MSCI Global Environment Index Methodology

February 2020

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1 Introduction

The MSCI Global Environment Index is a free float-adjusted market capitalization weighted index designed to maximize its exposure to environmental impact themes. The Index is comprised of companies that focus on offering products or services that contribute to a more environmentally sustainable economy by making a more efficient use of limited global natural resources.

The MSCI Global Environment Index aims to include companies with exposure to one or more of the following categories of the MSCI Sustainable Impact Metrics:

- Alternative Energy
- Energy Efficiency
- Green Building
- Sustainable Water
- Pollution Prevention and Control
- Connectivity – Digital Divide

MSCI also constructs the following indexes designed to include companies with exposure to individual themes:

- MSCI Alternative Energy Index
- MSCI Energy Efficiency Index
- MSCI Sustainable Water Index
- MSCI Green Building Index
- MSCI Pollution Prevention Index

2 MSCI ESG Research

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

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

2.1 MSCI ESG CONTROVERSIES

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

For more details on MSCI ESG Controversies, please refer to : https://www.msci.com/documents/10199/acbe7c8a-a4e4-49de-9cf8-5e957245b86b

2.2 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

2.3 MSCI SUSTAINABLE IMPACT METRICS

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

The MSCI Sustainable Impact Metrics framework could be leveraged to assess the extent companies' products and services address at least one of the major social and environmental challenges, as defined, for example, by the UN Sustainable Development Goals (UN SDGs).

MSCI Sustainable Impact Metrics 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 and control 6. Sustainable agriculture
Social Impact	Basic needs	7. Nutrition 8. Major disease treatments 9. Sanitation 10. Affordable real estate
	Empowerment	11. SME finance 12. Education 13. Connectivity - Digital divide

For more details on the MSCI Sustainable Impact Metrics, please refer to: https://www.msci.com/esg-sustainable-impact-metrics

3 Constructing the MSCI Global Environment Index

The MSCI Global Environment Index ("Index") is constructed using the following steps:

- Defining the Parent Index
- Defining the Eligible Universe
- Security Selection

3.1 DEFINING THE PARENT INDEX

The parent index serves as the selection universe of securities for the Index. The parent index for the MSCI Global Environment Index is the MSCI ACWI IMI Investable Market Index (IMI).

3.2 ELIGIBLE UNIVERSE

The eligible universe is constructed by starting from the parent index then excluding securities based on the following criteria:

3.2.1 COMPANIES HAVING FACED VERY SEVERE ESG CONTROVERSIES

Companies having faced very severe controversies pertaining to ESG issues in the last three years, defined as companies with an ESG Controversy Score of 0, are excluded from the Index.

3.2.2 COMPANIES INVOLVED IN CONTROVERSIAL WEAPONS BUSINESSES

Companies involved in Controversial Weapons, as defined by the methodology of the MSCI Global Ex-Controversial Weapons Indexes, are excluded from the Index. For more details on the controversial weapons exclusion, please refer to the MSCI Global ex Controversial Weapons Indexes Methodology at:

https://www.msci.com/index-methodology

3.3 SECURITY SELECTION

Companies remaining in the eligible universe which derives 50% or more of their revenue cumulatively from the six Environmental Impact themes are eligible to be included in the index. Companies are then evaluated for the level of involvement in and strategic commitment to six Environmental Impact themes which are as follows:

- Alternative Energy

- Energy Efficiency
- Green Building
- Sustainable Water
- Pollution Prevention and Control
- Sustainable Agriculture

Please refer to Appendix I for a detailed description of these categories.

The individual thematic indexes are constructed by selecting securities based on their revenue exposure to the relevant Environmental Impact theme. For example, the MSCI Alternative Energy Index is constructed by selecting securities from the eligible universe, as defined in section 3.2, which derive 50% or more of their revenue from the Alternative Energy theme.

Since the MSCI Global Environment Index is constructed by selecting securities which derive 50% or more of their revenue from the Environmental Impact themes on a *cumulative basis*, and the individual thematic indexes are constructed by selecting securities which have 50% or more revenue from a specific theme, the MSCI Global Environment Index is not an aggregated version of all the individual thematic indexes.

4 Maintaining the MSCI Global Environment Index

4.1 QUARTERLY INDEX REVIEWS

The MSCI Global Environment Index and the individual thematic indexes are reviewed on a quarterly basis to coincide with the regular Semi-Annual and Quarterly Index Reviews of the MSCI Global Investable Market Indexes. The changes are implemented as of the close of the last business day of February, May, August and November.

