

NORTH AMERICA State of the Market

2021



Climate Bonds INITIATIVE

Amundi
ASSET MANAGEMENT

MOODY'S | ESG Solutions

1. Introduction

About this report

This is the first State of the Market Report for North America. This report describes the shape and size of labelled green, social and sustainability (GSS) debt issued by entities domiciled in either the USA or Canada extending to the end of March 2021 (Q1 2021).

The US and Canadian climate-aligned universe is analysed in a separate section. This describes the portion of the bond market comprising vanilla bonds which are not labelled as green but issued by entities for which most of their business activities are aligned with the Climate Bonds Taxonomy. These are, for example, pure play renewable energy companies or rail companies. Bonds issued by such entities have the potential to be labelled green.

About the Climate Bonds Initiative

The Climate Bonds Initiative (Climate Bonds) is an international investor-focused not-for-profit organisation working to mobilise the USD100tn bond market for climate change solutions. We promote investment in projects and assets needed for a rapid transition to a low carbon and climate resilient economy. Our mission is to help drive down the cost of capital for large-scale climate and infrastructure projects and to support governments seeking increased access to capital markets to meet climate and greenhouse gas (GHG) emission reduction goals, as well as other sustainability objectives.

Contents

1. Introduction	2
2. Report highlights	3
3. Policy review: The USA and Canada	4
4. Market analysis USA	6
5. Market analysis Canada	15
6. Climate-aligned opportunities	20
7. Post-issuance reporting	22
8. Spotlight: Climate transition in the financial and real economy	25
9. Spotlight: Opportunities for green securitisation	28
10. Spotlight: Green bond pricing in the primary market	30
11. Outlook	33
Appendices	34
Endnotes	36

Scorecard of leading GSS debt markets



	USA		Canada	China	European Union (27 states)*
	USA with Fannie Mae	USA ex Fannie Mae			
Amount of GSS debt issued USD	USD276bn	USD182bn	USD35bn	USD211bn	USD689bn
Number of issuers	403	402	36	660	398
Number of repeat issuers	171	170	21	159	195
Number of instruments	5840	1640	95	1061	1635
Average instrument size	USD47m	USD111m	USD366m	USD199m	USD421m
Sovereign GSS bond	No		Announced	No, Indicated	Yes, Green, Sustainability and Social**
Disclosures for financial and large non-financial corporates	TCFD proposed. Voluntary / industry-led initiatives		No	TCFD early stages	TCFD recommended. Sustainable Finance Disclosure Regulation – investment managers must disclose how ESG is incorporated into decision-making
Central Bank Incentives	No		No	The PBOC offers 1% haircut on wholesale lending if green bonds posted as collateral. Planning to introduce risk weighting benefits. Multiple incentives at provincial level.	Central Bank of Hungary has risk-weighting benefits.
Central Bank/QE	Not explicit		QE limited to government bonds	Negligible QE	20% of eligible green securities for its QE programme. Ongoing discussion to establish preference for green assets.
Green classification scheme	No		Under development	Yes: The Green Bond Endorsed Project Catalogue (2021 Edition)	EU: Taxonomy Regulation and The EU Taxonomy Climate Delegated Act. Political agreement reached in April 2021.

*As of Q1 2021, GSS instruments had been issued from: Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Spain, and Sweden. No GSS instruments from: Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Malta, Romania, or Slovakia.

** Green: Belgium, France, Germany, Hungary, Italy, Lithuania, Netherlands, Poland, and Sweden. Sustainability: Luxembourg. Social: EU social bonds issued under EU SURE label. EU green bonds expected 2021.

NB: The Social and Sustainability bond database is being finalised and deal-level data may be subject to changes. Further, the Social and Sustainability Bond Database follows a different (less stringent) methodology than the Green Bond Database. The aim of this paper is to provide an indication of the shape and size of the market, and the data profile should be regarded as provisional.

2. Report highlights

Policy review: The USA and Canada

Following the Leaders' Summit on Climate in April 2021, the US has pledged to cut emissions to 50-52% below 2005 levels by 2030, and Canada has committed to a 40-45% reduction over the same period. We explore the policy measures that will translate these ambitions into practical action, page 4.

North American market overview

At the end of Q1 2021, the North American GSS debt market had reached USD311bn, and 5935 instruments had been issued under GSS labels since 2011. Green is the dominant theme, with 87% of the volume, followed by minor but growing shares of sustainability and social-themed bonds.

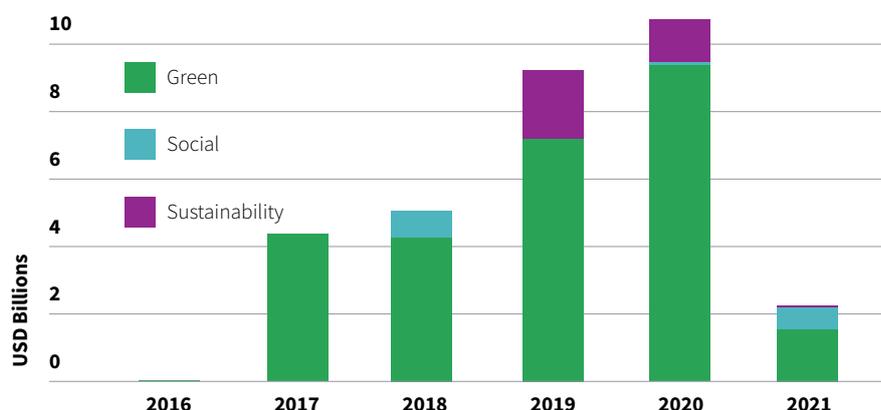
In terms of the cumulative amount issued, the US is the second largest source of GSS debt and the largest single country, while Canada ranks eleventh overall, and is the tenth largest country.

Total GSS bond issuance by country (Q1 2021)

Rank/Country	Number of bonds	Cumulative USD bn
1. Supranational	1046	434.9
2. USA*	5840	275.9
3. France	342	249
4. China	1061	212.3
5. Germany	294	128.8
6. Netherlands	132	91.8
7. Spain	137	63.7
8. Japan	358	62.4
9. South Korea	257	54.1
10. Sweden	467	48.5
11. Canada	95	34.8
12. Italy	56	32.4
13. UK	78	30.2
14. Australia	71	23.0
15. Other	868	239.6

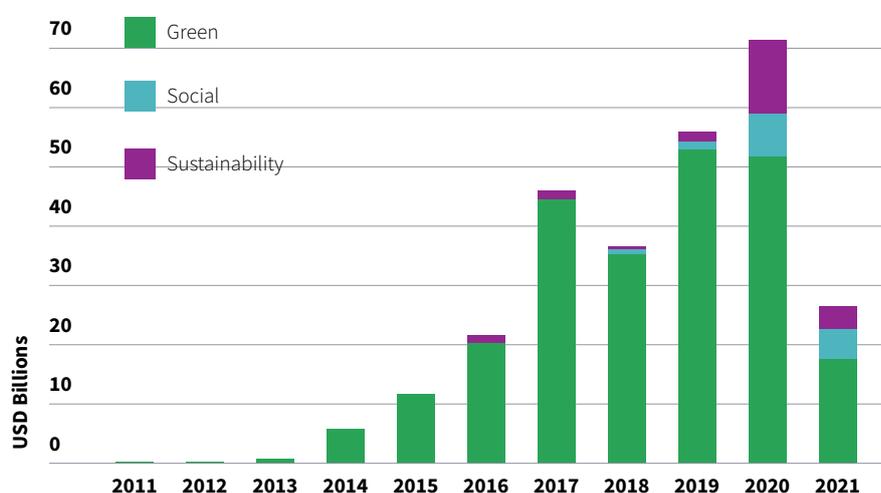
*Without Fannie Mae, USD182bn/1640 bonds have been issued. On this basis, the US would reach 4th place.

Canadian GSS volumes to Q1 2021



Source: Climate Bonds Initiative

US GSS volumes to Q1 2021



Source: Climate Bonds Initiative

Climate-aligned bonds

Beyond GSS labelled bonds, Climate Bonds analysis found North America was the source of 65 issuers of unlabelled climate-aligned bonds. These are vanilla bonds that are not labelled as green but issued by entities whose majority business activities are climate-aligned, for example, pure plays, or rail companies.

As these companies expand operations and refinance existing debt, their outstanding debt, worth USD120bn, could be rolled into labelled green bonds. North American climate-aligned bonds and issuers are discussed on page 20.

Post issuance reporting

Transparent, regular, and standardised reporting will be crucial in maintaining the credibility of the labelled bond space. Climate Bonds recently published the results of extensive work to gather and assess post issuance and impact reporting on green bonds included in the Climate Bonds Green Bond Database issued between Q4 2017 and Q1 2019. The analysis included 128

deals from 91 North American issuers, totalling USD32.6bn and the quality and frequency of their reporting is described on page 22.

Spotlights

We expect three themes will contribute to the growth of the North American GSS debt market:

- 1. Transforming all economic sectors.** including those at the core of the energy system will be key to meeting the goals of the Paris Agreement. We explore opportunities for issuers to support their transition on page 25.
- 2. The securitisation market is a niche but growing part of the US green finance space.** Policy and sentiment are stacked in favour of continued growth, and we explore some of the opportunities on page 28.
- 3. Climate Bonds' 'Green bond pricing in the primary market' research series** has developed and monitors the concept of the greenium to determine whether investors attach a value to the green label. The pricing behaviour of American and Canadian issuers is summarised on page 30.

3. Policy review: The USA and Canada

The USA and Canada have recently introduced economy-wide emission reduction targets at the highest levels of government, as well as publicly reaffirming their commitment to work together to achieve said goals.¹ However, both countries lag many of their DM counterparts in the speed, scale, and breadth of their climate action. This is not least due to a continued reliance on fossil fuels to power much of their economies; the legacy of heavyweight lobbying power from oil and gas companies and industry associations is clear in the scale of subsidies that both countries continue to pay.

The lack of binding climate-related reporting requirements is another hindrance to action in both the real economy as well as in finance. Moreover, political pressure especially in the US has previously given rise to efforts aimed at complicating sustainable asset allocation despite substantial demand growth, as evidenced in the recent surge of inflows into ESG and sustainable funds.² For example, the Trump administration Department of Labor introduced a rule to block private pension fund managers from allocating investments on the basis of ESG concerns, including climate change, a move that was criticised by some asset managers as “interfere[nce] with funds integrating investment strategies consistent with beneficiaries’ values.”³

A turning political tide

The urgency and magnitude of financial risk that climate change poses to the North American economies together with the need to both mitigate as well as adapt to that risk, is beginning to sink in: for example, a 2020 report from the US Commodity Futures Trading Commission (CFTC) cited estimates that between USD1tn and USD4tn of global wealth tied to fossil fuel assets could ultimately be lost, much of which is either physically in North America or owned by investors in the region.⁴

Since his inauguration, President Biden has exercised executive power to establish a “whole of government approach” to assessing and integrating climate risk considerations to decision-making in the various branches of government.

In November of last year, the Canadian government introduced a landmark legislative proposal, the Net-Zero Emissions Accountability Act, which would solidify the implementation of the country’s existing net-zero by 2050 target by introducing interim emission reduction checkpoints at five-year intervals.⁵ Canada is also pioneering its own taxonomy for investments that would facilitate the country’s low-carbon transition.

The United States

Executive action and global cooperation

US federal government climate leadership will catalyse action across the economic system. The Biden-Harris presidential ticket was built on a strong climate platform with action being taken to further its climate agenda. Highlights include:



- **Bringing the USA back in to the Paris Agreement** fulfilled in February 2021.⁶
- **Tackling the Climate Crisis at Home and Abroad**⁷ (executive order) established a National Climate Task Force of representatives from across the government. It was responsible for drafting the USA’s Nationally Determined Contribution (NDC), on the back of which it will develop the national climate strategy later this year.⁸ The NDC stipulates a halving of emissions by 2030 and complements a target for a zero-carbon electricity sector by 2035 and a net-zero economy by 2050.⁹
- **The US International Climate Finance Plan** including pledges to double climate mitigation and adaptation financing in developing countries, as well as to prioritise support for blended finance mechanisms and end international fossil fuel funding.¹⁰
- **The US joined a G7 new “30x30” initiative**, which seeks to protect 30% of the Earth’s land and sea area by 2030. Nature-based solutions, including the restoration of carbon sinks in soil and the oceans, are a critical tool in achieving decarbonisation goals and protecting against the physical impacts of climate change.¹¹
- **The Executive Order on Climate-Related Financial Risk** signed in May 2021 directed the National Climate Advisor and the Director of the National Economic Council to develop a government-wide strategy to **identify and report on climate-related financial risk** to government programmes, assets, and liabilities.¹²

Treasury

The increased international cooperation extends also to the US Treasury Department.

The Treasury joined the **global Coalition of Finance Ministers for Climate Action** in April. The Treasury’s priorities include the co-chairing of the G20 Sustainable Finance Working Group (SFWG).¹³ The SFWG will build on existing international approaches to sustainability disclosures and coordinate approaches to identifying sustainable and climate-aligned investments, including taxonomies.

A new Treasury Climate Hub will coordinate climate-relevant activities including key levers in the Treasury toolbox such as the directing of public investment and enacting of fiscal policy measures.¹⁴

The “American Jobs Plan” unveiled in March addresses both mitigation as well as adaptation and resilience across key sectors in the economy. Its goals cover electricity, water, waste, rail transportation, electric vehicles and energy efficient and affordable housing. If passed, the USD2.7tn plan would be the most comprehensive public infrastructure investment programme since the 1960s.

In tandem, a **“Made in America Tax Plan”** includes rolling back and ultimately eliminating fossil fuel subsidies, as well as re-introducing payments from polluters to ensure culpable industries participate in covering the cost of environmental remediation. See more on page 25.

The Fed

The Fed recently became a member of the **Network for Greening the Financial System** (NGFS), joining 80 of its peers to share information on integrating climate change risk management practices into regulation and activities. Furthermore, the Fed established Supervision and Financial Stability Climate Committees to analyse climate risks in the US financial system, and the readiness of supervised financial institutions in the country to respond to them.¹⁵

The SEC

The Securities and Exchange Commission (SEC) has created a solid foundation for climate-related action across its functions in the first half of 2021. This includes:

A Task Force focused on identifying ESG-related misconduct, announced in March.

The Division of Examinations stated that climate-related risks have been elevated to top priority.¹⁶

Climate disclosure public consultation - while SEC Guidelines for Climate Disclosure have been in place since 2010, these have been found largely ineffective among US publicly listed firms.¹⁷ To address criticisms and meet the soaring demand for information on climate change, a three-month public consultation began March 2021.

The PRI and others have recommended that the SEC also focuses on disclosure of individual debt securities. The COVID-19 pandemic saw record levels of bond issuance supported by low interest rates and quantitative easing programmes. Most corporate debt sold during the crisis was exempt from detailed disclosure normally required by Rule 144A.¹⁸ The SEC could use the Rule 144A to direct issuers to report on ESG-related issues that match those required of companies going forward.

Other work on climate disclosures

Regulators including the SEC could draw on the work of the Partnership for Carbon Accounting Financials (PCAF) to **calculate financed emissions in investment portfolios**.¹⁹ PCAF has the support of large US financial institutions, such as Bank of America, Citibank, and Morgan Stanley. Some banks have set a net-zero financed emissions target in their own operations. This could harmonise calculation approaches and accelerate the uptake of this reporting.

The proposed **Climate Risk Disclosure Act of 2021** would require public companies to report on climate-related risks. It is intended to add transparency and empower investors to assess these risks, driving the low-carbon transition. A letter of support for the bill has been signed by 82 organisations in response to polling that indicated clear demand for added transparency from Wall Street regarding climate change risks.²⁰

Sub-national climate action, disclosures, and guidance

State-level progress varies:

- **Half of the 50 states** (including District of Columbia) have economy-wide emission reduction targets in place.
- **Approximately half of the 100 largest American cities** also have targets in place.^{21, 22}
- **3,800 states**, cities, businesses, universities, faith-based, and other non-federal organisations have made climate commitments which, together, could deliver ~25% reduction in emissions by 2030 compared to 2005.²³
- State-level action on climate continued over the past five years despite the federal administration rolling back climate and environmental policy, a further testament to the power of sub-national climate action.
- **California** introduced a new **Climate Corporate Accountability Act in February 2021**. If it passes, it will require large corporations doing business in the state to report on Scope 1 – 3 GHG emissions from 2024, and to set and disclose a science-based emissions reduction target beginning in 2025.²⁴
- California's green bond market has been supported by the state's own **Green Bond Development Committee** since 2019.²⁵
- **New York's Department of Financial Services** (DFS) published Proposed Guidance in March 2021 detailing how climate-related financial risks are to be managed by state insurers.²⁶ The move was the first of its kind at the state level and could nudge similar actions from other financial regulators. DFS is also part of the NGFS.

Canada

Canada's ambition to become one of the greenest countries in the world is inscribed in a **Federal Sustainable**

Development Strategy. Part of the Federal Sustainable

Development Act, the strategy is comprised of 13 goals - the first of which is centered on effective climate action. However, Canada's actual net-zero 2050 target has been criticised for not being legislated and otherwise lacking detail.²⁷ Since the end of 2020, Prime Minister Justin Trudeau has announced several measures to strengthen it.

Canada's strengthened climate plan:

"A Healthy Environment and a Healthy Economy" was announced in December 2020.²⁸ The new plan commits an initial CAD15bn (USD12.4bn) of investment to foster a clean economy and create jobs, with specific examples including a CAD3bn (USD2.5bn) Net-Zero Accelerator Fund to help large emission-intensive companies reduce their emissions.

The government plans to launch the **Net-Zero Challenge** in 2021, a voluntary initiative to encourage large industrial emitters to develop and implement net-zero transition plans.

The Canadian Net-Zero Emissions

Accountability Act was proposed in November 2020. It is intended to formalise Canada's target to achieve net-zero emissions by 2050 by establishing a series of interim emissions



reduction targets at five-year milestones. To support the implementation of the Act, the Net-Zero Advisory Body was launched as an independent expert group that will advise the government on decarbonisation pathways.²⁹

Canada has enhanced its NDC to a 40-45% reduction from 2005 levels by 2030, adding further rigour to the decarbonization journey with this interim target.

In May 2021, Canada launched the **Sustainable Finance Action Council**, with the stated objective to bring together public and private sector financial expertise to support the growth of a strong, well-functioning, sustainable finance market. Participants will include representation from Canadian banks, insurance companies and pension funds. A public sector coordinating group will play an observer role in council meetings and advising the chair.³⁰

Other key memberships and forums include:

- Membership of the **G7 30x30** initiative.
- Membership of the **Net-Zero Producers Forum**, a platform for oil and gas-producing countries to discuss how the sector can implement the Paris Agreement and net-zero by 2050. It will be to develop pragmatic net-zero emission strategies, such as advancing the circular carbon economy approach as well as the development and deployment of clean-energy and carbon capture and storage technologies.^{31,32} Other members include Norway, Qatar, Saudi Arabia (about 40% of the world's oil and gas production).³³

Canada's Transition Taxonomy

Canada kick-started a process to work on a **Transition Taxonomy** in 2019.³⁴ The process is being led by the CSA Group, and forms part of creating a full National Standard of Canada for Transition Finance.

The process is currently on hold as an initial version of the Taxonomy failed to secure a majority vote from the Technical Committee working on it. Some of the performance thresholds for activities in the initial priority sectors, energy (oil and gas), utilities, and forestry, and their sub-sectors are still being revised. An additional four sectors (agriculture, materials, mineral mining, and transportation) are expected to be included later in the process.

A multi-faceted transition challenge

Beyond the obvious technical challenge of setting appropriate thresholds, the elephant in the room is the difficulty of swiftly moving away from the continued oil and gas reliance, particularly pertinent for the province of Alberta. This, however, is key to the successful delivery of a net-zero economy, and the risks of not doing so are immense.

The Transition Taxonomy will presumably include thresholds for continued but more efficient operations of the oil and gas sector, indicating that these sectors are not expected to be phased out in the short term. If done well, it *could* provide a clear, ambitious, and Paris-Aligned pathway for an industry that is vital for transition.

However, there are valid concerns that the taxonomy may not be ambitious enough. The Canadian Banking Association (CBA) maintains that any disclosure standard "must consider the importance of oil, gas and other resource-heavy industries to the Canadian economy."³⁵ Prioritising the economic importance of a sector as a starting point is at odds with the science-based approach taken in the EU and elsewhere.

Further, if Canada fails to get it right, it could put it in direct conflict with the other taxonomy developments around the world (and therefore global harmonisation).

4. Market analysis: USA

Overview

The USA is the largest country source of GSS bonds with USD275.9bn issued to date, and USD234bn outstanding at the end of Q1 2021. Nevertheless, GSS debt comprises just 0.6% of the USD46tn American bond market, so there remains great opportunity for expansion.³⁶

The green theme is by far the most developed, with 87.5% (USD241.4bn) of US GSS debt labelled green at the end of Q1 2021. The first green bond was issued in the US in 2011, when Yuba Community College District issued a USD15m note to finance solar PV. The largest US green issuer, Fannie Mae, entered the market in 2012, and has consistently brought new deals ever since reaching 4200 in number/USD94bn at the end of Q1 2021. The social and sustainability themes represent smaller but growing portions of the market. The first US sustainability bond was issued by Starbucks in 2016 and the theme now contributes 7.5% to the GSS market, while the social theme was first tested by New York Housing Finance Authority in 2018 and is now 5% of the market.

The US GSS market remains largely characterised by numerous small deals from Fannie Mae, and munis which are mostly bought by domestic retail or individual investors. To mobilise institutional money, and dedicated mandates which could help to drive policy change and shift capital at scale, the market needs more benchmark deals from the full range of economic sectors.

Green

- The USA is the largest source of green debt globally, in both number of bonds, and volume.
- At the end of Q1 2021 the Climate Bonds Green Bond Database included USD241.4bn/USD234bn amount issued/outstanding in green bonds and loans originating from the USA³⁷. The market has several unique features, including the large volume of green agency MBS from Fannie Mae which accounts for 39% of all issuance, without which the US would fall behind China and France in the league table. Green US municipal (muni) bonds issued by local governments and government-backed entities make up 23% of total volume. Other than agency MBS, the US green securitisation market includes a variety of other collateral types with auto ABS and PACE ABS being the most popular.
- Since inception in 2011, the market has experienced steady growth except for 2018 and 2020.



