



Methodology book for –

- 1. MSCI World ESG Broad Select Index**
- 2. MSCI Europe ESG Broad Select Index**
- 3. MSCI North America ESG Broad Select Index**
- 4. MSCI Emerging Markets ESG Broad Select Index**
- 5. MSCI EMU ESG Broad Select Index**
- 6. MSCI USA ESG Broad Select Index**
- 7. MSCI Japan ESG Broad Select Index**

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1 Introduction

The MSCI ESG Broad Select Indexes (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 Indexes also excludes companies meeting the below exclusion criteria–

- Companies involved in manufacturing of Controversial Weapons
- Companies involved in very severe ESG 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

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

- Maximize exposure to ESG factors for a target tracking error budget.
- 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 potential emissions intensity relative to Enterprise Value including Cash from fossil fuel reserves by 30% with respect to the Parent Index.

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

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 (Parent Index) 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 Select Index	MSCI World Index
MSCI Europe ESG Broad Select Index	MSCI Europe Index
MSCI North America ESG Broad Select Index	MSCI North America Index
MSCI Emerging Markets ESG Broad Select Index	MSCI Emerging Markets Index
MSCI EMU ESG Broad Select Index	MSCI EMU Index
MSCI USA ESG Broad Select Index	MSCI USA
MSCI Japan ESG Broad Select Index	MSCI Japan 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 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 Select Indexes –

No.	MSCI ESG Low TE Index	Ex-Ante Tracking Error
1	MSCI World ESG Broad Select Index	0.5%
2	MSCI Europe ESG Broad Select Index	0.5%
3	MSCI North America ESG Broad Select Index	0.5%
4	MSCI Emerging Markets ESG Broad Select Index	1.0%
5	MSCI EMU ESG Broad Select Index	0.5%
6	MSCI USA ESG Broad Select Index	0.5%
7	MSCI Japan ESG Broad Select Index	0.5%

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.

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 II and III 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 CarbonMetrics) 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.
- **Oil Sands**
 - All companies deriving 5% or more revenue from oil sands extraction, which own oil sands reserves and disclose evidence of deriving revenue from oil sands extraction. Companies that derive revenue from non-extraction activities (e.g. exploration, surveying, processing, refining) or intra-company sales are not excluded. Additionally, companies that own oil sands reserves with no associated revenue are also not excluded.

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%.

Optimization Constraints

No.	Parameter	Values
1	Minimum Constituent Weight	Minimum constituent weight in the Screened Parent
2 ^A	Asset Lower Bound	Maximum (Minimum constituent weight in the Screened Parent, 0.5 * Security Weight in the Screened Parent)
3 ^A	Asset Upper Bound	Minimum (4 * Security Weight in the Screened Parent, Security Weight in the Screened Parent +2%)
4 ^A	Active Sector Weights	+/-5%
5 ^A	Active Country Weights*	+/-5%
6 ^A	Minimum Reduction in the weighted average Carbon Intensity ² relative to the Parent Index	30%
7 ^A	Minimum Reduction in the Potential Emissions per dollar of Enterprise Value Including Cash relative to the Parent Index	30%
8 ^A	One Way Turnover during May and November Index Review	10%
9 ^A	One Way Turnover during Feb and Aug Index Review	5%
10	Specific Risk Aversion	0.075

² The weighted average carbon intensity is calculated as Scope 1+2 Emissions per dollar of Enterprise Value Including Cash

11	Common Factor Risk Aversion	0.0075
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* 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 Select Index is set at three times of the country's weight in the Parent Index.

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

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

- Relax the one-way index turnover constraint in steps of 1% upto 30%
- Relax the Carbon Intensity and Potential Emissions constraints in steps of 5% upto 20%
- Relax the ex-ante tracking error constraint in steps of 0.1% up to a maximum of 5 times of the original ex-ante tracking error in steps on 0.1%

In the event that feasible solution is not found for maximum ex-ante tracking error, the 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 (“GEMTLT”) for the optimization. A new release of the relevant Barra Equity Model or Barra Optimizer may replace the former version within a suitable timeframe.

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