

Barclays MSCI Green Bond Indices

Bringing clarity to the green bond market through benchmark indices



November 2014

Barclays¹

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UPDATE: This is an updated version of The Green Bond Index Guide first published in September 2014. The latest edition has been re-published to coincide with the official launch of the Barclays MSCI Green Bond index family and includes updated tables to reflect the prevailing index composition at launch, as well as enhanced detail in the appendix regarding the green bond eligible categories and definitions.

Following a wide-ranging consultation with market participants, Barclays, a global leader in fixed income indexing, and MSCI ESG Research, a leading provider of environmental, social, and governance (ESG) research, have collaborated to develop a new family of Green Bond Indices, complementing the existing Barclays MSCI ESG Fixed Income benchmark offering. This primer includes the rules and methodology for the index family, which will be available in November 2014. Key design features include:

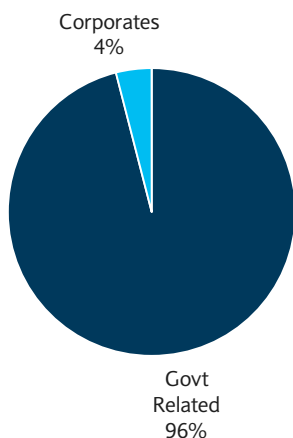
- Independent evaluation of securities by MSCI ESG Research along four dimensions (use of proceeds, project evaluation, management of proceeds, and reporting) to determine index eligibility. These eligibility criteria reflect the core elements of the Green Bond Principles (GBP).
- Fixed income eligibility criteria intended to ensure that the final benchmark index is both transparent and representative of the market being measured.
- A flexible design that allows for multiple variants, including indices that incorporate socially responsible investing (SRI) and ESG filters. Standard 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

The green bond market is growing rapidly, with projected issuance of \$40bn for 2014 (a four-fold increase from the previous year) and \$100bn for 2015.² In just three years, the

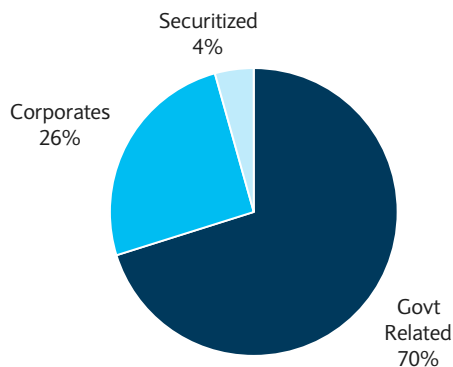
FIGURE 1
 Green Bond Market by sector, 2012 year-end



Source: MSCI ESG Research

Note: Labeled green bond issuance, excluding pure play, renewable, general purpose, and project bonds shown.

FIGURE 2
 Green Bond Market by sector, June 2014



Source: MSCI ESG Research

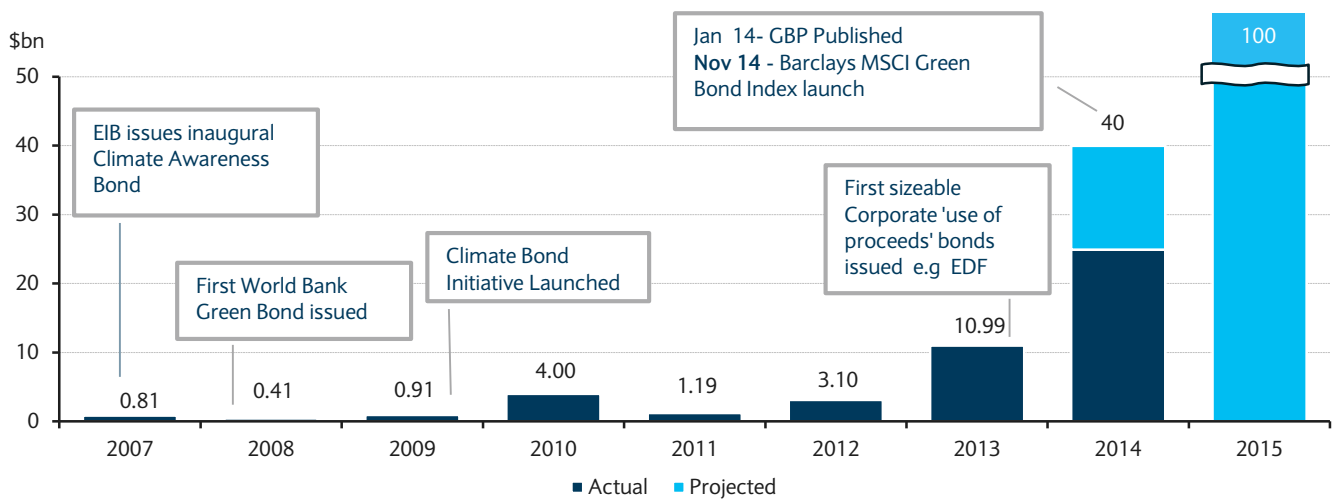
¹ The authors wish to acknowledge others from both Barclays and MSCI who were involved in the collaboration and development of this index family including (but not limited to) Tatyana Perlina, Tony Marengi, Jack Lau, Rod Martin, Sanjay Rao, Eric Moen, Hewson Baltzell, Mike Langlais, and Sergio Schuchner

² Source: Climate Bonds Initiative.