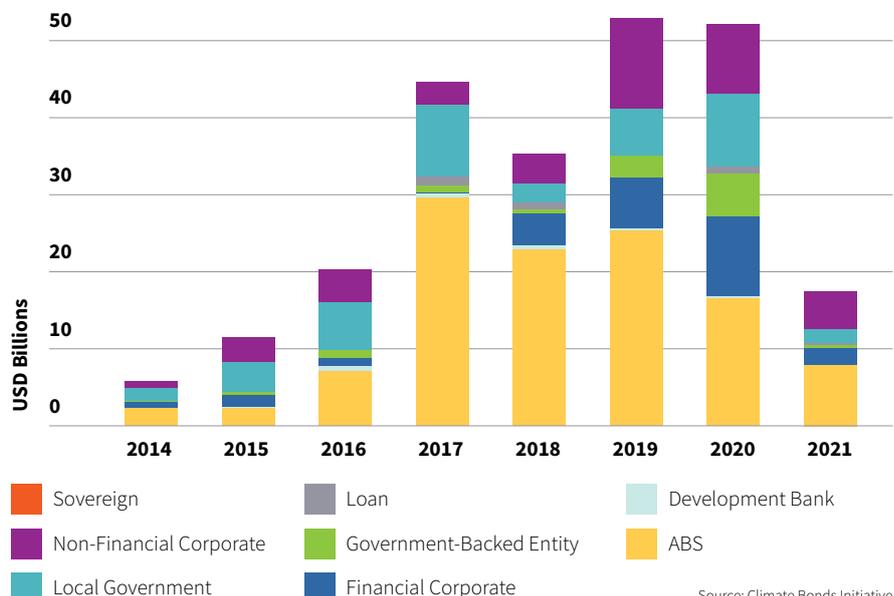
- The US green bond market counts 349 issuers with only 120 (34%) of them having issued at least two deals. The remaining 229 entities (66%) have only issued one deal. Repeat issuance allows investors to use economies of scale as they carry out initial due diligence when investing in an entity for the first time.
- Issuance dipped for all categories of bonds in the first half of 2020 as the COVID-19 pandemic had a major impact on confidence. US green volumes dropped to USD838m in April, but the Federal Reserve (Fed) intervened swiftly and USD6bn of green bonds were recorded for May. In H2 2020 issuance rebounded to a monthly average of USD5.6bn reaching peak monthly issuance in November with USD7.8bn. Despite

overall volume translating into an annual decrease of 2% compared to 2019, the Biden administration policy is expected to be broadly supportive of green bond markets thus we expect the market to grow steadily. March 2021 saw record monthly issuance with USD8.4bn. At the end of Q1 2021, US issuance for the year had already reached 34% of the 2020 volume.

ABS is the main issuer type

The US green bond market is dominated by agency MBS (falling under the ABS issuer type), and US munis (falling under either local government or government-backed entities issuer types). Agency MBS are mainly issued by Fannie Mae with the proceeds for financing green mortgage loans.

US market dominated by ABS



US muni bonds are primarily issued by local governments or government-backed entities (the former makes up the majority with 76% of all US muni issuance) and finance public projects which can fall into different green Use of Proceeds (UoP) categories such as Water, Buildings, Transport or Waste-related projects. These instruments marked the inception of the market with the first green US muni in 2011 and the first agency MBS in 2012. Since then, these instrument types have constituted over 50% of the annual volume. Despite the consistently large volume, ABS issuance declined 42% year-on-year from 2019 to 2020.

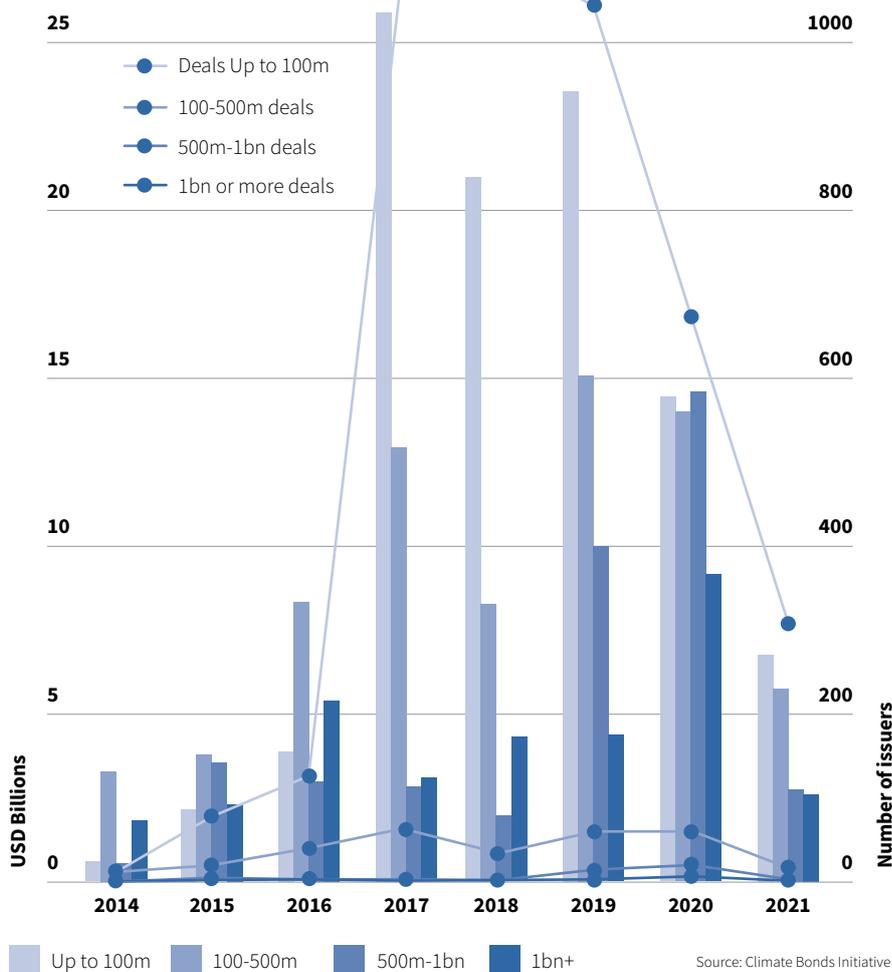
Issuance from financial and non-financial corporates has steadily increased since Bank of America entered the market with a USD500m green bond in 2013. The only blip was 2017 when annual issuance reached USD3.1bn. The yearly record for financial and non-financial corporates was achieved in 2020, with USD19.3bn. 17% of the annual issuance originated from non-financial corporates and 20% came from financial corporates. Financial corporates play a crucial role in the sustainable debt market as they facilitate lending to entities without direct access to capital markets. By enabling them to borrow money from banks or other lenders to finance or refinance green assets, the reach of the labelled space can be amplified. Citigroup ranks third among the financial corporates with a total volume of USD2.8bn issued to finance a broad range of eligible projects. Second is Bank of America with a total of USD4.4bn financing Renewable Energy projects and Low-carbon Buildings. The top issuer in the American financial corporate space is Digital Realty Trust – a Real Estate Investment Trust – with USD5.4bn issued to date. The top three non-financial corporates are all energy/utility companies with Xcel Energy, MidAmerican Energy and Southern Power Company issuing a total amount of USD4.3bn, USD3.9bn and USD3.5bn respectively, financing Renewable Energy projects including power generation facilities as well as infrastructure. AES Corporation ranked first in 2020 amongst the non-financial corporates with a total of USD1.8bn financing wind power plants.

Development bank issuance is less common in the USA, California Infrastructure and Economic Development Bank, Ibank, Mississippi Development Bank, OPIC and United States International Development Finance Corp raised a cumulative total of USD2.2bn. Development banks and green loans each contributes 1% of total issuance volume.

Most US green bonds are USD

USD accounts for almost 95% of total US green bond issuance. Six issuers (Apple, Citigroup, Digital Realty Trust, Equinix, Prologis, and Southern Power) have printed EUR deals, which together comprise 5%. AES Corporation priced

Small instruments prevail



a single BRL (USD210m) deal in 2019, and Prologis issued two JPY denominated bonds (combined USD172m) in 2020. The lack of currency diversification points to a mature and well-developed domestic bond market. Most of the US green bond market comprises agency MBS, and US munis which are largely bought by domestic investors.

Small deal size dominates due to market structure

Most of the volume comes from agency ABS and US munis and these instruments are usually of smaller size. It is therefore unsurprising that in 2017, 2018 and 2019 which were the strongest years for agency ABS, the highest volume and largest number of deals fell into the smallest bucket of Up to 100m. 2020, a weaker year for agency MBS but the strongest recorded year for financial corporates, deal sizes were distributed more evenly. Yet the number of deals was still much higher for the smallest size range with 659, 60 and 21 respectively for each bucket. Deals over USD1bn are rare peaking in 2020 with seven instruments raising USD9.1bn in total.

Benchmark deals are picking up

To the end of Q1 2021, there had been 83 benchmark sized (>= USD500m) US green

bonds. Prior to 2018, there were fewer than ten such deals a year. 2019 and 2020 saw 19 and 28 benchmark deals respectively, which shows the influence of an increasing number of corporate issuers. The largest deal from a non-financial corporate was Apple Inc.'s deal raising USD1.5bn in 2016 for multiple projects within Renewable Energy, Buildings, Energy Efficiency, Water Efficiency, and Waste. The largest green bond issued in the American market remains the USD2.3bn deal from financial corporate Bank of America in 2018 (called in May 2021). Despite larger US muni deals being rare, the second largest deal came from New York MTA in 2017 with USD2bn. The Transport Authority has raised USD11.3bn so far through 18 deals (of which eight were benchmark size), all Certified against the Low-carbon Transport Criteria of the Climate Bonds Standard. Other Municipalities issuing benchmark size instruments include Los Angeles County MTA, Central Puget Sound Transit Authority and San Francisco BART raising USD1.4bn, USD943m and USD625 respectively all financing Transport projects. Other benchmark muni issuers include New York Power Authority financing Renewable Energy projects, as well as Massachusetts Water Resources Authority, San Francisco Public Utilities and Illinois Finance Authority all financing Water projects.

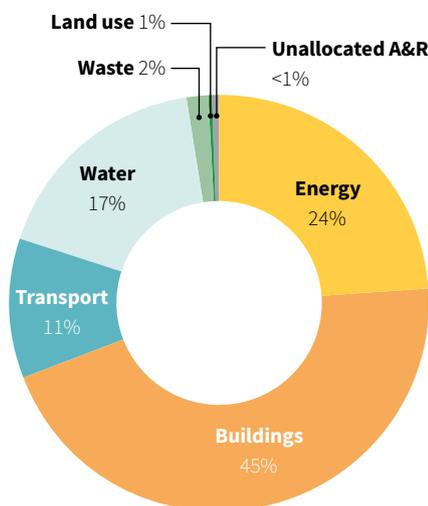
Longer tenors prevail

In recent years, a trend towards short term maturities has been observed. Since 2016 with the exemption of 2020 the 5-10 year bucket has consistently comprised the highest issuance with at least 40% of the annual total. A large chunk of Fannie Mae issuance falls into this maturity bucket and therefore constitutes a large portion of this figure – both in terms of amount issued as well as number of deals. Long dated maturities of at least 20 years are much less common with deal numbers remaining inside 100, but still contributing substantially to the yearly total ranging from 34% in 2014³⁸ to a maximum of 42% in 2016. This bucket was dominated by local governments i.e., US munis. Many US munis are issued in series which are then further broken down into bonds with different maturities reaching tenors way beyond 20 years. An example is District of Columbia Water which issued USD350m in 2014 with an SPO from V.E, part of Moody's ESG Solutions. The bond will mature in 2114 and is the longest-dated green bond so far. This is followed by a non-financial corporate – AES Corporation – which borrowed USD450m to be returned in April 2079. Financial corporates tend to preference shorter maturities with most maturing within ten years. Major banks such as Bank of America, Citigroup, JP Morgan and Morgan Stanley have all issued green bonds with most (USD8.5bn out of USD8.6bn) falling into the 5-10 year maturity bucket.

US green bonds finance Buildings and Energy

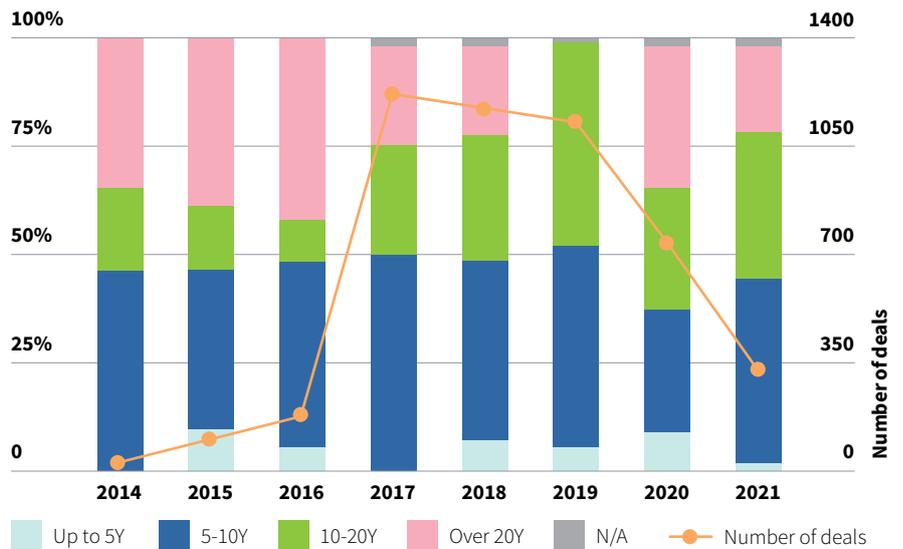
Buildings have been the leading Use of Proceeds (UoP) category since the inception of the US market, reaching USD109bn at the end of Q1 2021. This is followed by Renewable Energy with USD58bn, and Water with USD42bn. Assets and projects related to Water have decreased over the past year while Transport had its strongest year

Majority of proceeds fall into Buildings and Energy category



Source: Climate Bonds Initiative

Market split evenly between long and short-term tenors



Source: Climate Bonds Initiative

in 2018 with USD8bn. Renewable Energy projects have been steadily growing with only USD1.3bn in 2014 and peaking at USD15.4bn in 2020. As of Q1 2021, more than a third of the 2020 volume financing Renewable Energy assets or projects had been issued, reaching USD5.4bn, paving the way for yet another annual record within this category. Buildings projects saw their strongest year in 2019 (USD27.1bn), then decreased by 16% compared to 2020. At the end of Q1 2021 volume stood at USD9.3bn, already reaching more than a third of 2020 issuance.

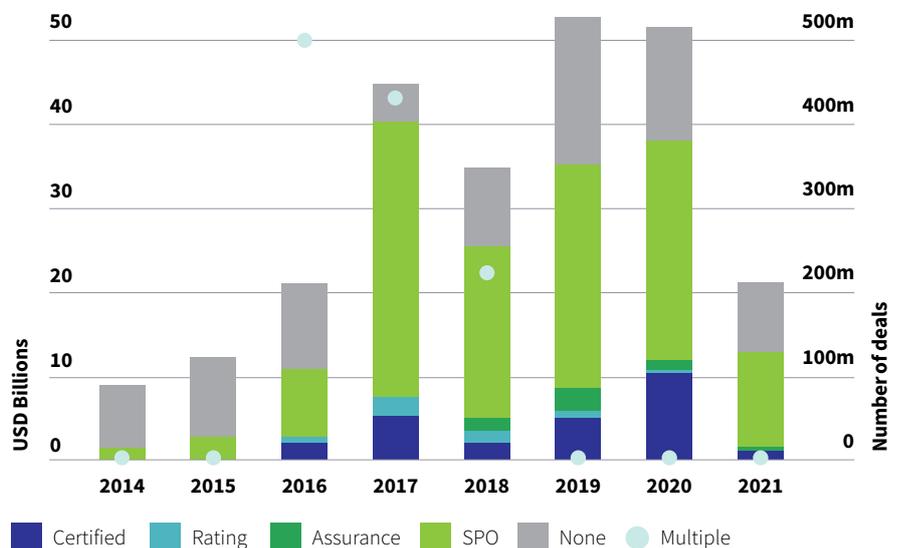
Waste and Land Use projects and assets both accounted for 1.5% and 0.6% of issuance respectively. Both slowed down in 2020. ICT and Industry comprised the smallest share of UoP with below 1% of total issuance volume. Only three deals dedicated a share of their UoP towards the Industry category namely South Carolina Jobs-Economic Development Authority,

San Francisco Public Utilities and Morgan Stanley. Similarly, only two deals financed ICT projects: Verizon and SC Jobs-Economic Development Authority.

Third-party reviews increasing

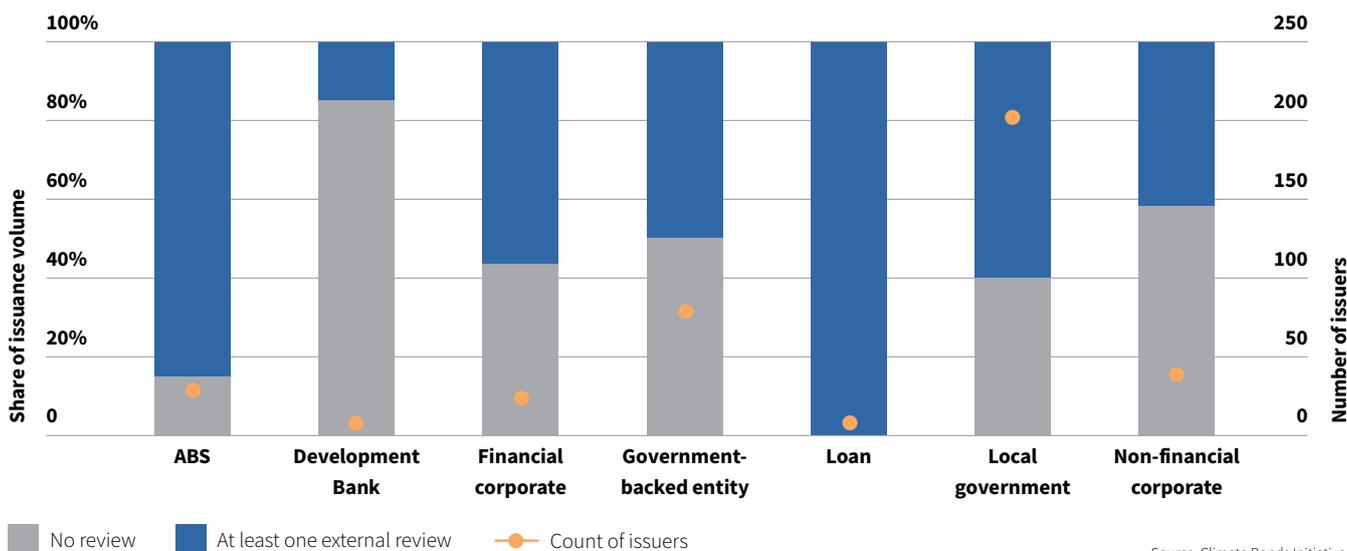
Transparency is critical to maintaining the credibility of labelled bond markets and the share of instruments without any external review is decreasing. In the US Muni sector where reviews were seen rarely, an increasing number of Assurance and SPOs can be observed. Though 49% of US munis had no review in 2019, this figure dropped to 27% in 2020. Regardless, of the top 10 issuing countries, third-party reviews are the least common in the USA with at least 27% of issuance volume every year not obtaining a review. Apart from loans and ABS which are dominated by Fannie Mae, financial corporates had the lowest share of volumes without a review at 44%.

SPOs are most popular third-party review



Source: Climate Bonds Initiative

Penetration of external reviews, US issuers



Post issuance reporting offers clarity and consistency around what has been done with bond proceeds, which is increasingly being extended to include impact reporting. We review post issuance reporting in the North American market in a separate section on page 22.

SPO is the most common review

US issuers most commonly commission a Second Party Opinion (SPO) which is in line with the overall market. For all instruments issued in Q1 2021, 65% of the volume was covered by an SPO. Previously, this figure was 61%, 53% and 49% in 2018, 2019 and 2020 respectively. Ratings are less common with a decreasing percentage since 2014. Despite a very low percentage issuance volume, in terms of deal count, the frequency of Assurance reports has grown. In 2020, 62 instruments received this kind of review which were mostly US munis apart from five deals issued by MidAmerican Energy in 2018 and 2019.

Certified Climate Bonds reached their peak in 2020 with a total volume of USD10.2bn Certified from 24 instruments. Since the inception of the market 79 instruments originating from the US have been Certified adding up to USD25bn. USD17bn were Certified against the Low-carbon Transport criteria, of which USD11.3bn was issued by programmatic Certified Climate

Bond issuer New York MTA. Others include San Francisco BART, Los Angeles County MTA, City and County Of San Francisco, Regional Transportation District of Colorado and Transbay Joint Power Authority. Generally, very few instruments have multiple reviews, with cases only occurring in 2016, 2017 and 2018 in the US market.

The state of the US green corporate bond market

Green bonds constitute a small fraction of non-financial corporate debt in the USA. There is ample opportunity to scale up the market as corporate America greens capital expenditures to prepare for net-zero. Non-financial corporates represent 16.8% of total green issuance volume since inception of the market. A total of 36 US issuers have issued 107 green instruments with a total face value of USD40.4bn. Nineteen of these 36 entities had only brought one instrument each. This is a miniscule fraction of the US non-financial corporate debt market which BIS sized at USD7.1tn.³⁹ 2020 saw 17 instruments from 12 US issuers.

Renewable Energy and Low-carbon Buildings account for the majority of projects and assets financed via green bonds by non-financial corporates, as evidenced by the Top-5 table. In the USA, Renewable Energy accounts for 76% within this issuer type and Low-carbon Buildings for 13%.

Investors with specific mandates or preferences to buy labelled debt thus have limited opportunity to construct diversified green bond portfolios. A broader variety of issuers from across sectors, financing different UoP categories would facilitate diversification. One example of such a diversification play comes from American telecommunications provider Verizon. Verizon issued green bonds in February 2019, and September 2020, each was USD1bn.

Another sector that bears potential for further issuance is the auto sector. So far, globally only a handful of auto manufacturers have issued green bonds, and more should join the market as the growth of electric vehicles accelerates. Apart from two Auto ABS from Toyota there has not been any green bond issuance from this sector in North America so far. Cases such as American car maker General Motors' commitment to developing EVs over the next five years and the pledge to phase out all ICE vehicle production by 2035 pose good opportunities for further diversified green issuance.⁴⁰

Top-5 US non-financial corporate green bond issuers

Issuer	Number of bonds	Total issued USD bn
Xcel Energy	8	4.1
MidAmerican Energy	6	3.9
Southern Power Company	4	3.5
Equinix	3	2.7
AES Corporation	5	2.5

Social

- The COVID-19 pandemic and its ramifications demonstrated how the social bond market could be used by entities to fund solutions to the many social issues created or exacerbated by the health crises.
- Events of 2020 pushed a social justice agenda into the spotlight and addressing inequality developed into a prominent UoP for social bonds.
- New York State Finance Housing Authority was the first US issuer to embrace the social theme when it issued a 35-year USD84m affordable housing bond in June 2018. By the end of 2018 five bonds worth USD81.6bn had been issued, and a further USD1.3bn was added in 2019.
- Powered by COVID-19, 2020 demonstrated robust growth for social bonds globally, and the US market finished with an additional USD7bn in 106 securities. 2021 has started very strongly, with 70% of the 2020 volume (USD4.9bn) having been added by the end of Q1.
- The Biden administration emphasis on addressing social inequalities is expected to result in further development of this market.
- The private sector has dominated issuance to date, but there is huge potential for the state sector to contribute to the growth of this market.
- The US social bond market is still in its infancy, and so far, all bonds have been issued in USD.



purchasing a home in a targeted area. Local government was the smallest category, with just USD1.8bn originating from 11 municipalities and non-profits.

