MSCI World Low Carbon Target Reduced Fossil Fuel Select Index

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1 Introduction

The MSCI World Low Carbon Target Reduced Fossil Fuel Select Index[1] ('the Index') aims to address two dimensions of carbon exposure – carbon emissions and fossil fuel reserves. . The Index is constructed from MSCI World Index (the "Parent Index") through an optimization process that aims to:

- Reflect a lower carbon exposure than that of the broad market Index by overweighting companies with low carbon emissions and low potential carbon emissions both relative to EVIC .
- Achieve a target level of predicted tracking error while minimizing the carbon exposure and excluding companies with exposure to Fossil Fuels.
- Increase exposure to companies that have carbon reduction targets while excluding those involved in certain controversial business activities.

[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 Index

The Index construction involves the following steps:

- Defining the Eligible Universe
- Defining the Exclusion Criteria
- Defining the Optimization Parameters
- Determining the Optimized Index

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

2.1 Defining the Eligible Universe[2]

The Eligible Universe for the Index is defined by applying the following exclusions on the constituents of the Parent Index.

2.2 Defining the Exclusion Criteria

2.2.1 Controversy Based Exclusions

ESG Controversies: Companies assessed as having involvement in ESG controversies that are classified as Red Flags (MSCI ESG Controversy Score of 0) A Red Flag indicates an ongoing Very Severe ESG controversy implicating a company directly through its actions, products, or operations.

Missing Controversy Score – Companies not assessed by MSCI ESG Research's MSCI ESG Controversy Scores are excluded from the Eligible Universe

2.2.2 Climate Change Based Exclusions

Companies that are involved in specific business activities associated with negative contribution to climate change are ineligible for inclusion in the Indexes. The Indexes use MSCI Climate Change Metrics to identify companies that are involved in the following business activities[3]:

Extraction & Production

- Thermal Coal Mining
- Unconventional Oil & Gas Extraction

[2] Where ESG data is applied, please refer to Section 4 for further information regarding the 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.

[3] Please refer to Appendix I for more details on these criteria.

- Oil Sands Extraction
- Conventional Oil & Gas Extraction

Power Generation

- Thermal Coal Based Power Generation
- Oil & Gas Based Power Generation

Fossil Fuel Reserves Ownership

- Fossil Fuel Reserves – Energy Application

2.3 Defining the Optimization Parameters

The Index is constructed using an optimization process that applies the following objective and constraints:

- Minimize the carbon emission intensity and potential emission intensity[4] subject to an ex-ante tracking error budget of 60 basis points relative to the Parent Index.
- The maximum weight of an Index constituent will be restricted to 20 times its weight in the Parent Index
- The index constituent weights will not deviate more than +/-2% from their weights in the Parent Index
- The minimum constituent weight in the Index will not be less than 0.1 times the minimum constituent weight in the Parent Index.
- The country weights in the Index will not deviate more than +/-2% from the country weights in the Parent Index
- The sector weights in the Index will not deviate more than +/-2% from the sector weights in the Parent Index with the exception of the Energy Global Industry Classification Standard (GICS®)[5] sector where no sector weight constraint is applied
- Minimum 10% Increase in aggregate weight in companies setting targets relative to the aggregate weight of eligible companies in the Parent Index (Companies Setting Targets are defined in Appendix III).
- The one-way turnover budget of the Index is 10% for each semi-annual index review.

In the event that there is no optimal solution that satisfies all the optimization constraints, the one-way index turnover and the predicted tracking error constraints will be relaxed in steps:

- The turnover budget will be relaxed up to a maximum of 20% in steps of 1%.
- The ex-ante tracking error will be relaxed in steps of 0.1% up to 1.00%.

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[4] The calculation of Carbon emission Intensity and Potential Emission Intensity is detailed in Appendix III.

[5] GICS, the global industry classification standard jointly developed by MSCI Inc. and S&P Dow Jones Indices.

- 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.

2.4 Determining the Optimized Index

The MSCI World Low Carbon Target Reduced Fossil Fuel Select Index are constructed using the Barra Open Optimizer in combination with the relevant Barra Equity Model. The optimization uses the universe of eligible securities and the specified optimization objective and constraints to determine the constituents of the Index.

3 Maintaining the Index

3.1 Semi-Annual Index Reviews

The Index is reviewed on a semi-annual basis in May and November to coincide with the May and November Index Reviews of the MSCI Global Investable Market Indexes, and the changes are implemented as of the close of the last business day of May and November. In general, the pro forma Index is announced nine business days before the effective date.

In general, MSCI uses MSCI ESG Research LLC data (including 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 LLC 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 Quarterly Index Reviews

The index is reviewed on a quarterly basis to coincide with the Index Reviews of the MSCI Global Investable Market Indexes, as of the close of the last business day of February and August. At quarterly reviews, the indexes are not reconstituted, but existing constituents will be deleted from the Indexes if they meet the business involvement criteria as defined in Section 3.2. MSCI ESG Climate Change Metrics data is used as of January and July for the February and August Quarterly Index Reviews, respectively. For some securities, this 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.

3.3 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.

Additionally, if the frequency of Index Reviews in the Parent Index is greater than the frequency of Index Reviews in the MSCI World Low Carbon Target Reduced Fossil Fuel Select Index, the changes made to the Parent Index during intermediate Index Reviews will be neutralized in the MSCI World Low Carbon Target Reduced Fossil Fuel Select Index.

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

New securities will not be added (except where noted below) to the Indexes 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.

4 MSCI ESG Research

The Index 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 Climate Change Metrics. MSCI Indexes are administered by MSCI.

4.1 MSCI Climate Change Metrics

MSCI Climate Change Metrics provides 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

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.

