

MSCI Climate Change CTB Select Indexes Methodology

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1 Introduction

The MSCI Climate Change CTB Select Indexes (the ‘Indexes’) aim to represent the performance of an investment strategy that re-weights securities based upon the opportunities and risks associated with the transition to a lower carbon economy. The Indexes also exclude companies meeting the below exclusion criteria –

- Companies involved in manufacturing of Controversial Weapons
- Companies involved in ESG Controversies
- Companies involved in Environmental Controversies
- Companies involved in the Tobacco-related businesses
- Companies involved in Thermal Coal extraction and mining
- Companies involved in oil & gas extraction

The Indexes are constructed from their corresponding market capitalization weighted indexes (the ‘Parent Indexes’) and use the MSCI Low Carbon Transition¹ (LCT) score and category to reweight constituents of the Parent Indexes to increase exposure to companies participating in opportunities associated with transition and decrease exposure to companies exposed to risks associated with transition. As a final step, the Indexes are designed to exceed the minimum standards of the EU Climate Transition Benchmark (CTB)². The Indexes apply an *heuristics-based* approach in order to meet the following objectives –

- Reduce the weighted average greenhouse gas intensity by 30% (compared to the underlying investment universe).
- Reduce the weighted average greenhouse gas (GHG) intensity by 7% on an annualized basis
- Reduce the weighted average potential emissions intensity by 30% (compared to the underlying investment universe).
- Have at least equivalent ratio of weighted average “Green Revenues” to weighted average “Fossil fuels-based Revenues” as that of the underlying investment universe³

To avoid concentration, the Indexes are capped as per the MSCI 20/35 Indexes methodology⁴.

¹ Please refer to Appendix II: MSCI Low Carbon Transition Risk Assessment and <https://www.msci.com/climate-change-solutions> for further details regarding the MSCI Low Carbon Transition score and category.

² On December 3, 2020, the European Commission has published the delegated acts in the Official Journal (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1818&from=EN>) which contain the minimum technical requirements for the EU Climate Transition Benchmarks. 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.

³ The Index is governed by a set of methodology and policy documents (“Methodology Set”), including the present index methodology document. Please refer to Appendix VIII for more details.

⁴ For more information on the MSCI 20/35 Indexes methodology, please refer to <https://www.msci.com/index-methodology>

2 Constructing the Indexes

The Indexes use company ratings and research provided by MSCI ESG Research⁵ to determine eligibility for Index inclusion.

2.1 Applicable Universe

The Applicable Universe includes all the existing constituents of corresponding Parent Indexes.

2.2 Minimum Requirements

The requirements⁶ imposed for the MSCI Climate Change CTB Select Indexes are detailed in Table 1.

Table 1: Requirements imposed for the MSCI Climate Change CTB Select Indexes

Minimum Requirements	MSCI Climate Change CTB Select Indexes
Minimum reduction in Weighted Average Scope 1+2+3 ⁷ Carbon Emissions Intensity (WACI) relative to Parent Index	30%
Minimum reduction in Weighted Average Potential Emissions Intensity relative to Parent Index	30%
Baseline Exclusions	<ul style="list-style-type: none"> Controversial Weapons ESG Controversy Score of 0 Tobacco Involvement⁸ Red or Orange Flag Environmental Controversies Thermal Coal Mining
Minimum average reduction (per annum) in WACI relative to WACI in the Base Date ⁹	7%
Minimum ratio of Green Revenue/ Fossil fuels-based Revenue relative to Parent Index	At least equivalent

⁵ 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 and MSCI Deutschland GmbH are the benchmark administrators for the MSCI indexes.

⁶ The minimum requirements for EU Climate Transition Benchmarks in the EU Delegated Acts are detailed in Appendix V

⁷ Prior to the May 2020 Semi-Annual Index Review (SAIR) of the Indexes, the Weighted Average Carbon Emissions Intensity was calculated based on Scope 1+2 Emissions.

⁸ All companies that are assessed as Tobacco Producers or derive 5% or more revenue from Tobacco related businesses.

⁹ Prior to the May 2020 Semi-Annual Index Review (SAIR) of the Indexes, the average reduction in WACI has been calculated using Scope 1+2 Emissions since Inception.

Active weight in High Climate Impact Sector relative to Parent Indexes as defined in Section 2.5	<p>0%</p>
Corporate Target Setting	<p>Aims to achieve higher allocation to companies that set targets, publish emissions and have reduced their Carbon Intensity by 7% over each of the last 3 years.¹⁰</p>

2.3 Eligible Universe

The Eligible Universe is constructed from the constituents for the Parent Indexes by excluding securities based on the exclusion criteria listed below:

- **Controversial Weapons:** Companies involved in Controversial Weapons as defined by the methodology of the MSCI Ex-Controversial Weapons Indexes.
- **ESG Controversies:** All 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.
- **Tobacco:** All companies that are Tobacco Producers or derive 5% or higher revenue from tobacco related businesses.
- **Environmental Harm:** All companies assessed as having involvement in environmental controversies that are classified as Red (MSCI Environmental Controversy Score of 0) or Orange Flags (score of 1).
 - A Red Flag indicates an ongoing, Very Severe ESG controversy implicating a company directly through its actions, products, or operations.
 - An Orange Flag indicates an ongoing Severe ESG controversy implicating a company directly, or a Very Severe ESG controversy that is either partially resolved or indirectly attributed to the company’s actions, products, or operations.
- **Nuclear Weapons:** All companies involved meeting specific Nuclear Weapons business involvement criteria as described in Appendix V.
- **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)

¹¹ As per https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter7.pdf, thermal coal based power generation has median lifecycle emissions exceeding 100gCO2/kWh.

