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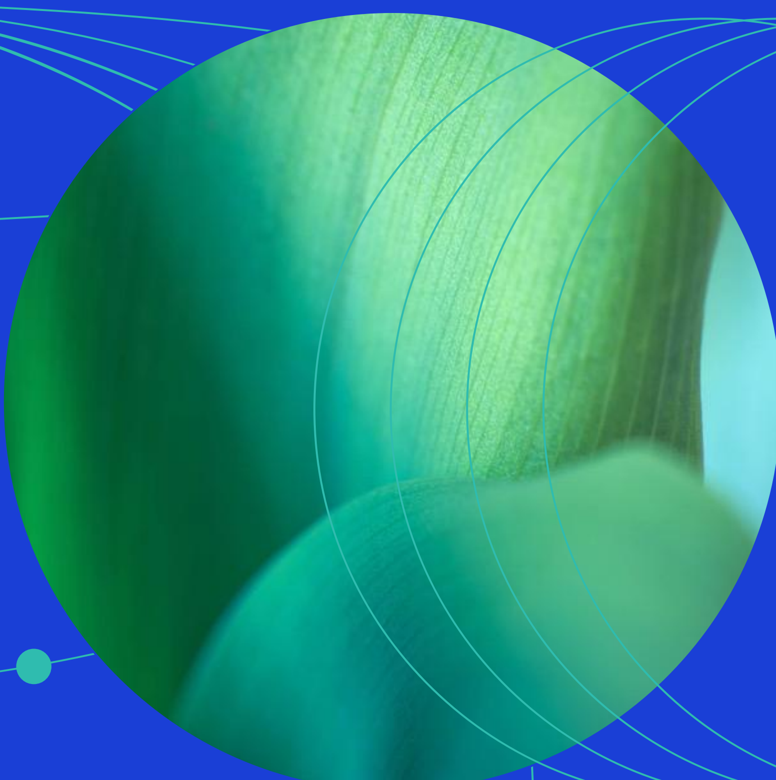
MSCI ESG Enhanced CTB Indexes Methodology



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1 Introduction

The MSCI ESG Enhanced CTB Indexes[1] (the 'Indexes' and each an 'Index') are designed to exceed the minimum requirements of the EU Climate Transition Benchmark (CTB)[2] while applying specific controversial business involvement or fossil fuel-based exclusions and maintaining an ESG Score that is equivalent or higher than their corresponding market cap weighted index, (each a 'Parent Index').

The Indexes are constructed from their respective Parent Index through an optimization process that aims to minimize the ex-ante tracking error while exceeding the minimum requirements of EU CTB and applying additional screens and constraints that are described in detail below.

- There are additional exclusions applied that exceed the EU CTB requirements:
  - Companies that are associated with nuclear weapons, civilian firearms and conventional weapons.
  - Companies that derive revenue from tobacco, thermal coal mining, thermal coal power generation and extraction of unconventional oil & gas.

The optimization process applies the minimum technical requirements laid out in Commission Delegated Regulation (EU) 2020/1818[3] and applies additional constraints on ESG Score and Sustainable Exposure:

- Reduce the weighted average greenhouse gas intensity by 30% compared to the Parent Index.
- Reduce the weighted average greenhouse gas (GHG) intensity by 7% on an annualized basis, compared to the GHG Intensity of the Index at the Base Date[4].
- Ensure that exposure to High Climate Impact sectors is at least equivalent to the Parent Index.
- Ensure that the ESG Score is at least equivalent or higher than the Parent Index.
- Ensure that the index-level sustainable exposure (which reflects a particular interpretation of the company-level sustainable investment assessment as per Article 2(17) of the Sustainable

[1] The Indexes are governed by a set of methodology and policy documents ("Methodology Set"), including the present index methodology document. Please refer to Appendix VI for more details.

[2] The corresponding minimum requirements are defined in Commission Delegated Regulation (EU) 2020/1818, available under https://eur-lex.europa.eu/eli/reg_del/2020/1818/oj. MSCI's approach to meeting these requirements is described in the MSCI EU CTB/PAB Index Framework, available under https://www.msci.com/index/methodology/latest/EUCTBPABIndexFramework. In case changes to the Index methodology are required to maintain compliance with the regulatory CTB/PAB labels, MSCI will issue an announcement prior to implementing the changes in the methodology. MSCI will not conduct a formal consultation for such an update.

[3] Available under https://eur-lex.europa.eu/eli/reg_del/2020/1818/oj

[4] The Base Date is defined in https://www.msci.com/index/methodology/latest/EUCTBPABIndexFramework. For more details on the Base Date please refer to Appendix IV

Finance Disclosure Regulation (SFDR) along with an associated aggregation method) meets the relevant index-level sustainable exposure percentage ("Index SE%") thresholds. The minimum thresholds vary depending on the respective Parent Index and are listed in Appendix II.

2 Constructing the Indexes

The Indexes use company ratings and research provided by MSCI Solutions LLC ("MSCI Solutions")[5] for the Index construction.

