

MSCI Index ESG Metrics Calculation Methodology

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Contents		
1	Introduction	3
2	Definition of ESG Metrics	4
2.1	Benchmark Regulation Metrics	4
2.2	SFDR Mandatory Metrics (Equity and Corporate Bond Indexes)	11
2.3	Other Metrics (Equity and Corporate Bond Indexes)	14
3	Calculation of Metrics	16
3.1	Data Used for the Calculation	16
3.2	Calculation Details and Formulas	17
4	Maintenance of Metrics	37
4.1	Ongoing Review and Publication	37
4.2	Correction Policy	37
5	MSCI ESG Research	38
5.1	MSCI ESG Ratings	38
5.2	MSCI ESG Controversies	38
5.3	MSCI ESG Business Involvement Screening Research	38
5.4	MSCI Climate Change Metrics	39
5.5	MSCI Impact Solutions: Sustainable Impact Metrics	39
	Appendix 1: ESG Data Definitions	41
	Appendix 2: Implied Temperature Rise	53
	Appendix 3: Changes to this Document	57

1 Introduction

This document outlines the methodology used to calculate and maintain index level ESG metrics:

- **Benchmark Regulation**

Index level ESG information as per the Commission Delegated Regulation (EU) 2020/1816 of 17 July 2020 supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council, as it forms part of UK domestic law by virtue of the European Union (Withdrawal) Act 2018, as regards the explanation in the benchmark statement of how environmental, social and governance factors are reflected in each benchmark provided and published (the “Delegated Act 2020/1816”)¹.

More information on the benchmark regulation applicable to MSCI indexes can be found on the index regulation page of MSCI’s website at: <https://www.msci.com/index-regulation> under “EU/UK Benchmark Regulation”.

- **EU Sustainable Finance Disclosure Regulation (SFDR)**

Index level ESG metrics, using select metrics as set out in the Final Report on the Draft Regulatory Technical Standards with regard to the content, methodologies and presentation of disclosures pursuant to Article 2a(3), Article 4(6) and (7), Article 8(3), Article 9(5), Article 10(2) and Article 11(4) of Regulation (EU) 2019/2088, dated 2 February 2021².

- **Other index level ESG metrics not required under EU SFDR or the Delegated Act 2020/1816**

MSCI Limited is not a “financial market participant” as defined in the Regulation (EU) 2019/2088 or Regulation (EU) 2020/852. Index names are not required to comply with these and do not indicate that any product aligned with, or referencing, such an index is compliant with these regulations. Financial market participants and other users of MSCI indexes remain solely responsible for the naming, designation and/or classification of any financial products related to these regulations or guidance.

¹ <https://www.legislation.gov.uk/eur/2020/1816/contents>

² <https://www.legislation.gov.uk/eur/2019/2088/contents>

2 Definition of ESG Metrics

The list and definition of each index level ESG metric published by MSCI is provided below.

2.1 Benchmark Regulation Metrics

Annex I to the Delegated Act 2020/1816 provides the relevant disclosure template, and Annex II provides a list of mandatory and voluntary ESG metrics based on the underlying assets of the indexes (e.g., equity, fixed income, etc.). MSCI discloses all mandatory ESG metrics and select voluntary ESG metrics, as well as a set of additional ESG metrics not mentioned in the Delegated Act for the purposes of enhancing transparency for the investment community.

The list and definition of each metric published by MSCI is provided below. The table also includes the relevant text from the Delegated Act 2020/1816 (Annex II).

2.1.1 Mandatory Metrics (Equity and Corporate Bond Indexes)

Metric Name	Metric Definition	Text from Delegated Act 2020/1816
Board Gender Diversity %	Weighted average percentage of women on the boards of index constituents.	Weighted average % of female board members.
Board Independence (Weighted Average) %	Weighted average percentage of board members that meet MSCI ESG Research criteria for board independence.	Weighted average percentage of board members who are independent.
Bribery & Corruption Controversies (Sum)	Total number of controversy cases in the last three years related to index constituents' involvement in bribery and corruption issues.	Numbers of convictions and amount of fines for violations of anti-corruption and anti-bribery laws.
Controversial Weapons %	Exposure to companies with ties to controversial weapons. MSCI ESG Research's Controversial Weapons definition covers cluster munitions, landmines, depleted uranium weapons, biological/chemical weapons, blinding lasers, non-detectable fragments and incendiary weapons.	Weighted average percentage of benchmark constituents in the controversial weapons sector.
Decarbonization %	Degree to which the IPCC decarbonization trajectory (1.5°C with no or limited overshoot) has been achieved on average per year since creation.	Degree to which the IPCC decarbonization trajectory (1.5°C with no or limited overshoot) has been achieved on average per year since creation.

Enterprise Carbon Intensity (t CO2e/\$M EVIC)	Weighted average Scope 1, Scope 2 and Scope 3 carbon emissions intensity normalized by enterprise value including cash. (Unit: tons of CO2/ \$ million enterprise value including cash)	Greenhouse gas (GHG) intensity of the benchmark.
Estimated Emissions %	Exposure to companies with estimated Scope 1 and Scope 2 carbon emissions.	Percentage of GHG emissions reported versus estimated.
Female: Male Board Diversity Ratio	Weighted average ratio of female to male board members (%).	Weighted average ratio of female to male board members.
Fossil Fuel-Based Sector Exposure (NACE) %	Exposure to companies that are involved in carbon-intensive activities based on GICS® sub-industries that are mapped from the EU's NACE classification, following a two-step approach: 1. An initial list of sub-industries based on carbon-intensive activities that fall under Divisions 05 to 09, 19 and 20 of Annex I to Regulation (EC) No 1893/2006; 2. The list is then filtered to exclude sub-industries wherein 80% of companies in the MSCI ACWI IMI universe belong to the Solutions or Neutral categories using MSCI ESG Research's Low Carbon Transition framework.	Exposure of the benchmark portfolio to companies the activities of which fall under Divisions 05 to 09, 19 and 20 of Annex I to Regulation (EC) No 1893/2006.
Gender Pay Gap	Weighted average difference between the average gross hourly earnings of male and female employees as a percentage of male gross earnings, based on company reported data. Note that reporting on this metric is inconsistent: some companies report the absolute or uncontrolled pay gap while other control for compensable factors such as role or location.	Weighted average gender pay gap.
Green Bonds % ³	Exposure to securities that meet the green bond criteria as defined by the MSCI ESG Research Green Bond Assessment methodology based on their use of proceeds and adherence	Percentage of green bonds in the benchmark portfolio.

³ Only disclosed for fixed income indexes.

	to the four Green Bond Principles GBPs).	
Green CapEx %	Weighted average of energy-related index constituents' percentage of capital expenditures (CapEx) derived from renewable energy. The scope of energy-related constituents are defined as companies belonging to the Utilities GICS® sector and those belonging to the Integrated Oil & Gas, Oil & Gas Exploration and Production, Oil & Gas Refining and Marketing, and Oil & Gas Storage & Transportation GICS® sub-industries.	Exposure of the benchmark portfolio to renewable energy as measured by capital expenditures (CapEx) in those activities (as a share of total CapEx by energy companies included in the portfolio).
Green Revenue	Weighted average of index constituents' percentage of revenue derived from alternative energy, energy efficiency, green building, pollution prevention, sustainable water, or sustainable agriculture.	Exposure of the benchmark portfolio to activities included in the environmental goods and services sector, as defined in Article 2, point (5) of Regulation (EU) No 691/2011 of the European Parliament and of the Council.
High Climate Impact Sector Exposure %	Exposure to companies that belong to high climate impact sectors based on GICS® sub-industries that are mapped from the EU's NACE classification. This includes sectors listed in Sections A to H and Section L of Annex I to Regulation (EC) No 1893/2006 of the European Parliament and of the Council.	Degree of exposure of the portfolio to the sectors listed in Sections A to H and Section L of Annex I to Regulation (EC) No 1893/2006 as a percentage of the total weight in the portfolio.
Lack of Due Diligence Policy (ILO) %	Exposure to companies without due diligence policies on labor issues addressed by the fundamental International Labor Organisation (ILO) Conventions 1 to 8.	Exposure of the benchmark portfolio to companies without due diligence policies on issues addressed by Conventions 1 to 8 of the International Labor Organisation.
Overlap between the benchmark and its investable universe (using the active share at asset level)	Overlap between those benchmarks and their investable universe, as defined in Article 1, point (e), of Commission Delegated Regulation (EU) 2020/1818, using the active share at asset level.	Overlap between those benchmarks and their investable universe, as defined in Article 1, point (e), of Commission Delegated Regulation (EU) 2020/1818, using the active share at asset level.

Reported Emissions %	Exposure to companies with reported Scope 1 and Scope 2 carbon emissions.	Percentage of GHG emissions reported versus estimated.
Social Violations (Count)	Absolute number of index constituents involved in social violations. Social violations are defined as Red Flag controversies related to customers, human rights & community impact or labor rights & supply chain, in accordance with the MSCI ESG Controversies methodology. A Red Flag indicates an ongoing Very Severe ESG controversy implicating a company directly through its actions, products, or operations.	Number of benchmark constituents subject to social violations (absolute number and relative divided by all benchmark constituents), as referred to in international treaties and conventions, United Nations principles and, where applicable, national law.
Social Violations (% of Constituents)	Percentage of index constituents involved in social violations. Social violations are defined as Red Flag controversies related to customers, human rights & community impact or labor rights & supply chain, in accordance with the MSCI ESG Controversies methodology. A Red Flag indicates an ongoing Very Severe ESG controversy implicating a company directly through its actions, products, or operations.	
Tobacco Involvement - Highly Restrictive %	Exposure to companies classified as tobacco producers, and companies that derive 5% or more aggregate revenue from the manufacture, distribution, retailing, licensing, and supply of tobacco products.	Weighted average % of constituents in the Tobacco sector
Total Recordable Injury Rate%	Weighted average total recordable injury rate (TRIR) per million hours worked. The TRIR includes fatalities, lost time injuries, restricted work injuries, and medical treatment injuries.	Weighted average ratio of accidents, injuries, fatalities.
Year on Year Decarbonization Trajectory	Forward-looking year-on-year decarbonization trajectory. This is not a calculated metric.	Forward-looking year-on-year decarbonization trajectory.

