
Construction Rules for the Morningstar® EU Climate IndexSM Family

Morningstar Indexes

December 2022

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Overview

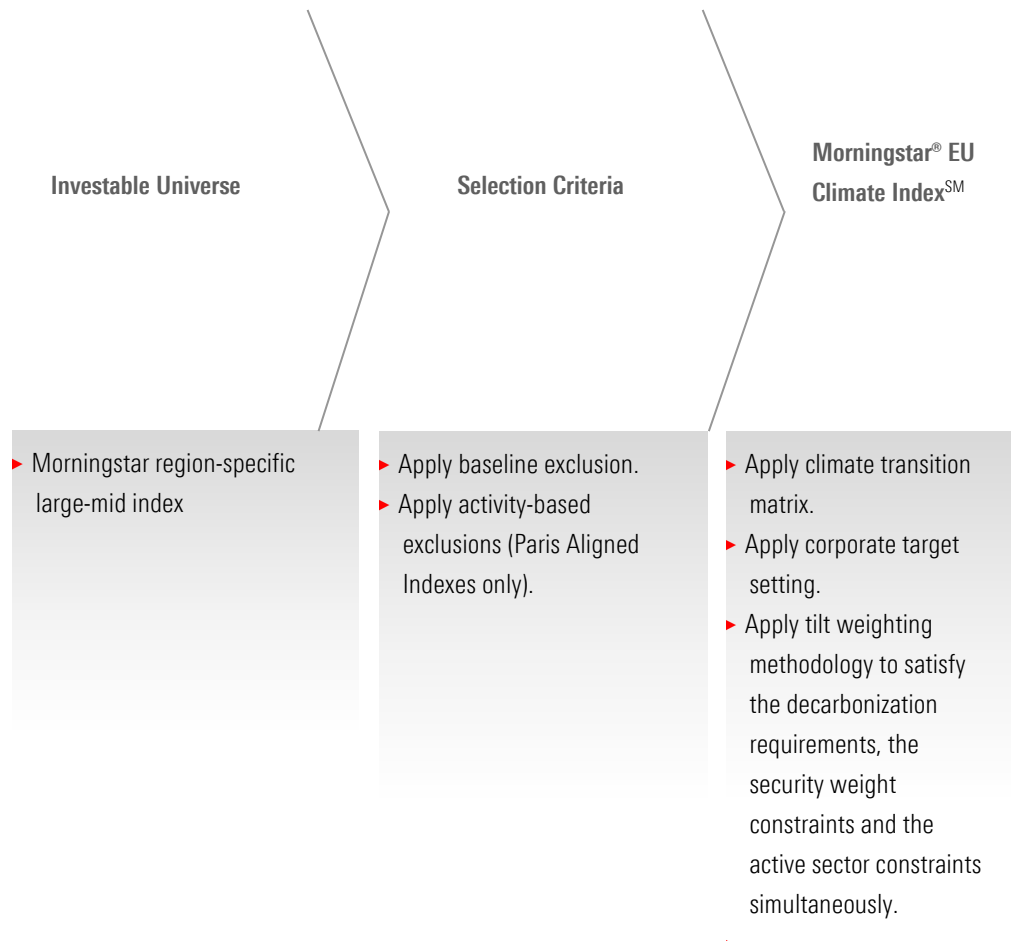
The Morningstar EU Climate Indexes, which include Climate Transition Benchmark (CTB) and Paris-Aligned Benchmark (PAB) variations, are designed to achieve the minimum standards laid out in the European Union delegated acts. The indexes support investors seeking to reduce their exposure to carbon risk and pursue opportunities arising from the transition to a low-carbon economy. The Index family also seek to reward companies that have credible carbon-reduction targets while achieving a modest tracking error with respect to the parent Index. The Index Family makes use of Carbon Emissions, Carbon Rating, Product Involvement and ESG Controversy data provided by Sustainalytics' and applies the Corporate Target Setting using data from Science Based Target Initiatives.