Constructing the MSCI ESG Enhanced CTB Indexes involves the following steps:

- Defining the Parent Index
- Defining the exclusion criteria
- Defining the optimization constraints
- Determining the optimized portfolio

The steps mentioned above are defined in detail in the subsequent sections.

2.1 Defining the Parent Index

MSCI ESG Enhanced CTB Index	Parent Index
MSCI World ESG Enhanced CTB Index	MSCI World Index
MSCI EM ESG Enhanced CTB Index	MSCI EM (Emerging Markets) Index
MSCI Europe ESG Enhanced CTB Index	MSCI Europe Index
MSCI EMU ESG Enhanced CTB Index	MSCI EMU Index
MSCI USA ESG Enhanced CTB Index	MSCI USA Index
MSCI Pacific ex Japan ESG Enhanced CTB Index	MSCI Pacific Ex Japan
MSCI Japan ESG Enhanced CTB Index	MSCI Japan Index
MSCI World Small Cap ESG Enhanced CTB Index	MSCI World Small Cap Index
MSCI USA Small Cap ESG Enhanced CTB Index	MSCI USA Small Cap Index

[5] See Section 4 for further information regarding sustainability and climate data used in the Indexes that MSCI Limited and MSCI Deutschland GmbH source from MSCI Solutions LLC ("MSCI Solutions"), a separate subsidiary of MSCI Inc. MSCI Solutions 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.

2.2 Defining The Exclusion Criteria

Companies assessed as having involvement in MSCI Controversies that are classified as Red Flags (MSCI Controversy Score of 0) are not eligible for inclusion in the Indexes.

- A Red Flag indicates an ongoing Very Severe controversy implicating a company directly through its actions, products, or operations.

In addition, starting from the November 2022 Index Review, 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) are also excluded from the Indexes.

- A Red Flag indicates an ongoing, Very Severe controversy implicating a company directly through its actions, products, or operations.
- An Orange Flag indicates an ongoing Severe controversy implicating a company directly, or a Very Severe controversy that is either partially resolved or indirectly attributed to the company's actions, products, or operations.

2.2.1 Business Exclusion criteria

Companies that are involved in specific businesses which have high potential for negative social and/or environmental impact are ineligible for inclusion in the Indexes.

- Controversial Weapons
- Civilian Firearms
- Tobacco
- Nuclear Weapons
- Thermal Coal
- Unconventional Oil and Gas

In addition to the above, companies that fail to comply with the United Nations Global Compact Principles (UN Global Compact Alignment Value of "Fail") are also excluded from the Indexes.

Please refer to Appendix I for more details on these criteria.

2.3 Optimization Constraints

The Optimization process aims to minimize the ex-ante tracking error while applying constraints that are required to exceed the EU CTB requirements.

Please refer to Appendix II for the Optimization constraints. The definitions of the target metrics for the optimization are detailed in Appendix III.

2.4 Determining the Optimized Index

The Indexes are constructed using the Barra Open Optimizer[6] 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 the Indexes.

2.5 Treatment of Unrated Companies

Companies not assessed by MSCI Solutions on data for any of the following MSCI sustainability and climate products are not eligible for inclusion in the Indexes.

- MSCI ESG Ratings
- MSCI Controversies

[6] Please refer to Appendix V for more details

3 Maintaining the Indexes

3.1 Index Reviews

The Indexes are rebalanced on a quarterly basis to coincide with the Index Reviews of the MSCI Global Investable Market Indexes. Changes are implemented at the end of February, May, August and November. The pro forma Indexes are in general announced nine business days before the effective date.

ESG Scores used for the quarterly Index Reviews will be taken as of the end of the month preceding the Index Review, i.e., January, April, July, and October.

At each Index Review, the optimization process outlined in Section 2 is implemented.

In general, MSCI uses MSCI Solutions data (including MSCI ESG Ratings, MSCI Controversies, MSCI Business Involvement Screening Research, MSCI Climate Change Metrics and MSCI Impact Solutions) as of the end of the month preceding the Index Reviews. For some securities, such data may not be published by MSCI Solutions by the end of the month preceding the Index Review. For such securities, MSCI will use ESG data published after the end of month, when available.

3.2 Monthly Review

Index constituents are reviewed on a monthly basis for the involvement in controversies, compliance with the United Nations Global Compact Principles, tobacco producers and any tie to Controversial Weapons (cluster munitions, landmines, depleted uranium weapons, biological/chemical weapons, blinding lasers, non-detectable fragments and incendiary weapons), as defined by the methodology of the MSCI Ex-Controversial Weapons Indexes available at https://www.msci.com/index/methodology/latest/XCW.

Existing constituents will be deleted if they face controversies as defined by MSCI Controversies Score of 0 ('Red Flag' companies), or if they fail to comply with the UN Global Compact Principles (UN Global Compact Alignment value of "Fail") or if they are flagged under the Tobacco Producers or Controversial Weapons screens.

