

Bloomberg MSCI Green Bond Indices

Bringing clarity to the green bond market through benchmark indices

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In 2014, following a wide-ranging consultation with market participants, Bloomberg, a global leader in fixed income indexing, and MSCI ESG Research LLC, a leading provider of environmental, social, and governance (ESG) research, introduced a new family of Green Bond Indices, complementing the existing Bloomberg MSCI ESG Fixed Income benchmark offering. This primer includes the rules and methodology for the Green Bond index family. Key design features include:

- Independent evaluation of securities by MSCI ESG Research along four dimensions (use of proceeds, project evaluation, management of proceeds, and reporting) to determine index eligibility. These eligibility criteria reflect the core elements of the Green Bond Principles (GBP).
- Fixed-income eligibility criteria chosen by Bloomberg so that the final benchmark index is both transparent and representative of the market being measured. Bloomberg performs the index calculation and is the benchmark administrator.
- A flexible design that allows for multiple variants: sub-indices defined by credit quality, region, currency, maturity, and use of proceeds, as well as issuer-capped indices, are also available as part of the family.

Introduction

The Green Bond Market: From niche to mainstream

A New Standard for Green Bonds

The green bond market is growing rapidly, with about \$170bn issued in 2018 according to The Climate Bonds Initiative. In just five years, the labeled “green” market has gone from modest issuance by a handful of development bank and supranational issuers to a burgeoning new asset class with an increasingly diverse investor base, including dedicated “green” investors and other broad-based investors who consider these new bonds part of their expanding investment choice set.

The rapid growth of this new market has necessitated the establishment of clear and broadly accepted guidelines for those issuing and evaluating green bonds. In 2014, a consortium of banks published an initial set of Green Bond Principles (GBP), an important milestone for the asset class. The GBP is an agreement among market participants on a set of standards designed to underpin the market by allowing investors to assess the green credentials of labelled issuance. Benchmark indices such as the Bloomberg MSCI Green Bond Index family are another important evolutionary step to provide further transparency to a market, giving end investors a means to evaluate performance and assess risk.

The Green Bond Index family also complements the existing Bloomberg MSCI ESG Fixed Income Index Series, launched in June 2013. Both offerings appeal to the growing number of investors who are incorporating ESG factors or criteria into their investment analysis, allocation, risk measurement, security selection, and performance attribution process.

Index Design and Overview

Objectives

A well-designed benchmark seeks to represent a particular market accurately, providing a clear measure of asset class risk and return and a transparent framework for defining an investment choice set when making allocation decisions.

A key challenge in constructing a green bond index is to set specific, transparent, and objective rules to identify what investors generally define as “green” (bonds whose proceeds have a clear net environmental benefit) and, therefore, consider part of their investment choice set.

Bloomberg and MSCI ESG Research conducted extensive consultations in July 2014 with a diverse set of index stakeholders (including issuers, asset managers, asset owners, and consultants) to solicit feedback on index design and methodology and to identify the emerging

standards in the definition of Green Bonds, as well as to canvass alternative interpretations that investors may have.

One consistent view expressed throughout the consultation period was the strong preference for the green bond index universe to be evaluated and defined independently from issuers. This was seen as paramount since it would add a layer of integrity beyond self-labelled designations that have not benefited from independent scrutiny, and beyond “second-party opinions” that have been solicited and paid for by issuers. With some issuers already pushing the limits of what can be reasonably considered green, the practice of pushing the boundary of acceptability (termed “green-washing”) is seen by many investors as a serious potential threat to the credibility of this market. To address this concern, MSCI ESG Research has established clearly defined rules for classifying green bonds, with an aim to provide sufficient transparency on the use of proceeds for eligible securities and, most importantly, to present investors with an investment universe that is generally regarded as green.

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Index Rules: Green Bond Eligibility and Classification

Green bonds are fixed-income securities in which the proceeds will be exclusively and formally applied to projects or activities that promote climate or other environmental sustainability purposes through their use of proceeds.

For the Bloomberg MSCI Green Bond Index, securities are independently evaluated by MSCI ESG Research along four dimensions to determine whether a fixed-income security should be classified as a green bond. These eligibility criteria reflect themes articulated in the Green Bond Principles and require clarity about a bond’s:

1. Stated use of proceeds;
2. Process for green project evaluation and selection;
3. Process for management of proceeds; and
4. Commitment to ongoing reporting of the environmental performance of the use of proceeds.