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 (Figures 1 and 2).

The rapid growth of this new market has necessitated the establishment of clear and broadly accepted guidelines for those issuing and evaluating green bonds. Earlier this year, 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 Barclays 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.

FIGURE 3
The Growth and Evolution of the Green Bond Market



Source: Climate Bonds Initiative, MSCI ESG Research, Barclays Research

The Green Bond Index family also complements the existing *Barclays 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 & METHODOLOGIES

Index Design 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. Barclays 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. 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.

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 Barclays 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.

Both self-labeled green bonds and unlabeled bonds will be evaluated using these criteria for potential index inclusion³. So long as projects fall within an eligible MSCI ESG Research

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

³ Meeting all four criteria is required for bonds issued after the publication of the Green Bond Principles in 2014. Green bonds issued prior to 2014 that are widely accepted by investors as green bonds may still qualify for the index, even if all four principles are not satisfied, since no formal guidelines were available to issuers at the time of issuance.

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 five eligible environmental categories⁴ defined by MSCI ESG Research (alternative energy, energy efficiency, pollution prevention and control, sustainable water, and green building)⁵. In cases where project categories do not overlap entirely, MSCI ESG Research will consider bonds eligible if at least 90% of the projected use of proceeds falls within eligible categories.

General purpose bonds are considered eligible if the issuer is considered pure-play, defined as a legal entity with greater than 90% of activities (as measured by revenues) within one or more of the eligible environmental categories, except where proceeds are explicitly used to finance another company's operations (eg, through payment of a dividend to a non-pure-play parent company).

The five 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:

- Generation, transmission, and distribution of electricity from renewable sources including wind, solar, geothermal, biomass, small-scale hydro (25 MW), waste energy, and wave tidal.
- 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.

Not eligible under this category: large-scale hydroelectric development projects (>25 MW installed capacity).

Energy Efficiency

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 (eg, turbines, motors, and engines), industrial automation and controls, and optimization systems (eg, cloud computing, data optimization systems).
- Infrastructure, technology, and systems that increase the efficiency of power management, power distribution, power storage (eg, batteries), demand-side management (eg, wireless sensors, advanced meters, smart grid).
- Technologies and systems focused on reducing fuel consumption of transport vehicles and industrial operations (eg, hybrid/electric vehicles).
- Sustainable transportation infrastructure including urban mass transit, efficiency improvements of public transportation fleets, electric vehicle charging, improved traffic systems.

⁴ These categories are not mutually exclusive – a bond may fall into one or more of the categories.

⁵ Other environmental activities that do not fit into these categories, including climate resilience projects (flood relief and mitigation) and sustainable forestry/afforestation, may also be candidates for inclusion based on evaluations by MSCI ESG Research.

- 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.

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:

- Technologies, systems, and projects aiming to reduce air pollution (environmental IT, conventional pollution control systems, CCS).
- 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.
- Technologies and products that reduce, reuse, or recycle water as a means of conservation (smart metering devices, low-flow equipment, 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 (eg, based on Energy Star, NABERS >3, or equivalent) or environmental design standards (eg, 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.

Green Building criteria will be re-evaluated periodically, and we anticipate raising the standard to only include higher levels of certification (eg, LEED Gold and above) in the future.

FIGURE 4
MSCI ESG Research Green Bond Use of Proceeds Categories and Sub-categories – Summary

Green Bond Category	Sub-Category
Alternative Energy	<i>Wind, Solar, Geothermal, Biomass, Waste Energy, Wave Tidal, Small Hydro (<25MW), Biogas, Bio-fuels (first and second generation)</i>
Energy Efficiency	<i>Demand-Side Management, Battery, Fuel Cells/Hydrogen Systems, Smart Grid, Other Energy 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</i>
Pollution Prevention & Control	<i>Environmental Remediation, Waste Treatment (excluding landfill and incineration), Reuse & Recycling of Waste, Low Toxicity/VOC, Conventional Pollution Control</i>
Sustainable Water	<i>Water Infrastructure & Distribution (with impact on water quality and access), Rainwater Harvesting, Smart Metering Devices, Drought-resistant Seeds, Desalinization, Waste Water Treatment, Water Recycling Equipment & Services, Watershed Conservation Efforts</i>
Green Building	<i>Green Certified Residential and Commercial Properties based on local environmental performance standards (eg Energy Star, NABERS >3, etc.), Green Certified Residential and Commercial Properties based on local environmental design standards (eg LEED Certified, BREEAM, etc.), Uncertified Green Property Investments (top 15% energy efficiency within local market)</i>

Source: MSCI ESG Research

2. Process for Green Project 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 (eg, green bond supplement, website, investor presentation, published third-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 waste water discharge.” Examples of non-eligible criteria include “green initiatives and other projects that contribute to environmental sustainability” without further definition.

A third-party opinion is not sufficient in the absence of clearly defined processes and criteria for project selection.

3. Management of Proceeds

A formal process to ring-fence net proceeds to the eligible use of proceeds must be disclosed in the bond prospectus or supporting documentation (as defined above). Eligible mechanisms to ring-fence net proceeds include: direct recourse to eligible revenues or assets (eg, 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 (eg, green house gas emissions savings, reduction in water consumption, increased energy efficiency per unit of output, etc.).

