Sizing the Potential Green Bond Market in Canada
Summary

The 2016 Canadian edition of the Bonds and Climate Change Report indicated that Canadian issuers currently account for $32.9bn outstanding of climate-aligned bonds, of which $2.9bn represents labelled green bonds (the other $30bn are unlabeled climate-aligned bonds).

In 2016 there were $1bn of labeled green bonds from Canadian issuers. Globally, 2016 saw record issuance of labeled green bonds: USD 81bn, up 92% on 2015 figures.

This report uses a bottom up analysis to arrive at a high-level estimate of the potential for annual green bond issuances by Canadian entities of $56.3 billion in fiscal 2017/18.

This report also assesses the current ReNew Canada list of the top 100 infrastructure projects in Canada, and found that fully 56 of them – with a total value of $107 billion – would be green-bond eligible.

These findings show that green bonds have the potential to become a much bigger part of Canadian capital markets with potential greenium benefits for issuers (lower cost of financing for green purposes), while creating a Canadian cluster of green finance expertise for arranging global green bond issues (a market estimated to exceed $1 trillion annually by 2020, according to Climate Bonds Initiative).
Methodology

A bottom up assessment of the green bond market in Canada

1. Defining the universe of bond issuers to consider.
   • The universe comprises 21 of the top 30 largest bond issuers in Canada who are well suited to offer green bonds. Bond issuer data provided by RBC Capital Markets

2. Identify the issuer’s CAPEX or other use of proceeds that are:
   • Explicitly Green (directly supports the green economy and is consistent with the Climate Bonds Standard)
   • Potentially Green (has the potential to directly support the green economy but is not necessarily green, for example, a hospital or affordable housing unit has the potential to be built in an energy efficient manner according to green standards)

3. Compile the combined “Explicit” and “Potential” Green Bond issuance across the universe
Top 21 Issuers
Explicitly Green vs Potentially Green use of proceeds in $bn for 2017

- Explicitly Green: $32.70
- Potentially Green: $23.60

$56.3bn green use of proceeds total for 2017
Federal Government

$3.4bn– Explicitly Green use of proceeds
$3.1bn– Potentially Green use of proceeds
Federal Government

Methodology
Net new BORROWING $39bn CAD*

Estimate based on allocation of budget 2016 to 2017 infrastructure investments plus allocation of 2017’s budget to long term infrastructure.

Potential green uses of proceeds Include:

Explicitly Green $3.4bn 53%
- Public Transit $1.9bn
- Green Infrastructure $1.5bn

Potentially Green $3.1bn 47%
- Social Infrastructure $1.69bn
- Strategic Investments in Post-Secondary Institutions $1bn
- Rural Broadband $0.08bn
- Trade and Transportation Provision $0.4bn

Crown Corporations

$0.36– Explicitly Green use of proceeds
$0– Potentially Green use of proceeds
Crown Corporations- Canadian Housing Trust

Methodology
The Canadian housing trust issues bonds and uses the proceeds to purchase mortgage backed securities. Potential Green Bond Offerings estimates derived by dividing the number of Energuide rated homes with 80% and above (120,000) by the number of private households in Canada (13 million) multiplied by the Canadian Housing Trust's annual expected total borrowing ($40bn).

Potential green uses of proceeds Include:
Explicitly Green $0.36bn 100%
Mortgage backed security comprising energy efficient homes.

Provinces

$11.9bn— Explicitly Green use of proceeds
$22.63bn— Potentially Green use of proceeds
Expected Net New Borrowing vs Green Bond Capacity $bn

Methodology
Potential Green Bond Offerings estimates derived from provincial budgetary documents. Provincial capital expenditures are considered if they are not related to building road infrastructure and have an “Explicitly Green”, or “Potentially Green” purpose.

Potential green uses of proceeds include:

Explicitly Green $6.07bn  47%
- Transportation – Transit e.g. TTC LRT project $5.3bn
- Other Transportation Property and Planning $0.77bn

Potentially Green $6.65bn 53%
- Education Infrastructure e.g. energy efficiency retrofits, building new schools $2bn
- Postsecondary - Colleges and Other retrofits $0.63bn
- Postsecondary – Universities $0.19bn
- Social Housing Infrastructure e.g. building or repairing community housing $0.31bn
- Health – Hospitals repairs, retrofits $2.88bn
- Health - Other Health Education $0.38bn
- Justice Infrastructure e.g. courthouse repairs $0.26bn

Provinces - Quebec

Methodology
Potential Green Bond Offerings estimates derived from provincial budgetary documents. Provincial capital expenditures are considered if they are not related to building road infrastructure and have an “Explicitly Green”, or “Potentially Green” purpose.

