MSCI World ESG Focus Low Carbon Screened Index Methodology

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Contents

1 Introduction

The MSCI World ESG Focus Low Carbon Screened Index (the 'Index') is designed to maximize its exposure to positive environmental, social and governance (ESG) factors while minimizing the carbon exposure and targeting risk and return characteristics similar to those of the MSCI World Index.

The index is constructed by selecting constituents of MSCI World index (the 'Parent Index') through an optimization process that aims to maximize exposure to ESG factors for a target tracking error budget and reduce the carbon exposure by half with respect to the MSCI World Index under certain constraints.

The Index aims to be sector-diversified and targets companies with high ESG ratings in each sector[1].

[1] The Indexes are governed by a set of methodology and policy documents ("Methodology Set"), including the present index methodology document. The Methodology Set for the Indexes can be accessed from MSCI's webpage https://www.msci.com/index-methodology in the section 'Search Methodology by Index Name or Index Code'.

The Methodology Set includes a document 'ESG Factors in Methodology' that contains the list of environmental, social, and governance factors considered, and how they are applied in the methodology (e.g., selection, weighting or exclusion).

2 Constructing the MSCI World ESG Focus Low Carbon Screened Index

The Indexes use company ratings and research provided by MSCI ESG Research[2] for the Index construction.

Constructing the MSCI World ESG Focus Low Carbon Screened Index involves the following steps:

- Defining the Carbon Exposure of each MSCI World Index constituent
- Defining the Exclusion Criteria
- Defining the Optimization Constraints
- Determining the Optimized Portfolio

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

2.1 Defining the Carbon Exposure of each MSCI World Index constituent

The carbon exposure of a security is measured in terms of its greenhouse gas emissions and its potential carbon emissions from fossil fuel reserves. The MSCI World ESG Focus Low Carbon Screened Index uses MSCI Climate Change Metrics data from MSCI ESG Research.

2.1.1 Greenhouse Gas Emissions

MSCI ESG Research collects company-specific direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions 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. The data is updated on an annual basis. Since the current carbon emissions of a company are directly influenced by its current business activity, MSCI normalizes for size by dividing the annual carbon emissions of the company by the annual sales of the company.

For newly added companies to the Index which do not report emission data and where MSCI ESG Research has not estimated the greenhouse gas emissions yet, MSCI uses the average emissions per dollar of issuer market capitalization for the

[2] See section 4 for further information regarding ESG and climate data used in the Indexes that MSCI Limited sources 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. MSCI Limited is the benchmark administrator for the MSCI indexes.

companies in the same industry group, multiplied by the market capitalization of the company as the estimated emissions for the company.

2.1.2 Potential Emissions from Fossil Fuels

MSCI ESG Research collects fossil fuel reserves data where relevant for companies which have reserves, typically in the Oil & Gas, Coal Mining and Electric Utilities industries[3]. Fossil fuel reserves can be used for several applications including energy or industrial purposes (e.g. coking coal used for steel production). For the construction of the MSCI Global Low Carbon Leaders Core Indexes, only fossil fuel reserves used for energy purposes are taken into account. The data is updated on an annual basis based on information disclosed by companies. Sources include company publications, other public records and third party data providers. For newly added companies to the index where data is not available yet, MSCI uses zero fossil fuel reserves. MSCI normalizes for the company's size by dividing the potential carbon emissions of the company by its market capitalization.

To convert reserves data to potential carbon emissions, MSCI ESG Research applies a formula from the Potsdam Institute for Climate Impact Research.[4]

2.2 Defining the Exclusion Criteria

Companies assessed as having involvement in ESG controversies that are classified as Red Flags (MSCI ESG Controversy Score of 0) are not eligible for inclusion in the MSCI World ESG Focus Low Carbon Screened Index. A Red Flag indicates an ongoing Very Severe ESG controversy implicating a company directly through its actions, products, or operations.

2.2.1 Business Exclusion Criteria

Companies that are involved in specific businesses which have high potential for negative social and/or environmental impact are ineligible for inclusion in the index. Please refer to Appendix 1 for more details on these criteria.

- Tobacco
- Controversial Weapons
- Nuclear Weapons

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

[4] Malte Meinshausen, Nicolai Meinshausen, William Hare, Sarah C. B. Raper, Katja Frieler, Reto Knutti, David J. Frame & Myles R. Allen. *Greenhouse-gas emission Target for limiting global warming to 2 °C.* ***Nature*** 458, 1158-1162 (30 April 2009) | doi:10.1038/nature08017; Received 25 September 2008; Accepted 25 March 2009. Supplementary Information, p. 7.

