MSCI World Low Carbon Target Reduced Fossil Fuel Select Index

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Contents

1 Introduction

The MSCI World Low Carbon Target Reduced Fossil Fuel Select Index aims to address two dimensions of carbon exposure – carbon emissions and fossil fuel reserves. The Index aims to reflect a lower carbon exposure than that of the broad market Index by overweighting companies with low carbon emissions relative to sales and those with low Potential Carbon Emissions per dollar of market capitalization. The Index is designed to achieve a target level of predicted tracking error while minimizing the carbon exposure and excluding companies with exposure to Fossil Fuels.

2 MSCI ESG Research

The Index uses company ratings and research provided by MSCI ESG Research. In particular, the Index uses the following MSCI ESG Research products: MSCI 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 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

3 Constructing the MSCI World Low Carbon Target Reduced Fossil Fuel Select Index

The MSCI World Low Carbon Target Reduced Fossil Fuel Select Index construction involves the following steps:

- Defining the Parent Index
- Defining the Exclusion Criteria
- Defining the Carbon Exposure of Each Security in the Eligible Universe
- Defining the Optimization Parameters
- Determining the Optimized Index

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

3.1 Defining the Parent Index

The starting security universe for the MSCI World Low Carbon Target Reduced Fossil Fuel Select Index includes all the constituents of the MSCI World Index (the "Parent Index").

3.2 Defining the Exclusion Criteria

3.2.1 Climate Change Based Exclusions

The Indexes use MSCI ESG Business Involvement Screening Research to identify companies that are involved in the following business activities.

Companies that meet the business involvement criteria are not eligible for inclusion in the Indexes. Please refer to Appendix I for details on these criteria.

Climate Change based Exclusions:

Reserves

- Fossil Fuel Reserves

Mining and Extraction

- Thermal Coal Mining
- Oil Sands Extraction
- Unconventional Oil and Gas Extraction
- Conventional Oil and Gas Extraction

Power Generation

- Thermal Coal based Power Generation
- Oil and Gas based Power Generation

3.3 Defining the Carbon Exposure of Each Security in the Eligible Universe

The Carbon Exposure of a security is measured in terms of its greenhouse gas (GHG) emissions and its potential emissions from fossil fuel reserves.

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

3.3.2 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[1]. 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. 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.

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

To convert reserves data to potential carbon emissions, MSCI ESG Research applies a formula from the Potsdam Institute for Climate Impact Research.[2]

3.4 Defining the Optimization Parameters

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

- Minimize the carbon exposure subject to a tracking error constraint of 50 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 country weights in the Index will not deviate more than +/-2% from the country weights 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 sector weights in the MSCI World Low Carbon Target Reduced Fossil Fuel Select Index will not deviate more than +/-2% from the sector weights in the Parent Index with the exception of the Energy Sector where no sector weight constraint is applied
- The one-way turnover of the Index is constrained to a maximum of 10% at each index review.

3.5 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. After the optimization process, any securities with extremely low weights (less than 1/10th of the minimum weight in the Parent Index) are eliminated, and their weight is proportionately distributed over the remaining securities in order to determine the final Index constituents.

[2] 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.

4 Maintaining the World Low Carbon Target Reduced Fossil Fuel Select Index

4.1 Semi-Annual Index Reviews

The Index is reviewed on a semi-annual basis in May and November to coincide with the May and November Semi-Annual 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.

4.2 Quarterly Index Reviews

The Index is reviewed on a quarterly basis to coincide with the regular Quarterly 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.

4.3 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 MSCI World Low Carbon Target Reduced Fossil Fuel Select Index.

No new securities will 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.

Appendix I: Climate Change Based Exclusion Criteria

- Extraction & Production
  - Thermal Coal Mining
    - 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 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

The following sections have been modified as of December 2022:

Section 3: Constructing the MSCI World Low Carbon Target Reduced Fossil Fuel Select Index

- Removed reference to the MSCI Global Low Carbon Target Indexes methodology
- Added sections 3.3, 3.4, and 3.5

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