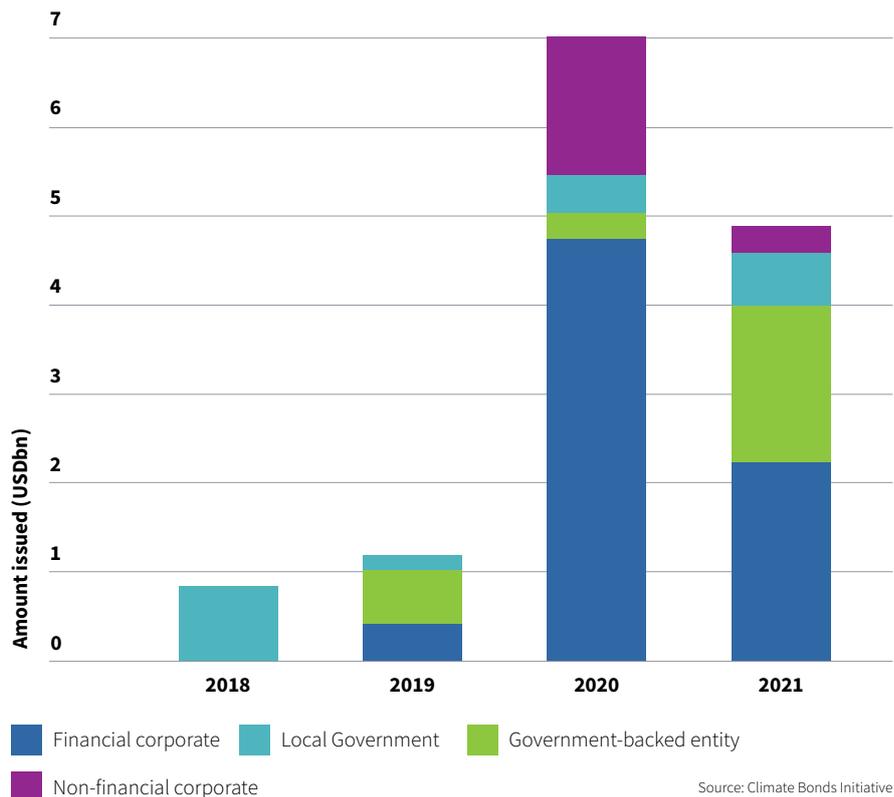
California Health Facilities Financing Authority (CHFFA) was the largest borrower in the local government space, raising USD500m in late 2019. The bond comprised 14 individual tranches ranging from USD28m to USD79.5m. The bonds were the first under California's No Place Like Home programme, which aims to develop permanent supportive housing for homeless people that are also in need of mental health support services. The proceeds of the bond went to eligible counties for the acquisition, construction or rental rehabilitation of rental housing developments, a reserve for building operations, and other related uses. To qualify for the funds, counties must commit to providing mental health support services to tenants for at least 20 years and to coordinate the provision of or referral to other services.



USA Social Scorecard

Global ranking end of Q1 2021 7	Number of bonds 504
Contribution to US GSS bond market 5%	Average bond size USD27m
Cumulative amount issued USD14bn	Biggest issuer/ amount issued Citigroup/ USD2.5bn
Number of entities 44	Contribution to the US debt market 0.03%
Repeat issuers 32	

Private sector dominates US social issuance



The private sector dominates

The private sector was the source of 68% of US social bond volume to the end of Q1 2021. Financial corporate was the dominant issuer type, with six issuers contributing USD7.6bn. Citigroup issued the largest individual bond in October 2020, a USD2.5bn variable bond with a 2024 maturity, to finance affordable house lending.

The largest number of individual instruments were in the local government space, with munis taking the lead to raise money for a variety of projects. For example, Colorado Housing and Finance Authority (CHFA) has issued 32 social bond tranches, the highest among US social bond issuers. The proceeds supported home ownership programmes that serve populations on low and moderate incomes, and that align with the SBP social project categories, affordable housing, access to essential services, and socioeconomic advancement and empowerment. Eligibility requirements for loans supported with the proceeds include income limits to help ensure the programme serves households experiencing low and moderate incomes, and that the borrower must be a first-time homebuyer, a qualified veteran, or

Non-financial corporate representation came from six foundations plus community development financial institution, Local Initiatives Support Corp (LISC), responsible for seven bonds. LISC social bonds aims to tackle social inequalities in the USA such as disparities in health and well-being, employment, financial security, and overall quality of life. LISC published its updated social bond framework in early 2021, obtaining an SPO from V.E, part of Moody's ESG Solutions. The Ford Foundation issued the largest deal worth USD1bn split between a 2050 and a 2070 maturity, with proceeds earmarked for Special Allocation Grants consistent with the foundation's mission of reducing poverty and injustice, strengthening democratic values, promoting international cooperation, and advancing human achievement – with a focus on target populations impacted by inequality.

The average US social bond is USD32m

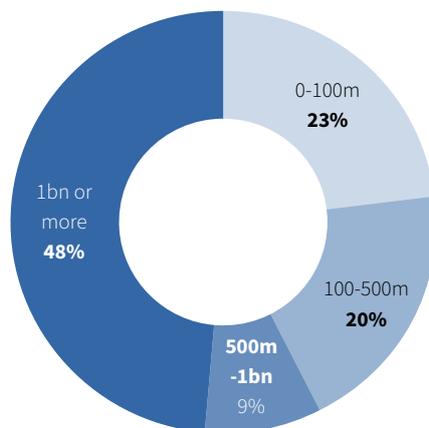
Many of the 504 US social bonds are smaller, or tranches of larger deals, with an average deal size of USD32m. Bonds of up to USD100m are in the majority, with 482 bonds (96%) falling into that category, collectively amounting to USD3.2bn. Seven bonds of at least USD500m constituted 56% (USD6.75bn) of the total volume at the end of Q1 2021. Six of those were from diversified banks, and one was from the Ford Foundation.

Maturity profile is barbell structure

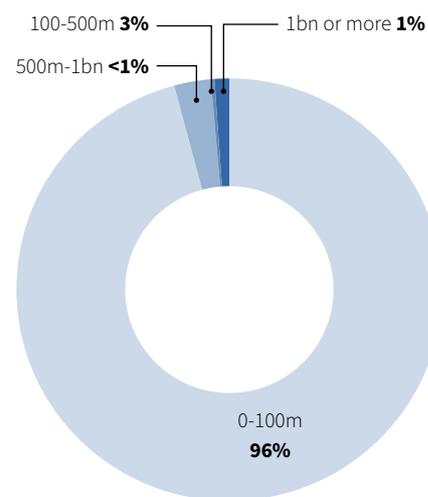
The US social bond market had a barbell maturity structure, with close to half (48%) the volume with a maturity of five years or less, and a third (30%) with a maturity of at least 20-years. The shortest bucket included 147 bonds with an average deal size of USD59m.

The 20-year plus bracket included 60 bonds and those had the largest average size of USD69m.

Over half the US social volume is from seven bonds

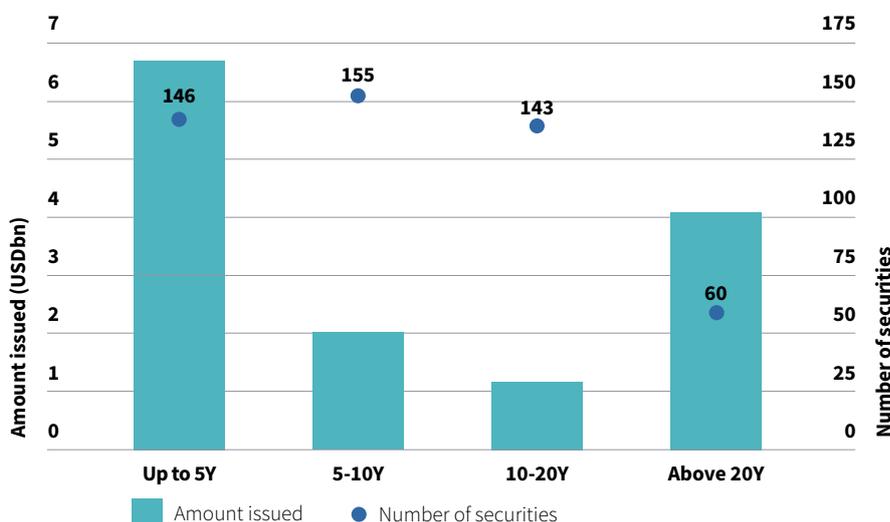


96% of US social bonds are USD100m or less



Source: Climate Bonds Initiative

US Social bond market is barbell structure



Source: Climate Bonds Initiative

What is an external review?

Issuers can label their bonds as green. At a minimum, the issuers provide detail to investors on the green eligibility criteria for the use of proceeds, for example disclosed in a green bond framework.

For more transparency, most issuers commission an external review on the green credentials of the use of proceeds before the bond is issued. This helps investors to assess whether the instrument complies with their investment objectives. These reviews can take different forms, which are described in the below table.

They may also obtain a Certification under the Climate Bonds Standard and Certification Scheme.

External review type	Scope	Providers
Second Party Opinion (SPO)	Confirm compliance with GBP/GLP. Provide assessment of issuer's green bond framework, analysing the "greenness" of eligible assets	Cicero, DNV GL, ISS-Oekom, Sustainalytics, and V.E, part of Moody's ESG Solutions
Pre-issuance verification	Third party verification confirms that the use of proceeds adheres to the Climate Bonds Standard and sector-specific criteria	Approved Verifiers under the Climate Bonds Standard such as Build America Mutual (BAM), Kestrel Verifiers, or V.E, part of Moody's ESG Solutions.
Assurance	Positive or negative assurance on compliance with the Green Bond Principles (GBP) or the Green Loan Principles (GLP)	EY, Deloitte, KPMG, etc.
Green bond rating	Rating agencies assess the bond's alignment with the GBP and the integrity of its green credentials	S&P, RAM (Malaysia), R&I (Japan)

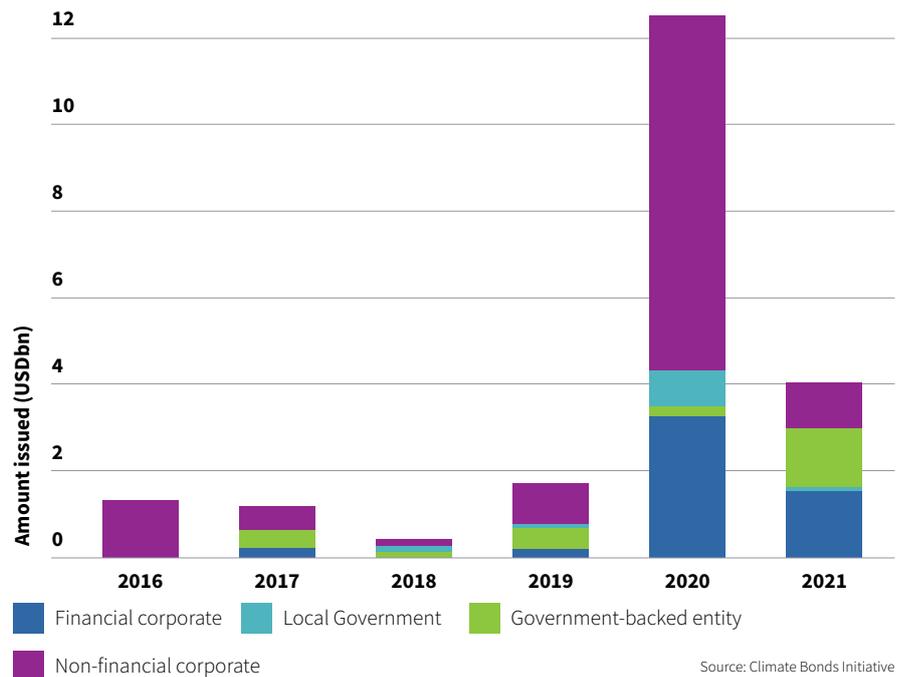
Sustainability

Introduction



- Starbucks opened the US sustainability bond market in 2016 with a pair of bonds worth USD1.25bn. Volumes remained similar the following year, and there was a dip in 2018, with total issuance reaching just USD153m. New bonds in 2019 totalled USD1.9bn and in 2020, a dramatic increase led to an extra USD12bn of bonds by year end. 2021 started in a similar vein, with new bonds worth USD3.9bn having been issued by the end of Q1.
- Under the sustainability theme, multiple labels have emerged (please see Appendix B) which finance green and/or social projects, assets, or expenditures. This offers flexibility to issuers as such instruments can cover a wide variety of UoP categories. A growing number of entities, of which Goldman Sachs is a US example, are designing single bond frameworks to encompass both green and social projects, allowing the flexibility to issue under the green, social, or sustainability themes.
- The development of the sustainability segment of the debt market was marked by the publication of the Sustainability Bond Guidelines (SBG) by ICMA in June 2018. The SBG extend good practice recommendations around transparency and market integrity, drawing upon the green project categories of the Green Bond Principles (GBP) and the social categories of the Social Bond Principles (SBP).
- The sustainability space is evolving rapidly which is reflected not just by a diverse set of themes but also the trend towards performance linked instruments such as sustainability-linked bonds (which are not within the remit of this report). Responding to this development, ICMA published their

Non-financial corporates top the sustainability theme



Sustainability-Linked Bond Principles aiming to provide a framework to the market that recommends structuring features, disclosure, and reporting.

Private sector leads US sustainability issuance

Over two thirds (68%) of the US sustainability bond volume came from nine non-financial corporate issuers, who together, were responsible for 13 bonds worth USD12.5bn by the end of Q1 2021. In August 2020, Google parent company Alphabet became the largest of those with a USD5.8bn three tranche deal. The proceeds financed projects under nine eligible categories ranging from Energy Efficiency and circular economy and design to affordable housing and a commitment to racial equity and support for small businesses. Starbucks issued four sustainability bonds between 2016 and 2019, amounting to USD3bn. These included the only JPY denominated sustainability bond from a US issuer, a JPY85bn (USD754m) 7-year maturity. The proceeds were used for sustainable coffee supply chain management, and the bond obtained a second party opinion from Sustainalytics. Pfizer became the first (and as of May 2021 remains the only) pharmaceutical company to issue a thematic bond when it issued a USD1.3bn 10-year sustainability bond in March 2020. The proceeds supported environmental sustainability, and the health of vulnerable populations and the issuer obtained an SPO.

Financial corporates constituted the second largest source of US sustainability bonds, with 17 bonds from 11 issuers amounting to USD3.4bn. The largest single instrument was a USD800m variable-rate 5-year bond issued by Goldman Sachs in February 2020. The proceeds can be used for five green, and four social project categories named in Goldman Sachs' Sustainability Issuance Framework.

Sixteen government-backed entities have issued 258 individual bonds or tranches, 66% of the total number of sustainability bonds (391), worth a cumulative 11% (USD2bn) of the amount issued. The New York State Housing Finance Agency (NYSHFA) printed its first sustainability bond in June 2019, a USD131m transaction spread over 31 tranches. The proceeds were used to finance affordable, energy efficient housing units in the State of New York and contributed to UN SDGs 1 (No Poverty), 7 (Access to affordable, reliable, and sustainable energy), and 11 (Sustainable cities and communities).

Local government was the smallest of the issuer types at USD676m at the end of Q1 2021. This was split among 131 tranches originating from seven issuers. The City of Phoenix issued its debut 24 tranche sustainability bond in March 2020, with maturity dates ranging from 2030 to 2044 and a total size of USD393m. The proceeds contributed to water resilience projects to help protect Phoenix residents during river shortages.



USA Sustainability Scorecard

Global ranking end of Q1 2021 2	Number of bonds 392
Contribution to US GSS bond market 7%	Average bond size USD25m
Cumulative amount issued USD21bn	Biggest issuer/ amount issued Alphabet / USD5.8bn
Number of entities 43	Contribution to the US debt market 0.04%
Repeat issuers 28	

US muni market poses huge potential for GSS labels

In 2020, 1973 green US municipal bonds with a combined volume of USD15bn were added to the Climate Bonds Green Bond Database. By the end of Q1 2021, a further USD2.2bn had been added across 386 bonds, compared with USD2.7bn from 201 bonds in Q1 of 2020. Despite the pandemic, 2020 posted a 66% increase in amount of green muni bond issuance compared with 2019. Issuance for 2021 could burgeon if Congress approves Biden's infrastructure plan, since the new administration has defined an agenda to invest in more sustainable infrastructure for the US.⁴¹ This is echoed at the individual state level, with states like Florida and New York actively proposing budget allocations for bond funds intended to address climate change and related environmental issues.

As the years 2020 and 2021 continue to demonstrate, there is considerable need for improving the resilience of both physical and social infrastructure across the continent. The pandemic, along with the hurricanes of 2020 and then the winter storms of 2021 laid bare the lack of resilience in American infrastructure systems, from widespread power outages across Texas to an ongoing water crisis in Jackson, Mississippi. These risks are expected to worsen. Moody's ESG Solutions finds that by 2040 51% of US zip codes will be highly exposed to flood risk, 28% to wildfires and 24% to water stress.

While Biden's proposed infrastructure bill would make inroads into addressing these systemic problems, Adaptation and Resilience (A&R) investment is in a state of flux as competing interests and budget shortfalls

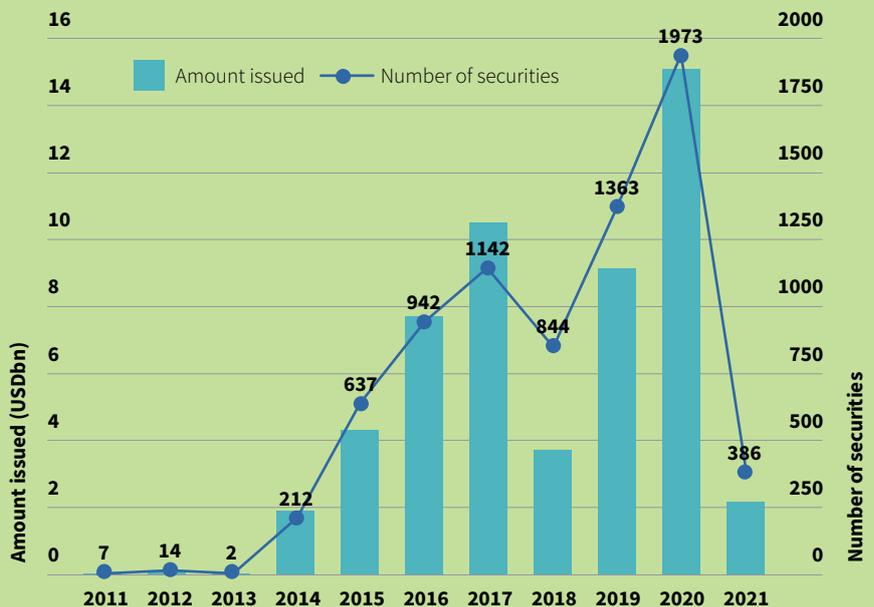
complicate the political landscape. Nevertheless there is huge scope to improve municipal water and power infrastructure to protect against adverse weather conditions.

Three labelled green municipal bonds deals addressed adaptation and resilience in innovative ways. The San Francisco Public Utilities Commission issued two series of green bonds in 2020, the proceeds of which were for upgrading their water system including hardening it against earthquakes. In December 2020, the city of Boston, MA issued green bonds to support energy efficiency and climate resilience projects, specifically for strengthening parks and facilities against the hazards of storm surges and sea level rise. Most recently, in

March 2021, Central Arkansas came to the market to protect their watershed through the acquisition of green infrastructure. The USD31.8m bond was the first one incorporating nature-based solutions to be Certified under the Climate Bonds Water Infrastructure criteria.⁴²

Resilience bonds are also having a moment in south Florida. In November 2020, the residents of the Village of Key Biscayne voted to approve the issuance of USD100m in general obligation climate resilience bonds. These follow the Miami Forever bonds issued by the city in 2017, and then the G.O. Miami Beach bonds issued in 2018 to address storms and sea level rise combined with socioeconomic resilience.

US green muni issuance grew 66% in 2020

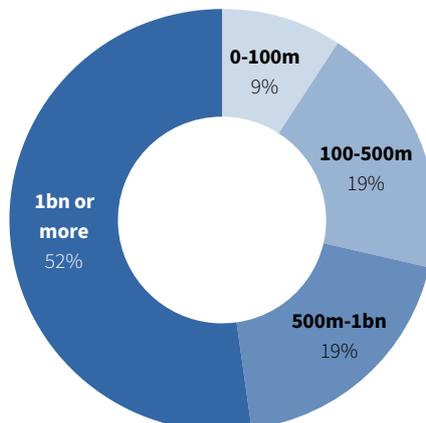


Source: Climate Bonds Initiative

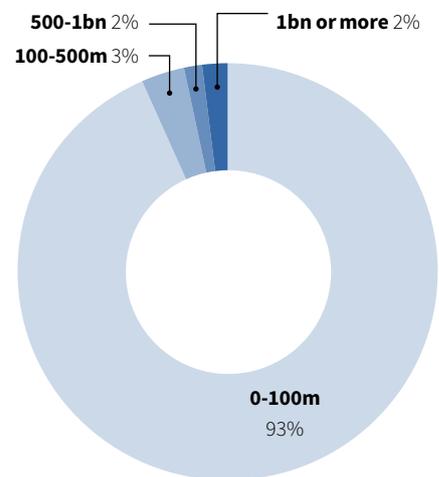
Sustainability bonds are mostly <USD100m

The average deal size of US sustainability bonds was USD53m. Like the social market, most (93%) fell into the smallest size category of less than USD100m, while over half (52%) of the volume originated from seven bonds of at least USD1bn from Alphabet, Bank of America, Pfizer, and Starbucks. Six benchmark sized bonds in the USD500m-1bn bucket came from five private sector issuers including Georgia Power, Sysco Corp, and MasterCard.

Benchmark size bonds are 71% of the volume



93% of instruments are in the smallest category

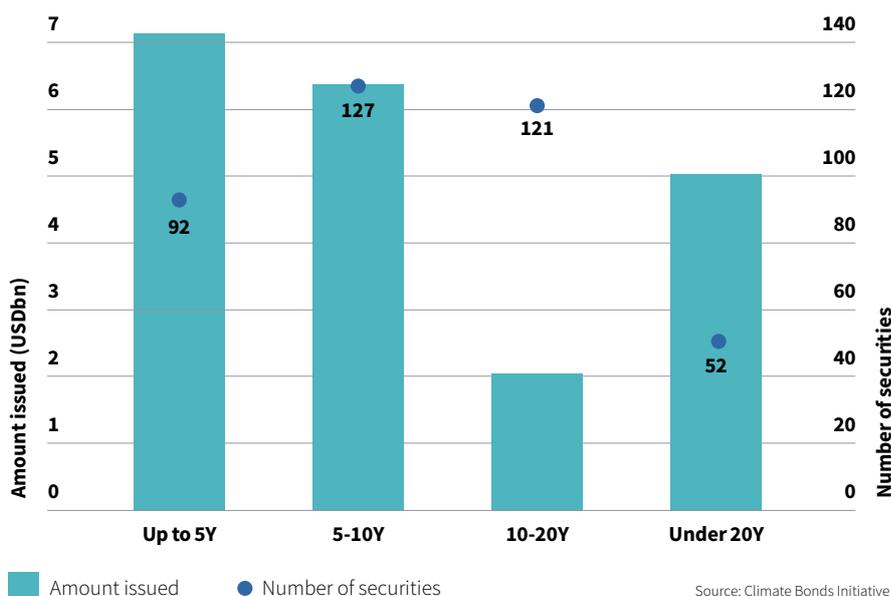


Source: Climate Bonds Initiative

Shortest tenor is the largest bucket

The 5-10 year maturity bucket includes 127 bonds worth USD6.7bn, which is the largest both in number (32%) and volume (34%). The 10-20 year bucket came a close second in number with 121 bonds (30%), but those instruments were smaller and together amounted to USD2bn (11%). The shortest (out to 5-years) and longest (20-years+) maturity buckets each include 27% of the volume, but the shorter bucket includes 91 (23%) bonds, while the longer one includes 52 (13%) which suggests that larger issuers favour longer dated paper.

Sustainability bonds are mostly shorter than 10-years



What are Adaptation and Resilience bonds?

To date, the green bond space has primarily focused on climate change mitigation with the relatively clear goal of GHG reduction. Now that the green bond market is well-established, more complex areas, such as transition and A&R are being tackled.

