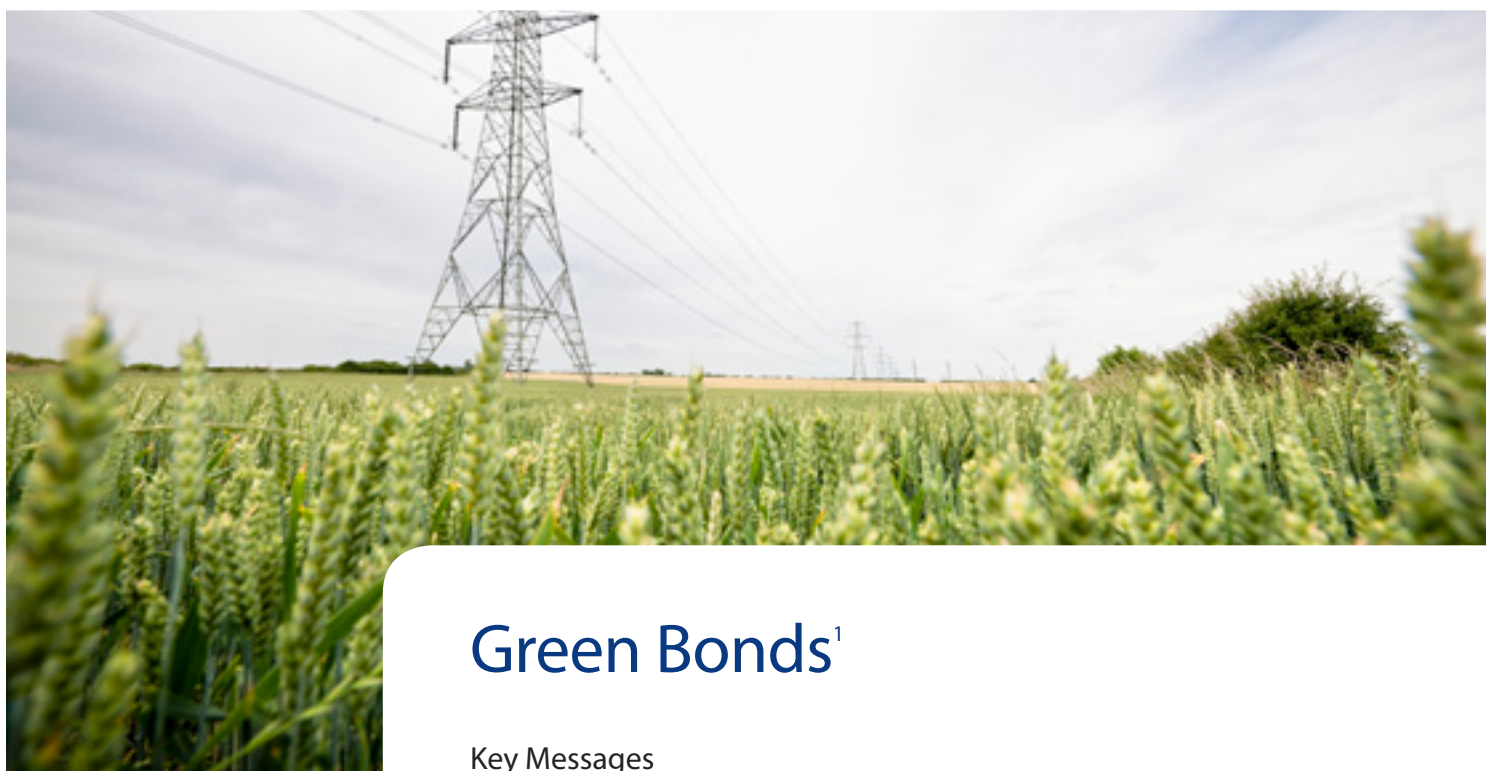


ECONOMY-WIDE AND EMERGING ISSUES



## Green Bonds<sup>1</sup>

### Key Messages

**Sustainable Prosperity** is a national research and policy network, based at the University of Ottawa. SP focuses on market-based approaches to build a stronger, greener, more competitive economy. It brings together business, policy and academic leaders to help innovative ideas inform policy development.