- Civilian Firearms
- Thermal Coal
- UN Global Compact Violators.

2.2.2 Other Exclusion Criteria

- Missing Controversy Score – Companies not assessed by MSCI ESG Research's MSCI ESG Controversy Scores are excluded from the index.
- Missing ESG Rating or ESG Score – Companies which are not rated by MSCI ESG Research for an MSCI ESG Rating are excluded from the index.

2.3 Defining the Optimization Constraints

The index is optimized to maximize exposure to higher ESG scores and minimize carbon exposure by at least 50% with respect to the MSCI World Index, subject to maintaining risk and return characteristics similar to the MSCI World Index. ESG scores are normalized and used in the optimization process. Optimization aims to maximize the Index's exposure to ESG scores and simultaneously minimize carbon emissions intensity and potential emissions by at least 50% with respect to the MSCI World Index for a given tracking error budget. The ex-ante tracking error target for the MSCI World ESG Focus Low Carbon Screened Index is 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.

2.4 Determining the Optimized Portfolio

The Index is constructed using MSCI's Barra® Open Optimizer in combination with the relevant Barra Equity Model[5]. The optimization uses a universe of eligible securities and the specified optimization objective and constraints to determine the constituents of the MSCI World ESG Focus Low Carbon Screened Index.

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

3 Maintaining the Index

3.1 Quarterly Index Reviews

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

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

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

In general, MSCI uses MSCI ESG Research data[6] (including MSCI ESG Ratings, MSCI ESG Controversies, MSCI ESG Business Involvement Screening Research, and MSCI 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 Ongoing Event-Related Maintenance

The general treatment of corporate events in the Index 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.

The following section briefly describes the treatment of common corporate events within the MSCI World ESG Focus Low Carbon Screened Index.

No new securities will be added (except where noted below) to the Index between Index Reviews. Parent Index deletions will be reflected simultaneously.

[6] See section 4 for details of data sourced from MSCI ESG Research used in the Indexes.

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.

4 MSCI ESG Research

The Index is a product of MSCI Inc. that utilizes 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 Index uses 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.

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/esg-and-climate-methodologies.

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/esg-and-climate-methodologies.

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.

For more details on MSCI ESG Business Involvement Screening Research, please refer to http://www.msci.com/resources/factsheets/MSCI_ESG_BISR.pdf

4.4 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-solutions

Appendix I: Busines Exclusion Criteria

- **Tobacco Involvement**
  - All companies classified as "Producer"
  - All companies deriving 15% or more aggregate revenue from the production, distribution, retail and supply of tobacco-related products.
- **Controversial Weapons Involvement**
  - Cluster Bombs

    MSCI ESG Research's cluster bomb research identifies public companies that are involved in the production of cluster bombs and munitions, or the essential components of these products.
  - Landmines

    MSCI ESG Research's landmines research identifies public companies that are involved in the production of anti-personnel landmines, anti-vehicle landmines, or the essential components of these products.
  - Depleted Uranium Weapons

    MSCI ESG Research's depleted uranium weapons research identifies public companies involved in the production of depleted uranium weapons and armor.
  - Chemical and Biological Weapons

    MSCI ESG Research's chemical and biological weapons research identifies public companies that are involved in the production of chemical and biological weapons, or the essential components of these products.
  - Blinding Laser Weapons

    MSCI ESG Research's blinding laser weapons research identifies public companies that are involved in the production of weapons utilizing laser technology to cause permanent blindness.
  - Non-Detectable Fragments

    MSCI ESG Research's non-detectable fragments research identifies public companies that are involved in the production of weapons that use nondetectable fragments to inflict injury.
  - Incendiary Weapons (White Phosphorus)

    MSCI ESG Research's incendiary weapons research identifies companies that are involved in the production of weapons using white phosphorus.

Involvement criteria:

- Producers of the weapons
- Producers of key components of the weapons (only applies to cluster bombs, landmines, depleted uranium weapons as well as chemical and biological weapons)
- Ownership of 20% or more of a weapons or components producer

The minimum limit is raised to 50% for financial companies having an ownership in a company that manufactures controversial weapons or key components of controversial weapons

- Owned 50% or more by a company involved in weapons or components production

Revenue limits:

- Any identifiable revenues, i.e., zero tolerance

For details please refer to MSCI Global ex Controversial Weapons Indexes Methodology at https://www.msci.com/index/methodology/latest/XCW

- **Nuclear Weapons Involvement**
  - 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 o 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
- **Civilian Firearms**
  - All companies classified as “Producer” of firearms and small arms ammunitions for civilian markets. It does not include companies that cater to the military, government, and law enforcement markets.

