



A BRIEFING ON GREEN BONDS

GREEN BOND MARKET OPPORTUNITIES

JULY 2014





SUMMARY

Green bonds offer the potential to raise billions in capital to fund renewable energy projects and a host of other sustainable technologies to enable the transition to a sustainable economy. But uncertainty among institutional investors about the environmental benefits of green bonds may limit this potential. A lack of transparency in the green bonds market has reputational risks for organizations issuing green bonds. Surging interest among companies in issuing green bonds could exacerbate these challenges unless something is done.

Trucost believes that natural capital quantification and valuation offers issuers and investors the opportunity to develop a green bond market that is robust, credible and transparent. By quantifying the environmental benefits of green bonds and putting a monetary value on those benefits, all players will be able to compare performance of different issuances on a like-for-like basis. Such a move would increase competition in the market, enhancing the contribution green bonds could make towards transitioning to a greener economy.

BACKGROUND

Green bonds are fixed-income instruments aimed at financing clearly defined projects that generate direct environmental benefits such as renewable energy, energy efficiency, water conservation and climate change adaptation. These were pioneered in 2006 by supranational organisations such as the World Bank, the European Investment Bank and the African Development Bank as a means to finance the transition towards a low-carbon economy.

In 2008 the French Nord-Pas de Calais region was the first local authority to issue a green bond, raising €50m to finance projects ranging from railways to construction to the reclassification of brownfield land. This initiative has since been replicated by a number of local governments in the US, Canada, France, and Sweden seeking to fund renewable energy and low-carbon infrastructure projects, as well as ground-breaking environmental developments like ecological corridors. Emerging economies are also exploring the benefits of green bonds. On June 9th 2014, Johannesburg in South Africa issued its first green bond.

Many companies are now using green bonds. In 2014, the market saw a rapid increase in the number of corporate green bond issuances as large multinationals including EDF, Unilever and GDF Suez sought ways to finance environmentally beneficial capital investments and projects.

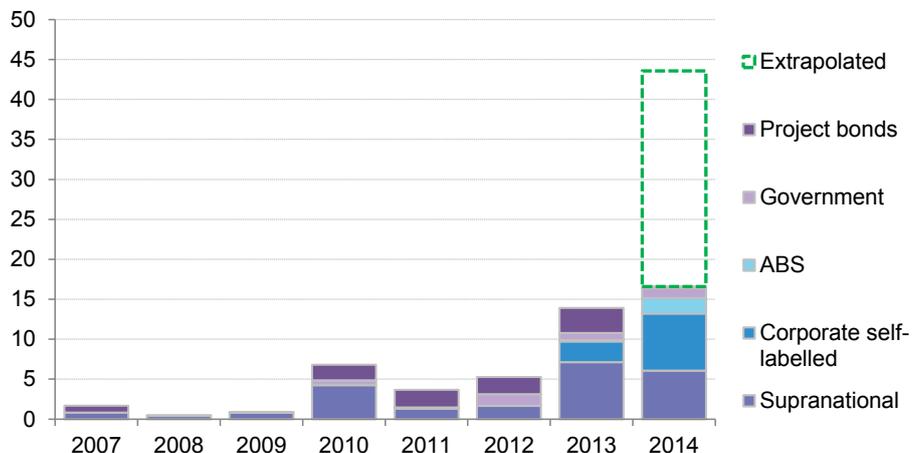
The myriad names and approaches inherent to green bond issuance, and the speed at which they are growing, may lead to confusion in the market. As a result, issuer environment, social and governance ratings, and verification and certification initiatives such as the Green Bond Principles are being introduced to improve clarity.

MARKET PROJECTIONS

The market is growing rapidly as evidenced by a large pool of issuers and a striking variety of funded projects. According to the Climate Bonds Initiative, a record of nearly \$20bn of green bonds have been issued this year, driven largely by a surge in corporate self-labelled bonds and sustained issuance from large international and supranational banks. Bloomberg New Energy Finance (BNEF) highlights that at current pace the total volume for 2014 is expected to surpass \$40bn by the end of the year, effectively tripling 2013's volume.

