

MSCI Value ESG Low Carbon Target Select Indexes Methodology

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Contents	1 Introduction	4
	2 Index Construction Methodology	5
	2.1 Defining the Parent Index and the Base Currency for Optimization5	ion
	2.2 Defining the Eligible Universe	5
	2.3 Defining the Business Exclusion Criteria	5
	2.4 Defining The Reference Factor Index	6
	2.5 Defining the Security Level Carbon Exposure	6
	2.5.1 Greenhouse Gas Emissions	6
	2.6 Defining the Optimization Setup	7
	2.6.1 Optimization Constraints	7
	2.7 Determining the Optimized Index	8
	3 Maintaining the Index	9
	3.1 Semi-Annual Index Reviews	9
	3.2 Ongoing Event Related Changes	9
	4 MSCI ESG Research	.11
	4.1 MSCI ESG Ratings	11
	4.2 MSCI ESG Controversies	11
	4.3 MSCI ESG Business Involvement Screening Research	11
	4.4 MSCI Climate Change Metrics	12
	Appendix I: The Parent Index, the Base Currency for	10
	Optimization and Reference Factor Index	
	Appendix II: Business Exclusion Criteria	.14
	Appendix III: Handling Infeasible Optimizations	. 17
	Appendix IV: Calculation of the Sector Relative Winsorized	10
	Value Z-Score	
	Appendix V: Calculation of Carbon Exposure Metrics	. 19



Appendix VI: New release of Barra® Equity Model or Barra®	
Optimizer	20



1 Introduction

The MSCI Value ESG Low Carbon Target Select Indexes (herein, 'the Indexes') are designed to represent the performance of a strategy that seeks to maximize its exposure to a value factor while systematically integrating environmental, social and governance (ESG) norms.

The Indexes are constructed by selecting constituents of a market capitalization weighted index (the 'Parent Index') and applying an optimization process that aims to maximize the exposure to a value factor, reduce the carbon-equivalent exposure to CO₂ and other Green House Gases (GHG), as well as improve the weighted-average industry-adjusted ESG score and weighted-average Environmental-Pillar score of the Index with respect to their respective Parent Indexes using certain constraints described below¹.

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 Index Construction Methodology

Constructing the Indexes involves the following steps:

- Defining the Parent Index and the base currency for optimization
- Defining the Eligible Universe
- Defining the business exclusion criteria
- Defining the Reference Factor Index
- Defining the security level carbon exposure
- Defining the optimization setup
- Determining the optimized Index

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

2.1 DEFINING THE PARENT INDEX AND THE BASE CURRENCY FOR OPTIMIZATION

Construction of the Indexes begins with identifying the Parent Index which is a free-float adjusted market capitalization weighted MSCI index as per the MSCI Global Investible Markets Index (GIMI) methodology². The Parent Index serves as the universe of eligible securities for optimization. The optimization is performed from a base currency³ perspective and does not allow short selling of securities. Please refer to Appendix I for more details.

2.2 DEFINING THE ELIGIBLE UNIVERSE

The Eligible Universe is constructed by excluding securities from the Parent Index based on the exclusion criteria as described below in Section 2.3.

2.3 DEFINING THE 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 Indexes. The Indexes use MSCI ESG Controversies Scores⁴ to identify such companies.

² For details about the methodology, please refer to: https://www.msci.com/index-methodology

³ Any currency within the relevant Barra Equity Model can be used as an optimization currency. The default currency is the US Dollar.

⁴ 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.



- Controversial Weapons
- Nuclear Weapons
- Tobacco
- Weapons
- Thermal Coal
- Oil Sands Extraction
- Unconventional Oil and Gas
- · Arctic Oil and Gas

Please refer to Appendix II for more details on these criteria.

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

Other Exclusion Criteria

Missing Controversy Score – Companies not assessed by MSCI ESG Research on ESG Controversies are not eligible for inclusion in the Indexes.

2.4 DEFINING THE REFERENCE FACTOR INDEX

The Reference Factor Index is an MSCI Factor Index that is used as the basis to calculate the minimum reduction in the Weighted Average Carbon Intensity relative to Enterprise Value including Cash (EVIC). For more information, please see Appendix I.