Self-labeled green bonds will be evaluated using these criteria for potential index inclusion. So long as projects fall within an eligible MSCI Green Bond category and there is sufficient transparency on the use of proceeds, a bond can be considered for the index even if it is not explicitly marketed as green.

1. Use of Proceeds

Use of proceeds and project bonds are considered eligible if the use of proceeds falls within at least one of seven eligible environmental categories defined by MSCI ESG Research (alternative energy, energy efficiency, pollution prevention and control, sustainable water, green building, climate adaption, and other)¹. In cases where project categories do not overlap entirely with MSCI ESG Research definitions, MSCI ESG Research will consider bonds eligible if at least 90% of the projected use of proceeds falls within eligible categories.

The seven eligible environmental categories defined by MSCI ESG Research are described below.

Alternative Energy

Investments in products, services, or infrastructure projects supporting the development or delivery of renewable energy and alternative fuels, including:

¹ The environmental categories are not mutually exclusive. i.e., a bond may fund one or more of the categories.

- Generation, transmission, and distribution of electricity from renewable sources including wind, solar, geothermal, biomass², small-scale hydro (25 MW)³, large-scale hydro (subject to additional sustainability criteria), waste energy, wave and tidal energy.
- Fuels, technology, and infrastructure for the production and distribution of cleaner hybrid fuels, hydrogen, fuel cells, and alternative fuels, including biodiesel, biogas, and cellulosic ethanol.

Due to their potential environmental and social externalities, large-scale hydroelectric projects are only eligible if they satisfy one of the following international sustainability best practices:

- Hydropower Sustainability Protocol – published assessment report and score of 3 or above (i.e. in line with “Good Practices”) on all relevant pillars; or
- International Finance Corporation (IFC) Performance Standards – publicly stated commitment to meet the requirements outlined by all eight IFC performance standards.

Energy Efficiency

Green Bond proceeds are exclusively and formally applied to projects or activities that promote climate or other environmental sustainability purposes

Investments in products, services, infrastructure, or technologies that proactively address the growing global demand for energy while minimizing effects on the environment, including:

- Technologies and systems that promote efficiency of industrial operation (e.g., turbines, motors, and engines), industrial automation and controls, and optimization systems (e.g., cloud computing, data optimization systems).
- Infrastructure, technology, and systems that increase the efficiency of power management, power distribution, power storage (e.g., batteries), demand-side management (e.g., wireless sensors, advanced meters, smart grid).
- Pumped storage hydro projects that meet the large hydropower sustainability criteria indicated above.
- Technologies and systems focused on reducing fuel consumption of transport vehicles and industrial operations (e.g., hybrid/electric vehicles).
- Sustainable transportation infrastructure including urban mass transit, efficiency improvements of public transportation fleets, electric vehicle charging, improved traffic systems.
- HVAC equipment and systems, architectural glass, efficient lighting, insulation, building automation and controls, and devices and systems designed to be utilized in the design and construction of environmentally sustainable buildings.

Not eligible under this category:

- Corporate operational energy efficiency efforts, such as efficiency gains in manufacturing, transporting, or distributing standard products or services, where under 90% of the proceeds are directly used for energy efficiency improvements or retrofits.
- Energy efficiency in fossil fuel-based energy generation, with the exception of natural gas-based co-generation.

Pollution Prevention and Control

Products, services, or projects that support pollution prevention, waste minimization, or recycling as a means of alleviating the burden of unsustainable waste generation, including:

² Biomass needs to be sustainably sourced to be eligible for the index i.e. sourced from FSC (Forest Stewardship Council), PEFC (Programme for the Endorsement of Forest Certification), SBP (Sustainable Biomass Program) and RSB (Roundtable on Sustainable Biomaterials) certified sources

³ Small hydro is formally defined as including projects that fall below the thresholds set by the International Commission on Large Dams (ICOLD), which require that dams be below 15 meters in height. Dams under 25MW in capacity also qualify as “small”, as capacity is used a proxy for size where detailed information is not available. For the purposes of index inclusion, large hydro will be defined as all projects exceeding the small hydro thresholds.