MSCI uses MSCI Solutions data (MSCI Controversies, MSCI Business Involvement Screening Research) as of the end of the month preceding the monthly review (e.g., end of June data for the end of July monthly review). For some securities, such data may not be published by MSCI Solutions by the end of the month preceding the review. For such securities, MSCI will use ESG data published after the end of month, when available, for the monthly review of the Indexes.

The pro forma Indexes are generally announced nine business days before the first business day of the month.

3.3 Ongoing Event-Related Maintenance

The general treatment of corporate events in the MSCI ESG Enhanced CTB Indexes aim 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.

The following section briefly describes the treatment of common corporate events within the MSCI ESG Enhanced CTB Indexes.

No new securities will be added (except where noted below) to the Indexes 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. 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/latest/CE.

4 MSCI Solutions

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

4.1 MSCI ESG Ratings

MSCI ESG Ratings aim to measure entities' management of environmental, social and governance risks and opportunities. MSCI ESG Ratings use a weighted average key issue calculation that is normalized by industry to arrive at an industry-adjusted ESG score (0-10), which is then translated to a seven-point scale from 'AAA' to 'CCC', indicating how an entity manages relevant key issues relative to industry peers. The ESG Score is an MSCI ESG Ratings product.

The MSCI ESG Ratings methodology can be found at:
https://www.msci.com/legal/sustainability-and-climate-resources-and-disclosures.

4.2 MSCI Controversies

MSCI 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 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 Controversies Score falls on a 0-10 scale, with "0" being the most severe controversy.

The MSCI Controversies methodology can be found at: https://www.msci.com/legal/sustainability-and-climate-resources-and-disclosures.

4.3 MSCI Business Involvement Screening Research

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

The MSCI Business Involvement Screening Research methodology can be found at:
https://www.msci.com/legal/sustainability-and-climate-resources-and-disclosures.

4.4 MSCI Climate Change Metrics

MSCI Climate Change Metrics provides climate data and tools to support institutional investors seeking to integrate climate risk and 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/legal/sustainability-and-climate-resources-and-disclosures

4.4.1 Fossil Fuels and Power Generation Metrics

MSCI Solutions identifies companies involved in fossil fuel-related assets and activities including fossil fuel reserves, resource extraction, power generation and generation capacity, revenue from such assets and activities and capital investments in such assets and activities. The metrics are based on disclosed activities, disclosed revenue and estimates of revenue that are extrapolated from company disclosures and eligible third-party sources (such as NGOs).

4.4.2 Greenhouse Gas (GHG) Emissions

MSCI Solutions collects reported emissions and uses proprietary estimation methodologies that follows the GHG Protocol in including carbon dioxide (CO2) and the five other principal GHGs: hydrofluorocarbons (HFCs), methane (CH4), nitrous oxide (N2O), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). Emissions of these other gases are accounted for in terms of the quantity of CO2 that has an equivalent global warming potential.

4.5 MSCI Impact Solutions: Sustainable Impact Metrics

MSCI Impact Solutions' Sustainable Impact Metrics is designed to identify companies that derive revenue from products or services with positive impact on society and the environment. The Sustainable Impact Metrics are comprised of six Environmental Impact categories and seven Social Impact categories arranged by theme.

MSCI Sustainable Impact Taxonomy

Pillar	Themes	Categories
Environmental Impact	Climate Change	1. Alternative energy 2. Energy efficiency 3. Green building
	Natural capital	4. Sustainable water 5. Pollution prevention 6. Sustainable agriculture
Social Impact	Basic needs	7. Nutrition 8. Major Disease Treatment 9. Sanitation 10. Affordable Real Estate

	Empowerment	11. SME Finance 12. Education 13. Connectivity – Digital divide

Under each of the actionable environmental and social impact themes, MSCI Solutionshas identified specific categories of products and services that it has determined companies can offer as potential solutions to environmental and social challenges.

For more details on MSCI Sustainable Impact Metrics, please refer to https://www.msci.com/legal/sustainability-and-climate-resources-and-disclosures.

Appendix I: Business Exclusion Criteria

MSCI Solutions have developed a framework designed to define significant involvement in controversial activities. According to this framework, there are three tolerance levels: Zero Tolerance, Minimal Tolerance and Low Tolerance.

Each controversial activity screened by the MSCI ESG Enhanced CTB Indexes (except Thermal Coal, Unconventional Oil & Gas and Global Norms) is assigned to one of these tolerance levels:

Activities classified under "Zero Tolerance"

- **Controversial Weapons**
  - All companies with any tie to Controversial Weapons (cluster munitions, landmines, depleted uranium weapons, biological/chemical weapons, blinding lasers, non-detectable fragments and incendiary weapons), as defined by the methodology of the MSCI Ex-Controversial Weapons Indexes available at https://www.msci.com/index/methodology/latest/XCW.

Activities classified under "Minimal Tolerance"

Civilian Firearms

- All companies that produce automatic firearms for civilian markets
- All companies that produce semi-automatic firearms for civilian markets
- All companies that produce small-arms ammunition intended for civilian markets.
- All companies deriving 5% or more revenue from the distribution (wholesale or retail) of firearms or small arms ammunition intended for civilian use.