Green bonds may be removed from the index if the issuer fails to report on the use of proceeds at least annually or if reporting indicates that investments fall outside of eligible categories.

Exceptions

Green bonds issued prior to 2014, before the launch of the Green Bond Principles, are subject only to criteria one (use of proceeds). General purpose bonds of pure-play issuers, defined as issuers deriving at least 90% of revenues from eligible environmental activities, are subject only to criteria one (use of proceeds) and four (ongoing reporting).

Many green bonds that have come to market since the formalization of the Green Bond Principles have clearly satisfied the four index inclusion criteria. However, there may be cases in which index eligibility may be less transparent. Examples of two different green bond evaluations where index eligibility is less certain are highlighted in Figures 5 and 6.⁶

FIGURE 5
Case Study: Index-Ineligible Issuer-Labeled “Green Bond”

Green Bond Criteria	Details and MSCI ESG Research Assessment
<p>X Use of Proceeds</p>	<p>The issuer states in supporting green bond documentation that “eligible projects could include green buildings, energy efficiency in manufacturing processes, and waste water management”. Not considered eligible as “energy efficiency in manufacturing processes” is not considered an eligible environmental category (Figure 4).</p>
<p>X Process for Green Project Selection</p>	<p>The issuer states that “proceeds will be used to fund certain eligible projects. Examples of eligible projects may include, among other projects, green buildings, waste water recycling, and green product development. Not considered eligible as the criteria are not exhaustive (eg, “projects may include, among other projects”) and categories are not clearly defined (eg, no definition of “green product” or “green building” based on existing industry standards or specific environmental criteria).</p>
<p>✓ Management of Proceeds</p>	<p>The issuer states that “proceeds will be credited to a special account that will support the company’s funding of eligible projects”. Considered eligible, even though more details could be given regarding how the issuer will ensure that proceeds are properly ring-fenced.</p>
<p>X Ongoing Reporting</p>	<p>The issuer does not commit to ongoing reporting and does not report on initial use of proceeds. Not considered eligible under reporting criteria.</p>

Source: MSCI ESG Research

⁶ Figures 5 and 6 show case studies for hypothetical, not actual, bonds

FIGURE 6

Case Study: Index-Eligible Unlabeled Green Bond by Pure-play Corporate Issuer

Green Bond Criteria	Details and MSCI ESG Research Assessment
✓ Use of Proceeds	General purpose corporate bond issued by company that is entirely engaged in the manufacture of solar cells, with no other lines of business. The issuer is considered pure-play, as 100% of revenues are derived from an eligible environmental category ("Alternative Energy").
N/A Process for Green Project Selection	This criterion is relaxed for pure-play issuers.
N/A Management of Proceeds	This criterion is relaxed for pure-play issuers.
✓ Ongoing Reporting	Issuer reports on its lines of business and environmental performance on an annual basis. Considered eligible on reporting criteria. Note that the bond could be removed from the index if MSCI ESG Research finds evidence of a significant drift in the company's business model or acquisition of businesses in other non-eligible categories, whereby the issuer would no longer be classified as pure-play.

Source: MSCI ESG Research

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

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 Barclays Global Aggregate Index. Green Bonds must be US Aggregate or Global Aggregate eligible or have been eligible for those indices prior to falling below their one year remaining to maturity requirement.

- **Sector:** Corporate, government-related, and securitized bonds are eligible for the Green Bond Index, provided they meet all other eligibility criteria.
 - Current index eligible issuance is primarily from government-related (ie, supranational) and corporate issuers, but asset-backed securities (ABS) with green underlying collateral may also qualify.
 - Taxable municipals are eligible for the Green Bond Index, but tax-exempt securities are not.

FIGURE 7

Barclays MSCI Green Bond Index by Sector

Sector	Count	Market Value (%)	Market Value (\$ bn)	Yield to Worst	OAD	OAS	ESG Quality	Index Rating
Government-Related	24	69.9	25.6	1.49	5.90	56	AA/A	AA2/AA3
Agency	8	26.7	9.8	1.04	5.39	31	AAA/AA	AAA/AA1
Local Authority	3	6.0	2.2	0.97	5.50	37	AA/A	AA1/AA2
Supranational	13	37.2	13.6	2.02	10.46	62	A	AA2
Corporate	16	28.8	10.6	0.94	4.50	21	AAA/AA	AAA
Utility	11	1.0	0.4	2.61	7.35	120	A/BBB	A3/BAA1
Financial	5	20.4	7.5	3.90	15.31	98	NR	AAA
Securitized	1	7.3	2.7	2.80	7.61	134	A/BBB	A3/BAA1
ABS	1	1.3	0.5	1.91	5.50	84	AA/A	A2/A3
Total	49	100.0%	36.7					

Note: Data as of November 2014. Source: MSCI ESG Research, Barclays Research

- **Currency:** The Green Bond Index is a multi-currency benchmark that includes local currency debt markets tracked by the Barclays Global Aggregate Index.⁷ Not every eligible currency will have bonds that qualify for the Green Bond Index.
 - **Americas:** USD, CAD, MXN, CLP
 - **EMEA:** EUR, GBP, CHF, CZK, DKK, ILS, NOK, PLN, RUB, SEK, ZAR, TRY
 - **Asian-Pacific:** JPY, AUD, HKD, KRW, NZD, SGD, MYR, THB

FIGURE 8

Barclays MSCI Green Bond Index by Currency

Currency	Count	Market Value %	Market Value (\$ bn)
EUR	14	48.5	17.8
USD	23	36.5	13.4
CAD	5	5.5	2.0
SEK	3	4.1	1.5
GBP	2	3.6	1.3
CHF	1	1.1	0.4
AUD	1	0.7	0.3
Total	49	100.0	36.7

Note: Data as of November 2014. Source: Barclays Research

- **Amount Outstanding:** Fixed minimum issue sizes are set for all local currency markets. To ensure investability, the Green Bond Index will have the same minimum amount outstanding as the flagship Barclays Global Aggregate and US Aggregate Indices, which are set for each local currency based on market-specific issuance patterns and benchmark issuance sizes.

