



50  
YEARS

Financing solutions for sustainable development

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## Green Bonds

Green bonds can mobilize resources from domestic and international capital markets for climate change adaptation, renewables and other environment-friendly projects. They are no different from conventional bonds, their only unique characteristic being the specification that the proceeds be invested in projects that generate environmental benefits. In its simplest form, a bond issuer will raise a fixed amount of capital, repaying the capital (principal) and accrued interest (coupon) over a set period of time. The issuer will need to generate sufficient cash flows to repay interest and capital.

**Key words:** Climate change; Innovative finance; Private capital; Sustainable investment; Green growth; Impact investment; Debt and capital markets; Municipal bonds

### How does it work?

Green bonds are innovative financial instruments where the proceeds are invested exclusively (either by specifying the use of the proceeds, direct project exposure, or securitization) in green projects that generate climate or other environmental benefits, for example in renewable energy, energy efficiency, sustainable waste management, sustainable land use (forestry and agriculture), biodiversity, clean transportation and clean water. Their structure, risk and returns are otherwise identical to those of traditional bonds. The [International Capital Market Association's Green Bond Principles](#) and the Climate Bonds Initiative's (CBI) [Climate Bond Standards](#) help to determine whether a bond qualifies as green or not. Usually, green bonds must undergo third-party verification/certification to establish that the proceeds are funding projects that generate environmental benefits (e.g. the Climate Bond Standard Board has established a procedure for certification, including the nomination of approved verifiers). The four [Green Bonds Principles](#) that define a green bond relate to:

- Use of proceeds: the issuer should declare the eligible green project categories it intends to support. It should also provide a clear definition of the environmental benefits connected to the project(s) financed by the proceeds.
- Process for project evaluation and selection: the issuer should outline the investment decision-making process it follows to determine the eligibility of individual investments using the green bond's proceeds.
- Management of proceeds: the proceeds should be moved to a sub-portfolio or otherwise attested to by a formal internal process that should be disclosed.
- Reporting: the issuer should report at least annually on the investments made from the proceeds, detailing wherever possible the environmental benefits accrued with quantitative/qualitative indicators.

Two categories of green bonds have emerged, i.e. green labelled bonds (i.e. certified as green) and unlabelled green bonds (issuances linked to projects that produce environmental benefits). Climate bonds are a sub-category where the proceeds are linked to projects that address climate change. To date, [CBI](#) has identified four main types of green bonds:

- **Green Use of Proceeds Bond:** a standard recourse-to-the-issuer debt where the credit rating is the same for the issuer and the bond. *Example: The European Investment Bank's [Climate Awareness Bonds](#) through which it raised €7.6 billion in the period 2007-2014.*
- **Green Use of Proceeds Revenue Bond:** a non-recourse-to-the-issuer debt that is pledged to a revenue stream that is generated by fees, taxes, etc. The proceeds can be invested in related or unrelated green project(s). *Example: The [Iowa Finance Authority](#) issued US\$321.5 million AAA rated revenue bonds with 1- to 2-year tenors, 1-5% coupon that were backed by water-related fees and taxes collected by the State. The proceeds will finance water and wastewater projects. The State of Hawaii's issuance of a revenue bond was backed by a Green Infrastructure Fee applied to the electricity bills.*
- **Green Project Bond:** a project bond for a single or multiple green project(s) for which the investor has direct exposure to the risk of the project(s) with or without recourse-to-the-issuer. *Example: [OPIC](#), a US development finance institution, offered US\$47 million of [Green Guarantees](#) to US investors. Proceeds will be invested in the [Luz del Norte](#) project in Chile, one of the largest photovoltaic projects in Latin America.*
- **Green Securitized Bond:** a bond collateralized by one or more specific projects, including covered bonds, ABS, and other structures. The first source of repayment is generally the revenue generated by the assets. This type of bond covers, for example, asset-backed securitizations of rooftop solar PVs and/or energy efficiency assets. *Example: [SolarCity Corp.](#), the biggest US residential solar installer, entered the green bonds market with emissions backed by the solar lease agreements signed with its customers. The company now uses different channels, including direct sales [online](#).*

More recent innovations include green *Sukuk*, which comply with Islamic Finance standards.