- **Tobacco**
  - All companies classified as a "Producer"
  - All companies deriving 5% or more aggregate revenue from the production, distribution, retail and supply of tobacco-related products.

Activities not classified under any specific tolerance level

- **Nuclear Weapons**

  All companies with categories below are excluded regardless of whether they have a country of classification located in a market that is a signatory of the Non-Proliferation Treaty of Nuclear Weapons:

  - All companies that manufacture nuclear warheads and/or whole nuclear missiles.
  - All companies that manufacture components that were developed or are significantly modified for exclusive use in nuclear weapons (warheads and missiles).

- All companies with categories below and have a country of classification located in a market that is not a signatory of the Non-Proliferation Treaty of Nuclear Weapons (Signatory = False) are excluded:

- All companies that manufacture nuclear warheads and/or whole nuclear missiles.
- All companies that manufacture components that were developed or are significantly modified for exclusive use in nuclear weapons (warheads and missiles).
- All companies that manufacture or assemble delivery platforms that were developed or significantly modified for the exclusive delivery of nuclear weapons.
- All companies that provide auxiliary services related to nuclear weapons.
- All companies that manufacture components that were not developed or not significantly modified for exclusive use in nuclear weapons (warheads and missiles).
- All companies that manufacture or assemble delivery platforms that were not developed or not significantly modified for the exclusive delivery of nuclear weapons.
- All companies that manufacture components for nuclear-exclusive delivery platforms.

- **Thermal Coal**
  - All companies deriving 5% 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.
  - All companies deriving 5% or more revenue (either reported or estimated) from the thermal coal based power generation.
- **Unconventional Oil and Gas**
  - All companies deriving 5% or more revenues from oil sands, oil shale (kerogen-rich deposits), shale gas, shale oil, coal-seam gas, coal-bed methane as well as Arctic onshore/offshore reserves.
- **Global Norms – United Nations Global Compact Compliance**
  - All companies that fail to comply with the United Nations Global Compact principles (UN Global Compact Alignment value of “Fail”).

Appendix II: Optimization Constraints

Screened Parent

The Screened Parent is constructed by excluding securities from the Parent Index based on the exclusion criteria as defined in Section 2.2. The security weights are then normalized to 100%. The Screened Parent constitutes the optimization portfolio used to construct the Indexes at each Index Review.

At each Index Review, the Indexes are constructed using an optimization process to minimize the ex-ante tracking error relative to the respective Parent Index subject to the following constraints:

Constraints imposed to meet transition and physical risk objectives

No.	Transition and Physical Risk Objective	MSCI ESG Enhanced CTB Indexes
1	Minimum reduction in Greenhouse Gas (GHG) Intensity (Scope 1+2+3)	30%
2	Minimum average reduction (per annum) in GHG Intensity relative to GHG Intensity at the Base Date	7%[8]
3	Minimum active weight in High Climate Impact Sector[9]	0%
4	Increase in ESG Score relative to the respective Parent Index	>= 1%

[8] A 2% buffer is applied to the 7% minimum average annual reduction in GHG Intensity relative to the Base Date. Please refer to Appendix IV for more details.

[9] For further details on how MSCI assigns companies to either the high or low climate impact sectors, please refer to the MSCI EU CTB/PAB Index Framework available on https://www.msci.com/index/methodology/latest/EUCTBPABIndexFramework

Diversification Constraints

No.	Parameter	Values
1	Minimum Constituent Weight	Minimum constituent weight in the Screened Parent
2*	Asset Lower Bound *(All regions except Japan & Pacific ex Japan)*	Maximum (Minimum constituent weight in the Screened Parent, 0.25 * Security Weight in the Screened Parent, Security Weight in the Screened Parent – 2%)
3*	Asset Upper Bound	Minimum (5 * Security Weight in the Screened Parent, Security Weight in the Screened Parent +2%)
4*	Asset Lower Bound *(For Japan and Pacific ex Japan)*	Maximum (Minimum constituent weight in the Screened Parent, Security Weight in the Screened Parent – 4%)
5*	Active Sector Weights[10]	+/-5%
6*	Active Country Weights**	+/-5%
7	One Way Turnover during Index Reviews	7.5%
8	Specific Risk Aversion	0.75
9	Common Factor Risk Aversion	7.5

* The Optimization Constraints are applied relative to the Parent Index.

** Active Country Weights – 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 the Parent Index then the upper bound of country weight in the MSCI ESG Enhanced CTB Index is set at three times of the country's weight in the Parent Index.

[10] For the MSCI Pacific ex Japan Enhanced CTB Index, the lower active sector weight constraint relative to the Parent Index was applied at "7%", instead of "5%" during the August 2023 Index Review.