Early green bond issuance tended to be in smaller denominations, but the average size has been quickly increasing as the green bond market has evolved. Established development bank and supranational issuers have historically issued relatively large bonds, but in recent times it has been more common for new issuers to come to market with benchmark-sized issues, which are often oversubscribed.

FIGURE 9

Fixed Minimum Issue Sizes for Local Currency Markets

Currency	Minimum Issue Size
USD	250mn
CAD, EUR, CHF, AUD	300mn
GBP	200mn
JPY	35bn
DKK, NOK, PLN, ZAR, ILS, HKD, MYR	2bn
SEK	2.5bn
CZK, THB	10bn
NZD, SGD	500mn
CLP	100bn
KRW	500bn

Source: Barclays Research

⁷ Please refer to the *Global Aggregate factsheet* for detailed inclusion rules.

- **Credit Quality:** The green bond Index includes only investment-grade bonds with a credit quality rating of Baa3/BBB- or higher, using the middle rating of Moody's, Fitch, and S&P. Green issuance in benchmark size thus far has almost exclusively been from investment-grade issuers.
- **Coupon Type:** The index includes fixed rate securities only, which includes fixed rate, zero coupon, step-up coupon and callable fixed-to-floating bonds. Note that bonds with a step-up coupon with predetermined schedules are eligible, and callable fixed-to-floating bonds are eligible during their fixed-rate term only.
- **Security Type:** Inflation-linked, convertible and government securities (ie, Bills, Strips and Treasury bonds) are ineligible for the Green Bond Index. Retail bonds, private placements and bonds without a third-party pricing source are also ineligible.
- **Maturity:** Unlike other Barclays Aggregate bond Indices, the Green Bond Index does not have a 1-year minimum time to maturity and will hold bonds until final maturity. During our consultation, market participants indicated that they typically hold Green Bonds to maturity. Therefore, the inclusion of Green Bonds to maturity within the indices is designed to accommodate this market practise by not forcing unwanted turnover.

FIGURE 10

Top Five Issuers by Market Value for Green Bond Index

Ticker	Description	Sector	# Bonds	Market Value (\$bn)	Market Value %	ESG Quality
EIB	European Investment Bank	Supranational	6	7.2	19.6%	AA
KFW	Kredit Fuer Weideraufbau	Agency	2	3.4	9.2%	AAA
GSZFP	Gaz de France	Utility	2	3.3	9.0%	A
IBRD	World bank	Supranational	6	2.7	7.4%	AA
IFC	International Financing Corp	Supranational	3	2.5	6.8%	AAA

