

MSCI ESG Broad CTB Select Indexes Methodology

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1. Introduction

The MSCI ESG Broad CTB Select Indexes¹ (the ‘Indexes’) aim to maximize exposure to positive environmental, social and governance (ESG) factors while maintaining risk and return characteristics similar to those of the respective underlying market capitalization weighted indexes (the ‘Parent Indexes’). The Index also excludes companies meeting the below exclusion criteria –

- Companies involved in very severe ESG Controversies and severe Environmental Controversies.
- Companies with any tie to Controversial Weapons, involved in the manufacturing of nuclear weapons or its components or involved in conventional weapons.
- Companies involved in Tobacco-related businesses.
- Companies involved in Thermal Coal mining and Power Generation.
- Companies involved in Oil & Gas extraction using unconventional methods including Arctic Oil and Gas.

The Indexes are constructed by selecting constituents of a Parent Index² through an optimization process that aims to:

- Maximize exposure to ESG factors for a target tracking error budget.
- Align with the minimum requirements for EU Climate Transition Benchmarks³ (EU CTB):
 - Reduce the weighted average greenhouse gas intensity relative to Enterprise Value including Cash by 30% relative to the Parent Index.
 - Reduce the weighted average greenhouse gas (GHG) intensity by 7% on an annualized basis.
 - Have an equivalent weight in companies which are categorized as High Climate Impact sector relative to the weight of such companies in the Parent Index.
- Applying additional constraints to meet Climate transition opportunity objectives:
 - Have at least equivalent ratio of weighted average “Green Revenues” to weighted average “Fossil Fuels-based Revenues” relative to the Parent Index.
 - Reduce the weighted average potential emissions intensity relative to Enterprise Value including Cash from fossil fuel reserves by 30% relative to the Parent Index.
 - Increase in aggregate weight in companies setting targets relative to the aggregate weight of such companies in the Parent Index.
- The Indexes aim to be sector-diversified and seek to target companies with high ESG ratings within each GICS®⁴ sector

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 Please refer to Section 2.1 for the list of Parent Indexes

³ 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 Benchmark. 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.

⁴ GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.

2. Constructing the Indexes

The Indexes use company ratings and research provided by MSCI ESG Research⁵ for Index construction.

2.1 Applicable Universe

The Applicable Universe includes all the existing constituents of the corresponding Parent Indexes as shown in the table below. This approach aims to provide an opportunity set with sufficient liquidity and investment capacity.

Index Name	Parent Index
MSCI World ESG Broad CTB Select Index	MSCI World Index
MSCI Europe ESG Broad CTB Select Index	MSCI Europe Index
MSCI North America ESG Broad CTB Select Index	MSCI North America Index
MSCI Emerging Markets ESG Broad CTB Select Index	MSCI Emerging Markets Index
MSCI EMU ESG Broad CTB Select Index	MSCI EMU Index
MSCI USA ESG Broad CTB Select Index	MSCI USA Index
MSCI Japan ESG Broad CTB Select Index	MSCI Japan Index
MSCI Pacific ESG Broad CTB Select Index	MSCI Pacific Index
MSCI China ESG Broad CTB Select Index	MSCI China Index
MSCI Europe Mid Cap ESG Broad CTB Select Custom Index	MSCI Europe Mid Cap Index
MSCI Europe Small Cap ESG Broad CTB Select Index	MSCI Europe Small Cap Index
MSCI EMU Small Cap ESG Broad CTB Select Custom Index	MSCI EMU Small Cap Index
MSCI Europe ex UK ESG Broad CTB Select Index	MSCI Europe ex UK Index
MSCI World ex Europe ESG Broad CTB Select Index	MSCI World ex Europe Index
MSCI Emerging Markets Asia ESG Broad CTB Select Index	MSCI Emerging Markets Asia Index
MSCI India ESG Broad CTB Select Index	MSCI India Index
MSCI AC Asia ex Japan ESG Broad CTB Select Index	MSCI AC Asia ex Japan Index

⁵ 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.