Minimum Index SE% Constraints

The following optimization constraints on minimum Index SE% are used for each index:

No.	Index	Index SE% Threshold
1	MSCI Europe ESG Enhanced CTB Index	30%
2	MSCI EMU ESG Enhanced CTB Index	30%
3	MSCI Japan ESG Enhanced CTB Index	30%
4	MSCI World ESG Enhanced CTB Index	25%
5	MSCI USA ESG Enhanced CTB Index	20%
6	MSCI Pacific ex Japan ESG Enhanced CTB Index	15%
7	MSCI World Small Cap ESG Enhanced CTB Index	15%
8	MSCI USA Small Cap ESG Enhanced CTB Index	10%
9	MSCI EM ESG Enhanced CTB Index	5%

Please refer to Appendix III for the criteria used to determine the company-level sustainable exposure qualification and the calculation of index-level sustainable exposure.

Infeasible Solution

During the quarterly Index Reviews, in the event that there is no optimal solution that satisfies all the optimization constraints, the following process is followed until an optimal solution is found:

- The one-way index turnover constraint will be relaxed in steps of 5% up to a maximum of 5 times the original one-way index turnover budget.
- The active sector weight constraint will be relaxed in steps of +/- 1% up to a maximum of +/-10%.

The one-way index turnover constraint and the active sector weight constraints are alternately relaxed until a feasible solution is achieved.

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

Appendix III: Calculation of Target Metrics

Greenhouse Gas (GHG) Emissions Intensity

The emissions and Enterprise Value including Cash (EVIC) data used for the security level GHG intensity calculation are aligned as of the same financial year. This security level GHG intensity represents the most recent aggregate GHG emissions of the company (Scopes 1 and 2, and estimated Scope 3 emissions) relative to the Enterprise Value including cash (EVIC).

Calculation of GHG Intensity

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 MSCI ACWI in the same GICS Industry Group in which the constituent belongs is used.

Security Level GHG Intensity =

$$\frac{Scope\ 1+2+3\ Carbon\ Emissions * \ (1+EVIAF)}{Enterprise\ Value + Cash(in\ M\$)}$$

Enterprise Value Inflation Adjustment Factor (EVIAF) =

$$EVIAF = \left(\frac{Average(Enterprise\ Value + Cash)}{Previous\ (Average(Enterprise\ Value + Cash))}\right) - 1$$

The EVIC data used for the EVIAF calculation is as of the same reporting year as the company's emissions.

Weighted Average GHG Intensity of Parent Index =

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

Weighted Average GHG Intensity of Derived Index =

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

Company-Level Sustainable Exposure and Calculation of Index SE%:

A company qualifies as having company-level sustainable exposure if it meets all the following conditions:

1. MSCI ESG Rating of "BB" or above[11]

[11] The condition is not met if the MSCI ESG Rating is missing for the company.

2. MSCI Controversies Score of 2 or above[12]
3. At least one of the following conditions is met:
   a. Derives 20% or more aggregate revenue from any of the thirteen social and environmental impact categories of Sustainable Impact Metrics (including nutrition, sanitation, major diseases treatment, SME finance, education, connectivity, affordable real estate, alternative energy, energy efficiency, green building, pollution prevention, sustainable agriculture and sustainable water)
   b. Has one or more active carbon emissions reduction target(s) approved by the Science Based Targets initiative (SBTi)
4. Not flagged by the following business involvement criteria:
   a. Has any tie to Controversial Weapons (cluster munitions, landmines, depleted uranium weapons, biological/chemical weapons, blinding lasers, non-detectable fragments and incendiary weapons), in line with the methodology of the MSCI Ex-Controversial Weapons Indexes available at https://www.msci.com/index/methodology/latest/XCW.
   b. Derives 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
   c. Manufactures tobacco products, such as cigars, blunts, cigarettes, e-cigarettes, inhalers, beedis, kreteks, smokeless tobacco, snuff, snus, dissolvable and chewing tobacco
   d. Derives 5% or more aggregate revenue from the production, distribution, retail, supply and licensing of tobacco-related products

The index-level sustainable exposure is calculated as the sum of the weight of companies in the Index that qualify as having company-level sustainable exposure.

[12] The condition is not met if the MSCI Controversies Score is missing for the company.

Appendix IV: Decarbonization Trajectory of the Indexes

The Weighted Average GHG Intensity on the Base Date (W_{t_b}) is used to compute the target Weighted Average GHG Intensity (W_t) at any given quarterly Index Review t, applying a 7% year-on-year reduction as per the below formula.

$$W_t = W_{t_b} * \ 0.93^{\frac{(t-t_b)}{4}} * (1 - decarb\ buffer)$$

Where '$t - t_b$' is the number of quarterly Index Reviews since (not including) the Base Date t_b and 'decarb buffer' equals 2%. The table below shows the Weighted Average GHG Intensity on the Base Date (W_{t_b}) applicable to the Indexes starting from the November 2025 Index Review:

