

MSCI EU CTB/PAB Overlay Indexes Methodology

July 2024

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1 Introduction

Two new categories of climate benchmark were introduced by the regulation (EU) 2016/1011 as amended by Regulation (EU) 2019/2089, which sets out the minimum standards for such indexes. The two benchmark types are EU Climate Transition Benchmarks (CTBs) and EU Paris-Aligned Benchmarks (PABs).

The MSCI EU CTB Overlay Indexes and the MSCI EU PAB Overlay Indexes (the “Indexes”) are designed to meet the minimum standards of the EU Climate Transition Benchmark (CTB) and the EU Paris-Aligned Benchmark (PAB) respectively¹. The MSCI EU CTB/PAB Overlay Indexes are constructed from their corresponding Parent Indexes using an optimization-based approach and aim to:

- Reduce the weighted average greenhouse gas intensity by 30% (50% for MSCI EU PAB Overlay Indexes) compared to the underlying investment universe.
- Reduce the weighted average greenhouse gas (GHG) intensity by 7% on an annualized basis.
- Achieve a modest tracking error compared to the Parent Index and low turnover.
- Exclude companies based on the following criteria:
 - MSCI EU CTB/PAB Overlay Indexes exclude companies involved in Controversial Weapons businesses, Red Flag ESG Controversies, Red and Orange Flag Environmental Controversies and Tobacco Manufacturing².
 - Additionally, MSCI EU PAB Overlay Indexes also exclude companies involved in Thermal Coal, Oil & Gas and Fossil Fuel-based power generation³.

¹ On December 3, 2020, the European Commission has published the delegated acts in the Official Journal (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1818&from=EN>) which contain the minimum technical requirements for the EU Climate Transition Benchmarks and EU Paris-Aligned Benchmarks. In case there are changes in the EU delegated acts and an update to the Index methodology is required, MSCI will issue an announcement prior to implementing the changes in the methodology. MSCI will not conduct a formal consultation for such an update.

² Exclusions for Tobacco Manufacturers were applied in MSCI EU CTB Overlay Indexes starting from 2023.

³ The Indexes are governed by a set of methodology and policy documents (“Methodology Set”), including the present index methodology document. Please refer to Appendix IX for more details.

2 Constructing the Indexes

The MSCI EU CTB Overlay Indexes and the MSCI EU PAB Overlay Indexes use company ratings and research provided by MSCI ESG Research⁴ for the Index construction.

2.1 Applicable Universe

The Applicable Universe includes all the existing constituents of any non-optimized MSCI Index⁵ (“Parent Index”).

2.2 Reference Index

The Reference Index aims to represent the Investment Universe for the Parent Index. This Index is the free-float adjusted market capitalization weighted index (“Reference Index”) corresponding to the Parent Index as per the MSCI Global Investible Markets Index (GIMI) methodology⁶. For Parent Indexes which follow the GIMI methodology, the Reference Index is the same as the Parent Index. For further details regarding the Reference Index, kindly refer to Appendix V.

2.3 Eligible Universe

The Eligible Universe is constructed from the Applicable Universe by excluding securities of companies based on the exclusion criteria below and as per the implementation schedule detailed in Table 1:

Table 1: Implementation schedule for exclusions in the MSCI CTB/PAB Indexes

	MSCI EU CTB Overlay Indexes	MSCI EU PAB Overlay Indexes
Controversial Weapons	Applicable	Applicable
ESG Controversies	Applicable	Applicable
Environmental Harm	Applicable	Applicable
Tobacco	Applicable	Applicable

⁴ See section 4 for further information regarding ESG and climate data used in the Indexes that MSCI Limited and MSCI Deutschland GmbH source from MSCI ESG Research LLC, a separate subsidiary of MSCI Inc. MSCI ESG Research is solely responsible for the creation, determination and management of such data as a provider to MSCI Limited and MSCI Deutschland GmbH. MSCI Limited and MSCI Deutschland GmbH are the benchmark administrators for the MSCI indexes

⁵ A non-optimized MSCI Index is defined as an Index which does not use the Barra Open Optimizer in its Index construction to determine the weights of securities.

