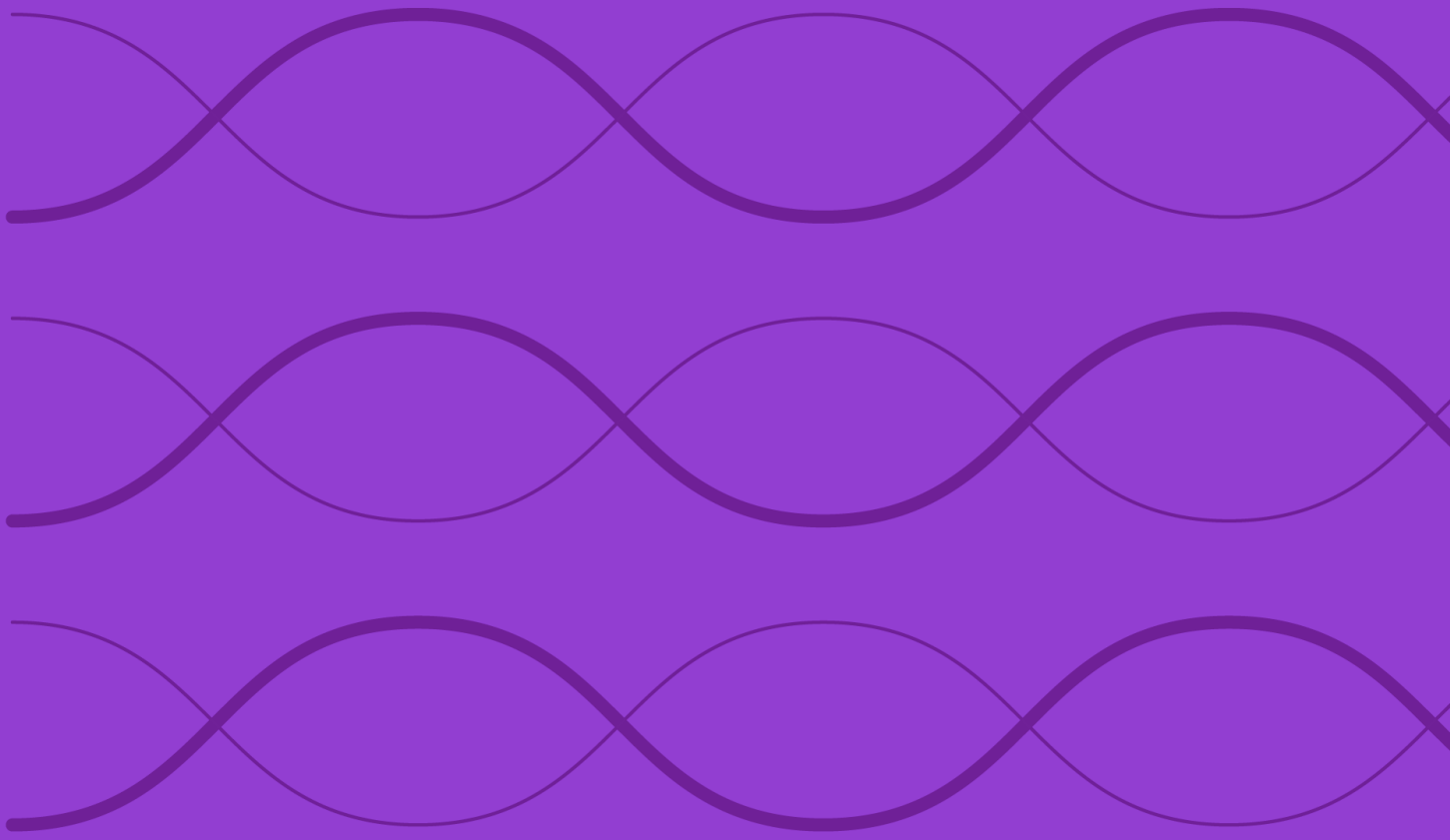
MORNINGSTAR Indexes

Construction Rules for the Morningstar Developed Markets Minimum Volatility Reduced Carbon Select Index



June 2025

Overview

The Morningstar Developed Markets Minimum Volatility Reduced Carbon Select Index aims to deliver lower return volatility than their parent benchmarks by using a holistic approach to portfolio construction with a constrained optimizer that seeks to mitigate exposure to unintended sources of risk and ensure investability. The index also targets 30% reduction in carbon emissions intensity relative to the parent benchmark and excludes companies identified by Mercer Global Investments Europe Limited (MGIE).