Index	Parent Index	Decarbonization Start Date[13] t_d	Base Date t_b	W_{t_b} (tCO2/M$ Enterprise Value + Cash)
MSCI World ESG Enhanced CTB Index	MSCI World Index	Dec 1, 2022	Dec 1, 2022	295.67
MSCI USA ESG Enhanced CTB Index	MSCI USA Index	Dec 1, 2022	Dec 1, 2022	238.70
MSCI EMU ESG Enhanced CTB Index	MSCI EMU Index	Dec 1, 2022	Dec 1, 2022	385.46
MSCI Europe ESG Enhanced CTB Index	MSCI Europe Index	Dec 1, 2022	Dec 1, 2022	409.30
MSCI Japan ESG Enhanced CTB Index	MSCI Japan Index	Dec 1, 2022	Dec 1, 2022	405.50
MSCI EM ESG Enhanced CTB Index	MSCI EM (Emerging Markets) Index	Dec 1, 2022	Dec 1, 2022	451.05
MSCI Pacific ex Japan ESG Enhanced CTB Index	MSCI Pacific ex Japan	Dec 1, 2021	Nov 26, 2024	234.94
MSCI USA Small Cap ESG Enhanced CTB Index	MSCI USA Small Cap Index	Dec 1, 2022	Dec 1, 2022	524.74
MSCI World Small Cap ESG Enhanced CTB Index	MSCI World Small Cap Index	Dec 1, 2022	Dec 1, 2022	514.23

[13] See the MSCI EU CTB/PAB Index Framework for the definition and additional details on the Decarbonization Start Date.

The following sections describe how the values of W_{t_b} were determined to ensure that the decarbonization trajectory of the Indexes is consistent with a 7% year-on-year reduction in Weighted Average GHG Intensity since the respective Decarbonization Start Date "t_d", under the current GHG intensity calculation methodology.

Decarbonization Trajectory for the MSCI ESG Enhanced CTB Indexes (except the MSCI Pacific ex Japan ESG Enhanced CTB Index), as adjusted at the November 2025 Index Review

New Base Date and Decarbonization Start Date

At the November 2025 Index Review, a new Base Date was set for the Indexes[14] in accordance with Article 8 of Commission Delegated Regulation (EU) 2020/1818 and Section 5.1: Changes in Base Dates, of the MSCI EU CTB/PAB Index Framework, in response to significant changes to the calculation methodology of the GHG intensity:

- Changes to the estimation methodology for scope 3 emissions, which were implemented by MSCI Solutions between November 2021 and November 2025.
- Switch of the calculation of the GHG intensity from using latest emissions and latest enterprise value, to using emissions and enterprise value from the same reporting year, resulting in a conceptual change to the interpretation of the GHG intensity.

These changes were assessed to result in a fundamental, conceptual difference in the GHG intensity calculation, in line with section 5.1.b. of the MSCI EU CTB/PAB Index Framework.

At the November 2025 Index Review, a customized approach to adjust the decarbonization trajectory of the Indexes was used (compared to the default approach described in the MSCI EU CTB/PAB Index Framework). Under this customized approach, both the Base Date and the Decarbonization Start Date (i.e. the applicable starting point for the decarbonization trajectory of the Indexes) were changed from December 1, 2021 to December 1, 2022.

Details of the Calculation

At the November 2025 Index Review, the updated Weighted Average GHG Intensity on the Base Date W_{t_b} was recalculated, using the updated GHG intensity methodology applied to the underlying data as of the updated Base Date (t_b = December 1, 2022, i.e. for the November 2022 Index Review).

Starting from the November 2025 Index Review, the decarbonization constraints applied to the Indexes are hence consistent with the Indexes decarbonizing since December 1, 2022, under the updated GHG intensity calculation methodology as described above.

More precisely, the updated decarbonization trajectory of the Indexes was determined as follows:

[14] The exception for the MSCI Pacific ex Japan ESG Enhanced CTB Index is in the corresponding section below.

a) $W_{t_b,parent}^{recalculated}$ was determined as the GHG intensity of each Parent Index (see section 2.1), as of the November 2022 Index Review, recalculated utilizing the latest scope 3 emissions model and combining the emissions with the EVIC from the same year, based on the availability of underlying data as of the November 2022 Index Review.

b) The updated Weighted Average GHG Intensity on the Base Date (W_{t_b}) of each MSCI ESG Enhanced CTB Index was obtained by applying the initial decarbonization percentage of 30% to the GHG intensity of the Parent Index at the November 2022 Index Review, recalculated with the latest emissions model as per item a) above, i.e. $W_{t_b} = W_{t_b,parent}^{recalculated} * (1 - 0.3)$

c) The start date for the calculation of the Enterprise Value Inflation Adjustment Factor (EVIAF) was set to December 1, 2022.

Decarbonization Trajectory for the MSCI Pacific ex Japan ESG Enhanced CTB Index, as adjusted at the November 2024 Index Review

New Base Date

At the November 2024 Index Review, a new Base Date was set for the MSCI Pacific ex Japan ESG Enhanced CTB Index in line with Article 8 of Commission Delegated Regulation (EU) 2020/1818 and Section 5.1 of the MSCI EU CTB/PAB Index Framework, in response to significant changes to the calculation methodology of the GHG intensity:

- Changes to the estimation methodology for scope 3 emissions, which were implemented by MSCI Solutions between November 2021 and November 2024.
- Switch of the calculation of the GHG intensity from using latest emissions and latest enterprise value, to using emissions and enterprise value from the same reporting year, resulting in a conceptual change to the interpretation of the GHG intensity.

