Methodology Book for:

- MSCI World Select ESG Climate Solutions Target Index
- MSCI USA Select ESG Climate Solutions Target Index
- MSCI Emerging Markets Select ESG Climate Solutions Target Index
- MSCI AC Asia Pacific ex Japan Select ESG Climate Solutions Target Index
- MSCI Europe ex UK Select ESG Climate Solutions Target Index
- MSCI Japan Select ESG Climate Solutions Target Index
- MSCI UK IMI Select ESG Climate Solutions Target Index

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Contents

1 Introduction

The MSCI World Select ESG Climate Solutions Target Index, the MSCI USA Select ESG Climate Solutions Target Index, the MSCI Emerging Markets Select ESG Climate Solutions Target Index, the MSCI AC Asia Pacific ex Japan Select ESG Climate Solutions Target Index, the MSCI Europe ex UK Select ESG Climate Solutions Target Index, the MSCI Japan Select ESG Climate Solutions Target Index and the MSCI UK IMI Select ESG Climate Solutions Target Index (herein, the “Indexes”) are indexes designed to represent the performance of strategies that seeks systematic integration of environmental, social and governance (ESG) norms, multiple dimensions of carbon exposure (carbon emissions and fossil fuel reserves) and green revenue in index construction.

The MSCI World Select ESG Climate Solutions Target Index, the MSCI USA Select ESG Climate Solutions Target Index, the MSCI Emerging Markets Select ESG Climate Solutions Target Index, the MSCI AC Asia Pacific ex Japan Select ESG Climate Solutions Target Index, the MSCI Europe ex UK Select ESG Climate Solutions Target Index, the MSCI Japan Select ESG Climate Solutions Target Index and the MSCI UK IMI Select ESG Climate Solutions Target Index are designed to minimize the ex-ante tracking error relative to the MSCI World Index, the MSCI USA Index, the MSCI Emerging Markets Index, the MSCI AC Asia Pacific ex Japan Index, the MSCI Europe ex UK Index, the MSCI Japan Index and the MSCI UK IMI Indexes (herein, the “Parent Indexes”) respectively.

The Indexes are constructed using risk-constrained optimization along with specific ESG Score, carbon exposure and green revenue exposure criteria. The Index construction aims to improve the Indexes’ ESG profile, reduce the carbon exposure (carbon emissions relative to sales and Potential Carbon Emissions per dollar of market capitalization) and improve green revenue exposure (clean technologies solutions) relative to that of the Parent Indexes.

2 MSCI ESG Research

The Indexes use company ratings and research data provided by MSCI ESG Research. 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 ESG Climate Change Metrics.

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

2.1 MSCI ESG Ratings

MSCI ESG Ratings aim to measure entities' management of environmental, social and governance risks and opportunities. MSCI ESG Ratings are based on 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/esg-and-climate-methodologies.

2.2 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/esg-and-climate-methodologies.

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.

2.4 MSCI Climate Change Metrics

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

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

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

3 Index Construction Methodology

The Applicable Universe includes all the existing constituents of an underlying Parent Index. This approach aims to provide an opportunity set with sufficient liquidity and capacity.

The Indexes are constructed based on an optimization process applied to the underlying Parent Indexes using a Barra Equity Model while controlling the tracking error relative to the Parent Indexes.

The steps for constructing the Indexes are described below.

3.1 Eligible Universe

The Eligible Universe consists of the securities in the Parent Index that are not involved in business activities as defined in Appendix III.

3.2 Constituent Selection

The selection and weighting of constituents from the Applicable Universe is performed by using an optimization process. The optimization is performed using a base currency. The default currency is the US Dollar.

3.3 Optimization Constraints

At each Index Review, the following optimization constraints are employed:

- The ex-ante tracking error of the Indexes, relative to the Parent Indexes will be capped at 0.40% (soft constraint, relaxed if infeasible).

- For the Indexes below, the weighted-average industry-adjusted ESG Score of the Indexes will be at least 20% more than the weighted-average industry adjusted ESG Score of the Parent Indexes:
  - MSCI World Select ESG Climate Solutions Target Index
  - MSCI USA Select ESG Climate Solutions Target Index
  - MSCI Emerging Markets Select ESG Climate Solutions Target Index
  - MSCI AC Asia Pacific ex Japan Select ESG Climate Solutions Target Index

- For the Indexes below, the weighted-average industry-adjusted ESG Score of the Indexes will be at least 10% more than the weighted-average industry adjusted ESG Score of the Parent Indexes:
  - MSCI Europe ex UK Select ESG Climate Solutions Target Index

- MSCI Japan Select ESG Climate Solutions Target Index
- MSCI UK IMI Select ESG Climate Solutions Target Index

- The weighted-average clean technologies solutions revenue percentage of the Indexes will be at least 50% more than the weighted-average clean technologies solutions revenue percentage of the Parent Indexes.