The pro forma indexes are announced nine business days before the effective date.

At the Quarterly Index Reviews, all companies in the underlying universe are reviewed and eligible companies are added to the MSCI Global Environment Index and the individual thematic indexes. Existing constituents may be deleted from the MSCI Global Environment Index and the individual thematic indexes due to declining exposure to the Environmental Impact themes, subject to buffer rules as described below. Any constituent that is deleted from the underlying parent index as a result of the Quarterly Index Review is also deleted from the MSCI Global Environment Index and the individual thematic indexes.

In general, MSCI uses MSCI ESG Research data (including MSCI ESG Ratings, MSCI ESG Controversies Scores and MSCI Business Involvement Screening Research) as of the end of the month preceding the Index Reviews. For some securities, such data may not be published by MSCI ESG Research by the end of the month preceding the Index Review. For such securities, MSCI will use ESG data published after the end of month, when available.

4.2 BUFFER RULES

To reduce index turnover and enhance index stability, buffer rules are applied for securities which have a relevant exposure to the Environmental Impact themes between 40% and 50%. Existing constituents of the MSCI Global Environment Index are retained in the index as long as they meet eligibility criteria mentioned in section 3.2 and their cumulative exposure to the Environmental Impact themes does not fall below 40%. For individual thematic indexes, the existing constituents are retained in the index as long as they meet the eligibility criteria and their exposure to the relevant Environmental Impact theme does not fall below 40%.

However, if an existing constituent remains in the buffer zone for two consecutive years, the security would be deleted at the subsequent Index Review.

4.3 ONGOING EVENT-RELATED MAINTENANCE

The following section briefly describes the treatment of common corporate events within the MSCI Global Environment Index and the individual thematic indexes.

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

EVENT TYPE	EVENT DETAILS
New additions to the Parent Index	New securities added to the Parent Index (such as IPOs, other early inclusions and migrations from a different size-segment) will not be added to the Index at the time of event implementation. Such securities will be considered for addition in the Index at the subsequent Index Review.
Spin-Offs	All securities created as a result of the spin-off of an existing Index constituent will not be added to the Index at the time of event implementation. Reevaluation for addition in the Index will occur at the subsequent Index Review.
Merger/Acquisition	If an existing Index constituent is acquired by a non-Index constituent, the existing constituent will be deleted from the Index and the acquiring non-constituent will not be added to the Index.
Changes in Security Characteristics	A security will continue to be an Index constituent if there are changes in characteristics (country, sector, size segment, etc.). Reevaluation for continued inclusion in the Index will occur at the subsequent Index Review.

Further detail and illustration regarding specific treatment of corporate events relevant to this Index can be found in the MSCI Corporate Events Methodology book.

The MSCI Corporate Events methodology book is available at:

https://www.msci.com/index-methodology

Appendix I: Environmental Impact Themes

The MSCI Global Environment Index includes companies based on their involvement in and strategic commitment to the Environmental Impact themes included in the MSCI Sustainable Impact Metrics:

- Alternative Energy
- Energy Efficiency
- Green Building
- Sustainable Water
- Pollution Prevention and Control
- Sustainable Agriculture

A description of these categories is included below.

Alternative Energy

This category includes products and services that support the transmission, distribution and generation of renewable energy and alternative fuels to reduce carbon and pollutant emissions in supporting affordable and clean energy to combat climate change.

INCLUSIONS

- Renewable energy sources include wind, solar, geothermal, biomass, small scale hydro (25 MW), waste-to-energy and wave tidal.
- Alternative energy sources include natural gas-powered combined heat and power, biodiesel, biogas and cellulosic ethanol.
- Other alternative energy technologies include batteries & energy storage devices for alternative energy and fuel cells.