2.1.2 Mandatory Metrics (Sovereign Bond Indexes)

Metric Name	Metric Definition	Text from Delegated Act 2020/1816
International Convention Signatory (%) - Sovereign	Exposure to issuers that are a party to international conventions. MSCI ESG Government Ratings include specific environment and social conventions (detailed in the appendix).	The percentage of underlying fund management companies signed up to international standards.
Wtd Avg GHG Intensity (t/USD million GDP nominal) - Sovereign	Weighted average of sovereign issuers' carbon emissions generated by all economic activities performed domestically, per unit of GDP (USD million).	GHG intensity of the benchmark.
Reported Emissions (%) - Sovereign	Exposure to sovereign issuers with reported carbon emissions	Reported emissions %
Estimated Emissions (%) - Sovereign	Exposure to sovereign issuers with estimated carbon estimation	Estimated emissions %
Green Bonds (%) - Sovereign	Exposure to securities that meet the green bond criteria as defined by the MSCI ESG Research Green Bond Assessment methodology based on their use of proceeds and adherence to the four Green Bond Principles (GBPs).	Percentage of green bonds in the index.
Social Violations (Count) - Sovereign	The number of unique issuers with European External Action Service (EEAS) restrictive measures (sanctions) on imports and exports.	Number of index constituents subject to social violations (absolute number and relative number divided by all index constituents), as referred to in international treaties and conventions, United Nations principles and, where applicable, national law.
Social Violations (% of Constituents) - Sovereign	The percentage of unique issuers with European External Action Service (EEAS) restrictive measures (sanctions) on imports and exports.	
Human Rights Performance - Sovereign	Weighted average of the WJP Rule of Law Index, Fundamental Rights Sub-score (measures a country's performance on human rights issues, as per Factor 4 of the WJP Rule of Law Index. Scores can range from 0-1.0, and higher values denote stronger national performance across a broad range of human rights issues)	Average human rights performance of the issuers (including a quantitative indicator and the methodology used to calculate it).
Income Inequality Score - Sovereign	Weighted average Income Inequality score from MSCI ESG Government	Average income inequality score, measuring the

	Ratings. The Income Inequality score measures whether a sovereign's GINI Index score is greater than 50 (higher number indicates greater inequality)	distribution of income and economic inequality among the participants in a particular economy (including a quantitative indicator and the methodology used to calculate it).
Press Freedom Sovereign Score - Sovereign	Weighted average of the World Press Freedom Index score from MSCI ESG Government Ratings. This uses data from the Reporters Without Borders to measure the level of press freedom, where those countries with higher scores have higher levels of press freedom (detailed in the appendix).	Average freedom of expression score measuring the extent to which political and civil society organizations can operate freely (including a quantitative indicator and the methodology used to calculate it).
Corruption Score - Sovereign	Weighted average of the Control of Corruption score from MSCI ESG Government Ratings. This uses data from the World Bank's World Governance Indicators to measure the extent to which power could be exercised for private gain (detailed in the appendix).	Average corruption score measuring the perceived level of public sector corruption (including a quantitative indicator and the methodology used to calculate it).
Stability & Peace Score - Sovereign	Weighted average of Stability & Peace score from MSCI ESG Government Ratings. This measures the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means (detailed in the appendix).	Average political stability score, measuring the likelihood that the current regime will be overthrown by the use of force (including a quantitative indicator and the methodology used to calculate it).
Rule of Law Score - Sovereign	Weighted average of Rule of Law score from MSCI ESG Government Ratings. This measures the extent to which agents have confidence in and abide by the rules of society, sourced from WDI (detailed in the appendix).	Average rule of law score, based on the absence of corruption, respect for fundamental rights, and the state of civil and criminal justice (including a quantitative indicator and the methodology used to calculate it).

2.1.3 Voluntary Metrics (Equity and Corporate Bond Indexes)

Metric Name	Metric Definition	Text from Delegated Act 2020/1816
Environmental Pillar Score	Weighted average Environmental Pillar Score. The Environmental Pillar Score measures index constituents' management of and exposure to key environmental risks and opportunities. Scores range from 10 (best) to 0 (worst).	Weighted average environmental rating of the benchmark.
ESG Rating - Top Ten Constituents	Company ESG Rating of the largest ten index constituents by index weight. The ESG Rating indicates how well the index constituents manage their most material ESG risks relative to sector peers. ESG Ratings range from AAA (best) to CCC (worst).	Overall ESG rating of top ten benchmark constituents by weighting in the benchmark.
ESG Score	Weighted average ESG Score. The ESG Score indicates how well the index constituents manage their most material ESG risks relative to sector peers. Scores range from 10 (best) to 0 (worst).	Weighted average ESG rating of the benchmark.
Governance Pillar Score	Weighted average Governance Pillar Score. The Governance Pillar Score measures index constituents' management of and exposure to key governance risks. Scores range from 10 (best) to 0 (worst).	Weighted average governance rating of the benchmark.
Physical Risk Climate VaR %	An aggregated downside or upside potential based on issuers' "worst-case" (95th percentile) value at risk, expressed as a percentage of the securities' market value, assuming trends in extreme cold, extreme heat, extreme precipitation, heavy snowfall, extreme wind, coastal flooding, fluvial flooding, and tropical cyclones continue along a Business-As-Usual pathway.	Exposure of the benchmark portfolio to climate-related physical risks, measuring the effects of extreme weather events on companies' operations and production or on the different stages of the supply chain (based on issuer exposure).
Social Pillar Score	Weighted average Social Pillar Score. The Social Pillar Score measures index constituents' management of and exposure to key social risks and opportunities. Scores range from 10 (best) to 0 (worst).	Weighted average social rating of the benchmark.

2.1.4 Controversial Weapons – International Treaties and Conventions

The Delegated Act 2020/1816 requires the disclosure of “International treaties and conventions, United Nations principles or, where applicable, national law used in order to determine what constitutes a controversial weapon”.

The list of treaties and conventions related to the “Controversial Weapons %” metric is provided below:

- The Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction.
- The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction.
- Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction.
- Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects.
- The Convention on Cluster Munitions.

2.2 SFDR Mandatory Metrics (Equity and Corporate Bond Indexes)

Metric Name	Metric Definition
Carbon Footprint (Scope 1+2+3)	Weighted average Scope 1, Scope 2 and Scope 3 carbon emissions intensity normalized by enterprise value including cash. (Unit: tons of CO2/ EUR million enterprise value including cash)
Carbon Footprint (Scope 1)	Weighted average Scope 1 carbon emissions intensity normalized by enterprise value including cash. (Unit: tons of CO2/ EUR million enterprise value including cash)
Carbon Footprint (Scope 2)	Weighted average Scope 2 carbon emissions intensity normalized by enterprise value including cash. (Unit: tons of CO2/ EUR million enterprise value including cash)
Carbon Footprint (Scope 3)	Weighted average Scope 3 carbon emissions intensity normalized by enterprise value including cash. (Unit: tons of CO2/ EUR million enterprise value including cash)
Carbon Footprint (Scope 1+2)	Weighted average Scope 1 and Scope 2 carbon emissions intensity normalized by enterprise value including cash. (Unit: tons of CO2/ EUR million enterprise value including cash)
GHG Intensity of Investee Companies	Weighted average Scope 1, Scope 2 and Scope 3 carbon emissions intensity normalized by sales. (Unit: tons of CO2e / million EUR of sales).

Exposure to companies active in fossil fuel sector %	Exposure to companies involved in oil and gas and thermal coal related revenue generating activities. The metric does not include revenue generating activities from metallurgical coal, and storage and transportation of coal.
Share of non-renewable energy consumption and production %	Weighted average energy consumption and/or production from non-renewable sources as a percentage of total energy use and/or generation.
Energy consumption intensity per high impact climate sector	Energy consumption (GwH) per million EUR revenue per high impact climate sector (based on GICS® sub-industries that are mapped from the EU's NACE classification. This includes sectors listed in Sections A to H and Section L of Annex I to Regulation (EC) No 1893/2006 of the European Parliament and of the Council).
Activities negatively affecting biodiversity - sensitive areas	Exposure to companies having operations in or near to biodiversity sensitive areas that have been implicated in Red or Orange Flag controversies with adverse impact on the environment. 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.
Emissions to water	Weighted average tons pollutants released to surface water normalized by enterprise value including cash. (Unit: tons/EUR million enterprise value including cash)
Hazardous Waste Ratio	Weighted average hazardous waste normalized by enterprise value including cash. (Unit: tons/EUR million enterprise value including cash)
Violations of UN Global Compact principles and Organisation for Economic Cooperation and Development (OECD) Guidelines for Multinational Enterprises	Exposure to companies involved 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.
Lack of processes and compliance mechanisms to monitor compliance with UN Global Compact principles and OECD Guidelines for Multinational Enterprises %	Exposure to companies without policies to monitor compliance with UNGC Principles.

Unadjusted Gender Pay Gap %	Weighted average difference between the average gross hourly earnings of male and female employees as a percentage of male gross earnings, based on company reported data. Note that reporting on this metric is inconsistent: some companies report the absolute or uncontrolled pay gap while other control for compensable factors such as role or location.
Board Gender Diversity %	Weighted average percentage of women on the boards of index constituents.
Exposure to controversial weapons ⁴ %	Exposure to companies with industry ties to landmines, cluster munitions, chemical weapons or biological weapons. Notes: Industry ties cover ownership, manufacturing and investments. Ties to landmines do not cover related safety products.

⁴ As defined in the ESA's Final Report on the draft Regulatory Technical Standards:
https://www.esma.europa.eu/sites/default/files/library/jc_2021_03_joint_esas_final_report_on_rts_under_sfdr.pdf

2.3 Other Metrics (Equity and Corporate Bond Indexes)

Metric Name	Metric Definition
1.5°C Aggregated Climate VaR	Aggregated climate value-at-risk (VaR) aligned to the 1.5°C scenario. It is the sum of the weighted averages for the Aggregated Policy Risk Climate VaR , Technology Opportunity Climate VaR, and Physical Risk Climate VaR based on an aggressive scenario.
1.5°C Aggregated Policy Risk Climate VaR	An aggregate downside policy risk exposure according to all emission sources (Scope 1, 2, 3), expressed as a percentage of the securities’ market value, assuming a global 1.5°C target and using carbon prices from the AIM CGE model under the Advanced scenario.
1.5°C Technology Opportunity Climate VaR	An upside technology opportunity exposure, expressed as a percentage of the securities’ market value, assuming a global 1.5°C target and calculated using carbon prices from the AIM CGE model under the Advanced scenario.
Baseline Criteria Test (% Fail)	Exposure to companies that have 1) MSCI ESG Rating B or CCC, 2) MSCI ESG Controversies assessed as Red or Orange Flag, 3) Any tie to controversial (banned) weapons, 4) At least 1% of their revenue from thermal coal mining, and/or 5) Involvement in tobacco - in particular, tobacco production or at least 5% of their aggregate revenue from tobacco-related activities.
Economic Activities Test	Exposure to companies generating at least 20% of their revenue from products or services targeting one or more social or environmental objectives.
Estimated Environmental Impact Involvement (%)	Weighted average of index constituents’ percentage of revenue derived from MSCI Sustainable Impact Solutions’ environmental impact themes (including alternative energy, energy efficiency, green building, pollution prevention, sustainable water, or sustainable agriculture), provided that such constituents meet MSCI ESG Research’s criteria to be considered an EU Sustainable Investment as per the MSCI SFDR Article 2(17) Sustainable Investment Methodology.
Estimated EU Taxonomy % Alignment	Weighted average of index constituents’ estimated maximum percent of revenue from products and services addressing environmental objectives, based on the MSCI Sustainable Impact Metrics framework, provided that such constituents do not have any of the following characteristics: 1) Red and Orange Flag environmental controversies 2) Red Flag social and governance controversies 3) Involvement in tobacco - in particular, tobacco production or at least 5% of their aggregate revenue from tobacco-related activities 4) Any tie to controversial (banned) weapons.
Fossil Fuel Reserves %	Exposure to companies with evidence of owning proven or probable coal and proven oil and natural gas reserves used for energy generation.
Implied Temperature Rise	Aggregate measure of an index’s temperature alignment (in °C) to keeping the world’s temperature rise to 2°C by 2100. The calculation uses an aggregated budget approach that compares the sum of financed emission budget overshoot against the sum of financed

	carbon emission budgets for the underlying index constituents. The total index carbon emission over/undershoot is then converted to a degree of temperature rise using the science-based ratio approach of Transient Climate Response to Cumulative Carbon Emissions (TCRE). The allocation base used to define an index's financed stake is Enterprise Value including Cash (EVIC), in order to enable the analysis of equity and corporate bond portfolios.
Estimated Social Impact Involvement (%)	Weighted average of index constituents' percentage of revenue from MSCI Sustainable Impact Solutions' social impact themes (nutrition, sanitation, major diseases treatment, SME finance, education, affordable real estate, or connectivity), provided that such constituents meet MSCI ESG Research's criteria to be considered an EU Sustainable Investment as per the MSCI SFDR Article 2(17) Sustainable Investment Methodology.
Sustainable Investment Test	Aggregated exposure to companies that could be considered sustainable investment under SFDR Article 2(17), based on MSCI's interpretation of the three building blocks: good governance practices, do no significant harm, and positive contribution criteria. Positive contribution can be demonstrated either by meeting the economic activity test (at least 20% of revenue from MSCI defined Sustainable Impact Solutions) or having a carbon emissions reduction target approved by the Science Based Targets initiative (SBTi).
Tobacco involvement Moderately Restrictive %	Exposure to companies that derive 5% or more revenue from tobacco production, and companies that derive 15% or more aggregate revenue from the manufacture, distribution, retailing, licensing, and supply of tobacco products.
UNGC Violations %	Exposure to companies in violation of the UN Global Compact (UNGC) principles, in accordance with the MSCI ESG Research methodology.
Red Flag ESG Controversies %	Exposure to companies involved 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.
Weighted Average Carbon Intensity (t CO2e/\$M SIs)	Weighted average Scope 1, Scope 2 and Scope 3 carbon emissions intensity normalized by sales. (Unit: tons of CO2e / million \$ of sales).