- The reduction in the Carbon Emission Intensity and the Potential Emissions per dollar of market capitalization of the Indexes relative to the Parent Indexes will be at least 50%. The Carbon Emission Intensity and the Potential Emissions per dollar of market capitalization of the Index are calculated using the formulae defined in Appendix IV.

- The maximum weight of an Index constituent will be restricted to the lower of (the weight of the security in the Parent Index + 2%) and 10 times the weight of the security in the Parent Index. The minimum weight of an Index constituent will be restricted to the higher of the (weight of the security in the Parent Index - 2%) and 0.

- The exposure of the Indexes to the Size and Midcap Barra style factors will be restricted to +/-0.25 standard deviations relative to the Parent Indexes.

- For the Indexes below, the sector weights of the Indexes will not deviate more than +/-2% from the sector weights of the Parent Indexes:
- MSCI World Select ESG Climate Solutions Target Index
- MSCI USA Select ESG Climate Solutions Target Index
- MSCI Emerging Markets Select ESG Climate Solutions Target Index
- MSCI AC Asia Pacific ex Japan Select ESG Climate Solutions Target Index
- MSCI Europe ex UK Select ESG Climate Solutions Target Index
- MSCI Japan Select ESG Climate Solutions Target Index

- For the Index below, the sector weights of the Index, excluding the Energy sector, will not deviate more than +/-2% from the sector weights of the Parent Index. The weight of the Index in Energy sector will be unconstrained:
- MSCI UK IMI Select ESG Climate Solutions Target Index

- For countries with weight greater than 2.5% in the Parent Index, the weight in the Index will not deviate more than +/-2% from the country weight in the Parent Index.
- For countries with weight less than 2.5% in the Parent Index, the weight in the Index will be capped at 3 times their weight in the Parent Index.
- The above country weight constraint will also apply on China A Stock Connect listings as a group separately in addition to the usual country weight constraint on China.
- The one-way turnover of the Indexes will be constrained to a maximum of 2.5% at each Index Review.

Constituents with weights below 0.005% after the optimization process will be removed and the total weight of removed constituents will be distributed among the remaining constituents in the proportion of their existing weights.

3.4 Determining the Optimized Index

The Indexes are constructed using the Barra Open Optimizer in combination with the relevant Barra Equity Model[1]. The optimization uses the universe of eligible securities and the specified optimization objective and constraints to determine the Index. The handling of infeasible optimizations is explained in Appendix I.

[1] Please refer to Appendix II for the detailed information on model usage

4 Maintaining the Indexes

4.1 Index Reviews

The Indexes are rebalanced on a quarterly basis, usually as of the close of the last business day of May, August, November and February, coinciding with the May and November Semi-Annual Index Reviews (SAIRs) and the February and August

Quarterly Index Reviews (QIRs) of the MSCI Global Investable Market Indexes. The Barra Equity Model data as of the end of April, July, October and January are used respectively. This approach aims to capture timely updates to the risk characteristics of the companies and coincide with the rebalancing frequency of the relevant Parent Index. Similarly, the ESG data used for the Index Reviews will be taken as of the end of the month preceding the Index Review i.e., April, July, October and January. For some securities, ESG 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, for the rebalancing of the Indexes. This approach aims to capture timely updates to ESG data of the constituents and coincides with the rebalancing of the relevant MSCI Parent Indexes.

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

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 Indexes, the changes made to the Parent Index during intermediate Index Reviews will be neutralized in the Indexes.

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

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 NonMarket Capitalization Weighted indexes.

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

Appendix I: Handling Infeasible Optimizations

During the Index Review, in the event that there is no optimal solution that satisfies all the optimization constraints defined in Section 3.3, the following constraints are relaxed, until an optimal solution is found:

- Relax the turnover constraint in steps of 1.25%, up to a maximum value of 15%
- Relax the maximum weight multiple in steps of 2 up to a maximum value of 20 based on the following formula:

$$\mathrm{wm}_{i+1} = 2 + \mathrm{wm}_i \;\; for\ i = 0\ to\ 5$$

Where wm_i = Maximum Active weight multiple

$$wm_0 = 10$$

- The maximum turnover constraint and maximum active weight multiple constraint are alternately relaxed until a feasible solution is achieved. For example, constraints relaxation for the first 4 relaxations, will be executed in the sequence as follows:

Order of Relaxation	Turnover Limit	Maximum Asset Weight Multiple
1	3.75%	10 times the weight of the security in the Parent Index
2	3.75%	12 times the weight of the security in the Parent Index
3	5.00%	12 times the weight of the security in the Parent Index
4	5.00%	14 times the weight of the security in the Parent Index

In the event that no optimal solution is found after the above constraints have been relaxed, the Index will not be rebalanced for that Index Review.