Note: Data as of November 2014. Source: MSCI ESG Research, Barclays Research

FIGURE 11

Barclays MSCI Green Bond Flagship Index Composition, as of November 2014

ISIN	Issuer	Issue Date	Maturity Date	Coupon	Currency	Amount Outstanding (Local, bn)	MV (\$, bn)	Alt. Energy	Energy Efficiency	Use of Proceeds			ISIN
										Pollution Prevention	Sustainable Water	Green Building	
Govt Related - Agencies													
XS1111084718	AGENCE FRANCAISE DE DEVELOPPEM	10-Sep-14	17-Sep-24	1.375	EUR	1.0	1.3	✓	✓	ü			✓
US30216BER96	EXPORT DEVELOPMENT CANADA	23-Jan-14	30-Jan-17	0.875	USD	0.3	0.3	✓	✓	✓	✓		✓
FR0011637586	ELECTRICITE DE FRANCE SA	20-Nov-13	27-Apr-21	2.25	EUR	1.4	1.9	✓					
US302154BG39	EXPORT-IMPORT BANK OF KOREA	20-Feb-13	27-Feb-18	1.75	USD	0.5	0.5	✓	✓		✓		
XS1084043451	HERA SPA	26-Jun-14	04-Jul-24	2.375	EUR	0.5	0.7	✓	✓	✓	✓		
US50048MBM10	KOMMUNALBANKEN AS	06-Nov-13	21-Nov-16	0.75	USD	0.5	0.5	✓	✓	✓	✓	✓	✓
XS1087815483	KFW	15-Jul-14	22-Jul-19	0.375	EUR	1.5	1.9	✓					
XS0993154748	NEDERLANDSE FINANCIERINGS MAAT	05-Nov-13	13-Nov-18	1.25	EUR	0.5	0.7	✓	✓	✓	✓	✓	✓
XS1083955911	NEDERLANDSE WATERSCHAPSBANK NV	26-Jun-14	03-Jul-19	0.625	EUR	0.5	0.6	✓	✓		✓		
US500769GF56	KFW	07-Oct-14	15-Oct-19	1.75	USD	1.5	1.5	✓					
Govt Related - Local Authorities													
US254845JZ44	DISTRICT OF COLUMBIA WATER & S	23-Jul-14	01-Oct-14	4.814	USD	0.4	0.4				✓		
FR0011225325	REGION OF ILE DE FRANCE	20-Mar-12	27-Mar-24	3.625	EUR	0.4	0.5	✓	✓			✓	
FR0011858323	REGION OF ILE DE FRANCE	14-Apr-14	24-Apr-26	2.375	EUR	0.6	0.8	✓	✓		✓		✓
CA68323ACW23	PROVINCE OF ONTARIO CANADA	02-Oct-14	09-Oct-18	1.75	CAD	0.5	0.4		✓			✓	✓
Govt Related - Supranational													
US00828EAX76	AFRICAN DEVELOPMENT BANK	10-Oct-13	18-Oct-16	0.75	USD	0.5	0.5	✓		✓	✓		
US29874QCN25	EUROPEAN BANK FOR RECONSTRUCTI	10-Sep-13	10-Apr-18	1.625	USD	0.3	0.3	✓	✓	✓	✓	✓	✓
XS0773059042	EUROPEAN INVESTMENT BANK	10-Apr-12	23-Apr-19	3	SEK	3.8	0.6	✓	✓				
LU0953782009	EUROPEAN INVESTMENT BANK	11-Jul-13	15-Nov-19	1.375	EUR	2.6	3.5	✓	✓				
CH0233004172	EUROPEAN INVESTMENT BANK	08-Jan-14	04-Feb-25	1.625	CHF	0.4	0.4	✓	✓				
XS1051861851	EUROPEAN INVESTMENT BANK	26-Mar-14	07-Mar-20	2.25	GBP	0.5	0.8	✓	✓				
XS1107718279	EUROPEAN INVESTMENT BANK	03-Sep-14	13-Nov-26	1.25	EUR	0.8	0.9	✓	✓				
XS0398811959	INTERNATIONAL BANK FOR RECONST	05-Nov-08	12-Nov-14	3.5	SEK	3.4	0.5	✓	✓				✓
US45905UNJ96	INTERNATIONAL BANK FOR RECONST	09-Aug-13	24-Aug-15	0.375	USD	0.6	0.6	✓	✓				✓
XS1047440448	INTERNATIONAL BANK FOR RECONST	13-Mar-14	20-Mar-17	0.25	EUR	0.6	0.7	✓	✓				✓
AU3CB0220424	INTERNATIONAL BANK FOR RECONST	16-Apr-14	29-Apr-19	3.5	AUD	0.3	0.3	✓	✓				✓
US45950VBV71	INTERNATIONAL FINANCE CORP	26-Apr-12	15-May-15	0.5	USD	0.5	0.5	✓	✓				✓

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US45950VCJ35	INTERNATIONAL FINANCE CORP	13-Feb-13	16-May-16	0.5	USD	1.0	1.0	✓	✓		✓
US45950VCP94	INTERNATIONAL FINANCE CORP	04-Nov-13	15-Nov-16	0.625	USD	1.0	1.0	✓	✓		✓
US298785GQ39	EUROPEAN INVESTMENT BANK	07-Oct-14	15-Oct-24	2.5	USD	1.0	1.0	✓	✓		
US45905UQE72	INTERNATIONAL BANK FOR RECONST	17-Sep-14	23-Sep-16	0.65	USD	0.3	0.2	✓	✓		T
XS1078475024	INTERNATIONAL BANK FOR RECONST	11-Jun-14	23-Jun-19	1.375	SEK	3.5	0.5	✓	✓		T
US65562QAW50	NORDIC INVESTMENT BANK	22-Sep-14	30-Sep-21	2.25	USD	0.5	0.5	✓	✓	✓	✓
Corporate - Financial											
US06051GEZ81	BANK OF AMERICA CORP	18-Nov-13	21-Nov-16	1.35	USD	0.5	0.5	✓	✓		✓
US75884RAT05	REGENCY CENTERS LP	13-May-14	15-Jun-24	3.75	USD	0.3	0.3				✓
CA891145N340	TORONTO-DOMINION BANK/THE	28-Mar-14	03-Apr-17	1.824	CAD	0.5	0.4	✓	✓		✓
XS1038708522	UNIBAIL-RODAMCO SE	19-Feb-14	26-Feb-24	2.5	EUR	0.8	1.0				✓
US929043AH00	VORNADO REALTY LP	09-Jun-14	30-Jun-19	2.5	USD	0.5	0.5				✓
Corporate - Utility											
CA05573YAC53	BROOKFIELD RENEWABLE ENERGY PA	25-Nov-09	30-Nov-16	6.132	CAD	0.3	0.3	✓			
CA05573YAD37	BROOKFIELD RENEWABLE ENERGY PA	07-Oct-10	13-Oct-20	5.14	CAD	0.5	0.4	✓			
CA05572ZAA71	BROOKFIELD RENEWABLE ENERGY PA	31-Jan-12	07-Feb-22	4.79	CAD	0.4	0.4	✓			
US83416WAA18	SOLAR STAR FUNDING LLC	20-Jun-13	30-Jun-35	5.375	USD	1.0	1.1	✓			
US89054XAA37	TOPAZ SOLAR FARMS LLC	16-Feb-12	30-Sep-39	5.75	USD	0.9	0.9	✓			
US89054XAB10	TOPAZ SOLAR FARMS LLC	10-Apr-13	30-Sep-39	4.875	USD	0.3	0.3	✓			
XS0995413340	GREATER GABBARD OFTO PLC	26-Nov-13	29-Nov-32	4.137	GBP	0.3	0.5	✓			
FR0011911239	GDF SUEZ	12-May-14	19-May-20	1.375	EUR	1.2	1.6	✓	✓		
FR0011911247	GDF SUEZ	12-May-14	19-May-26	2.375	EUR	1.3	1.7	✓	✓		
XS0942102673	HERO ASIA INVESTMENT LTD	05-Aug-13	12-Aug-16	3.25	USD	0.3	0.3	✓			
Corporate - Industrial											
US575718AE16	MASSACHUSETTS INSTITUTE OF TEC	22-Sep-14	01-Jul-38	3.959	USD	0.4	0.4				✓
Securitized - ABS											
US89231MAC91	TOYOTA AUTO RECEIVABLES 2014-A	19-Mar-14	15-Dec-17	0.67	USD	0.5	0.5			✓	