In a recently published report *The Greening of the Corporate Bond Market*, Standard and Poor's forecast that corporate bonds (excluding banks and financial institutions) will account for half of the market, or around \$20bn. Evidently, the size of the corporate green bonds market is growing (it stood at \$2.1bn in 2013). While the green bond market is small relative to the size of the overall bond market, it is evidence of a rapidly accelerating trend for companies to attract low-cost capital from specific types of investors that are interested in funding green projects using fixed income instruments.

FIGURE 1: HISTORICAL GREEN BOND ISSUANCE BY TYPE (\$bn)



Source: Bloomberg New Energy Finance Note: 'Extrapolated' assumes continuation of current pace.

DEFINITIONS

The standard definition for what constitutes a green bond continues to evolve. The industry is building consensus on key issues as the issuance of corporate green bonds gains ground. Two perspectives prevail: on one hand the likes of BNEF and French research group Novethic consider green bonds as those self-labelled as such by their issuers; on the other hand the British not-for-profit Climate Bonds Initiative defines green bonds as debt issued by companies active in green or sustainable business areas.

BNEF's definition of green bonds encompasses:

- Corporate self-labelled green bonds: Bonds issued by corporations and explicitly labelled as green
- Green ABS: Asset-backed securities whose cash flows come from a portfolio of underlying receivables such as loans, leases, and PPAs, associated with green (e.g. renewable energy, energy efficiency) projects
- Supranational: Bonds issued by supranational or international organisations like multilateral banks, development banks and export credit agencies
- Government: Bonds issued by national, regional and local governments to finance green projects. Includes US municipal bonds
- Project: Bonds backed by the cashflows of an underlying renewable energy project or portfolio of projects

ENSURING CREDIBILITY

The question is: what makes a 'green bond' green? The definition of what constitutes a green bond is broad and comprises a range of sectors including renewable energy, energy efficiency, transport, waste and water reduction, information and communication technology, sustainability, and adaptation to climate change. Currently, issuers are free to choose the projects they intend to fund as there are no legally binding guidelines to evaluate and determine the legitimacy of the issuers' bonds.

The Green Bond Principles (GBP) is an initiative that seeks to clarify this. GBP provides voluntary process guidelines supported by 25 leading banks which aim to establish procedures for designating, disclosing, managing and reporting the proceeds of green bonds. The GBP's guidelines intend to provide room for development and continued evolution. The team behind GBP says it is not their intention to prescribe eligible green bond project categories or to create frameworks for enforcement. Instead, its goal is to make recommendations to issuers on how they communicate and categorize their use of proceeds in a clear manner so that investors can determine if the bonds are consistent with their investment strategy.



Other options include third-party verification against the Climate Bonds Standard (an externally verifiable standard that includes wind, solar, green buildings and other asset classes), and second-party opinions that do not involve standards but instead rely on the credentials of the institution issuing the bond. For example, French non-financial rating agency Vigeo was appointed by GDF Suez during their recent issuance of green bonds to determine eligibility criteria for projects in renewable energy and energy efficiency. Vigeo's criteria includes environmental protection, contribution to local development, ethical and fair treatment of suppliers and sub-contractor or human resources management.

The terms of Unilever green bond were defined following the GBP. These have been reviewed by an external third party, while an auditing firm was responsible for controlling the allocation of proceeds for selected projects. In Toyota's case, the categories of hybrid cars that will be financed have not been defined by an external third party. Novethic notes that while the required performance in terms of CO₂ emissions per km may be demanding on the American market, they are below average in Europe.

The variety of perspectives on what constitutes green bonds is illustrated by the different opinions over what qualifies as a green project. For instance, is the retrofit of technology aimed at reducing pollution at a coal-fired power plant a green project? What about investment in biofuels? Only certain kinds should qualify, as some lead to deforestation or compete with food crops for land and water. Others, such as sugar-based ethanol, offer genuine environmental benefits. And what about an energy utility that operates coal or gas-fired power stations issuing a green bond to invest in new renewable energy capacity?

In order for green bonds to preserve their green credibility, many believe that a clear framework should be in place that allows issuers to prove that their green bond is genuinely additional to a business as usual approach. It therefore follows that it does not matter which company issues a green bond, provided the bond has demonstrable environmental benefits consistent with the framework.