A&R investments are defined as those that improve the ability of assets and systems to persist, adapt and/or transform in the face of climate-related stresses and shocks.⁴³ This should be done in a timely, efficient, and fair manner that reduces risk, avoids maladaptation, unlocks development, and creates benefits. Addressing these physical climate risks will require not just investments in hard infrastructure, but also increased investment in 'soft' areas such as technologies, services, supply chain management, operations etc., that have a key role to play in enabling climate resilience in ecosystems, economies, and societies.

Analysis of the green bond market using resilience screening criteria has demonstrated that investments in asset- and system-level resilience are already flowing, albeit at an insufficient scale and speed. Examples include infrastructure projects in the water utilities, forestry, and built environment sectors, and the strengthening of existing infrastructure assets to withstand predominantly physical climate risks. The first labelled 'Climate Resilience Bond' was issued by the European

Bank for Reconstruction and Development (EBRD) in January 2020, a green bond fully dedicated to support climate resilient infrastructure, businesses, and agriculture and ecological systems. Within the green bond space where part of the proceeds is going towards adaptation and resilience projects and assets, Fannie Mae accounts for the majority of deals. Its green MBS issuance programme targets energy and/or water efficiency improvements in existing properties – thus helping to prepare for an even more resource-constrained world which is an expected outcome of climate change. Other than that A&R allocations in the US market have mostly come from munis. For example, the State of Michigan's multiple green bonds have financed environmental and natural resource protection programmes that help clean up and redevelop environmentally contaminated sites, lakes, rivers and streams; further protect and improve water quality; prevent pollution and abate lead contamination; reclaim and revitalise community waterfronts; make state park infrastructure improvements and enhance local recreational opportunities. An example from Canada is the bond issued by Province of Ontario which finances projects such as flood protection and storm water management in tandem with several climate change mitigation measures.

5. Market analysis: Canada

Overview

Cumulatively, Canadian GSS bonds and loans amounted to USD34.8bn (CAD42.1bn⁴⁴) at the end of Q1 2021, putting the country in 11th place in the global ranking. The first green bond was issued by the Export Development Bank of Canada in 2014 (USD300m, matured in 2017) and the market reached its peak in 2020 with USD9.4bn of issuance. Canadian Imperial Bank of Commerce (CIBC) issued the first social bond, in 2018. The market remains small with just four bonds but is nevertheless the 17th largest by volume. The sustainability theme got off the ground in 2019, and five issuers had brought 12 bonds by the end of Q1 2021.

The Canadian market is populated by larger deals compared to the US, with an average size of USD366m. Larger deals help to attract a broad range of international investors, which was also reflected in the fact that Canadian GSS bonds had been issued in six currencies: AUD, CAD, EUR, JPY, SGD, and USD. Four of the entities had issued under more than one theme (CIBC, City of Toronto, BMO and TD Bank), and over half had revisited the market.

Green

Introduction

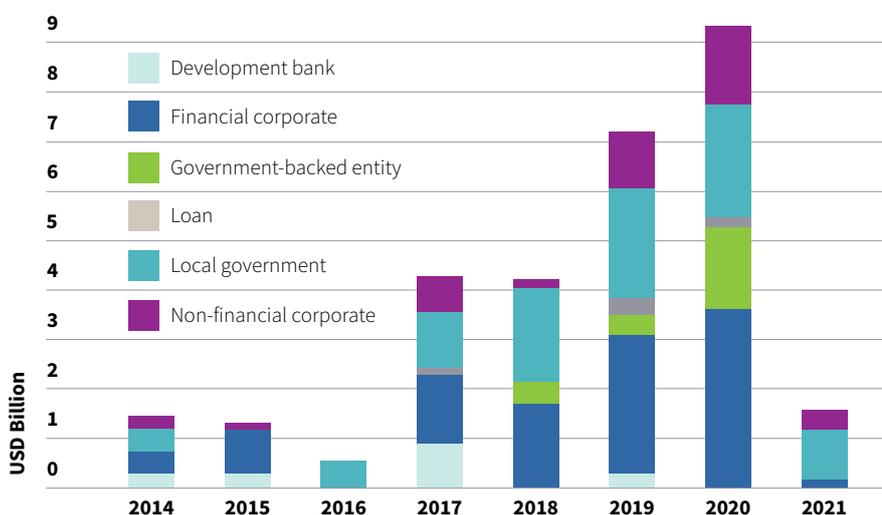
- At the end of Q1 2021 the Climate Bonds Green Bond Database included USD30bn in green bonds and loans originating from Canada. The deal count stands at 79. This puts Canada in ninth place on the country list. Financial corporate and local government issuers have dominated the market every year except 2015.
- Issuance stood at its lowest in 2016 with USD537m. Q1 2021 issuance amounted to USD1.5bn, leaving room for improvement to achieve 2020 levels and beyond.

Public and private sectors are equally active

The Canadian green bond market was dominated by financial corporates and local governments each contributing around a third (USD10.7bn and USD9.2bn respectively) to the total volume issued. This has been a trend since the inception of the market with both issuer types peaking in 2020 with record volumes. Financial corporates have issued a total of 23 deals with four of them coming from issuers that only issued one instrument so far and seven issuers that have come to the market multiple times. At the top of the list was CPPIB, a Canadian asset manager, raising a total of USD4.6bn through seven deals. The other repeat issuers – Brookfield Asset Management, CoPower, Manulife Financial, RE Royalties, RioCan Real Estate Investment Trust and TD Bank – all came to the market twice raising a total of USD4.1bn. On the local government side, two cities and two provinces have issued multiple green bonds. The issuing entities are Province of Ontario, Province of Quebec, City of Ottawa and City of Toronto. Just as with Sovereign Government bonds, also Local Government bonds in Canada are occasionally being tapped meaning the issuance will be funged with a previous bond after the settlement.

Non-financial corporates ranked third amongst the issuer types with a total of USD4.7bn. Brookfield Renewable Partners and Algonquin Power made up the lion's share of this with USD1.7bn and USD825m respectively whereas the former issued six instruments and the latter two. Government-backed entities and development banks made up a smaller share of total issuance with 9% and 6%. Export Development Canada, responsible for the first Canadian green bond, was the only Development Bank to have issued a green bond albeit USD1.8bn of issuance spread between five deals. Loans contributed 2% to total issuance.

Record Canadian issuance in 2020



Source: Climate Bonds Initiative



Canada Green Scorecard

Global ranking end of Q1 2021 9	Number of bonds 79
Contribution to Canadian GSS bond market 86%	Average size USD380m/ CAD459.7
Cumulative amount issued USD30bn/ CAD36.3bn	Biggest issue/ amount Province of Ontario (USD6.2bn/ CAD7.5bn)
Number of entities 32	Contribution to the Canadian debt market 0.8%
Repeat issuers 18	

CAD is preferred currency

The strongest currency in the Canadian green bond market was the local currency CAD claiming 62% of the volume since market inception. The second strongest currency is the USD with a total of USD6.3bn (21%) issued via 13 instruments. Export Development Canada issued three of these deals totaling USD1.1bn. Other currencies occur less frequently, with three issuers having issued in EUR and one issuer each in AUD, SGD and JPY.

Top-5 Canadian non-financial corporate green bond issuers

Issuer	Number of bonds	Total issued USD bn
Brookfield Renewable Partners	6	1.7
Algonquin Power	2	0.8
Quadreal Property Group	2	0.6
MPT Finco	2	0.5
Brookfield Power NY Finance	1	0.3

Most deals are <USD500m

With 57% of the total number of deals issued, the USD100-500m (CAD121-604.9m) bucket lead Canadian issuance. These added up to USD13.2bn also translating into the largest share of total issuance in terms of volume. Non-financial corporates contributed most of the volume with deals financing mainly Renewable Energy and Buildings. The year 2020 saw 15 instruments in this size range.

Benchmark size mainly came from local governments such as Province of Quebec and Province of Ontario which issued one deal worth USD609m (CAD800m) and two initial deals which were reopened, respectively. CPPIB's (Canada Pension Plan Investment Board) CAD1.5bn (USD1.2bn) bond was the largest bond in the Canadian market. The issuer has returned to the market multiple times since their maiden green bond in June 2018.

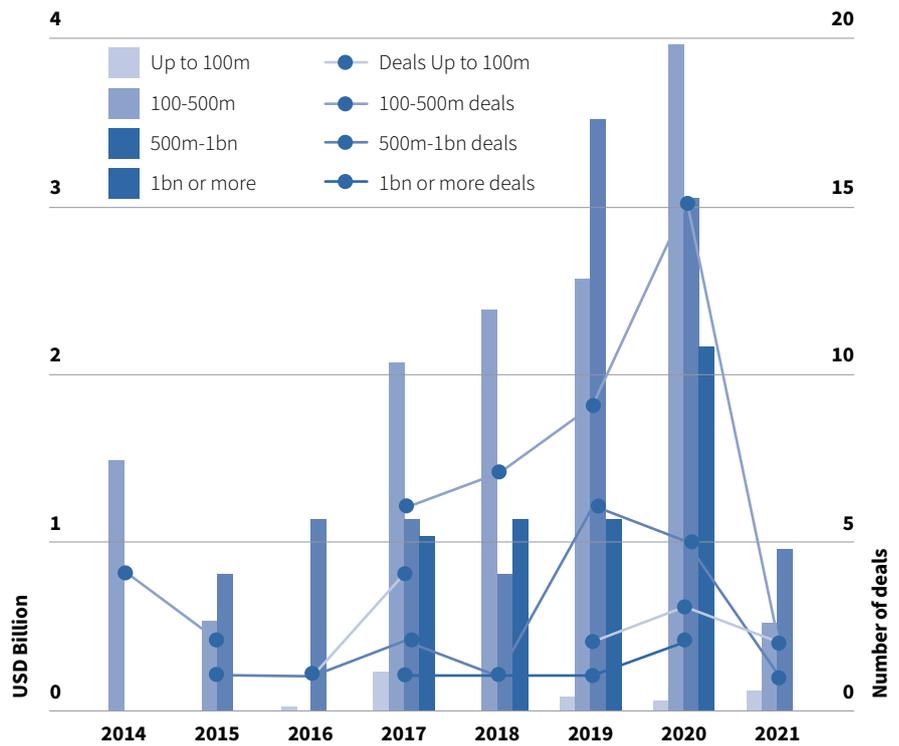
Small deals under USD100m are rare with a total of 12 adding up to USD470m. The smallest came from financial corporate CoPower, raising USD7.5m. Canadian Solar also frequently raised funds in the green bond market with most of their solely JPY-denominated deals in the Up to 100m range.

Medium tenors prevail

Tenor length varies but most of the issuance volume falls into the 5-10 year bucket with 28 deals and a volume of USD15.8bn. USD5.7bn from Province of Ontario falls into that range as well as USD3.4bn from CPPIB with the latter covering a broad range of maturities with their issuances falling into every bucket up to 20-years. The second largest bucket is Up to 5-years with volume mainly coming from financial corporates such as Bank of Nova Scotia, and Canadian Imperial Bank and CPPIB with each raising USD500m. TD Bank and Royal Bank of Canada raised USD1.5bn with two instruments maturing within three years and USD560m maturing in five years respectively.

Maturities over 20-years made up 10% of the overall issuance with volume peaking in 2019 and 2020. The bond with the longest original term was issued in 2020 by Brookfield Asset Management with a 60-year tenor, which raised USD400m for a variety of Renewable Energy projects.

Majority of instruments falls into USD100-500m bucket



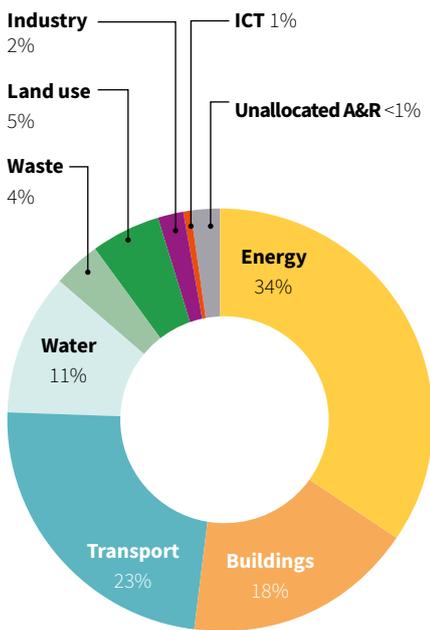
Source: Climate Bonds Initiative

Maturity profile mixed in the Canadian green market



Source: Climate Bonds Initiative

Majority of proceeds finances Energy and Transport



Three quarters of bonds include hydropower

One third of total issuance went towards Renewable Energy projects. Given that a large share of Canadian electricity comes from renewables – mainly hydropower – this is unsurprising. Out of a total of 79 deals, 59 dedicated a share of their UoP to this category and 18 financed 100% Renewable Energy projects and assets. This includes energy companies such as Canadian Solar, Algonquin Power, Ontario Power Generation and Brookfield Renewable Partners. These issuers finance a range of different projects covering solar, wind, and hydro, as well as storage. Low-carbon Transport ranked second, with 23% of the issuance volume and twelve deals solely dedicating proceeds towards this category of which almost all were local governments. City of Ottawa, Province of Quebec, City of Toronto, and Province of Ontario together raised USD3bn in deals solely going towards Low-carbon Transport projects financing light rail transit and metro assets amongst others.

The Buildings and Water categories constituted 18% and 11% respectively, both showing an upward trend since 2016. The latest deal fully dedicated to financing low-carbon buildings was a green loan taken out by Concert Properties raising CAD72m (USD53m) for LEED Gold certified properties. Water projects represent less than 35% of each deal with mainly financial corporates financing assets and projects in this space.

The state of the Canadian green corporate bond market

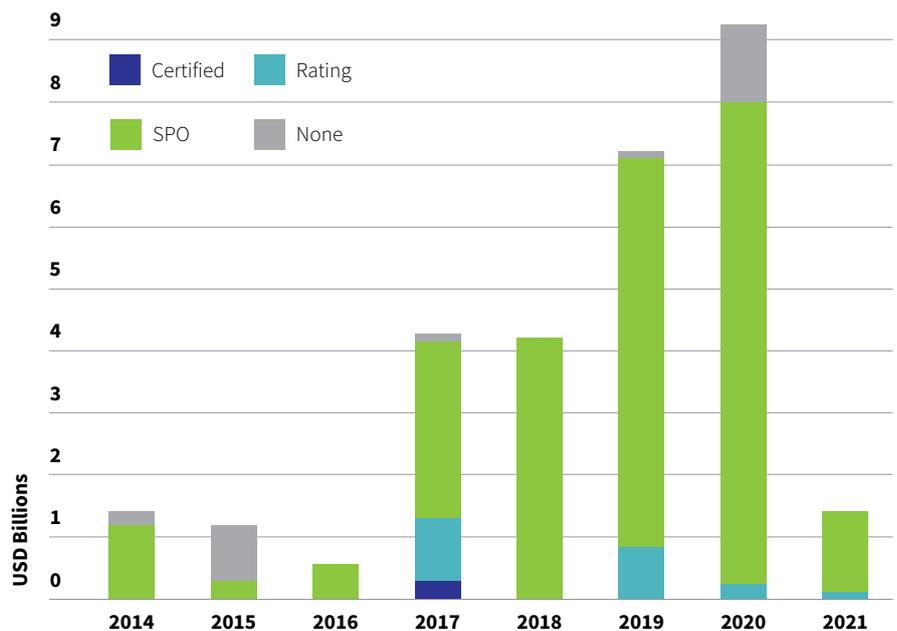
The Climate Bonds Green Bond database includes 20 green bonds from nine non-financial corporate issuers with a combined face value of USD4.9bn. BIS sizes the Canadian non-financial corporate bond market at USD291bn, thus green bonds represent 1.6%. In 2020 four Canadian issuers printed six green instruments. The green bond market offers huge potential for Canadian issuers to finance green capital expenditures to prepare for net-zero.

Renewable Energy accounts for most projects and assets financed via green bonds by non-financial corporates, as evidenced by the Top-5 table below - it accounts for 71% within this issuer type. Most of the electricity in Canada comes from hydro power plants which justifies financing assets in this space. Also in the

non-labelled space, Renewable Energy poses an opportunity for further refinancing existing assets. Many of the Canadian climate-aligned issuers are aligned with the Renewable Energy theme. Hydro-Quebec, Lower Mattagami Energy and Toronto Hydro Corp are examples of companies that haven't issued any green bonds as of Q1 2021, but potentially have the assets to do so.

Low-carbon Buildings is the second largest UoP theme within the Canadian green bond market with 11% of total issuance. This poses an opportunity for further expansion as the majority of Canada's GDP in 2020 came from Real estate and rental and leasing.⁴⁵ Green building stock is a crucial component of the transition to a low-carbon economy.

SPOs most common in Canadian green market



Source: Climate Bonds Initiative

Waste and Land Use projects are rare with only USD1.1bn and USD1.7bn of issuance and so are Industry and ICT. The latter is only financed by Ontario Power Generation in the Canadian green bond market with three deals.

Most issuers obtain an SPO

Most deals issued by Canadian organisations carry an SPO (70%). Fifty-five out of 79 deals with a total amount of USD24.9bn were issued with

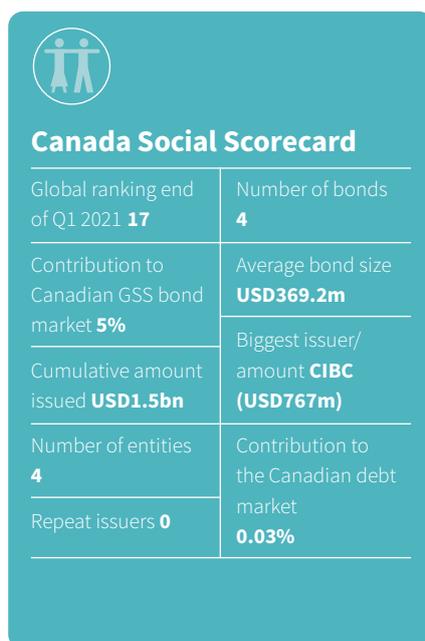
this type of third-party review. With an initial drop after the market inception in 2014, deals reviewed by SPO providers have been growing continuously since 2015, reaching USD7.8bn in 2020. Other types of reviews are rare with eight Ratings and one Certification. Manulife Financial Certified its issuance in 2017 against the Solar and Wind Criteria of the Climate Bonds Standard raising SGD500m (USD369m). Fifteen deals did not receive any kind of third-party review.

Social and sustainability

The social and sustainability themes are in the early stages of development in Canada, with 15 bonds issued by the end of Q1 2021, cumulatively worth USD4.8bn.

Four bonds issued under the social theme

Four Canadian entities have issued one social bond each, all of which were denominated in CAD. Two of the bonds were benchmark-sized, two were not. The City of Toronto has also issued a green bond, while BMO has brought a sustainability deal to market. The eligible use of proceeds categories of the four social bonds included social housing, female empowerment, essential services, and basic infrastructure. The social bond concept is aligned with the Canadian culture of acceptance and inclusivity, and we expect this market to expand accordingly.



Canadian social bonds						
Issuer	Issuer Type	SPO	Pricing date	Amount issued USD/LOC	Currency	Tenor
City of Toronto	Local Government	✓	06/16/2020	USD73m/ CAD100m	CAD	10-Years
Canadian Imperial Bank of Commerce	Financial Corporate	✓	09/12/2018	USD730m/ CAD1bn	CAD	3-Years
Bank of Montreal	Financial Corporate	✓	03/08/2021	USD603m/ CAD750m	CAD	5-Years
HI-C Issuer Trust	Financial Corporate	✗	03/15/2021	USD32.5m/ CAD40m	CAD	40-Years (sinkable)

Eligible project categories
<p>City of Toronto</p> <p>1. Social and affordable housing new development and/or capital repair projects 2. Affordable basic infrastructure (e.g. clean drinking water, sewers, sanitation, transit) 3. Access to essential services (e.g. long term care, senior services, emergency shelters) d. Socioeconomic advancement and empowerment</p>
<p>Canadian Imperial Bank of Commerce:</p> <p>Eligible Assets for Women in Leadership Bonds include loans to a corporation that meet Criterion 1 and 2 where</p> <p>Criterion 1: a. Minimum of 30% of board positions held by women; or b. Minimum of 30% of executive positions held by women; or c. Signatory of the Catalyst Accord 2022.</p> <p>Criterion 2: Minimum of one woman on the board and one woman in an executive position.</p> <p>Exclusionary Criteria: 1. Proceeds will not support: alcohol, tobacco, gambling CIBC, Military Contracting, Predatory Lending, Palm Oil, Adult Entertainment 2. Proceeds will not support any corporation that are involved in major ESG controversies.</p>
<p>Bank of Montreal</p> <p>1. Indigenous Peoples' Business and Community Lending, 2. Women-Owned Business Lending, 3. Access to Free or Subsidized Essential Services, 4. Affordable Housing" Affordable Housing targeting specified populations.</p>
<p>HI-C Issuer Trust</p> <p>Affordable Housing targeting specified populations</p>

Financial corporates support the sustainability theme

Four Canadian financial corporates, and one non-financial have printed 12 sustainability bonds between them in a mixture of currencies. The four financial corporate issuers all obtained external reviews of their frameworks.

Toronto Dominion released a combined framework in 2020, under which it can issue social, sustainability, or green bonds. The framework included seven green and six social project categories.

Canadian sustainability bonds						
Issuer	Issuer Type	SPO	Pricing date	Amount issued USD/LOC	Currency	Tenor
Concordia University	Non-Financial Corporate	✗	02/04/2019	USD37.6m/ CAD50m	CAD	40-Years
Concordia University		✗	02/04/2019	USD18.8m/ CAD25m	CAD	20-Years
National Bank of Canada	Financial Corporate	✓	05/14/2019	USD45m/ EUR40m	EUR	15-Years
			02/13/2019	USD45m/ EUR40m	EUR	12-Years
			03/10/2020	USD22m/ EUR20m	EUR	20-Years
			02/05/2021	USD50m	USD	5-Years
			12/03/2020	USD750m	USD	4-Years
			10/02/2019	USD750m	USD	3-Years
			03/11/2019	USD56m/ EUR50m	EUR	15-Years
Sun Life Financial Inc	Financial Corporate	✓	07/08/2019	USD567m/ CAD750m	CAD	10-Years
Toronto-Dominion Bank	Financial Corporate	✗	09/23/2020	USD500m	USD	3-Years
Bank of Montreal	Financial Corporate	✓	10/16/2019	USD500m	USD	3-Years

Eligible project categories	
Concordia University	Develop and finance projects aligned with academic and research projects
Concordia University	LEED certified science Hub
National Bank of Canada	1. Renewable Energy, 2. Sustainable Buildings, 3. Low Carbon Transportation, 4. Affordable Housing, 5. Access to Basic and Essential Services, 6. Loans to Small and Medium sized Enterprises (SME's)
Sun Life Financial Inc	1. Renewable Energy, 2. Energy Efficiency, 3. Green Buildings, 4. Clean Transportation, 5. Sustainable Water Management, 6. Access to Essential Services
Toronto-Dominion Bank	1. Renewable Energy, 2. Energy Efficiency, 3. Pollution Prevention and Control, 4. Environmentally Sustainable Management of Living Natural Resources and Sustainable Land Use, 5. Clean Transportation 6. Sustainable water and wastewater management, 7. Green buildings, 8. Affordable basic infrastructure, 9. Access to essential services: Healthcare, 10. Access to Essential services, Education, 11. Affordable/Community Housing, 12. Employment generation and programmes designed to prevent and/or alleviate unemployment stemming from socioeconomic crises, including through the potential effect of SME financing, 13. Socioeconomic advancement and empowerment
Bank of Montreal	1. Renewable Energy, 2. Green Buildings & Infrastructure 3. Energy Efficiency 4. Clean transportation 5. Pollution prevention and control 6. Sustainable water & wastewater management, 7. Sustainable management of living natural resources & sustainable land use, 8. Indigenous peoples business and community lending, 9. Women-owned business lending, 10. Access to free or subsidised essential services, 11. Affordable housing

6. Climate-aligned opportunities

Introduction

The climate-aligned research identifies unlabelled bonds (climate-aligned bonds) which finance climate-aligned activities and/or assets. These bonds are not labelled green.