2.5 DEFINING THE SECURITY LEVEL CARBON EXPOSURE

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 Indexes use MSCI Climate Change Metrics data from MSCI ESG Research.

2.5.1 GREENHOUSE GAS EMISSIONS

MSCI ESG Research collects company-specific direct (Scope 1) and indirect (Scope 2) greenhouse gas (GHG) 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 emissions⁵.

⁵ For more information on MSCI Climate Change Metrics, please refer to https://www.msci.com/climatechange-solutions.



MSCI ESG Research estimates company-specific indirect (Scope 3) GHG emissions from the Scope 3 Carbon Emissions Estimation Model.

2.6 DEFINING THE OPTIMIZATION SETUP

The optimization objective is to maximize the sector-relative winsorized Value Z-score while controlling the ex-ante Tracking Error relative to the Parent Index at the time of rebalancing. The sector-relative winsorized Value Z-score for each security is calculated using the formulae defined in Appendix IV. The Common Factor Risk Aversion and Specific Risk Aversion factors in the optimization is set to 0.0015 and 0.015 respectively.

2.6.1 OPTIMIZATION CONSTRAINTS

At each semi-annual Index Review, the following optimization constraints are employed, which aim to meet the objectives of the index while ensuring replicability and investability:

- 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 be the higher of the (weight of the security in the Parent Index - 2%) and 0.05%
- The ex-ante Tracking Error of the Index, relative to the Parent Index will be constrained to be equal to or less than 5%
- The sector weights of the Index will not deviate more than +/-5% from the sector weights of the Parent Index
- For countries with weight greater than 2.5% in the Parent Index, the weight in the Index will not deviate more than +/-5% 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 weighted-average industry-adjusted ESG score of the Index will be at least 10% more than the weighted-average industry-adjusted ESG score of the Parent Index at the time of rebalancing



- The weighted-average Environmental Pillar score⁶ of the Index will be at least 10% more than the weighted-average Environmental Pillar score of the Parent Index at the time of rebalancing
- The minimum reduction of 50% in the Weighted Average Carbon Intensity relative to EVIC⁷ of the Index relative to the Parent Index at the time of rebalancing
- The minimum reduction of 50% in the Weighted Average Carbon Intensity relative to EVIC of the Index relative to the Reference Factor Index at the time of rebalancing
- The minimum number of constituents of the Index will be 100 at the time of rebalancing
- The one-way turnover of the Index is constrained to a maximum of 20% at the time of rebalancing

The Weighted Average Carbon Intensity relative to EVIC is calculated using the formulae defined in Appendix V.

2.7 DETERMINING THE OPTIMIZED INDEX

The Indexes are constructed using the Barra Open Optimizer in combination with the relevant Barra Equity Model⁸. The optimization uses the Eligible Universe as the universe of eligible securities and the specified optimization objective and constraints to determine the Index. Infeasible optimizations are handled as explained in Appendix III.

⁶ Please refer to the MSCI ESG Ratings Methodology at https://www.msci.com/esg-and-climate-methodologies for details on Environmental Pillar Score.

⁷ Carbon Intensity relative to EVIC = Scope 1+2 & 3 GHG Emission / EVIC. Prior to the May 2020 Index Review of the Indexes, the Weighted Average Carbon Intensity relative to EVIC has been calculated based on Scope 1+2 GHG Emissions.

⁸ Please refer to Appendix VI for the detailed information on model usage.



3 Maintaining the Index

3.1 SEMI-ANNUAL INDEX REVIEWS

The Indexes are rebalanced on a semi-annual basis, usually as of the close of the last business day of May and November, coinciding with the May and November Index Reviews of the MSCI Global Investable Market Indexes. The Barra Equity Model data as of the day before the rebalancing day is used.

Similarly, the MSCI ESG Research data (including MSCI ESG Ratings, MSCI ESG Controversies Scores, MSCI Business Involvement Screening Research and MSCI Climate Change Metrics) used for the semi-annual Index Reviews will be taken as of the end of the month preceding the Index Review, i.e. April and October. 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, for the rebalancing of the Index.

