

The Next Green Revolution: An Overview of the Rapidly Evolving Green Bond Market

by Bhakti Mirchandani

As the United States finds itself poised between the recent catastrophic hurricanes and the current administration's disavowal of climate change, investors interested in protecting the planet can look to green bonds. The green bond market is also a good bet when it comes to the ever-important bottom line. As the author writes, "The Climate Bonds Initiative projects that \$1 trillion in green bonds annually will be issued by 2020."

RESPONSIBLE INVESTMENT MEANS incorporating environmental, social, and governance (ESG) factors into investment decisions to generate sustainable returns and better manage risk. On a human level, it means incorporating the desire to make a difference in the world into the investment process. Green bonds, fixed income instruments that fund projects with environmental and/or climate benefit, are a type of responsible investment.¹ More broadly, they are an example of leadership from the investment community in addressing the threat of climate change. In the wake of recent catastrophic hurricanes, this article provides an overview of the green bond market for potential investors and issuers seeking to do more to protect the planet.

Market Size and Trajectory

Green bonds have grown rapidly since they were invented by investors in 2007 to fund projects with climate or environmental benefits. Since then, two

categories of green bonds (labeled and unlabeled) with four main structures (*use of proceeds, revenue, project, and securitized*) have emerged from a broadening range of issuers. Global green bond issuance is projected to double in 2017 from \$93.4 billion of issuance in 2016,² after doubling from \$42 billion in 2015.³ With the Paris Climate Agreement and China's clean energy campaign as drivers of continuing growth, this deep dive into the emerging asset class is warranted. By way of background: under the Paris Climate Agreement, investors with an aggregate \$11 trillion of assets under management (AUM) committed to build a green bond market,⁴ and the United States committed to reducing its greenhouse gas emissions 26 to 28 percent below the 2005 level by 2025.⁵

Despite U.S. President Donald Trump's decision to withdraw from the Paris Agreement, over a thousand U.S. mayors, governors, college and university leaders, businesses, and investors pledged to continue to work

toward the United States' nationally determined contribution to mitigate global warming.⁶ Among states, California, Washington, and New York are leaders in taking aggressive action on climate change.⁷ Green bond issuance facilitates countries and states alike in funding their carbon-reduction targets. Last year, China accounted for approximately 40 percent of global green bond issuance,⁸ including China's Bank of Communications' record ¥30 billion (\$4.3 billion) two-tranche green bond issuance in November 2016.⁹

Green Bond Sectors, Proceeds, Standards, and Structures

There are five sectors of green bonds: *renewable energy development, energy efficiency improvements, climate-smart agriculture, transport improvements, and water resource management and climate-smart water infrastructure*. The energy sector generates about 40 percent of global CO₂ emissions. Agriculture, including associated



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deforestation, is the largest contributor to greenhouse gas emissions, and transport contributes 15 percent of greenhouse gas emissions.¹⁰ Green bond proceeds run the gamut from climate change mitigation to climate change adaptation. Climate change mitigation projects facilitate reductions in greenhouse gas emissions, among other things. Climate change adaptation projects reduce suffering caused by climate change and build resilience, including protection against flooding.¹¹ Labeled green bonds are certified as green, while unlabeled green bonds simply have issuances linked to projects that produce environmental benefit.¹² The Climate Bonds Initiative estimated \$576 billion of unlabeled green bond issuance in 2016 across transport, energy, buildings and industry, water, waste and pollution control, and agriculture and forestry.¹³

Green Bond Principles, Climate Bonds Standard & Certification Scheme, and external reviews mitigate the risk that green bond proceeds are used for projects with limited environmental benefit.¹⁴ Although there is no universal approach to designating use of proceeds as “green,” issuers, investors, and rating agencies have established frameworks, and approximately 60 percent of green-labeled bonds are subject to external review. For example, Green Bond Principles are voluntary guidelines on use of proceeds, project evaluation and selection, management of proceeds, and reporting crafted in part by the International Capital Market Association.¹⁵ In addition, the Climate Bonds Standard & Certification Scheme, administered by the Climate Bonds Initiative, entails third-party verification pre- and post-issuance to ensure that the bond meets the requirements.¹⁶ Climate Bonds Initiative, an investor-focused nonprofit governed by a board that represents \$34 trillion in AUM, maintains the Climate

