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1 Introduction

Two new categories of climate benchmark were created by the EU Benchmark Regulation (EU delegated acts)\(^1\) which sets out the minimum standards for such indexes. The two benchmark types are EU Climate Transition Benchmarks (CTBs) and EU Paris-Aligned Benchmarks (PABs).

The MSCI ACWI EU Paris Aligned Requirements Index (“The Index”) is designed to meet the minimum standards of the EU Paris-Aligned Benchmark (PAB). The Index is constructed from MSCI ACWI (“The Parent Index”) using an optimization-based approach\(^3\) and aims to:

- Reduce the weighted average greenhouse gas intensity by 50% compared to the underlying investment universe.
- Reduce the weighted average greenhouse gas (GHG) intensity by 7% on an annualized basis
- Achieve a modest tracking error compared to the Parent Index and low turnover.
- Exclude companies involved in Controversial Weapons businesses, Very Severe ESG Controversies, Severe Environmental Controversies, Tobacco Manufacturing, Thermal Coal, Oil & Gas and Fossil Fuel-based power generation.

Additionally, the index implements a phase-in of Scope 3 Emissions as detailed in section 3.6 of this methodology.

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\(^1\) Regulation (EU) 2016/1011 as amended by Regulation (EU) 2019/2089

\(^3\) In case there are changes in the EU delegated acts and an update to the Index methodology is required, MSCI will issue an announcement prior to implementing the changes in the methodology. MSCI will not conduct a formal consultation for such an update.
MSCI ESG Research

MSCI ESG Research provides in-depth research, ratings and analysis of the environmental, social and governance-related business practices of thousands of companies worldwide. It consists of an integrated suite of tools and products to efficiently manage research, analysis and compliance tasks across the spectrum of ESG factors.

The Index uses company ratings and research provided by MSCI ESG Research. In particular, this index uses the following MSCI ESG Research products: MSCI Climate Change Metrics, MSCI ESG Controversies and MSCI ESG Business Involvement Screening Research.

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 provides climate data & tools to support investors integrating climate risk & opportunities into their investment strategy and processes. It supports investors seeking to achieve a range of objectives, including measuring and reporting on climate risk exposure, implementing low carbon and fossil fuel-free strategies, align 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
2.2 MSCI ESG CONTOVERSIES

MSCI ESG Controversies (formerly known as MSCI Impact Monitor) provides assessments of controversies concerning the 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.

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

2.3 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
3 Constructing the Index

3.1 APPLICABLE UNIVERSE
The Applicable Universe includes all the existing constituents of the MSCI ACWI Index (“Parent Index”).

3.2 ELIGIBLE UNIVERSE
The Eligible Universe is constructed from the Applicable Universe by excluding securities of companies based on the exclusion criteria below

1. **Controversial Weapons**: All companies involved in Controversial Weapons as defined by the methodology of the MSCI Ex-Controversial Weapons Indexes.

2. **ESG Controversies**: All companies having faced very severe controversies pertaining to ESG issues – Defined as companies with an ESG Controversy Score of 0.

3. **Environmental Harm**: All companies having faced very severe and severe controversies pertaining to Environmental issues – Defined as companies with an Environment Controversy Score of 0 or 1.

4. **Tobacco**: All companies that are involved in the manufacturing of Tobacco products

5. **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 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 (either reported or estimated)

6. **Oil & Gas**: All companies deriving 10% or more revenue from oil and gas related activities, including distribution / retail, equipment and services, extraction and production, pipelines and transportation and refining but excluding biofuel production and sales and trading activities.
7. **Power Generation**: All companies deriving 50% or more revenue from thermal coal based power generation, liquid fuel based power generation and natural gas based power generation.

### 3.3 SECURITY SELECTION AND WEIGHTING

Securities in the Eligible Universe are selected and weighted following an optimization based approach.

### 3.4 OPTIMIZATION CONSTRAINTS

At each Semi-Annual Index Review, the index is constructed using an optimization process that aims to achieve replicability and investability as well as minimize ex-ante tracking error relative to the Parent Index subject to the following constraints:

1. Climate objectives – constraints detailed in Table 1
2. Diversification objectives – constraints detailed in Table 2

The definitions of the target metrics for the optimization are detailed in Appendix I.