MSCI AC Asia Pacific ex Japan ESG Broad CTB Select Index	MSCI AC Asia Pacific ex Japan Index
MSCI Emerging Markets ex China ESG Broad CTB Select Index	MSCI Emerging Markets ex China Index
MSCI World Small Cap ESG Broad CTB Select Index	MSCI World Small Cap Index

2.2 Eligible Universe

The Eligible Universe is constructed from the Applicable Universe by excluding companies that are involved in the following business activities as identified by MSCI Business Involvement Screening Research or MSCI Climate Change Metrics:

- **Controversial Weapons:** Companies involved in Controversial Weapons as defined by the methodology of the MSCI Ex-Controversial Weapons Indexes.
- **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.
- **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).
 - A Red Flag indicates an ongoing, Very Severe ESG controversy implicating a company directly through its actions, products, or operations.
 - 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.
- **Tobacco:** All companies that are Tobacco Producers or derive 5% or more aggregate revenue from the production, distribution, retail and supply of tobacco-related products.
- **Nuclear Weapons:** All companies involved meeting specific Nuclear Weapons business involvement criteria as described in Appendix II
- **Aggregate Weapons:** All companies deriving 10% or more aggregate revenue from conventional, controversial and nuclear weapons based on the following categories:
 - Companies involved in the production of conventional weapons, components for such products or support systems and services for such products.
 - Companies involved in the production of biological or chemical weapons, components for such products.
 - Companies involved in the production of blinding laser, incendiary or non-detectable fragments weapons in its most recently completed fiscal year.
 - Companies involved production of nuclear weapons, exclusive and dual-use delivery platform capable to deliver such products, intended and dual-use components of such products, services provided for such products.

- **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.
 - All companies generating 50% or more power from thermal coal.
 - All companies that own thermal coal reserves
- **Unconventional Oil & 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
- **Arctic Oil & Gas**
 - All companies deriving 5% or more revenue from Arctic Oil
 - All companies deriving 5% or more revenue from Arctic Gas
 - All companies with evidence of producing Arctic oil. This factor does not capture revenue from non-extraction activities (e.g. exploration, surveying, processing, refining); ownership of Arctic oil reserves with no associated extraction revenues; revenue from intra-company sales
 - All companies with evidence of producing Arctic gas. This factor does not capture revenue from non-extraction activities (e.g. exploration, surveying, processing, refining); ownership of Arctic gas reserves with no associated extraction revenues; revenue from intra-company sales

2.3 Securities Selection and Weighting

Securities in the Eligible Universe are selected and weighted following an optimization-based approach.

2.4 Optimization Constraints

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

The Optimization process aims to maximize the Index's exposure to ESG scores for a given tracking error budget. ESG scores are normalized and used in the optimization process. The following ex-ante tracking error targets are used for the construction of MSCI ESG Broad CTB Select Indexes –

No.	MSCI ESG Broad CTB Index	Ex-Ante Tracking Error
1	MSCI World ESG Broad CTB Select Index	0.75%
2	MSCI Europe ESG Broad CTB Select Index	0.75%
3	MSCI North America ESG Broad CTB Select Index	0.75%
4	MSCI Emerging Markets ESG Broad CTB Select Index	1.00%
5	MSCI EMU ESG Broad CTB Select Index	0.75%
6	MSCI USA ESG Broad CTB Select Index	0.75%
7	MSCI Japan ESG Broad CTB Select Index	0.75%
8	MSCI Pacific ESG Broad CTB Select Index	0.75%
9	MSCI China ESG Broad CTB Select Index	1.00%
10	MSCI Europe Mid Cap ESG Broad CTB Select Custom Index	0.75%
11	MSCI Europe Small Cap ESG Broad CTB Select Index	0.75%
12	MSCI EMU Small Cap ESG Broad CTB Select Custom Index	0.75%
13	MSCI Europe ex UK ESG Broad CTB Select Index	0.75%
14	MSCI World ex Europe ESG Broad CTB Select Index	0.75%
15	MSCI Emerging Markets Asia ESG Broad CTB Select Index	1.00%
16	MSCI India ESG Broad CTB Select Index	1.00%
17	MSCI AC Asia ex Japan ESG Broad CTB Select Index	0.75%
18	MSCI AC Asia Pacific ex Japan ESG Broad CTB Select Index	0.75%
19	MSCI Emerging Markets ex China ESG Broad CTB Select Index	1.00%
20	MSCI World Small Cap ESG Broad CTB Select Index	0.75%

Normalization of the ESG scores is designed to allow the optimization process to assess each score in the context of the overall distribution of the ESG scores.

The Minimum reduction in Weighted Average Potential Emissions Intensity constraint as per Appendix I is not applied to the MSCI Europe Mid Cap ESG Broad CTB Select Custom Index or the MSCI EMU Small Cap ESG Broad CTB Select Custom Index.