THE NEED FOR NATURAL CAPITAL QUANTIFICATION AND VALUATION

Trucost believes that clear and robust quantification of the environmental benefits of green bonds is needed to support the development of the market.

Green bonds offer the potential to raise billions of dollars in capital to fund renewable energy projects and a host of other sustainable technologies to enable the transition to a sustainable economy. But uncertainty among institutional investors about the environmental benefits of green bonds may limit this potential. A lack of transparency also has reputational risks for organizations issuing green bonds. As more companies issue green bonds, these concerns will increase.

Trucost supports initiatives like the Green Bond Principles which aim to support the credibility of the market by outlining best practice for green bonds including project selection, use of proceeds and reporting. In particular, the principles recommend that issuers should use quantitative performance indicators to measure the impact of specific investments, such as reduction of greenhouse gas emissions or number of people with access to clean energy or water.

While this form of quantification is a welcome first step, Trucost believes that traditional metrics provide limited insight especially for complex projects with a variety of environmental effects. This is because measuring different environmental impacts each with its own individual metric means it is not possible to compare the performance of a range of green bonds – one is comparing apples and pears.

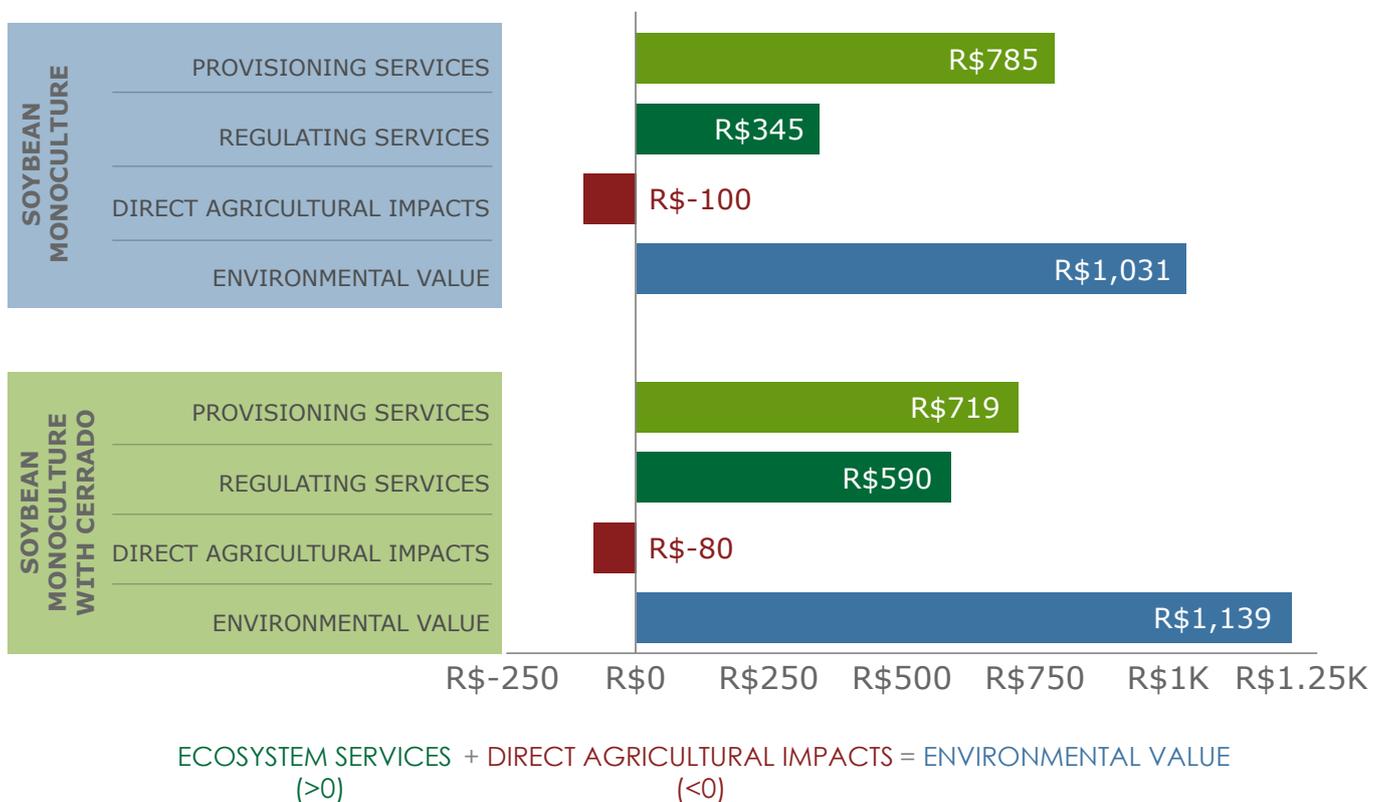
Natural capital valuation provides the solution by creating a robust and transparent way to measure the performance of green bonds. By putting a single monetary value on the benefits of a green bond, issuers will have the confidence to communicate the benefits of their product to the market. Investors will be able clearly compare a range of green bonds and select one that best meets their needs. Overall, greater transparency will drive competition, improving the environmental performance of green bonds and benefiting the environment as a result.