As a result, this work exposes green investment opportunities for thematic investors, beyond the labelled market, which lack the visibility and transparency afforded by a GSS label. It also highlights opportunities for issuers to label their debt as green in conjunction with refinancing and new issuance. Please see page 34 for methodology.

The current analysis focuses on climate-aligned bonds from North America.

The 2020 research identified a total of 65 climate-aligned entities from North America and USD119.7bn of cumulative climate-aligned outstanding bonds. Most of the volume comes from the US (72%, USD86.6bn), while Canada accounts for 28% (USD33.1bn). North America is the second most prolific of the developed markets (DM), and the third globally. Union Pacific Corp (US, USD22bn), Hydro-Québec (Canada, USD17.1bn) and American Water Capital (US, USD8.4bn) are the top three issuers from the region. Hydro-Québec is the source of the largest deal included in the 2020 research (CAD7bn/USD6.1bn).

The relatively small volume of climate-aligned bonds from North America compared to the labelled GSS market can be explained by munis and government agencies such as Fannie Mae and Freddie Mac being beyond the scope of the climate-aligned 2020 research.

North America's top 10 climate-aligned issuers

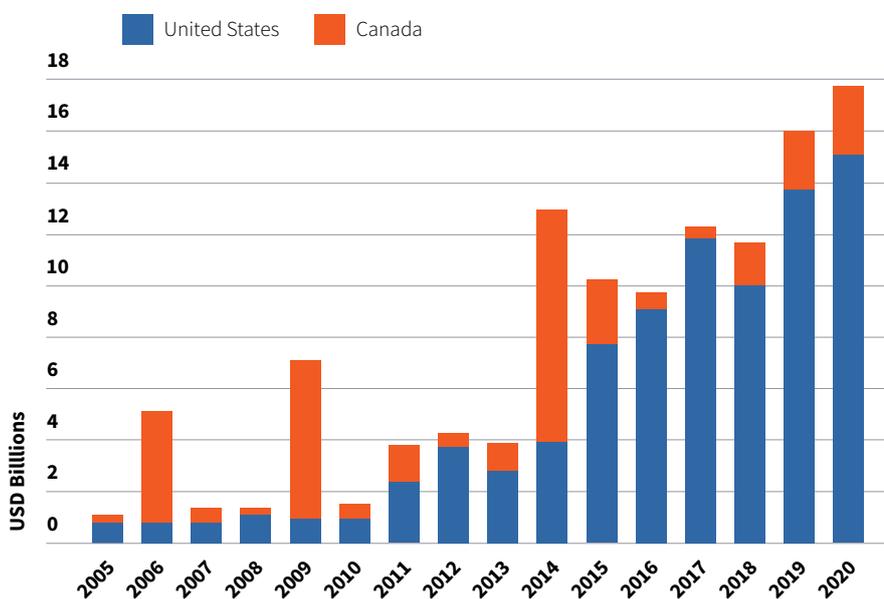
Issuer	Country	Outstanding climate-aligned debt	Regional market contribution	Climate theme
Union Pacific Corp	US	USD22.0bn	18%	Transport
Hydro-Québec	Canada	USD17.1bn	14%	Energy
American Water Capital Corp	US	USD8.4bn	7%	Water
International Paper Co.	US	USD6.0bn	5%	Land use & agriculture
Tesla Inc.	US	USD6.0bn	5%	Transport
Republic Services Inc.	US	USD5.7bn	5%	Waste
Waste Management Inc.	US	USD5.5bn	4%	Waste
Canadian Pacific Railway Co.	Canada	USD4.7bn	4%	Transport
Essential Utilities Inc.	US	USD4.2bn	4%	Water
Kansas City Southern Railway	US	USD3.7bn	3%	Transport

Transport is the top climate theme

Climate-aligned issuers from North America operate across a variety of climate themes, with Transport (36%) and Energy (26%) companies dominating the regional market volume. Most entities operating in Transport are based in the US (USD36.4bn): railway companies are the most prevalent, except for EV manufacturer Tesla (USD6bn) which is the second largest transport issuer in the country. USD6.6bn of Transport climate-aligned issuance comes from six Canadian companies; Canadian Pacific Railway (USD4.7bn) represents the largest issuer.

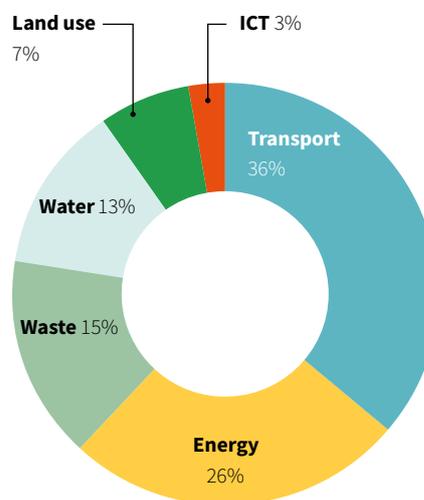
Conversely, most of the Energy climate-aligned volume comes from Canada (USD24.3bn, 78%), with Hydro-Québec being the top issuer (USD17.1bn). Water and Waste companies are mostly based in the US (92% of cumulative Water and Waste climate-aligned volume): American Water Capital Corp (USD8.4bn) and Republic Services Inc. (USD5.7bn) are the top entities for the respective categories. Land use takes a tiny share of the volume, with International Paper Co. accounting for over 70%. ICT (Information and Communications Technology) is only represented by three companies, with US-based SBA Communication Corp. (USD3.5bn) being the top exponent.

The US accounts for 72% of issuance in North America



Source: Climate Bonds Initiative

Transport is the top climate-aligned UoP category



Source: Climate Bonds Initiative

Hard currencies dominate climate-aligned issuance in North America

USD dominates the climate-aligned universe at 77% (USD92.2bn), followed by CAD at 22% (USD26.8bn). Canadian Pacific Railway and GFL Environmental are the only two Canadian entities to have issued in USD. Just 1% of the regional issuance is EUR-denominated; this comes from US based company Xylem Inc. (USD558m) and Canadian Société de Transport de Montreal (USD84m).

USD250-500m deals are the most popular by volume and deal count

Benchmark and medium-sized deals are the most frequent in the North American climate-aligned universe, with the USD250m-500m and USD500m-1bn buckets accounting for 32% and 27% of the regional amount issued, respectively. Deals in the USD250-500m are also the most frequent by number (116 deals, 32% of market share). Only six companies have issued deals larger than USD1bn, the most prominent being Hydro-Québec (three deals, USD16.1bn), Union Pacific Corp (seven deals, USD 10.5bn) and Tesla (three deals, USD5bn). Deals in the USD50-250m bucket are the second most popular by number (73 deals, 23%), however they only account for 8% of the volume issued. A total of 44 deals (14%) of up to USD50m represent USD402m. Deals between USD500m-1bn account for 32% of volume issued. By contrast, in the labelled green bond market, just 1.2% of the deals (57 in number) reside in the USD500m-1bn bucket. This presents an opportunity for climate-aligned issuers wishing to issue labelled debt. Larger deals attract a broad range of investors, and domestic investors may be more willing to set up dedicated funds if there were more availability of larger ticket paper.

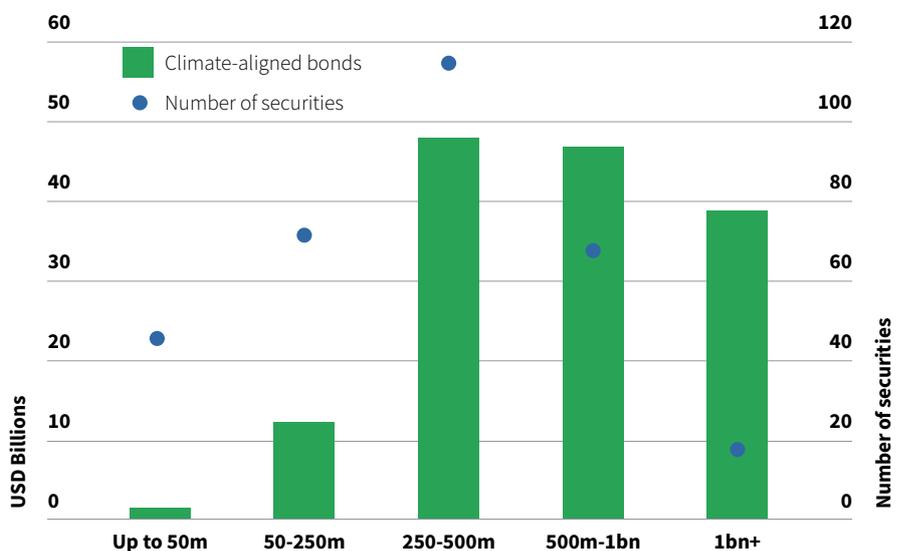
Opportunities to scale-up the labelled universe in North America

The maturity profile of the North American climate-aligned bond universe reveals substantial opportunities to scale-up the labelled bond universe. Climate-aligned issuers can refinance their maturing liabilities via the labelled bond market, and hence benefit from the extra visibility and multiple potential other benefits offered by such instruments.

Only six climate-aligned issuers included in the current research have already issued labelled bonds: Ontario Power Generation (USD1.6bn), Brookfield Renewable Partners (USD1.1bn), Xylem Inc. (1bn) and Tesla Energy Operations

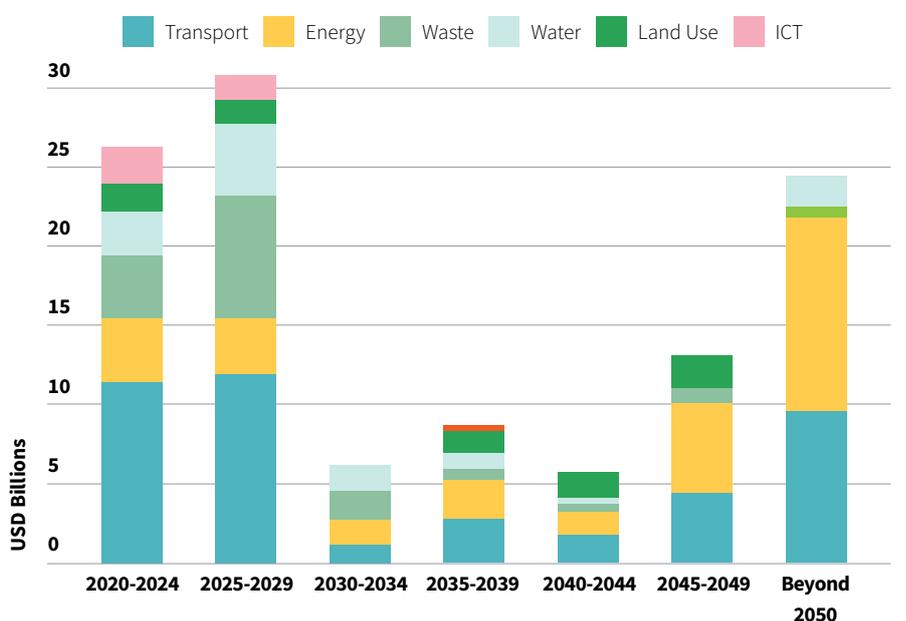
(USD366m) are the most prominent examples. This suggests that many entities in North America can still discover the additional value brought by the label, including top issuers such as Hydro-Québec and Union Pacific Corp. Multiple benefits of issuing green bonds were highlighted by 83 issuers interviewed for the [2020 Green Bond Treasurer Survey](#) conducted by Climate Bonds.⁴⁶ These include a broader investor base and new engagement opportunities, enhanced reputation and visibility, as well as strengthened internal integration between departments. Both Tesla Energy Operation and Ontario Power have labelled a substantial share of their outstanding debt: 76% for the former (USD366m) and 61% for the latter (USD1.6bn).

Most deals are at least USD250m



Source: Climate Bonds Initiative

Climate-aligned bonds can be relabelled as green as they roll off



Source: Climate Bonds Initiative

In May 2021, French Real Estate company Gecina, reclassified its debt portfolio under the green theme. Gecina labelled its 15 outstanding bonds worth a combined EUR5.6bn (USD6.8bn) as green and committed to issue all future bonds under the green label.⁴⁷ The ambitious framework was published in April 2021 and obtained an external review. Relabelling bonds contributes both scale and liquidity to the secondary green bond market and sends a signal to investors that Gecina has audited its activities according to climate compatibility. Gecina has committed to reaching net-zero by 2030.

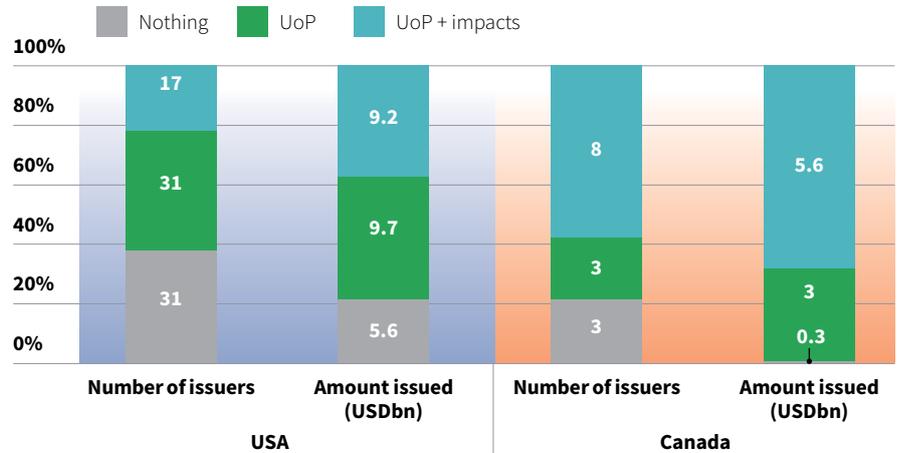
7. Post-issuance reporting

This section is based on the research for Climate Bonds' recent [Post-issuance reporting in the green bond market 2021](#) report.⁴⁸

As part of this research, all green bonds included in the Climate Bonds Green Bond Database issued between Q4 2017 and Q1 2019 were analysed, except for securitised deals and loans which have different reporting requirements and expectations. This included 128 deals from 91 North American issuers, totalling USD32.6bn.

The results shown are valid as of 2020. This allows issuers with deals over a year old to report, and about half the two-year maximum recommended by the green bond principles (GBP). In practice, almost all non-reporting deals at the time of research have now made reporting available (at least on UoP), i.e., 100% in Canada and 90% in the USA.

Higher reporting share in Canada than USA



Source: Climate Bonds Initiative

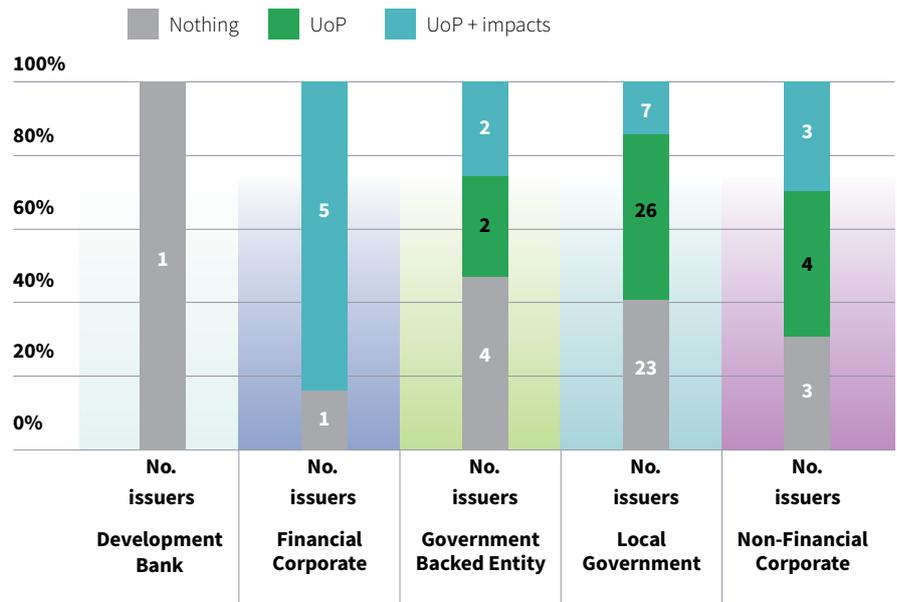
USA among large markets with lowest reporting level⁴⁹

The **USA** was one of only four countries globally with reporting below 80% and more than USD1bn issued (within the sample period) – as well as the largest, at just over USD24bn.

Canada, a smaller market with a different profile of issuers, achieved 96% reporting by volume.⁵⁰

The share of reporting was considerably lower in both countries when looking at number of issuers. This reflects the fact that larger issuers are more likely to report and is most noticeable in Canada. In addition, the increase in share from number of issuers to amount issued was largest when both UoP and impacts are reported, i.e., larger issuers were especially likely to report both.

USA: Public sector issuers have lower reporting share



Source: Climate Bonds Initiative

Lower reporting share in USA reflects issuer profile

American issuers had USD5.6bn of non-reporting volume from 40 deals. The vast majority of these were US Munis, but over half (52%) of the volume was contributed by two energy companies: MidAmerican Energy (USD2.2bn) and Xcel Energy (USD700m). Of their combined four deals, two were from Q1 2019 and two from 2018 – all now have reporting available, although MidAmerican's only seems to include UoP disclosure.

Non-reporting local governments, as well as government-backed entities, tend to be relatively small issuers and may face less pressure to report, e.g., from retail investors. An analysis by deal size points to a similar conclusion: small deals are much less likely to have reporting, especially regarding impacts.

The only development bank in the sample – California Infrastructure and Economic Development Bank (Ibank) – was also found to be non-reporting at the time of research (the projects were mentioned but allocations were not given).

By contrast, in Canada two of the three non-reporting issuers were non-financial corporates, the other being a government-backed entity (but the three have now reported). All four local governments included in the sample had reported UoP at the time of research, and two also included disclosure of impacts. It is important to note that the difference in local government reporting levels between the two

countries is likely related to the size of deals. In Canada only one of seven deals within this issuer type was under USD100m, and the average was USD460m; in the USA, the average dropped to USD118m. Considering this, the fact that many US Munis are small issuers – and that there are many compared to other markets – is positive, reflecting the drive to issue green among the public sector in many US states.

USA: improving, but barriers remain

The reporting share among US public sector entities is improving. A greater share of US munis was found to provide post-issuance UoP reporting now compared to two years ago although it is often unclear where this is made available and robust impact reporting is still chronically lacking within this issuer type (only seven of 55 issuers reported post-issuance impacts).

As well as being small issuers, the relatively lower availability and quality of reporting among US munis may also be due to budget constraints, incorporation in broader city or state budget reporting, and/or to the fact that they allocate a relatively high share for refinancing, for which post-issuance reporting may be less relevant.

Quality of reporting varies, particularly in the USA

To assess the quality of reporting, we developed an internal scoring methodology that evaluates several aspects of disclosure and scores reporting issuers between 0 and 25 points (see our global report for more detail).

North American issuers exhibited a wide range of scores, from seven to 25 points, which is almost the same as the global analysis (6-25). Many of the low scorers being US Munis.

The USA therefore had the wider range (7-24) but achieved a relatively high mode of 19 points and most issuers (29 out of 48) scored in the 18-21 interval. Canada's narrower range of 14-25 points suggests Canadian issuers are more consistent in terms of reporting quality, for example being more likely to report in line with commitments made at issuance, but it is also because the sample size is smaller.

The highest scorer among North American issuers was Canada's Manulife Financial with 24.5 points, followed by Boston Properties, with 24. SPFUC is another issuer with high-quality reporting (23 points) and is highlighted below as a best practice case study. The City of Toronto and Province of Quebec are also local governments that score highly (23 and 22 points respectively).

Case study: San Francisco Public Utilities Commission - SFPUC (USA)

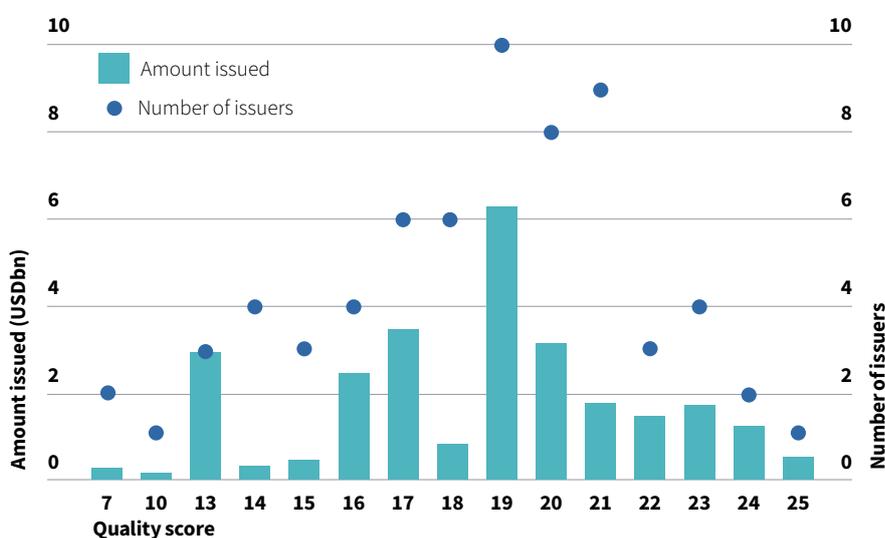
SFPUC stands out as the US Muni issuer with highest quality reporting, closely related to the Programmatic Certification it obtained under the Water Infrastructure Criteria of the Climate Bonds Standard.

We experienced issues accessing SFPUC's website on multiple occasions, but the reporting is still easily reached from the Climate Bonds [website](#).⁵⁶ The annual [green bond report](#) includes the amounts allocated and pending allocation at bond- and project-

level (there are many), along with qualitative and quantitative information on each one in supporting tables, including contributions to the SDGs (particularly rare among US Munis).⁵⁷

The green issuance programme is clearly framed within the issuer's sustainability plans at the start of each report, and the pre- and post-issuance verification required by the Climate Bonds Certification scheme – in this case provided by Sustainalytics – is attached at the end. One area for improvement, however, would be to provide project-level quantitative impact data more consistently in the report (although there is more information on this on its website).

Wide range of reporting quality in North America



Source: Climate Bonds Initiative

Impact reporting & methodologies

Impact reporting is a highly important aspect of green bond (and broader) disclosure. Given that it is a more technical topic, and the results of our global analysis broadly apply across all geographies, it is not covered here, but is discussed thoroughly in the main global report.

There appears to be an increasing number of resources and tools that North American issuers can use to provide green bond disclosure, especially when it comes to impact reporting which is often more complex.

For example, the **US EPA** has developed a *GHG Equivalencies Calculator* which was used by three relatively small but very different issuers in our sample: American Municipal Power (AMP), Bank Windhoek and the North American Development Bank. AMP also highlighted the use of the EPA's *Landfill Gas Energy Benefits Calculator* to

estimate reduced and avoided GHG emissions from landfill gas energy (AMP is one of the best reporters among US Muni issuers, and one of the few that discloses a methodology).