⁶ For further details regarding the MSCI Global Investible Markets Index methodology, kindly refer to <https://www.msci.com/index-methodology>

	MSCI EU CTB Overlay Indexes	MSCI EU PAB Overlay Indexes
Thermal Coal Mining	Not Applicable	Applicable
Oil & Gas	Not Applicable	Applicable
Power Generation	Not Applicable	Applicable

1. **Controversial Weapons:** All companies involved in Controversial Weapons as defined by the methodology of the MSCI Ex-Controversial Weapons Indexes⁷.
2. **ESG Controversies:** All companies assessed as having involvement in ESG controversies that are classified as Red Flags (MSCI ESG Controversy Score of 0). A Red Flag indicates an ongoing, Very Severe ESG controversy implicating a company directly through its actions, products, or operations.
3. **Environmental Harm:** All companies assessed as having involvement in environmental controversies that are classified as Red (MSCI Environmental Controversy Score of 0) or Orange Flags (score of 1).
 - o A Red Flag indicates an ongoing, Very Severe ESG controversy implicating a company directly through its actions, products, or operations.
 - o An Orange Flag indicates an ongoing Severe ESG controversy implicating a company directly, or a Very Severe ESG controversy that is either partially resolved or indirectly attributed to the company's actions, products, or operations.
4. **Tobacco⁸:** All companies that are involved in the manufacturing of Tobacco products.

Further, MSCI EU PAB Overlay Indexes also exclude companies based on the additional exclusion criteria below. These exclusions are not applied in the MSCI EU CTB Overlay Indexes.

5. **Thermal Coal Mining:** All companies deriving 1% or more revenue (either reported or estimated) from the mining of thermal coal (including lignite, bituminous, anthracite and steam coal) and its sale to external parties. It excludes revenue from metallurgical coal, coal mined for internal power generation (e.g. in the case of vertically integrated power producers), intra-company sales of mined thermal coal, and revenue from coal trading (either reported or estimated).
6. **Oil & Gas:** All companies deriving 10% or more revenue from oil and gas related activities, including distribution / retail, equipment and services, extraction and production, pipelines and transportation and refining but excluding biofuel production and sales and trading activities.

⁷ For more details regarding the MSCI Ex-Controversial Weapons Index methodology, please refer to <https://www.msci.com/index/methodology/latest/XCW>.

⁸ Exclusions for Tobacco Manufacturers are applied in MSCI EU CTB Overlay Indexes from the beginning of 2023. This exclusion was applied since the beginning for the MSCI EU PAB Overlay Indexes.

7. **Power Generation:** All companies deriving 50% or more revenue from thermal coal based power generation, liquid fuel based power generation and natural gas based power generation⁹.

2.4 Security Selection and Weighting

Securities in the Eligible Universe are selected and weighted following an optimization-based approach described below in Section 2.5 of this methodology book.

The MSCI EU CTB Overlay C-Series Indexes provide an alternative to the optimization-based approach. These indexes are constructed by following a “non-optimized” approach as detailed in Appendix IV.

2.5 Optimization Constraints

At each Semi-Annual Index Review, the indexes are constructed using an optimization process that aims to achieve replicability and investability as well as minimize ex-ante tracking error relative to the Parent Index subject to the following constraints:

1. Climate objectives – constraints detailed in Table 2
2. Diversification objectives – constraints detailed in Table 3

The definitions of the target metrics for the optimization are detailed in Appendix I.

Table 2: Constraints imposed to meet climate objectives

No.	Climate Objectives	MSCI EU CTB Overlay Indexes	MSCI EU PAB Overlay Indexes
1.	Minimum reduction in Greenhouse Gas (GHG) Intensity relative to EVIC (Scope 1+2+3 ¹⁰) relative to the Reference Index	30%	50%
2.	Minimum average reduction (per annum) in GHG Intensity (relative to EVIC) relative to GHG Intensity of the index at the Base Date ¹¹	7%	7%
3.	Minimum active weight in High Climate Impact Sector relative to Reference Index as defined in Appendix I	0%	0%

⁹ As per https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter7.pdf, thermal coal based power generation, liquid fuel based power generation and natural gas based power generation have median lifecycle emissions exceeding 100gCO2/kWh.

¹⁰ Prior to the May 2020 Semi-Annual Index Review (SAIR) of the Indexes, the Weighted Average Carbon Emissions Intensity relative to EVIC has been calculated based on Scope 1+2 Emissions.

¹¹ Prior to the May 2020 Semi-Annual Index Review (SAIR) of the Indexes, the average reduction in Weighted Average Carbon Emissions Intensity relative to EVIC has been calculated using Scope 1+2 Emissions since Inception.