- **Thermal Coal Generation:**
 - All companies deriving more than 10% revenues from thermal coal-based power generation.
 - All companies that are deriving 50% or more power¹¹ from thermal coal.
 - All companies that provide evidence of owning thermal coal including those that own less than 50% of a reserves field. Evidence of owning reserves includes companies providing the exact volume of reserves, and companies making a statement about their ownership of reserves. Thermal coal is used to fire power plants that produce steam for electricity and industrial uses.
- **Unconventional Oil & Gas:** 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 intra-company sales

2.4 Determination Of Combined Score

Each company in the Eligible Universe is assigned a Combined Score, which is calculated using a company’s LCT Category and its Low Carbon Transition Score as outlined below.

2.4.1 Category Tilt Score

The ‘Category Tilt Score’ is used to express relative tilt towards or away from a stock based on the LCT Category. Based on the LCT Category of a company, a Category Tilt Score is assigned based on the table below:

LCT Category	Category Tilt Score
Solutions	2
Neutral	1

¹¹ As per https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter7.pdf, thermal coal based power generation has median lifecycle emissions exceeding 100gCO2/kWh.

Operational Transition	0.667
Product Transition	0.333
Asset Stranding	0.167

2.4.2 Relative Tilt Score

The 'Relative Tilt Score' differentiates companies within an LCT Category. Companies with higher LCT Score are determined by MSCI ESG Research to be relatively better at managing their climate related risk compared to their peers with worse LCT Score.

The Relative Tilt Score is calculated by normalizing security level LCT score relative to the maximum¹² LCT Score of the LCT Category within the Parent Indexes. The 'Relative Tilt Score' is floored at 0.5 to balance its effect on the final weight of index constituents.

$$\text{Relative Tilt Score} = \frac{\text{LCT Score}}{\text{Maximum}^2 \text{ LCT Score in LCT Category}}$$

2.4.3 Combined Score

The Combined Score is calculated for each company as follows:

Combined Score = Category Tilt Score * Relative Tilt Score.

2.5 Weighting Scheme

At each rebalancing, all the securities from the Eligible Universe are weighted by the product of their weight in the Parent Index and the Combined Score.

$$\text{Security Weight} = \text{Combined Score} * \text{Weight in Parent Index}$$

The above weights are then normalized to 100%.

2.6 Intermediate Universe

Each security in the Applicable Universe is classified into one of two climate impact sectors¹³ based on its NACE section code. A stock can be assigned to either a 'High Climate Impact' or 'Low Climate Impact' sector. The Eligible Universe is broken into two smaller universes as described below:

2.6.1 High Climate Impact Intermediate Universe

High Climate Impact Intermediate Universe is constructed in following two steps –

- Select all securities in the High Climate Impact Sector from the Applicable Universe.

¹² To account for potential outliers within each LCT Category, the category maximum LCT Score is calculated after winsorizing the security level LCT Score at 90th percentile of the LCT Category.

¹³ NACE is the European Union's classification of economic activities. 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. For further details regarding NACE, please refer to https://ec.europa.eu/eurostat/statistics-explained/index.php?title=NACE_background. The GICS Sub-Industry code for each security is mapped to the corresponding "Climate Impact Sector" using a mapping. For further information regarding GICS, please refer to <https://www.msci.com/gics>

- Renormalize the weights of securities so that the aggregate weight of securities is equal to the weight of High Climate Impact Sector in the Parent Indexes.

2.6.1.1 Increased Allocation to Companies Setting Targets

Within the High Climate Impact Intermediate Universe, securities (“securities with targets”) that meet each of the below criteria are identified:

- Securities of companies that have published emissions reduction targets.
- Securities of companies that publish their emissions.
- Securities of companies that have reduced their emissions intensity by 7% over each of the last 3 years.

The Indexes aims to increase the aggregate weight to securities with targets in the following steps¹⁴:

1. Calculate the aggregate weight in the Parent Indexes of all securities with targets in High Climate Impact Sector as W_p
2. Securities in the Applicable Universe are sorted in increasing order of their Scope 1+2+3 Carbon Emissions Intensity and securities in the top half of the sorted list are identified as “Top Half” securities.
3. Calculate the aggregate weight in the High Climate Impact Intermediate Universe of all “Top Half” securities with targets as W_o
4. If W_o is less than 1.2 times of W_p , then the weights of all “Top Half” securities with targets in the High Climate Impact Intermediate Universe are scaled up proportionately so that their aggregate weight in the High Climate Impact Intermediate Universe is equal to 1.2 times of W_p
5. The weight of the remaining securities in the High Climate Impact Sector will be reduced proportionately in order to retain the aggregate weight of the High Climate Impact Intermediate Universe.