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

3.2 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.

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 in the Index.



EVENT TYPE EVENT DETAILS

New additions to the Parent IndexA new security added to the Parent

Index (such as IPO and other early inclusion) 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 CharacteristicsA 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:

 $\underline{\text{https://www.msci.com/index/methodology/latest/CE}}.$



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, 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 in: https://www.msci.com/esg-and-climate-methodologies.

4.2 MSCI ESG CONTROVERSIES

MSCI ESG Controversies provides 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 in: https://www.msci.com/esq-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-change-solutions.



Appendix I: The Parent Index, the Base Currency for Optimization and Reference Factor Index

Value ESG Low Carbon Target Select Index	Parent Index	Base Currency for Optimization	Reference Factor Index
MSCI USA IMI Value ESG Low Carbon Target Select Index	MSCI USA IMI Index	USD	MSCI USA Enhanced Value Index



Appendix II: Business Exclusion Criteria

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 Global Ex-Controversial Weapons Indexes available at https://www.msci.com/index-methodology.

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.

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.



Weapons

 All companies that derive 10% or more revenue from weapons systems, components, and support systems and services.

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.

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.

• Unconventional Oil & Gas Extraction

 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 intracompany sales.



Appendix III: 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 2.6, the following constraints are relaxed, until an optimal solution is found:

- Relax the turnover constraint in steps of 2%, up to a maximum of 30%
- Relax the maximum weight multiple in steps of 2 up to a maximum of 5 iterations (up to a maximum of 20 times the weight of the security in the Parent Index)
- The maximum turnover and the maximum active weight multiple constraint are alternately relaxed until a feasible solution is achieved. For example, constraints relaxation is executed in the sequence as illustrated below:

Order of Relaxation	Turnover Limit	Maximum Asset Weight Multiple
1	22%	10 times the weight of the security in the Parent Index
2	22%	12 times the weight of the security in the Parent Index
3	24%	12 times the weight of the security in the Parent Index
4	24%	14 times the weight of the security in the Parent Index

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



Appendix IV: Calculation of the Sector Relative Winsorized Value Z-Score

The value score for each security is calculated by combining the security-level exposures to two factors, Book-to-Price and Earnings Yield, from the GEMLT model. A sector-relative winsorized score is derived from the combined score by standardizing the latter within each sector and winsorizing at +/- 3.

$$Value_i = (0.33) * BtoP_i + (0.67) * EarningsYield_i$$



Appendix V: Calculation of Carbon Exposure Metrics

Calculation of Carbon Intensity relative to EVIC:

For Parent Index constituents where the Carbon Intensity relative to EVIC is not available, the average Carbon Intensity relative to EVIC (Scope 1 & 2 and Scope 3) of all the constituents of the MSCI ACWI Index in the same GICS^{®9} Industry Group in which the constituent belongs is used.

Security Level Carbon Intensity relative to EVIC =

Scope 1 + 2 + 3 GHG Emissions Enterprise Value + Cash(in M\$)

Weighted Average Carbon Intensity relative to EVIC of the Parent Index = $\sum_{i} (Weight \ in \ Parent \ Index * Security \ Level \ Carbon \ Intensity \ relative \ to \ EVIC)$

Weighted Average Carbon Intensity relative to EVIC of the Reference Factor Index =

\(\sum_{\text{(Weight in Reference Factor Index}}\)

* Security Level Carbon Intensity relative to EVIC)

Weighted Average Carbon Intensity relative to EVIC of the Optimized Index =

 $\sum (Index\ Weight*\ Security\ Level\ Carbon\ Intensity\ relative\ to\ EVIC)$

⁹ GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.



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

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



Contact us

AMERICAS

msci.com/contact-us

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
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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
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ASIA PACIFIC

10800 852 1032 *
10800 152 1032 *
+ 852 2844 9333
+ 91 22 6784 9160
00798 8521 3392 *
800 852 3749 *
+ 61 2 9033 9333
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