Bonds Standards. Lastly, mainstream ratings agencies S&P and Moody’s have developed methodologies to rate green bonds on their “greenness.”¹⁷

Most of the approximately \$160 billion of green bonds outstanding globally are use of proceeds bonds.¹⁸ The four major green bond structures are set forth in Table 1.¹⁹

Structural innovations include environmental impact bonds (in which the performance risk of the green bond is shared among the issuer and the investors),²⁰ and sharia-compliant green *sukuks* (which harness Islamic finance for climate-friendly investments).²¹ China-owned Edra Power Holdings Sdn Bhd’s unit, Tadau Energy Sdn Bhd, issued the world’s first green *sukuk* this past June.²²

Issuer Types

Green bonds were primarily issued by supranational issuers through 2012. Starting in 2013, issuer types broadened, with financial institutions and nonfinancial corporates driving 50 percent and 24 percent, respectively, of 2016 full-year green bond issuance.²³ Last fall, British bank HSBC estimated that labeled green municipal bonds represented 8 percent of the total labeled green bond issuance since 2007.²⁴ If Trump’s tax reform is successful, lower taxes would reduce the attractiveness of municipal bonds’ tax-exempt status.²⁵ Special-purpose entities, such as partnerships and trusts, drove 5 percent of green bond issuance in 2016.²⁶ In December 2016, Poland became the first sovereign nation to issue a green bond, followed by France’s record €7 billion sale of twenty-two-year green bonds in January 2017.²⁷ (See Table 2.)

The Road Ahead

The Climate Bonds Initiative projects that \$1 trillion in green bonds annually will be issued by 2020.²⁸ This projection is

Table 1			
Structures	Use of Proceeds	Recourse/Collateral	Examples
Green use of proceeds bond/ green general obligation bond	Green projects in general	Standard recourse to the issuer	European Investment Bank's €16.8 billion in Climate Awareness Bonds
Green revenue bond	Green projects in general	Revenue stream generated by fees, taxes, etc.	Iowa Finance Authority's \$321.5 million AAA-rated revenue bonds backed by Iowa water-related fees and taxes ²⁹
Green project bond	Ring-fenced for the specific underlying green project(s)	Limited to a specific project's assets and balance sheet	DC Water's \$25 million Environmental Impact Bond to finance infrastructure to reduce the incidence and volume of combined sewer overflows ³⁰
Green securitized bond	Either (1) earmarked for green projects or (2) flowed directly into underlying green projects	One or more specific projects	SolarCity's green bond backed by solar lease agreements ³¹

Table 2		
Issuer	Key Issuers	Bond Examples
Municipalities	New York's Metropolitan Transport Authority (MTA), DC Water's Clean River Project	The MTA issued an aggregate \$2.7 billion in green bonds since February 2016 to finance capital investments in electrified rail assets. ³²
Supranational organizations	World Bank, European Investment Bank	The World Bank issued over 130 green bonds valued at over \$10 billion for climate investments in developing countries since 2008. ³³
Corporates	Apple, Toyota	Apple's 2016 \$1.5 billion green bond is the largest ever for a U.S. company. ³⁴
Sovereigns	Poland, France (the only two nations that have issued green bonds to date) ³⁵	Poland's €750 million 5-year note was 2xs oversubscribed. ³⁶
Special purpose entities	Mexico City Airport Trust, Deutsche Kreditbank AG	Mexico City Airport Trust's \$1 billion 10-year and \$1 billion 30-year green bonds, rated "Baa1" by Moody's, are backed by passenger charges at the old and new airports. Bond proceeds will be used to facilitate a carbon-neutral airport. ³⁷

set against the backdrop of an estimated \$93-trillion cost to replace fossil fuel-powered infrastructure with low-carbon alternatives to achieve the Paris Agreement's objective to limit global temperature rise to below 2°C. This includes \$8 trillion in the United States.³⁸ As over one hundred leading businesses contemplate their support for the Michael Bloomberg–chaired Task Force on Climate-related Financial Disclosures (TCFD), their consideration of the implications for a 2°C scenario should drive climate adaptation projects and bonds to finance them.³⁹ While numerous Trump administration policies generate headwinds for the climate bonds market, this networked age allows many American actors connected below the level of the U.S. federal government to continue to build and finance climate-friendly infrastructure.⁴⁰

NOTES

1. This article should not be construed as investment advice.

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