Potential green uses of proceeds Include:

Explicitly Green $1.32bn 18%
- Public Transit $0.96bn
- Marine, Air, Rail and Other Transportation e.g. ferries, wharves, stations, railways $0.36bn

Potentially Green $5.95bn 82%
- Health and Social Services building Infrastructure $1.62bn
- Education Infrastructure e.g. buildings, retrofits $1.47bn
- Higher Education and Research Infrastructure e.g. buildings, retrofits $0.68bn
- Culture Infrastructure e.g. buildings, retrofits $0.19bn
- Municipal, Sports, Community and Recreational Infrastructure $0.97bn
- Social and Community Housing $0.28bn
- Government Buildings e.g. repairs $0.35bn
- Information Resources e.g. information technology$0.40bn

Source: https://www.tresor.gouv.qc.ca/fileadmin/PDF/budget_depenses/16-17/quebecPublicInfrastructure.pdf
Provinces - Manitoba

Methodology
Potential Green Bond Offerings estimates derived from provincial budgetary documents. Provincial capital expenditures are considered if they are not related to building road infrastructure and have an “Explicitly Green”, or “Potentially Green” purpose.

Potential green uses of proceeds Include:

Explicitly Green $0.69bn 18.28%
Potentially Green $3.10bn 81.72%


*Manitoba reports capital expenditure using CPA standards. Recognizing amortization in this way allocates the cost of capital assets to the periods of service provided and amortization is recorded as an expense in the statement of operations. We used Quebec as a comparable province to estimate the split between Explicitly Green and Potentially Green projects as Quebec has similar debt capacity as well as a state owned hydro company.
Provinces – British Columbia

Methodology
Potential Green Bond Offerings estimates derived from provincial budgetary documents. Provincial capital expenditures are considered if they are not related to building road infrastructure and have an “Explicitly Green”, or “Potentially Green” purpose.

Potential green uses of proceeds Include:

Explicitly Green $2.83bn 51%
BC Transit $161m
Columbia River Power Projects $12m
Transportation Investment Corporation $46m
BC Hydro $2,613m

Potentially Green $2.725bn 49%
Schools (k-12) Buildings $687m
Post Secondary Institutions e.g. building repairs and retrofits $987m
BC Housing Management Commission and Provincial Rental Housing $134m
Health Infrastructure e.g. buildings $917m

Provinces - Alberta

Expected Net New Borrowing vs Green Bond Capacity $bn

Methodology
Potential Green Bond Offerings estimates derived from provincial budgetary documents. Provincial capital expenditures are considered if they are not related to building road infrastructure and have an “Explicitly Green”, or “Potentially Green” purpose.

Potential green uses of proceeds Include:

Explicitly Green $981m 25%
Climate Change, Environmental Protection & Sustainability e.g. Municipal Water and Wastewater Program $931m
Farming, Natural Resources & Industry e.g. Alberta Tree Improvement and Seed Centre (ATISC) $50m

Potentially Green $2,920m 75%
Adult Education and Skills e.g. campus upgrades, retrofits $292m
Capital Maintenance and Renewal $1000m
Family, Social Supports & Housing e.g. New Housing Supply – Community and Specialized Housing $248m
Government Facilities, Equipment and Other $277m
Health Facilities and Equipment $688m
Municipal Infrastructure Support $238m
Public Safety and Emergency Services e.g. Courthouse renewal $90m
Sports, Arts, Recreation & Culture e.g. Calgary Zoo expansion $87m

Provinces - Saskatchewan

Expected Net New Borrowing vs Green Bond Capacity $bn

Methodology
Potential Green Bond Offerings estimates derived from provincial budgetary documents. Provincial capital expenditures are considered if they are not related to building road infrastructure and have an “Explicitly Green”, or “Potentially Green” purpose.

Potential green uses of proceeds Include:

Potentially Green $0.73bn 100%
Municipal Infrastructure e.g. Regina Stadium $279.3m
Education Capital e.g. School infrastructure and preventative maintenance and renewal $119.1m
Advanced Education e.g. maintenance capital $21.5m
Health Care e.g. maintenance and facility regeneration, Hospitals $231.2m
Government Services e.g. IT capital, courts and correctional capital, government buildings, parks capital $79.9m

### Provinces – New Brunswick

**Expected Net New Borrowing vs Green Bond Capacity $bn**

- **Explicitly Green**: $1.8m (2%)
  - Agriculture, Aquaculture and Fisheries: $0.6m
  - Environment and Local Government: $1.22m

- **Potentially Green**: $120.48m (98%)
  - Energy and Resource Development: $2.9m
  - Education and Early Childhood Development (e.g., schools): $2.1m
  - Health (e.g., hospitals): $20m
  - Post-Secondary Education, Training and Labour: $2m
  - Regional Development Corporation: $92m
  - Tourism, Heritage and Culture: $9.1m

**Methodology**
Potential Green Bond Offerings estimates derived from provincial budgetary documents. Provincial capital expenditures are considered if they are not related to building road infrastructure and have an “Explicitly Green”, or “Potentially Green” purpose.