2.6.2 Low Climate Impact Intermediate Universe

Low Climate Impact Intermediate Universe is constructed in following two steps –

- Select all securities in the Low Climate Impact Sector from the Applicable Universe.
- Renormalize the weights of securities so that the aggregate weight of securities is equal to the weight of Low Climate Impact Sector in the Parent Index.

2.6.2.1 Increased Allocation to Companies Setting Targets

Within the Low Climate Impact Intermediate Universe, securities (“securities with targets”) that meet each of the below criteria are identified:

- Securities of companies that have published emissions reduction targets
- Securities of companies that publish their emissions

¹⁴ The steps applied are applicable starting from the May 2020 Semi-Annual Index Review.

- Securities of companies that have reduced their emissions intensity by 7% over each of the last 3 years

The Indexes aims to increase the aggregate weight to securities with targets in the following steps:

1. Calculate the aggregate weight in the Parent Indexes of all securities with targets in Low Climate Impact Sector as W_p
2. Securities in the Applicable Universe are sorted in increasing order of their Scope 1+2+3 Carbon Emissions Intensity and securities in the top half of the sorted list are identified as “Top Half” securities.
3. Calculate the aggregate weight in the Low Climate Impact Intermediate Universe of all “Top Half” securities with targets as W_o
4. If W_o is less than 1.2 times of W_p , then the weights of all “Top Half” securities with targets in the Low Climate Impact Intermediate Universe are scaled up proportionately so that their aggregate weight in the Low Climate Impact Intermediate Universe is equal to 1.2 times of W_p
5. The weight of the remaining securities in the Low Climate Impact Sector will be reduced proportionately in order to retain the aggregate weight of the Low Climate Impact Intermediate Universe.

2.7 Final Universe

The Final Universe is constructed by combining the High Impact Intermediate Universe and the Low Impact Intermediate Universe. The High Impact Sector and Low Impact Sector weights are equal to their respective weight in the Parent Indexes.

The security weight within the High Impact and Low Impact sectors are in proportion of the security’s LCT Category¹⁵ and LCT Score. Compared to the Parent Indexes, the Final Universe typically has

- Lower Carbon Footprint
- Higher Green Revenue to Fossil fuels-based Revenue ratio
- Equal weight in High Impact and Low Impact Sector

The weight of securities in the Final Universe is capped as per the below table:

No.	Constrants	Capping Level
1.	Issuer Weights Limits	Max (5%, Parent Issuer Weight) at Issuer Level for Broad Indexes Max (10%, Parent Issuer Weight) at Issuer Level for Narrow Indexes

¹⁵ For details regarding the LCT Category and LCT Score, please refer to Appendix I: MSCI Low Carbon Transition Risk Assessment

2.	Active Sector Weights (the Energy GICS® ¹⁰ Sector is not constrained) relative to the Parent Index	+/- 5%
3.	Min Active Solutions Category Weights relative to the Parent Index	+2%
4.	High Climate Impact Sector and Low Climate Impact Sector Weights relative to the Parent	+/-0%

Please refer to Appendix IV for more details on capping and relaxations.

2.7.1 EU CTB Check

The Final Universe is assessed against the minimum requirements detailed in Table 1 except for the requirement on “Corporate Target Setting”. In case the Final Universe does not meet any of the minimum requirements, then the weights of the securities in the Final Universe are modified through an iterative process as described in Appendix IV.

The weight of issuers in the iterative process is capped as per the below table:

For Broad Indexes	Max(5%, Max (Parent Issuer Weight))
For Narrow Indexes ¹⁶	Max(10%, Max(Parent Issuer Weight))

2.7.2 Applying the MSCI 20/35 Indexes Methodology

The MSCI 20/35 Indexes methodology¹⁷ is then applied to construct the Final Universe, such that the Indexes constrain the weight of the largest group entity¹⁸ at 35%, and all other group entities at 20%, with a buffer of 10% applied on these limits at each index rebalancing.

2.8 Treatment of Unrated Companies

Companies not assessed by MSCI ESG Research on data for any of the following MSCI ESG Research products are not eligible for inclusion in the Indexes:

- MSCI ESG Controversies
- MSCI Climate Change Metrics
- MSCI Business Involvement Screening Research (BISR)

For the treatment of unrated companies in the calculation of target metrics, please refer to Appendix II.

¹⁶ Narrow Parent Indexes are defined as those indexes for which the maximum market capitalization weight in the Parent Index is more than 10%.

¹⁷ For more details, please refer to the MSCI 20/35 Indexes Methodology at www.msci.com/index-methodology

¹⁸ For a definition and a description of the maintenance of Group Entities, please refer to the MSCI 20/35 Indexes methodology at www.msci.com/index-methodology.

3 Maintaining the Indexes

3.1 Semi-Annual Index Reviews

The Indexes are 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 Indexes are 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 Sustainable Impact 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 Indexes.

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.

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.

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 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 Index uses the following MSCI ESG Research products: MSCI ESG Ratings, MSCI ESG Controversies, MSCI ESG Business Involvement Screening Research, and MSCI Climate Change Metrics. MSCI Indexes are administered by MSCI Limited and MSCI Deutschland GmbH.