A recent project between Trucost, agricultural products company Monsanto and environmental organization Conservation International in Brazil, illustrates how natural capital valuation can be used to prove the case for complex sustainability projects such as farming methods that better respect nature and also benefit companies and local people.

Trucost calculated the environmental value associated with single crop or ‘monocultural’ production of soybean compared to a plantation that mixed 80% soybean and 20% indigenous Cerrado forest. One of the main impacts identified was the greenhouse gas emissions from the fuel, fertilizer and pesticides used in monocultural production. Important ecosystem services included the provision of food and timber, and regulating services such as climate and water.

The results showed that the total environmental value provided by soybean production with Cerrado conservation was 11% higher than that provided by soybean monoculture – R\$1,139 (US\$486) per hectare per year compared to R\$1,031 (US\$440) per hectare per year. The most significant difference was the increased global climate regulation services provided by soybean production with Cerrado (see Figure 2).

FIGURE 2: COMPARISON OF THE ENVIRONMENTAL VALUE OF SOYBEAN MONOCULTURE AND SOYBEAN MONOCULTURE WITH CERRADO (IN R\$2012 PER HA PER YEAR)



The project showed Monsanto that it could benefit from developing a new relationship with farmers which emphasizes enhancing ecosystem services through plantations that conserve Cerrado. Farmers could earn higher incomes from diversifying crop production. There is a growing market for responsibly sourced fruits and seeds used in food and beauty products. Putting a monetary value on the environmental benefits also showed how Monsanto could communicate the deployment of more sustainable business practices.