Index Inception Date and Performance Inception Date

Performance inception date of the indexes are Dec. 18, 2014, when the first back-tested index value was calculated. Inception date of the indexes are Sept. 30, 2021.

Index Construction

Exhibit 1 Morningstar EU Climate Index Family Construction Process



For additional details, refer to the "Assigning Stocks to the Index" section.

Assigning Stocks to the Index

Selection Universe

At each reconstitution, securities for the Climate Transition and Paris-aligned Indexes are derived from their respective market-capitalization parent index.

Security Selection

To be eligible for the Morningstar EU Climate Indexes, all constituents must meet the following criteria:

Baseline Exclusions

- ▶ The company must not have any revenue involvement in controversial weapons, essential or nonessential.
- ▶ The company must be compliant with the principles of the United Nations Global Compact.
- ▶ The company must not have a severe controversy rating (or a level of 5).

Activity-Based Exclusions (applies only to Paris-aligned Indexes)

- ▶ The company must not have any revenue involvement in thermal coal extraction, thermal coal supporting products/services and tobacco production/cultivation.
- ▶ The company must not have 10% or more of its revenue from oil & gas production and oil & gas supporting products/services.
- ▶ The company must not have 50% or more of its combined revenue from oil and gas generation and coal power generation.

Portfolio Constraints

At each semiannual review, the indexes are constructed using a tilt-weighting methodology that aims to achieve replicability and investability while keeping the tracking error with respect to the parent index low subject to the following conditions and constraints:

Parameter	CTB	PAB
Minimum reduction in greenhouse gas intensity (scope 1 + 2 +3) relative to Parent Index	30%	50%
Minimum average reduction (annualized with geometric compounding) in greenhouse gas intensity relative to greenhouse gas intensity of the index at previous reconstitution date	7%	
Minimum active weight in high climate sector relative to Parent Index as defined in Appendix 4*	5% of the weight in the Parent Index	
Minimum increase in weight of companies having revenue involvement equal to or greater than 25% in carbon solutions relative to the Parent Index	50% or 25% as determined by the climate transition matrix	
Minimum decrease in weight of companies with high or severe carbon risk scores relative to the Parent Index	50% or 25% as determined by the climate transition matrix	
Minimum increase in weight of companies setting carbon reduction targets relative to the Parent Index. In case of conflicts, the climate transition matrix gets priority to the corporate target setting application.	1.5 degree scenario –20% 2 or way below 2 degree scenario – 10%	
Minimum constituent weight	1% of weight in the Parent Index	
Maximum constituent weight	Min(weight in Parent Index+ 5%, 20x of weight in Parent Index)	

The above objectives are achieved by using a tilt-weighting approach as mentioned below:

$$W_{PORT} = W_P * SCI^\alpha * FCM * FCTS * FSC * FCP$$

- ▶ W_{PORT} : Weight of the security in the Climate Index
- ▶ W_P : Weight of the security in the Parent Index
- ▶ SCI : Carbon Intensity Standard Score (refer to Step 1 of process below)
- ▶ FCM : Climate matrix Factor Score (refer to Appendix 2, calculation methodology)
- ▶ $FCTS$: Corporate Target Setting Factor Score (refer to Appendix 3)
- ▶ FSC : Sector constraint control factor (refer to Appendix 7)
- ▶ FCP : Security tilt factor that enforces floor and ceiling constraints (refer to the parameter table above)
- ▶ α : Exponential tilt powers determined at each index rebalance to achieve the design objectives. The power has a sensitivity of 0.01.

The Process

Step 1: The carbon intensity standard scores are determined by first calculating the respective Z scores over the entire universe and then using a cumulative distribution function to determine the S scores. To reflect the inverse correlation of carbon intensity with portfolio weights, the S scores are changed to $1 - S$ scores.

Step 2: The Parent Index weights are tilted by the carbon intensity S score, subject to the exponential power α .

Step 3: The climate transition matrix and corporate target setting metrics are incorporated at the security floor and ceiling weight constraints.