4.1 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/legal/disclosures/climate-disclosures>

4.2 MSCI Impact Solutions: Sustainable Impact Metrics

MSCI Impact Solutions' Sustainable Impact Metrics is designed to identify companies that derive revenue from products or services with positive impact on society and the environment. The Sustainable Impact Metrics are comprised of six Environmental Impact categories and seven Social Impact categories arranged by theme.

MSCI Sustainable Impact Taxonomy

Pillar	Themes	Categories
Environmental Impact	Climate Change	<ol style="list-style-type: none"> Alternative energy Energy efficiency Green building
	Natural capital	<ol style="list-style-type: none"> Sustainable water Pollution prevention Sustainable agriculture
Social Impact	Basic needs	<ol style="list-style-type: none"> Nutrition Major Disease Treatment Sanitation Affordable Real Estate
	Empowerment	<ol style="list-style-type: none"> SME Finance Education Connectivity – Digital divide

Under each of the actionable environmental and social impact themes, MSCI ESG Research has identified specific categories of products and services that it has determined companies can offer as potential solutions to environmental and social challenges.

For more details on MSCI Sustainable Impact Metrics, please refer to <https://www.msci.com/legal/disclosures/esg-disclosures>.

4.3 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 Ratings methodology can be found at: <https://www.msci.com/legal/disclosures/esg-disclosures>.

4.4 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.

The MSCI Business Involvement Screening Research methodology can be found at: <https://www.msci.com/legal/disclosures/esg-disclosures>.

Appendix I: MSCI Low Carbon Transition Risk Assessment

MSCI ESG Research’s Low Carbon Transition Risk assessment¹⁹ is designed to identify potential leaders and laggards by measuring companies’ exposure to and management of risks and opportunities related to the low carbon transition. The assessment is derived from company disclosures and estimates.

The final output of this assessment is two company-level factors as described below:

- (1) **Low Carbon Transition Category:** This factor groups companies in five categories that highlight the predominant risks and opportunities they are most likely to face in the transition (Exhibit 1).
- (2) **Low Carbon Transition Score:** This score is based on a multi-dimensional risks and opportunities assessment and considers both primary and secondary risks a company faces. It is an industry agnostic assessment of a company’s position vis-à-vis the transition.

LOW CARBON TRANSITION SCORE	LOW CARBON TRANSITION CATEGORY		LOW CARBON TRANSITION RISK / OPPORTUNITY	INDUSTRY EXAMPLES
SCORE = 0	ASSET STRANDING		Potential to experience “stranding” of physical / natural assets due to regulatory, market, or technological forces arising from low carbon transition.	Coal mining & coal-based power generation; industries in the Oil & Gas value chain
	TRANSITION	PRODUCT	Reduced demand for carbon-intensive products and services. Leaders and laggards are defined by the ability to shift product portfolio to low-carbon products.	Petrol/diesel-based automobile manufacturers
		OPERATIONAL	Increased operational and/or capital cost due to carbon taxes and/or investment in carbon emission mitigation measures leading to lower profitability of the companies.	Cement, Steel
	NEUTRAL		Limited exposure to low carbon transition carbon risk. Though companies in this category could have exposure to physical risk and/or indirect exposure to low carbon transition risk via lending, investment etc.	Consumer Staples, Healthcare
	SCORE = 10	SOLUTIONS		Potential to benefit through the growth of low-carbon products and services.

Exhibit 1: Low Carbon Transition Categories and Scores

Calculation methodology

The Low Carbon Transition Categories and Scores are determined by a combination of each company’s current risk exposure and its efforts to manage the risks and opportunities presented by the low carbon transition. The 3-step process followed by MSCI ESG Research is explained below.

¹⁹ For more details on MSCI Climate Change Metrics, please refer to <https://www.msci.com/climate-change-solutions>

Step 1: Measure Low Carbon Transition Risk Exposure

The first step towards measuring the Low Carbon Transition Risk Exposure for a company is the computation of its estimated total net carbon intensity – which considers operational and product carbon emissions. In the next step, we compute Low Carbon Transition Risk Exposure Category and Score based on total net carbon intensity.

Step 2: Assess Low Carbon Transition Risk Management

In the second step, MSCI ESG Research assesses a company's management of risks and opportunities presented by the low carbon transition. This assessment is based on policies and commitments to mitigate transition risk, governance structures, risk management programs and initiatives, targets and performance, and involvement in any controversies.

Step 3: Calculate Low Carbon Transition Category and Score

In the final step, the Low Carbon Transition Risk Exposure Category and Score that was calculated in Step 1 is adjusted for the strength of management efforts. Following this adjustment, Low Carbon Transition Risk Exposure Score of companies with top or second quartile risk management improves and some top and second quartile companies may move up one category.

Appendix II: Calculation of Target Metrics

Greenhouse Gas (GHG) Emissions Intensity

MSCI ESG Research collects company-specific direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions (GHG) 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 generally updated on an annual basis.

Calculation of GHG Intensity

Carbon emissions of a company are normalized for size by dividing annual carbon emissions by Enterprise Value including Cash (EVIC). The Carbon Emissions Intensity is calculated using the latest Scope 1+2 carbon emissions, Scope 3 carbon emissions and EVIC of a company.