Table 3: Constraints imposed to meet diversification objectives

No.	Diversification Objective	
4.	Constituent Active Weight ¹² relative to the Parent Index ¹³	+/- 2%
5.	Security Weight as a multiple of its weight in the Parent Index	20x
6.	Active Sector Weights (the Energy GICS Sector is not constrained) relative to the Parent Index	+/-5%
7.	Active Country Weights relative to the Parent Index ¹⁴	+/-5%
8.	One Way Turnover	5%
9.	Common Factor Risk Aversion	0.0075
10.	Specific Risk Aversion	0.075

During the Semi-Annual Index Review, in the event that there is no optimal solution that satisfies all the optimization constraints, the following constraints will be relaxed, until an optimal solution is found:

- Relax the one-way index turnover constraint in steps of 1% up to 20%.
- Relax the active sector weight constraint in steps of 1% up/down to +/-20%.
- The one-way index turnover constraint and the active sector weight constraint are alternately relaxed until a feasible solution is achieved.

In the event that no optimal solution is found after the above constraint relaxations are exhausted, the relevant Index will not be rebalanced for that Semi-Annual Index Review.

¹² For the MSCI Switzerland IMI EU PAB Overlay Index, MSCI France IMI EU PAB Overlay Index and MSCI France EU PAB Overlay Index, the constituent active weight constraint relative to the Parent is “+/- 5%”, instead of “+/- 2%”.

¹³ For the MSCI France IMI EU CTB Overlay Index, the constituent active weight constraint relative to the Parent was relaxed to “-3%” instead of “-2%” at the May 2024 Index Review to achieve a feasible solution during the optimization process.

¹⁴ In case there are countries in the parent index which weigh less than 2.5% in the parent index then for such countries the active country upper bound of +5% is not applicable. When a country weighs less than 2.5% in parent index then the upper bound of country weight in the Index is set at three times of the country’s weight in Parent Index.

2.6 Determining the Optimized Index

The Index is constructed using the Barra Open Optimizer¹⁵ in combination with the relevant Barra Equity Model. The optimization uses the universe of eligible securities and the specified optimization objectives and constraints to determine the constituents of and the weights of constituents in the Indexes.

2.7 Treatment of Unrated Companies

Companies not assessed by MSCI ESG Research on data for the following MSCI ESG Research products are not eligible for inclusion in the Indexes:

- MSCI ESG Controversies

For the treatment of unrated companies in the calculation of target metrics for the optimization, please refer to Appendix I.

¹⁵ Please refer to Appendix III and IV for more details.

3 Maintaining the Indexes

3.1 Semi-Annual Index Reviews

The Indexes are rebalanced on a semi-annual basis, as of the close of the last business day of May and November, coinciding with the May and November Index Reviews of the MSCI Global Investable Market Indexes. The pro forma Indexes are in general announced nine business days before the effective date.

In general, MSCI uses MSCI ESG Research data¹⁶ (including MSCI Climate Change Metrics, MSCI ESG Controversies and MSCI ESG Business Involvement Screening Research) as of the end of the month preceding the Index Reviews for the rebalancing of the Indexes.

3.2 Ongoing Event Related Changes

The general treatment of corporate events in the Indexes aims to minimize turnover outside of Index Reviews. The methodology aims to appropriately represent an investor’s participation in an event based on relevant deal terms and pre-event weighting of the index constituents that are involved. Further, changes in index market capitalization that occur as a result of corporate event implementation will be offset by a corresponding change in the Variable Weighting Factor (VWF) of the constituent.

Additionally, if the frequency of Index Reviews in the Parent Index is greater than the frequency of Index Reviews in the Index, the changes made to the Parent Index during intermediate Index Reviews will be neutralized in the Index.

The following section briefly describes the treatment of common corporate events within the Index.

No new securities will be added (except where noted below) to the Index between Index Reviews. Parent Index deletions will be reflected simultaneously.

EVENT TYPE

EVENT DETAILS

New additions to the Parent Index

A new security added to the Parent Index (such as IPO and other early inclusions) will not be added to the Index.

Spin-Offs

All securities created as a result of the spin-off of an existing Index constituent will be added to the Index at the time of event implementation. Reevaluation for continued inclusion in the Index will occur at the subsequent Index Review.

Merger/Acquisition

For Mergers and Acquisitions, the acquirer’s post event weight will account for the proportionate amount of shares involved in deal consideration, while cash proceeds will be invested across the Index.

¹⁶ See section 4 for details of data sourced from MSCI ESG Research used in the Indexes.

If an existing Index constituent is acquired by a non-Index constituent, the existing constituent will be deleted from the Index and the acquiring non-constituent will not be added to the Index.