Please refer to Appendix I for the Optimization constraints.

2.5 Determining the Optimized Index

The Indexes are constructed using the Barra Open Optimizer⁶ in combination with the relevant Barra Equity Model. The optimization uses universe of eligible securities and the specified optimization objectives and constraints to determine the constituents of the Indexes.

2.6 Treatment of Unrated Companies

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

- MSCI ESG Ratings
- MSCI ESG Controversies

⁶ Please refer to Appendix V and VI for more details.

3. Maintaining the Indexes

3.1 Quarterly Index Reviews

The Index is rebalanced on a quarterly basis to coincide with the regular 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.

At each Index Review, the optimization process outlined in Section 3 is implemented.

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

Index constituents are reviewed on a monthly basis for the involvement in ESG controversies and Environmental Controversies⁷.

Existing constituents will be deleted if they are assessed as having involvement in ESG controversies that are classified as Red Flags (MSCI ESG Controversies Score of 0) or Environmental controversies that are classified as Red (MSCI Environmental Controversy score of 0) or Orange Flags (score of 1).

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

MSCI uses MSCI ESG Controversies data as of the end of the month preceding the review (e.g., end of June data for the July monthly review). For some securities, such data may not be published by MSCI ESG Research 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 Index.

The pro forma Indexes are generally announced nine business days before the effective date.

3.3 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

⁷ The monthly review of ESG and Environmental Controversies is applied within the Index, starting on July 2023, and is not applicable historically prior to that date.

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.

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 ESG Research

The 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 ESG Ratings, MSCI ESG Controversies, MSCI ESG Business Involvement Screening Research and MSCI Climate Change Metrics. 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 MSCI ESG Ratings methodology can be found at: <https://www.msci.com/legal/disclosures/esg-disclosures>.

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.

The MSCI Business Involvement Screening Research methodology can be found at: <https://www.msci.com/legal/disclosures/esg-disclosures>.

4.4 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.

4.4.1 Fossil Fuels and Power Generation Metrics

MSCI ESG Research 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).

4.1.2 Greenhouse Gas (GHG) Emissions

MSCI ESG Research 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.

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

Appendix I: Optimization Constraints

At each Quarterly Index Review, the following optimization constraints along with the ex-ante tracking error targets defined in Section 3.4 are used to ensure replicability and investability.

Screened Parent

The Screened Parent is constructed by excluding securities from the Parent Index based on the exclusion criteria as defined in Section 2.1.1. The security weights are then normalized to 100%.

Constraints imposed to meet transition and physical risk objectives

No.	Transition and Physical Risk Objective	MSCI ESG Broad Select CTB Indexes
1	Minimum reduction in Greenhouse Gas (GHG) Intensity (Scope 1+2+3 ⁸) relative to the Parent Index	30%
2	Minimum average reduction (per annum) in GHG Intensity relative to GHG Intensity at the Base Date ⁹	7%
3	Minimum active weight in High Climate Impact Sector relative to the Parent Index as defined in Appendix III	0%
4	Minimum reduction in Weighted Average Potential Emissions Intensity ¹⁰ relative to the Parent Index	30%
5	Minimum ratio of Weighted Average Green Revenue/ Weighted Average Fossil fuels-based Revenue	At least equal
6	Minimum Increase in aggregate weight in companies setting targets relative to the aggregate weight of such companies in the Parent Index. Companies Setting Targets are defined in Appendix III	10% ¹¹

Diversification Constraints

No.	Parameter	Values
1	Minimum Constituent Weight	Minimum constituent weight in the Screened Parent

⁸ Prior to the May 2020 Index Review, the Weighted Average Carbon Emissions Intensity relative to EVIC has been calculated based on Scope 1+2 Emissions.

⁹ Prior to the May 2020 Index Review, the average reduction in Weighted Average Carbon Emissions Intensity relative to EVIC has been calculated using Scope 1+2 Emissions since Inception.

¹⁰ Does not apply to the MSCI Europe Mid Cap ESG Broad CTB Select Custom Index or the MSCI EMU Small Cap ESG Broad CTB Select Custom Index.