Security Level GHG Intensity (Scope 1+2+3) =

$$(Unadjusted\ Security\ Level\ GHG\ Intensity\ (Scope\ 1+2) + Unadjusted\ Security\ Level\ GHG\ Intensity\ (Scope\ 3)) * (1 + EVIAF)$$

Unadjusted Security Level GHG Intensity (Scope 1+2) =

$$\frac{(Scope\ 1 + 2\ Carbon\ Emissions)}{EVIC\ (in\ M\$)}$$

If Scope 1+2 carbon emissions and/or EVIC are not available, the average Scope 1+2 intensity of all the constituents of the MSCI ACWI in the same GICS Industry Group in which the security belongs is used.

Unadjusted Security Level GHG Intensity (Scope 3) =

$$\frac{(Scope\ 3\ Carbon\ Emissions)}{EVIC\ (in\ M\$)}$$

If Scope 3 carbon emissions and/or EVIC are not available, the average Scope 3 intensity of all the constituents of the MSCI ACWI in the same GICS Industry Group in which the security belongs is used.

Enterprise Value Inflation Adjustment Factor (EVIAF) =

$$\left(\frac{Average(EVIC)}{Previous\ (Average(EVIC))} \right) - 1$$

Weighted Average GHG Intensity of Parent Index =

$$\sum (Weight\ in\ Parent\ Index * Security\ Level\ GHG\ Intensity)$$

Weighted Average GHG Intensity of Derived Index =

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

Calculation of Potential Carbon Emissions Intensity

Security Level Potential Carbon Emissions (PCE) Intensity =

$$\frac{Absolute\ Potential\ Emissions}{EVIC\ (in\ M\$)}$$

If Absolute Potential Emissions data is not available, MSCI uses zero fossil fuel reserves.

Weighted Average Potential Emissions Intensity of Parent Index =

$$\sum (Weight\ in\ Parent\ Index * Security\ Level\ PCE\ Intensity)$$

Weighted Average Potential Emissions Intensity of Derived Index =

$$\sum (Index\ Weight * Security\ Level\ PCE\ Intensity)$$

Calculation of Average Decarbonization

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

$$W_t = W_1 * 0.93^{\frac{(t-1)}{2}}$$

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 Carbon Intensity will be $W_1 * 0.93$.

Calculation of Green Revenue to Fossil fuels-based Revenue Multiple

Green Revenue

For each constituent in the Parent Index, the Green Revenue% is calculated as the cumulative revenue (%) from the six CleanTech themes which are as follows:

- Alternative Energy – products and services that support the transmission, distribution and generation of renewable energy and alternative fuels to reduce carbon and pollutant emissions in supporting affordable and clean energy to combat climate change.
- Energy Efficiency – products, and services that support the maximization of productivity in labor, transportation, power and domestic applications with minimal energy consumption to ensure universal access to affordable, reliable and modern energy services.

- Sustainable Water – products, services, infrastructure projects and technologies that resolve water scarcity and water quality issues, through minimizing and monitoring current water demand, improving the quality and availability of water supply to improve resource management in both domestic and industrial use.
- Green Building – design, construction, redevelopment, retrofitting, or acquisition of green-certified properties to promote mechanisms for raising capacity for effective climate change mitigation and adaptation.
- Pollution Prevention – products, services, infrastructure projects and technologies that reduces volume of waste materials through recycling, minimizes introduction of toxic substances, and offers remediation of existing contaminants such as heavy metals and organic pollutants in various environmental media to significantly address pollution in all levels and its negative effects
- Sustainable Agriculture - revenues from forest and agricultural products that meet environmental and organic certification requirements to address significantly biodiversity loss, pollution, land disturbance, and water overuse

The Weighted Average Green Revenue% is calculated as:

$$= \sum (Weight\ in\ Index * Green\ Revenue\%)$$

Fossil fuels-based Revenue

For each constituent in the Parent Index, the Fossil fuels-based Revenue% is calculated as the cumulative revenue (%) from the following sources:

- 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)
- Revenue% from the extraction, production and refining of Conventional and Unconventional Oil & Gas. Conventional Oil and Gas includes Arctic onshore/offshore, deepwater, shallow water and other onshore/offshore. Unconventional Oil and Gas includes oil sands, oil shale (kerogen-rich deposits), shale gas, shale oil, coal seam gas, and coal bed methane.
- Revenue% from thermal coal based power generation, liquid fuel based power generation and natural gas based power generation.

The Weighted Average Fossil fuels-based Revenue% is calculated as:

$$= \sum (Weight\ in\ Index * Brown\ Revenue\%)$$

The Green Revenues to Fossil fuels-based Revenues multiple for either the Parent Index or the Index is calculated as a ratio of the Weighted Average Green Revenue to the Weighted Average Fossil fuels-based Revenue as per the formula below:

$$= \frac{Weighted\ Average\ Green\ Revenue\%}{Weighted\ Average\ Brown\ Revenue\%}$$

Appendix III: Decarbonization Trajectory of Indexes

The Weighted Average Carbon Intensity on the Base Date (W_1) is used to compute the target Weighted Average Carbon Intensity at any given Semi-Annual Index Review (W_t) as per the below formula.

$$W_t = W_1 * 0.93^{\frac{(t-1)}{2}}$$

Where ‘t’ is the number of Semi-Annual Index Reviews since the Base Date. The table below shows the Weighted Average Carbon Intensity on the Base Date(W_1) for each of the regions where the Indexes are constructed:

Index	Parent Index	Base Date	W_1 (tCO ₂ /M\$ Enterprise Value + Cash)
MSCI World Climate Change CTB Select Index	MSCI World	June 01, 2020	208.74
MSCI Europe Climate Change CTB Select Index	MSCI Europe	June 01, 2020	309.07

Appendix IV: Iterative Down Weighting Process

The iterative down weighting process is applied on the securities of the Final Universe with the objective of meeting all the minimum requirements²⁰ detailed in Table 1.