**Potential green uses of proceeds Include:**

- **Explicitly Green**: $1.8m (2%)
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Expected Net New Borrowing vs Green Bond Capacity $bn

Methodology
Potential Green Bond Offerings estimates derived from provincial budgetary documents. Provincial capital expenditures are considered if they are not related to building road infrastructure and have an “Explicitly Green”, or “Potentially Green” purpose.

Potential green uses of proceeds Include:

Potentially Green $330m 100%
Buildings and Land $137.4 m
Buildings - Halifax Convention Centre $169.2m
Vehicles and Equipment $19.8m

Provinces – Newfoundland & Labrador

Expected Net New Borrowing vs Green Bond Capacity $bn

- **Expected Net New Borrowing 2017/2018**: $0.40
- **Green Bond Offering Capacity**: $0.12

### Methodology
Potential Green Bond Offerings estimates derived from provincial budgetary documents. Provincial capital expenditures are considered if they are not related to building road infrastructure and have an “Explicitly Green”, or “Potentially Green” purpose.

### Potential green uses of proceeds Include:

- **Explicitly Green $11.8m 10%**
  - Transportation and Works e.g. Ferry Terminals & refits $11.8m

- **Potentially Green $108m 90%**
  - Advanced Education, Skills & Labour $27.8m
  - Fisheries & Land Resources $1.7m
  - Tourism, Culture, Industry, & Innovation $0.88m
  - Heath & Community Services e.g. Building improvements, Health Care infrastructure $77m
  - Justice & Public Safety e.g. Court Facilities, Correctional Facilities $0.91m

Telecommunications

$0–Explicitly Green use of proceeds
$6.78bn–Potentially Green use of proceeds
Expected Net New Borrowing vs Green Bond Capacity $bn

Methodology
Potential Green Bond Offerings estimates derived from company’s 10-K where explicitly stated.

Potential green uses of proceeds include:

Potentially Green $3.88bn 100%
“Capital investments supported the continued rollout of broadband fibre, including the build-out of Gigabit Fibre in the city of Toronto and other urban locations, the ongoing deployment of our 4G LTE and LTE-A mobile networks, and expansion of wireless and internet network capacity to support subscriber growth and accelerating data consumption.”

Expected Net New Borrowing vs Green Bond Capacity $bn

Methodology
Potential Green Bond Offerings estimates derived from company’s 10-K where explicitly stated.

Potential green uses of proceeds include:

Potentially Green $2.9bn 100%
“Continuing investment in broadband infrastructure to support customer growth, technology evolution and reliability”

Utilities

$5.42B –Explicitly Green use of proceeds
$0–Potentially Green Capex use of proceeds
Utilities – Hydro One Inc.

Methodology
Potential Green Bond Offerings estimates derived from company’s disclosed financial reporting

Potential green uses of proceeds Include:

Explicitly Green $1.52bn 100%
Capital Expended on Transmission($1.09bn) to link renewables to the grid and Distribution ($648bn) of energy
Utilities – Quebec-Hydro

Expected Net New Borrowing vs Green Bond Capacity $bn

Methodology
Potential Green Bond Offerings estimates derived from company's disclosed financial reporting

Potential green uses of proceeds Include:

Explicitly Green $3.9bn 100%
Continued support of power generation and distribution that is 99% renewable.

Investors

$0.98bn – Explicitly Green use of proceeds
$0.19bn – Potentially Green use of proceeds
Investors - PSP

Methodology
Potential Green Bond Offerings Estimates derived by forecasting PSP’s 2017 direct investment into infrastructure and natural resources asset classes using the 5 year compound annual growth rate. We assume a capital allocation to be consistent with previous year’s targets.