Another example is the **American Carbon Registry (ACR) Green Finance Impact Program**, which supports issuers – especially munis – to estimate and standardise their impacts.

In Canada, the **American Public Transportation Association's (APTA)** recommended practice to quantifying GHG emissions from transit projects was employed by the Province of Quebec. At a global level, we also noticed some methodological guides provided by public sector entities focused on different sectors that were used in their respective countries. Most of these were developed by Ministries of Environment, and **British Columbia's** was one (referenced by TransLink).

Looking ahead and driving further transparency

Overall, while it is true that the USA's reporting share has risen from 71% in our previous study, we expect to see this increase further, along with improvements in the availability and quality of *impact* reporting. Now that sustainable finance is gaining more traction under the Biden Administration, continued development of the USA's green bond market is likely to bring improving post-issuance disclosure practices from both private and public sector entities. We hope this extends to US Munis, given they form a large part of the country's issuance and their role in financing sustainable projects/assets will only increase.

While this may apply more to larger deals (not many US Munis), 55% of respondents in Climate Bonds' [2019 Investor Survey](#) stated they would sell a bond if post-issuance reporting was poor, and 79% would not buy the bond if the use of proceeds at issuance was not clearly green.⁵¹ Moreover, transparent use of proceeds and impact reporting both scored above average as features that enhance the appeal of green bonds. The survey was conducted over two years ago, so the figures now would likely be even higher.

Investors can exert pressure on issuers to improve reporting practices. Guidance on several aspects of reporting has also increased in recent years, including through [ICMA's Handbook – Harmonised Framework for Impact Reporting](#)⁵², the [NPSI Position Paper on Green Bonds Impact Reporting](#)⁵³, and through our own [Post-issuance report](#), which provides an extensive list of best practice recommendations for issuers.

Policymakers and financial market participants can leverage this to drive greater and better post-issuance reporting, for instance by making the information easily available and potentially even offering technical support and financial incentives. In the meantime, momentum is gathering globally to create a common and widely adopted reporting framework for thematic debt instruments, which could be further spurred by the implementation of the EU Green Bond Standard. This would make it much easier for issuers to report and for investors and other data users to access the information, particularly if a centralised reporting platform is created in parallel (and there are already some being developed). In the green bond market, reporting has almost become a de facto requirement; and it may well become mandatory in the not-too-distant future.

In terms of impact reporting, it is also important to think beyond green bonds and other thematic debt instruments. The USA's Securities Exchange Commission (SEC) is becoming more active in this space. In March the SEC announced the opening of a comment period regarding climate change disclosures, with the

submissions planned to be used in developing future guidance and proposals on ESG issues more broadly.⁵⁴ In this light, SEC Chair Allison Lee recently indicated that the regulator is undertaking concrete steps to develop and implement a mandatory ESG disclosure framework.⁵⁵ Like developments in Europe, this could also be complemented by stricter ESG fund reporting in the medium-term.

Now that the USA is back in climate talks, the time is ripe for a new initiative that uses a common language and drives comprehensive, consistent sustainability reporting – and a robust, resilient transition – globally.

8. Spotlight Climate transition in the financial and real economy

This section explores the role of key economic sectors and industries – especially those at the core of the energy system – in facilitating the transition to a net-zero economy and maps out opportunities. The US and Canada are discussed separately, and there are case studies of issuers operating across the region.

The Energy system at the heart of transition

Energy is one of the central themes around the global climate debate and climate action. It is needed for most economic activities, serving as a key input for heat and electricity production, industrial processes, and transportation. This demand translates into a meaningful share of global GHG emissions, as well as those of North America. Whilst renewable and low-carbon alternatives are available, at this point most of the world's primary energy demand is still met by fossil fuels – coal, gas and oil.⁵⁸

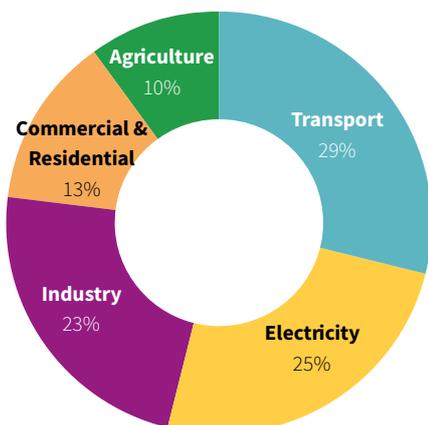
The COVID-19 pandemic has caused a massive decrease in global oil demand – with oil futures reaching negative prices for the first time in history and forecasts reflecting lower demand – and peak oil could be reached earlier than previously anticipated.⁵⁹ Concurrently, low-carbon alternatives such as solar, hydro and wind to generate secondary energy such as electricity, refined automotive fuels or hydrogen have been on the rise.

The US

In 2020, **the USA was the largest oil producing country in the world** as well as the largest natural gas producer.⁶⁰ In 2018, the oil and gas industry generated total revenue of USD181bn.⁶¹

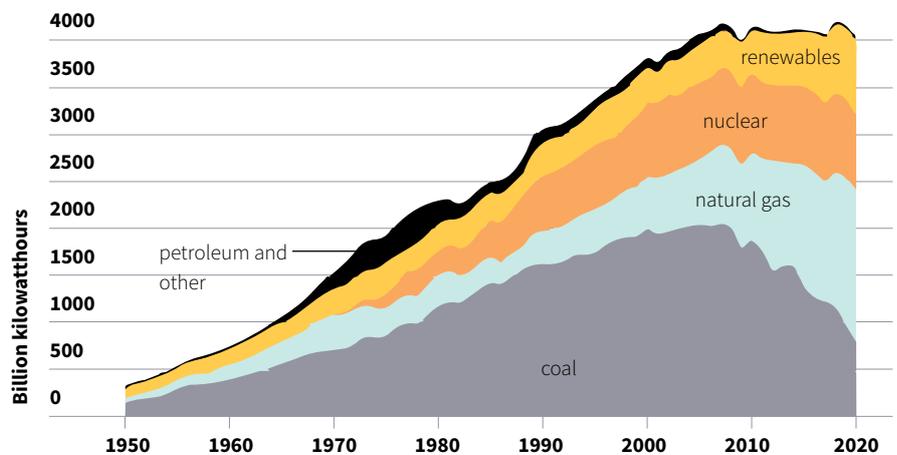


US GHG emissions by economic sector



Source: United States Environmental Protection Agency, 2021

US electricity generation by major energy source



Source: U.S. Energy Information Administration

In 2019, 82% (compared to 86% in 1990) of primary energy production in the United States came from fossil fuels, mainly from natural gas and oil. Of the 18% sourced from non-fossil fuel sources, the largest share is from nuclear (10%).⁶²

The transport sector accounted for the largest share of energy related GHG emissions with 29%, closely followed by electricity generation with 25%, and industry at 23%.

As of 2020, **60.3% of electricity generation was based on fossil fuels** with gas contributing the most (40.3%) followed by coal (19.3%) which made up the lion's share of emissions. Lower carbon alternatives such as nuclear and renewables (mainly wind, hydropower and solar) accounted for 19.7% and 19.8% respectively.⁶³

US decarbonisation policy: Energy generation and end use sectors

President Biden's decarbonization plans are focused on energy and on jobs. Key pillars include:

- A goal to **100% net neutral electricity by 2035**
- A **'Clean Electricity Standard'** requiring that a certain percentage of electricity in the United States be generated by zero-carbon energy sources.
- The **American Jobs Plan** aims to build a workforce and communities that benefit from a clean energy economy^{64,65} and includes substantial funding for R&D on clean technologies such as hydrogen.
- Biden's **tax plan**⁶⁶ to replace fossil fuel subsidies with clean energy incentives, such as a 10-year extension to the production and investment tax credits for renewable energy generation and energy storage, and a new tax incentive for long-distance transmission lines to help

distribute clean electricity. The plan also covers a blender's tax credit for sustainable aviation fuel, which could help decarbonise a key part of the US transport sector.⁶⁷

- The US Senate recently passed the **American Energy Innovation Act (AEIA)** to unlock investments in energy R&D such as geothermal, marine and hydrokinetic power, and grid-scale energy storage.⁶⁸
- The **Solar Investment Tax Credit** is a 26% tax credit for solar systems on residential and commercial properties enacted in 2006. This has given a massive boost to investment in solar energy and will phase out according to a schedule until 2023 and beyond.⁶⁹

State regulation offers an extra boost

At the state level, the **Renewable Portfolio Standards (RPS)** is a critical lever as it mandates the percentage of electricity that utilities sell that must originate from renewable sources. RPS have been adopted by 30 states and Washington D.C., and three territories. These vary but some encouraging developments are visible: for example, California is aiming for 100% of the electricity sold in the state to be renewable by 2045.

In the transport sector, State measures include funding for lower emission buses, and expanding access to EV charging stations.⁷⁰ The **Alternative Fuel Vehicle Tax Credit** can be claimed towards the cost of purchasing a new Alternative Fuel Vehicle or converting a vehicle to operate on an alternative fuel. Around 45 states offer incentives to support the growth of EVs or alternative fuel

vehicles and supporting infrastructure.⁷¹

Canada



In 2019, Canada's energy mix was still reliant on fossil fuels with 75%, compared with 25% from non-fossil fuels.

The fossil fuel component was mainly based on oil and gas, like the US.⁷²

Canada ranks fourth among oil producing countries having increased its output by 69% since 2009.⁷³ Similarly, Canada ranked sixth in 2019 in production of natural gas worldwide with roughly 19% of the United States' output.

The center of the oil and gas industry in Canada is Alberta and in **2018/2019 11% of total government revenue came from Alberta's oil and gas resources.**⁷⁴

The sector currently responsible for the highest proportion of emissions in Canada is transportation at 38%. Industry is the second largest, currently accounting for 36% of emissions with the main contributor being mining, quarrying, and oil and gas extraction with 17% of total emissions (electricity generation is wrapped into these figures).⁷⁵ Overall, electricity production makes up a relatively small share of emissions. In 2018, only 18% of electricity came from fossil fuels with the mix being dominated by hydroelectricity (60%). Wind, biomass, and solar power constituted 5.1%, 1.7% and 0.6% respectively.⁷⁶ Canada is the fourth largest producer of hydroelectricity globally.⁷⁷

The implications for GSS bonds

Sustainable finance can support the implementation of the strong policy support detailed above. The time is ripe for North American entities to utilise the sustainable debt markets for their low-carbon transitions.

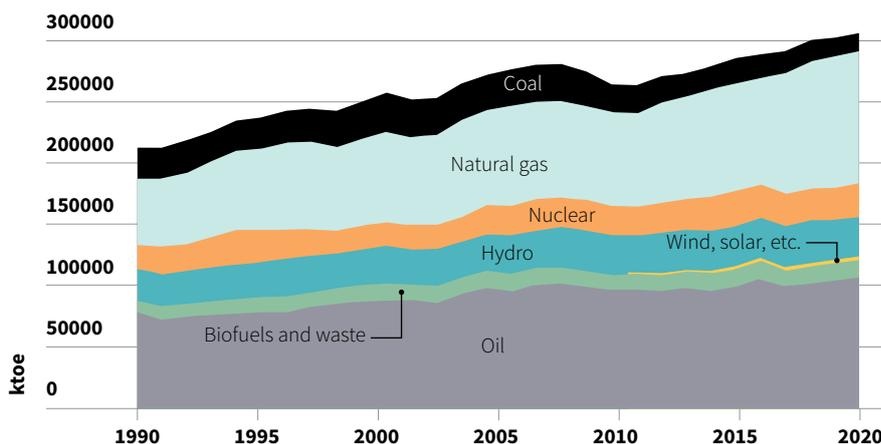
Transition finance

Transition investments – including labelled transition bonds and Sustainability-Linked Bonds (SLBs) – are slowly becoming more prevalent with approximately USD15bn and USD20bn issued to the end of Q1 2021.⁷⁸

Transition financing is intended to broaden the scope of industry sectors that can get involved in the collective decarbonisation effort. The types of entities and activities that are arguably best suited to benefit from this type of funding are those:

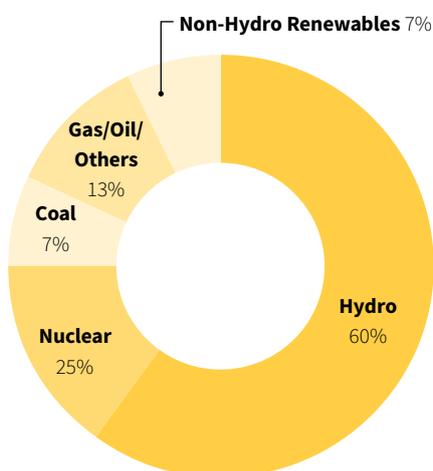
- that have a role to play in a post-2050 economy but for which the pathway to net zero is highly uncertain, and/or
- for which viable alternatives already exist or are expected to become available by then – therefore these should be phased out. Interim

Canada Energy supply



Source: U.S. International Energy Agency

Canadian generation by source, 2018



activities can also be important.

Green bonds are a transition mechanism

In addition to the newer transition bonds and SLBs, green bonds can be a mechanism for transition. Examples of transitioning from fossil fuels to renewable energy exist globally in the context of energy generation and utilities: Danish energy company Ørsted (former Dong Energy) funded most of its shift from a fossil fuel power company into a renewable energy pure play with green bonds. Peers EDF, Enel, and Iberdrola have done the same, with labelled green issues reportedly resulting in emissions savings equivalent to as much as 43% of their interim 2030 reduction targets.⁷⁹

North American energy issuers utilising the label

North American companies that already have green energy assets on their balance sheet and are financing them via green bonds include Algonquin Power which issued two green bonds with a combined amount of USD900m financing solar and wind power as well as hydro

Just transition

The transition of the energy sector will inevitably involve a changing landscape for jobs. The Canadian government is addressing some of the issues in the transition away from coal by establishing the Task Force on Just Transition for Canadian Coal Power Workers and Communities in 2018. The transition could yield estimated total economic benefits of CAD4.7bn (USD3.5bn), including CAD3.4bn (USD2.5bn) in avoided climate change damage. On the other hand, the Coal Association of Canada estimates this would eliminate 42,000 jobs. To address some of these questions, the Task Force outlined ten recommendations, a few of which the federal government addressed in the 2019 budget including:

- CAD35m (USD26m) allocated for a five-year period to fund Worker Transition Centres that will provide re-skilling and skills development programs to enhance economic diversification in Western and Eastern Canada, which is home to both coal mining operations and coal-fired generating stations.
- The establishment of a dedicated CAD150m (USD113m) infrastructure fund to support priority projects and economic diversification in communities affected by the transition.
- A pledge to explore novel ways to protect the wages and pensions for workers whose livelihoods would be most at risk.

The response to the Task Force and the government proposals has been largely positive, with many stakeholders calling for similar work to be undertaken in support of a transition away from oil and gas.⁸⁵

5 principles for an ambitious transition



1. In line with 1.5 degree trajectory

All goals and pathways need to align with zero carbon by 2050 and nearly halving emissions by 2030.



2. Established by science

All goals and pathways must be led by scientific experts and be harmonised across countries.



3. Offsets don't count

Credible transition goals and pathways don't count offsets, but should count upstream scope 3 emissions.



4. Technological viability trumps economic competitiveness

Pathways must include an assessment of current and expected technologies. Where a viable technology exists, even if relatively expensive, it should be used to determine the decarbonisation pathway for that economic activity.



5. Action not pledges

A credible transition is backed by operating metrics rather than a commitment/pledge to follow a transition pathway at some point in the future. In other words, this is NOT a transition to a transition.

and storage projects. Brookfield Renewable Partners, among the top five Canadian issuers with USD1.7bn, also issued multiple green bonds financing different projects, including renewable energy and storage. The company is also part of the climate-aligned universe with an alignment of 90% of revenue coming from green activities. Ontario Power Generation is also part of the fully climate-aligned universe and the green bond universe ranking number six in the top ten Canadian issuers having returned to the green bond market multiple times.

In the US market, issuers setting the tone include repeat green bond issuer MidAmerican Energy, which has issued USD1.4bn since its inaugural issuance in 2017. All the bonds financed wind power projects. Others, such as DTE Electric issued multiple green bonds having set goals to reduce the carbon emissions of its electric utility operations by 32% by 2023, 50% by 2030, and 80% by 2040 from 2005 levels and achieving net zero emissions in the electric business by 2050. The company's plan is also to transition away from coal-powered sources. The bonds mainly finance wind energy projects and energy waste reduction projects. Similarly, Duke Energy and Xcel Energy have both come to the market multiple times since 2018 financing mainly solar and wind projects, respectively.

In addition to assets and projects that are already financed through labelled debt instruments, there are companies that have such assets on their balance sheets yet not financing them through green bonds. Examples are pure-play issuers such as Tesla or SunPower Corp, both fully committed to a transition to a

low-carbon economy.

Potential in transport

Global companies in key energy end-use sectors are seasoned green bond issuers. The automotive (auto) industry provides examples with labelled deals outstanding from the likes of Volvo, Volkswagen and Porsche. This has yet to impact the US auto market, with Toyota the only issuer to come to the market so far. However, in 2020, the largest automaker in the US, General Motors (GM), committed USD20bn to developing EVs over the next five years, and the company subsequently became the first US-based auto company to pledge to phase out all ICE vehicle production by 2035.⁸⁰ Ford recently introduced its all-electric F-150 Lightning Pro, the first-ever all-electric F-Series truck purpose-built for commercial customers.⁸¹ These and other auto companies are adding green assets to their balance sheet that could be financed or refinanced via green bonds.

What comes next – identifying the big opportunities

Labelled bonds can finance transitions that require companies to transform their business models, and many North American companies across the key sectors of energy (generation and utilities) and transport (auto and aviation) appear poised to take advantage of the variety of transition funding mechanisms available to them, including green bonds, SLBs and transition bonds. Buy-side pressure to move is mounting. In September 2020, the institutional investor group Climate Action 100+ comprising more than 500 members with a combined USD47tn AUM, invited the world's 161 highest-emitting companies to release their plans for achieving net-zero emissions by 2050. The Climate Action 100+ Net Zero Company Benchmark details which

companies are leading the transition to net zero emissions and was published in March 2021.⁸²

For example, Canadian national airline Air Canada recently set a net zero target that will involve a host of absolute midterm GHG net reduction targets by 2030 in its air and ground operations vis-à-vis a 2019 baseline. The company also committed to investing USD50m in Sustainable Aviation Fuel (SAF), carbon reduction, and carbon removal. Much of the improvements to its existing fleet and the scaling up of SAFs – both of which are highly capital-intensive activities – could benefit from transition bonds and other financing mechanisms. Air Canada's peers in the US recently announced a joint net zero effort, including significant planned action on advancing SAF.⁸³ This indicates further opportunities for (labelled) transition financing.

Shareholders are keen for the highest emitters to adopt climate friendly policies. Exxon Mobil appointed two new climate-minded Board members in May 2021.⁸⁴ The new Board members were nominated in a resolution from a minority climate activist shareholder, hedge fund Engine No. 1. Exxon has previously come under pressure from one of their largest shareholders, asset manager giant BlackRock, who are pushing companies to set a course to limit global warming to below two degrees by 2050. BlackRock voted in favour of the members named by Engine No. 1. Though the company does not yet have a comprehensive transition strategy in place, the vote is a signal that shareholders in the world's most polluting companies expect action. A serious decarbonisation move from Exxon could entail a watershed moment for the industry. Also in May, shareholders of Chevron, which has not set a target to reach net zero, voted in favour of a proposal to cut Scope 3 (end user) emissions.

9. Spotlight Green securitisation in the US

Introduction

The securitisation market is well developed in North America, and at the end of 2020, there was USD12.7tn of debt outstanding in commercial mortgage-backed securities (CMBS), residential mortgage-backed securities (RMBS), and ABS.⁸⁶

A securitisation qualifies as green when the underlying cash flows relate to low-carbon assets or where the stated use-of-proceeds are low-carbon assets.

Examples of financial assets suitable for green collateral pools



mortgages on certified buildings, e.g., under LEED, BREEAM, Energy Star or other building standards



mortgage financing for energy efficiency upgrades



loans for energy efficiency improvements such as PACE



loans/leases on electric and alternative fuel vehicles



loans/leases on solar and wind energy generation assets



loans/leases on equipment, e.g., EV charging stations



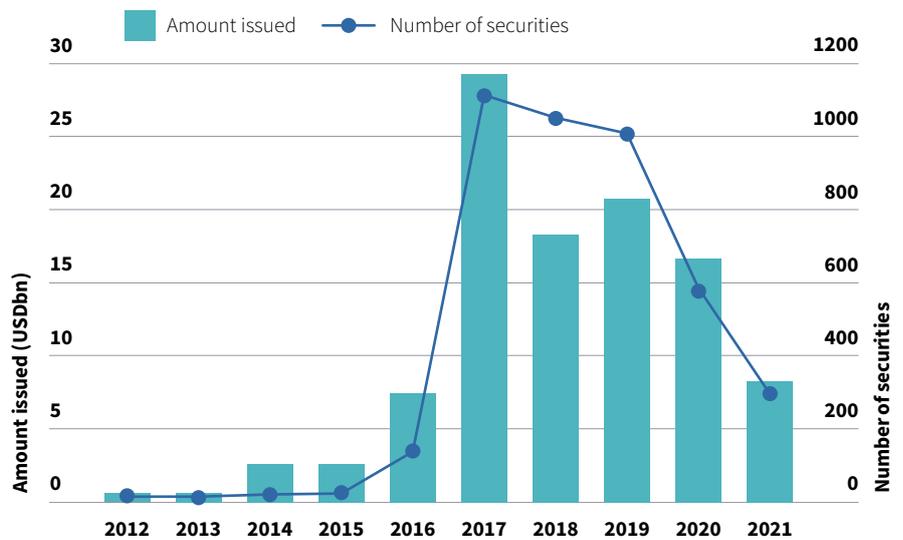
loans to green (pure play) SMEs

Green securitisation

The US is the leading source of securitised green debt, and as of the end of Q1 2021 the cumulative volume stood at USD115.5bn, originating from 25 issuers and over 4,250 deals. The Climate Bonds Green Bond Database does not currently include any securitised deals from Canada, and the social and sustainability dataset does not include any deals categorised as ABS.