- Technologies, systems, and projects aiming to reduce air pollution (e.g., environmental IT, conventional pollution control systems and carbon capture and storage).
- Projects to salvage, use, reuse, and recycle post-consumer waste products.
- Waste treatment and environmental remediation projects, including land treatment and brownfield cleanup, soil washing, chemical oxidation, bioremediation.
- Sustainable alternative materials including raw materials, paints, adhesives, etc. used primarily in the construction of environmentally sustainable buildings.

Not eligible under this category: landfill or incineration waste treatment projects without a specific waste-to-energy component.

Sustainable Water

Products, services, and projects that attempt to resolve water scarcity and water quality issues, including minimizing and monitoring current water use and demand increases, improving the quality of water supply, and improving the availability and reliability of water.

- Infrastructure and engineering projects developing new or repairing existing water and sanitation pipelines, including equipment and technology providers, resulting in improved quality and/or water use efficiency. Note that all large dams (i.e. above 15 meters in height) for sustainable water projects are eligible only if they have a publicly stated commitment to meet the requirements outlined by all eight IFC performance standards.⁴
- Technologies and products that reduce, reuse, or recycle water as a means of conservation (smart metering devices, low-flow equipment, and rainwater harvesting systems).
- Advanced materials, equipment, technologies, and services that filter or chemically treat wastewater for consumer or industrial use, including desalination.
- Investments in protection of land, forests, and other vegetation in the upper watershed as a means to improve the quality of water bodies and groundwater recharge areas.

Not eligible under this category: distribution of drinking water without measurable improvements to water quality, water efficiency, or climate change resilience component.

Green Building

Design, construction, redevelopment, retrofitting, or acquisition of 'green' certified properties - subject to local green building criteria, including:

- Properties that are certified as 'green' based on the local country's environmental performance standard (e.g., based on Energy Star, NABERS >3, or equivalent) or environmental design standards (e.g., LEED Certified, BREEAM, or local equivalent).
- Uncertified properties may also be considered eligible if they rank in the top 15% on energy efficiency measures relative to same-sector properties within the local market.
- Mortgage backed securities and bonds for funding real estate properties may be considered green and eligible for the Index if the real estate properties achieve a minimum 30% improvement in energy compared to baseline performance prior to the renovations and other capital improvements funded through the use of proceeds.⁵

Climate Adaptation

Projects that reduce the vulnerability of social or environmental systems to the effects of risks related to climate change by maintaining or increasing adaptive capacity, reducing sensitivity to climate change or increasing climate resilience, including:

⁴ For further detail, please refer to the IFC's E&S Performance Standards resources

⁵ Eligible post the 2019 client consultation and hence eligible post November 2019

- Flood protection (flood defenses, waterway management, pumping stations and drainage improvement);
- Food security and stress-resilient agricultural systems;
- Reforestation and watershed management;
- Climate resiliency services (modernization of meteorological systems, catastrophe risk insurance).

Other

The “other” use of proceeds category includes environmental activities and projects that are not included in the six use of proceeds categories: alternative energy; energy efficiency; pollution prevention and control; sustainable water; green building and climate adaptation. These activities and projects include, but are not limited to, the protection and conservation of biodiversity; sustainable forestry and afforestation projects; and sustainable agricultural projects.

Figure 1

MSCI ESG Research Green Bond Use of Proceeds Categories and Sub-categories - Summary

Green Bond Category	Sub-Category
Alternative Energy	Wind, Solar, Geothermal, Biomass (subject to additional sustainability criteria), Waste Energy, Wave and Tidal, Small Hydro, Large Hydro (subject to additional sustainability criteria), Biogas, Bio-fuels (first and second generation)
Energy Efficiency	Demand-Side Management, Battery, Fuel Cells/Hydrogen Systems, Smart Grid, Other Energy Storage (including pumped hydro storage), Superconductors, Natural Gas Combined Heat & Power, LED Lighting, Compact Fluorescent Lighting, Insulation, Hybrid/Electric Vehicles, Clean Transportation Infrastructure, Industrial Automation, IT Optimization Service & Infrastructure
Pollution Prevention & Control	Environmental Remediation, Waste Treatment (excluding landfill and incineration), Reuse & Recycling of Waste, Low Toxicity/VOC, Conventional Pollution Control
Sustainable Water	Water Infrastructure & Distribution (with impact on water quality and access), Rainwater Harvesting, Smart Metering Devices, Drought-resistant Seeds, Desalinization, Wastewater Treatment, Water Recycling Equipment & Services, Watershed Conservation Efforts
Green Building	Green Certified Residential and Commercial Properties based on local environmental performance standards (e.g., Energy Star, NABERS >3, etc.), Green Certified Residential and Commercial Properties based on local environmental design standards (e.g., LEED Certified, BREEAM, etc.), Uncertified Green Property Investments (top 15% energy efficiency within local market), Green CMBS or renovated real estate (subject to additional sustainability criteria)
Climate Adaptation	Flood protection, food security and stress-resilient agricultural systems, reforestation and watershed management, climate resiliency services (modernization of meteorological systems, catastrophe risk insurance).
Other	The “other” use of proceeds category includes environmental activities and projects that are not included in the six use of proceeds categories.