Step 4: The sector tilt factors are applied to achieve the sector constraints.

Step 5: The individual security constraints are applied without distorting the sector constraints.

Index Weighting

The index is a tilt market-cap weighted. For more details, refer to the [Morningstar Indexes Calculation Methodology rulebook](#).

Index Maintenance and Calculation

Scheduled Maintenance

The indexes are reconstituted semiannually. 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. Market data used for reconstitution is as of the last trading day of May and November. During quarterly reviews, constituents with a controversy rating of 5 are deleted from the index. Parent Index eligibility is maintained during the quarterly reviews.

Corporate Action

The treatment of corporate actions will be as per the market-capitalization-weighted indexes. The treatment of corporate actions can be found in 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 Cessation Policy

The index methodology is continually reviewed to ensure it achieves all stated objectives. These reviews take into account corporate action treatment, selection, and maintenance procedures. Subscribers to the indexes will be notified before any methodology changes are made. For more details, refer to the [Morningstar Index Methodology Change Process](#).

Morningstar also notifies all index subscribers and stakeholders that circumstances might arise that require a material change to an index, or a possible cessation of the index. Circumstances that could lead to an index cessation include, but are not limited to, market structure change, product definition change, inadequate supply of data, insufficient revenue associated with the index, insufficient number of clients using the index, and/or other external factors beyond the control of the Morningstar Index Committee.

Because the cessation of an index or Index index could disrupt subscriber products that reference it, all subscribers are encouraged to have robust fallback procedures if an index is terminated. For more details, refer to the [Morningstar Index Cessation Process](#).

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 daily highs or lows, it is corrected retroactively as soon as is feasible.

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 within five days of its occurrence, will always 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](#).

Computational and Reporting Precision

For reporting purposes, index values are rounded to two decimal places and divisors are rounded to appropriate decimal places.

Appendixes

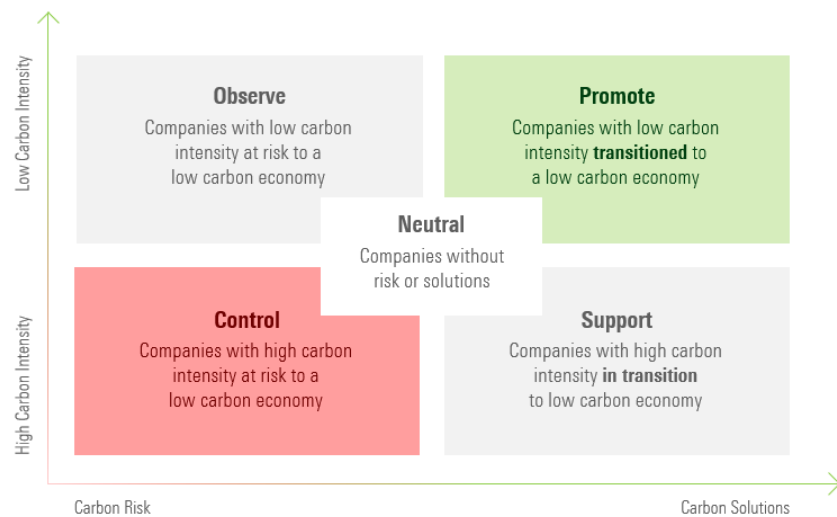
Appendix 1: Glossary

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 2: Morningstar Climate Transition Matrix

The Morningstar climate transition matrix is designed to identify companies that have high or severe risk to their valuation from the transition to a low-carbon economy, based on the Carbon Risk Rating from Sustainalytics, or that have more than 25% exposure to key business that will gain prominence in a low-carbon economy as assessed by the Sustainalytics Carbon Solutions Involvement. The other dimension evaluates the carbon intensity of a company within its respective NACE Section.

Exhibit 2 Morningstar climate transition matrix



Calculation Methodology

Step 1: Assess a company for carbon risk and carbon solution. Unless a company scores high or severe in carbon risk or derives more than 25% of its revenue from carbon solutions, the company is assigned to the neutral cohort.