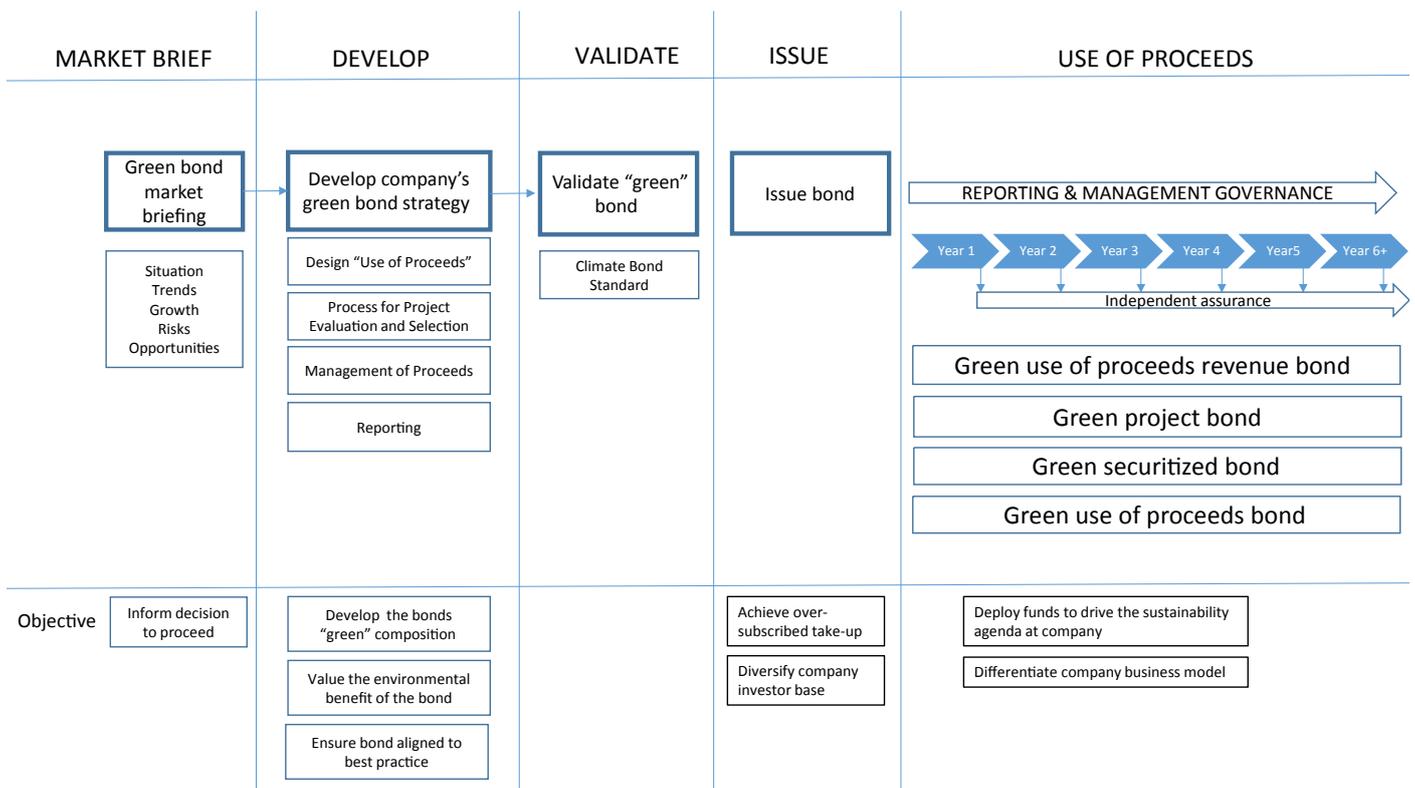
WHY ISSUE OR INVEST IN A GREEN BOND?

- **Respond to demand for responsible investment**
Some 1,200 asset owners and investment managers are committed to the Principles for Responsible Investment which require signatories to incorporate environmental considerations in investment decision making. Green bonds provides a way to deliver on this commitment.
- **Achieve fiduciary risk/return whilst improving environmental performance**
- **No premium to be green**
To date, issuers of green bonds are not charging a premium due to the environmental performance of their product, so investors can be green at no extra cost. “We don’t mind buying green bonds but we don’t have a specific mandate to do so. It has to make sense on price,” according to Wolfgang Kuhn, head of pan-European fixed income at Aberdeen Asset Management.
- **Diversify company’s investor base & access deeper pools of capital**
BNEF reports a broad range of investors far from limited to purely environmentally-mandated funds. Vesakronan reports that more than half the buyers are thought to be new investors.
- **Lower cost of debt & improve cash flow**
Arise Windpower reports that by refinancing its debt, the bond has allowed the company to diversify its financing, and because the bond rates are so low, improve cash flow by \$4.5m per year. The bond replaced existing bank debt financing of the wind farms, wiping out SEK90m in debt and a further SEK70m in negative interest rate hedges.
- **Finance/refinance low-carbon capital expenditure and operations**
The proceeds from Unilever’s green bond are to fund a number of new and existing factories to cut in half the amount of waste, water use, and GHG emissions.
- **Improve corporate reputation through competitive differentiation**
The green bonds market is thriving, with issuers frequently making headlines. For instance: Vasakronan issues the world’s first green corporate bond; SCA first Swedish listed company to issue green bond; GDF Suez to structure and issue the largest green bond ever; Unilever’s - a transformational deal that took sustainable bonds into the corporate mainstream.
- **Alignment to organisational culture or business model**
- **Further integrate sustainability into financial functions**
“Growing numbers of investors and corporate clients are seeing Green Bonds as an important badge of honor that signals how they are assisting to improve environmental sustainability.” Jamie Stuart, head of UK debt origination, Deutsche Bank.
- **Reduce risk of fixed income asset class**
The 2011 Mercer report on the implications of climate change for strategic asset allocation highlighted the need for investors to reduce carbon risk in different asset classes. Switching to green bonds provides a way to achieve this for the fixed income assets class.