Examples of and services typically included under the Alternative Energy category

Products	Services
• **Solar panels** • **Solar inverters** • **Wind mills** • **Wind Towers** • **Biofuel** • **Geothermal turbines**	• Electricity generation from geothermal power • Electricity generated from photovoltaic power plants • Construction of biomass plants • Transmission and distribution of renewable energy

• **Tidal Turbines** • **Batteries supporting renewable energy**	• Construction of waste incineration plants that generate electricity

Source: MSCI ESG Research

EXCLUSIONS

- Large scale hydroelectric plants (>25 MW installed capacity)
- Biomass coming from virgin palm oil
- Financing and investing on renewable energy
- Site assessment for wind and solar farms
- Landfill or incineration waste treatment projects without a specific waste-to-energy component

Energy Efficiency

This category includes products, and services that support the maximization of productivity in labor, transportation, power and domestic applications with minimal energy consumption to ensure universal access to affordable, reliable and modern energy services.

INCLUSIONS

- Products and services that improve business and industrial operations and IT systems include energy-efficient industrial automation and IT optimization services and infrastructure.
- Technologies and systems that increase the efficiency of power usage include demand-side management, smart grid, LED and CFL lighting, insulation, superconductors and batteries & energy storage devices for other sustainable applications.
- Products that focuses on help reduce fuel consumption and improve transport infrastructure include hybrid/electric vehicles, charging stations for hybrid/electric vehicles and improved traffic systems.

Examples of products and services typically included under the Energy Efficiency category

Products	Services
• **Building automation** • **LED lightbulbs**	• LED streetlight installation services • Railway installation and construction

• **Electric and hybrid vehicle units** • **Batteries for hybrid/electric vehicles** • **Solar and geothermal powered water heaters** • **Insulation building materials** • **Infrastructure as a Service (IaaS)** • **Platform as a Service (PaaS)**	• Smart grid services • Installation of insulating materials for homes • Telematics services • Provider of electric/hybrid car rental services.

Source: MSCI ESG Research

EXCLUSIONS

- Corporate operational energy efficiency efforts, such as efficiency gains in manufacturing, transporting, or distributing standard products or services.
- Energy efficient components of finished goods
- Energy efficient consumer devices (e.g. electronics) and appliances (e.g. refrigerators)
- Cloud computing services or technologies that only offers software as a service (SaaS)
- Building and industrial automation technologies that do not have notable energy efficiency benefits

Green Building

This includes design, construction, redevelopment, retrofitting, or acquisition of green-certified properties to promote mechanisms for raising capacity for effective climate change mitigation and adaptation.

INCLUSIONS

- Ownership of properties, facilities and buildings designed and built according to environmental or sustainable standards and certified by third parties.
- Construction of green or sustainable properties, facilities or buildings, which may also include retrofitting or redevelopment of non-certified properties to comply with green building standards.
- Provision of consultancy services that aid in the green building certification of properties, facilities, or building.

Examples of green building certifications

Green building certifications

- LEED (United States)
- BREEAM (United Kingdom)
- Green Star (Australia)
- Green Mark (Singapore)
- Energy Star (United States)
- Pearl Rating System for Estidama (United Arab Emirates)
- MINERGIE (Switzerland)
- Building-Housing Energy-Efficiency Labeling System (Japan)
- BEAM (Hong Kong)
- BEE (India)
- BOMA (Canada)
- CALENER (Spain)
- CASBEE (Japan)
- China Tree Star (China)
- Development Bank Japan (Japan)
- DGNB (Germany)
- Green Building Index (Malaysia)
- Green Garage Certification (United States)
- Green Globe (United States)
- Green Globes (Canada)
- Green Key (Denmark)
- Green Standard (Russia)
- Green Star (Australia)
- Green Star SA (South Africa)
- GRIHA (India)
- HQE (France)
- Homestar (New Zealand)
- IGBC (India)
- Living Building Challenge (United States)
- NABERS (Australia)
- Nordic Ecolabelling (Denmark, Finland, Iceland, Norway, Sweden)
- Qualiverde (Brazil)
- Superior Energy Performance (United States)
- Built Green (United States)
- GreenPoint (United States)
- Trakhees (United Arab Emirates))

Source: MSCI ESG Research

EXCLUSIONS

- Building materials, equipment or supplies that are included in the scope of other Sustainable Impact Metrics categories. Examples include: solar panels, energy efficient lighting, advanced materials used in construction, smart grids, etc. These are covered in other categories.
- Buildings that are only pre-certified

Sustainable Water

This includes products, services, infrastructure projects and technologies that resolve water scarcity and water quality issues, through minimizing and monitoring current water demand, improving the quality and availability of water supply to improve resource management in both domestic and industrial use.