Changes in Security Characteristics

A security will continue to be an Index constituent if there are changes in characteristics (country, sector, size segment, etc.) Reevaluation for continued inclusion in the Index will occur at the subsequent Index Review.

Further detail and illustration regarding specific treatment of corporate events relevant to this Index can be found in the MSCI Corporate Events Methodology book under the sections detailing the treatment of events in Capped Weighted and Non-Market Capitalization Weighted indexes.

The MSCI Corporate Events methodology book is available at: <https://www.msci.com/index-methodology>.

4 MSCI ESG Research

The MSCI EU CTB Overlay Indexes and the MSCI EU PAB Overlay Indexes are products of MSCI Inc. that utilize information such as company ratings and research produced and provided by MSCI ESG Research LLC (MSCI ESG Research), a subsidiary of MSCI Inc. In particular, the Indexes use the following MSCI ESG Research products: MSCI Climate Change Metrics, MSCI ESG Controversies and MSCI ESG Business Involvement Screening Research. MSCI Indexes are administered by MSCI Limited and MSCI Deutschland GmbH.

4.1 MSCI Climate Change Metrics

MSCI Climate Change Metrics provides climate data & tools to support institutional investors seeking to integrate climate risk & opportunities into their investment strategy and processes. This includes investors seeking to achieve a range of objectives, including measuring and reporting on climate risk exposure, implementing low carbon and fossil fuel-free strategies, alignment with temperature pathways and factoring climate change research into their risk management processes, in particular through climate scenario analysis for both transition and physical risks.

The dataset spans across the four dimensions of a climate strategy: transition risks, green opportunities, physical risks and 1.5° alignment.

For more details on MSCI Climate Change Metrics, please refer to <https://www.msci.com/climate-change-solutions>.

4.2 MSCI ESG Controversies

MSCI ESG Controversies provide assessments of controversies concerning the potential negative environmental, social, and/or governance impact of company operations, products and services. The evaluation framework used in MSCI ESG Controversies is designed to be consistent with international norms represented by the UN Declaration of Human Rights, the ILO Declaration on Fundamental Principles and Rights at Work, and the UN Global Compact. MSCI ESG Controversies Score falls on a 0-10 scale, with “0” being the most severe controversy.

The MSCI ESG Controversies methodology can be found at: <https://www.msci.com/legal/disclosures/esg-disclosures>

4.3 MSCI ESG Business Involvement Screening Research

MSCI ESG Business Involvement Screening Research (BISR) aims to enable institutional investors to manage environmental, social and governance (ESG) standards and restrictions reliably and efficiently.

For more details on MSCI ESG Business Involvement Screening Research, please refer to <https://www.msci.com/legal/disclosures/esg-disclosures>.

Appendix I: Calculation of Target Metrics

Greenhouse Gas (GHG) Emissions Intensity

MSCI ESG Research collects company-specific direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions (GHG) data from company public documents and/or the Carbon Disclosure Project. If a company does not report GHG emissions, then MSCI ESG Research estimates Scope 1 and Scope 2 GHG emissions.

MSCI ESG Research estimates company-specific indirect (Scope 3) GHG emissions from the Scope 3 Carbon Emissions Estimation Model. The data is generally updated on an annual basis.

Calculation of GHG Intensity

Carbon emissions of a company are normalized for size by dividing annual carbon emissions by Enterprise Value including Cash (EVIC). The Carbon Emissions Intensity is calculated using the latest Scope 1+2 carbon emissions, Scope 3 carbon emissions and EVIC of a company.

Security Level GHG Intensity (Scope 1+2+3) =

$$(\text{Unadjusted Security Level GHG Intensity (Scope 1+2)} + \text{Unadjusted Security Level GHG Intensity (Scope 3)}) * (1 + \text{EVIAF})$$

Unadjusted Security Level GHG Intensity (Scope 1+2) =

$$\frac{(\text{Scope 1} + 2 \text{ Carbon Emissions})}{\text{EVIC (in M\$)}}$$

If Scope 1+2 carbon emissions and/or EVIC are not available, the average Scope 1+2 intensity of all the constituents of the MSCI ACWI in the same GICS Industry Group in which the security belongs is used.

Unadjusted Security Level GHG Intensity (Scope 3) =

$$\frac{(\text{Scope 3 Carbon Emissions})}{\text{EVIC (in M\$)}}$$

If Scope 3 carbon emissions and/or EVIC are not available, the average Scope 3 intensity of all the constituents of the MSCI ACWI in the same GICS Industry Group in which the security belongs is used.