Appendix I : Climate Change Based Exclusion Criteria

- **Extraction & Production**
  - **Thermal Coal Mining**
    - All companies deriving 1% 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
  - **Unconventional Oil & Gas Extraction**
    - All companies deriving 5% or more revenue (either reported or estimated) from unconventional oil and gas production. It includes revenue from the production of oil sands, oil shale (kerogen-rich deposits), shale gas, shale oil, coal seam gas, and coal bed methane, as well as revenue from onshore or offshore oil and gas production in the Arctic region. It excludes revenue from conventional oil and gas production including deep water, shallow water, and other onshore/offshore oil and gas.
  - **Oil Sands Extraction**
    - 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.
  - **Conventional Oil & Gas Extraction**
    - All companies deriving more than 0% revenue (either reported or estimated) from conventional oil and gas production and are deriving less than 40% revenue from products, services, or infrastructure projects supporting the development or delivery of renewable energy and alternative fuels.

      The Conventional Oil & Gas Extraction revenue includes revenue from the production of deep water, shallow water, and other onshore /offshore oil and gas. It excludes revenue from unconventional oil and gas production (oil sands, shale oil, shale gas) and onshore /offshore oil and gas production in the Arctic region
- **Power Generation**
  - Thermal Coal-based Power Generation
    - All companies deriving 5% or more revenue (either reported or estimated) from thermal coal-based power generation

- **Oil & Gas-based Power Generation**
  - All companies generating 30% or more of their total electricity from liquid fuel and natural gas in a given year
- **Fossil Fuel Reserves Ownership**
  - Fossil Fuel Reserves – Energy Application
    - Companies that have proved & probable coal reserves and/or oil and natural gas reserves used for energy purposes

Appendix II: Emissions Data Collection by MSCI ESG Research

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.

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

The data is updated on an annual basis.

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[6]. 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 World Low Carbon Target Reduced Fossil Fuel Select Index, 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.

MSCI ESG Research applies a formula from the Potsdam Institute for Climate Impact Research.[7] to convert company level fossil fuel reserves estimates to potential carbon emissions.

For newly added companies to the index where data is not available yet, MSCI uses zero fossil fuel reserves.

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

[7] 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.

Appendix III: Calculation of Target Metrics

Index Carbon Emissions Intensity

Carbon emission intensity of a company is derived by dividing carbon emissions by Enterprise Value including Cash (EVIC).

Security Level GHG Intensity =

$$\frac{Scope\ 1+2+3\ \ Carbon\ Emissions}{Enterprise\ Value + Cash\ (in\ M\$)}$$

Weighted Average GHG Intensity of Index =

$$\sum_i (Index\ Weight * Security\ Level\ GHG\ Intensity)$$

For the constituents where the Scope 1+2+3 Emissions Intensity is not available, the average Scope 1+2+3 Emissions Intensity of all the constituents of the MSCI ACWI in the same GICS Industry Group in which the constituent belongs is used.

Index Potential Emissions Intensity

Potential emission intensity of a company is derived by dividing the potential carbon emissions of the company by its Enterprise Value including Cash (EVIC).

Security Level Potential Emissions Intensity =

$$\frac{Potential\ Emissions}{Enterprise\ Value + Cash\ (in\ M\$)}$$

Potential Emissions Intensity of Index =

$$\sum_i (Index\ Weight\ \ * Security\ Level\ Potential\ Emissions)$$

Companies Setting Targets

The Indexes require a minimum 10% increase in the aggregate weight of companies setting targets compared to the weight of such companies in the Eligible Universe (as defined in section 2.1). Companies setting targets are defined as companies having one or more active carbon emissions reduction target(s) approved by the Science Based Targets initiative (SBTi), or companies meeting all the following requirements:

- Companies publishing emissions reduction targets

- Companies publishing their Scope 1 and 2 annual emissions and
- Companies reducing their GHG intensity by 7% over each of the last 3 years

Missing Data Treatment: For the companies selected through the second criteria, if any of the three metrics is missing then that security is not considered for the companies setting target calculation. Also, if a company's carbon intensity data is missing for any of the last 4 years, then the company's carbon intensity reduction for last three years is not calculated and the company is not considered for the companies setting target calculation.

Changes to the Document

The following sections have been modified as of December 2022:

Section 3: Constructing the Index

- Removed reference to the MSCI Global Low Carbon Target Indexes methodology
- Added the following sections:
  - Section 3.3 Defining the Carbon Exposure of Each Security in the Eligible Universe
  - Section 2.4: Defining the Optimization Parameters
  - Section 2.5: Determining the Optimized Indexes.

The following sections have been modified as of February 2023:

Section 3: Index Maintenance

- Methodology book was updated to reflect the transition of the MSCI Global Investable Market Indexes (GIMI) to Quarterly Comprehensive Index Reviews.
- References to “Semi-Annual Index Reviews” and “Quarterly Index Reviews” of the MSCI GIMI were replaced with “Index Reviews”

The following sections have been modified as of May 2023:

Section 1: Introduction:

- The methodology book was updated with a footnote on Methodology Set

Section 2: Constructing the Index:

The Methodology book was updated to add the relaxation steps when there I no optimal solution that satisfied all the optimization constraints.

The following changes have been modified as of November 2023:

Section 2: Constructing the Index:

- Added Section 2.2.1 ESG Controversy based exclusion.
- Section 2.3 updated to reflect the changes/addition to the optimization constraints:
  - Updated ex-ante tracking error budget
  - Updated carbon intensity & potential emission intensity calculation

  - Added constraint for active asset bounds
  - Added constraint for minimum constituent weight
  - Added Target Setting Companies constraint

Appendix I: Climate Change Based Exclusion Criteria

- Updated to reflect thermal coal mining revenue threshold change

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