3 Calculation of Metrics

3.1 Data Used for the Calculation

The calculation of index level ESG metrics use the following data:

- Index security weights as of the close of the last weekday of the month. The weights do not take into account changes to be effective after the last weekday of the month.
- Company ratings and research provided by MSCI ESG Research⁵ as of the last weekday of the month.
- Global Industry Classification Standard (GICS[®]) classification of companies as of the last weekday of the month.
- Fundamental data of companies as of the last weekday of the month^{6 7}.

The metrics for an MSCI index are generally calculated based on security data for that index.

However, for the following MSCI indexes the metrics are calculated based on security data for the “parent index” or “underlying index”⁸.

- MSCI Hedged Indexes
- MSCI Daily Hedged Indexes⁹
- MSCI Adaptive Hedged Indexes
- MSCI Cross Hedged Indexes
- MSCI Dividend Point Indexes
- MSCI Risk Control Indexes⁷

⁵ See section 5 for further information regarding ESG and climate data used 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.

⁶ For more information, please refer to the MSCI Fundamental Data Methodology available at: <https://www.msci.com/index-methodology>

⁷ MSCI uses the latest available Enterprise Value Including Cash (EVIC) data as of the last weekday of the month for the calculation of index level ESG metrics. Please note that the EVIC data used for such calculation may not be the same as the EVIC data that is simultaneously provided by MSCI ESG Research, as there exists a lag between the time the data is available for use in the calculation of index level ESG metrics and the time it is distributed by MSCI ESG Research.

⁸ For more information, please refer to the respective index methodology books available at: <https://www.msci.com/index-methodology>

⁹ ESG metrics disclosed only for MSCI indexes that pursue ESG objectives.

- MSCI Decrement Indexes⁷
- MSCI Short & Leveraged Indexes^{7, 10}

3.2 Calculation Details and Formulas

This section shows how the different data (index security weights, ESG data, GICS® classification, Fundamental data) is combined and aggregated to derive each of the index level ESG metrics.

ESG data from MSCI ESG Research is displayed in upper characters. The detailed definition of each ESG datapoint is provided in Appendix 1.

3.2.1 Benchmark Regulation Metrics

3.2.1.1 Equity and Corporate Bond Indexes

Metric Name	Metric Calculation
Board Gender Diversity %	$\frac{\sum_{i=1}^n (Weight_i \times CORP_GOV_PCT_WOMEN_BOARD_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with female board members percentage available • $Weight_i$ = closing index weight for security i • $CORP_GOV_PCT_WOMEN_BOARD_i$ = Female board members percentage of security i's issuer
Board Independence (Weighted Average)%	$\frac{\sum_{i=1}^n (Weight_i \times BOARD_INDEP_PCT_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with Board independence percentage available • $Weight_i$ = closing index weight for security i • $BOARD_INDEP_PCT_i$ = Board independence percentage of security i's issuer
Bribery & Corruption Controversies (Sum)	$\sum_{i=1}^n (CONTR_BRIR_CORRUP_N_TOTAL_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index issuer (i.e., issuer with at least one index constituent security included in the index) • $TRIR_i$ = Total bribery and correction controversy cases of issuer i

¹⁰ For indexes that combine long and short positions, the metrics are calculated based on security data for the long component index.

<p>Controversial Weapons %</p>	$\frac{\sum_{i=1}^n (Weight_i \times Controversial\ Weapons\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $Controversial\ Weapons\ Factor_i$ = Controversial weapons factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i has ties to controversial weapons ($CWEAP_TIE_i = 'True'$), otherwise equals to 0
<p>Decarbonization %</p>	<p>This metric is calculated at each Semi-Annual Index Review of the index. The metric is not updated between Semi-Annual Index Reviews.</p> $\left(\frac{W_t}{W_1}\right)^{\frac{2}{t-1}}$ <p>Where:</p> <ul style="list-style-type: none"> • t = number of Semi-Annual Index Reviews since the index Base Date • W_t = Enterprise Carbon Intensity (t CO2/\$M EVIC) as of t • W_1 = Enterprise Carbon Intensity (t CO2/\$M EVIC) as of index Base Date
<p>Enterprise Carbon Intensity</p>	$\frac{\sum_{i=1}^n (Weight_i \times (CARBON_EMISSIONS_SCOPE_12_i + CARBON_EMISSIONS_SCOPE_3_TOTAL_i) / EVIC_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with both Carbon emissions (scope 1, 2 and 3) and EVIC available • $Weight_i$ = closing index weight for security i • $CARBON_EMISSIONS_SCOPE_12_i$ = scope 1 and 2 carbon emissions of security i's issuer (in t CO2) • $CARBON_EMISSIONS_SCOPE_3_TOTAL_i$ = Estimated scope 3 emissions (total) as defined by the Greenhouse Gas Protocol (in t CO2) of security i's issuer • $EVIC_i$ = Company enterprise value including cash for security i's issuer (in USD million)
<p>Environmental Pillar Score</p>	$\frac{\sum_{i=1}^n (Weight_i \times ENVIRONMENTAL_PILLAR_WEIGHT_i \times ENVIRONMENTAL_PILLAR_SCORE_i)}{\sum_{i=1}^n (Weight_i \times ENVIRONMENTAL_PILLAR_WEIGHT_i)}$ <p>Where:</p>

	<ul style="list-style-type: none"> • i = index security with Environmental Pillar Score available • $Weight_i$ = closing index weight for security i • $ENVIRONMENTAL_PILLAR_WEIGHT_i$ = Environmental pillar weight of security i • $ENVIRONMENTAL_PILLAR_SCORE_i$ = Environmental pillar score of security i
ESG Score	$\frac{\sum_{i=1}^n (Weight_i \times INDUSTRY_ADJUSTED_SCORE_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with ESG score available • $Weight_i$ = closing index weight for security i • $INDUSTRY_ADJUSTED_SCORE_i$ = ESG score of security i
Estimated Emissions %	$\sum_{i=1}^n (Weight_i \times Estimated\ Emissions\ Factor_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $Estimated\ Emissions\ Factor_i$ = estimated emissions factor for security i • Equals to 1 if security i's issuer has estimated emissions ($CARBON_EMISSIONS_SCOPE_12_KEY_i \neq$ 'Reported'), otherwise equals to 0
Female: Male Board Diversity Ratio %	$\frac{\sum_{i=1}^n (Weight_i \times CORP_GOV_PCT_WOMEN_BOARD_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with female board members percentage available • $Weight_i$ = closing index weight for security i • $CORP_GOV_PCT_WOMEN_BOARD_i$ = Female board members percentage of security i's issuer
Fossil Fuel-Based Sector Exposure (NACE) %	$\frac{\sum_{i=1}^n (Weight_i \times FF\ Sector\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $FF\ Sector\ Factor_i$ = fossil fuel-based sector factor for security i

	<ul style="list-style-type: none"> ○ Equals to 1 if security i has a GICS® classification that indicates fossil fuel-based sector exposure, otherwise equals to 0 <p>On each date that the calculation is performed, the set of GICS® Sub-Industries that indicate fossil fuel-based sector exposure is derived as follows:</p> <ul style="list-style-type: none"> • First, the fossil fuel-based sector classifications as defined by the EU Delegated Act (i.e., NACE classifications from Divisions 05 to 09, 19 and 20 of Annex I to Regulation (EC) No 1893/2006) are mapped to the GICS® Sub-Industries using the GICS® to NACE mapping¹¹ • Second, the mapped GICS® Sub-Industries are filtered to remove GICS® Sub-Industries with more than 80% weight in the Solutions and Neutral categories of the Low Carbon Transition framework <p>The 80% threshold will be reviewed and adjusted as necessary each time there is a relevant change in the GICS® and/or NACE methodologies or mapping, or a change in the Low Carbon Transition methodology.</p>
Gender Pay Gap%	$\frac{\sum_{i=1}^n (Weight_i \times GENDER\ PAY\ GAP\ RATIO_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with gender pay gap ratio available • $Weight_i$ = closing index weight for security i • $GENDER\ PAY\ GAP\ RATIO_i$ = Gender pay gap ratio (as defined in section 2.1) for security i's issuer
Governance Pillar Score	$\frac{\sum_{i=1}^n (Weight_i \times GOVERNANCE_PILLAR_WEIGHT_i \times GOVERNANCE_PILLAR_SCORE_i)}{\sum_{i=1}^n (Weight_i \times GOVERNANCE_PILLAR_WEIGHT_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with Governance Pillar Score available • $Weight_i$ = closing index weight for security i • $GOVERNANCE_PILLAR_WEIGHT_i$ = Governance pillar weight of security i • $GOVERNANCE_PILLAR_SCORE_i$ = Governance pillar score of security i
Green Bonds %	<p>This metric is calculated for MSCI Fixed Income Indexes only.</p>

¹¹ This mapping is available in the [Handbook of Climate Transition Benchmarks, Paris-Aligned Benchmark and Benchmarks' ESG Disclosures](#). Please note that the mapping does not reflect changes in the GICS structure that were implemented in the MSCI indexes on June 1, 2023.

	$\frac{\sum_{i=1}^n (Weight_i \times Green\ Bond\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $Green\ Bond\ Factor_i$ = Green bond factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i meets the relevant green bond criteria ($GB_ELIGIBLE_i = 'True'$), otherwise equals to 0
Green Capex%	$\sum_{i=1}^n (Weight_i \times RENEW_ENERGY_CAPEX_VS_TOTAL_CAPEX_PCT_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $RENEW_ENERGY_CAPEX_VS_TOTAL_CAPEX_PCT_i$ = Capital expenditure in renewable power generation assets as a proportion of total company capital expenditure for security i
Green Revenues %	$\sum_{i=1}^n (Weight_i \times CT_TOTAL_MAX_REV_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $CT_TOTAL_MAX_REV_i$ = Clean tech revenue for security i
High Climate Impact Sector Exposure %	$\frac{\sum_{i=1}^n (Weight_i \times High\ Climate\ Impact\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $High\ Climate\ Impact\ Factor_i$ = High climate impact factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i has a GICS® classification that indicates High climate impact sector exposure, otherwise equals to 0 ○ To determine if a GICS® classification indicates High climate impact sector exposure, the High climate impact sector classifications as defined by the EU Delegated Act (i.e., NACE sectors listed in Sections A to H and Section L of Annex I to Regulation (EC) No 1893/2006) are mapped to

	the GICS® Sub-Industries using the GICS® to NACE mapping ¹²
Lack of Due Diligence Policy (ILO)%	$\frac{\sum_{i=1}^n (Weight_i \times ILO \text{ Due Diligence Factor}_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $ILO \text{ Due Diligence Factor}_i$ = ILO due diligence factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i's issuer does not have due diligence policies on labor issues addressed by the fundamental ILO Conventions 1 to 8, otherwise: <ul style="list-style-type: none"> ▪ Equity to 1 if $LABOR_POLICY_INTL_RECOGNIZED_M_i$ = 'No', otherwise equals to 0
Overlap between the benchmark and its investable universe (using the active share at asset level)	$\left[\sum_{i=1}^n Abs(Weight \text{ Parent}_i - Weight_i) \right] / 2$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security of parent index • $Weight \text{ Parent}_i$ = parent index closing index weight for security i • $Weight_i$ = closing index weight for security i
Physical Risk Climate VaR%	$\frac{\sum_{i=1}^n (Weight_i \times PHYSICAL \text{ RISK CLIMATE } VAR_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with extreme weather Climate VaR available • $Weight_i$ = closing index weight for security i • $PHYSICAL \text{ RISK CLIMATE } VAR_i$ = extreme weather Climate VaR – aggressive scenario (as defined in section 2.1) for security i
Reported Emissions %	$\sum_{i=1}^n (Weight_i \times Reported \text{ Emissions Factor}_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $Reported \text{ Emissions Factor}_i$ = reported emissions factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i's issuer has reported emissions ($CARBON_EMISSIONS_SCOPE_12_KEY_i$ = 'Reported'), otherwise equals to 0

¹² This mapping is available in the [Handbook of Climate Transition Benchmarks, Paris-Aligned Benchmark and Benchmarks' ESG Disclosures](#). Please note that the mapping does not reflect changes in the GICS structure that were implemented in the MSCI indexes on June 1, 2023.