These changes were assessed to result in a fundamental, conceptual difference in the GHG intensity calculation, in line with section 5.1.b. of the MSCI EU CTB/PAB Index Framework.

At the November 2024 Index Review, the Base Date t_b for the MSCI Pacific ex Japan ESG Enhanced CTB Index was set to November 26, 2024 and the Decarbonization Start Date t_d was retained as December 1, 2021. At the November 2024 Index Review, the updated Weighted Average GHG Intensity on the Base Date W_{t_b} for this Index was recalculated using the updated GHG intensity calculation methodology, and applying the yearly decarbonization since the Decarbonization Start Date.

Starting from the November 2024 Index Review, the decarbonization constraints applied to the MSCI Pacific ex Japan ESG Enhanced CTB Index are hence consistent with the Index decarbonizing since December 1, 2021, under the updated GHG intensity calculation methodology.

Details of the Calculation

More precisely, for the MSCI Pacific ex Japan ESG Enhanced CTB Index, the target Weighted Average GHG intensity for November 2024 Index Review was calculated as follows:

a) $W_{t_d,parent}^{recalculated}$ is determined as the GHG intensity of MSCI Pacific Ex Japan, as of the Decarbonization Start Date (November 2021 Index Review), recalculated utilizing the latest scope 3 emissions model and combining the emissions with the EVIC from the same year, based on the availability of underlying data as of the November 2021 Index Review.

b) The decarbonization constraint $W_{t_b}^{max}$ for the Index was calculated for the new Base Date (November 2024 Index Review), from the Decarbonization Start Date (November 2021 Index Review) by:

- Applying the initial decarbonization percentage of 30% to the GHG intensity of the Parent Index at the November 2021 Index Review, recalculated with the latest emissions model as per item a) above
- Applying a 7% year-on-year annual self-decarbonization rate:

I.e., $W_{t_b}^{max} = W_{t_d,parent}^{recalculated} * (1 - 0.3) * (1 - 0.07)^3$

c) Since the EVIAF is reset to 0 at the November 2024 Index Review (i.e. the security-level GHG intensities are adjusted only for the EVIC inflation since November 2024), the decarbonization constraint as obtained in b) above was multiplied with the ratio of the average EVIC at the November 2021 Index Review, to the average EVIC at the November 2024 Index Review (in each case synchronized with the emissions data as per item a) above).

$$W_{t_b}^{max,adjusted} = W_{t_b}^{max} * \frac{Average\ EVIC\ (November\ 2021)}{Average\ EVIC\ (November\ 2024)}$$

d) The updated Weighted Average GHG Intensity on the Base Date (W_{t_b}) was obtained as the Weighted Average GHG Intensity of the Index, as determined in the November 2024 Index Review, under the target decarbonization constraint $W_{t_b}^{max,adjusted}$ determined in c) above, and with an EVIAF of 0.

Appendix V: New Release of Barra® Equity Model or Barra® Optimizer

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

Appendix VI: 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
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- MSCI Global ex Controversial Weapons Methodology – https://www.msci.com/index/methodology/latest/XCW
- MSCI EU CTB/PAB Index Framework – https://www.msci.com/index/methodology/latest/EUCTBPABIndexFramework
- 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 VII: Changes to this Document

The following sections have been modified as of August 2021:

- Update to include the index construction parameters for the MSCI World Small Cap ESG Enhanced Focus Index

The following sections have been modified as of November 2021:

- Section 3.2: Addition of screening criteria on Environmental Controversies.
- Appendix I: Addition of screening criteria on Conventional Weapons and Unconventional Oil & Gas. The screening on Oil Sands will no longer be applied in the methodology.
- Appendix II: Optimization constraints updated to align with the minimum requirements of the EU Climate Transition Benchmarks.
- Appendix IV: Additional details on calculation of metrics used in optimization.

The following sections have been modified as of February 2022:

- Update to include the index construction parameters for the MSCI USA Small Cap ESG Enhanced Focus Index
- Appendix II: Added clarification that the relaxation parameters are also applicable for Quarterly Index Reviews

The following sections have been modified as of October 2022:

- Appendix IV: Updated to clarify the Indexes require a minimum 10% increase in the aggregate weight of companies setting emissions reduction target relative to their corresponding Parent Indexes

The following sections have been modified as of November 2022:

- Introduction: Updated to reflect the new requirement on index-level sustainable exposure
- Section 4.2: New section
- Appendix 2: Updated to reflect the optimization constraints on index-level sustainable exposure.
- Appendix IV: Updated to reflect the criteria used to determine the company-level sustainable exposure qualification and the calculation of index-level sustainable exposure

The following sections have been modified as of July 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 2.2: Clarified the exclusion criteria for companies involved in ESG Controversies.
- Section 4: MSCI ESG Research

  - Moved that section after the Section 3
  - Updated the descriptions of MSCI ESG Research products.