*Table 1: Constraints imposed to meet climate objectives*

<table>
<thead>
<tr>
<th>No.</th>
<th>Climate Objectives</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Minimum reduction in Greenhouse Gas (GHG) Intensity (Scope 1+2+3) relative to the Reference Index</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Minimum average reduction (per annum) in GHG Intensity relative to GHG Intensity of the index at the Base Date</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Minimum active weight in High Climate Impact Sector relative to Reference Index as defined in Appendix I</td>
<td></td>
</tr>
</tbody>
</table>

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9 As per [https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter7.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter7.pdf), thermal coal based power generation, liquid fuel based power generation and natural gas based power generation have median lifecycle emissions exceeding 100gCO₂/kWh.

10 Prior to the May 2020 Semi-Annual Index Review (SAIR) of the Index, the Weighted Average Carbon Emissions Intensity has been calculated based on Scope 1+2 Emissions.

11 For more details on Base Date, please refer to section 3.6.
Table 1: Constraints imposed to meet diversification objectives

<table>
<thead>
<tr>
<th>No.</th>
<th>Diversification Objective</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Constituent Active Weight relative to the Parent Index</td>
<td>+/- 2%</td>
</tr>
<tr>
<td>5.</td>
<td>Security Weight as a multiple of its weight in the Parent Index</td>
<td>20x</td>
</tr>
<tr>
<td>6.</td>
<td>Active Sector Weights (the Energy GICS Sector is not constrained) relative to the Parent Index</td>
<td>+/-5%</td>
</tr>
<tr>
<td>7.</td>
<td>Active Country Weights relative to the Parent Index&lt;sup&gt;12&lt;/sup&gt;</td>
<td>+/-5%</td>
</tr>
<tr>
<td>8.</td>
<td>One Way Turnover</td>
<td>5%</td>
</tr>
<tr>
<td>9.</td>
<td>Common Factor Risk Aversion</td>
<td>0.0075</td>
</tr>
<tr>
<td>10.</td>
<td>Specific Risk Aversion</td>
<td>0.075</td>
</tr>
</tbody>
</table>

During the Semi-Annual Index Review, in the event that there is no optimal solution that satisfies all the optimization constraints, the following constraints will be relaxed, until an optimal solution is found:

- Relax the one-way index turnover constraint in steps of 1% up to 20%
- Relax the active sector weight constraint in steps of 1% up to +/-20%
- The one-way index turnover constraint and the active sector weight 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 Semi-Annual Index Review.

**DETERMINING THE OPTIMIZED INDEX**

The Index is constructed using the Barra Open Optimizer<sup>13</sup> in combination with the relevant Barra Equity Model. The optimization uses universe of eligible securities and the specified optimization objectives and constraints to determine the constituents of the Indexes.

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<sup>12</sup> In case there are countries in the parent index which weigh less than 2.5% in the parent index then for such countries the active country upper bound of +5% is not applicable. When a country weighs less than 2.5% in parent index then the upper bound of country weight in the Index is set at three times of the country’s weight in parent index.

<sup>13</sup> Please refer to Appendix II and III for more details.
3.6 **Phase-in of Scope 3 Emissions**

As per the EU Delegated Acts, Scope 3 Emissions may be phased-in as per an implementation schedule, based on the companies’ NACE classifications. NACE is the European Union's classification of economic activities. Index aims to phase-in Scope 3 emissions as per the same implementation schedule. The table below details the NACE Divisions for which the Scope 3 emissions would be considered (“Target Divisions”) based on the corresponding Sem-Annual Index Review dates.