THE OPPORTUNITY

Entering the green bond market poses an attractive opportunity for companies to finance low carbon, water and energy efficiency capital expenditure in growing markets. A firm would align core financial needs with its green business credentials. Moreover, a company could enhance its credibility and establish new best practice standards by going beyond the current practice of self-labelling bonds as green. A strategic green bond relationship with Trucost would allow a company to measure the projected benefits of the bonds in a clear and consistent way, incorporating both impacts and benefits analysis, thus defining the bonds ‘environmental yield’ in addition to its financial return. Describing the environmental yield generated by green bonds in natural capital terms (e.g. 1bn issue generating \$10bn of environmental benefit over the life of the bond) would strengthen communication between issuers and investors alike, attract new impact investors, and expand the distribution and investor base for its corporate debt.

FIGURE 3: THE PROCESS OF ISSUING A GREEN BOND



TRUCOST ADVISORY SUPPORT

The Trucost approach to green bond strategy is closely aligned with current best practice Green Bond Principles, a voluntary framework supported by 25 leading banks that aims to suggest processes for designating, disclosing, managing and reporting the proceeds of green bonds. The Principles were developed by JPMorgan Chase in collaboration with Bank of America, Merrill Lynch, Citi and Crédit Agricole Investment Bank in January 2014.

FIGURE 4: TRUCOST'S SERVICE ALIGNS WITH THE GREEN BOND PRINCIPLES





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ADDITIONAL INFORMATION

Green bond structure and market drivers

- Self-labelled green corporate bonds function similarly to international and supranational bonds in that they fund green activities, but their repayments come from general corporate funds. As a result, they benefit from receiving the same credit rating as other bonds of similar composition from the same issuer, meaning that investors do not sacrifice yield to gain green exposure nor significantly increase their risk profile to invest in assets that aid environmental efforts.
- A major concern of corporate bond investors regarding green bonds is that such bonds would contain some sort of premium, however small, to non-green bonds of the same issuer. Yet, this concern now appears unfounded.
- According to S&P, coupons for corporate green bonds tend to be about 2 percent, with virtually none over 4 percent, suggesting they are marketed as low-to-moderate return investments, commensurate with their maturity profiles. Maturities are typically between four and eight years for all industry groups, making them medium-length investments.
- Furthermore, corporate issues are helping to shift the market away from AAA rated multilateral development banks issues meeting demand further along the yield curve.
- Issuance to date has come from a number of industries but has been led by utilities, which represent 63 percent of issuances to date.
- Bank of America Merrill Lynch is the top underwriter with just over \$1bn since mid-2013, having issued its own \$500m as well as in deals with GDF Suez, Unibail-Rodamco and Iberdrola. Swedish bank SEB comes second.
- S&P predicts that issuance is likely to accelerate not just because this aids diversification of investor pools, but because of investors' growing intention to implement environmental, social and governance targets initiated by the UN Principles for Responsible Investment. Larger asset managers such as State Street Global Advisors, TIAA-CREF, CalSTRS and Swedish pension fund AP4 are frequent investors.
- It is said that for the long-term development of the market it is important that green bonds are viewed on an equal economic basis with other fixed income instruments.
- So far, corporate green bonds have mostly been issued in Europe, generally with investment-grade ratings of 'A+' or 'A'.