- Green bonds are broadly defined as fixed-income securities that raise capital for a project with specific environmental benefits. Most green bonds issued to date have been climate bonds, where the proceeds go to climate mitigation or adaptation efforts.
- Corporate, infrastructure and other projects have reduced access to traditional finance given the financial crisis' effect on the global financial sector, so debt capital markets represent a key pool of assets that must be tapped in order to finance the transition to a low-carbon, resource-efficient and climate resilient economy.
- Institutional investors are a natural market for higher rated green bonds, given their growing concern for managing the risks associated with long-term issues such as climate change, and their existing heavy investment in low-risk bonds. However, given that not all green bonds have been investment grade (at least BBB), the lower rated bonds are not of sufficient interest to large institutional investors due to their limited size and higher risk.
- There is already a sizeable global market for green bonds, though the issuances to date are dwarfed by the mainstream bond market. The biggest immediate issues for the expansion of a green bond market are issuance scale, liquidity and monitoring. A larger number of bigger green bond issuances are needed, especially for renewable energy and other corporate green bonds. A liquid green bond market requires at least USD \$200–300 Billion, made up of bonds rated BBB or higher.
- In this early stage of development for green bonds, governments can play a role in growing the market by creating a secure policy environment for environmental technologies, which creates investment opportunities, and providing guarantees, tax incentives and other support.

<sup>1</sup> Sustainable Prosperity would like to thank Sidney Kidney of the Climate Bonds Initiative, and Jane Ambachtsheer and Ryan Pollice of Mercer for their very thoughtful comments and contributions to this *Brief*. Responsibility for the final product and its conclusions is Sustainable Prosperity's alone, and should not be assigned to any reviewer or other external party.

## The Issue

Green bonds are fixed-income financial mechanisms which use the capital raised to fund projects with environmental benefits. While the existing green bond market is sizeable, much more financing is required to drive the transition to a low-carbon economy, which green bonds can help to tap. The green bonds issued by International Financial Institutions such as the World Bank (largely to fund their own projects) have been highly rated, while asset-backed bonds by renewable energy and other corporate issuers have been smaller and higher risk. If governments could provide the right support and enabling environment, the market for green bonds could grow.

## The Knowledge Base

Green bonds are broadly defined as fixed-income securities that raise capital for a project with specific environmental benefits. The majority of green bonds issued to date have been “climate bonds”, meaning that the money raised is invested in climate change mitigation or adaptation, including clean energy, energy efficiency, mass transit and water technology. Most green bonds have been either plain vanilla treasury-style retail bonds (with a fixed rate of interest and redeemable in full on maturity), or asset-backed securities tied to specific green infrastructure projects, though they can vary based on the following characteristics:

- **Issuer:** Governments, commercial or development banks or corporations;
- **Coupon Rate<sup>2</sup>:** Zero coupon, fixed-rate, floating rate, index-linked, coupon linked to environmental performance, etc.; and,
- **Securitization:** Backed by the assets they fund, the issuing institution, mortgages or public sector loans (covered bonds) or guaranteed by a third party.

In addition, green bonds are monitored to ensure that they are fulfilling their environmental objectives.

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2 The coupon rate refers to the bond's stated interest rate.

## Market Size

The value of bonds labelled “green” or “climate” issued globally to date is approximately **USD \$7.2 Billion**.<sup>3</sup> Labelled green bonds have been issued predominantly as AAA-rated securities by multilateral lenders such as the World Bank, the International Finance Corporation (IFC), the African Development Bank (ADB) and the European Investment Bank (EIB). These bonds carry the same credit risk and pay the same (or close to the same) coupon as the issuer’s conventional paper, but the proceeds are ring-fenced for environmental-related investments chosen on the basis of internal due diligence processes that include ongoing monitoring of “green” projects. Repayment of the bond is not linked to the credit or performance of the projects and investors do not assume the specific project risk. As shown in Figure 1, although not labelled “green bonds,” some asset-backed renewable energy bonds have also been issued. Table 1 shows some select large green bonds issuances to date.