<p>Social Pillar Score</p>	$\frac{\sum_{i=1}^n (Weight_i \times SOCIAL_PILLAR_WEIGHT_i \times SOCIAL_PILLAR_SCORE_i)}{\sum_{i=1}^n (Weight_i \times SOCIAL_PILLAR_WEIGHT_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with Social Pillar Score available • $Weight_i$ = closing index weight for security i • $SOCIAL_PILLAR_WEIGHT_i$ = Social pillar weight of security i • $SOCIAL_PILLAR_SCORE_i$ = Social pillar score of security i
<p>Social Violation (Count)</p>	$\sum_{i=1}^n (Social\ Violations\ Factor_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Social\ Violations\ Factor_i$ = Social violations factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i has Red Flag social controversies ($SOCIAL_CONTROVERSY_SCORE_i = 0$), otherwise equals to 0
<p>Social Violation (% Constituents)</p>	$\frac{\sum_{i=1}^n (Social\ Violations\ Factor_i)}{\sum_{i=1}^n (i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Social\ Violations\ Factor_i$ = Social violations factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i has Red Flag social controversies ($SOCIAL_CONTROVERSY_SCORE_i = 0$), otherwise equals to 0
<p>Tobacco involvement Highly Restrictive %</p>	$\frac{\sum_{i=1}^n (Weight_i \times Tobacco\ Highly\ Restrictive\ Screen_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $Tobacco\ Highly\ Restrictive\ Screen_i$ = Screening status for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i is screened for Tobacco Involvement at Highly Restrictive level ($TOB_PRODUCER_i = 'True'$ or $TOB_MAX_REV_PCT_i >= 5$), otherwise equals to 0
<p>Total Recordable Injury Rate%</p>	$\frac{\sum_{i=1}^n (Weight_i \times TRIR_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with total recordable injury rate available • $Weight_i$ = closing index weight for security i • $TRIR_i$ = Total recordable injury rate per million hours worked (as defined in section 2.1) for security i's issuer

3.2.1.2 Sovereign Bond Indexes

Metric Name	Metric Calculation
International Convention Signatory (%) - Sovereign	$\frac{\sum_{i=1}^n (Weight_i \times Signatory\ Convention\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $Signatory\ Convention\ Factor_i$ = Signatory Convention Factor for security i equals to 1 if security i meets at least 7 of the following international conventions, otherwise equals to 0 <ul style="list-style-type: none"> ▪ Basel Convention (GOVERNMENT_BASEL_CONVENTION = "Yes" or "Yes, but did not subscribe to Nagoya Supplement") ▪ Biological Diversity Convention (GOVERNMENT_CONV_BIO_DIVERSITY = "Yes" or "Yes, but did not subscribe to Nagoya Supplement") ▪ Convention on International Trade in Endangered Species of Wild Fauna and Flora (GOVERNMENT_CONV_ENDANGERED_SPECIES = "Yes" or "Yes, but did not subscribe to Nagoya Supplement") ▪ Kyoto Protocol (GOVERNMENT_KYOTO_PROTOCOL = "Yes" or "Yes, but did not subscribe to Nagoya Supplement") ▪ Anti-Personnel Landmines Convention (GOVERNMENT_MINE_BAN_TREATY = "Yes" or "Yes, but did not subscribe to Nagoya Supplement") ▪ Biological Weapon Convention (GOVERNMENT_BIO_WEAPONS = "Yes" or "Yes, but did not subscribe to Nagoya Supplement") ▪ Chemical Weapon Convention (GOVERNMENT_CHEM_WEAPONS = "Yes" or "Yes, but did not subscribe to Nagoya Supplement") ▪ Convention against Torture and other cruel, inhuman or degrading treatment or punishment (GOVERNMENT_CONV_TORTURE = "Yes" or "Yes, but did not subscribe to Nagoya Supplement")

	<ul style="list-style-type: none"> ▪ Convention on Certain Conventional Weapons (GOVERNMENT_CONVENTIONAL_WEAPONS = “Yes” or “Yes, but did not subscribe to Nagoya Supplement”) ▪ Convention on Cluster Munitions (GOVERNMENT_CLUSTER_MUNITIONS = “Yes” or “Yes, but did not subscribe to Nagoya Supplement”) ▪ Convention for the protection of all persons from enforced disappearance (GOVERNMENT_CONV_PROTECT_PERSONS = “Yes” or “Yes, but did not subscribe to Nagoya Supplement”) ▪ United Nations Convention against Corruption (GOVERNMENT_UN_CONVEN_CORRUP = “Yes” or “Yes, but did not subscribe to Nagoya Supplement”) ▪ United Nations Convention against Transnational Organized Crime (GOVERNMENT_UN_CONVEN_CRIME = “Yes” or “Yes, but did not subscribe to Nagoya Supplement”) ▪ World Health Organization Framework Convention on Tobacco Control (GOVERNMENT_WHO_TOBACCO_CTRL = “Yes” or “Yes, but did not subscribe to Nagoya Supplement”)
<p>Wtd Avg GHG Intensity (t/USD million GDP nominal) - Sovereign</p>	$\frac{\sum_{i=1}^n (Weight_i \times CARBON_GOVERNMENT_GHG_INTENSITY_GDP_TONPERMN_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $CARBON_GOVERNMENT_GHG_INTENSITY_GDP_TONPERMN_i$ = GHG intensity of security i (in tons per USD million GDP nominal).
<p>Reported Emissions (%) - Sovereign</p>	<p>MSCI ESG Research only estimates the Carbon Emissions Intensity of sovereign bonds and hence the reported emissions are always 0%</p>
<p>Estimated Emissions (%) - Sovereign</p>	$\sum_{i=1}^n (Weight_i \times Estimated\ Emissions\ Factor_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $Estimated\ Emissions\ Factor_i$ = estimated emissions factor for security i equals to 1 if security i's issuer has reported emissions

	(CARBON_GOVERNMENT_GHG_INTENSITY_GDP_TONPERMN _i is not null), otherwise equals to 0
Green Bonds (%) - Sovereign	$\frac{\sum_{i=1}^n (Weight_i \times Green\ Bond\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> <i>i</i> = index security <i>Weight_i</i> = closing index weight for security <i>i</i> <i>Green Bond Factor_i</i> = Green bond factor for security <i>i</i> equals to 1 if security <i>i</i> meets the relevant green bond criteria (<i>GB_ELIGIBLE_i</i> = 'True'), otherwise equals to 0
Social Violations (Count) - Sovereign	$\sum_{i=1}^n (Social\ Violations\ Issuer_i)$ <p>Where:</p> <ul style="list-style-type: none"> <i>i</i> = unique index issuer <i>Social Violations Factor_i</i> = Social violations factor for issuer <i>i</i> equals to 1 if issuer <i>i</i> is alleged to be involved in human rights violations and abuses subject to EU sanctions (<i>GOVERNMENT_EU_SANCTIONS_i</i> = 'Yes'), otherwise equals to 0
Social Violations (% of Constituents) - Sovereign	$\frac{\sum_{i=1}^n (Social\ Violations\ Factor_i)}{\sum_{i=1}^n (i)}$ <p>Where:</p> <ul style="list-style-type: none"> <i>i</i> = unique index issuer <i>Social Violations Factor_i</i> = Social violations factor for issuer <i>i</i> equals to 1 if issuer <i>i</i> is alleged to be involved in human rights violations and abuses subject to EU sanctions (<i>GOVERNMENT_EU_SANCTIONS_i</i> = 'Yes'), otherwise equals to 0
Human Rights Performance - Sovereign	$\frac{\sum_{i=1}^n (Weight_i \times GOVERNMENT_FUNDAMENTAL_RIGHTS_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> <i>i</i> = index security <i>Weight_i</i> = closing index weight for security <i>i</i> <i>GOVERNMENT_FUNDAMENTAL_RIGHTS_i</i> = WJP Rule of Law Index, Fundamental Rights Sub-score for security <i>i</i>
Income Inequality Score - Sovereign	$\frac{\sum_{i=1}^n (Weight_i \times GOVERNMENT_RAW_GINI_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> <i>i</i> = index security <i>Weight_i</i> = closing index weight for security <i>i</i>

	<ul style="list-style-type: none"> $GOVERNMENT_RAW_GINI_i$ = GINI Index for security i
Press Freedom Sovereign Score - Sovereign	$\frac{\sum_{i=1}^n (Weight_i \times GOVERNMENT_RAW_PRESS_FREED_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i $GOVERNMENT_RAW_PRESS_FREED_i$ = World Press Freedom Index for security i
Corruption Score - Sovereign	$\frac{\sum_{i=1}^n (Weight_i \times GOVERNMENT_RAW_CORR_PERC_INDEX_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i $GOVERNMENT_RAW_CORR_PERC_INDEX_i$ = Corruption Perception Index for security i
Stability & Peace Score - Sovereign	$\frac{\sum_{i=1}^n (Weight_i \times GOVERNMENT_STABILITY_PEACE_SCORE_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i $GOVERNMENT_STABILITY_PEACE_SCORE_i$ = Stability & Peace Score for security i
Rule of Law Score - Sovereign	$\frac{\sum_{i=1}^n (Weight_i \times GOVERNMENT_RAW_RULE_OF_LAW_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i $GOVERNMENT_RAW_RULE_OF_LAW_i$ = Rule of law Index for security i