#### Stakeholders

<http://www.undp.org/content/sdfinance/en/home/solutions/green-bonds.html>

## Summary

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## Instruments Used



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## Sources of Finance

PUBLIC

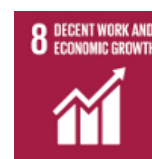
PRIVATE

NATIONAL

INTERNATIONAL

## Related SDG

- **Green Bonds issuer(s):** Any company, government agency or financial institution that develops, registers and sells a bond. The Chinese Government, Toyota and the World Bank are only a few examples. The issuer usually selects a financial institution as an underwriter to administer the issuance of the bond.
- **Green Bonds investor(s):** Individuals, companies or institutional investors who buy green bonds with the expectation of a financial return. They include individuals, companies and institutional investors (e.g. endowment funds, hedge funds, insurance companies, asset managers, investment companies, investment trusts, mutual funds, pension funds, sovereign wealth funds, pension funds, etc.).
- **Green Bonds partner(s):** A broad spectrum of organizations interested in developing a commercially viable green bonds' market, including financial institutions, development banks, NGOs, credit rating agencies, etc.
- **Credit rating agencies and auditors:** institutions responsible for verifying compliance with the standards for green bonds or established credit standards.
- **Regulators:** Financial authorities responsible for regulating capital markets; they examine the qualifications of underwriters as well as the securitization of credit assets and bonds' custodial arrangements; and regulate the issuance, clearing and settlement provisions. Regulators include securities commissions and other regulatory bodies, including stock exchanges and central banks.
- **Credit guarantors and other intermediaries:** Creditor guarantors provide credit guarantees and credit enhancement products in secondary markets, thus modifying the risk profile of the underlying bond. A wide range of financial intermediaries offers a variety of intermediation and credit enhancement services, including raising investor capital, establishing special purpose vehicles etc.



### Potential in monetary terms (revenues, realignment or cost-savings)

The volume of labelled green bonds has grown steadily since 2013, reaching US\$65.9 billion in outstanding issuances in 2015. Less strict criteria (unlabelled green bonds) put outstanding issuances at about US\$ 600 billion. The landscape is mostly dominated by rail (i.e. clean transport) and renewable energy projects that are not labelled "green" by the issuer. Potential demand from investors is extremely high. Investors with over US\$45 trillion of assets under management have made public commitments to make responsible investments, and green bonds can help them to achieve their pledges. The supply of unfunded investment projects is also large with investment in energy supply and efficiency estimated at US\$53 trillion.

Green bonds were traditionally demanded by environmentally and socially responsible investors but market opportunities extend beyond this category of investors. The demand for green bonds is high in all regions and the market's US\$100 billion milestone is within reach. The breakdown of issuers by geographic origin is changing with Asian countries emerging as the biggest issuers. The Agricultural Bank of China issued the first green bond by a state-owned Chinese bank in 2015, mobilizing a total of US\$1 billion. Earlier in 2015, Xinjiang Goldwind Science & Technology (wind energy) issued a US\$300 million bond for which it received orders worth US\$1.4 billion. The value of each green bond issue varies greatly, from a few US\$ million to over US\$2 billion.

## When is it feasible?

A regulated capital market to govern the issuance of debt must be in place. No specific legal requirement is necessary for issuing green bonds, however. Existing international standards such as the Green Bond Principles or Climate Bond Standards can be recognized/adopted by national financial authorities, issuers and certifying bodies.

The debt market should be sufficiently liquid to sustain daily transactions. The size of the money and bond market and the existence (and competition among) financial intermediaries, credit rating agencies and market indexes can reduce the costs of issuing green bonds. These factors indicate that emerging markets and middle-large countries are in a better position to issue green bonds. Countries with limited financial depth or illiquid markets (e.g. low income or small countries) can issue bonds in foreign markets, including via the intermediation of international and regional development banks. For example, the African Development Bank used proceeds from green bonds to finance the Ithezi-Tezhi Power Project in Zambia, the Kivu Watt Project in Rwanda and the Buseruka Hydropower Project in Uganda, three LDCs.

The bond issuer should be prepared to enter regulated capital markets, which require certain criteria for listing financial products to be met, e.g. number of years in operation, certified budgets, turnover, etc. Beyond eligibility, the issuer should be ready to demonstrate its financial strength and creditworthiness publicly. Other forms of green finance are available for smaller enterprises or individuals (e.g. green mortgages). The price of and interest on the bond is directly connected to the financial standing of the issuer and/or the cash flows generated by the underlying projects.