TABLE 1: CORPORATE BOND ISSUES SINCE JUNE 2013

ISSUER	DETAILS	AMOUNT	TERMS OF BOND	KEY CHARACTERISTIC	USE OF FUNDS	ELIGIBILITY CRITERIA
GDF Suez (FR)	<p>Sector: Power Utility</p> <p>Date: Apr 14</p>	€2.5bn (\$3.4bn)	<p>Tranche 1: a €1.2 billion, six-year tranche, with an annual coupon of 1.375%.</p> <p>Tranche 2: 12-year tranche of €1.3 billion with a 2.375% annual coupon. The average coupon amounts to 1.895% for a 9.1-year average duration.</p> <p>Rating: The bond shares GDF's credit rating of A1/A negative.</p> <p>Details: Three times oversubscribed; raised in line with comparable debt issues by the company in terms of pricing and yield.</p>	The largest ever green bond almost doubling the previous record of \$1.9bn set by another French power company, EDF.	To finance renewable energy projects such as wind farms and hydroelectric plants, as well as energy efficiency projects such as remote (smart) metering and the construction of integrated district heating networks powered by low-emission biomass plants.	<p>Vigeo: Projects financed must meet social and environmental criteria in 5 areas.</p> <p>GDF's auditor Deloitte will provide accreditation that the proceeds are used for projects that meet the criteria laid out by the bond.</p> <p>GDF will report annually on the environmental impacts that the projects financed by the bond will have.</p>



ISSUER	DETAILS	AMOUNT	TERMS OF BOND	KEY CHARACTERISTIC	USE OF FUNDS	ELIGIBILITY CRITERIA
Arise Windpower (SE)	Sector: Renewables Date: Apr 14	SEK1.1bn (\$170m)	Coupon: 3% above STIBOR (the Stockholm Interbank Offered Rate) Tenure: 5 years. Details: Allows the company to diversify its financing and, because bond rates are so low, improve cash flow by SEK30 million (\$4.5 million) a year.	This is the first senior secured bond issue in Sweden in the wind power sector.	To refinance existing wind farms in the southern part of Sweden, all of which have production and operating history.	DNV GL provided a second opinion on the bond.
Iberdrola (ES)	Sector: Utility Date: Apr 14	€750m (\$1bn)	Coupon: 2.5%. Tenure: 8 years. Rating: Baa1 rating from Moody's and a BBB rating from Standard & Poor's. Details: Four times oversubscribed.	The first green bond from a Spanish corporate.	To refinance some of Iberdrola's existing green investments, as well as supporting new ventures.	Iberdrola engaged independent assessor Vigeo to provide a second party opinion on the bond before its issuance.
SolarCity (US)	Sector: Solar leasing Date: Apr 14	\$70.2m	Interest rate: 4.59%. Tenure: 8 years. Rating: BBB+ rating from Standard and Poor's. Details: The size of the issue was smaller than many investors had expected and was oversubscribed.	Second issue of asset backed securities in six months.	To cover 6,596 solar panel systems in the US, of which almost 90% are residential installations, mainly in California, Arizona, and Colorado.	"The notes will be secured by, and payable solely from the cash flow generated by, a pool of photovoltaic systems and related leases and power purchase agreements and ancillary rights and agreements".
Skanska (SE)	Sector: Construction Date: Apr 14	SEK850m (\$130.6m)	Coupon: Undisclosed Tenure: 5 years Details: The bond was bought by the buyers of Skanska's mainstream bonds, such as large Nordic institutional investors, but also helped the company to diversify its investor base.	Skanska's first green bond.	To support Skanska's energy efficient property developments.	Skanska has devised a Green Bond Framework, endorsed by the Centre for International Climate and Environmental Research (CICERO), an independent research centre associated with the University of Oslo, Norway.
Svenska Cellulosa (SE)	Sector: Basic Materials (Manufacturing) Date: Mar 14	SEK1.5bn (\$230m)	Tenure: 5 years Details: The bond has two tranches. One tranche 1 billion floating rate note, priced at three-month STIBOR +0,68% annually and one SEK 500m fixed rate tranche with an annual coupon of 2,5%. SCA's green bond offer was oversubscribed. The bond was placed with approximately 30 investors.		To fund energy efficiency improvements and waste and water use reductions in their facilities, and generally invest in more sustainable business practices.	Cicero