Enterprise Value Inflation Adjustment Factor (EVIAF) =

$$\left(\frac{\text{Average(EVIC)}}{\text{Previous (Average(EVIC))}} \right) - 1$$

Weighted Average GHG Intensity of Parent Index =

$$\sum (Weight\ in\ Parent\ Index * Security\ Level\ GHG\ Intensity)$$

Weighted Average GHG Intensity of Derived Index =

$$\sum (Index\ Weight * Security\ Level\ GHG\ Intensity)$$

Calculation of Average Decarbonization

On average, the Indexes follow a 7% decarbonization trajectory since the Base Date. The Weighted Average GHG Intensity relative to EVIC at the Base Date (W_1) is used to compute the target Weighted Average GHG Intensity relative to EVIC at any given Semi-Annual Index Review (W_t) as per the below formula.

$$W_t = W_1 * 0.93^{\frac{(t-1)}{2}}$$

Where 't' is the number of Semi-Annual Index Reviews since the Base Date.

Thus, for the 3rd Semi-Annual Index Review since the Base Date (t=3), the target Weighted Average GHG Intensity relative to EVIC will be $W_1 * 0.93$.

Climate Impact Sectors

NACE¹⁷ is the European Union's classification of economic activities. As per the draft DA, stocks in the NACE Section codes A, B, C, D, E, F, G, H, L are classified as "High Climate Impact" sector and other stocks are classified 'Low Climate Impact' sector. The GICS¹⁸ Sub-Industry code for each security is mapped to the corresponding "Climate Impact Sector" using a mapping. This mapping is constructed in the following steps:

1. MSCI has published a mapping¹⁹ between the NACE classes and GICS Sub-Industry.
2. For each GICS Sub-Industry, the number of NACE classes which fall under the High Climate Impact Sector (say the number of classes is N_H) and Low Climate Impact Sector (say the number of classes is N_L) is identified.
3. If all the NACE classes for a given GICS Sub-Industry are identified in the High Climate Impact Sector ($N_L = 0$), then the GICS Sub-Industry is mapped to the High Climate Impact Sector. Conversely, if all the NACE classes for a given GICS Sub-Industry are identified in the Low Climate Impact Sector ($N_H = 0$) then the GICS Sub-Industry is mapped to the Low Climate Impact Sector.

¹⁷ For further details regarding NACE, please refer to https://ec.europa.eu/eurostat/statistics-explained/index.php?title=NACE_background

¹⁸ For further information regarding GICS, please refer to <https://www.msci.com/gics>

¹⁹ This mapping is available in the [Handbook of Climate Transition Benchmarks, Paris-Aligned Benchmark and Benchmarks' ESG Disclosures](#). Please note that the mapping does not reflect changes in the GICS structure that were implemented in the MSCI indexes on June 1, 2023.

4. In case a GICS Sub-Industry is mapped to some NACE classes in the High Climate Impact Sector and the others in the Low Climate Impact Sector, the GICS Industry is mapped to the Climate Impact Sector in the following manner:
 - a. **$N_H \geq N_L$** : If the number of NACE classes in the High Climate Impact Sector is at least equivalent to the number of NACE classes in the Low Climate Impact Sector, the GICS Sub-Industry is mapped to the High Climate Impact Sector.
 - b. **$N_H < N_L$** : If the number of NACE classes in the High Climate Impact Sector is less than the number of NACE classes in the Low Climate Impact Sector, the GICS Sub-Industry is mapped to the Low Climate Impact Sector.
5. Using the GICS Sub-Industry to Climate Impact Sector mapping created in Step 4, and the security-level GICS Sub-Industry, each security in the Parent Index is classified in either High Climate Impact Sector or Low Climate Impact Sector.

Appendix II: Decarbonization Trajectory of Indexes

The Weighted Average GHG Intensity on the Base Date (W_1) is used to compute the target Weighted Average GHG Intensity at any given Semi-Annual Index Review (W_t) as per the below formula.

$$W_t = W_1 * 0.93^{\frac{(t-1)}{2}}$$

Where 't' is the number of Semi-Annual Index Reviews since the Base Date. The table below shows the Weighted Average GHG Intensity on the Base Date (W_1) for each of the regions where the Indexes are constructed:

Index	Parent Index	Base Date	W_1 (tCO2/M\$ Enterprise Value + Cash)
MSCI ACWI EU CTB Overlay Index	MSCI ACWI Index	June 01, 2020	339.12
MSCI ACWI EU PAB Overlay Index	MSCI ACWI Index	June 01, 2020	242.23
MSCI World EU CTB Overlay Index	MSCI World Index	June 01, 2020	332.90
MSCI World EU PAB Overlay Index	MSCI World Index	June 01, 2020	237.79
MSCI World Enhanced Value EU PAB Overlay Index	MSCI World Enhanced Value Index	June 01, 2020	237.79
MSCI World Growth EU PAB Overlay Index	MSCI World Growth Index	June 01, 2020	190.09
MSCI World Momentum EU PAB Overlay Index	MSCI World Momentum Index	June 01, 2020	179.22
MSCI World Quality EU PAB Overlay Index	MSCI World Quality Index	June 01, 2020	218.88
MSCI World Value EU PAB Overlay Index	MSCI World Value Index	June 01, 2020	237.79
MSCI EM EU CTB Overlay Index	MSCI EM (Emerging Markets) Index	June 01, 2020	550.49
MSCI EM EU PAB Overlay Index	MSCI EM (Emerging Markets) Index	June 01, 2020	393.21
MSCI Europe EU CTB Overlay Index	MSCI Europe Index	June 01, 2020	378.32
MSCI Europe EU PAB Overlay Index	MSCI Europe Index	June 01, 2020	270.23
MSCI EMU EU CTB Overlay Index	MSCI EMU Index	June 01, 2020	428.92
MSCI EMU EU PAB Overlay Index	MSCI EMU Index	June 01, 2020	306.37
MSCI France IMI EU CTB Overlay Index	MSCI France IMI Index	June 01, 2020	481.06

MSCI France IMI EU PAB Overlay Index	MSCI France IMI Index	June 01, 2020	343.61
MSCI France EU PAB Overlay Index	MSCI France Index	June 01, 2020	310.70
MSCI Japan EU CTB Overlay Index	MSCI Japan Index	June 01, 2020	561.11
MSCI Japan EU PAB Overlay Index	MSCI Japan Index	June 01, 2020	400.80
MSCI Switzerland IMI EU PAB Overlay Index	MSCI Switzerland IMI Index	June 01, 2020	121.53
MSCI UK EU CTB Overlay Index	MSCI United Kingdom Index	June 01, 2020	304.99
MSCI UK EU PAB Overlay Index	MSCI United Kingdom Index	June 01, 2020	312.01
MSCI USA EU CTB Overlay Index	MSCI USA Index	June 01, 2020	307.98
MSCI USA EU PAB Overlay Index	MSCI USA Index	June 01, 2020	219.99

Appendix III: Barra Equity Model Used in The Optimization

The MSCI EU CTB/PAB Overlay Indexes currently use an optimization setup using the MSCI Barra Global Equity Model for Long-Term Investors (GEMTL).

Appendix IV: New release of Barra® Equity Model or Barra® Optimizer

A major new release of the relevant Barra Equity Model or Barra Optimizer may replace the former version within a suitable timeframe.

Appendix V: MSCI EU CTB Overlay C-Series Indexes

The MSCI EU CTB Overlay C-Series Indexes provide an alternative to the optimization-based approach used in Section 2.5 of this methodology book. These indexes are constructed based on the steps below.

Intermediate Universe

Each security in the Applicable Universe is classified into one of two climate impact sectors²⁰ based on its NACE section code. The Eligible Universe is broken into two smaller universes as described below:

High Climate Impact Intermediate Universe

High Climate Impact Intermediate Universe is constructed in following two steps –

- Select all securities in the High Climate Impact Sector from the Eligible Universe.
- Renormalize the weights of securities so that the aggregate weight of securities is equal to the weight of High Climate Impact Sector in the Parent Index.

Low Climate Impact Intermediate Universe

Low Climate Impact Intermediate Universe is constructed in following two steps –

- Select all securities in the Low Climate Impact Sector from the Applicable Universe.
- Renormalize the weights of securities so that the aggregate weight of securities is equal to the weight of Low Climate Impact Sector in the Parent Index.

Final Universe

The Final Universe is constructed by combining the High Impact Intermediate Universe and the Low Impact Intermediate Universe. The High Impact Sector and Low Impact Sector weights are equal to their respective weight in the Parent Index.

The Final Universe is then assessed against the minimum requirements detailed in Table 2. In case the Final Universe is found deficient on any of the minimum requirements, then the weights of the securities in the Final Universe are determined through an iterative process as described in below.