**Table 3: Phase-in of Scope 3 emissions**

<table>
<thead>
<tr>
<th>Period</th>
<th>Target Divisions</th>
<th>Base Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to but not including the May 2020 SAIR</td>
<td>Scope 3 Emissions are not considered for any NACE Division</td>
<td>November 2013 SAIR</td>
</tr>
<tr>
<td>From the May 2020 up to but not including the November 2022 SAIR</td>
<td>Scope 3 Emissions to be considered only for Divisions 05 to 09 and 19 and 20</td>
<td>May 2020 SAIR</td>
</tr>
<tr>
<td>From the November 2022 SAIR up to but not including the November 2024 SAIR</td>
<td>In addition to the above NACE Divisions, Scope 3 Emissions to be considered for Divisions 10 to 18, 21 to 33, 41, 42 and 43, 49 to 53 and Division 81</td>
<td>November 2022 SAIR</td>
</tr>
<tr>
<td>From the November 2024 SAIR onwards</td>
<td>Scope 3 Emissions to be considered for all NACE Divisions</td>
<td>November 2024 SAIR</td>
</tr>
</tbody>
</table>

MSCI uses the following steps to identify the GICS Sub-Industries which map to the Target Divisions for each of the Phase-In periods.

1. MSCI has published a mapping\(^{15}\) between the NACE classes and GICS Sub-Industry.

2. Based on this mapping, for each GICS Sub-Industry, the number of NACE Classes which fall under the Target Divisions (\(N_T\)) are identified.

3. If a GICS Sub-Industry is mapped to any NACE class falling under the “Target Divisions” (\(N_T>0\)), Scope 3 Emissions are considered for all constituents of the Applicable Universe which belong to the given GICS Sub-Industry.

Additionally, when the Target Divisions are updated as per the above Phase-In Schedule, a new Base Date will be implemented at the first Semi-Annual Index Review (SAIR) of that period –

- The One-way Index Turnover Constraint (Diversification Objective 8) will be relaxed to 100%
- The 7% Minimum average reduction (per annum) in GHG Intensity relative to GHG Intensity of the index at the Base Date (Climate Objective 2) will not be applied. Instead, going forward, the GHG Intensity (described further below) as of the first SAIR of the period will be used to calculate the 7% average reduction trajectory for subsequent rebalances.

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\(^{15}\)This mapping is available in the Handbook of Climate Transition Benchmarks, Paris-Aligned Benchmark and Benchmarks’ ESG Disclosures
4 Maintaining the Index

4.1 SEMI-ANNUAL INDEX REVIEWS

The Index is rebalanced on a semi-annual basis, as of the close of the last business day of May and November, coinciding with the May and November Semi-Annual Index Review of the MSCI Global Investable Market Indexes. The pro forma Index is in general announced nine business days before the effective date.

In general, MSCI uses MSCI ESG Research data (including MSCI Climate Change Metrics, MSCI ESG Controversies and MSCI Business Involvement Screening Research) as of the end of the month preceding the Index Reviews for the rebalancing of the Index.

4.2 ONGOING EVENT RELATED CHANGES

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 Index, the changes made to the Parent Index during intermediate Index Reviews will be neutralized in the Index.

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

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

<table>
<thead>
<tr>
<th>EVENT TYPE</th>
<th>EVENT DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>New additions to the Parent Index</td>
<td>A new security added to the parent index (such as IPO and other early inclusions) will not be added to the index.</td>
</tr>
</tbody>
</table>
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: Calculation of Target Metrics

Calculation of GHG Intensity

For Parent Index 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.

Security Level GHG Intensity =

\[
\frac{\text{Scope 1 + 2 + 3 Carbon Emissions} \times (1 + \text{EVIAF})}{\text{Enterprise Value} + \text{Cash (in M$)}}
\]

Enterprise Value Inflation Adjustment Factor (EVIAF) =

\[
\text{EVIAF} = \left(\frac{\text{Average (Enterprise Value + Cash)}}{\text{Previous (Average (Enterprise Value + Cash))}}\right) - 1
\]

Weighted Average GHG Intensity of Parent Index =

\[
\sum (\text{Weight in Parent Index} \times \text{Security Level GHG Intensity})
\]

Weighted Average GHG Intensity of Derived Index =

\[
\sum (\text{Index Weight} \times \text{Security Level GHG Intensity})
\]

Calculation of Average Decarbonization

On average, the Indexes follow a 7% decarbonization trajectory since the Base Date. The Weighted Average GHG Intensity at the Base Date \(W_1\) is used to compute the target Weighted Average GHG Intensity at any given Semi-Annual Index Review \(W_t\) as per the below formula.

\[
W_t = W_1 \times 0.93^{(t-1)/2}
\]

Where ‘t’ is the number of Semi-Annual Index Reviews since the Base Date.