¹¹ During the November 2023 and February 2024 Index Reviews, the Companies Setting Target constraint was not applied for the MSCI China ESG Broad CTB Select Index

2	Asset Lower Bound	Maximum (Minimum constituent weight in the Screened Parent, 0.25 * Security Weight in the Screened Parent)
3	Asset Upper Bound	Minimum (5 * Security Weight in the Screened Parent, Security Weight in the Screened Parent +2%)
4	Active Sector Weights	+/-5%
5	Active Country Weights ¹²	+/-5%
6	One Way Turnover during May and November Index Review	10%
7	One Way Turnover during Feb and Aug Index Review	5%
8	Specific Risk Aversion	0.075
9	Common Factor Risk Aversion	0.0075

Infeasible Solution –

During the Semi-Annual or Quarterly 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:

- The turnover constraint will be relaxed up to a maximum of 5 times of the original turnover budget in steps of 5%.
- The ex-ante tracking error is relaxed up to a maximum of 5 times of the original ex-ante tracking error in steps on 0.1%.
- The one-way index turnover constraint and the ex-ante tracking error 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 Index Review.

¹² 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 Broad CTB Select Index is set at three times of the country’s weight in the Parent Index.

Appendix II: Companies Involved in Nuclear Weapons Business

Companies, whose activities meet the following criteria, as determined by MSCI ESG Research, are excluded from the Index:

- 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) but can be used in nuclear weapons.
- All companies that manufacture or assemble delivery platforms that were not developed or not significantly modified for the exclusive delivery of nuclear weapons but have the capability to deliver nuclear weapons.
- All companies that manufacture components for nuclear-exclusive delivery platforms.

Appendix III: Calculation or 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) =

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

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

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

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) =

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

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) =

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

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 Potential Carbon Emissions Intensity

Security Level Potential Carbon Emissions (PCE) Intensity =

$$\frac{Absolute\ Potential\ Emissions}{EVIC\ (in\ M\$)}$$

If Absolute Potential Emissions data is not available, MSCI uses zero fossil fuel reserves.

Weighted Average Potential Emissions Intensity of Parent Index =

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

Weighted Average Potential Emissions Intensity of Derived Index =

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

Calculation of Average Decarbonization

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

$$W_t = W_1 * 0.93^{\frac{(t-1)}{4}}$$

Where 't' is the number of Quarterly Index Reviews since the Base Date.

Thus, for the 5th Semi-Annual Index Review since the Base Date (t=5), the target Weighted Average GHG Intensity will be $W_1 * 0.93$.

Companies Setting Targets

Relative to their corresponding Parent Indexes, the Indexes require a minimum 10% increase in the aggregate weight of companies setting emissions reduction targets

- Companies publishing emissions reduction targets
- Companies publishing their annual emissions and
- Companies reducing their GHG intensity by 7% over each of the last 3 years

Calculation of Green Revenue to Fossil fuels-based Revenue Multiple

Green Revenue

For each constituent in the Parent Index, the Green Revenue% is calculated as the cumulative revenue (%) from the six Clean Tech themes which are as follows:

- **Alternative Energy** – products and services that support the transmission, distribution and generation of renewable energy and alternative fuels to reduce carbon and pollutant emissions in supporting affordable and clean energy to combat climate change.
- **Energy Efficiency** – products, and services that support the maximization of productivity in labor, transportation, power and domestic applications with minimal energy consumption to ensure universal access to affordable, reliable and modern energy services.
- **Sustainable Water** – products, services, infrastructure projects and technologies that resolve water scarcity and water quality issues, through minimizing and monitoring current water demand, improving the quality and availability of water supply to improve resource management in both domestic and industrial use.
- **Green Building** – design, construction, redevelopment, retrofitting, or acquisition of green-certified properties to promote mechanisms for raising capacity for effective climate change mitigation and adaptation.
- **Pollution Prevention** – products, services, infrastructure projects and technologies that reduces volume of waste materials through recycling, minimizes introduction of toxic substances, and offers remediation of existing contaminants such as heavy metals and organic pollutants in various environmental media to significantly address pollution in all levels and its negative effects
- **Sustainable Agriculture** - revenues from forest and agricultural products that meet environmental and organic certification requirements to address significantly biodiversity loss, pollution, land disturbance, and water overuse

The Weighted Average Green Revenue% is calculated as:

$$= \sum (Weight\ in\ Index * Green\ Revenue\%)$$

Fossil fuels-based Revenue

For each constituent in the Parent Index, the Fossil fuels-based Revenue% is calculated as the cumulative revenue (%) from the following sources:

- 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)
- Revenue% from the extraction, production and refining of Conventional and Unconventional Oil & Gas. Conventional Oil and Gas includes Arctic onshore/offshore, deep water, shallow water and other onshore/offshore. Unconventional Oil and Gas includes oil sands, oil shale (kerogen-rich deposits), shale gas, shale oil, coal seam gas, and coal bed methane.