Source: MSCI ESG Research

2. Process for Green Bond Selection

Bonds are considered eligible if the issuer clearly delineates the specific criteria and process for determining eligible projects or investments in the bond prospectus or supporting documentation (e.g., green bond supplement, website, investor presentation, published second-party opinion).

Project criteria must outline either specific projects or the specific categories of activities to be financed. Examples of eligible criteria include “Alta Wind acquisition” or “installation of wind turbines, production of photovoltaic cells, and rehabilitation of municipal water infrastructure to reduce wastewater discharge.” Examples of non-eligible criteria include “green initiatives and other projects that contribute to environmental sustainability” without further definition.

A second-party opinion or certification to an external standard is not sufficient in the absence of clearly defined processes and criteria for project selection.

3. Management of Proceeds

A formal process to apply net proceeds raised or an amount equal to net proceeds raised to the eligible use of proceeds must be disclosed in the bond prospectus or supporting documentation. Eligible mechanisms to apply net proceeds raised or an amount equal to net proceeds raised include: direct recourse to eligible revenues or assets (e.g., a green securitized bond, green project bond, or green revenue bond); creation of a separate legal entity; creation of a sub-portfolio linked to the issuer’s investment operations for eligible projects; or other auditable mechanism whereby the balance of tracked proceeds is reduced periodically by amounts matching investments made in eligible projects during that period.

Third-party verification by an external auditor is preferred but not required.

4. Ongoing Reporting

At issuance, the issuer must either report on eligible projects or state its commitment to report within one year of issuance. For reporting to be considered eligible, it must include one or more of the following: a list of specific projects/investments, including amount disbursed to each individual project; aggregate project/investment categories, including amount disbursed to each project type; or quantitative or qualitative reporting on the environmental impact of the project pool (e.g., greenhouse gas emissions savings, reduction in water consumption, increased energy efficiency per unit of output, etc.).

Because of the current lack of standardization in green bond reporting, we provide a measure of flexibility to issuers.

- **Annual Reporting:** At issuance, issuers of index eligible green bonds must either report on projects financed by the bonds’ proceeds or commit to doing so within one year. This reporting obligation continues for the life of the bond or until proceeds have been fully disbursed, with issuers expected to publicly report on the use of proceeds within 12 months of the prior use of proceeds report.
- **Reporting Review Period:** MSCI ESG Research reserves an additional three months beyond the 12-month deadline to review an issuer’s green bond report. This allows time for the green bond report to be located and contact to be made with the issuer in case any questions or issues are raised. This is necessary since green bond reporting is not yet standardized and reports are not always available through standard financial reporting channels.
- **Reporting Grace Period:** If an issuer has not published a report within 15 months of issuance, or 15 months of the prior use of proceeds report, it will be flagged as “On Watch” in the next monthly green bond technical note, with details provided on the conditions, timing, and process for removal of the bond from the index. If the issuer has not published a report