Appendix II: 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 III: ESG-based Exclusion Criteria

Controversial Weapons:

- All companies that are involved in the production of cluster bombs and munitions, or the essential components of these products.
- All companies that are involved in the production of anti-personnel landmines, anti-vehicle landmines, or the essential components of these products.
- All companies involved in the production of depleted uranium weapons and armour.
- All companies that are involved in the production of chemical and biological weapons, or the essential components of these products.
- All companies that are involved in the production of weapons utilizing laser technology to cause permanent blindness.
- All companies that are involved in the production of weapons that use nondetectable fragments to inflict injury.
- All companies that are involved in the production of weapons using white phosphorus.
- Tobacco:
- All companies classified as a "Producer".
- All companies deriving 5% or more aggregate revenue from the production, distribution, retail, supply and licensing of tobacco-related products.

Thermal Coal:

- All companies deriving 5% or more aggregate revenue (either reported or estimated) from the mining and sale to external parties of thermal coal (including lignite, bituminous, anthracite and steam coal) and the extraction of unconventional oil and gas.

- The underlying Thermal Coal factor does not cover 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.
- The underlying Unconventional Oil & Gas factor covers revenues from oil sands, oil shale (kerogen-rich deposits), shale gas, shale oil, coal seam gas, and coal bed methane. It does not cover all types of conventional oil and gas production including Arctic onshore/offshore, deep water, shallow water and other onshore/offshore.
- All companies deriving 5% or more revenue (either reported or estimated) from thermal coal-based power generation.

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) 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

ESG Controversy Score ("Red Flags"):

- Securities of companies having faced very severe controversies pertaining to ESG issues are not eligible for inclusion in the Index. This is implemented by excluding constituents of Parent Index with MSCI ESG Controversy Score = 0 ("Red Flag" companies). For more details on MSCI ESG Controversies Score, please refer to https://www.msci.com/esg-integration

Missing ESG Data:

- All companies with missing ESG Score or Controversy Score

Appendix IV: Calculation of Carbon Exposure Metrics

Index Carbon Emissions –

Parent Index Carbon Emissions –

$$\sum_i \left(\frac{(Float\ Market\ Capitalization\ * Absolute\ Emissions)}{Issuer\ Market\ Capitalization}\right)$$

Derived Index Carbon Emissions –

$$\sum_i \left(\frac{(Derived\ Index\ Market\ Capitalization\ * Absolute\ Emissions)}{Issuer\ Market\ Capitalization}\right)$$

Parent Index Carbon Emission Intensity is defined as Parent Index Carbon Emissions, as defined above, divided by Parent Index Sales –

$$\sum_i \left(\frac{(Float\ Market\ Capitalization\ * Absolute\ Emissions)}{Issuer\ Market\ Capitalization}\right) / \sum_i \left(\frac{(Float\ Market\ Capitalization\ * Sales)}{Issuer\ Market\ Capitalization}\right)$$

Derived Index Carbon Emissions Intensity is defined as Derived Index Carbon Emissions, as defined above, divided by Derived Index Sales –

$$\sum_i \left(\frac{(Derived\ Index\ Market\ Capitalization\ * Absolute\ Emissions)}{Issuer\ Market\ Capitalization}\right) / \sum_i \left(\frac{(Derived\ Index\ Market\ Capitalization\ * Sales)}{Issuer\ Market\ Capitalization}\right)$$

Index Potential Carbon Emissions from Fossil Fuels–

Parent Index Potential Carbon Emissions from Fossil Fuels–

$$\sum_i \left(\frac{(Float\ Market\ Capitalization\ * Absolute\ Potential\ Emissions)}{Issuer\ Market\ Capitalization}\right)$$

Derived Index Potential Carbon Emissions from Fossil Fuels–

$$\sum_i \left(\frac{(Derived\ Index\ Market\ Capitalization\ * Absolute\ Potential\ Emissions)}{Issuer\ Market\ Capitalization}\right)$$

The following sections have been modified effective December 2022:

- Section 3.3 Optimization Constrains: Update to reference Appendix IV
- Appendix IV: Added to reference formulae used for Carbon Emission Intensity and Potential Emissions per dollar of market capitalization calculation

Contact us

msci.com/contact-us

AMERICAS

Americas	1 888 588 4567 *
Atlanta	+ 1 404 551 3212
Boston	+ 1 617 532 0920
Chicago	+ 1 312 675 0545
Monterrey	+ 52 81 1253 4020
New York	+ 1 212 804 3901
San Francisco	+ 1 415 836 8800
São Paulo	+ 55 11 3706 1360
Toronto	+ 1 416 628 1007

EUROPE, MIDDLE EAST & AFRICA

Cape Town	+ 27 21 673 0100
Frankfurt	+ 49 69 133 859 00
Geneva	+ 41 22 817 9777
London	+ 44 20 7618 2222
Milan	+ 39 02 5849 0415
Paris	0800 91 59 17 *

ASIA PACIFIC

China North	10800 852 1032 *
China South	10800 152 1032 *
Hong Kong	+ 852 2844 9333
Mumbai	+ 91 22 6784 9160
Seoul	00798 8521 3392 *
Singapore	800 852 3749 *
Sydney	+ 61 2 9033 9333
Taipei	008 0112 7513 *
Thailand	0018 0015 6207 7181 *
Tokyo	+ 81 3 5290 1555

* = toll free

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