In a report by HSBC and the Climate Bonds Initiative, the authors analyze the broader universe of what can be considered as climate-themed bonds issued since 2005.<sup>4</sup> These bonds are above and beyond those explicitly labelled “green” or “climate” bonds. The authors estimate that global climate-themed bonds outstanding amount to at least **USD \$174 Billion**. Of this figure, the majority (USD \$119 Billion) is for low-carbon transport. Low-carbon energy bonds account for USD \$29 Billion. On top of the USD \$174 Billion, another USD \$204 Billion of bonds have more than 50% of their revenues going to climate change solutions. Most of these bonds (82%) were issued by private, public or state-owned companies, followed by development banks and financial institutions (13%), project bonds (3%) and municipal bonds (2%).

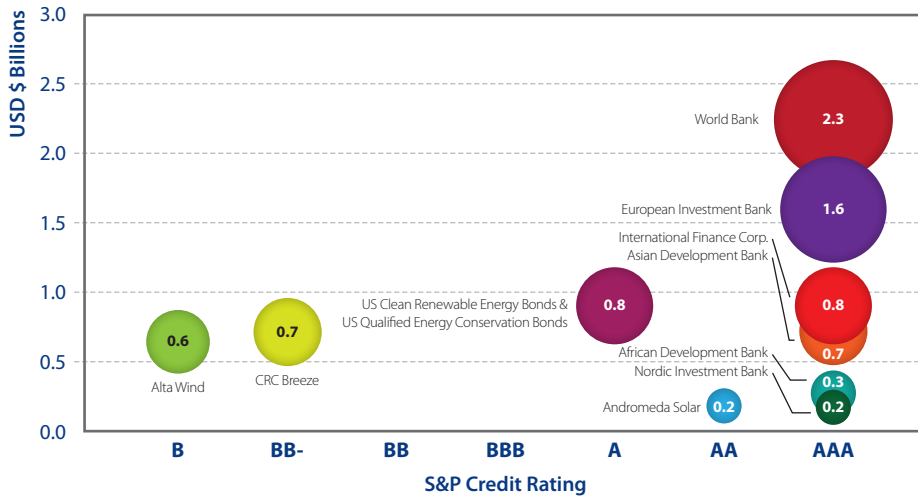
However, no matter the exact size of the current green bond market, it still comprises a very small share of the USD \$95 Trillion (2010) overall global bond market.<sup>5</sup> Figure 2 summarizes the size of the current global green bond market in the context of the total bond market.

3 World Bank, July 2011. *Green Bond Fact Sheet*, [http://treasury.worldbank.org/cmd/pdf/WorldBank\\_GreenBondFactsheet.pdf](http://treasury.worldbank.org/cmd/pdf/WorldBank_GreenBondFactsheet.pdf).

4 Boule, Bridget, Kidney, Sean, Oliver, Padraig and Silver, Nick, 2012. *Mobilising bonds for the climate economy*. Climate Bonds Initiative.

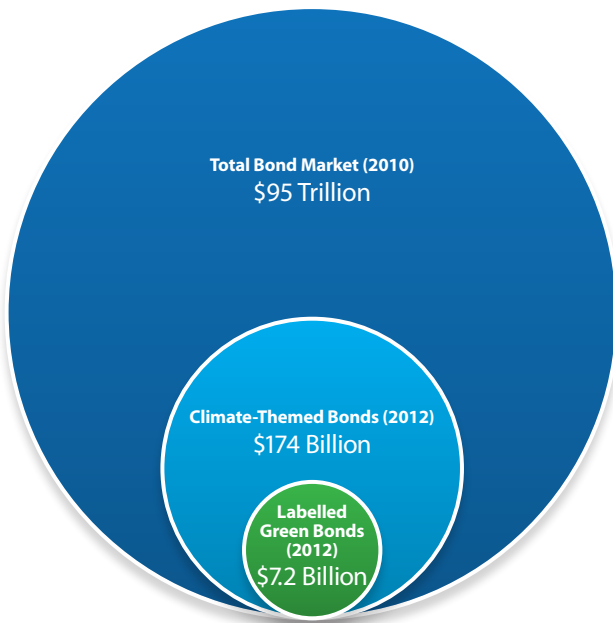
5 TheCityUK, July 2011. *Financial Markets Series: Bond Markets*, <http://www.thecityuk.com/assets/Reports/Financial-Markets-Series/BondMarkets2011.pdf>.