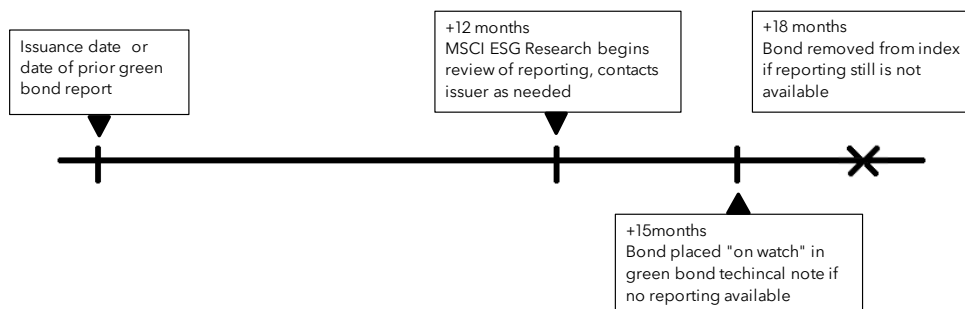
Green Bond Index bonds must also be Global Aggregate eligible if greater than one year to maturity

within 18 months from issuance or the last annual report, its bond(s) will be removed from the index upon the next index rebalance.

- **Annual Use of Proceeds Review:** If MSCI ESG Research's review of annual green bond reporting confirms that the use of proceeds deviates from the eligible use of proceeds categories, the bond will be removed from the index during the next rebalance.

Green bonds may be removed from the index if the issuer fails to meet the Principle 4 ongoing reporting criteria.

Figure 2
Annual Reporting Requirement Timeline



Source: MSCI ESG Research

Figure 3
Examples of Quantitative or Qualitative Effect Reporting Metrics

Category	Example of Effect Metrics
Alternative Energy	<ul style="list-style-type: none"> • MW renewable capacity added • Annual GHG emissions avoided in tons of CO_{2e}
Energy Efficiency	<ul style="list-style-type: none"> • Annual energy savings in MWh or GJ • % annual energy efficiency gains relative to an established baseline • Annual GHG emissions avoided in tons of CO_{2e}
Pollution Prevention & Control	<ul style="list-style-type: none"> • Annual reduction in waste to landfill • Measureable improvement in air quality • Project-specific targets and results
Sustainable Water	<ul style="list-style-type: none"> • Annual reduction in water consumption • Measureable improvement in water quality • Project-specific targets and results
Green Building	<ul style="list-style-type: none"> • Level of certification by property • Energy efficiency gains in MWh or % vs. baseline • Annual GHG emissions avoided in tons of CO_{2e} • Annual reduction in water consumption
Climate Adaptation	<ul style="list-style-type: none"> • Project-specific targets and results
Other	<ul style="list-style-type: none"> • Project-specific targets and results

Source: MSCI ESG Research

Exceptions

Green bonds issued prior to the launch of the Green Bond Principles in 2014, are subject only to criteria one (use of proceeds).

Index Rules: Fixed-Income Criteria

Once a security has been defined as a green bond, additional fixed income eligibility rules are applied with the goal of making the benchmark appropriately representative of the market from a bond investor's perspective. Many of rules for the green bond Index mirror eligibility criteria used for widely used broad market benchmarks such as the Bloomberg Global Aggregate Index. Green bonds must be Global Aggregate eligible or have been eligible for those indices prior to falling below their one year remaining to maturity requirement.

Sector

Treasury, corporate, government-related, and securitized bonds are included. This includes taxable municipals.

Eligible Currencies

- The Global Green Bond Index is a multi-currency benchmark that includes local currency debt markets tracked by the Bloomberg Global Aggregate Index. Principal and interest must be denominated in one of the following currencies:
 - Americas: CAD, CLP, COP, MXN, PEN, USD
 - EMEA: CHF, CZK, DKK, EUR, GBP, HUF, ILS, NOK, PLN, RON, RUB, SEK
 - Asian-Pacific: AUD, CNY, HKD, IDR, JPY, KRW, MYR, NZD, SGD, THB
- Eligible currencies will not necessarily have debt included in the index if no securities satisfy the inclusion rules.
- For CNY denominated securities, only treasuries and government related securities are index eligible.
- New currency inclusion is reviewed annually through the index governance process. To be considered for inclusion, new currency candidates must be rated investment grade and sufficiently tradable, convertible and hedge able for international investors.