Step 1. Divide securities in the Applicable Universe into “Top Half” (Lowest Intensity) and “Bottom Half” (Highest Intensity) based on Scope 1+2+3 Intensity.

Step 2. Select the stock with the highest Security Level GHG Intensity in the “Bottom Half” and reduce its weight in steps of 25% (free weight) and distribute the free weight among the stocks of “Top Half” in proportion of their weight at Step 1. The Final Universe is then assessed against the targets imposed. If the targets are met, no further downweighting is required and the iterative process is stopped.

Step 3. If the weight of the stock with the highest Security Level GHG Intensity from Step 1 has been down weighted by more than 75% then select the stock with the next highest Security Level GHG Intensity and repeat step 2. The Final Universe is then assessed against the targets

²⁰ For details regarding the Climate Impact Sectors, kindly refer to Appendix I.

imposed. If the targets are met, no further downweighting is required and the iterative process is stopped.

Step 4. Relaxation Steps:

- a. If all stocks in the “Bottom Half” have been down weighted by 75% and targets are still not met, then repeat step 2 and 3 by downweighting stock with highest Security Level GHG Intensity by 90% of its weight from Step 1.
- b. If targets are not met at Step 4a, then repeat Steps 2 and 3 by excluding – down weighting by 100%, the stocks in order of their Security Level GHG Intensity.

Step 5. STOP: If the targets are still not met at Step 5 then the index is rebalanced with stock weights at the end of Step 5.

Appendix VI: Identifying the Reference Index

For Indexes where the Parent Index follows the MSCI Global Investible Markets Index (GIMI) methodology, the Reference Index is the same as the Parent Index. For Indexes where the Parent Index does not follow the MSCI GIMI methodology, the methodology²¹ of the Parent Index defines the Global Investible Markets Index on which the Parent Index is constructed.

The below table provides *select examples* which may help identify the Reference Index based on the Parent Index for the corresponding MSCI EU CTB/PAB Overlay Index.

Table 4: Select Examples for identifying Reference Index

Parent Index	Reference Index
Parent Index follows the GIMI Methodology	
MSCI World	MSCI World
MSCI World ex Financials	MSCI World ex Financials
Parent Index does not follow the GIMI Methodology	
MSCI Europe ex Financials ESG Screened	MSCI Europe ex Financials
MSCI World ex Fossil Fuels	MSCI World
MSCI World ex Australia Enhanced Value	MSCI World ex Australia

²¹ For further details regarding Index methodologies, please refer to <https://www.msci.com/index-methodology>

Appendix VII: MSCI Factor EU PAB Indexes

The Methodology of constructing the MSCI Factor EU PAB Overlay differs from the above defined MSCI EU PAB Overlay Indexes in the following constraints:

- The one-way turnover of the MSCI Factor EU PAB Indexes is constrained to a maximum of 20% at each index review. For MSCI Momentum EU PAB Indexes, the one-way turnover is constrained to a maximum of 50% at each Index Review.
- During the Index Review, in the event that there is no optimal solution that satisfies all the optimization constraints, the following constraints will be relaxed, until an optimal solution is found:
 - Relax the one-way index turnover constraint in steps of 2% up to 30%. For MSCI Momentum EU PAB Indexes, the one-way turnover is relaxed in steps of 5% up to 75%.
 - Relax the active sector weight constraint in steps of 1% up/down to +/-20%
 - The one-way index turnover constraint and the active sector weight constraint are relaxed exhaustively until a feasible solution is achieved.

In the event that no optimal solution is found after the above constraint relaxations are exhausted, the relevant MSCI Factor EU PAB Index will not be rebalanced for that Index Review.

As described in Section 2.1, the Parent Index of the MSCI Factor EU PAB Index is the underlying MSCI Factor Index. As described in Section 2.2, the Reference Index is the free-float adjusted market capitalization weighted index corresponding to the Parent Index as per the MSCI Global Investible Markets Index (GIMI) methodology²². The below table provides *select examples* which may help identify the Reference Index and the Parent Index for the corresponding MSCI Factor EU PAB Overlay Index.

Table 5: Select Examples for identifying Reference Index and Parent Index

Index	Parent Index	Reference Index
MSCI World Enhanced Value EU PAB Index	MSCI World Enhanced Value Index	MSCI World Index
MSCI World Quality EU PAB Index	MSCI World Quality Index	MSCI World Index
MSCI World Value EU PAB Index	MSCI World Value Index	MSCI World Index

²² For further details regarding the MSCI Global Investible Markets Index methodology, kindly refer to <https://www.msci.com/index-methodology>

Appendix VIII: Conditional Rebalancing of the MSCI Momentum EU PAB Overlay Indexes

In addition to the two Semi-Annual Index Reviews in May and November, the MSCI Momentum EU PAB Indexes undergo ad-hoc rebalancing subject to meeting certain trigger criteria. The details of the ad-hoc rebalancing are provided in Appendix III of the MSCI Momentum Indexes Methodology.