Figure 1: Selected Large Green Bond Issuances (2012)



Source: Climate Bonds Initiative/OECD 2011

Figure 2: Global Green and Climate-Themed Bond Markets vs. Total Bond Market (all in USD)



Source: Sustainable Prosperity  
 Note: Figure not to scale

Table 1: Notable Existing Green Bond and Related Issuances (2012)

ISSUER	YEAR(S)	TYPE	AMOUNT (USD) MILLIONS	NOTES
<b>World Bank</b>	2008–2010	Green Bond	\$1896.7	For climate change projects at 2–10 year terms. World Bank green bonds have been structured to have simple and standard financial features, including equivalent credit quality and yield levels to other World Bank AAA-rated bonds. The World Bank (IBRD) has issued over USD \$2.5 Billion equivalent of green bonds in 15 currencies.
<b>European Investment Bank (EIB)</b>	2007–2010	Climate Awareness bond	\$1630	For investment in RE and EE. 3–8 year term. Have issued one structured note: 2007 issue due 2012: At maturity, holder receives an additional amount linked to the change in the level of the FTSE4Good Environmental Leaders Europe 40 Index over the lifetime of the Bonds, subject to a minimum of 5% of the nominal amount of the Bonds.
<b>US Government agencies and utilities</b>	2009–2012	Qualified Energy Conservation Bonds (QECB) program and Clean Renewable Energy Bonds (CREB) program	\$895	May be used by state, local and tribal governments to finance 'qualified energy conservation projects.' A cap of USD \$3.2 Billion has been allocated to states under the US 2009 stimulus package, although only USD \$895 Million has been utilised to date according to reports by Bloomberg New Energy Finance.
<b>Topaz Solar Farms LLC</b>	2012	Wind project bond	\$850	The Topaz bonds were the largest for a renewable-energy project without a US government guarantee and the first to be rated by the three top ratings companies. Issued USD \$850 Million of 5.75 percent, unsecured debt due in September 2039 that priced to yield 379.7 basis points, or 3.797 percentage points, more than similar-maturity Treasuries, according to data compiled by Bloomberg. Baa3/BBB-.
<b>African Development Bank (AfDB)</b>	2010	Clean energy bond	\$705	For investment in renewable energy sources and infrastructure. 3.5–7 year terms.
<b>CRC Breeze Finance (Breeze II)</b>	2006	Wind ABS	\$676	EUR 470 Million (\$676 Million at an exchange rate of EUR/USD 1.44) 20 year bonds issued through SPV against a combined portfolio of wind farms in Germany and France, tranches rated BBB and BB+ (downgraded in 2010 to BB and B due to insufficient wind).
<b>Asian Development Bank (ADB)</b>	2010	Water bond	\$645	For improving water quality, management and irrigation. 2–3 year terms.
<b>Alta Wind Energy Center</b>	2010	Wind project bond	\$580	25 year bond to fund the construction of 3GW of wind farms. Rated Ba3 by Moody's.
<b>Shepherds Flat Wind Farm</b>	2010	Wind project bond	\$525	845MW wind farm in Oregon. USD \$420 Million guaranteed by DOE. 22 year maturity.
<b>International Finance Corporation (IFC)</b>	2012	Green Bond	\$500	May 15 2015, 0.5% Coupon; Price 99.865% First IFC Green Bond in the US market. Some of the investors are BlackRock, TIAA-CREF, California State Teachers' Retirement System (CalSTRS) and United Nations Joint Staff Pension Fund.
<b>FPL Energy American Wind LLC</b>	2003	Wind ABS	\$370	Bonds rated BBB- secured on the cashflow of 7 US wind projects.
<b>Airticity</b>	2006	RE corporate bond	\$300.8	3 year bond to fund wind energy farms in Europe and US.
<b>Sunpower/Andromeda Finance</b>	2010	Solar project bond	\$260	Secured on a 44MW solar park, partially guaranteed by Italian export credit agency SACE. 2 tranches at 18 year terms. The bond was structured as an asset-backed issuance, with half placed to institutional investors. The institutionally placed bonds were fully guaranteed by SACE. The second, non-guaranteed, tranche was sold exclusively via the EIB.
<b>Asian Development Bank (ADB)</b>	2010	Clean energy bond	\$243	4–7 year term tranches for RE and EE investment.
<b>REC Group</b>	2009	RE corporate bond	\$212.5	5 year bond to fund activities of a solar energy company.
<b>Nordic Investment Bank (NIB)</b>	2010	Environmental support bond	\$200	For financing its CLEERE lending facility on climate change, EE and RE investments. 3 year maturity.
<b>European Investment Bank (EIB)</b>	2012	Climate Awareness Bond	\$148	April 2012, SEK 1 Billion. Issue Price 99.379.
<b>Delaware Sustainable Energy Utility</b>	2011	EE bond	\$67.4	Established by the state in 2007 to coordinate energy efficiency services and the deployment of renewable energy, the bond proceeds were backed for energy conservation measures in public buildings and backed by guaranteed energy savings agreements from six energy service companies. This allowed it to gain an AA rating. <sup>6</sup>
<b>European Bank for Reconstruction and Development (EBRD)</b>	2010–2011	Environmental Sustainability Bond	\$48	For a portfolio of green projects aimed at promoting sustainable development. 4 year term.
<b>Georgetown Special Taxing District</b>	2006	EE Green bond	\$14.5	For the construction of a green multi-use complex.