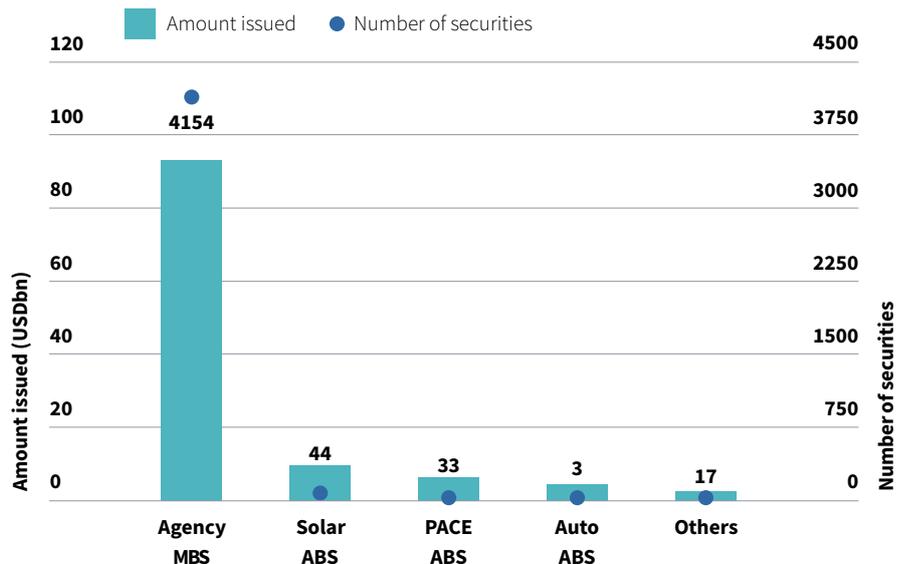
So far, green securitisation has been dominated by MBS from Fannie Mae, which, by the end of Q1 2021, had issued 4158 deals worth a total of USD92bn, making it the largest single issuer of green debt globally (EIB was second with USD43.5bn). The underlying assets are loans secured on properties with Green Building certification or to which energy efficiency

US green ABS peaked in 2017



Source: Climate Bonds Initiative

Types of securitisation used in the US green bond market



Source: Climate Bonds Initiative

improvements will be made. The second largest presence in US green securitisation is Toyota which has issued three bonds worth a combined USD4.6bn. The underlying assets are retail loan and lease contracts on low emission vehicles, which will contribute to reducing GHG emissions from the transport sector. Renovate America has issued 14 deals worth USD3bn. Renovate America is a financing provider of the California-based Property Assessed Clean Energy (PACE) financing provider and issued labelled green ABS as securitisation of PACE loans. The proceeds of

these green ABS will be used to refinance home improvements projects, such as renewable energy, energy efficiency and water improvement projects through the Home Energy Renovation Opportunity (HERO) programme. Solar Mosaic has issued nine deals worth a combined total of USD2.3bn. These are secured by pools of loans incurred by homeowners to finance the purchase and installation costs of solar energy system on their home, which are offered to them by a network of installers.

Opportunity

At the end of Q1 2021, outstanding US green securitisations constituted around 1% of the total US securitisation market. There is huge potential for this segment of the market to grow, some examples are highlighted below:

Home lending

As of Q3 2020, the US MBS market stood at USD11.2tn, while Climate Bonds captured green MBS worth USD93bn, i.e., less than 1%.⁸⁷

Commercial and residential property are the source of 13% of GHG emissions in the USA, and 12% in Canada. Pervasive green standards for new builds and increased energy-efficient retrofits to existing stock will be crucial to the stated ambitions of both nations to halve emissions by 2030. Biden's infrastructure plan includes measures to build and retrofit energy efficient homes and could tilt domestic borrowing towards expenditures and projects which could be classified as green. Many lenders are already sitting on green portfolios suitable for green securitisation, and green tagging exercises should be undertaken on existing portfolios and ongoing lending to classify and identify such assets. Green bond issuers have noted that exercises such as green tagging help to focus company attention on green initiatives and increase visibility internally.⁸⁸ In some cases, this has resulted in preferential borrowing costs for green Use of Proceeds loans. Green tagging also helps issuers to categorise exposures embedded in their own liabilities.

SME pure play lending

The Climate Bonds climate-aligned research sets out a framework to evaluate the green credentials of pureplay borrowers. Lenders could use this framework to categorise lending to SMEs and bundle the resulting loans into green securitisations.

Electric vehicles

As of Q3 2020, there was USD206bn outstanding in US auto ABS. So far, Toyota has brought three green auto receivables bonds to the market worth a combined USD4.6bn (USD842m outstanding at the end of Q1 2021).⁸⁹ These bonds were secured against cash flows from existing car leases and the proceeds financed new leases and loans exclusively on hybrid and electric vehicles. The transfer of capital from existing brown assets to finance green assets can help to fund the transition to a low carbon economy.

According to the EPA, transportation is the largest source of US GHG emissions, responsible for 29%. Over half of that originates from passenger cars, medium- and heavy-duty trucks, and light-duty trucks, including sport utility vehicles, pickup trucks, and minivans.⁹⁰

In the US, plug-in hybrid electric vehicles (PHEVs) and zero emission vehicles (ZEVs) comprise just 2% of the new car market and 1% of all cars, sport-utility vehicles, vans and pickup trucks on the road. The top three reasons consumers give for not buying PHEVs and ZEVs are lack of charging stations, time to charge, and the cost of purchasing the vehicle in the first place. Biden's USD2tn infrastructure plan earmarked up to USD174bn to address those issues.⁹¹ Proposed initiatives include tax credits and rebates for individuals and businesses, and the installation of half a million charge points by 2030. Money will also be made available to encourage auto companies to manufacture PHEVs and ZEVs in the US and improve battery storage. Further, Biden has committed to achieve or facilitate clean and zero-emission vehicles for Federal, State, local, and Tribal government fleets, including vehicles of the United States Postal Service (currently 200,000), hence adding an imperative to infrastructure development.⁹²

California and Massachusetts will require a complete transformation to ZEV (including PHEV) sales by 2035 and other states are considering similar initiatives. Globally, automakers are concentrating all their development resources on such vehicles, for instance GM will invest USD27bn on ZEVs including autonomous vehicles over the next four years. This will inevitably be a massive growth market.

Almost 95% of Americans own cars, and a recent study determined that auto loans are used on 85% of new and 53% of used car purchases in America.⁹³ As purchases tilt towards ZEVs, the amount of green auto receivables available for securitisation will accelerate, and we therefore expect this segment of the green securitisation market to grow in the medium term.

Solar energy

Solar ABS is currently the second largest source of green securitisation in the US, with USD9.9bn spread over 44 deals issued to the end of Q1 2021. Residential solar company Solar Mosaic was the largest single issuer with nine deals worth USD2.2bn.

Solar ABS are secured on cash flows from solar assets. Most deals are backed by lease payments and power purchase agreements. Some are backed by loans extended to fund the acquisition and installation of solar panels, predominantly for electricity generation. Solar ABS has been used primarily to refinance residential rooftop solar, but commercial solar has considerable scaling potential. The availability of subsidies and the level of feed-in tariffs can influence the level of issuance and several policies at the federal, state, and local levels have encouraged the adoption of solar energy in the US. The most prominent of those is the federal solar investment tax (ITC) which has contributed to a

10,000% growth in the US solar industry since it was enacted in 2006. In December 2020, this was extended for a further two years.⁹⁴ At state level, the California solar mandate requires that all new single-family homes and multi-family residences up to three stories high and permitted after January 2020 must have a solar photovoltaic system as an electricity source. This and other policy support is expected to contribute to the continued growth of the solar business in the US affording further opportunities for securitisation.

PACE

The US Property Assessed Clean Energy (PACE) model is an innovative mechanism for financing energy efficiency and renewable energy improvements. PACE loans fund the upfront cost of energy improvements on residential and commercial properties and are paid back over time by property owners through property tax bills. The sponsoring states implement legislation to collect loan repayments through property tax bills and redistribute them to lending agencies. PACE-enabling legislation is active in 36 states plus D.C. and PACE programmes are launched and operating in 24 states plus D.C. Residential PACE is offered in California, Florida, and Missouri. There is potential for this to scale up as states implement programmes.

The funding and credit risk are passed onto ABS investors through the securitisation of the loans. Each ABS frees up lending capacity for new loans.

10. Spotlight Green bond pricing in the primary market

Since 2017, Climate Bonds has published a series of green bond pricing research papers.

The purpose of the series is to determine whether investors attach any value to the green label and to explore any market dynamics that could influence the price of green bonds.

Between 2016 and December 2020, there were eight qualifying bonds originating from issuers based in Canada and 48 from the US, together, these 56 bonds constitute the sample discussed here.

Green bonds attract larger book cover

Book cover data was available for 42 green bonds in the sample. On average, green bonds achieved a reconciled book cover of 3.6x against 2.8x for vanilla equivalents with 60% of green bonds achieving larger book cover.⁹⁵ In November 2020, Ontario Teachers' Pension Plan achieved book cover of 8.9x for a EUR750m (USD891m) 2030 bond. This is remarkable given that Ontario Teachers' is in the SSA asset class, where pricing metrics are typically less dramatic compared to corporate issuers. Ontario Teachers' has committed to net-zero emissions by 2050 and has stated that it will hold itself accountable by establishing concrete targets for portfolio emissions and investments in climate solutions. Progress will be audited annually. A well-defined sustainability or transition strategy that includes clear ambitions and quantified measures towards carbon reduction targets can give investors additional comfort around green bonds and the wider labelled universe and minimise exposure to greenwashing.

Green bonds achieve greater spread compression

Spread compression data was available for 45 bonds in the sample. Two bonds achieved the same levels of spread compression as vanilla equivalents, slightly more than half (56%) achieved a greater magnitude of spread compression. For instance, Johnson Controls (JCI) managed spread compression of 30bps with its debut green bond, a USD625m 10-year. JCI was issued in USD and priced in September 2020, when demand for all types of US bond was high. However, the matched vanilla equivalent achieved a spread compression of 20bps.

Methodology

Our pricing analysis aims to capture the most liquid portion of the labelled green bond market.

Qualifying bonds must meet the following criteria:

- **Currency: EUR or USD**
- **Prior to 2018, a minimum size of USD300m, thereafter >= USD500m**
- **Investment grade rated by at least one agency**
- **Minimum term to maturity of three years at issue**
- **Consistent with the Climate Bonds Taxonomy and included in the Climate Bonds Green Bond Database**

Amortising, perpetual, floating rate, and other non-vanilla structures are excluded.

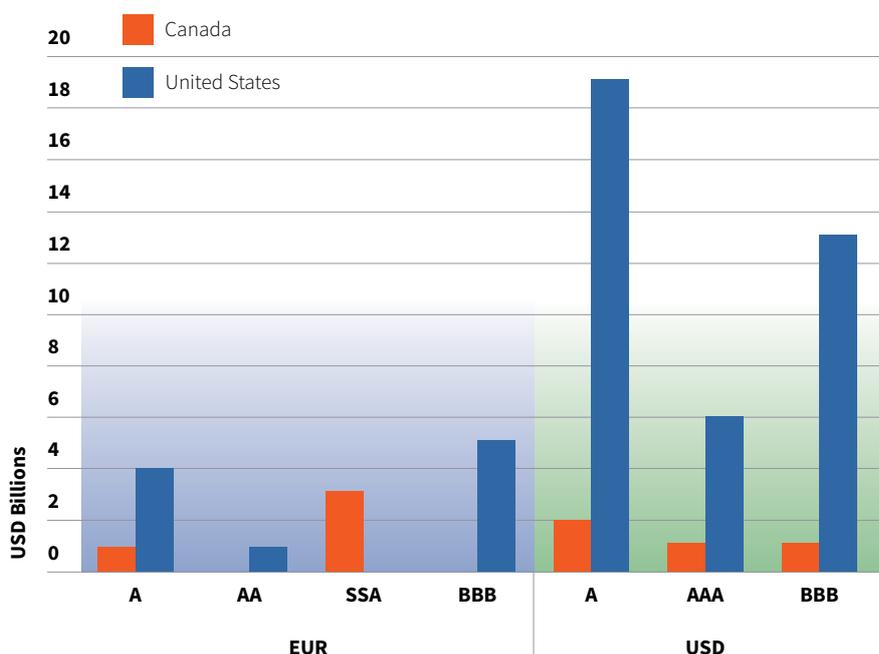
To contextualise behaviour, each green bond is compared to carefully selected vanilla equivalents sharing similar characteristics. Comparable baskets include bonds issued in the same quarter as the subject green bond. Comparable bonds must fit the parameters described above except that they are not labelled green or otherwise. Baskets comprise the closest possible matches based on the following considerations in order of priority: a) currency, b) market type (EM/DM/Sukuk), c) no

other thematic label d) seniority e) maturity, f) credit rating and g) sector, among bonds issued in the same quarter. If corresponding bonds cannot be found, best efforts are made to find suitable alternatives from the available sample. The resulting baskets are a proxy for how the money could have been invested in the same quarter in which the green bond was issued. The number of bonds in each basket varies. We acknowledge that bonds behave differently depending on when they are issued and that geo-political events can affect bond prices from one day to the next. This proxy was designed to circumvent the fact that vanilla bonds and green bonds with similar characteristics are rarely issued on the same day. *Example: Coca-Cola Femsa SAB de CV 1.85% 01/09/2032 was priced 26th of August 2020 and was compared with a single bond, Mars Inc. 1.625% 16/07/2032 which was priced on 13th July 2020.*

For immediate secondary market performance, each bond is matched with a corresponding iBoxx bond index. This is to compare the performance of new green bonds to 'the market'. *Example: Verizon 1.5% 18/09/2030 was matched with iBoxx USD Corporates BBB 7-10 years index.*

In our analysis counts we only include bonds where data is available for both the green bond and the equivalent.

48 North American bonds qualified for Climate Bonds' pricing analysis



Source: Climate Bonds Initiative

Around half of green bonds were allocated to investors describing themselves as green

Issuers included in our pricing analysis are contacted and invited to disclose the percentage of their green bonds that were allocated to investors describing themselves as green. At present, there is no standard methodology for this, and some issuers decline to contribute because of the ambiguous nature of the data. Data was gathered for 26 bonds in the sample, and almost half (49%) was allocated to dedicated green investors.

Green investors are growing in number and represent a unique source of support for green bond issuers. The COVID-19 pandemic has put greater emphasis on socially responsible investment strategies, and we expect this interest to continue to grow with supportive policies from Canada and the US. Further, broad market

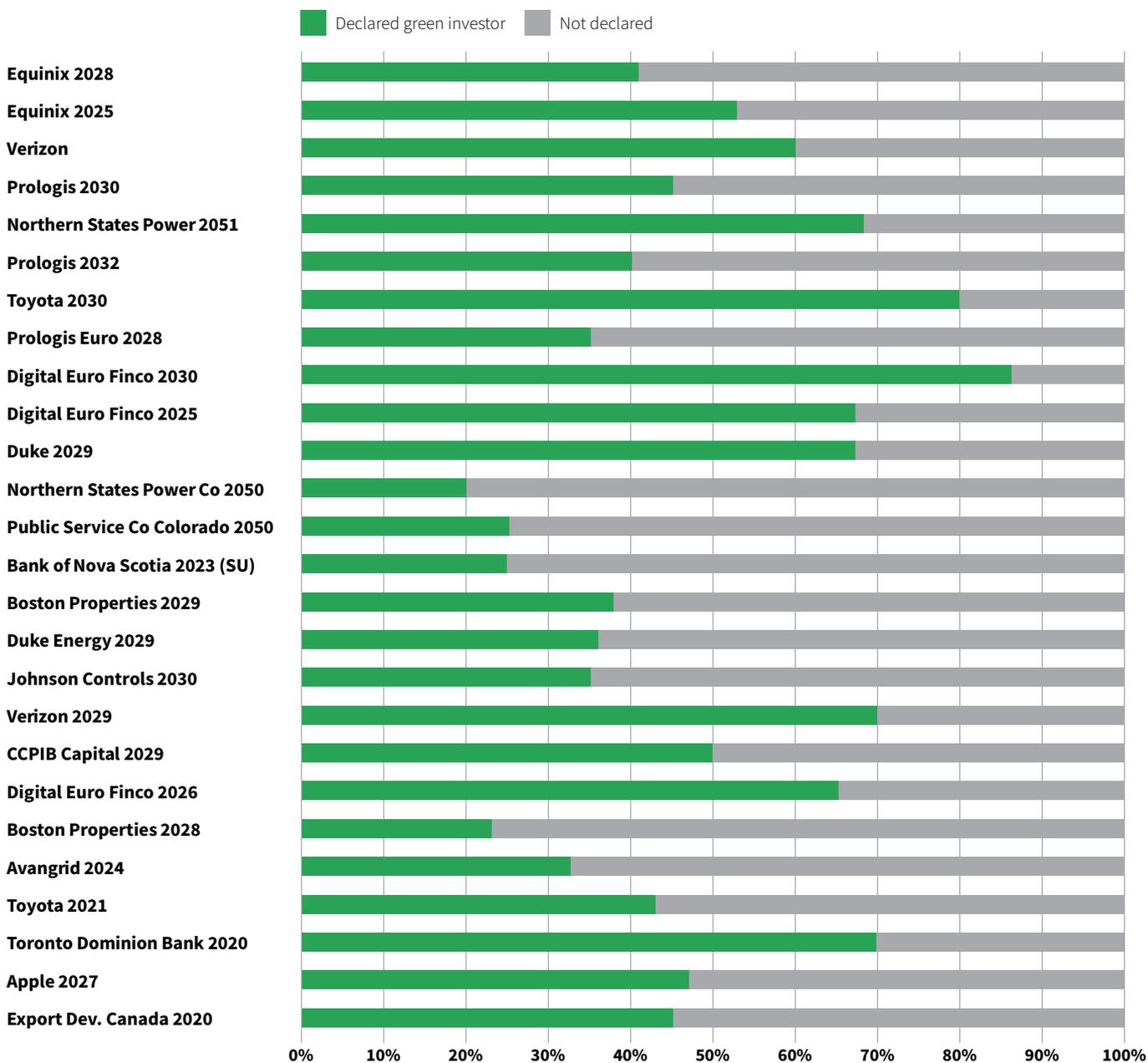
indices include green bonds where they meet the criteria for constituent inclusion, and therefore any investor benchmarked to such an index would consider all eligible bonds, including those labelled green. As more benchmark sized green bonds are issued the extra demand from mainstream investors will escalate. In April 2020, Climate Bonds published [The Green Bond Treasurer Survey 2020](#), a comprehensive assessment of 86 treasurers' experiences of issuing green bonds. Treasurers almost always described the inclusion of new investors as an intangible benefit of issuing green bonds.

The most frequently stated benefits of this were

1. A more diverse pool of investors, offering greater flexibility to reopen or issue new bonds
2. A stickier investor base and
3. Greater visibility.

91% of respondents to the survey said a green bond facilitated more engagement with investors compared to a vanilla one. Investors interrogated issuers on topics including the use of proceeds, the framework, and post issuance reporting. This dialogue resulted in investors having a more intimate knowledge of the organisation. Over two thirds (70%) of respondents said the demand for their green bond was higher than for vanilla equivalents. These findings were consistent with anecdotal evidence we have gathered from multiple conversations with treasurers and primary dealers in the preparation of our pricing research series.

Almost 50% of green bonds were allocated to green investors



Source: Climate Bonds Initiative

Three quarters of green bonds achieved a greenium

Climate Bonds defined and monitors the concept and the presence of the greenium.⁹⁶ The new issue premium is the extra yield that a buyer receives, and a seller pays for a new bond compared to where seasoned bonds from the same issuer are trading in the secondary market at the time of issuance. A new issue premium is a standard feature of the bond market.

Sometimes, a bond may be issued with a higher price, and thus lower yield compared to outstanding debt. The bond will price inside its own yield curve. This is known as a new issue concession; when present in a green bond, we have termed it greenium.

Yield curves were available for 30 bonds in our sample. Twelve bonds priced with a greenium, 11 priced on their yield curves, and seven priced with a normal new issue premium.

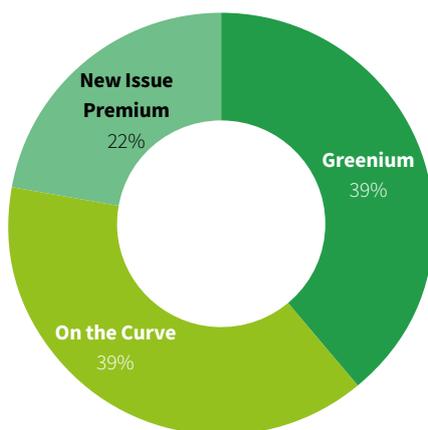
More than three quarters of the bonds in the sample priced either on the curve or with a greenium, which suggests that investors do attach value to the green label. In 2021, investors are likely to be more cautious given the post-COVID economic recovery and associated inflation expectations. However, there is a woeful shortage of large US green bonds with adequate transparency, and until this is addressed, we expect the squeeze on pricing to persist, albeit in a potentially less exaggerated way.

Performance in the immediate secondary market

Many bonds deliver price tightening in the immediate secondary market since investors may want to increase their position or open a position in a bond they did not get allocated. Timing is an important factor, because bond indices rebalance at each month end. Therefore, for bonds issued early in the month, managers could add some off-benchmark performance. Once bonds enter indices, except for credit events, liquidity largely evaporates, and accurate spreads are quoted on a bilateral basis. Our consideration of the secondary market consequently only extends to one month post pricing date for each bond.

More bonds in our sample exhibited tighter spreads after both one week and month than not. When compared to vanilla bonds and indices, after a week slightly fewer US bonds had experienced greater spread tightening compared to vanilla baskets, but when compared to seasoned bonds represented by indices, the number was close to 80% of green bonds. After a month, more US bonds had experienced a greater magnitude of spread tightening compared to both vanilla baskets and indices. Canadian bonds exhibited stronger secondary market tightening than equivalents across all metrics. This is encouraging and suggests that

North America pricing outcomes



green bonds can offer benefits to investors, since they tend to tighten more aggressively in the secondary market compared to vanilla equivalents.

Our analysis demonstrates that broadly speaking, green bonds offer pricing benefits to both issuers, and investors. This topic is analysed in greater depth in our ongoing Green Bond Pricing in the Primary Market research series, which is available to view and download at <https://www.climatebonds.net/resources/reports>. The next paper will include bonds issued in H1 2021 and will be available in September 2021.

US and Canadian bonds priced with a greenium

Country of Risk	Bond	Pricing Date
CA	CIBC 2025	10/19/2020
US	Equinix 2025	09/23/2020
US	Equinix 2028	09/23/2020
US	Verizon	09/16/2020
US	Prologis 2030	08/06/2020
US	Metlife 2025	06/29/2020
US	Niagara Mohawk Power 2030	06/23/2020
US	Toyota 2030	02/10/2020
US	Duke 2029	11/21/2019
US	MidAmerican Energy 2050	10/01/2019
US	Toyota 2021	11/14/2017
US	MidAmerican Energy 2027	01/23/2017

Green bond spreads tighten in the secondary market

Bonds in our sample	US	Canada
Spread tightening: Green bonds exhibiting tightening spreads 1 week post pricing date	51%	100%
Spread tightening: Green bonds exhibiting spread tightening 1 month post pricing date	69%	88%
Compared to vanilla equivalents: Green bonds exhibiting a greater magnitude of tightening after 1 week	49%	86%
Compared to vanilla equivalents: Green bonds exhibiting a greater magnitude of tightening after 1 month	68%	75%
Compared to iBoxx indices: Green bonds exhibiting a greater magnitude of tightening after 1 week	79%	86%
Compared to iBoxx indices: Green bonds exhibiting a greater magnitude of tightening after 1 month	76%	88%

11. Outlook

Finance can play a vital role in accelerating the transition to a zero-carbon economy and building a climate-resilient future. Following record growth in GSS instruments in 2020, we expect 2021 and the following years to continue the positive trend. Increased policy support starting with the net-zero commitments we have seen from the US and Canadian administrations and increasingly sophisticated investor expectations are expected to encourage more entities to audit their businesses to mitigate against and prepare for the impacts of climate change and associated policy risk which will be reflected in the greening of capex and borrowing programmes.

The Paris Agreement is a global target and will require international collaboration, particularly with the largest emitting nations – China, the US, EU and India. With the US back in climate talks and committing to net-zero, the major global economies are aligning on climate change. International collaboration is crucial at all levels – central banks, ministries, etc. The US and Canada’s membership of and participation in global bodies such as NGFS, IPSF and others are critical to facilitating the re-orientation of finance to support SDG goals and to enabling the international flow of capital between developed and emerging markets.