Step 2: Assess the carbon intensity of a company relative to its NACE Section median. Assign a high or low carbon intensity category based on the comparison.

Step 3: Down weight or upweight securities relative to the Parent Index based on the cohort assignment.

- ▶ Control (carbon risk and high carbon intensity) cohort securities are downweighted at least 50% relative to their weight in the Parent Index.
- ▶ Observe (carbon risk and low carbon intensity) cohort securities are downweighted at least 25% relative to their weight in the Parent Index.
- ▶ Support (carbon solution and high carbon intensity) cohort securities are upweighted at least 25% relative to their weight in the Parent Index.
- ▶ Promote (carbon solution and low carbon intensity) cohort securities are upweighted at least 50% relative to their weight in the Parent Index.

Appendix 3: Corporate Target Setting

Securities are upweighted relative to the Parent Index based on the following conditions:

- ▶ The company publishes its annual emissions.
- ▶ The company has reduced its greenhouse gas intensity at least 7% for the last three consecutive years.
- ▶ The company has published carbon reduction targets. This is ascertained through commitments from Science Based Targets initiatives.
 - ▶ Company that commits to a 1.5 °C scenario is upweighted by 20% relative to the Parent Index.
 - ▶ Company that commits to a way below 2° or a 2° scenario is upweighted by 10% relative to the Parent Index.

*For all the indexes listed in this methodology book, Corporate Target Setting will be applied from June'24 onwards.

Science Based Targets Initiative

The Science Based Targets initiative drives ambitious climate action in the private sector by enabling companies to set science-based emissions-reduction targets. The initiative is a collaboration between CDP, World Resources Institute, the World Wide Fund for Nature, and the United Nations Global Compact. Science-based targets show companies how much and how quickly they need to reduce their greenhouse gas emissions to prevent the worst effects of climate change. For a list of companies taking action or for more information on the initiative, please visit the Science Based Targets Initiative [website](#).

Targets are considered science-based if they are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement — limiting global warming to well below 2 degrees Celsius above preindustrial levels and pursuing efforts to limit warming to 1.5 C.

Appendix 4: Calculation of Target Metrics

Calculation of Carbon, or Greenhouse Gas, intensity

The Total Emission of a security is defined as the sum of the Scope 1, Scope 2 and Scope 3 emissions. The Enterprise Value Including Cash (EVIC) is the sum, at fiscal year-end, of the market capitalization of ordinary shares, the market capitalization of preferred shares, and the book value of total debt and non-controlling interests, without the deduction of cash or cash equivalents. The Carbon Intensity of a security is defined as the ratio of the Total Emissions (in metric tonnes) adjusted for the inflation in EVIC and the EVIC of the company (in millions of U.S. dollars).

For Parent Index constituents where the Scope 1+2+3 Emissions Intensity is not available, the average Scope 1+2+3 Emissions Intensity of all the constituents of the Morningstar Global Markets Large Mid Index in the same NACE Section in which the constituent belongs is used. A valid carbon intensity value can only be calculated if both the emissions and EVIC values are available for the company.

$$\text{Total Emissions} = (\text{Scope 1} + \text{Scope 2} + \text{Scope 3}) \text{ Emissions}$$

$$\text{Security Level Carbon Intensity} = \frac{\text{Total Emissions} (1 + \text{EVIAF})}{\text{Enterprise Value Including Cash (in Mn USD)}}$$

$$\text{Enterprise Value Inflation Factor (EVIAF)} = \frac{\text{Average Enterprise Value Including Cash}}{\text{Previous Average Enterprise Value Including Cash}} - 1$$

$$\text{Enterprise Value Including Cash (EVIC)} = (\text{MktCapOrdinaryShares} + \text{MktCapPreferred Shares} + \text{BVDebt} + \text{NCI})$$

$$\begin{aligned} \text{Weighted Average Carbon (GHG) Intensity} \\ = \sum (\text{Index Weight} * \text{Security Level GHG Intensity}) \end{aligned}$$

Calculation of Target High Impact NACE Section Weights

For Climate Transition Benchmark Index Family, the target weight of the NACE Sections belonging to the High Impact Group (A,B,C,D,E,F,G,H,L) is set at 1.05x their respective weights in the Parent Index.