The index is powered by the Morningstar Global Industry Standard Risk Model (the risk model), which is used to forecast volatility of the entire portfolio. Return volatility is relative to the currency of measurement. The index design followed the assumption that investors are interested in reducing the volatility of their investments in the primary currency of exposure of their liabilities and expenses. For more information on the risk model, refer to Morningstar Risk Model Methodology. For the list of available parent benchmark and target currency index variants, refer to Appendix 3.

Index Inception and Performance Start Date

The index inception date, and the performance start date, when the first back-tested index value was calculated, are listed in Appendix 3.

Index Construction

Methodology Summary

Starting Universe	Eligibility	Portfolio Construction	
• Large-mid cap parent index from the Morningstar Global Markets Index family ○ Covers stocks representing the top 90% of the investable universe	• Companies must be covered by the risk model and have at least six months of return history • Companies on the Mercer Global Investments Europe Limited (MGIE) exclusion list are removed	• Select and weight companies through an optimization process based on marginal risk contribution while enforcing constraints	Morningstar Developed Markets Minimum Volatility Reduced Carbon Select Index

Starting Universe

At each reconstitution, securities eligible for the Morningstar Developed Markets Minimum Volatility Reduced Carbon Select Index are derived from the Morningstar Developed Markets Large-Mid Cap Index (the benchmark) from the Morningstar Global Markets Index family. For more details on benchmark construction, refer to the construction rules for the Morningstar Global Markets Indexes. Securities must also be covered by the risk model and have sufficient return history for estimation of specific risk as determined by the risk model parameters.

Eligibility

Certain issuers are excluded at each reconstitution based on a custom list of securities provided by Mercer Investments. The custom exclusion list is available at this location: https://investment-solutions.mercer.com/global/all/en/investment-solutions-home/exclusion-list.html listed under "MGIE Exclusion List for Article 8 Funds." The latest list is taken from the site at the time of each index reconstitution.

Portfolio Construction

Optimization Parameters

At every reconstitution, the Morningstar Developed Markets Minimum Volatility Reduced Carbon Select Index portfolio is created using an optimizer to minimize the objective and meet the constraints as follows:

- Minimize the forecast volatility of the portfolio[1]
- No short positions are allowed.
- The maximum weight of a security is restricted to 20 times its weight in the benchmark.
- The maximum weight of a security should be less than or equal to 1.5%.
- The minimum weight of a security included in the index portfolio should be greater than or equal to 0.05%[2]
- Carbon intensity of the portfolio is at least 30% lower relative to the parent index[3]
- The maximum one-way turnover should be less than 10%.
- Country active weight constraints: To limit deviation from corresponding weights in the parent benchmark, the country of classification weights in the index are maintained within a lower and upper bound, calculated as:
  - Lower bound = Weight in the benchmark - 5%
  - Upper bound = Min (Weight in the benchmark + 5%, Weight in the benchmark * 3)
- Sector active weight constraints: To limit deviation from corresponding weights in the parent benchmark, the sector weights in the index are maintained within a lower and upper bound, calculated as:
  - Lower bound = Weight in the benchmark - 5%
  - Upper bound = Weight in the benchmark + 5%
- Style risk factor active exposure constraints: To limit deviation from corresponding factor exposures of the parent benchmark, exposures of the index to all style risk factors[4] (except the volatility factor) are maintained within a lower and upper bound, calculated as:
  - Lower bound = Exposure of the benchmark - 0.25 standard deviations
  - Upper bound = Exposure of the benchmark + 0.25 standard deviations

For more details on optimized construction, please refer to Appendix 5.

Number of Stocks

The number of stocks in the index is variable, subject to the eligibility criteria, as well as the minimization objectives and constraints described in the "Optimization Parameters" section.

Index Weighting

The company weights of index constituents are determined through an optimization process subject to the objective function and weight constraints described in the "Optimization Parameters" section above. Appendix 5 contains further details. The index applies 5-10-40 capping, meaning the largest constituent weighting is capped at 10%, and the sum of weightings over 5% cannot exceed 40%.

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[1] For more details on the objective function, please refer to Appendix 5.
[2] For more details on the implementation of minimum weight constraint, please refer to Appendix 5.
[3] For the exact definition of carbon intensity used, see Appendix 6.
[4] For more details on the style factors in the risk model, please refer to Morningstar Risk Model Methodology. Style factor exposures are normalized to unit standard deviation and zero mean.

Index Maintenance and Calculation

Scheduled Maintenance

The index is reconstituted, where the membership is reset, and rebalanced semi-annually. Adjustments are made on the Monday following the third Friday of June and December. If the Monday is a holiday, reconstitution occurs on the Tuesday immediately following. The Morningstar Industry Standard Risk Model used in index reconstitution is constructed as of last Friday of the month preceding the month of reconstitution.