Note: Data as of November 2014. Source: MSCI ESG Research, Barclays Research

Index Rebalancing

The general *core index rules and mechanics* applied to Barclays' flagship aggregate indices will be used within the Barclays MSCI Green Bond index family. Additional rebalancing considerations are required for the independent determination of eligible green bond candidates on a monthly basis.

Monthly Green Bond Evaluation Date

The list of green bonds evaluated by MSCI ESG research is set on the twenty-fifth calendar day of each month (the Green Bond Evaluation Date). This list includes all securities that have been previously evaluated by MSCI ESG Research and classified as green bonds, as well as bonds evaluated since the previous Green Bond Evaluation Date that have been newly classified as green bonds.

MSCI evaluations must be completed by the Green Bond Evaluation Date to qualify for index inclusion at the next index rebalancing:

- Bonds issued prior to the Green Bond Evaluation Date that are still under review by MSCI ESG research as of the Green Bond Evaluation Date will not be eligible for the Green Bond Index at the next monthly rebalancing.⁸
- Bonds issued after the Green Bond Evaluation Date but prior to month-end will also not be eligible for the index at the month-end rebalancing.

Monthly Index Rebalancing Date

The Barclays MSCI Green Bond Index is rebalanced on a monthly basis on the last business day of each month. For each index, two populations of securities are maintained daily: a fixed returns universe, which is held constant throughout the month and used to compute returns, and a statistics universe⁹, which projects the next month's index composition based on current eligibility. For Green Bond Indices, new issues *will not* be added to the statistics universe until after the Green Bond Evaluation Date. On the last business day of the month (the rebalancing date), the composition of the latest statistics universe becomes the returns universe for the following month.

Index Variants

In addition to the flagship indices, sub-indices will be available by currency, purpose (use of proceeds), maturity, sector, and credit quality. Variants incorporating ESG themes (excluding MSCI ESG Quality rating of CCC or MSCI ESG Impact Monitor "red") and SRI themes (excluding issuers with business involvement in nuclear power, GMOs, or controversial weapons) will also be available. Please see Figure 12 for a full list of sub-indices available.

⁸ Bonds from new issuers will generally require extra scrutiny to ensure that they belong in the Green Bond Index universe. Therefore, these issues may not be included in the index in the following month. Established issuers that have a proven track record of issuing green bonds (eg, development banks) and issue close to or on the green bond evaluation date will be included on the Monthly Green Bond Eligibility List.

⁹ The Green Bond index statistics universe can change throughout the month as bonds become ineligible due to fixed income criteria evaluation. For example, if a Green Bond index credit rating falls below investment grade, it will exit the index. However, the green bond index statistics universe will only be updated on the Green Bond Evaluation Date to reflect eligibility according to green bond criteria. Therefore, from the Green Bond Evaluation date until month-end, the statistics universe will be fixed with respect to the Green Bond criteria and may only change subject to ineligibility according to the fixed income criteria.

FIGURE 12
Barclays MSCI Green Bond Index Family

Available Sub-Indices					
Use of Proceeds	Currency	Sector	Maturity	Credit Quality	ESG/SRI
Alternative Energy	USD	Government-Related	0-1 Yr	Aaa	Ex CCC, Ex Red IM
Energy Efficiency	EUR	Supranational	1-5 Yr	Aa	Ex Nuclear Power
Pollution Prevention / Control	GBP	Agency	5-10 Yr	A	
Sustainable Water	CHF	Local Authority	10+ Yr	Baa	
Green Building	CAD	Corporate	1+ Yr		
Other	AUD	Industrial	1-10 Yr		
	SEK	Utility			
	JPY	Financial Institutions			
	Other	Securitized			

Source: Barclays Research

FIGURE 13
Flagship Green Bond Index - Bloomberg Tickers

Index	Ticker
Barclays MSCI Global Green Bond Index	GBGL
Barclays US Global Green Bond Index	GBUS
Barclays Euro Global Green Bond Index	GBEU

Source: Barclays Research

Index Governance

Barclays MSCI ESG Fixed Income Indices, including the Green Bond Indices, are jointly governed by an index steering committee with representation from Barclays and MSCI ESG Research.