Consistent income must be generated by the underlying green project. Unlike dividends, coupons are distributed at regular intervals. Companies and entities seeking to issue bonds need to rely on activities that can generate sufficient cash to pay coupons.

### Minimum investment required and running costs

Public and private entities incur various costs when they issue bonds. Depending on the value, complexity, number of markets, taxes, risk profile of the issuer, etc., the issuance of a green bond might cost from thousands of US dollars to millions. Fees are usually calculated as a share of the face value of the emission. Depending on the number of services bought, service fees can exceed 1 per cent of the face value. For smaller and riskier emissions the sum of fees and taxes can reach 5 per cent of the face value. The lead financial institution usually charges a fee that comprises structuring, placement, legal and underwriting services. The level of complexity of the deal is a primary determinant of the fee, a plain vanilla bond, for example, being one of the cheapest products. In certain developing countries it might be cheaper to issue a bond abroad. Amortization and deferred payments are used to budget issuance costs across the maturity.

## Related Sectors

AGRICULTURE

ENERGY

FORESTRY

FISHERY

WATER

TOURISM

FINANCE

MINING

TRANSPORT

### Use in appropriate time and context

Green bonds offer direct access to regulated debt markets. Therefore, all considerations related to the use of debt finance apply (e.g. leverage, liquidity, cost, maturity, currency etc.). Their appropriateness versus other instruments (e.g. stocks etc.) has to be assessed on a case-by-case basis. Green bonds are usually best suited to large-scale projects such as low carbon transportation, sustainable water management and renewable energy, which generate cash flows over a long investment horizon.

The municipal bond market is particularly attractive for green bonds given that responsibility for overseeing water, waste and transport services is often devolved to local authorities. However, issuing government securities is a complex undertaking, particularly by sub-national entities with limited capacities. Recourse to capital markets can have a radical impact on the budget of a local authority, thus calling for strict oversight to prevent the generation of uncontrolled public liabilities, given that municipal bonds are generally implicitly or explicitly guaranteed by the national state. Prerequisites include credible governance, sound budget and audit records, relevant legal, tax, and regulatory frameworks, and viable arrangements for settling disputes.

The issuance of green bonds should never be abused as a means to greenwash a company's operations or to deceive investors and consumers.

## What are the main risks and challenges?

### Pros

- Investors benefit from funding green projects, helping them to deliver on the commitments made as signatories to the Principles for Responsible Investment (PRI), as members of the Institutional Investors Group on Climate Change (IIGCC) and/or other similar bodies.
- Green bonds can foster greater transparency in the use of proceeds from a bond and help to ensure that the climate impact of fixed income investments is reported.
- Green bonds can play a positive role in raising awareness and building expertise among investors on green and climate issues.
- As the financial risk and return characteristics of green bonds are the same as for classic bonds, the main benefits are lower interest rates—for example from the one a company could obtain from a bank—the possibility of raising larger amounts of capital and greater flexibility in the use of capital.
- Local governments and companies can profit from the increase in demand from socially responsible investors, which have proved to have a strong appetite for green bonds by oversubscribing issuances (though this might be explained by other factors, including the coupon).
- Green bonds can raise large amounts of financial resources to support environmental projects for which funding might otherwise not be available, or which might be uneconomic if they had to rely on more expensive capital.
- The market is growing but it is still young. Companies and government entities can enhance their reputation by branding themselves as innovative and sustainable.
- Green bonds can facilitate the establishment of public-private partnerships that might accelerate the pace of green investment and lead to the adoption of new technologies.

### Cons

- The lack of consensus regarding what constitutes a green bond is a source of uncertainty when assessing long-term investment options.
- Transparency and reporting are weak in the green bond market, which still relies on voluntary reporting. As the market grows, transparency will emerge as an increasingly important issue.
- Retail investment is still limited because green bonds are not yet well integrated into mainstream funds, indices and other products. The cost of issuing green bonds might be lower in the future.