The following sections have been modified effective September 2023:

- Appendix II: Added a footnote in to document the that the MSCI Pacific ex Japan Enhanced Focus CTB Index rebalanced during August 2023 Index Review a lower active sector weight constraint relative to the Parent Index of "7%" instead of "5%".

The following sections have been modified as of May 2024:

- Appendix II: Optimization Constraints
  - The calculation of aggregate weight of 'Companies Setting Target' will only include companies which are eligible, as per the exclusion criteria described in Section 2.2.
  - The one-way turnover budget was updated to 7.5% for all Index Reviews.
  - The relaxation process applied when the optimization does not result in a feasible solution was updated.
- Appendix III: Calculation of Target Metrics
  - The calculation of aggregate weight of 'Companies Setting Target' was updated to only include companies that are eligible, as per the exclusion criteria described in section 2.2 of the methodology.
- Appendix IV: The Barra Equity Model used in the optimization process was added.
- Appendix V: A new release of the Barra Equity Model was added.
- Appendix VII: Methodology Set: Added details on the Methodology Set for the Indexes

The following sections have been modified as of July 2024

- Appendix II: Optimization Constraints
  - Clarified the description of the Asset Lower Bound constraint.

The following sections have been modified as of November 2024

- Appendix III: Calculation of Target Metrics
  - Updated to reflect the change in security GHG intensity calculation for Pacific ex Japan ESG Enhanced Focus CTB Index.
- Appendix IV: Base Reset for Pacific ex Japan ESG Enhanced Focus CTB Index was added.

The following sections have been modified as of December 2024

- Section 2.2.2 Other Exclusion Criteria
  - Removed sub section and transition to Section 2.5
- Section 2.5 Treatment of Unrated Companies
  - New section detailing the treatment of companies with ratings and research not available from MSCI ESG Research

- Section 4.4: MSCI Climate Change Metrics
    - Added sub-sections under Climate Change Metrics to provide additional details on Fossil Fuels related activities and Greenhouse Gas Emissions.

The following sections has been modified as February 2025

Appendix VIII: Changes to this Document

- Updated the description for Section 2.5 Treatment of Unrated Companies in December's changes section

The following sections have been modified as of November 2025

- The methodology and Index names were updated. As of November 25, 2025, the MSCI ESG Enhanced Focus CTB Indexes have been renamed as MSCI ESG Enhanced CTB Indexes

Section 1: Introduction

- The introduction text has been updated
- Added a new footnote with reference to the MSCI EU CTB/PAB Index Framework

Appendix I: Business Exclusion Criteria

- The conventional weapons description has been updated

Appendix II: Optimization Constraints

- Updated the optimization objective to minimize the ex-ante tracking error
- The Active Security Weight for both the MSCI Japan ESG Enhanced CTB Index and the MSCI Pacific ex Japan ESG Enhanced CTB Index has been updated, and the Diversification Constraints table has been changed accordingly to disclose the enhancement
- Removed the ex-ante tracking error relaxation from the infeasibility resolution steps

Appendix III: Calculation of Target Metrics

- The Index Methodology has been updated to remove the application of the following climate constraints and all corresponding references have been deleted:
    - Potential Emissions
    - Companies Setting Targets
    - Calculation of Green Revenue to Fossil fuels-based Revenue Multiple

Appendix IV: Decarbonization Trajectory of the Indexes

- Added a new subsection describing the decarbonization trajectory applicable to MSCI ESG Enhanced CTB Indexes

- Clarified description of the Base Reset process and updated the formatting of equations and tables for clarity.
- Added cross-references to the MSCI EU CTB/PAB Index Framework Book to clarify the basis for the Base Date resets and decarbonization trajectory adjustment.
- Added a new table summarizing Base Dates, Decarbonization Start Dates, and Weighted Average GHG Intensities at the Base Date (W_{t_b}) for all relevant MSCI ESG Enhanced CTB Indexes.
- Updated Base Date and Decarbonization Start Date for all MSCI ESG Enhanced CTB Indexes to December 1, 2022 apart from MSCI Pacific ex Japan ESG Enhanced CTB Index where the Base Date is November 26 2024 and the Decarbonization Start Date is December 1, 2021.

Appendix V and VI were merged and updated.

Appendix VI: Methodology Set

- Added a reference to the MSCI EU CTB/PAB Index Framework.

The following sections have been modified as of February 2026

Section 1.1.1 Business Exclusion criteria:

- The Conventional Weapons screen was removed.

Section 3.2: Monthly Reviews

- Updated section to incorporate the monthly review for companies flagged under the Tobacco Producers or Controversial Weapons screens

Appendix I: Business Exclusion Criteria:

- The conventional weapons screen was removed, and the nuclear weapons and civilian firearms screens were modified.

Appendix IV: Decarbonization Trajectory of the Indexes:

- The decarbonization buffer was updated from 1% to 2%.

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