Source: Calculation derived through OECD analysis using the Climate Bonds Initiative database, Daiwa research and Energy Hedge Magazine  
 Note: In the table above, RE refers to Renewable Energy and EE refers to Energy Efficiency.

6 University of Delaware, 2011. *Energy conservation initiative: Bond issue supports energy conservation, job creation*. UDaily. Available at: <http://www.udel.edu/udaily/2012/aug/SEU-081911.html>.

## Green Bonds in Canada

There are examples of Canadian government and corporate debt financing green projects linked to low-carbon infrastructure, and, some Canadian financial organizations have been involved in the issuance of “green bonds” by multilateral development banks (for example, TD Securities was the lead manager on three of the World Bank Green bond issuances). In terms of debt issued by Canadian companies linked to low-carbon infrastructure, a study by HSBC and the Climate Bonds Initiative calculate a total of **USD \$6.5 Billion** in debt issued to-date that can be categorized as “climate-themed bonds” (3.8% of the USD \$174 Billion total, 8.1% of energy-themed bonds, 3.5% of transport bonds). The largest Canadian issuer in the energy theme is Brookfield Renewable Energy Partners, with 23% of all outstanding Canadian “climate-themed” bonds, most in hydro (82% of its bond portfolio) and wind (15%). The largest single issuer is the Canadian National Railway with USD \$3.4 Billion outstanding with a Standard & Poors (S&P) rating of A-. To date, no municipalities or governments in Canada have issued green bonds although several proposals have been tabled for discussion.<sup>7</sup>

## Financing Gap

Environmental pressures continue to increase; one of the major barriers to the deployment of technologies that would increase energy efficiency, reduce carbon emissions and provide other environmental benefits is lack of capital. According to the International Energy Agency (IEA), halving global emissions by 2050, using existing or emerging technologies, would require an investment of USD \$46 Trillion.<sup>8</sup> HSBC estimates that USD \$10 Trillion is required by 2020, of which USD \$6 Trillion could be expected to come from the debt market (including both bank loans and bonds).<sup>9</sup> Similar large gaps exist in other key forms of infrastructure, such as water, which is estimated to require investment of upwards of USD \$400 Billion per year in OECD countries.<sup>10</sup> Low-carbon infrastructure tends to have high upfront costs but predictable revenue streams, making it ideal for bond financing.

The capital required for transitioning to a low-carbon, resource-efficient and resilient economy exists, notably in the institutional investment sector (pension, mutual and insurance funds) with global assets under management of USD \$79.3 Trillion in 2010.<sup>11</sup>

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7 See: [www.greenbonds.ca](http://www.greenbonds.ca) and Fine, Ben, Madison, Oliver, Paddon, Emily, Sniderman, Andrew and Rand, Tom, 2008. *Green Bonds: A Public Policy Proposal*, <http://www.actioncanada.ca/en/wp-content/uploads/2008/10/teamgreenbondsprojectenglish.pdf>.

8 Organisation for Economic Co-operation and Development (OECD) and the International Energy Agency (IEA), December 2011. *Green Growth Strategy for Energy: A Window of Opportunity*, <http://www.oecd.org/dataoecd/37/41/49157149.pdf>.