### Risks

- The main risk of debt is the default of the issuer. Default risks are issuer/bond specific and relate to the capacity to generate sufficient cash flow to repay capital and interest over time. A default in regulated markets might have large and long-standing negative impacts on a company's credit rating.
- The structuring of a bond implies additional risks to be factored in both for the issuer and the investor, as with bonds with variable interest rates or linked to an index (e.g. Libor). Secondary instruments (e.g. currency forwards and futures) exist to help hedge these risks, but at a cost.
- Variability in transaction costs and issuance fees, particularly for low value issues in developing countries might make other financial mechanisms more affordable.
- Variability in the taxation of debt market instruments can influence investors' decisions. Tax incentives can motivate investors to buy green bonds while higher rates of taxation on debt instruments might reduce the attractiveness of bonds.
- Evaluating the environmental benefits claimed by issuers of green bonds has been a key issue since the market started to grow. The reputational risk for green bonds issuers, i.e. when bonds labelled as green issued by others are found not to be "green", remain high and can have an impact on investors' trust.
- If the green bond is issued abroad, additional risks, including changes in foreign market regulations on capital flows, and exchange rates, should be accounted for. Plus, in the long term, offshore markets may draw liquidity

away from the domestic market. However, these additional risks are often lower than the ones incurred in issuing bonds in underdeveloped markets.

## How can the design be ameliorated to improve the impact?

The growth of bond markets provides increasing opportunities to finance the implementation of the SDGs and green economy projects. Moreover, green bonds can help to promote Environmental and Social Governance in the financial sector. They can stimulate financial, regulatory, and economic policy reforms to boost green growth and can help countries make the transition towards becoming low carbon economies.

The direct impact of green bonds on the environment largely depends on the quality and performance of the underlying projects financed by the proceeds. The World Bank provides data on the estimated impact of its portfolio, e.g. two energy saving projects in China expect to save 12.6 million tons of CO<sub>2</sub> equivalent annually through US\$400 million of financing from green bonds. Multilateral development banks have established a [harmonized framework](#) for impact reporting on renewable energy and energy efficiency projects financed by green bonds proceeds that with time should allow a more stringent measurement of impact.

The quality of the projects can be strengthened through the deeper integration of environmental and climate factors into the project design (e.g. achieving multiple environmental benefits). With time, markets can provide incentives for doing so, but transparency, agreed standards, Measurement, Reporting and Verification (MRV) and oversight are required. The work of regulators, investors and intermediaries to improve transparency and reporting should continue along with the establishment of complementary financial products, such as green indices, mutual funds and ratings. Making mandatory the publishing and third party verification of information presented to investors and the public will help green bonds to graduate into a more recognizable product.

While green bonds, by definition, should have a positive impact on the environment, additional steps can be taken to improve their social impact. Interested parties should not only progressively enhance the Green Bond Principles to better address environmental impacts and concerns but also to introduce reporting on social outcomes according to international standards.

## Guidelines and Case Studies

**Île de France:** The French regional government raised US\$830 million for a project portfolio that included installing renewable energy in schools and providing energy efficient social housing.

**Johannesburg:** The city issued Africa's first municipal green bond to finance emissions-reducing projects, including ones for the development of biogas energy, solar power, and sustainable transportation.

**Nacional Financiera,** Mexico's state-owned development bank, issued its first green bond in 2015, which is worth US\$500 million and has a coupon rate of 3.41 per cent over five years. It will be used to finance nine wind energy projects located in various parts of Mexico.

The **World Bank** manages a large portfolio of green bonds (100 plus), mostly in middle-income countries. The **Group** has issued US\$8.5 billion in green bonds in 18 currencies, including the **IFC**-issued green bonds in Peru (local currency) to finance renewable energy and energy efficiency projects.

**Engie** (formerly GDF Suez): The French utility company is one of the world's largest corporate issuers of green bonds, having issued one with a value of US\$2.5 billion to finance its renewable energy and energy efficiency pipeline. Despite the verification system, the bond issuance was not immune to criticism over the use of the proceeds, which included a controversial dam in the Amazon.

### Our work

[International Guidebook of Environmental Finance Tools](#) null



### Sustainable Development Goals



### Environmental finance

#### Our Perspective

**09 Jul 2015**  
We should reach a consensus on the fact that macroeconomic policies in low-income economies need to also jettison the conventional wisdom of undue restrictiveness.