INCLUSIONS

- Products and projects that aim to address water supply and access include water infrastructure projects and distribution, water recycling technologies and smart metering devices.
- Technologies and services that use alternative water sources include desalination and rainwater harvesting systems.
- Products that improve the water efficiency and drought resiliency of agricultural operations include drought resistant seeds.

Examples of products and services typically included under the Sustainable Water category

Products	Services
• **Specialized wastewater treatment chemicals** • **Smart metering devices** • **Drought resistant seeds** • **Waste water filters** • **Desalination equipment**	• Desalination services • Maintenance of current water distribution infrastructure • Construction of wastewater plants • Construction of stormwater systems

Source: MSCI ESG Research

EXCLUSIONS

- Distribution of drinking water without measurable improvements to water quality or availability / Water treatment for potability
- Generic water treatment chemicals such as hydrogen peroxide

Pollution Prevention & Control

This category includes products, services, infrastructure projects and technologies that reduces volume of waste materials through recycling, minimizes introduction of toxic substances, and offers remediation of existing contaminants such as heavy metals and organic pollutants in various environmental media to significantly address pollution in all levels and its negative effects.

INCLUSIONS

- Technologies and systems that aim to reduce pollution include conventional pollution control devices.
- Services and infrastructure projects that address the growing waste problem and environmental pollutants include recycling, environmental remediation and waste treatment.
- Sustainable alternative materials for buildings and homes include low toxicity/VOC products.

Examples of products and services typically included under the Pollution Prevention & Control category

Products	Services
• **Diesel exhaust fluid** • **Selective catalytic reduction units** • **Low VOC paints and coating materials** • **Recycling units**	• Remediation services • Recycling services • Hazardous waste treatment • Construction of carbon adsorbers and electrostatic precipitators • Oil spill removal

Source: MSCI ESG Research

EXCLUSION

Recycled products

Sustainable Agriculture

This category currently includes revenues from forest and agricultural products that meet environmental and organic certification requirements to address significantly biodiversity loss, pollution, land disturbance, and water overuse.

INCLUSIONS

Production of agricultural and forestry products using certified sustainable or organic practices.

Examples of Sustainable Agriculture certifications

Sustainable agriculture certifications

- Bonsucro
- Rountable for Responsible Soy
- Better Cotton Initiative
- Forest Stewardship Council
- Programme for the Endorsement of Forest Certification
- Sustainable Forest Initiative
- UTZ
- Rainforest Alliance
- Good Agricultural Practices
- Aqua Stewardship Council
- United Stated Department of Agriculture Organic
- National Association for Sustainable Agriculture Australia Organic
- Australian Forestry Standard
- Genesis GAP
- Best Aquaculture Practice
- Green Licenses
- India Organic Certified
- Malaysian Good Agricultural Practices

EXCLUSIONS

- Beef and beef products due to the high overall environmental impact of beef production not fully offset through certification themes1.
- Forestry services such reforestation
- Services to assess the sustainability of a food product
- Products that use certified raw materials (e.g., paper from certified pulp)
- Buildings that use certified wood or building materials

[1] UN Food and Agriculture Organization (FAO) "Tackling Climate Change Through Livestock", 2013

Appendix II: Methodology Transition

Prior to the May 2017 Semi-Annual Index Review, the MSCI Global Environment Index (GEI) was based on the methodology described below:

https://www.msci.com/eqb/methodology/meth_docs/MSCI_Global_Environment_Indices_November2013.pdf

The MSCI Global Environment Index transitioned to the current methodology from the May 2017 Semi-Annual Index Review (SAIR) over two index reviews (May 2017 SAIR and the August 2017 Quarterly Index Review (QIR)).

Appendix III: Regional/Country MSCI Environment Indexes

MSCI also constructs regional/country MSCI Environment Indexes by applying the index construction and maintenance rules on any regional/country subset of ACWI IMI. For example, the MSCI China IMI Environment Index is constructed by applying these rules on the MSCI China IMI.

The following sections have been modified as of May 2017:

Methodology transitioned to the current enhanced methodology from the May 2017 Semi-Annual Index Review onwards

The following sections have been modified as of July 2017:

Addition of Appendix III to include details on regional/country MSCI Environment Indexes

The following sections have been modified as of May 2018:

Update to the definition of the Controversial Weapons

The following sections have been modified as of February 2020:

Addition of 'Connectivity – Digital Divide' as a new Environmental Impact category

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