9 HSBC, 2010. *Sizing the Climate Economy*, <http://www.research.hsbc.com/midas/Res/RDV?ao=20&key=wU4BbdyRmz&n=276049.PDF>.

10 Organisation for Economic Co-operation and Development (OECD), 2007. *Infrastructure 2030: Volume 2: Mapping Policy for Electricity, Water and Transport*, <http://www.oecd.org/dataoecd/61/27/40953164.pdf>.

11 TheCityUK, October 2011. *Financial Markets Series: Fund Management*, [www.thecityuk.com/assets/Uploads/Fund-Management-2011.pdf](http://www.thecityuk.com/assets/Uploads/Fund-Management-2011.pdf).

## Institutional Investors: a Natural Market

In principle, institutional investors should be a natural market for many climate change solutions investments, such as clean energy. Green bonds can provide long-term and secure returns that match their long-term liabilities. In addition, their portfolios are already heavily invested in bonds (more than 50% on average in OECD countries).<sup>12</sup>

Many institutional investors are concerned about the risks of climate change, water scarcity and other environmental issues. Climate change increases uncertainty for long-term institutional investors and as such, needs to be proactively managed.<sup>13</sup> This concern has been channelled into greater integration of environmental, social and governance issues into engagement and investment decision-making, as well as investor coalitions pushing for greater corporate and political action on climate change, such as the more than USD \$78 Trillion in assets backing the Carbon Disclosure Project.<sup>14</sup>

Green bond issuances to-date demonstrate that investors do not have to sacrifice yield to invest in assets and projects that support climate change mitigation and adaptation efforts. Further, investors gain the additional benefit of climate risk mitigation by deploying capital towards low-carbon infrastructure.<sup>15</sup> In addition, low-carbon infrastructure and energy efficiency financing could represent attractive sources of future yield.

Growing investor appreciation of the risks and investment opportunities related to climate change and other environmental issues means they have a qualified interest in green bonds. According to pension funds, their interest is dependent on the risk-return profile of a particular bond,<sup>16</sup> meaning that they require green bonds that are investment grade.

Bonds need to achieve investment grade (meaning low-risk, with at least a BBB bond rating), if they are to have any chance of tapping mainstream markets.

12 Della Croce, Raffaele, Kaminker, Christopher and Stewart, Fiona, 2011. *The Role of Pension Funds in Financing Green Growth Initiatives*. Organisation for Economic Co-operation and Development (OECD) Working Papers on Finance, Insurance and Private Pensions, No. 10.

13 A study by Mercer involving 14 pension plans and sovereign wealth funds estimates that climate change could contribute as much as 10% of portfolio risk over the next 20 years. For more information, see: [www.mercer.com/climatechange](http://www.mercer.com/climatechange).

14 See: [www.cdproject.net](http://www.cdproject.net).

15 "Call to increase opportunities to make low carbon fixed income investments" – a call from ClimateWise members for bonds where revenues are specifically allocated to climate change solutions. Statement available at: [http://www.climatewise.org.uk/storage/climatewise-docs/climatewise\\_investment\\_PN.pdf](http://www.climatewise.org.uk/storage/climatewise-docs/climatewise_investment_PN.pdf).

16 Institutional Investors Group on Climate Change. *IIGCC positioning paper on green bonds*, [http://www.iigcc.org/\\_\\_\\_data/assets/pdf\\_file/0017/15263/IIGCC-Green-Bonds-final.pdf](http://www.iigcc.org/___data/assets/pdf_file/0017/15263/IIGCC-Green-Bonds-final.pdf).

## Scaling Up the Green Bond Market

Bonds need to achieve investment grade (meaning low-risk, with at least a BBB bond rating), if they are to have any chance of tapping mainstream markets. The biggest immediate issues for the expansion of a green bond market are around issuance scale and liquidity.<sup>17</sup> The benchmark for issuance size to attract mainstream investors is at least USD \$300 Million.<sup>18</sup> HSBC found that 103 climate bonds have been over the USD \$500 Million threshold.<sup>19</sup> Larger green bond issuances would be included in fixed-income benchmark indices,<sup>20</sup> bringing index-tracking investors into the pool. A liquid green bond market requires at least USD \$200–300 Billion, made up of bonds rated BBB or higher.<sup>21</sup>