3.2.2 SFDR Mandatory Metrics (Equity and Corporate Bond Indexes)

Metric Name	Metric Calculation
Carbon Footprint (Scope 1+2+3)	$\frac{\sum_{i=1}^n (Weight_i \times (CARBON_EMISSIONS_SCOPE_12_i + CARBON_EMISSIONS_SCOPE_3_TOTAL_i) / EVIC_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security with both Carbon emissions (scope 1, 2 and 3) and EVIC available $Weight_i$ = closing index weight for security i $CARBON_EMISSIONS_SCOPE_12_i$ = scope 1 and 2 carbon emissions of security i's issuer (in t CO₂) $CARBON_EMISSIONS_SCOPE_3_TOTAL_i$ = Estimated scope 3 emissions (total) as defined by the Greenhouse Gas Protocol (in t CO₂) of security i's issuer $EVIC_i$ = Company enterprise value including cash for security i's issuer (in EUR million)
Carbon Footprint (Scope 1)	$\frac{\sum_{i=1}^n (Weight_i \times (CARBON_EMISSIONS_SCOPE_1_i) / EVIC_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security with both Carbon emissions (scope 1) and EVIC available $Weight_i$ = closing index weight for security i $CARBON_EMISSIONS_SCOPE_1_i$ = scope 1 carbon emissions of security i's issuer (in t CO₂) $EVIC_i$ = Company enterprise value including cash for security i's issuer (in EUR million)
Carbon Footprint (Scope 2)	$\frac{\sum_{i=1}^n (Weight_i \times (CARBON_EMISSIONS_SCOPE_2_i) / EVIC_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security with both Carbon emissions (scope 2) and EVIC available $Weight_i$ = closing index weight for security i $CARBON_EMISSIONS_SCOPE_2_i$ = scope 2 carbon emissions of security i's issuer (in t CO₂) $EVIC_i$ = Company enterprise value including cash for security i's issuer (in EUR million)

<p>Carbon Footprint (Scope 3)</p>	$\frac{\sum_{i=1}^n (Weight_i \times (CARBON_EMISSIONS_SCOPE_3_TOTAL_i) / EVIC_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security with both Carbon emissions (scope 3) and EVIC available $Weight_i$ = closing index weight for security i $CARBON_EMISSIONS_SCOPE_3_TOTAL_i$ = Estimated scope 3 emissions (total) as defined by the Greenhouse Gas Protocol (in t CO₂) of security i's issuer $EVIC_i$ = Company enterprise value including cash for security i's issuer (in EUR million)
<p>Carbon Footprint (Scope 1+2)</p>	$\frac{\sum_{i=1}^n (Weight_i \times (CARBON_EMISSIONS_SCOPE_12_i) / EVIC_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security with both Carbon emissions (scope 1 and 2) and EVIC available $Weight_i$ = closing index weight for security i $CARBON_EMISSIONS_SCOPE_12_i$ = scope 1 and 2 carbon emissions of security i's issuer (in t CO₂) $EVIC_i$ = Company enterprise value including cash for security i's issuer (in EUR million)
<p>GHG Intensity of Investee Companies</p>	$\frac{\sum_{i=1}^n (Weight_i \times (CARBON_EMISSIONS_SCOPE_12_i + CARBON_EMISSIONS_SCOPE_3_TOTAL_i) / SALES_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security with both Carbon emissions (scope 1, 2 and 3) and Sales available $Weight_i$ = closing index weight for security i $CARBON_EMISSIONS_SCOPE_12_i$ = scope 1 and 2 carbon emissions of security i's issuer (in t CO₂) $CARBON_EMISSIONS_SCOPE_3_TOTAL_i$ = Estimated scope 3 emissions (total) as defined by the Greenhouse Gas Protocol (in t CO₂) of security i's issuer $SALES_i$ = Company sales for security i's issuer (in EUR million)
<p>Exposure to companies active in fossil fuel sector %</p>	$\frac{\sum_{i=1}^n (Weight_i \times Active\ Fossil\ Fuel\ Sector\ Exposure\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p>

	<ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • <i>Active Fossil Fuel Sector Exposure Factor</i>$_i$ = Active Fossil Fuels Sector Exposure factor for security i <ul style="list-style-type: none"> ◦ Equals to 1 if security i's issuer has exposure to oil and gas and thermal coal related revenue generating activities ($ACTIVE_FF_SECTOR_EXPOSURE_i = 'True'$), otherwise equals to 0
Share of non-renewable energy consumption and production %	$\frac{\sum_{i=1}^n (Weight_i \times PCT_NONRENEW_CONSUMP_PROD_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with % non-renewable energy consumption and production available • $Weight_i$ = closing index weight for security i • $PCT_NONRENEW_CONSUMP_PROD_i$ = Percentage of non-renewable energy consumption and production of security i
Energy consumption intensity per high impact climate sector	$\frac{\sum_{i=1}^n (Weight_i \times ENERGY_CONSUMP_INTEN_EUR_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security that belong to High Climate Impact sector • $Weight_i$ = renormalized closing index weight for security i, for sub-portfolio of all securities classified in High Climate Impact Sector <p>To determine if a GICS® classification indicates High climate impact sector exposure, the High climate impact sector classifications as defined by the EU Delegated Act (i.e., NACE sectors listed in Sections A to H and Section L of Annex I to Regulation (EC) No 1893/2006) are mapped to the GICS® Sub-Industries using the GICS® to NACE mapping¹³</p>
Activities negatively affecting biodiversity - sensitive areas	$\frac{\sum_{i=1}^n (Weight_i \times Negative\ Biodiversity\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • <i>Negative Biodiversity Factor</i>$_i$ = Negative biodiversity factor for security i

¹³ This mapping is available in the [Handbook of Climate Transition Benchmarks, Paris-Aligned Benchmark and Benchmarks' ESG Disclosures](#). Please note that the mapping does not reflect changes in the GICS structure that were implemented in the MSCI indexes on June 1, 2023.

	<ul style="list-style-type: none"> ○ Equals to 1 if security i's issuer is involved in activities which negatively affect biodiversity sensitive areas ($OPS_PROT_BIODIV_CONTROVS_i = 'Yes'$), otherwise equals to 0
Emissions to water	$\sum_{i=1}^n (Weight_i \times (WATER_EM_EFF_METRIC_TONS_i) / EVIC_i) / \sum_{i=1}^n (Weight_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with both Emissions to water and EVIC available • $Weight_i$ = closing index weight for security i • $WATER_EM_EFF_METRIC_TONS_i$ = Total tons of pollutants released to surface waters as a result of companies' operations • $EVIC_i$ = Company enterprise value including cash for security i's issuer (in EUR million)
Hazardous Waste Ratio	$\sum_{i=1}^n (Weight_i \times (HAZARD_WASTE_METRIC_TON_i) / EVIC_i) / \sum_{i=1}^n (Weight_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with both Emissions to water and EVIC available • $Weight_i$ = closing index weight for security i • $HAZARD_WASTE_METRIC_TON_i$ = Total hazardous waste (metric tons) • $EVIC_i$ = Company enterprise value including cash for security i's issuer (in EUR million)
Violations of UN Global Compact principles and Organisation for Economic Cooperation and Development (OECD) Guidelines for Multinational Enterprises	$\sum_{i=1}^n (Weight_i \times Very\ Severe\ Controversies\ Factor_i) / \sum_{i=1}^n (Weight_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with ESG score available • $Weight_i$ = closing index weight for security i • $Red\ Flag\ ESG\ Controversies\ Factor_i$ = Red Flag ESG controversies factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i is flagged for a Red Flag ESG controversy ($OVERALL_FLAG_i = 'Red'$), otherwise equals to 0
Lack of processes and compliance mechanisms to monitor compliance with UN Global Compact principles and OECD Guidelines	$\sum_{i=1}^n (Weight_i \times UNGC\ Compliance\ Mechanisms\ Factor_i) / \sum_{i=1}^n (Weight_i)$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $UNGC\ Compliance\ Mechanisms\ Factor_i$ = UNGC Compliance mechanisms factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i's issuers with no evidence for being signatory to the UN Global Compact and being required to

for Multinational Enterprises %	monitor and report compliance with the UN Global Compact principles ($MECH_UN_GLOBAL_COMPACT_i$ = 'No evidence'), otherwise equals to 0
Unadjusted Gender Pay Gap %	$\frac{\sum_{i=1}^n (Weight_i \times GENDER\ PAY\ GAP\ RATIO_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security with gender pay gap ratio available $Weight_i$ = closing index weight for security i $GENDER\ PAY\ GAP\ RATIO_i$ = Gender pay gap ratio (as defined in section 2.1) for security i's issuer
Board Gender Diversity %	$\frac{\sum_{i=1}^n (Weight_i \times CORP_GOV_PCT_WOMEN_BOARD_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security with female board members percentage available $Weight_i$ = closing index weight for security i $CORP_GOV_PCT_WOMEN_BOARD_i$ = Female board members percentage of security i's issuer
Exposure to controversial weapons %	$\frac{\sum_{i=1}^n (Weight_i \times SFDR\ Controversial\ Weapons\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i $SFDR\ Controversial\ Weapons\ Factor_i$ = SFDR controversial weapons factor for security i <ul style="list-style-type: none"> Equals to 1 if security i has ties to cluster munitions, landmines, biological/chemical weapons ($CONTRO_WEAP_CBLMBW_ANYTIE_i$ = 'True'), otherwise equals to 0

3.2.3 Other Metrics

Metric Name	Metric Calculation
1.5°C Aggregated Policy Risk Climate VaR %	$\frac{\sum_{i=1}^n (Weight_i \times POLICY\ RISK\ CLIMATE\ VAR_i)}{\sum_{i=1}^n (Weight_i)}$

	<p>Where:</p> <ul style="list-style-type: none"> i = index security with policy risk Climate VaR available $Weight_i$ = closing index weight for security i $POLICY RISK CLIMATE VAR_i$ = policy risk Climate VaR (as defined in section 2.3) for security i
<p>1.5°C Technology Opportunity Climate VaR %</p>	$\frac{\sum_{i=1}^n (Weight_i \times TECH OPP CLIMATE VAR_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security with technology opportunity Climate VaR available $Weight_i$ = closing index weight for security i $TECH OPP CLIMATE VAR_i$ = technology opportunity Climate VaR (as defined in section 2.3) for security i
<p>1.5°C Aggregated Climate VaR %</p>	<p><i>Physical Risk Climate VaR % + 1.5°C Aggregated Policy Risk Climate VaR % + 1.5°C Technology Opportunity Climate VaR %</i></p>
<p>Baseline Criteria Test (% Fail)</p>	$\frac{\sum_{i=1}^n (Weight_i \times Baseline Criteria Fail Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i Baseline Criteria Fail Factor$_i$ = Baseline Criteria test (%SI) factor for security i <ul style="list-style-type: none"> Equals to 1 if security fails DNSH or Good Governance criteria ($EU_SI_DNSH_TEST <> 'Pass'$ OR $EU_SI_GOOD_GOV_TEST <> 'Pass'$), otherwise equals to 0
<p>Economic Activities Test</p>	$\frac{\sum_{i=1}^n (Weight_i \times Economic Activities Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i Economic Activities Factor$_i$ = Economic Activities factor for security i <ul style="list-style-type: none"> Equals to 1 if security i has more than 20% revenues from environmental or social themes ($EU_SI_ECONOMIC_ACT_TEST = 'Pass'$), otherwise equals to 0
<p>Estimated Environmental Impact Involvement (%)</p>	$\sum_{i=1}^n (Weight_i \times EU_SI_ENV_IMPACT_REV_i)$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i

	<ul style="list-style-type: none"> $EU_SI_ENV_IMPACT_REV_i$ = Estimated environmental Impact revenue for security i
Estimated EU Taxonomy % Alignment	$\sum_{i=1}^n (Weight_i \times EST_EU_TAXONOMY_MAX_REV_i)$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i $EST_EU_TAXONOMY_MAX_REV_i$ = Estimated impact revenue for security i
Estimated Social Impact Involvement (%)	$\sum_{i=1}^n (Weight_i \times EU_SI_SOC_IMPACT_REV_i)$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i $EU_SI_SOC_IMPACT_REV_i$ = Estimated social Impact revenue for security i
Fossil Fuel Reserves %	$\frac{\sum_{i=1}^n (Weight_i \times Fossil\ Fuel\ Reserves\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> i = index security $Weight_i$ = closing index weight for security i $Fossil\ Fuel\ Reserves\ Factor_i$ = Fossil Fuel Reserves factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i's issuer has evidence of owning fossil fuel reserves used for energy applications ($FF_RESERVES_ENERGY_APPLICATION_i$ = 'True'), otherwise equals to 0
Implied Temperature Rise	<p>Step 1: Compute "Ownership" The ownership per index security 'i' is computed as follows: Security Ownership_i = (Security Weight_i) / (EVIC_i)</p> <p>Step 2: Index Cumulative 2°C Carbon Budget The financed budget per index security 'i' is computed as follows: Financed Budget_i = Ownership_i * Company Budget_i</p> <p>Step 3: Absolute Carbon Budget Overshoot The financed overshoot per index security 'i' is computed as follows: Financed Overshoot_i = Ownership_i * Company Absolute Overshoot_i</p> <p>Step 4: Index Budget and Overshoot</p>