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

- **International Norms**
  - Failure to comply with the United Nations Global Compact Principles (UN Global Compact Alignment value of "Fail").

- **Thermal Coal**
  - All companies deriving 30% 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 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
  - All companies deriving 30% or more revenue (either reported or estimated) from the thermal coal based power generation

Appendix II: Optimization Constraints

At each Quarterly Index Review, the following optimization constraints are used to ensure replicability and investability:

Optimization Constraints

No.	Parameter	Values
1	Ex-Ante Tracking Error	0.5%
2	Min Constituent Weight	0.1%
3	Constituent Active Weight	+/-2%
4	Security Weight as a Multiple of its weight in the Parent Index	20
5	Active Sector Weights	+/-5%
6	Active Country Weights*	+/-5%
7	Minimum Reduction in the Carbon Emission Intensity relative to the Parent Index	50%
8	Minimum Reduction in the Potential Emissions per dollar of market capitalization relative to the Parent Index.	50%
9	One Way Turnover during May and November Index Review	10%
10	One Way Turnover during Feb and Aug Index Review	5%
11	Specific Risk Aversion	0.075
12	Common Factor Risk Aversion	0.0075

* Active Country Weights – In case there are countries in the MSCI World Index which weigh less than 2.5% in the MSCI World Index, then for such countries the active country upper bound of +5% is not applicable. When a country weighs less than 2.5% in MSCI World Index then the upper bound of country weight in the MSCI World ESG Focus Low Carbon Screened Index is set at three times of the country's weight in MSCI World 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, first the turnover constraint will be relaxed up to a maximum turnover of 30% in steps of 1% until an optimal solution is found. If a feasible solution is not found at turnover of 30%, 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%. 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.

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

Appendix III: 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 IV: Calculation of Carbon Exposure Metrics

Index Carbon Emissions

- Parent Index Carbon Emissions –

$$\text{Parent Index Carbon Emissions} = \sum_{i} \left(\frac{\text{Float Market Capitalization} * \text{Absolute Emissions}}{\text{Issuer Market Capitalization}} \right)$$

- Derived Index Carbon Emissions –

$$\text{Derived Index Carbon Emissions} = \sum_{i} \left(\frac{\text{Derived Index Market Capitalization} * \text{Absolute Emissions}}{\text{Issuer Market Capitalization}} \right)$$

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

$$\sum\nolimits_{i} \left(\frac{\text{Float Market Capitalization} * \text{Absolute Emissions}}{\text{Issuer Market Capitalization}} \right) \Big/ \sum\nolimits_{i} \left(\frac{\text{Float Market Capitalization} * \text{Sales}}{\text{Issuer Market Capitalization}} \right)$$

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

$$\sum\nolimits_{i} \left(\frac{\text{Derived Index Market Capitalization} * \text{Absolute Emissions}}{\text{Issuer Market Capitalization}} \right) \Big/ \sum\nolimits_{i} \left(\frac{\text{Derived Index Market Capitalization} * \text{Sales}}{\text{Issuer Market Capitalization}} \right)$$

Index Potential Carbon Emissions from Fossil Fuels

- Parent Index Potential Carbon Emissions from Fossil Fuels –

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

- Derived Index Potential Carbon Emissions from Fossil Fuels –

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

Appendix V: Changes to this Document

The following sections have been modified effective December 2022:

- Appendix II: Optimization Constrains: Update to reference Appendix IV
- Appendix IV: Added to reference formulae used for Potential Emissions per dollar of market capitalization calculation

The following sections have been modified as of July 2023:

- Updated to reflect the transition of the MSCI Global Investable Market Indexes (GIMI) to Quarterly Comprehensive Index Reviews (all references to "Semi-Annual Index Reviews" and "Quarterly Index Reviews" of the MSCI GIMI were replaced with "Index Reviews".)
- Section 2.2 Defining the Exclusion Criteria, clarified the exclusion criteria for companies involved in ESG Controversies
- MSCI ESG Research. Moved that section after the Section 3. Updated the descriptions of MSCI ESG Research products.

Contact us

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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 *
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Taipei	008 0112 7513 *
Thailand	0018 0015 6207 7181 *
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