- Revenue% from thermal coal based power generation, liquid fuel based power generation and natural gas based power generation.

The Weighted Average Fossil fuels-based Revenue% is calculated as:

$$= \sum (Weight\ in\ Index * Fossil\ fuels\ -\ based\ Revenue\%)$$

The Green Revenues to Fossil fuels-based Revenues multiple for either the Parent Index or the Index is calculated as a ratio of the Weighted Average Green Revenue to the Weighted Average Fossil fuels-based Revenue as per the formula below:

$$= \frac{Weighted\ Average\ Green\ Revenue\%}{Weighted\ Average\ Fossil\ fuels\ -\ based\ Revenue\%}$$

Climate Impact Sectors

NACE¹³ 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 GICS¹⁴ 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 mapping¹⁵ 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
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

¹³ For further details regarding NACE, please refer to https://ec.europa.eu/eurostat/statistics-explained/index.php?title=NACE_background

¹⁴ For further information regarding GICS, please refer to <https://www.msci.com/gics>

¹⁵ This mapping is available in the [Handbook of Climate Transition Benchmarks, Paris-Aligned Benchmark and Benchmarks’ ESG Disclosures](#)

- 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

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 IV: Decarbonization Trajectory of Indexes

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

$$W_t = W_1 * 0.93^{\frac{(t-1)}{4}}$$

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

Index Name	Parent Index	Base Date	W_1 (tCO2/M\$ Enterprise Value + Cash)
MSCI World ESG Broad CTB Select Index	MSCI World Index	March 01, 2022	215.67
MSCI Europe ESG Broad CTB Select Index	MSCI Europe Index	March 01, 2022	320.32
MSCI North America ESG Broad CTB Select Index	MSCI North America Index	March 01, 2022	166.34
MSCI Emerging Markets ESG Broad CTB Select Index	MSCI Emerging Markets Index	March 01, 2022	335.58
MSCI EMU ESG Broad CTB Select Index	MSCI EMU Index	March 01, 2022	322.84
MSCI USA ESG Broad CTB Select Index	MSCI USA Index	March 01, 2022	150.57
MSCI Japan ESG Broad CTB Select Index	MSCI Japan Index	March 01, 2022	401.33
MSCI Pacific ESG Broad CTB Select Index	MSCI Pacific Index	March 01, 2022	342.7
MSCI China ESG Broad CTB Select Index	MSCI China Index	March 01, 2022	237.75
MSCI Europe Mid Cap ESG Broad CTB Select Custom Index	MSCI Europe Mid Cap Index	March 01, 2022	286.16
MSCI Europe Small Cap ESG Broad CTB Select Index	MSCI Europe Small Cap Index	March 01, 2022	279.86
MSCI EMU Small Cap ESG Broad CTB Select Custom Index	MSCI EMU Small Cap Index	March 01, 2022	378.07
MSCI Europe ex UK ESG Broad CTB Select Index	MSCI Europe ex UK Index	March 01, 2022	275.89
MSCI World ex Europe ESG Broad CTB Select Index	MSCI World ex Europe Index	March 01, 2022	181.45
MSCI Emerging Markets Asia ESG Broad CTB Select Index	MSCI Emerging Markets Asia Index	March 01, 2022	335.58
MSCI India ESG Broad CTB Select Index	MSCI India Index	March 01, 2022	569.13
MSCI AC Asia ex Japan ESG Broad CTB Select Index	MSCI AC Asia ex Japan Index	March 01, 2022	309.43

MSCI AC Asia Pacific ex Japan ESG Broad CTB Select Index	MSCI AC Asia Pacific ex Japan Index	March 01, 2022	316.01
MSCI Emerging Markets ex China ESG Broad CTB Select Index	MSCI Emerging Markets ex China Index	March 01, 2022	450.49
MSCI World Small Cap ESG Broad CTB Select Index	MSCI World Small Cap Index	March 01, 2022	425.70

Appendix V: Barra Equity Model Used in The Optimization

The Indexes currently use an optimization setup using the MSCI Barra Global Equity Model for Long-Term Investors (GEMTLT).