ITERATIVE DOWNWEIGHTING

Starting with the Final Universe, an iterative down weighting process is applied in order to meet with the minimum requirements for the Indexes. The iterative down weighting stops when all the requirements defined in above are met. The steps followed in the iterative downweighting (Exhibit 2) are outlined below:

- Step 1. Check whether all targets for the index are met. If all targets are met, then no downweighting is required.
- Step 2. Securities in the Applicable Universe are sorted in increasing order of their Scope 1+2+3 Carbon Emissions Intensity and securities in the top half of the sorted list are identified as "Top Half" securities. Securities in the bottom half of the sorted list are identified as "Bottom Half" securities.
- Step 3. If the target based on Minimum reduction in WACI relative to Parent Index and the Minimum average reduction in WACI (per annum) is not met, the lowest ranked "Bottom Half" stock in ascending order of Scope 1+2+3 Carbon Emissions Intensity is selected for downweighting and the weight is reduced by 25% of its weight in the Final Universe. Note that stocks with an LCT Category of Solutions are not eligible for downweighting²¹. If this target is met, but
 - a. If the target based on Weighted Average Potential Emissions Intensity relative to Parent Index is not met, the "Bottom Half" stock with highest Potential Carbon Emissions Intensity is downweighted.
 - b. Otherwise if the target based on Minimum ratio of Green Revenue/ Fossil fuels-based Revenue relative to Parent Index is not met, the "Bottom Half" stock with largest difference between its Fossil fuels-based Revenue% and its Green Revenue% is downweighted.
- Step 4. If the targets are still not met, the stock is downweighted in steps of 25% of its weight in the Final Universe till a maximum downweighting of 75%.
- Step 5. Stocks of the Final Universe in the "Top Half", belonging to the same "Climate Impact Sector" as the stock being downweighted are proportionally upweighted to ensure that the overall allocation to the High Climate Impact Sector is the same as that in the Parent Index and the sum of the weights of all constituents is 1.
- Step 6. While upweighting stocks, the security weights of the stocks being upweighted is capped as per Section 2.7.2, with the excess weight being distributed among the remaining securities that are being upweighted. The issuers which already satisfy the below conditions after Section 2.7 will not be upweighted:

²⁰ In the steps detailed for the iterative process, "targets" refers to all the minimum requirements as detailed in Table 1.

²¹ This rule was not applied for the MSCI Denmark IMI Climate Change at the time of the May and November 2023 Index Reviews in order to achieve a feasible solution during the rebalancing process.

- Issuers which already have a weight greater than 5% for Broad Indexes or 10% for Narrow Indexes.
- Issuers which already have a weight greater than Parent+2% for Broad Indexes or Parent+5% for Narrow Indexes.

Step 7. If the targets are still not met, the iterative process continues and Steps 3-6 are repeated.

Step 8. If the targets are not met and all “Bottom Half” stocks of the Final Universe are downweighted by 75% of the weight in the Final Universe, Steps 3-7 are repeated, with a maximum downweighting of 90% in a single downweighting step of 15 percentage points of the weight in the Final Universe.

Step 9. If the targets are not met after the maximum downweighting of 90% of all “Bottom Half” stocks, then stocks are iteratively excluded in the same order as outlined in Step 3.

Step 10. If the targets are not met after excluding all the “Bottom Half” stocks, then the index will rebalance using the constituents and weighting of stocks as after Step 9.

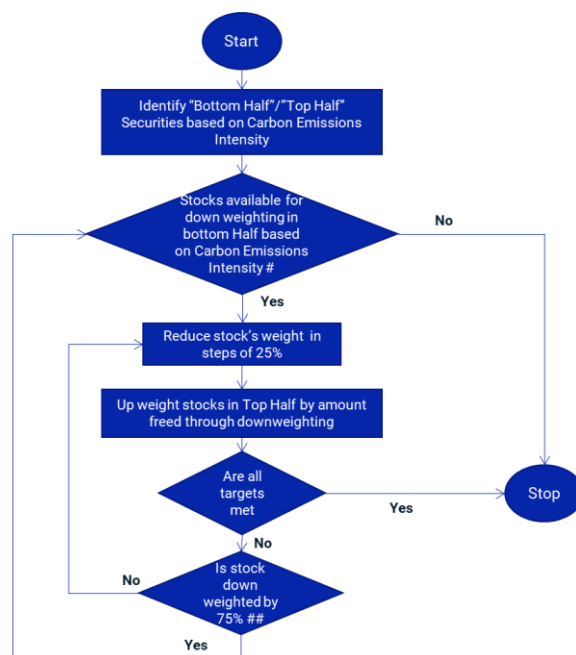


Exhibit 2: Schematic Representation of the Iterative Downweighting Process

If the target based on Minimum reduction in WACI relative to Parent Index and the Minimum average reduction in WACI (per annum) is met but the target on Weighted Average Potential Emissions Intensity relative to Parent Index is not met, the “Bottom Half” security with the highest Potential Carbon Emissions Intensity is selected for downweighting. If the target on Weighted Average Potential Emissions Intensity relative to Parent Index is also met but the target on Minimum ratio of Green Revenue/ Fossil fuels-based Revenue relative to Parent Index is not met, the “Bottom

