

MSCI ESG Broad CTB Select Indexes Methodology

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1 Introduction

The MSCI ESG Broad CTB Select Indexes (the ‘Index’) 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 Index’). The Index also excludes companies meeting the below exclusion criteria –

- Companies involved in manufacturing of Controversial Weapons
- Companies involved in very severe ESG Controversies and severe Environmental Controversies
- Companies involved in the Tobacco-related businesses
- Companies involved in Thermal Coal mining and Power Generation
- Companies involved in Oil Sands Extraction
- Companies involved in Nuclear Weapons
- Companies involved in Arctic Oil and Gas related businesses

The Indexes are constructed by selecting constituents of a market capitalization weighted index (the ‘Parent Index’) 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 Benchmarks (EU CTBs)
- Reduce the weighted average greenhouse gas intensity relative to Enterprise Value including Cash by 30% with respect to the Parent Index.
- Reduce the weighted average greenhouse gas (GHG) intensity by 7% on an annualized basis
- Reduce the weighted average potential emissions intensity relative to Enterprise Value including Cash from fossil fuel reserves by 30% with respect to the Parent Index.
- Have at least equivalent ratio of weighted average “Green Revenues” to weighted average “Fossil Fuels-based Revenues” as that of the underlying investment universe.

The Indexes aim to be sector-diversified and target companies with high ESG ratings in each sector.

2 MSCI ESG Research

MSCI ESG Research provides in-depth research, ratings and analysis of the environmental, social and governance-related business practices of thousands of companies worldwide. It consists of an integrated suite of tools and products to efficiently manage research, analysis and compliance tasks across the spectrum of ESG factors.

The Index uses company ratings and research provided by MSCI ESG Research. In particular, this index uses the following MSCI ESG Research products: MSCI Climate Change Metrics, MSCI ESG Controversies and MSCI ESG Business Involvement Screening Research.

For details on MSCI ESG Research's full suite of ESG products, please refer to: <https://www.msci.com/esg-investing>

2.1 MSCI CLIMATE CHANGE METRICS

MSCI Climate Change Metrics provides climate data & tools to support investors integrating climate risk & opportunities into their investment strategy and processes. It supports investors seeking to achieve a range of objectives, including measuring and reporting on climate risk exposure, implementing low carbon and fossil fuel-free strategies, align 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-solutions>.

2.2 MSCI ESG CONTROVERSIES

MSCI ESG Controversies provides assessments of controversies concerning the 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.

For more details on MSCI ESG Controversies, please refer to <https://www.msci.com/documents/10199/acbe7c8a-a4e4-49de-9cf8-5e957245b86b>

2.3 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 http://www.msci.com/resources/factsheets/MSCI_ESG_BISR.pdf.

3 Constructing the Indexes

3.1 APPLICABLE UNIVERSE

The applicable universe includes all the existing constituents of the corresponding free float adjusted market capitalization weighted index as shown in the table below ("Parent Index"). 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

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

3.2 ELIGIBLE UNIVERSE

The Eligible Universe is constructed from the Applicable Universe by excluding companies that are involved in the following businesses and meet the business involvement exclusion criteria as detailed in Appendix 1:

- Controversial Weapons
- Tobacco
- Thermal Coal
- Oil Sands Extraction
- Nuclear Weapons

Additionally, companies are required to have an MSCI ESG Controversies Score of 1 and an MSCI Environmental Controversies Score of 2 to be eligible for inclusion.

3.3 SECURITY SELECTION AND WEIGHTING

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

3.4 OPTIMIZATION CONSTRAINTS

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%

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 2 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 2 for the Optimization constraints.

3.5 DETERMINING THE OPTIMIZED INDEX

The Index is constructed using the Barra Open Optimizer¹ 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.

¹ Please refer to Appendix 2 and 3 for more details.

4 Maintaining the Indexes

4.1 QUARTERLY INDEX REVIEWS

The Index is rebalanced on a quarterly basis to coincide with the regular Index Reviews (Semi-Annual Index Reviews in May and November and Quarterly Index Reviews in February and August) 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 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.

4.2 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.

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>

Appendix 1: Business Exclusion Criteria

MSCI ESG Research has 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 Broad Select Indexes (except Thermal Coal, Oil Sands 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>.

Activities classified under “Minimal Tolerance”

- **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 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.

- **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

- **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 10% 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

Appendix 2: 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 3.3. 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)	30%
2	Minimum average reduction (per annum) in GHG Intensity relative to GHG Intensity at the Base Date	7%
3 [^]	Minimum active weight in High Climate Impact Sector as defined in Appendix 4	0%
4 ^{^,**}	Minimum reduction in Weighted Average Potential Emissions Intensity	30%
5 [^]	Minimum ratio of Weighted Average Green Revenue/ Weighted Average Fossil fuels-based Revenue	At least equal

Diversification Constraints

No.	Parameter	Values
1	Minimum Constituent Weight	Minimum constituent weight in the Screened Parent
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*	+/-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

* 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.

** 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.

[^] The Optimization Constraints are applied relative to the Parent Index.

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.

Appendix 3: New Release of Barra® Equity Model or Barra® Optimizer

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

The following sections have been modified since March 2022:

- Sections 3.3, 3.4, 3.5: Updated to align with the minimum requirements of the EU CTB
- Appendix 1 – Updated to add exclusions based on thermal coal power, thermal coal reserves and Arctic Oil & Gas
- Appendix 2 - Updated to align with the minimum requirements of the EU CTB

The following sections have been modified effective April 2022:

- Sections 3.1, 3.4: 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 3.1, 3.4: 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 2: 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 3.1, 3.4: 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.

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