For Paris-Aligned Indexes, NACE Section B is left unconstrained because of its significant removal due to Activity-Based exclusions that are required by the EU Regulations. The weight of the excluded securities from NACE Section B is redistributed to the remaining High impact NACE Sections (A,C,D,E,F,G,H,L) in proportion to their weights in the Parent Index. 1.05x of these updated weights of the High Impact NACE Sections in the Parent Index is set as the target weight.

Calculation of Average Decarbonization

The Climate Transition and Paris-Aligned Indexes follow a 7% decarbonization trajectory since the base date. The weighted average greenhouse gas intensity of the Index at the (n-1)th reconstitution is used to compute the target weighted average greenhouse gas intensity at any given semiannual index review, according to the following formula.

$$CI_t = CI_{t-1} * (0.93)^{(t-1/2)}$$

Where t is the number of semiannual index reviews since the base date. The base date for all carve-outs is set at June 21, 2021. CI_{t-1} is the achieved carbon intensity of the portfolio on the (n-1)th reconstitution date.

We also aim to achieve a min 30% (50% for Paris-Aligned Indexes) reduction in greenhouse gas intensity with respect to the Parent Index on each reconstitution date. The minimum of these two intensity targets is set as the target portfolio intensity for the given semiannual index review.

Parent Index	Base Date	Benchmark intensity (MT CO ₂ /Mn USD EVIC)
Morningstar Global Markets Large Mid Index	June 21, 2021	258.8
Morningstar Developed Markets Large Mid Index	June 21, 2021	234.4
Morningstar Developed Europe Large Mid Index	June 21, 2021	331.4
Morningstar Emerging Markets Large Mid Index	June 21, 2021	421.3

Appendix 5 : Product Involvement Based Exclusions

Detailed Criteria	Revenue Threshold for Climate Transition Indexes	Revenue Threshold for Paris-Aligned Indexes
Controversial Weapons Tailor Made & Essential	0%	0%
Controversial Weapons Non-Tailor Made or Non-Essential	0%	0%
Tobacco Production	NA	0%
Thermal Coal Production	NA	0%
Thermal Coal Supporting Products & Services	NA	0%
Oil & Gas Production	NA	<10%
Oil & Gas Supporting Products & Services	NA	<10%
Thermal Coal Power Generation	NA	a%*
Oil & Gas Power Generation	NA	b%*

* (a+b)% < 50%

*The *null* values for the below-mentioned data points have been backfilled in history for all Climate-Transition and Paris-Aligned Benchmark Indexes - Tobacco Production, Thermal Coal Production, Thermal Coal Supporting Products & Services, Oil & Gas Production, Oil & Gas Supporting Products & Services, Thermal Coal Power Generation, Oil & Gas Power Generation.

*In the backtest of Indexes listed in this methodology book, *null* values post backfilling for activity-based screens have been removed from the universe with the exception of Oil & Gas Power Generation and Thermal Coal Generation, where *null* values have been treated as 0% revenue involvement.

*The *null* values for Controversial Weapons Tailor Made & Essential and Controversial Weapons Non-Tailor Made or Non-Essential have been retained in the universe throughout history.

* From Dec'22 onwards, any security with missing values for the above-mentioned data points (Controversy score and GCC Status) will be removed from the universe.