	<p>The index relative overshoot is computed as follows: Index Budget = $\sum \text{Financed Budget}_i$ Index Overshoot = $\sum \text{Financed Overshoot}_i$</p> <p>Step 5: Index Relative Overshoot Index Relative Overshoot = (Index Overshoot) / (Index Budget)</p> <p>Step 6: Index Implied Temperature Rise Index Implied Temperature Rise = 2°C + Index Relative Overshoot * TCRE * Global Budget</p> <p>Refer to Appendix 2 for more details.</p>
<p>Sustainable Investment Test %</p>	$\frac{\sum_{i=1}^n (Weight_i \times Sustainable\ Investment\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $Sustainable\ Investment\ Factor_i$ = Sustainable Investment (%SI) factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i passes the Sustainable Investment test ($EU_SUSTAINABLE_INVESTMENT_SCREEN = 'Pass'$), otherwise equals to 0
<p>Tobacco involvement Moderately Restrictive %</p>	$\frac{\sum_{i=1}^n (Weight_i \times Tobacco\ Moderately\ Restrictive\ Screen_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security • $Weight_i$ = closing index weight for security i • $Tobacco\ Moderately\ Restrictive\ Screen_i$ = Screening status for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i is screened for Tobacco Involvement at Moderately Restrictive level ($TOB_PROD_MAX_REV_PCT_i \geq 5$ or $TOB_MAX_REV_PCT_i \geq 15$), otherwise equals to 0
<p>Red Flag ESG Controversies %</p>	$\frac{\sum_{i=1}^n (Weight_i \times Very\ Severe\ Controversies\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with ESG score available • $Weight_i$ = closing index weight for security i • $Red\ Flag\ ESG\ Controversies\ Factor_i$ = Red Flag ESG controversies factor for security i <ul style="list-style-type: none"> ○ Equals to 1 if security i is flagged for a Red Flag ESG controversy ($OVERALL_FLAG_i = 'Red'$), otherwise equals to 0

<p>UNGC Violations %</p>	$\frac{\sum_{i=1}^n (Weight_i \times UNGC\ Violations\ Factor_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with ESG score available • $Weight_i$ = closing index weight for security i • $UNGC\ Violations\ Factor_i$ = UN Global Compact violations factor for security i <ul style="list-style-type: none"> ◦ Equals to 1 if security i fails to comply with UNGC principles ($UNGC_COMPLIANCE_i$ = 'Fail'), otherwise equals to 0
<p>Weighted Average Carbon Intensity (t CO2e/\$M SIs)</p>	$\frac{\sum_{i=1}^n (Weight_i \times (CARBON_EMISSIONS_SCOPE_12_i + CARBON_EMISSIONS_SCOPE_3_TOTAL_i) / SALES_i)}{\sum_{i=1}^n (Weight_i)}$ <p>Where:</p> <ul style="list-style-type: none"> • i = index security with both Carbon emissions (scope 1, 2 and 3) and Sales available • $Weight_i$ = closing index weight for security i • $CARBON_EMISSIONS_SCOPE_12_i$ = scope 1 and 2 carbon emissions of security i's issuer (in t CO2) • $CARBON_EMISSIONS_SCOPE_3_TOTAL_i$ = Estimated scope 3 emissions (total) as defined by the Greenhouse Gas Protocol (in t CO2) of security i's issuer • $SALES_i$ = Company sales for security i's issuer (in USD million)

3.2.4 Percentage of Coverage

For each of the ESG and SFDR metrics, MSCI discloses the corresponding percentage of coverage of the underlying ESG data used for the ESG metric calculation.

The percentage of coverage is derived by dividing the number of index constituent securities that have underlying ESG data available with the total number of index constituent securities.

For example, the percentage of coverage for the ESG Score metric is calculated as follows:

$$\frac{\text{Number of index constituent securities with } INDUSTRY_ADJUSTED_SCORE \text{ available}}{\text{Total number of index constituent securities}}$$

Where:

- $INDUSTRY_ADJUSTED_SCORE_i$ = ESG score of security i

4 Maintenance of Metrics

4.1 Ongoing Review and Publication

The ESG and SFDR metrics are calculated once a month using end of month data, as described in section 3.1.

4.2 Correction Policy

In certain circumstances, such as errors in the calculation of the metrics or in the input data used for the calculation, MSCI reserves the right to correct the ESG metrics information, and in such case would release a relevant announcement accordingly.

5 MSCI ESG Research

The following MSCI ESG Research products are used for the calculation of ESG metrics: MSCI ESG Ratings, MSCI ESG Controversies, MSCI ESG Business Involvement Screening Research, MSCI Climate Change Metrics and MSCI ESG Sustainable Impact Metrics.

For details on MSCI ESG Research’s full suite of ESG products, please refer to: <https://www.msci.com/esg-investing>.

5.1 MSCI ESG Ratings

MSCI ESG Ratings aim to measure entities’ management of environmental, social and governance risks and opportunities. MSCI ESG Ratings use a weighted average key issue calculation that is normalized by industry to arrive at an industry-adjusted ESG score (0-10), which is then translated to a seven-point scale from ‘AAA’ to ‘CCC’, indicating how an entity manages relevant key issues relative to industry peers.

The MSCI ESG Ratings methodology can be found at: <https://www.msci.com/esg-and-climate-methodologies>.

5.2 MSCI ESG Controversies

MSCI ESG Controversies provide assessments of controversies concerning the potential negative environmental, social, and/or governance impact of company operations, products and services. The evaluation framework used in MSCI ESG Controversies is designed to be consistent with international norms represented by the UN Declaration of Human Rights, the ILO Declaration on Fundamental Principles and Rights at Work, and the UN Global Compact. MSCI ESG Controversies Score falls on a 0-10 scale, with “0” being the most severe controversy.

The MSCI ESG Controversies methodology can be found at: <https://www.msci.com/esg-and-climate-methodologies>.

5.3 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.

5.4 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-change-solutions>.

5.5 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	1. Alternative energy 2. Energy efficiency 3. Green building
	Natural capital	4. Sustainable water 5. Pollution prevention 6. Sustainable agriculture
Social Impact	Basic needs	7. Nutrition 8. Major Disease Treatment 9. Sanitation 10. Affordable Real Estate
	Empowerment	11. SME Finance 12. Education 13. 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.

More detailed taxonomy for each category can be found in Section 2.4 of the MSCI ACWI Sustainable Impact Index Methodology available at <https://www.msci.com/index-methodology>

Appendix 1: ESG Data Definitions

The list of ESG datapoints (“Factors”) provided by MSCI ESG Research and used for the calculation of index level ESG metrics is provided below.

Field Name (Column Header)	Factor Name	Factor Description
ACTIVE_FF_SECTOR_EXPOSURE	Active Fossil Fuel Sector Exposure	Company’s exposure to oil and gas and thermal coal related revenue generating activities. Metric does not include revenue generating activities from metallurgical coal, and storage and transportation of coal.
BOARD_INDEP_PCT	Board Independence Percentage	The percentage of board members that meet our designated criteria for independence. For companies with a two-tier board, the calculation is based on members of the Supervisory Board only.
CARBON_EMISSIONS_SCOPE_12	Carbon Emissions - Scope 1+2 (metric tons)	This figure represents the company’s most recently reported or estimated Scope 1 + Scope 2 greenhouse gas emissions (if available). Scope 1 emissions are those from sources owned or controlled by the company, typically direct combustion of fuel as in a furnace or vehicle. Scope 2 emissions are those caused by the generation of electricity purchased by the company.
CARBON_EMISSIONS_SCOPE_3_TOTAL	Carbon Emissions Scope 3 - Total Emissions Estimated	Estimated scope 3 emissions (total) as defined by the Greenhouse Gas Protocol [tCO2e/yr].
CARBON_EMISSIONS_SCOPE_12_KEY	Carbon Emissions - Scope 1+2 KEY	This field indicates whether the Scope 1 + 2 emissions figure was reported by the company or estimated. See the Carbon Estimation Methodology for details.
CARBON_GOVERNMENT_GHG_INTENSITY_GDP_TONPERMN	GHG intensity (t/USD million GDP nominal)	This data point represents GHG intensity of an economy (in tons per USD million GDP nominal). The higher the value the more carbon intensive the economy is. Six greenhouse gases, considered under Kyoto Protocol, are considered for this data point. These gases are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. GDP is in nominal terms. (Sources: EDGAR, WDI). The unit used is aligned with the one for corporates inte

		nsity data (Scope 1+2 Intensity (t/USD million sales))
CONTRO_WEAP_CBLMBW_ANYTIE	Exposure to controversial weapons (landmines, cluster munitions, chemical weapons and biological weapons)	Company has an industry tie to landmines, cluster munitions, chemical weapons or biological weapons. Note: industry tie includes ownership, manufacture or investment. Landmines do not include related safety products.
CONTR_BRIB_CORRUPT_N_TOTAL	Total number of Bribery and Corruption Controversies	Total number of controversy cases in last three years related to company's involvement in: Bribery & corruption issues.
CORP_GOV_PCT_WOMEN_BOARD	Corporate Governance Percentage of Women on the Board	This figure indicates the number of women on the board as a percentage of total board members.
CT_TOTAL_MAX_REV	Environmental Impact Solutions - Maximum Percentage of Revenue	This field represents the total of all revenues derived from any of the six environmental impact themes including alternative energy, energy efficiency, green building, pollution prevention, sustainable water, or sustainable agriculture.
CWEAP_TIE	Controversial Weapons - Any Tie	Companies that have any ties to cluster munitions, landmines, biological / chemical weapons, depleted uranium weapons, blinding laser weapons, incendiary weapons, and/or non-detectable fragments.
ENERGY_CONSUMP_INTEN_EUR	Energy consumption intensity (GWh / EUR million sales)	Energy consumption (GWh) per million EUR revenue
ENVIRONMENTAL_PILLAR_SCORE	Environmental Pillar Score	The Environmental Pillar Score represents the weighted average of all Key Issues that fall under the Environment Pillar.
ENVIRONMENTAL_PILLAR_WEIGHT	Environmental Pillar Weight	The Environmental Pillar Weight represents the sum of the weights of all Key Issues that fall under the Environment Pillar.
EST_EU_TAXONOMY_MAX_REVENUE	Estimated EU Taxonomy Alignment - Maximum Percentage of Revenue	Estimated EU Taxonomy Alignment - Maximum Percentage of Revenue indicates a company's estimated maximum percent of revenue from products and services addressing environmental objectives, based on the MSCI Sustainable Impact Metrics framework. Companies with Red and Orange Flag environmental controversies, and Red Flag social and governance controversies are excluded from the list as failing to

		meet the Do No Significant Harm and Minimum Social Safeguards criteria of the EU Taxonomy. Also excluded are tobacco producers; companies generating 5% or more of revenue from supply, distribution, or retail of tobacco products; and companies with any involvement in controversial weapons.
EU_SI_DNSH_TEST	EU Sustainable Investment – DNSH Test	Signals if the company passes or fails MSCI ESG Research’s criteria for the SFDR article 2 (17) “do no significant harm”. Pass indicates the company has no ties to controversial weapons, less than 1% of revenue from thermal coal, less than 5% of revenue from tobacco related activities, is not a tobacco producer, and has no red or orange ESG Controversies. Please refer to the MSCI SFDR Article 2(17) Sustainable Investment Methodology document for additional methodological details.
EU_SI_ECONOMIC_ACT_TEST	EU Sustainable Investment – Economic Activities Test	Signals if the company has at least 20% of revenue from economic activities that positively contribute to a social or environmental theme, as measure by MSCI Sustainable Impact Solutions. Please refer to the MSCI SFDR Article 2(17) Sustainable Investment Methodology document for additional methodological details.
EU_SI_ENV_IMPACT_REV	EU Sustainable Investment – Environmental Impact Revenue	The percentage of revenue from MSCI Sustainable Impact Solutions’ environmental impact themes (alternative energy, energy efficiency, green building, pollution prevention, sustainable water, or sustainable agriculture). The company must meet MSCI ESG Research’s criteria to be considered an EU Sustainable Investment as per the MSCI SFDR Article 2(17) Sustainable Investment Methodology.
EU_SI_GOOD_GOV_TEST	EU Sustainable Investment – Good Governance Test	Signals if the company passes or fails MSCI ESG Research’s criteria for the SFDR Article 2 (17) “good governance” (strong overall management and governance structures). Pass indicates that the ESG Rating score is BB or above.

