

MSCI GLOBAL LOW CARBON TARGET INDEXES METHODOLOGY

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1 INTRODUCTION

The MSCI Global Low Carbon Target Indexes are designed to address two dimensions of carbon exposure – carbon emissions and fossil fuel reserves. By overweighting companies with low carbon emissions relative to sales and those with low potential carbon emissions per dollar of market capitalization, the indexes aim to reflect a lower carbon exposure than that of the broad market. The indexes are designed to achieve a target level of tracking error while minimizing the carbon exposure.

This methodology may be applied to create MSCI Low Carbon Target Indexes from any of the existing MSCI equity indexes (herein, “Parent Indexes”). Some of the parameters applied to determine the MSCI Low Carbon Target Index may vary based on the Parent Index from which the Low Carbon Target Index is constructed.

2 CHARACTERISTICS OF MSCI GLOBAL LOW CARBON TARGET INDEXES

The MSCI Global Low Carbon Target Indexes aim to demonstrate the following characteristics across markets by re-weighting constituents relative to the underlying free float-adjusted market capitalization weighted Parent Index:

- Lower carbon exposure – in terms of carbon emissions and fossil fuel reserves¹
- Low tracking error relative to the Parent Index
- Low active sector, country and regional biases relative to the Parent Index

¹ Defined in Appendix I

3 CONSTRUCTING THE MSCI GLOBAL LOW CARBON TARGET INDEXES

The MSCI Global Low Carbon Target Indexes are constructed using the following steps:

- Defining the Parent Index
- Defining the Carbon Exposure of each Parent Index constituent
- Defining the optimization parameters
- Determining the optimized pro forma index

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

3.1 DEFINING THE PARENT INDEX

The Parent Index serves as the universe of eligible securities for the Index. The MSCI Global Low Carbon Target Indexes can be constructed on any market capitalization weighted MSCI Index.

3.2 DEFINING THE CARBON EXPOSURE OF EACH PARENT INDEX CONSTITUENT

The Carbon exposure of a security is measured in terms of its greenhouse gas (GHG) emissions and its potential carbon emissions from fossil fuel reserves. The MSCI Global Low Carbon Target Indexes use MSCI ESG CarbonMetrics data provided by MSCI ESG Research Inc.

3.2.1 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 emission for the company.

3.2.2 POTENTIAL CARBON 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 industries². Fossil fuel reserves can be used for several applications including energy or industrial (e.g. coking coal used for steel production). For the development of the MSCI Global Low Carbon Target Indexes, only fossil fuel reserves used for energy are taken into account. The data is updated on an annual basis and 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. The size of reserves of a company typically influences its market valuation, and hence MSCI normalizes for 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.³

3.3 DEFINING THE OPTIMIZATION PARAMETERS

At each semi-annual index review, the MSCI Global Low Carbon Target Indexes are constructed using an optimization process that aims to achieve replicability and investability, subject to the following optimization objective and constraints:

- Minimize the carbon exposure subject to a tracking error constraint of 30 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 MSCI Global Low Carbon Target Index will not deviate more than +/-2% from the country weights in the Parent Index
- The sector weights in the MSCI Global Low Carbon Target 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

² For more information, please refer to the MSCI ESG CarbonMetrics methodology

³ 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.

3.4 DETERMINING THE PRO FORMA INDEX

The MSCI Global Low Carbon Target Indexes are constructed using the Barra Open Optimizer in combination with the relevant Barra Equity Model. The optimization uses the Parent Indexes as the universe of eligible securities and the specified optimization objective and constraints to determine the optimized MSCI Global Low Carbon Target Indexes. After the optimization process, any securities with extremely low weights (less than $1/10^{\text{th}}$ of the minimum weight in the Parent Indexes) are eliminated, and their weight is proportionately distributed over the remaining securities in order to determine the final pro forma indexes.

4 MAINTAINING THE MSCI GLOBAL LOW CARBON TARGET INDEXES

4.1 SEMI-ANNUAL INDEX REVIEWS

The changes resulting from the Semi-Annual Index Reviews of the MSCI Global Low Carbon Target Indexes will be made as of the close of the last business day of May and November, coinciding with the May and November Semi-Annual Index Reviews of the Parent Indexes. The pro forma indexes are announced nine business days before the effective date.

For the May and the November Semi-Annual Index Reviews, the Barra model data as of the end of April and the end of October is used respectively.

At each rebalancing, a constraint factor is calculated for each constituent in the MSCI Global Low Carbon Target Index. The constraint factor is defined as the weight in the MSCI Global Low Carbon Target Index at the time of the rebalancing divided by the weight in the Parent Index. The constraint factors as well as the constituents in the index remain constant between index reviews except in case of corporate events as described below.

4.2 ONGOING EVENT RELATED CHANGES

The MSCI Global Low Carbon Target Indexes follow the event maintenance of the Parent Index subject to the exceptions noted below.

4.2.1 IPOS AND OTHER EARLY INCLUSIONS

IPOs and other newly listed securities will only be considered for inclusion at the next Semi-Annual Index Review, even if they qualify for early inclusion in the Parent Indexes.

4.2.2 ADDITIONS AND DELETIONS DUE TO CORPORATE EVENTS

There will be no early inclusion of new securities to the MSCI Global Low Carbon Target Indexes. A constituent deleted from the Parent Index following a corporate event or during the Index Review of the Parent Index will be simultaneously deleted from the MSCI Global Low Carbon Target Indexes.

Please refer to the MSCI Corporate Events Methodology book available at: <http://www.msci.com/products/indexes/size/standard/methodology.html> for more details.

APPENDIX I: CALCULATION OF CARBON EXPOSURE METRICS

INDEX CARBON EMISSIONS –

- Parent Index Carbon Emissions –

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

- 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 –

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

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

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

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–

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

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