Thus, for the 3rd Semi-Annual Index Review since the Base Date \(t=3\), the target Weighted Average GHG Intensity will be \(W_1\times 0.93\).

Climate Impact Sectors
NACE\textsuperscript{16} is the European Union’s classification of economic activities. As per the draft DA, stocks in the NACE Section codes A, B, C, D, E, F, G, H, L are classified as “High Climate Impact” sector and other stocks are classified ‘Low Climate Impact’ sector. The GICS\textsuperscript{17} Sub-Industry code for each security is mapped to the corresponding “Climate Impact Sector” using a mapping. This mapping is constructed in the following steps:

1. MSCI has published a mapping\textsuperscript{18} between the NACE classes and GICS Sub-Industry.

2. For each GICS Sub-Industry, the number of NACE classes which fall under the High Climate Impact Sector (say the number of classes is \(N_H\)) and Low Climate Impact Sector (say the number of classes is \(N_L\)) is identified.

3. If all the NACE classes for a given GICS Sub-Industry are identified in the High Climate Impact Sector (\(N_L = 0\)), then the GICS Sub-Industry is mapped to the High Climate Impact Sector. Conversely, if all the NACE classes for a given GICS Sub-Industry are identified in the Low Climate Impact Sector (\(N_H = 0\)) then the GICS Sub-Industry is mapped to the Low Climate Impact Sector.

4. In case a GICS Sub-Industry is mapped to some NACE classes in the High Climate Impact Sector and the others in the Low Climate Impact Sector, the GICS Industry is mapped to the Climate Impact Sector in the following manner:
   a. \(N_H \geq N_L\): If the number of NACE classes in the High Climate Impact Sector is at least equivalent to the number of NACE classes in the Low Climate Impact Sector, the GICS Sub-Industry is mapped to the High Climate Impact Sector.
   b. \(N_H < N_L\): If the number of NACE classes in the High Climate Impact Sector is less than the number of NACE classes in the Low Climate Impact Sector, the GICS Sub-Industry is mapped to the Low Climate Impact Sector.

5. Using the GICS Sub-Industry to Climate Impact Sector mapping created in Step 4, and the security-level GICS Sub-Industry, each security in the Parent

\textsuperscript{16} For further details regarding NACE, please refer to https://ec.europa.eu/eurostat/statistics-explained/index.php?title=NACE_background

\textsuperscript{17} For further information regarding GICS, please refer to https://www.msci.com/gics

\textsuperscript{18} This mapping is available in the Handbook of Climate Transition Benchmarks, Paris-Aligned Benchmark and Benchmarks’ ESG Disclosures.
Index is classified in either High Climate Impact Sector or Low Climate Impact Sector
Appendix II: Barra Equity Model Used in The Optimization

The MSCI Climate Paris Aligned Indexes currently use an optimization setup using the MSCI Barra Global Equity Model for Long-Term Investors (GEMLTL).
Appendix III: New release of Barra® Equity Model or Barra® Optimizer

A major new release of the relevant Barra Equity Model or Barra Optimizer may replace the former version within a suitable timeframe.
## ABOUT MSCI

MSCI is a leader provider of critical decision support tools and services for the global investment community. With over 50 years of expertise in research, data and technology, we power better investment decisions by enabling clients to understand and analyze key drivers of risk and return and confidently build more effective portfolios. We create industry-leading research-enhanced solutions that clients use to gain insight into and improve transparency across the investment process.

The process for submitting a formal index complaint can be found on the index regulation page of MSCI’s website at: https://www.msci.com/index-regulation.

To learn more, please visit www.msci.com.

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### ASIA PACIFIC

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<td>Thailand</td>
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