Half” security with the highest difference in its Fossil fuels-based Revenue% and Green Revenue% is selected for downweighting.

If the targets are not met and all “Bottom Half” stocks of the Final Universe are downweighted by 75% of the weight in the Final Universe, maximum downweighting is relaxed to 90% in a single downweighting step of 15 percentage points of the weight in the Final Universe.

If the targets are not met after the maximum downweighting of 90% of all “Bottom Half” stocks, then stocks are iteratively excluded in the same order.

If the targets are not met after excluding all the “Bottom Half” stocks then the index will rebalance using the constituents and weighting of stocks at the final step.

Appendix V: Companies Involved in Nuclear Weapons Business

Companies, whose activities meet the following criteria, as determined by MSCI ESG Research, are excluded from the Index:

- 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.

Appendix VI: Minimum Requirements of EU CTB

The below details the minimum requirements of EU CTBs as per the EU Delegated Acts:

Exclusions

- **Controversial Weapons:** companies involved in any activities related to controversial weapons;
- **Tobacco:** companies involved in the cultivation and production of tobacco;
- **Environmental Harm:** companies significantly harm one or more of environmental objectives;
- **Controversies:** companies in violation of the United Nations Global Compact (UNGC) principles or the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises;

Objectives

- **Relative Reduction:** 30% minimum reduction in Weighted Average Scope 1+2+3 Carbon Emissions Intensity (WACI) relative to Parent Index
- **Self-Decarbonization:** 7% minimum average reduction (per annum) in WACI relative to WACI in the Base Date
- **Exposure Constraint:** At least equivalent exposure to the High Climate Impact Sector relative to Parent Index

Appendix VII: The Capping Methodology

The capping methodology is applied on issuer, country, and sector weights to mitigate the concentration in the Index and maintain a minimum Index-level sustainable exposure.

A. Parameters for Capping

The maximum weight of an Index constituent at an issuer level will be restricted to $\max(5\%, \text{weight in the Parent Index})$ for Broad Indexes. The maximum weight of an Index constituent at an issuer level will be restricted to $\max(10\%, \text{weight in the Parent Index})$ for Narrow Indexes.

The maximum/minimum GICS sector weight in the Index will not deviate more than $\pm 5\%$ from the sector weight in the Parent Index excluding the energy sector.

The minimum solutions category weight in the Index will not deviate less than $+2\%$ from the solutions category weight in the Parent Index.

The High Climate Impact and Low Climate Impact sector weight in the Index will be the same as in the Parent Index.

B. The Capping Methodology

The Capping methodology is iteratively applied with the following steps:

- Find the most violating constraint from all the given constraints (issuer maximum bound, solutions minimum bound, sector minimum bound, sector maximum bound, and bound for maintaining the same high climate impact and low climate impact sector split as in the Parent Index). For each group (for example, IT sector) within all the constraints, the deviation ratio is calculated based on:
 - ratio of current value (for example, weight of issuer 'A' in the Index) to maximum bound (for example, maximum bound of issuer 'A' weight), in case of maximum bound constraint.
 - ratio of minimum bound value (for example, minimum bound of IT sector weight) to current value (for example, weight of IT sector in the Index), in case of minimum bound constraint.
- The most violating constraint is the maximum of all the deviation ratios.
- The most violating constraint is adjusted first to the respective bound value.
- The excess weight (difference of current value to the respective bound value) is distributed proportionally to all the other constituents
- The iterative capping stops when the most violating constraint ratio (rounded off to 5 decimals) is less than or equal to 1 or it has reached the maximum iteration count. In case of maximum iteration count, the capping steps will return the solution found until this maximum iteration step.
- If the most violating constraint ratio value for each group (for example, IT sector in sector minimum bound) is repeated in more than 10 iterations, the capping methodology applies relaxation steps.