Quality

Securities must be rated investment grade (Baa3/BBB-/BBB- or higher) using the middle rating of Moody's, S&P and Fitch; when a rating from only two agencies is available, the lower is used; when only one agency rates a bond, that rating is used. In cases where explicit bond level ratings may not be available, other sources may be used to classify securities by credit quality:

- Local currency treasury and hard currency sovereign issues are classified using the middle issuer-level local currency and hard currency debt ratings from each agency for all outstanding bonds, even if bond-level ratings are available.
- Expected ratings at issuance may be used for timely index inclusion or to properly classify split-rated issuers.
- Unrated securities may use an issuer rating for index classification purposes if available.
- Unrated subordinated securities are included if a subordinated issuer rating is available.
- German Pfandbriefe are assigned ratings that are one full rating category above the issuer's unsecured debt.
- For the Canadian Dollar market, DBRS is considered in addition to Moody's, S&P and Fitch. When all four ratings agencies are available, the highest and lowest rating are removed and the lower of the two remaining is used.

Amount Outstanding

Fixed minimum issue sizes are set for all local currency markets:

- 300mn: USD (excluding MBS, ABS, and CMBS)*, EUR, CHF, AUD
- 150mn: CAD
- 200mn: GBP
- 25mn: USD ABS and CMBS tranches*
- 35bn: JPY
- 1bn: RON, PEN
- 2bn: DKK, NOK, PLN, ILS, HKD, MYR
- 2.5bn: SEK
- 5bn: CNY**
- 10bn: MXN, CZK, THB
- 20bn: RUB
- 500mn: NZD, SGD
- 100bn: CLP
- 200bn: HUF
- 500bn: KRW
- 1trn: COP
- 2trn: IDR

*As of April 1, 2017, ABS and CMBS tranches eligible for the US Aggregate between \$25-300mn became eligible for Global Green Bond Index.

**As of April 1, 2019, CNY-denominated government and policy bank securities became eligible with their amounts outstanding initially scaled at 5%. On each subsequent month, this scaling factor on CNY-denominated bonds is increased in 5% increments until it reached 100% in November 2020.

Coupon

- Fixed-rate coupon.
- Callable fixed-to-floating rate bonds are eligible during their fixed-rate term only.
- Bonds with a step-up coupon that changes according to a predetermined schedule are eligible.

Maturity

- Unlike other Bloomberg Aggregate Bond Indices, the Global Green Bond Index does not have a 1-year minimum time to maturity and will hold bonds until final maturity. The inclusion of Green Bonds to maturity within the indices is designed to accommodate this market practice by not forcing unwanted turnover.
- Bonds that convert from fixed to floating rate, including fixed-to-float perpetuals, will exit the index before converting to floating-rate. Fixed-rate perpetual bonds are not included.

Taxability

- Only fully taxable issues are eligible.
- Build America Bonds (BABs) with the tax credit to the issuer are eligible; those with tax credits issued to investors are considered tax exempt.
- Dividend Received Deduction (DRD) and Qualified Dividend Income (QDI) eligible securities are excluded.

Market of Issue

Fully taxable, publicly issued in the global and regional markets.

Seniority of Debt

Senior and subordinated issues are included.

Figure 4
Security Types

Included	Excluded
Fixed-rate bullet, putable, sinkable/amortizing and callable bonds	Contingent capital securities, including traditional CoCos and contingent write-down securities, with explicit capital ratio or solvency/balance sheet-based triggers
Taxable municipal securities, including Build America Bonds (BABs)	Bonds with equity type features (e.g., warrants, convertibles, preferreds, DRD/QDI-eligible issues)
Original issue zero coupon bonds	Inflation-linked bonds, floating-rate issues
Bonds issued through underwritten MTN programs	Fixed-rate perpetuals
Enhanced equipment trust certificates (EETC)	Tax-exempt municipal securities
Certificates of deposit	Private placements, retail bonds
Fixed-rate and fixed-to-float (including fixed-to-variable) capital securities	USD25/USD50 par bonds
Loan participation notes (as of April 1, 2013)	Structured notes, pass-through certificates
US Agency CMBS (as of July 1, 2014)	Non-ERISA eligible CMBS, US agency MBS hybrid ARMs
Malaysian government Sukuk (as of April 1, 2015)	Formosa bonds
Covered Bonds	Illiquid securities where reliable pricing is unavailable
CNY treasury and policy bank debt (as of April 1, 2019)	Sinkable Russian OFZ bonds issued prior to 2009
	CMBS AIA tranches (as of January 1, 2011)
	CNY denominated corporates and government-related bonds (non-policy bank debt)

Source: Bloomberg

Index Rebalancing Rules

Frequency

For each index, Bloomberg maintains two universes of securities: the Returns (Backward) and the Projected (Forward) Universes. The composition of the Returns Universe is rebalanced at each month-end and represents the fixed set of bonds on which index returns are calculated for the next month. The Projected Universe is a forward-looking projection that changes daily to reflect issues dropping out of and entering the index but is not used for return calculations. On the last business day of the month (the rebalancing date), the composition of the latest Projected Universe becomes the Returns Universe for the following month.

