ coefficient matrix with N being the number of stocks in the underlying index and K being the number of factors which is fixed at 50, Σ is the $K \times K$ factor covariance matrix (which is diagonal since principal components are uncorrelated with each other), and D is the $N \times N$ diagonal matrix of residual variances.

1.2 Index Weights

The index weights W_i are determined using the following optimization which minimizes the (Scope 1, 2 & 3) Weighted Average Carbon Intensity:

$$\underset{w}{\text{Minimize}} \left[\sum_{i=1}^{N} W_i \times EI_i \right] \tag{3}$$

subject to the following constraint on ex-ante tracking error:

$$(W - W_B)^T \, C \, (W - W_B) \leq TE_{Target} \tag{4}$$

where W and W_B are vectors of index and benchmark weights respectively.

Further constraints limiting absolute active country weights, absolute active industry weights, stock weights, capacity ratios and turnover are also applied and are set out in Table 1.

Should the optimization be infeasible, a hierarchical approach to constraint relaxation is applied:

(1) Increase turnover constraint by 5%. Repeat until a solution is found or up to a maximum of 4 times.
(2) Increase ex-ante tracking error budget by 5 bps. Repeat until a solution is found or up to a maximum 4 times.

Should the relaxation process fail to yield a feasible solution, the index weights will consist of the pre-reconstitution index weights, renormalized to account for exclusion of stocks that are not members of the underlying benchmark on the effective date.

2 Index Parameters

Table 1 sets out the indexes that currently constitute the FT Wilshire Low Carbon Index Series and their targets and constraints.

Table 1: Targets and Constraints for Low Carbon Indexes

Index Name	Underlying Benchmark	Tracking Error Target (bps)	Active Industry Weight (%)	Active Country Weight (%)	Max. Weight (%)	Min. Weight (bps)	Max. Cap. Ratio	Max. 2-Way T/O (%)
FT Wilshire Global Large Cap Low Carbon Index	FT Wilshire Global Large Cap Index	30	+/-2	+/-2	5	1	20	20
FT Wilshire Developed Large Cap Low Carbon Index	FT Wilshire Developed Large Cap Index	30	+/-2	+/-2	5	1	20	20
FT Wilshire US Large Cap Low Carbon Index	FT Wilshire US Large Cap Index	30	+/-2	-	10	1	20	20

3 Index Maintenance

3.1 Index Reconstitution

The indexes in the FT Wilshire Low Carbon Index Series are reconstituted semi-annually in March and September. The price data cutoff date is Wednesday before the first Friday of the review month. Constituent and free-float changes are updated in line with the underlying parent index, typically after the close of trading on the third Friday of the reconstitution month.

Emission data is updated at the end of January for the March reconstitution, and at the end of July for the September reconstitution.

3.2 Intra-Reconstitution Additions

Additions to the benchmarks underlying the FT Wilshire Low Carbon Index Series (as per Table 1) are eligible for inclusion in the corresponding index in the FT Wilshire Low Carbon Index Series at the next index reconstitution.

3.3 Intra-Reconstitution Deletions

A constituent will be removed from an index in the FT Wilshire Low Carbon Index if it is removed from the corresponding underlying benchmark (as per Table 1). The deletion will be concurrent with that from the underlying benchmark and its weight will be distributed pro-rata amongst the remaining constituents in the index.

4 Corporate Events

4.1 Corporate Action Treatment

Corporate action treatment for the indexes in the FT Wilshire Low Carbon Index Series can be found in the Wilshire Indexes Equity Index Calculation and Corporate Action Guide. The index will be treated as a non-market capitalization index.

4.2 Suspension of Dealing

Suspension of Dealing rules for the indexes in the FT Wilshire Low Carbon Index Series can be found in the Wilshire Indexes Equity Index Calculation and Corporate Action Guide.

4.3 Takeovers, Mergers and Spinoffs

The treatment of takeovers, mergers and spinoffs for the indexes in the FT Wilshire Low Carbon Index Series can be found in the Wilshire Indexes Equity Index Calculation and Corporate Action Guide, the index will follow the non-market capitalization sections of the guide.

Methodology Approval

This Methodology was approved by the Index Management Committee on 14 August 2025.

Legal Notices

1. Intellectual Property

2. Disclaimers

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About Wilshire Indexes

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