C. Relaxation Steps

- The following conditions are alternatively relaxed until the most violating constraint ratio (rounded off to 5 decimals) is less than or equal to 1:
- Relax the minimum bound of weight for solutions category in steps of -0.5% up to a maximum of 4 iterations.
- Relax the minimum bound of sector weights in steps of -0.5%, up to a maximum of 10 iterations.
- Relax the maximum bound of sector weights in steps of 0.5%, up to a maximum of 10 iterations. At each step of relaxation, if the most violating constraint ratio value for each group is repeated more than 10 times, the next step of relaxation is initiated

Appendix VIII: Methodology Set

The Indexes are governed by a set of methodology and policy documents (“Methodology Set”), including the present index methodology document as mentioned below:

- Description of methodology set – <https://www.msci.com/index/methodology/latest/ReadMe>
- MSCI Corporate Events Methodology – <https://www.msci.com/index/methodology/latest/CE>
- MSCI Fundamental Data Methodology – <https://www.msci.com/index/methodology/latest/FundData>
- MSCI Index Calculation Methodology – <https://www.msci.com/index/methodology/latest/IndexCalc>
- MSCI Index Glossary of Terms – <https://www.msci.com/index/methodology/latest/IndexGlossary>
- MSCI Index Policies – <https://www.msci.com/index/methodology/latest/IndexPolicy>
- MSCI Global Industry Classification Standard (GICS) Methodology – <https://www.msci.com/index/methodology/latest/GICS>
- MSCI Global Investable Market Indexes Methodology – <https://www.msci.com/index/methodology/latest/GIMI>
- MSCI 10 40 Indexes Methodology – <https://www.msci.com/index/methodology/latest/1040>
- MSCI Climate Change Indexes Methodology – <https://www.msci.com/index/methodology/latest/ClimateChange>
- MSCI Global ex Controversial Weapons Indexes Methodology – <https://www.msci.com/index/methodology/latest/XCW>
- ESG Factors In Methodology*

The Methodology Set for the Indexes can also be accessed from MSCI’s webpage <https://www.msci.com/index-methodology> in the section ‘Search Methodology by Index Name or Index Code’.

* ‘ESG Factors in Methodology’ contains the list of environmental, social, and governance factors considered, and how they are applied in the methodology (e.g., selection, weighting or exclusion). It can be accessed in the Methodology Set as described above.

Appendix IX: Changes to this Document

The following sections have been modified since October 2020-

- Sections 3.5.1.1, 3.5.2.1 – Updated to increase allocation in companies in Top Half based on Scope 1+2+3 Carbon Emissions Intensity
- Appendix IV – Updated iterative downweighting process to identify stocks for downweighting based on the constraint not being met

The following sections have been modified since May 2021-

- Introduction – Updated to reflect that the index follows the minimum requirements as per the EU Delegated Acts instead of the TEG Final Report
- Section 3.3 – Updated to reflect the changes in the MSCI Climate Change Index Methodology. Detail on exclusion of Controversial Weapons moved to Section 3.4

The following sections have been modified since March 01, 2022²²-

- Section 3.4 – Updated to add exclusions based on thermal coal power and thermal coal reserves

The following sections have been modified effective June 01, 2022:

Section 3.4: Eligible Universe

- Updated to add exclusions based on nuclear weapons, unconventional oil & gas, and arctic oil & gas
- Updated to add reference to Appendix V

Appendix V: Business Exclusion Criteria

- Updated to add new exclusion criteria for ‘Nuclear Weapons’, ‘Unconventional Oil & Gas’, and ‘Arctic Oil & Gas’

The following sections have been modified effective February 2024:

Section 2.2 Minimum Requirements

- Removed the reference to the standard MSCI Climate Change methodology and added baseline exclusions to the minimum requirements table.

Section 2.3: Eligible Universe

- Clarified the Tobacco Involvement, Red and Orange Flag for Environment Controversies and Thermal Coal screens.

Section 2.4: Determination of Combined Score

- Section was updated including a detailed description on each step

²² This change in screening criteria was implemented in the index on February 16, 2022, effective on March 01, 2022, by excluding existing constituents which meet the updated exclusion criteria. The weights of the remaining securities were subsequently renormalized to 100%.

Section 4: MSCI ESG Research

- Moved section after Section 3 (Maintaining the Indexes)
- Updated definitions for ESG Research products

Appendix II: Calculation of Target Metrics

- The Target Metrics for Greenhouse Gas Emissions and Total Potential Emissions was updated.

Appendix VI: Methodology Set

- Added details on the Methodology Set for the Indexes

The following section has been modified effective May 2024:

Section 2.3: Eligible Universe

- Updated to reference Appendix V for Nuclear Weapons criteria.
- Updated the exclusion criteria for the Thermal Coal Power Generation screen.

Section 4: MSCI ESG Research

- Updated language on the MSCI ESG Products.

Appendix I: MSCI Low Carbon Transition Risk Assessment

- Updated language and the Low Carbon Transition Categories and Scores table.

The following section has been modified effective November 2024

Section 2.4.1 Category Tilt

- Updated to reflect New Solutions Multiplier

Section 2.7 Final Universe

- Added details of security weighting in the Final Universe

Section 2.7.1 EU CTB Check

- Updated section name
- Added details regarding issuer weight capping in the iterative process.

Section 2.7.2 Applying the MSCI 20/35 Indexes Methodology

- Updated to reflect the new capping parameters

Section 2.8: Treatment of Unrated Companies

- Added the treatment of companies when business involvement screening research, ESG controversies or climate change metrics research not available from MSCI ESG Research

Appendix IV: Iterative Downweighing Process

- Updated details on the iterative process.

Appendix VI: Minimum Requirements of EU CTB

- Added details on the minimum requirements of EU CTBs as per the EU Delegated Acts



Appendix VII: The Capping Methodology

- Added details on the Capping Methodology for the Indexes.

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