- The formal list of green bonds evaluated and identified by MSCI ESG Research is updated on the 25th calendar day of each month. Evaluations must be completed by the evaluation date to qualify for inclusion at the next index rebalancing. All relevant information (green bond framework, reporting, etc.) should be publicly accessible or provided to MSCI ESG Research by the 23rd of the month to enable a timely evaluation.
- Inadequate information on the issuer's green bond program may result in a bond being considered "Under Review", in which case it will be mentioned in the technical note but not added to the index. If, after six months, MSCI ESG Research still lacks sufficient information to determine bond eligibility, the bond will be considered permanently ineligible for the index.
- The Bloomberg MSCI Green Bond Index is rebalanced on the last business day of each month. New issues will not be added to the statistics universe until after the Green Bond Evaluation Date.

Index Changes

During the month, indicative changes to securities (credit rating change, sector reclassification, amount outstanding changes, corporate actions, and ticker changes) are reflected daily in the Projected and Returns Universe of the index. These changes may cause bonds to enter or fall out of the Projected Universe of the index on a daily basis, but will affect the composition of the Returns Universe at month-end only, when the index is next rebalanced.

Reinvestment of Cash Flows

Intra-month cash flows from interest and principal payments contribute to monthly index returns but are not reinvested at a short-term reinvestment rate between rebalance dates. At each rebalancing, cash is effectively reinvested into the Returns Universe for the following month so that index results over two or more months reflect monthly compounding.

New Issues

Qualifying securities issued, but not necessarily settled on or before the month-end rebalancing date, qualify for inclusion in the following month's index if the required security reference information and pricing are readily available.

Pricing and Related Rules

Sources & Frequency

All index-eligible bonds are priced on a daily basis by Bloomberg's evaluated pricing service, BVAL, except CHF-denominated bonds, which are priced by SIX, and JPY-denominated corporate bonds, which are priced by JSDA.

Prices are snapped at the following times:

- North American currency bonds: 4pm (New York time) for USD-denominated securities; 4pm (Toronto time) for CAD-denominated securities. USD-denominated bonds prior to January 14, 2021 used 3pm New York time pricing snap.
- Pan-European currency bonds: 4:15pm (London time); 4pm (London time) for CHF-denominated securities.
- Asian currency bonds: 5pm (Sydney time) for AUD-denominated and NZD-denominated securities; 3pm (Tokyo time) for JPY-denominated securities; 5pm (Shanghai time) for CNY-denominated securities; 5pm (Tokyo time) for all other securities.

If the last business day of the month is a public holiday in a major regional market, prices from the previous business day are used to price bonds in the particular market.

Bid or Offer Side

Bonds in the index are priced on the bid side. The initial price for new corporate issues entering the index is the offer side; after the first month, the bid price is used. Japanese, Euro, and Sterling treasury bonds use mid prices.

Settlement Assumptions

T+1 calendar day settlement basis for all bonds except MBS, which are priced for Public Securities Association (PSA) settlement in the following month and discounted back to same-day settlement. At month-end, settlement is assumed to be the first calendar day of the following month, even if the last business day is not the last day of the month, to allow for one full month of accrued interest to be calculated.

Verification

Daily price moves for each security are analyzed by the index pricing team to identify outliers. Index users may also challenge price levels, which are then reviewed and updated as needed.

Currency Hedging

Returns hedged to various currencies are published for multi-currency indices. The indices' FX hedging methodology takes rolling one-month forward contracts that are reset at the end of each month and hedges each non-reporting currency-denominated bond in the index into the reporting currency terms. No adjustment is made to the hedge during the month to account for price movements of constituent securities in the Returns Universe of the index.