		Please refer to the MSCI SFDR Article 2(17) Sustainable Investment Methodology document for additional methodological details.
EU_SI_SOCIAL_IMPACT_REV	EU Sustainable Investment – Social Impact Revenue	The percentage of revenue from MSCI Sustainable Impact Solutions’ social impact themes (nutrition, sanitation, major diseases treatment, SME finance, education, affordable real estate, or connectivity). The company must meet MSCI ESG Research’s criteria to be considered an EU Sustainable Investment as per the MSCI SFDR Article 2(17) Sustainable Investment Methodology.
EU_SUSTAINABLE_INVESTMENT_SCREEN	EU Sustainable Investment Screen	This factor signals if the company meets all the criteria to be considered a sustainable investment under SFDR Article 2(17), based on MSCI’s interpretation of the three building blocks: good governance practices, do no significant harm, and positive contribution criteria. Positive contribution can be demonstrated either by meeting the economic activity test (at least 20% of revenue from MSCI defined Sustainable Impact Solutions) or having a carbon emissions reduction target approved by the Science Based Targets initiative (SBTi) . Please see the MSCI SFDR Article 2(17) Sustainable Investment Methodology document for details.
FF_RESERVES_ENERGY_APPLICATION	Fossil Fuel Reserves – Energy Application	This factor identifies companies, regardless of their industries, with evidence of owning fossil fuel reserves used most likely for energy applications. For high intensity industries (Energy, Utilities, Diversified Metals & Mining), this factor flags companies with evidence of fossil fuel reserves (excluding metallurgical coal). For other industries, it flags companies with evidence of fossil fuel reserves (excluding metallurgical coal) and deriving revenue from business segments associated with energy application of fossil fuels such as thermal coal mining, oil & gas

		exploration & production and downstream activities e.g. refining; distribution & retail; pipeline & transportation; trading and fossil fuel based power generation. Fossil fuel reserves are defined as proved and probable reserves (i.e. 2P) for coal and proved reserves (i.e. 1P) for oil and natural gas. Evidence of owning reserves includes companies providing the exact volume of reserves, and companies making a statement about their ownership of reserves.
GB_ELIGIBLE	Green Bond Eligible	The eligibility of the bond as per the MSCI ESG Research Green Bond Methodology
GOVERNMENT_BASEL_CONVENTION	Party to Basel Convention	Ratification status of Basel Convention by different countries. Countries which have deposited any of the ratification instruments (such as Ratification, Succession, Accession, Approval, Acceptance and Formal Confirmation) are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.
GOVERNMENT_BIO_WEAPONS	Party to Biological Weapon Convention	Ratification status of different countries. Countries which have deposited any of the ratification instruments are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.
GOVERNMENT_CHEM_WEAPONS	Party to Chemical Weapon Convention	Ratification status of different countries. Countries which have deposited any of the ratification instruments are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.

GOVERNMENT_CONV_BIO_DIVERSITY	Party to Convention on Biological Diversity (CBD)	Ratification status of Convention on Biological Diversity by different countries. Countries which have deposited any of the ratification instruments (such as Ratification, Succession, Accession, Approval, Acceptance etc) are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.
GOVERNMENT_CONV_ENDANGERED_SPECIES	Party to Convention on International Trade in Endangered Species of Wild Fauna and Flora	Ratification status of different countries. Countries which have deposited any of the ratification instruments (such as Ratification, Succession, Accession, Approval, Acceptance and Continuation) are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.
GOVERNMENT_CONV_TORTURE	Party to Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment	This indicator will identify whether a country is a party to the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment. (Source: UN OHCHR)
GOVERNMENT_CONVENTIONAL_WEAPONS	Party to Convention on Certain Conventional Weapons	Ratification status of different countries. Countries which have deposited any of the ratification instruments are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.
GOVERNMENT_CLUSTER_MUNITIONS	Party to Convention on Cluster Munitions	Ratification status of different countries. Countries which have deposited any of the ratification instruments are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.
GOVERNMENT_CONV_PROTECT_PERSONS	Party to International Convention for the Protection of All Persons from Enforced Disappearance	This indicator will identify whether a country is a party to the International Convention for the Protection of All Persons from Enforced Disappearance. (Source: UN OHCHR)

GOVERNMENT_EU_SANCTIONS	European Union (EU) Sanctions	<p>Countries alleged to be involved in human rights violations and abuses can be subject to EU sanctions. Restrictive measures imposed by the EU may target governments of third countries, or non-state entities and individuals. Sanctions may consist of asset freezes, travel bans, economic and financial measures or arms embargoes, among other measures.</p> <p>Data source: European External Action Service</p>
GOVERNMENT_FUNDAMENTAL_RIGHTS	WJP Rule of Law Index, Fundamental Rights Sub-score	<p>This indicator is the 'Fundamental Rights' sub-score from the World Justice Project (WJP) Rule of Law Index. The sub-score measures a country's performance on human rights issues, as per Factor 4 of the WJP Rule of Law Index. Scores can range from 0-1.0, and higher values denote stronger national performance across a broad range of human rights issues. Countries not covered will not have a value populated for this indicator. Values are updated annually via the World Justice Project with no analytical inputs from MSCI ESG Research. Data source: World Justice Project (WJP) Rule of Law Index®.</p>
GOVERNMENT_KYOTO_PROTOCOL	Party to Kyoto Protocol	<p>Ratification status of Kyoto Protocol by different countries. Countries, which have deposited any of the ratification instruments (such as Ratification, Accession, Approval) are considered as party to the protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.</p>
GOVERNMENT_MINE_BAN_TREATY	Party to Anti-Personnel Landmines Convention	<p>Ratification status of different countries. Countries which have deposited any of the ratification instruments are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.</p>

GOVERNMENT_RAW_CORR_PERC_INDEX	Corruption perception index	<p>It measures the degree to which public sector corruption is perceived to exist in different countries around the world.</p> <p>Data source: Transparency International. Countries with lower score are perceived to be more corrupt.</p>
GOVERNMENT_RAW_GIN	GINI Index	<p>Measures the equality of income distribution within the population. Ranges from 0 (perfect equality) to 100 (perfect inequality). (Source: CIA, WDI)</p>
GOVERNMENT_RAW_PRESS_FREED	World Press Freedom Index score	<p>Press freedom is defined as the ability of journalists as individuals and collectives to select, produce, and disseminate news in the public interest independent of political, economic, legal, and social interference and in the absence of threats to their physical and mental safety. The World Press Freedom Index compares the level of press freedom in 180 countries and territories and those countries with higher scores have higher levels of press freedom</p> <p>Data source: Reporters Without Borders</p>
GOVERNMENT_RAW_RULE_OF_LAW	Rule of law	<p>Capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.</p> <p>Data source: Worldwide Governance Indicators (WGI). Countries with higher score demonstrate better rule of law.</p>
GOVERNMENT_STABILITY_PFACE_SCORE	Stability & Peace Score	<p>Assesses the level of stability and peace in a region. This sub-factor is assessed using two data points: (1) political stability and absence of violence/ terrorism, which captures the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism;</p>

		and 2) global peace index, which measures the relative position of nations' and regions' peacefulness by gauging ongoing domestic and international conflict, safety and security in society, and militarization in different regions. Regions with high political instability and violence and conflict score poorly. (Score: 0-10)
GOVERNMENT_UN_CONVEN_CORRUP	Party to United Nations Convention against Corruption	Ratification status of different countries. Countries which have deposited any of the ratification instruments are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.
GOVERNMENT_UN_CONVEN_CRIME	Party to United Nations Convention against Transnational Organized Crime	Ratification status of different countries. Countries which have deposited any of the ratification instruments are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.
GOVERNMENT_WHO_TOBACCO_CTRL	Party to World Health Organization Framework Convention on Tobacco Control	Ratification status of different countries. Countries which have deposited any of the ratification instruments (such as Ratification, Succession, Accession, Approval, Acceptance, Formal Confirmation etc) are considered as party to this protocol. Countries which have not used any ratification tool (even if they have signed to it) are not considered party to the protocol.
GOVERNANCE_PILLAR_SCORE	Governance Pillar Score	The Governance Pillar Score provides an assessment of risk and management practices related to Corporate Governance and Corporate Behavior. The 0-10 score is based on the sum of deductions derived from Key Metrics included in the Corporate Governance (including Board, Pay, Ownership & Control, and Accounting) and Corporate Behavior (including Business Ethics and Tax Transparency) themes. Low scores correspond to companies with weak corporate governance practices, weak business ethics programs, high exposure to corruption risk, and/or

		involvement in business ethics-related controversies. (Score: 0-10)
GOVERNANCE_PILLAR_WEIGHT	Governance Pillar Weight	The Governance Pillar Weight represents the sum of the weights of all Key Issues that fall under the Governance Pillar.
HAZARD_WASTE_METRIC_TON	Hazardous Waste (metric tons)	Hazardous Waste (metric tons)
INDUSTRY_ADJUSTED_SCORE	Final Industry-Adjusted Company Score	The score is calculated by normalizing the Weighted Average Key Issue Score to the Industry peer set, adjusted to reflect any Ratings Review Committee overrides; see the ESG Rating Methodology document for details.
IVA_COMPANY_RATING	ESG Rating	A company's final ESG Rating. To arrive at a final letter rating, the weighted average of the key issue scores are aggregated and companies are ranked from best (AAA) to worst (CCC).
LABOR_POLICY_INTL_RECOGNIZED_M	Policy addressing internationally recognized labor conventions (Yes, No)	Flagged as "Yes" if company has a policy addressing internationally recognized labor conventions for its workforce.
OVERALL_FLAG	Company Summary - Overall Flag	The overall company assessment signals whether a company has a notable controversy related to a company's operations and/or products, and the severity of the social or environmental impact of the controversy.
MECH_UN_GLOBAL_COMPACT	Mechanism to monitor compliance with UN Global Compact	The company is a signatory to the UN Global Compact and is required to monitor and report compliance with the UN Global Compact principles.
OPS_PROT_BIODIV_CONTROLS	Company has operations located in biodiversity sensitive areas and is involved in controversies with severe impact on the environment	Company reports having operations in or near to biodiversity sensitive areas and has been implicated in controversies with severe or very severe adverse impact on the environment
OVERALL_FLAG	Company Summary - Overall Flag	The overall company assessment signals whether a company has a notable controversy related to a company's operations and/or products, and the severity of the social or environmental impact of the controversy.