International Financial Institutions have been the first players in the green bonds market. The World Bank and the European Investment Bank, for example, have issued some USD \$5 Billion of green bonds so far, mostly to fund their own projects. In Canada, TD Bank and RBC have provided investors with access to some of these bonds.<sup>22</sup> Many of these have been issued through private placements, which does not add to the liquidity of the total green bond market.<sup>23</sup>

The other major issuer of green bonds have been renewable energy companies, which tend to have a lower rating (usually BB for wind and solar projects<sup>24</sup>), and smaller scale. Renewable energy and energy efficiency markets are much more disaggregated than traditional energy sectors, with many small projects. Smaller projects need to be aggregated into larger offerings suitable for the appetite of larger investors. Another option for upgrading the credit rating for asset-based renewable energy bonds is for issuers to refinance existing projects, which are more likely to achieve higher ratings.<sup>25</sup>

There are hopes that state development banks like the United Kingdom (UK)'s new Green Investment Bank will play a role in issuing various types of green bonds, which will blaze a trail and grow the market.<sup>26</sup> A proposal has been put forward by a private sector consortium, called the Green Deal Finance Company, to administer the UK's Green Deal (the UK's plan for large scale energy efficiency retrofits in the housing sector), including issuing green bonds.<sup>27</sup>

17 Wood, David and Grace Katie, February 2011. *A Brief Note on the Global Green Bond Market*, [hausercenter.org/iri/wp-content/uploads/.../IRI-Green-Bonds-note.pdf](http://hausercenter.org/iri/wp-content/uploads/.../IRI-Green-Bonds-note.pdf). Initiative for Responsible Investment (IRI) at the Hauser Center for Non-profit Organizations (Harvard University).

18 International Energy Agency, 2012. *Tracking Clean Energy Progress: Energy Technology Perspectives 2012 excerpt as IEA input to the Clean Energy Ministerial*, [http://www.iea.org/papers/2012/Tracking\\_Clean\\_Energy\\_Progress.pdf](http://www.iea.org/papers/2012/Tracking_Clean_Energy_Progress.pdf).

19 Boule, Bridget, Kidney, Sean, Oliver, Padraig and Silver, Nick, 2012. *Mobilising bonds for the climate economy*. Climate Bonds Initiative.

20 Nicholls, Mark, February 21, 2012. *The big push for green bonds*, <http://www.environmental-finance.com/features/view/672>.

21 International Energy Agency, 2012. *Tracking Clean Energy Progress: Energy Technology Perspectives 2012 excerpt as IEA input to the Clean Energy Ministerial*, [http://www.iea.org/papers/2012/Tracking\\_Clean\\_Energy\\_Progress.pdf](http://www.iea.org/papers/2012/Tracking_Clean_Energy_Progress.pdf).

22 World Bank, July 2011. *Green Bond Issuances To Date*, <http://treasury.worldbank.org/cmd/htm/GreenBondIssuancesToDate.html>.

23 Morel, Romain and Bordier, Cécile, May 2012. *Financing the transition to a green economy: their word is their (green) bond?* [http://www.cdclimat.com/IMG/pdf/12-05\\_climate\\_brief\\_14\\_-\\_financing\\_the\\_transition\\_to\\_a\\_green\\_economy\\_their\\_word\\_is\\_their\\_green\\_bond.pdf](http://www.cdclimat.com/IMG/pdf/12-05_climate_brief_14_-_financing_the_transition_to_a_green_economy_their_word_is_their_green_bond.pdf). CDC Climat.

24 International Energy Agency, 2012. *Tracking Clean Energy Progress: Energy Technology Perspectives 2012 excerpt as IEA input to the Clean Energy Ministerial*, [http://www.iea.org/papers/2012/Tracking\\_Clean\\_Energy\\_Progress.pdf](http://www.iea.org/papers/2012/Tracking_Clean_Energy_Progress.pdf).

25 Ibid.

26 Holmes, Ingrid, March 2011. *The Green Investment Bank and Green Bonds*, <http://www.environmental-finance.com/file/103/eb-16-55-ingrid-holmes>.