Index files are published according to the global calendar schedule. For more information, please refer to the Morningstar Indexes Holiday Calendar.

Refer to Appendix 2 for details on reconstitution and rebalancing.

Corporate Actions

The treatment of corporate actions will be as per the alternatively-weighted indexes. For more details, please refer to the Morningstar Indexes Corporate Actions Methodology rulebook.

Index Calculation and Price Data

Details about index calculations and price data can be found in their respective rulebooks: Morningstar Indexes Calculation Methodology and Equity Closing Prices Used for Index Calculation.

Methodology Review and Index Decommissioning Policy

The index methodology is continually reviewed to ensure it achieves all stated objectives. These reviews consider corporate action treatment, selection, and maintenance procedures. Subscribers to the index will be notified before any methodology changes are made. For more details, refer to the Morningstar Index Methodology Change Policy.

Morningstar Indexes notifies all subscribers and stakeholders of the index that circumstances might arise that require a material change to, or a possible cessation of, the index. These circumstances are generally not within Morningstar's control and may include significant changes to the underlying market structure, inadequate access to necessary data, geo-political events, and regulatory changes. In addition, factors such as low usage or methodology convergence may result in the cessation of an index.

Because the cessation of the index or benchmark index could disrupt subscriber products that reference this index, all subscribers are encouraged to have robust fallback procedures if an index is terminated. For more details, refer to the Morningstar Index Decommissioning Policy.

Data Correction and Precision

Intraday Index Data Corrections

Commercially reasonable efforts are made to ensure the accuracy of data used in real-time index calculations. If incorrect price or corporate action data affects index calculations, corrections are applied prospectively.

Index-Related Data and Divisor Corrections

Incorrect pricing and corporate action data for individual issues in the database will be corrected upon detection. In addition, an incorrect divisor of an index, if discovered if discovered within two days of its occurrence will be fixed retroactively on the day it is discovered to prevent an error from being carried forward. Commercially reasonable efforts are made to correct an older error subject to its significance and feasibility.

For more details, refer to the Recalculation Guidelines.

Exceptions

While Morningstar will seek to apply the methodology as described within this document, the market environment, supervisory, legal, financial, or tax reasons may require an alternative approach to be adopted. A decision to take an alternative approach will be made by the Morningstar Index Methodology Committee, and in all instances, the application of a nonstandard process will be reported to the Morningstar Index Oversight Committee.

Appendixes

Appendix 1: Modifications to the Rulebook

Section	Description of Change	Update Date
Entire rulebook	Moved to new rulebook template.	March 2023
Appendix 3	Dynamic Hedged variants added	December 2023
Data Correction and Precision	Computational and Reporting Precision Section removed	June 2025

Appendix 2: Glossary

Terms	Description
Reconstitution	During each reconstitution, the steps mentioned in the index construction process are performed, resulting in membership reset.
Rebalance	During each rebalancing, the weights are adjusted for updated free-float and shares outstanding data.

Appendix 3: Index Variants and Inception Dates

Index Name	Risk Model Currency/Base Currency	Parent/ Underlying Equity Index	Performance Start Date	Inception Date
Morningstar Developed Markets Minimum Volatility Reduced Carbon Select Index (USD)	USD	Morningstar Developed Markets Large-Mid Cap Index	June 20, 2014	December 10, 2021
Morningstar Developed Markets Minimum Volatility (USD) Reduced Carbon Select Dynamic Hedged GBP	GBP	Morningstar Developed Markets Minimum Volatility (USD) Reduced Carbon Select GBP	August 5, 2022	August 8, 2022
Morningstar Developed Markets Minimum Volatility (USD) Reduced Carbon Select Dynamic Hedged EUR	EUR	Morningstar Developed Markets Minimum Volatility (USD) Reduced Carbon Select EUR	August 5, 2022	August 8, 2022
Morningstar Developed Markets Minimum Volatility (USD) Reduced Carbon Select Dynamic Hedged USD	USD	Morningstar Developed Markets Minimum Volatility (USD) Reduced Carbon Select USD	March 1, 2022	January 27, 2023

For more details on the Dynamic Hedged Indexes, refer to the Morningstar Dynamic Hedging Methodology.