ISSUER	DETAILS	AMOUNT	TERMS OF BOND	KEY CHARACTERISTIC	USE OF FUNDS	ELIGIBILITY CRITERIA
Toyota Financial Services (JP)	Sector: Automotive Date: Mar 14	\$1.75bn	Rating: Three Aaa-rated tranches were issued. 1: The A-2 tranche with one-year weighted average maturity priced at 13 basis points (bps) over the comparable swaps rate. 2: The two-year A-3 tranche was priced at 15 bps over the swaps rate. 3: The three-year A-4 tranche at 22 bps over the swaps rate. Details: increased in size from a planned \$1.25 billion, in response to strong investor demand.	The first asset-backed issue from the automotive industry where the proceeds will be dedicated to environmental objectives.	The bond is a standard auto-loan backed ABS whose cashflows are tied to repayments of outstanding loans for the company's cars. What makes it green is that the company has ring-fenced the proceeds for a fund that will provide leases and loans for the company's green vehicles such as the Prius.	Qualifying vehicles must meet three key criteria: a hybrid or 'alternative fuel' engine; fuel consumption of at least 35miles/gallon; and exhaust emissions no greater than the Californian low-emission vehicle standard.
Unilever (GB-NL)	Sector: Fast moving consumer goods (FMCG) Date: Mar 14	£250m (\$420m)	Coupon: 2% fixed Tenure: 5 years Details: Morgan Stanley was the lead structuring adviser.	The first fast-moving consumer goods company to issue a corporate green bond. Bankers said Unilever's was a transformational deal that took sustainable bonds beyond those previously issued by development banks and utility groups into the corporate mainstream.	To fund a number of new factories, to cut in half the amount of waste, water use and greenhouse gas emissions of existing factories, incl. a laundry liquid plant and an ice cream factory in South Africa. Some of the money will be invested in existing factories to use 30 percent less water, waste and greenhouse gas emissions.	DNV GL, the Norwegian certification organisation, is to vet the projects annually against the pledged criteria.
Vasakronan (SE)	Sector: Real estate Date: Mar 14	SEK1bn (\$157m)	Issue 1: SEK350 million with a coupon of 2.473% Issue 2: SEK650 million at a variable rate of 67 basis points above five-year Swedish Treasury bond rates. Details: This is the second from Vesakronan in the past six months. Half the buyers are new, helping the firm diversify its pool of lenders.	Swedish real estate giant Vasakronan second green bond.	To help the firm green its portfolio through projects "aimed at achieving both lower energy use and lower climate impact".	



ISSUER	DETAILS	AMOUNT	TERMS OF BOND	KEY CHARACTERISTIC	USE OF FUNDS	ELIGIBILITY CRITERIA
Unibail–Rodamco (FR)	Sector: Commercial real estate Date: Feb 14	€750m (\$1bn)	Coupon: 2.5% Tenure: 10 years Rating: A (S&P), in line with the company's conventional bonds Details: The issue was 3.4-times oversubscribed, with the order book reaching over €2.5 billion in less than two hours.	The second major corporate issue after EDF's €1.4 billion green bond in November, and the first euro-denominated issue from a real-estate company.	To help finance the building of shopping centres or offices that meet the company's sustainability criteria.	The criteria have been approved by sustainability analysts Vigeo.
EDF (FR)	Sector: Utility and project developer Date: Nov 13	€1.4bn (\$1.9bn)	Details: The issue was twice oversubscribed	The biggest issue at the time by a European company, and the first euro-denominated green bond issued by a large corporate.	Dedicated entirely to renewable energy projects.	
Vesakronan (SE)	Sector: Property Date: Nov 13	SEK1.3bn (\$190m)	Details: Issued in response to an increased demand for green investments from the capital market.	The world's first corporate labelled green bond.	To finance new construction and renovation projects with high environmental certification requirements.	The framework used in the selection of these green projects comes from Cicero, the Norwegian Center for International Climate and Environmental Research.
SolarCity (US)	Sector: Solar leasing Date: Nov 13	\$54.4m	Coupon: 4.8% Tenure: 3 years	This inaugural solar-backed ABS marked the start of what is expected to be a significant market for solar securitisation in the US.		
MidAmerica Energy's Solar Star (US)	Sector: Renewable energy Date: Jun 13	\$1bn	Coupon: 5.375% Yield: 296 basis points more than benchmarks Maturity: June 2035 Rating: Baa3 (Moody's) Details: MidAmerican's third successful bond offering in solar, all of which have been oversubscribed.	The largest single bond financing for a solar project at the time.	To complete the build-out of the world's largest solar plant, the 579 megawatt (MW) Solar Star Project in southern California's Antelope Valley.	



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