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

The methodology presently uses MSCI Barra Global Equity Model for Long-Term Investors (“GEMLTL”) for the optimization. A new release of the relevant Barra Equity Model or Barra Optimizer may replace the former version within a suitable timeframe.

Appendix VII: 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 Methodology – <https://www.msci.com/index/methodology/latest/XCW>
- 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 VIII: Changes to this Document

The following sections have been modified since March 2022:

- Sections 2.3, 2.4, 2.5: Updated to align with the minimum requirements of the EU CTB
- Appendix I – Updated to add exclusions based on thermal coal power, thermal coal reserves and Arctic Oil & Gas
- Appendix II - Updated to align with the minimum requirements of the EU CTB

The following sections have been modified effective April 2022:

- Sections 2.1, 2.4: Updated to add construction parameters for the MSCI Pacific ESG Broad CTB Select Index, the MSCI China ESG Broad CTB Select Index and the MSCI China A ESG Broad CTB Select Index.

The following sections have been modified effective June 1, 2022:

- Sections 2.1, 2.4: Updated to add construction parameters for the MSCI Europe Mid Cap ESG Broad CTB Select Custom Index, MSCI Europe Small Cap ESG Broad CTB Select Index, MSCI EMU Small Cap ESG Broad CTB Select Custom Index, MSCI Europe ex UK ESG Broad CTB Select Index, MSCI World ex Europe ESG Broad CTB Select Index and to remove the construction parameters for the MSCI China A ESG Broad CTB Select Index.
- Appendix II: Updated to reflect optimization parameters for to the MSCI Europe Mid Cap ESG Broad CTB Select Custom Index and the MSCI EMU Small Cap ESG Broad CTB Select Custom Index.

The following sections have been modified effective June 27, 2022:

- Sections 2.1, 2.4: Updated to add construction parameters for the MSCI Emerging Markets Asia ESG Broad CTB Select Index, MSCI India ESG Broad CTB Select Index, MSCI AC Asia ex Japan ESG Broad CTB Select Index, MSCI AC Asia Pacific ex Japan ESG Broad CTB Select Index and the MSCI Emerging Markets ex China ESG Broad CTB Select Index.

The following sections have been modified effective September 1, 2022:

- Section 1: Introduction
- Appendix I: Updated to add exclusions based on weapons.
- Appendix II: Updated to add the optimization constraint for companies setting credible carbon reduction targets.
- Appendix IV: Added to provide clarification on the calculation of relevant Target Metrics and the definition of Companies Setting Targets.

The following sections have been modified as of July 3, 2023:

- Section 3: The monthly review of ESG and Environmental Controversies is applied within the Index effective July 3, 2023, and is not applicable historically prior to that date.
- Section 4: The ESG Research Product descriptions were updated and moved from Section 2 to Section 4

The following sections have been modified as of December 1, 2023

- Section 2: The special treatment for the Companies Setting Target constraint at the November 2023 Index Review was noted for the MSCI China ESG Broad CTB Select Index in Appendix II.

The following sections have been modified as of March 1, 2024

- Section 2: The special treatment for the Companies Setting Target constraint at the February 2024 Index Review was noted for the MSCI China ESG Broad CTB Select Index in Appendix II.
- Appendix VII: Added details on the Methodology Set for the Indexes

The following sections have been modified as of June 3, 2024

- Section 1: Updated the description of the MSCI ESG Broad CTB Indexes and added a footnote on the Methodology Set
- Section 2:
 - Updated to add the construction parameters for the MSCI World Small Cap ESG Broad CTB Select Index.
 - Moved the screening criteria and the description to this section.
 - Updated the exclusion criteria for the Thermal Coal Power Generation screen and updated the language for Aggregate Weapons
- Section 3: Replaced references to “Semi-Annual Index Reviews” and “Quarterly Index Reviews” of the MSCI GIMI with “Index Reviews”.
- Section 4: Updated the description for MSCI ESG Research Products.
- Appendix IV: Added the base intensity for all Indexes.
- Appendix V: Added details of the Barra Model used for the optimization process.

The following sections have been modified as of December 2024

Section 2.6: Treatment of Unrated Companies

- Added the treatment of companies when ESG Ratings are not assessed from MSCI ESG Research

Section 4.4: MSCI Climate Change Metrics

- Added a sub-section under Climate Change Metrics to provide additional details on Fossil Fuels related activities.

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