Appendix 6 : Index Inception Date and Performance Inception Date

Index Name	Performance Inception Date	Inception Date
Morningstar Global Markets EU Climate Transition Benchmark	19/12/2014	30/09/2021
Morningstar Global Markets Paris Aligned Benchmark	19/12/2014	30/09/2021
Morningstar Developed Markets EU Climate Transition Benchmark	19/12/2014	30/09/2021
Morningstar Developed Markets Paris Aligned Benchmark	19/12/2014	30/09/2021
Morningstar Developed Markets EU Europe Climate Transition Benchmark	19/12/2014	30/09/2021
Morningstar Developed Europe Paris Aligned Benchmark	19/12/2014	30/09/2021
Morningstar Emerging Markets EU Climate Transition Benchmark	19/12/2014	30/09/2021
Morningstar Emerging Markets Paris Aligned Benchmark	19/12/2014	30/09/2021

Appendix 7: Climate Impact Sectors

NACE is the European Union's classification of economic activities. According to EU regulations, NACE Sections A, B, C, D, E, F, G, H, and L are deemed high climate impact sectors and cannot be underweight relative to their respective weights in the Parent Index. The other sections are left unconstrained as a part of the tilt weighting methodology. To accommodate for activity-based exclusions, Section B is left unconstrained in the Paris-Aligned Indexes. Every company in the Parent Index is mapped to a particular NACE section and further aggregated to form the respective sector constraint cohorts. In the backtests, for companies that had a missing NACE section in their history, the NACE data has been back-propagated as NACE is a slow-changing data point. Companies for which we did not have a valid NACE section even after back-propagating have been removed from the eligible universe.

For further details regarding NACE, please refer to https://ec.europa.eu/eurostat/statistics-explained/index.php?title=NACE_background

Appendix 8: Index Treatment in Case of Inability to Meet Required Decarbonization Target

In the off chance that the Index is unable to achieve the target decarbonization in a particular year, then we will relax the active sector constraint from being 5% of the benchmark weight for the High Impact NACE Sections to incrementally lower numbers greater than or equal to 0% till the target is met. We will still be in compliance with the EU Regulations which requires the cumulative weight of the High Impact Sector group to not be less than that in the benchmark. We have implemented a stricter approach in our methodology.

Appendix 9: Modifications to Rulebook

Section	Description	Update Date
Product involvement based exclusions	Added the following screens: <ul style="list-style-type: none"> • Thermal Coal Supporting Products / Services • Oil & Gas Supporting Products / Services • Thermal Coal Power Generation Revenue • Oil & Gas Power Generation Revenue 	Dec 19, 2022
Decarbonization Trajectory	Minimum average reduction (annualized with geometric compounding) in greenhouse gas intensity is set at 7% relative to greenhouse gas intensity of the Paris-Aligned Index at the previous reconstitution date	Dec 19, 2022
Active Sector Constraint	The minimum active weight of the individual High Impact NACE Section (with the exception of NACE Section B in Paris-Aligned Benchmark Indexes) has been set at 0.05% of their corresponding weight in the Parent Index instead of an absolute value of 0%	Dec 19, 2022

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About Morningstar Indexes

Morningstar® Indexes combine the science and art of indexing to give investors a clearer view into the world's financial markets. Our indexes are based on transparent, rules-based methodologies that are thoroughly back-tested and supported by original research. Covering all major asset classes, our indexes originate from the Morningstar Investment Research Ecosystem—our network of accomplished analysts and researchers working to interpret and improve the investment landscape. Clients such as exchange-traded fund providers and other asset management firms work with our team of experts to create distinct, investor-focused products based on our indexes. Morningstar Indexes also serve as a precise Indexing resource.

Morningstar Index Product Committee

The Morningstar Index Product Committee is comprised of members who possess a wide array of knowledge in relation to Indexes. The Product Committee is responsible for the governance over the creation and maintenance of all Morningstar branded Indexes, ensuring the highest standards are continuously met. Any matters arising from exceptional or undocumented events will be resolved at the discretion of the Morningstar Index Product Committee.

Morningstar Index Oversight Committee

The Morningstar Index Oversight Committee is comprised of informed and qualified professionals who are responsible for the process governance of Morningstar branded Indexes. The Oversight Committee assesses and where appropriate challenges the decisions of Morningstar Indexes with regards to Index decisions.

For More Information

For any queries, reach out to us via our [communication page](#).



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