Potential green uses of proceeds Include:

Explicitly Green $0.98bn 83%
- Water Utilities $0.1bn
- Renewable Electrical Generation and Transmission $0.61bn
- Agriculture $0.27bn

Potentially Green $0.19bn 17%
- Telcom Infrastructure $0.19bn

Green Use of Proceeds Breakdown $bn

- Electric Generation & Transmission $0.6
- Telcom Infrastructure $0.3
- Water Utilities $0.1
- Agriculture $0.2

Cars

$0.13bn—Explicitly Green use of proceeds

$0—Potentially Green use of proceeds
Methodology
Potential Green Bond Offerings Estimates derived by multiplying Prius Family vehicle sales (8095) by percentage of Canadian’s expressing interest to purchase a car through financing (63%) multiplied by the average cost of a Prius Family vehicle ($26,051). (Prius Family includes Prius V, Prius C, Prius Plugin)

Potential green uses of proceeds Include:

Explicitly Green $0.13bn 100%
Extending credit to potential Prius owners to finance the purchase of Hybrid Vehicles

Source: [http://www.goodcarbadcar.net/2013/03/total-toyota-prius-sales-figures.html](http://www.goodcarbadcar.net/2013/03/total-toyota-prius-sales-figures.html), [http://www.canadianblackbook.com/](http://www.canadianblackbook.com/)
Banks

$1.41bn – Explicitly Green Power Finance

$0 – Potentially Green Power Finance
Banks – Royal Bank of Canada

Methodology
Power Finance Estimates from Bloomberg Power Financing Data. We assume banks will have a similar capacity for power financing in 2017.

Potential green uses of proceeds Include:

- Explicitly Green $0.38 bn (100%)

Renewable Power Financing 2016
Solar - $0.38bn

Source: Bloomberg Power Finance
Methodology
Power Finance Estimates from Bloomberg Power Financing Data. We assume banks will have a similar capacity for power financing in 2017

Potential green uses of proceeds Include:

Explicitly Green $0.18bn 100%
Renewable Power Financing 2016
Wind- $0.06bn
Solar – $0.12bn

Source: Bloomberg Power Finance
Methodology
Power Finance Estimates from Bloomberg Power Financing Data. We assume banks will have a similar capacity for power financing in 2017

Potential green uses of proceeds include:

Explicitly Green $0.28 100%
Renewable Power Financing 2016
Large Hydro- $0.12bn
Wind - $0.16bn
Power Finance By Energy Type $bn

Methodology
Power Finance Estimates from Bloomberg Power Financing Data. We assume banks will have a similar capacity for power financing in 2017.

Potential green uses of proceeds Include:

Explicitly Green $0.22bn 100%
Renewable Power Financing 2016
Solar - $0.22bn

Source: Bloomberg Power Finance
Banks – Bank of Montreal

Power Finance By Source $bn

- Large Hydro, $0.31
- Natural Gas, $0.09
- Solar, $0.03

Explicitly Green $0.35bn 100%
Renewable Power Financing 2016
- Solar - $0.04bn
- Large Hydro – $0.31bn

Methodology
Power Finance Estimates from Bloomberg Power Financing Data. We assume banks will have a similar capacity for power financing in 2017.

Potential green uses of proceeds include:

Source: Bloomberg Power Finance
### Appendix – Top Canadian Green Bond Eligible Projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windfarm 1 Project</td>
<td>$1,450,000,000</td>
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<tr>
<td>Eighty Five Creek Dam Project</td>
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<tr>
<td>Sioux CI Clear Energy Project</td>
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<tr>
<td>Harrison Dam Project</td>
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<td>Esquimalt Channel Expansion Project</td>
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<td>Kejimkujik Natural Park Development Project</td>
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<td>Picguit Powerhouse Project</td>
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<td>Regional Energy Network Project</td>
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<tr>
<td>Trans-Canada Pipeline Project</td>
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<tr>
<td>New Brunswick Gas Transmission Line</td>
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<tr>
<td>Ontario Wind Energy Project</td>
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<tr>
<td>Nova Scotia Trans Canada Pipeline Project</td>
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<td>Cape Breton Water and Power Project</td>
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<td>Lower Thames River Water and Power Project</td>
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<td>Great Bear Water Treatment Plant</td>
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<td>Newfoundland Water Treatment Plant</td>
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<td>Yukon Water and Power Project</td>
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<tr>
<td>Gaspesie-Grande-Anse Water Treatment Plant</td>
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<td>Saint John Water and Power Project</td>
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<tr>
<td>Ontario Municipal Water and Power Project</td>
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</table>

*Note: The total value of $107bn is calculated based on the provided values.*

**Source:** [http://top100projects.ca/2017filters/](http://top100projects.ca/2017filters/), Climate Bonds Initiative, Corporate Knights
Sizing the Potential Green Bond Market in Canada

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