The trigger condition for ad-hoc rebalancing is checked every month as detailed in Appendix III of the MSCI Momentum Indexes Methodology (for details about the methodology, please refer to: <https://www.msci.com/index-methodology>).

Appendix IX: Methodology Set

The Indexes are governed by a set of methodology and policy documents (“Methodology Set”), including the present index methodology document as mentioned below:

- Description of methodology set – <https://www.msci.com/index/methodology/latest/ReadMe>
- MSCI Corporate Events Methodology – <https://www.msci.com/index/methodology/latest/CE>
- MSCI Fundamental Data Methodology – <https://www.msci.com/index/methodology/latest/FundData>
- MSCI Index Calculation Methodology – <https://www.msci.com/index/methodology/latest/IndexCalc>
- MSCI Index Glossary of Terms – <https://www.msci.com/index/methodology/latest/IndexGlossary>
- MSCI Index Policies – <https://www.msci.com/index/methodology/latest/IndexPolicy>
- MSCI Global Industry Classification Standard (GICS) Methodology – <https://www.msci.com/index/methodology/latest/GICS>
- MSCI Global Investable Market Indexes Methodology – <https://www.msci.com/index/methodology/latest/GIMI>
- MSCI Global ex Controversial Weapons Indexes Methodology – <https://www.msci.com/index/methodology/latest/XCW>
- MSCI EU CTB/PAB Overlay Indexes Methodology – <https://www.msci.com/index/methodology/latest/MSCIEUCTBPABOverlay>
- ESG Factors In Methodology*

The Methodology Set for the Indexes can also be accessed from MSCI’s webpage <https://www.msci.com/index-methodology> in the section ‘Search Methodology by Index Name or Index Code’.

* ‘ESG Factors in Methodology’ contains the list of environmental, social, and governance factors considered, and how they are applied in the methodology (e.g., selection, weighting or exclusion). It can be accessed in the Methodology Set as described above.

Appendix X: Changes to this Document

The following sections have been modified as October 2022:

- Appendix VI has been added to describe the MSCI Factor EU PAB Indexes.
- Appendix VII has been added to describe the conditional rebalancing of the MSCI Momentum EU PAB Indexes.

The following sections have been modified as June 2023:

- Methodology book was updated to reflect the transition of the MSCI Global Investable Market Indexes (GIMI) to Quarterly Comprehensive Index Reviews.
- All references to “Semi-Annual Index Reviews” and “Quarterly Index Reviews” of the MSCI GIMI were replaced with “Index Reviews”.
- Section 2.3 Eligible Universe. Clarified the exclusion criteria for companies involved in ESG Controversies.
- Section 4 MSCI ESG Research. Moved that section after Section 3. Updated the descriptions of MSCI ESG Research products.

The following sections have been modified as July 2023:

- Methodology book was updated to add a footnote in Section 2.5 to denote that Indexes which are not feasible with an active constituent weight relative to the Parent Index of “+/- 2%” will have a higher active constituent weight of “+/- 5%”. The MSCI Switzerland IMI EU PAB Overlay Index applies a higher active constituent weight of “+/- 5%”.

The following sections have been modified as October 2023:

- Methodology book was updated to update the footnote in Section 2.5 to denote that that two additional Indexes will have a higher active constituent weight of “+/- 5%”. The MSCI France IMI EU PAB Overlay Index and the MSCI France EU PAB Overlay Index apply a higher active constituent weight of “+/- 5%”.

The following sections have been modified as January 2024:

- Section 2.7 Treatment of Unrated Companies. New section detailing the treatment of companies with ratings and research not available from MSCI ESG Research.
- Appendix I Calculation of Target Metrics. Updated the calculation of GHG Intensity to reflect the missing data treatment for Scope 1+2. Scope 3 and EVIC.
- Appendix II Decarbonization Trajectory of Indexes. Added details on the decarbonization trajectory of the Indexes.
- Appendix IX Methodology Set. Added details on the Methodology Set for the Indexes.

The following sections have been modified as of July 2024:

- Section 4: MSCI ESG Research. Updated language and links for ESG Research Products

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