PCT_NONRENEW_CONSUMP_PROD	Percentage of non-renewable energy consumption and production	The company's energy consumption and/or production from non-renewable sources as a percentage of total energy use and/or generation
RENEW_ENERGY_CAPEX_VS_TOTAL_CAPEX_PCT	Renewable power generation CapEx as a proportion of total CapEx (%)	Capital expenditure in renewable power generation assets (wind, solar, biomass, hydro and other renewables) as a proportion of total company capital expenditure (including networks infrastructure, all power generation assets and other capital expenditure) in the most recently reported capital expenditure plan.
SOCIAL_CONTROVERSY_SCORE	Social - Controversy Score	This Social pillar is an assessment of controversies (if any) related to a firm's impact on Customers, Human Rights & Community, and Labor Rights & Supply Chain. The score is derived from the lowest scoring sub-pillar (Customers, Human Rights & Community, and Labor Rights & Supply Chain) within the Social pillar.
SOCIAL_PILLAR_SCORE	Social Pillar Score	The Social Pillar Score represents the weighted average of all Key Issues that fall under the Social Pillar.
SOCIAL_PILLAR_WEIGHT	Social Pillar Weight	The Social Pillar Weight represents the sum of the weights of all Key Issues that fall under the Social Pillar.
TOB_MAX_REV_PCT	Tobacco Total - Maximum Percentage of Revenue	The recent-year percent of revenue, or maximum estimated percent, a company has derived from tobacco-related business activities.
TOB_PROD_MAX_REV_PCT	Tobacco Producer - Maximum Percentage of Revenue	The recent-year percent of revenue, or maximum estimated percent, a company has derived from the manufacture of tobacco products.
TOB_PRODUCER	Tobacco Producer	Companies that manufacture tobacco products, such as cigars, blunts, cigarettes, e-cigarettes, inhalers, beedis, kreteks, smokeless tobacco, snuff, snus, dissolvable and chewing tobacco. This also includes companies that grow or process raw tobacco leaves.
UNGC_COMPLIANCE	Global Compact Compliance	This factor indicates whether the company is in compliance with the United Nations Global Compact principles. The possible values are Fail, Watch List, or Pass. See the

		ESG Controversies and Global Norms methodology document for detailed explanations.
WATER_EM_EFF_METRIC_TONS	Water Emissions (metric tons)	Total tons of pollutants released to surface waters as a result of companies' operations.

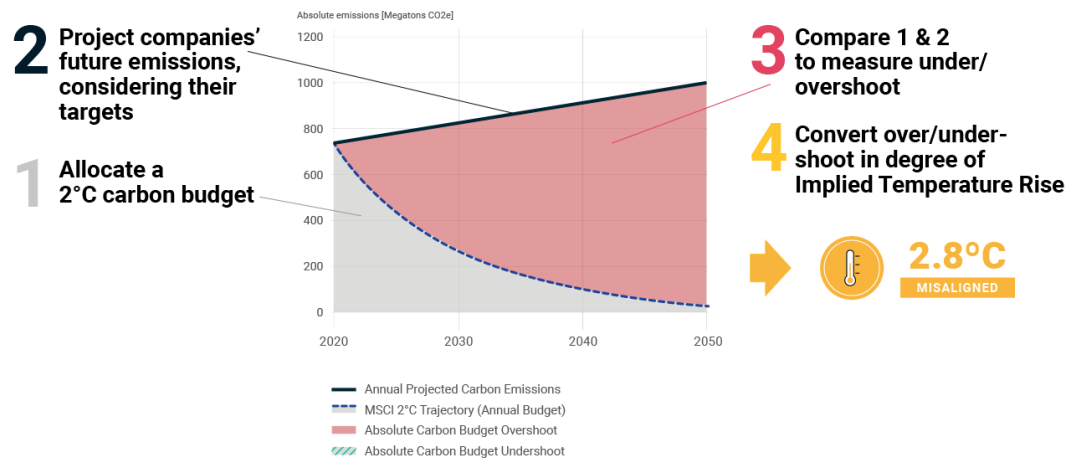
Appendix 2: Implied Temperature Rise

Company Implied Temperature Rise

The MSCI Implied Temperature Rise at issuer level was introduced in September 2021 and is designed to show the temperature alignment of companies, portfolios, indexes and funds with global climate targets. With this forward-looking and intuitive estimate for company, portfolio or benchmark alignment, investors can use Implied Temperature Rise to set decarbonization targets and support engagement on climate risk.

The calculation of the company-level Implied Temperature Rise involves four key steps:

Exhibit 1: Modelling steps to compute the company Implied Temperature Rise.



Source: MSCI ESG Research.

1. Allocate a 2°C carbon budget Each year, MSCI ESG Research calculates a Global 2°C Carbon Budget based on the global remaining carbon budget available to limit warming to 2°C, obtained from the IPCC.¹⁴ This global budget is allocated to individual companies based on their sector, country and business activities to determine a company’s “fair share”.

¹⁴ The IPCC Special Report on 1.5 °C provides the remaining global carbon budget for different temperature rises and probabilities

(https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter2_Low_Res.pdf, (in Table 2.2).

2. Project companies' future emissions, considering their targets Using companies' current emissions and reported emissions reduction targets, MSCI ESG Research projects an absolute emissions timeseries for each company until 2070 for Scopes 1, 2 and 3 emissions.

3. Calculate the companies' over/undershoot of its carbon budget MSCI ESG Research computes each company's carbon budget over-/undershoot by calculating the difference between each company's projected carbon emissions and its allocated 2°C budget. This is then transformed to a relative over-/undershoot by dividing it by the allocated 2°C budget of the company.

4. Convert the relative over/undershoot to a degree of temperature rise MSCI ESG Research converts the relative emissions over-/undershoot to degrees of warming (in Celsius) using the science-based Transient Climate Response to Cumulative Emissions (TCRE) approach: $\text{Implied Temperature Rise} = 2^\circ\text{C} + \text{company level relative over/undershoot} \times \text{Global } 2^\circ\text{C Budget} \times \text{TCRE Factor}$.

MSCI ESG Research performs this analysis on each scope of emissions (Scopes 1, 2 and 3) to capture both direct and indirect contributions to global warming. Additionally, MSCI ESG Research provides both the Implied Temperature Rise on each scope and an aggregated Implied Temperature Rise for each company. This allows users to understand the contribution of each scope.

Transient Climate Response to Cumulative CO2 Emissions (TCRE)

The TCRE was established by the IPCC and provides a relationship that is used to link each additional unit of emissions emitted beyond the available remaining 2°C carbon budget to degrees of additional warming. A TCRE factor of 0.000545°C warming per Gt CO₂ is used.¹⁵ In other words, for each GtCO₂ exceeding the global 2°C carbon budget, we can expect an additional ~0.000545°C warming over 2°C.

This relationship is used in the Implied Temperature Rise methodology to convert a company's, portfolio's or index's allocated carbon budget over-/undershoot into a degree of warming.¹⁶ The Implied Temperature Rise estimates an answer to the following question: What is the additional warming if the whole economy over-/undershoots the global 2°C carbon budget at the same proportion as the company, portfolio or index analyzed? As described in the 2020 Measuring Portfolio Alignment Report, the relationship from above can be used to derive following formula:

¹⁵ The 2020 Measuring Portfolio Alignment Report recommends a TCRE factor of 0.000545°C warming per Gt CO₂ which is based on IPCC 2013 The Physical Science Basis report (<https://www.tcfhub.org/wp-content/uploads/2020/10/PAT-Report-20201109-Final.pdf>).

¹⁶ Based on the relationship presented in the 2020 Measuring Portfolio Alignment Report (<https://www.tcfhub.org/wp-content/uploads/2020/10/PAT-Report-20201109-Final.pdf>).

Additional Warming = Relative company-level over/undershoot × Global 2°C Budget × TCRE Factor

To then calculate the Implied Temperature Rise, we need to add the additional warming to the base temperature of 2°C:

Implied Temperature Rise = 2°C + Relative company-level over/undershoot × Global 2°C Budget × TCRE Factor

Global 2°C Carbon Budget and Pathway

The remaining global carbon budget available to limit global warming to 2°C was estimated by the IPCC to be 1,170 Gt CO₂ as of January 1, 2018.¹⁷ By subtracting global emissions for the years 2018 and 2019 (41.4 and 44.3 Gt CO₂, respectively),¹⁸ the remaining global carbon budget as of January 1, 2020 can be computed to be 1,084.3 Gt CO₂. This budget only covers CO₂ emissions and no other greenhouse gas emissions. MSCI ESG Research assumes that the emission of other greenhouse gases will need to decrease at a similar rate to CO₂ to limit warming to 2°C. Using this assumption, the global GHG emission budget as of January 1, 2020, is computed to be 1551 Gt CO₂e to limit warming to 2°C.¹⁹ This calculation is updated annually.

Now that the global remaining carbon budget was established, what is the global emission pathway aligned with this budget? There are multiple pathways to reduce emissions and ensure that the global carbon budget is not exceeded, and these can depend on many factors like socio-economic development, policies and technologies deployed. The IPCC Special Report on 1.5°C²⁰ provides a set of mitigation pathways based on different socio-economic scenarios, projected energy use and amounts of Carbon Dioxide Removal (CDR).²¹

MSCI ESG Research constructed a single global pathway by combining global budget considerations with global 2°C emission levels, as defined in the 2020 UNEP Gap report, and a zero-emission assumption by 2070 to limit warming to 2°C, as

¹⁷ Table 2.2 in the IPCC Special Report on 1.5 °C (https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter2_Low_Res.pdf) outlines the remaining carbon budget for different temperature rises and probabilities calculated as of the 1.1.2018.

¹⁸ Annual global CO₂ emissions are published in the UNEP Gap Report (<https://www.unep.org/emissions-gap-report-2020>).

¹⁹ To convert the global CO₂ budget to a global GHG budget, we assumed that other GHG emissions need to decarbonize at the same rates as CO₂ emissions.

²⁰ FIGURE SPM.3A in the IPCC Special Report on 1.5 °C provides more details on the required reduction rates for CO₂ and other GHG Gases (<https://www.ipcc.ch/sr15/chapter/spm/spm-c/spm3a/>)

²¹ FIGURE SPM.3B in the IPCC Special Report on 1.5 °C provides more details on different pathways to limit global warming to 1.5°C (<https://www.ipcc.ch/sr15/chapter/spm/spm-c/spm3b/>)

presented in the IPCC Special Report on 1.5°C.^{22 23} This global pathway, illustrated in Exhibit 3, is then used to allocate a 2°C Carbon Budget to companies (explained in following sections).

²² United Nations Environment Programme (2020). Emissions Gap Report 2020. Nairobi. (<https://www.unep.org/emissions-gap-report-2020>)

²³ According to the IPCC Special Report on 1.5 °C, net zero emissions need to be reached around 2070 to limit warming to below 2°C (https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Hheadline-statements.pdf).

Appendix 3: Changes to this Document

The following sections have been modified as of December 2023:

- Added metrics for sovereign bond indexes (sections 2.1.2, 3.2.1.2, Appendix 1).
- Updated Sustainable Investment Test metric (sections 2.3, 3.2.3, Appendix 1).
- Clarified the definition of Red Flag and Orange Flag ESG controversies for relevant metrics (sections 2.1.1, 2.2, 2.3, 3.2.1.1, 3.2.2 and 3.2.3).
- Added footnote on the use of Enterprise Value Including Cash (EVIC) data for the calculation of metrics (section 3.1).

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