Calendar

The Global Green Bond Index is a global, multi-currency index that is generated every business day of the year except for January 1, the only holiday common to all regional calendars. During holidays observed by local markets, the index will still be generated using prices from the previous business day. FX rates are updated daily using WM Reuters 4pm (London) rates. FX forwards are also sourced from WM Company.

Accessing Index Data

Bloomberg Terminal®

- INDE<GO> - The Bloomberg Indices dashboard page, which contains daily, monthly, and year-to-date index returns for key indices from each index family as well as a link to index publications.

- **IN<GO>** - The Bloomberg Index Browser displays the latest performance results and statistics for the indices as well as history. IN presents the indices that make up Bloomberg's global, multi-asset class index families into a hierarchical view, facilitating navigation and comparisons. The "My Indices" tab allows a user to focus on a set of favorite indices.
- **DES<GO>** - The index description page provides transparency into an individual index including membership information, aggregated characteristics and returns, and historical performance.
- **INP<GO>** - The Bloomberg Indices Publications page, which includes methodologies, factsheets, monthly reports, announcements and technical notes. A user may also subscribe to index publications via the "Actions" button.
- **PORT<GO>** - Bloomberg's Portfolio & Risk Analytics solution includes tools to analyze the risk, return, and current structure of indices. Analyze the performance of a portfolio versus a benchmark or use models for performance attribution, tracking error analysis, value-at-risk, scenario analysis, and optimization.

Bloomberg Indices Website

(www.bloomberg.com/indices)

The index website makes available limited index information including:

- Index methodology and factsheets
- Current performance numbers for select indices

Data Distribution

Index subscribers may choose to receive index data in files. Files may include:

- Index level and/or constituent level returns and characteristics for any indices.
- Automatic delivery of files via email or SFTP following the completion of the index production process after market close.
- Clients may receive standard files or may customize file contents.
- Index data is also available via authorized redistributors.

Sub-indices and Index Customizations

Standard Bloomberg MSCI Green Bond Indices are available for a range of sector, use of proceeds, and credit quality breakdowns. Some investors may prefer an even more customized index solution that offers even better matching of their green bond investment considerations. They should contact their Bloomberg or MSCI ESG Research sales representative for further details on bespoke index solutions. Several types of bespoke indices are available to select or customize the most appropriate benchmark for specific portfolio needs:

Sub-Index Type	Description	Examples
Enhanced Constraint	Applies a more or less stringent set of constraints to any existing index.	Global Aggregate ex Baa Global Aggregate 1-3 Year
Composites	Investors assign their own weights to sectors or other index sub-components within an overall index.	50% Global Treasury; 50% Global Aggregate ex Treasury
Issuer Constrained	Indices that cap issuer exposure to a fixed percentage. Options available for applying issuer caps and redistributing excess MV to other issuers.	Global Aggregate 2% Issuer Capped
Alternative Weights	Uses other rules-based weighting schemes instead of market value weights.	Global Aggregate GDP Weighted Global Aggregate Fiscal Strength Weighted

ESG Screened/Weighted	Applies Environmental, Social and Governance filters and/or tilts to a standard index.	Global Corporate Socially Responsible Index Global Aggregate ESG Weighted
Mirror Futures Index (MFI)	An index consisting of 14 funded futures contracts weighted to match closely the beginning-of-month OAD of the index.	Global Aggregate Mirror Futures Index
Duration Hedged	Indices constructed to reflect the underlying return of an index with its duration fully or partially hedged using its MFI.	Global Aggregate Duration Hedged Index

Bloomberg Total Return Index Value Tickers: Global Green Bond Index and Related Indices

Ticker (USD Unhedged)	Index	Ticker (USD Hedged)	Index
GBGLTRUU	Global Green Bond Index	GBGLTRUH	Global Green Bond Index
GBUSTRUU	US Green Bond Index	GBUSTRUH	US Green Bond Index
GBEUTRUU	Euro Green Bond Index	GBEUTRUH	Euro Green Bond Index

Total Return Index Values are available in other currencies and on a hedged basis.

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- Mutual Funds
- Separately Managed Accounts (SMAs)

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As the green bond market matures, further innovation and standardization can be expected. Bloomberg and MSCI ESG Research will continue to monitor market developments, adapting the Green Bond Indices to reflect broadly accepted market standards and guidelines.

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