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

Index Customization and Reporting Options

Standard Barclays 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 Barclays or MSCI ESG Research representative for further details on bespoke index solutions.

APPENDIX

FIGURE A1

MSCI ESG Research Green Bond Use of Proceeds Eligible Categories

Category	Definition
Alternative Energy	<p>Investments in products, services, or infrastructure projects supporting the development or delivery of renewable energy and alternative fuels, including:</p> <ul style="list-style-type: none"> • Generation, transmission, and distribution of electricity from renewable sources, including wind, solar, geothermal, biomass, small-scale hydro (25 MW), waste energy, and wave tidal. • 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. <p>Not eligible under this category: large-scale hydroelectric development projects (>25 MW installed capacity).</p>
Energy Efficiency	<p>Investments in products, services, infrastructure, or technologies that proactively address the growing global demand for energy while minimizing their impact on the environment, including:</p> <ul style="list-style-type: none"> • Technologies and systems that promote efficiency of industrial operation (eg, turbines, motors, and engines), industrial automation and controls, and optimization systems (eg, cloud computing, data optimization systems). • Infrastructure, technology, and systems that increase the efficiency of power management, power distribution, power storage (eg, batteries), and demand-side management (eg, wireless sensors, advanced meters, smart grid). • Technologies and systems focused on reducing fuel consumption for transport vehicles and industrial operations (eg, hybrid/electric vehicles) • Sustainable transportation infrastructure, including urban mass transit, efficiency improvements of public transportation fleets, electric vehicle charging, improved traffic systems • Certified HVAC equipment and systems, architectural glass, efficient lighting, insulation, building automation and controls, and devices and systems be utilized in the design and construction of environmentally sustainable buildings • Corporate operational energy efficiency efforts (eg, efficiency gains in manufacturing, transporting, or distributing standard products or services) only where at least 90% of the earmarked proceeds are directly used for energy efficiency improvements or retrofits. <p>Not eligible under this category: corporate energy efficiency efforts where less than 90% of the earmarked proceeds are directly used for energy efficiency improvements.</p>
Pollution Prevention & Control	<p>Products, services, or projects that support pollution prevention, waste minimization, or recycling as a means of alleviating the burden of unsustainable waste generation, including:</p> <ul style="list-style-type: none"> • Technologies, systems, and projects aiming to reduce air pollution (environmental IT, conventional pollution control systems, CCS) • 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 <p>Not eligible under this category: landfill or incineration waste treatment projects without a specific waste-to-energy component.</p>
Sustainable Water	<p>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.</p> <ul style="list-style-type: none"> • 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; • Technologies and products that reduce, reuse, or recycle water as a means of conservation (smart metering devices, low-flow equipment, rainwater harvesting systems) • Advanced materials, equipment, technologies, and services that filter or chemically treat wastewater for consumer or industrial use, including desalination • Investments in the 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 <p>Not eligible under this category: distribution of drinking water without measurable improvements to water quality, water efficiency, or climate change resilience component.</p>
Green Building	<p>Design, construction, redevelopment, retrofitting, or acquisition of 'green' certified properties, subject to local green building criteria, including:</p> <ul style="list-style-type: none"> • Properties that are certified as 'green' based on the local country's environmental performance standard (eg, based on Energy Star, NABERS >3, or equivalent) or environmental design standard (eg, 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. <p>Green Building criteria will be re-evaluated periodically, and we expect to raise the standard to include only higher levels of certification (eg, LEED Gold and above).</p>
Other	<p>Other environmental activities that do not fit into the categories above, including climate resilience projects (flood relief, mitigation) and sustainable forestry/afforestation.</p>