Appendix 4: Morningstar Sectors

The sector assignments from Morningstar Global Equity Classification Structure (GECS) are considered while applying the active sector constraints:

- Basic Materials
- Communication Services
- Consumer Cyclical
- Consumer Defensive
- Energy
- Financial Services
- Healthcare
- Industrials
- Real Estate
- Technology
- Utilities

Appendix 5: Optimization Methodology

Objective Function

$$\boldsymbol{minimize}\ \boldsymbol{w_p^T}\left(\boldsymbol{X^T F X} + \boldsymbol{\lambda D}\right)\boldsymbol{w_p}$$

Where:
w_p = vector of portfolio weights
X = matrix of asset factor exposures
F= factor covariance matrix
D = specific (idiosyncratic, residual) risk block of covariance matrix
$X^T FX$ = systematic (factor-driven) risk block of covariance matrix from the risk model
λ = 10, specific risk aversion parameter; λ=1 results in a specific risk-neutral volatility forecast; λ>1 implies greater penalty for asset-specific risk not modelled by systematic risk factor exposures

Any risk model will miss some systematic sources of risk due to bias-variance tradeoff. The model will therefore underestimate the contribution of specific risk to the risk of the overall portfolio, because it assumes the residual risk is perfectly uncorrelated and diversifiable. λ = 10 was chosen to compensate for the above effects based on empirical testing of ex-ante minimized risk. Higher specific risk aversion also tends to encourage higher portfolio diversification, which was a desired outcome.

Handling of Infeasible Optimizations

Constraints will be relaxed if a feasible solution is not obtained. The relaxation happens in the following order**:**

- One-way turnover constraint is relaxed from 10% to 30% in the increments of 5%
- The minimum weight constraint of a security is relaxed from 0.05% to 0.01% in increments of 0.01%
- If a feasible solution is not found after the above constraint relaxation, the index will not be reconstituted for that semi-annual review, and Index Committee review of the constraint methodology will be conducted and completed by the next semi-annual reconstitution date

Minimum Weight Constraint Implementation

Unlike the other constraints and objective of the index, minimum weight constraint is non-convex due to its binary decision nature (each of eligible securities can either have weight greater than minimum threshold of 0.05%, or zero weight). To satisfy the constraint in an efficient manner for parent benchmarks with thousands of eligible stocks, the following two-pass heuristic approach is employed. Securities are excluded from the portfolio if they receive weights below the minimum weight threshold in the first optimization pass. The weights or the remaining securities are re-adjusted to meet the constraints by a second pass of optimization, where a zero weight (exclusion) constraint is added for the excluded securities, and strict minimum weight constraint of 0.05% is added for each of the remaining holdings.

Appendix 6: Carbon Intensity

- Carbon intensity of a stock is defined as Scope 1 and 2 emissions in metric tons of greenhouse gases equivalent, divided by revenue in millions of U.S. dollars.
- Carbon intensity of a portfolio is defined as the weighted mean of its holdings.
- For the very small fraction of portfolio holdings where carbon emissions data is not available from Sustainalytics (usually new entrants into the benchmark), carbon intensity is estimated as the Morningstar industry group average.

About Morningstar Indexes

Morningstar Indexes was built to keep up with the evolving needs of investors—and to be a leading-edge advocate for them. Our rich heritage as a transparent, investor-focused leader in data and research uniquely equips us to support individuals, institutions, wealth managers, and advisors in navigating investment opportunities across major asset classes, styles, and strategies. From traditional benchmarks and unique IP-driven indexes to index design, calculation, and distribution services, our solutions span an investment landscape as diverse as investors themselves.

Morningstar Index Methodology Committee

The Morningstar Index Methodology Committee oversees all new index development, index methodology changes, and cessation of indexes for any indexes where Morningstar owns the intellectual property. This committee is also charged with ensuring that indexes align with Morningstar Research principles and values. The group comprises members of the index team with index research, product development, product management, client service, index implementation, and operation expertise who provide the first layer of governance over index design and methodology.

Morningstar Index Operations Committee

The Morningstar Index Operations Committee governs the processes, systems, and exception handling of the day-to-day management of all live indexes, including index rebalancing and reconstitution, restatements, market classification, and contingency management. The committee oversees the annual review of index methodology (as required by U.K. and EU benchmark regulations, or BMR), ensuring that methodologies remain fit for purpose and continue to achieve their stated investment objectives. The group comprises members of the index team with data, operations, corporate actions, product development, index launch, client service, and index management experience who provide the first layer of governance over index operations.

Morningstar Index Oversight Committee

The Morningstar Index Oversight Committee is responsible for the index oversight function as per the requirements of the U.K. and European BMR, providing independent oversight of all aspects of the governance of benchmark administration as required by the relevant BMR. Its remit extends to all calculation and administration-related business activities of Morningstar Indexes, including administration of Morningstar-owned benchmarks as well as client-owned benchmarks and index calculation. The oversight function is part of the organizational structure of Morningstar but is separate and independent from the index business, index management, and the other index committees.

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