27 The Green Deal Finance Company, 2012. *About TGDFC*, <http://www.thegreendealfinancecompany.com/html/home.html>.



Traditional bonds are highly standardized, which reduces transaction costs. In order to do the same for green bonds, the Climate Bonds Initiative has launched the first set of standards for verifying the credentials of green bonds, to create more security for investors.<sup>28</sup> The Standard is intended to support funds to create climate-themed portfolios; the larger the pool the more mainstream funds will participate, the lower the cost of finance will be. Credibly identifying green bonds allows institutional investors looking for ways to address climate change risks to easily screen their portfolios accordingly; it allows them to outsource their due diligence around environmental characteristics.

In the early stage of development for green bonds, growing the market will require various forms of preferencing for green bonds. Governments have a role to play in growing the green bond market, from creating a secure policy environment for environmental technologies, which creates investment opportunities, to providing guarantees and tax incentives.<sup>29</sup> Evolving the models for private-public risk sharing will be key to expanding the market for green bonds.

In the early stage of development for green bonds, growing the market will require various forms of preferencing for green bonds.

28 Climate Bond Standards Board, 2011. *Climate Bond Standard Launched*, <http://standards.climatebonds.net/>.

29 Kidney, Sean, February 7, 2012. *8 steps to bring investors into the \$1trn per annum needed to prevent dangerous climate change*, [http://www.responsible-investor.com/home/article/sk\\_8\\_points/](http://www.responsible-investor.com/home/article/sk_8_points/).

## Implications for Policy-Makers

In Canada, action could be taken by governments at the municipal, provincial and federal levels to help develop the market for green bonds by supporting deal flow and aggregation, and creating the enabling policy and risk environment. Capital is required by those undertaking projects with environmental benefits, including renewable energy developers (including utilities) and governments. Governments could issue a green bond, but could also support private issuers in a variety of ways, as shown below. The bonds could be used to fund a variety of projects, depending on the level of government and its objectives, including public transit, renewable energy, and energy efficiency. Investors could include the general public, pension funds, utilities and insurance companies.

- 1. Provide Credit Enhancement/Guarantees/De-Risking:** The government could use its own assets to provide a guarantee for some portion of the underlying liabilities to enhance the credit rating of the bond. This helps to reduce the bond's risk level ("de-risk"). (E.g. US Department of Energy Loan Guarantee program). Public entities can insure Power Purchase Agreements (PPAs) on renewable energy generation projects as well as provide credit enhancement wraps for Collateralized Debt Obligations (CDOs) of project loans to address political and other market risks and first-loss (default) risk.
- 2. Backstopping:** The government could purchase sub-tranches of subordinated debt from early bond issuances to improve the risk profile of bonds by temporarily taking some first-loss layers from early issuances which would serve to lower their price and help the market gain familiarity. The government could also insure the credit or debt of the bond issuer. (E.g. European Investment Bank offers credit enhancement product targeted for clean energy). Governments can, as demonstrated in the case of the state of Pennsylvania, purchase and securitize energy efficiency loans to recycle capital for further lending.
- 3. Tax Preferencing:** Using internationally standard qualifying criteria, governments could make the income from green bonds either tax-free or taxed at a lower rate than typical investments. For example, the United States provides tax credits for clean energy bonds.
- 4. Bond Issuance/Marketing:** Canadian governments at all levels could issue retail green bonds, similar to Canada Savings Bonds, but to fund renewable energy or other projects. According to a poll conducted by Nanos, 81.8% of Canadians support the green bonds idea, and 62.2% stated that they would purchase them if they had an interest rate similar to that of Canada Savings Bonds.<sup>30</sup>

<sup>30</sup> Fine, Ben, Madison, Oliver, Paddon, Emily, Sniderman, Andrew and Rand, Tom, 2008. *Green Bonds: A Public Policy Proposal*, <http://www.actioncanada.ca/en/wp-content/uploads/2008/10/teamgreenbondsprojectenglish.pdf>.

5. **Policy Framework:** Government have a role to play in ensuring that financial sector regulations and institutions reflect the evolving needs of the capital markets and investors. Existing legislation should be updated where needed, and new legislation could also be created, as for example, the UK's Green Deal legislation derisks securitised energy efficiency loan portfolios through legislated repayment collection mechanisms. In terms of institutions, the creation of a 'Green Investment Bank' in Canada (as is proposed in the UK) could facilitate a number of the previous examples.