Note: Eligible categories as of September 2014. Source: MSCI ESG Research

FIGURE A2

MSCI ESG Research Eligible Environmental Categories - Definitions

Category	Sub-Category	Definition
Alternative Energy	Wind	Generation, transmission, and distribution of electricity from renewable sources: wind energy.
	Solar	Generation, transmission, and distribution of electricity from renewable sources: solar energy.
	Geothermal	Generation, transmission, and distribution of electricity from renewable sources: geothermal energy.
	Biomass	Generation, transmission, and distribution of electricity from biomass converted to energy via combustion. Biomass can also be converted to energy through gas (biogas) or fuels (biodiesel, ethanol).
	Waste Energy	Generation of energy in the form of electricity and/or heat from the incineration of waste.
	Wave Tidal	Generation, transmission, and distribution of electricity from renewable sources: wave tidal energy.
	Small Hydro	Generation, transmission, and distribution of electricity from renewable sources: small run-of-river hydro plants with an installed capacity no greater than 25 MW.
	Biogas	Technology, infrastructure, production, and distribution of methane derived from agricultural or human waste (eg, landfill gas).
	Bio-fuels (first generation)	Technology, infrastructure, production, and distribution of biodiesel and bioethanol using the edible part of the plant. Biodiesel refers to vegetable oil used in standard diesel engines, whereas bioethanol refers to alcohol made of sugar/starch.
Energy Efficiency	Biofuels (second generation)	Technology, infrastructure, production, and distribution of biofuels coming from inedible parts of the plant (eg Cellulosic Ethanol).
	Demand-Side Management	Infrastructure, technology, and systems that aim to incentivize energy users to reduce consumption, including advanced metering infrastructures for electric smart meters, resulting in reduced energy usage and stabilized energy supply.
	Battery	Battery technology to enhance the efficiency of power storage, resulting in increased energy efficiency and enabling electric and hybrid vehicles, cogeneration, and storage of energy generated from renewable sources. Also includes battery stations/infrastructures (hydrogen refueling station, battery charging stations, etc.).
	Fuel Cells / Hydrogen Systems	Devices that convert hydrogen into electricity, resulting in increased energy efficiency and enabling electric and hybrid vehicles, cogeneration, and storage of energy generated from renewable sources.
	Smart Grid	Modernized electrical grid that uses IT to gather and act on information, such as information about the behaviors of suppliers and consumers in an automated fashion, resulting in improved efficiency, reliability, and sustainability of the production and distribution of electricity.
	Other Energy Storage	Includes distributed storage in households to support decentralized intermittent power generation and virtual power plant infrastructure system to manage large volume of urban decentralized power, resulting in increased energy efficiency or enabling shift to energy generated from renewable sources.
	Superconductors	Element or compound that will conduct electricity without resistance below a certain temperature. Applications: smart grid, electric power transmissions, transformers, power storage devices, electric motors.
	Natural Gas Combined Heat & Power	Cogeneration or CHP is the use of a heat engine or power station to simultaneously generate electricity and heat, which puts otherwise wasted thermal energy to use.
	LED Lighting	Light Emitting Diodes: LEDs have many advantages over incandescent light sources including lower energy consumption, longer lifetime, improved physical robustness, smaller size, and faster switching.
	Compact Fluorescent Lighting	Fluorescent lamp designed to replace an incandescent lamp. Compared to general-service incandescent lamps giving the same amount of visible light, CFLs use one-fifth to one-third the electric power, and last eight to fifteen times longer
	Insulation	Materials used in buildings for thermal purposes.
	Hybrid / Electric Vehicles	Electric cars: automobile that is propelled by one or more electric motors, using electrical energy stored in batteries or another energy storage device Hybrid cars: hybrid electric vehicles (HEVs), which combine an internal combustion engine and one or more electric motors. Includes private, commercial, freight, and public vehicles.
	Clean Transport infrastructure	Urban mass transit projects, efficiency improvements of public transportation fleets, electric vehicle charging stations, improved traffic systems. Note that general rail operations or infrastructure would not qualify automatically without demonstrating specific energy efficiency gains.

Category	Sub-Category	Definition
Energy Efficiency (Cont.)	Industrial Automation	Technologies enabling the automation of manufacturing processes (eg, programmable logic controller, computers, robots) with the aim to reduce energy consumption and increase efficiency.
	Environmental IT	Software that manage environmental footprint (mostly air emissions, GHG management, GHG accounting software, etc) including transportation software (eg, telematics)
	IT Optimization Services & Infrastructure	Technologies that aims to increase efficiency including cloud computing, cloud services, data center optimization, virtualization, telepresence. Also includes environmental IT (eg, software that manages environmental footprint including air emissions, GHG management, GHG accounting, etc) and including transportation software (eg, telematics).
Pollution Prevention & Control	Environmental Remediation	Technologies that aim to remove pollution or contaminants from environmental media such as soil, groundwater, sediment, or surface water (eg, thermal desorption, excavation, sobilization, pump & treat, stalization, oxidation, soil vapor extraction).
	Waste Treatment	Activities required to ensure that waste has the least practicable impact on the environment (composting, landfill, incineration, recycling). Only includes recycling/composting and waste to energy; does not include landfill or incineration without waste to energy component.
	Reuse & Recycling of Waste	Technologies and processes that transform waste materials into new products.
	Low Toxicity / VOC	Materials containing less VOC or other toxic chemicals found in paints, adhesives, flooring products (carpets, vinyl); and formaldehyde in reconstituted fibre boards or plywood
	Conventional Pollution Control	Technologies designed to reduce pollution to air (eg, filter, scrubber, absorbers, cyclones, condenser), resulting in improved air quality.
Sustainable Water	Water Infrastructure & Distribution	Infrastructure and engineering projects developing new or repairing existing waste water treatment facilities, sanitation pipelines, sewer systems, storm water, and other waste water projects with measurable impact on water quality. Note that water utilities or activities to manage existing pipelines would not automatically qualify without infrastructure investments aimed at improving water quality and increasing access to clean water.
	Rainwater Harvesting	Technologies' aiming to collect rainwater for reuse before it reaches the aquifer, resulting in water conservation.
	Smart Metering Devices	Devices measuring water consumption (may also be used for measuring electricity and gas consumption) that enable the end user to record consumption and report back to the utility, resulting in increased water efficiency.
	Drought-resistant seeds	Seeds that limit the impact of heat, resulting in reduced water usage in agriculture.
	Desalinization	Processes that remove some amount of salt and other minerals from saline water, resulting in improved water supply.
	Waste Water Treatment	Technologies that aim to remove contaminated materials from water including biochemical process, filters, drainage, etc., resulting in improved water quality.
	Green Building	Green Certified Properties
Uncertified Green Property Investments		Uncertified projects 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

Source: MSCI ESG Research Eligible categories as of September 2014

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