Canada’s decision to issue a sovereign green bond in 2021 is a welcome step as is the May announcement of a Sustainable Finance Action Council. Extending the existing green bond programmes at a provincial level in Canada would amplify the impact of the upcoming sovereign bond. The proposed Biden infrastructure bill provides a platform to stimulate much needed climate resilient investment in the US built environment. A renewed focus by the SEC on climate risks and opportunities facing corporations and investors will eventually lead to a positive impact in ESG investment. In both nations, political action would engender a further response from the private sector, deepening respective markets and encouraging more participants.

Notwithstanding this positive backdrop, the current USD311bn of GSS debt described in this paper is inadequate for addressing the scale of the climate crisis. At the end of Q1 2021 total GSS debt from the US constituted 0.6% of the USD46.2tn local bond market, while for Canada, the figure was 0.9% of USD3.7tn. Now more than ever, with supportive leadership, the US and Canada have an opportunity to contribute to the greening of both public and private sector expenditures.

Six factors will be essential to the growth of the GSS debt markets in North America:

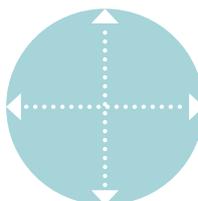
1. Sovereign GSS bonds issued by the US and Canada

will support policy commitments and targets for carbon neutrality and endorse the development of a liquid GSS bond market. The US should follow Canada’s announcement and signal an examination of green issuance within its debt programme. This would add considerable momentum to the development of liquidity within the global GSS bond market. [The Climate Bonds Sovereign Green, Social, and Sustainability Bond Survey](#) describes a range of benefits experienced by nations issuing sovereign GSS debt.⁹⁷ A strong signal of commitment, and green market creation were two examples of both a motivation to issue, and an outcome.



2. A broader range of GSS issuers

will facilitate the commitment of high-profile investors. Prominent asset owners such as the San Francisco City and County Employees Retirement System and CalSTRS have already integrated responsible investment principles into their policy guidelines. More would be inclined to commit to thematic investing if they were able to construct well diversified portfolios. Entities from all economic sectors can issue GSS bonds to finance the transition of their activities to protect their revenues from climate risks. And yet, the North American GSS market is totally dominated by agencies and municipalities with very little representation from the real economy especially heavy emitting sectors (which need to transition).



3. Clear transition pathways will enable issuers from a broader range of sectors to be active in the GSS market at scale.

Both investors and issuers need clear guidance to determine the transition pathway for different sectors, its application to whole entity transition strategies, and then to bond issuance. The decarbonisation of industrial sectors like cement and steel is pivotal to achieving an inclusive transition. This will enable institutional investors, policy makers and the market to place increasing focus on preferencing and directing capital flows to support entities and activities that are following credible transition pathways and away from those that are not.



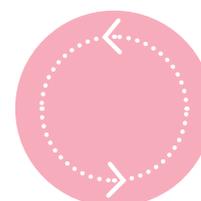
4. More benchmark-sized, labelled deals

create critical mass. Global, high profile investors with dedicated mandates can help to drive policy change and shift capital at scale. GSS assets and revenue streams beyond the labelled space exist on the balance sheets of many North American issuers. Analysis of climate-aligned bond issuance in the US market demonstrates huge potential for the GSS market to grow if such issuers refinance their vanilla debt or finance expansion via GSS labelled bonds. European real estate company, Gecina, has set a precedent by labelling all its existing debt as green, and committing to only issue under thematic labels in the future.



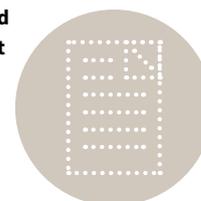
5. Repeat issuance

enables issuers as well as investors to leverage economies of scale: as outlined in the [2020 Climate Bonds Green Bond Treasurer Survey](#), issuers incur a marginally higher cost for their initial green bond as most of them carry out an internal audit to determine which assets and projects to include in their green bond, as well as external reviews. Investors benefit from buying bonds from repeat issuers as the due diligence on the issuing entity will be conducted for the first bond and reviewed for subsequent deals.



6. Clear, accessible, and consistent pre and post issuance reporting – bolstered by wider use of third-party reviews – will support investor confidence in the credibility of the GSS

themes. Many investors like the transparency afforded by GSS bonds but that is only helpful if the reporting is delivered. As noted, pre and post issuance reporting in North America is improving, and we expect to see this increase further, along with impact reporting. Issuers must plan or be helped to plan, the scope, timing, and content of their reporting well in advance, and make sure it is delivered on time and is accessible to market participants.



Appendix A

We cover three sustainable debt themes based on the projects, activities, and expenditures financed: green, social, and sustainability. Pandemic bonds are included as a sub-set of the social theme.

The themes can be described as follows:

Green: dedicated environmental benefits (captured since 2012)

Social: dedicated social benefits (captured since 2020)

Sustainability: green and social benefits are combined into one instrument (captured since 2020).

The methodology used to identify climate-aligned bonds and issuers is described below and is independent.

Methodology overview

This report is based on the Climate Bonds Green Bond Database, as well as the Social and Sustainability Bond Database. To qualify for inclusion, debt instruments must a) have a label and b) finance sustainable projects, activities, or expenditures. Debt labels describe the types of projects, activities, or expenditures financed, and/or their benefits. 'Green', 'Social', and 'Sustainability' labels are the most common in each theme, but a broad range of labels is used (see Appendix B).

Green

All deals in the green theme have been screened to verify their integrity. Screening is based on a set of process rules stipulated in Climate Bonds Green Bond Database Methodology, including the following two overarching criteria:

1. Deals must carry a variant of the green label
2. All net proceeds must verifiably (based on public disclosure) meet Climate Bonds' green definitions based on the Climate Bonds Taxonomy.⁹⁸

Social and sustainability

Market participants have not yet developed a "social taxonomy" or equivalent classification and screening system, though work on this is ongoing in the EU and elsewhere. Climate Bonds does not screen social and sustainability bonds' use of proceeds against performance thresholds. The use of proceeds are, however, classified in accordance with the respective labels and categorised as follows:

Sustainability:

Label describes a combination of green and social projects, activities, or expenditures e.g., sustainable; SDG; SRI; ESG, etc.

Social:

Label is exclusively related to social projects e.g., pandemic, COVID-19, housing, gender, women, health, education, etc.

Thus, any instrument financing only green projects is included in the green theme irrespective of its label. On the other hand, a sustainability-labelled bond that only finances social projects, as well as one that finances a combination of green and social, is considered to fall under the sustainability theme. Because of this, our analysis of other themes provides an initial indication of capital market funding aimed at each theme based on the deal label (Appendix B).

Climate-aligned methodology

Climate-aligned bonds are identified via two research phases: the issuer screening, and the subsequent identification of climate-aligned bonds.

1. Issuer screening

In the first phase, climate-aligned issuers are identified through an analysis of the revenue streams of a global pool of public and private companies and entities. Revenue streams are assessed based on their alignment with the climate-aligned activities table across eight climate categories: Renewable Energy, Transport, Buildings, Water, Waste, Land Use and Agriculture, Climate Adaptation, and ICT (Information and Communications technology). Only companies (or their subsidiaries and/or financing arms) with outstanding debt are eligible for inclusion.

- Companies that derive at least 95% of their revenue streams from climate-aligned activities are classified as fully-aligned issuers
- Companies that derive between 75%-95% of their revenues from climate-aligned activities are classified as strongly-aligned issuers

2. Identification of climate-aligned bonds

In phase two, the amount of climate-debt is calculated. Bonds issued by climate-aligned issuers are defined as climate-aligned bonds as they finance and/or refinance operating activities that have been identified as climate-aligned. The total climate-aligned outstanding debt is calculated as follows:

- For fully-aligned issuers: 100% of outstanding debt is considered climate-aligned
- For strongly-aligned issuers: a pro-rata amount based on the issuers' percentage alignment is considered climate-aligned. For example, if an issuer is 80% aligned, then 80% of its outstanding debt is considered climate-aligned.

- The combination of climate-aligned outstanding volume issued by fully- and strongly-aligned issuers is defined as climate-aligned outstanding debt, and this is the basis for the charts and market analysis below.

Not included in the market analysis in this report

Transition labels

Transition finance describes instruments financing activities that are not low- or zero emission (i.e., not green), but have a role to play in decarbonising an activity or supporting an issuer in its transition to Paris Agreement alignment. The transition label enables inclusion of a more diverse set of sectors and activities. At present, transition bonds predominantly originate from highly polluting, and hard to-abate industries. They do not fall into the existing definitions of green but are a critical component of a transition to net zero. Example sectors include extractives such as mining; materials such as steel and cement; and industrials including aviation. Work around building standards for transition activities is underway; we discuss progress in and implications for North America on page 25.

Performance-linked instruments

Performance or KPI-linked debt instruments are excluded from this analysis. These instruments raise general purpose finance and involve penalties (e.g., coupon step-ups) linked to not meeting pre-defined, time-bound sustainability performance improvements. The two main types of instruments are commonly referred to as Sustainability-Linked Bonds (SLBs) and Sustainability-Linked Loans (SLLs). Climate Bonds does not presently examine or track data on SLBs or SLLs, preventing inclusion of these categories of debt in this analysis. However, coverage of performance-linked instruments is currently in development and the theme is discussed on page 25.

Appendix B

Methodology notes and caveats

1. Due to the methodological difference between Green and other themes, our analysis of other themes is merely an indicator of the financing aimed at each, based on the deal's label. For instance, some deals labelled as 'SDG', and therefore included under the Sustainability theme, may only actually finance social projects. Importantly, there will also, for example, be various deals under the Social and Sustainability themes that finance, in whole or in part, pandemic-related investments. Climate Bonds is developing the more granular UoP analysis for other themes.

2. Some of the analysis is shown in terms of 'number of issuers' rather 'amount issued' – this reflects the number of issuers in each individual theme. The total number of issuers is slightly lower than the total adding across themes, since some issuers have printed deals that cover more than one theme.

3. Our Green Bond Database includes many loans and ABS (securitised) deals. We have historically treated these as issuer types, and the same applies to this report. However, under our new methodology, these are considered different instrument – not issuer – types. It remains uncommon to see loans or ABS deals with a sustainability, social, or pandemic label (a reminder that performance-linked loans are not included).

4. In addition to the exclusion of performance-linked instruments and transition labels, we excluded several deals because we could not find publicly available labels. This included some by repeat issuers, most of which had issued clearly labelled deals – where possible, we suggest improving the availability and clarity of information related to each deal, including labels.

Climate Bonds Database updates

Climate Bonds has been expanding data coverage to other labelled debt instruments, particularly sustainability and social bonds, and a separate database covering these will be launched later in 2021. The extended databases will complement other enhancements to our data collation and analysis including the collection of more granular information on the Use of Proceeds and impacts of green bonds, more robust and detailed analysis of climate-aligned issuers, and a more detailed assessment of SDG alignment.

The following table shows examples of labels in each theme

 Green	 Sustainability	 Social
Blue	ESG	Affordable Housing
Climate	Green Innovation	Education, Youth and Employment
Climate Awareness	Positive Impact	Gender Equality
Climate Resilience	SDG	Healthcare
Environmental	Sustainability	SDG Housing
Green	Sustainability Awareness	Social
Renewable Energy	Sustainable Development	Social Housing
Solar	Sustainable Housing	Social Inclusion
Sustainability Awareness		Socially Responsible Investment
Water		Sustainable Development
Wind		University
		Wellbeing
		Women
		Women's Livelihood
		Pandemic
		COVID-19 Social
		COVID-19 Response
		COVID-19 Social Inclusion
		Fight COVID-19
		Vaccine

Endnotes

1. Global Citizen, 2021. <https://www.globalcitizen.org/en/content/united-states-canada-net-zero-emissions-2050/>
2. Morningstar, 2021. <https://www.morningstar.com/articles/1019195/a-broken-record-flows-for-us-sustainable-funds-again-reach-new-heights>
3. Reuters, 2020. <https://www.reuters.com/article/us-esg-rule-idUSKBN27F35M>
4. CTFIC, 2020. <https://www.ctfic.gov/sites/default/files/2020-09-19-2020Report%20of%20the%20Subcommittee%20on%20Climate-Related%20Market%20Risk%20-%20Managing%20Climate%20Risk%20in%20the%20U.S.%20Financial%20System%20for%20posting.pdf>
5. Government of Canada, 2020. <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/net-zero-emissions-2050.html>
6. The Guardian, 2021. <https://www.theguardian.com/environment/2021/feb/19/us-official-return-paris-climate-pact>
7. Executive Order 14008
8. The White House, 2021. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>
9. The White House, 2021. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>
10. White House, 2021. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/executive-summary-u-s-international-climate-finance-plan/>
11. World Economic Forum and McKinsey, 2021. http://www3.weforum.org/docs/WEF_Consultation_Nature_and_Net_Zero_2021.pdf
12. The White House, 2021. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/05/20/fact-sheet-president-biden-directs-agencies-to-analyze-and-mitigate-the-risk-climate-change-poses-to-homeowners-and-consumers-businesses-and-workers-and-the-financial-system-and-federal-government/>
13. US Department of the Treasury, 2021. <https://home.treasury.gov/news/press-releases/jy0139>
14. US Department of the Treasury, 2021. <https://home.treasury.gov/news/press-releases/jy0134>
15. Board of Governors of the Federal Reserve System, 2021. <https://www.federalreserve.gov/newsevents/speech/brainard20210323a.htm>
16. SEC, 2021. <https://www.sec.gov/sec-response-climate-and-esg-risks-and-opportunities>
17. PRI, 2021. https://dwtvz6upkss.cloudfront.net/Uploads/b/r/n/uspolicybriefing_secclimateanddisclosurecomment_314113.pdf
18. PRI, 2021. https://dwtvz6upkss.cloudfront.net/Uploads/s/p/i/uspolicybriefing_considerationsforregulators_18march2021_870057.pdf
19. PRI, 2021. https://dwtvz6upkss.cloudfront.net/Uploads/s/p/i/uspolicybriefing_considerationsforregulators_18march2021_870057.pdf
20. Elizabeth Warren, 2021. <https://www.warren.senate.gov/newsroom/press-releases/warren-casten-colleagues-reintroduce-bill-requiring-public-companies-to-disclose-climate-related-risks>
21. Center for Climate and Energy Solutions, 2021. <https://www.c2es.org/document/greenhouse-gas-emissions-targets/>
22. Brookings, 2020. <https://www.brookings.edu/research/pledges-and-progress-steps-toward-greenhouse-gas-emissions-reductions-in-the-100-largest-cities-across-the-united-states/>
23. Hultman, Clarke and O'Neill, 2020. <https://www.nature.com/articles/s41467-020-18903-w>
24. The National Law Review, 2021. <https://www.natlawreview.com/article/california-leads-nation-introduction-ambitious-climate-disclosure-bill-state>
25. Berkeley, 2021. <https://gssp.berkeley.edu/faculty-and-impact/centers/cepp/projects/green-bonds-market-development-committee/ca-green-bond-market-development-committee>
26. New York Department of Financial Services, 2021. https://www.dfs.ny.gov/system/files/documents/2021/03/proposed_ins_climate_guidance_2021_public_comment_1.pdf
27. o the end of 2019, Canada had in place a goal to reduce its GHG emissions by 30% by 2030 relative to a 2005 baseline.
28. Prime Minister Justin Trudeau on Canada, 2020. <https://pm.gc.ca/en/news/news-releases/2020/12/11/prime-minister-announces-canadas-strengthened-climate-plan-protect>
29. Government of Canada, 2021. <https://www.canada.ca/en/environment-climate-change/news/2021/02/government-of-canada-delivers-on-commitment-to-appoint-an-independent-net-zero-advisory-body.html>
30. <https://www.canada.ca/en/department-finance/news/2021/05/canada-launches-sustainable-finance-action-council.html>
31. <https://www.energy.gov/articles/joint-statement-establishing-net-zero-producers-forum-between-energy-ministries-canada>
32. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/>
33. Government of Canada, 2021. <https://www.canada.ca/en/natural-resources-canada/news/2021/04/canada-joins-us-in-establishing-net-zero-producers-forum.html>
34. Government of Canada, 2019. http://publications.gc.ca/site/archivee-archived.html?url=http://publications.gc.ca/collections/collection_2019/cecc/En4-350-2-2019-eng.pdf
35. Corporate Knights, 2021. <https://www.corporateknights.com/channels/climate-and-carbon/canadian-corporations-push-back-against-internationally-aligned-climate-reporting-16110600/>
36. BIS sizes the US bond market at USD46.2tn as of September 2020.
37. Aligned with the Climate Bonds Green Bond Taxonomy
38. Years 2011 to 2013 are not included in these figures as deals issued were below 10 in these years.
39. BIS, non-financial corporate debt as of September 2020.
40. <https://www.cbc.com/2020/03/04/gm-to-spend-20-billion-on-new-electric-autonomous-vehicles.html><https://>
41. For a detailed discussion on the American Jobs Plan and other key regulatory and policy proposals, see page 4.
42. Central Arkansas Water is First in World With Certified Green Bond To Protect Drinking Watershed For Water Quality | Central Arkansas Water (carkw.com)
43. Climate Bonds Initiative, Climate Resilience Principles, <https://www.climatebonds.net/files/page/files/climate-resilience-principles-climate-bonds-initiative-20190917-.pdf>
44. USD/CAD = 1/1.21 as of 10/06/2021.
45. Statista, Gross Domestic Product (GDP) of Canada in December 2020, by industry, 2020, <https://www.statista.com/statistics/594293/gross-domestic-product-of-canada-by-industry-monthly/>
46. [Green Bond Treasurer Survey 2020](https://www.greenbondtreasurer.com/survey/2020)
47. FX rate as of 01/06/2021
48. Climate Bonds Initiative, [Post-issuance reporting in the green bond market 2021](https://www.climatebonds.net/files/page/files/climate-resilience-principles-climate-bonds-initiative-20190917-.pdf).
49. At the time the research was conducted
50. The North American Development Bank (NADB), which focuses on providing financing for environmental projects in the USA and Mexico, was not included here as it is classified as Supranational. It issued one bond during the sample period for which UoP and impact reporting is available, and achieved a quality score of 23 points (second-highest development bank globally).
51. Climate Bonds Initiative, [Green Bond European Investor Survey 2019](https://www.climatebonds.net/files/page/files/climate-resilience-principles-climate-bonds-initiative-20190917-.pdf).
52. ICMA, [Handbook – Harmonised Framework for Impact Reporting](https://www.icma.org/Handbook-Harmonised-Framework-for-Impact-Reporting), 2021.
53. [Nordic Public Sector Issuers Position Paper on Green Bonds Impact Reporting](https://www.nordicpublicsectorissuers.com/Nordic-Public-Sector-Issuers-Position-Paper-on-Green-Bonds-Impact-Reporting), 2020.
54. US SEC, [SEC Response to Climate & ESG Risks & Opportunities](https://www.sec.gov/SEC-Response-to-Climate-&-ESG-Risks-&-Opportunities), 2021.
55. Norton Rose Fulbright, [SEC makes clear ESG disclosure framework is coming](https://www.nortonrosefulbright.com/en-us/news-and-insights/articles/default.aspx?guid=7c1e1e1e-1e1e-1e1e-1e1e-1e1e1e1e1e1e), 2021.
56. Climate Bonds Initiative, [San Francisco Public Utilities Commission](https://www.climatebonds.net/files/page/files/climate-resilience-principles-climate-bonds-initiative-20190917-.pdf).
57. Climate Bonds Initiative, [SFPUJ Green Bond Report Wastewater Enterprise FY 2018-19](https://www.climatebonds.net/files/page/files/climate-resilience-principles-climate-bonds-initiative-20190917-.pdf).
58. <https://ourworldindata.org/energy-mix>
59. <https://www.iea.org/fuels-and-technologies/oil>
60. <https://www.statista.com/statistics/273504/oil-production-in-selected-countries-since-2000/>
61. <https://www.statista.com/statistics/294614/revenue-of-the-gas-and-oil-industry-in-the-us/#:~:text=In%202018%2C%20the%20total%20revenue,billion%20U.S.%20dollars%20in%202015>
62. <https://www.iea.org/countries/united-states>
63. <https://www.eia.gov/countries/faqs/faq.php?id=74&t=11#:~:text=In%202019%2C%20total%20U.S.%20electricity,of%20CO2%20emissions%20per%20kWh>
64. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/>
65. <https://www.nytimes.com/2021/03/31/business/economy/biden-infrastructure-plan.html>
66. See p. 4 for more discussion.
67. NASDAQ, 2021. <https://www.nasdaq.com/articles/biden-tax-plan-replaces-fossil-fuel-subsidies-with-incentives-for-clean-energy-u-s-0>
68. <https://www.wri.org/insights/7-things-know-about-decarbonization-american-energy-innovation-act>
69. <https://www.seia.org/initiatives/solar-investment-tax-credit-itc>
70. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/>
71. <https://afdc.energy.gov/laws/5950>
72. <https://www.iea.org/countries/canada>
73. <https://www.statista.com/statistics/273504/oil-production-in-selected-countries-since-2000/>
74. <https://www.capp.ca/economy/industry-across-canada/>
75. <https://oeec.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=HB§or=aaa&juris=ca&rn=3&page=0#sources>
76. <https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/energy-facts/electricity-facts/20068>
77. <https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/energy-facts/electricity-facts/20068>
78. Data from the Climate Bonds Initiative Green, Social and Sustainability Databases; Refinitiv Eikon; and Bloomberg.
79. Tuhkanen & Vulturius, 2020. <https://www.tandfonline.com/doi/full/10.1080/20430795.2020.1857634>
80. <https://www.cbc.com/2020/03/04/gm-to-spend-20-billion-on-new-electric-autonomous-vehicles.html><https://>
81. <https://media.ford.com/content/fordmedia/fna/us/en/news/2021/05/24/all-electric-f-150-lightning-pro.html>
82. <https://www.climateaction100.org/progress/net-zero-company-benchmark/>
83. <https://www.prnewswire.com/news-releases/major-us-airlines-commit-to-net-zero-carbon-emissions-by-2050-301259109.html>
84. the Solar Investment Tax Credit which is a 26% tax credit for solar systems on residential and commercial properties enacted in 2006. This has given a massive boost to investment in solar energy and will now step down according to a schedule until 2023
85. <https://www.wri.org/just-transitions/canada-national-task-force>
86. SIFMA
87. SIFMA
88. Green bond treasurer survey, sovereign green bond survey
89. SIFMA
90. The remaining greenhouse gas emissions from the transportation sector come from other modes of transportation, including commercial aircraft, ships, boats, and trains, as well as pipelines and lubricants.
91. <https://www.nytimes.com/2021/03/31/business/biden-electric-vehicles-infrastructure.html>
92. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>
93. <https://www.lexingtonlaw.com/blog/news/american-auto-loan-survey.html>
94. [Solar Investment Tax Credit \(ITC\) | SFEIA](https://www.irs.gov/efile/2021/03/15/solar-investment-tax-credit-itc-sfeia)
95. Reconciled refers to firm bids at the final price.
96. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3684927
97. [Sovereign Green, Social, and Sustainability Survey 2021](https://www.climatebonds.net/files/page/files/climate-resilience-principles-climate-bonds-initiative-20190917-.pdf)
98. We review all green debt instruments to ensure their green credentials.



Prepared by Climate Bonds Initiative

Sponsored by Amundi and Moody's ESG Solutions

Co-Authors: Caroline Harrison and Lea Muething

Contributors: Bridget Boule, Miguel Almeida, Amanda Giorgi, Candace Partridge, Krista Tukiainen, and Andrew Whiley

Suggested citation: Harrison C., Muething L., North American State of the Market 2020, Climate Bonds Initiative, June 2021.

Design: Godfrey Design

© Published by Climate Bonds Initiative, June 2021 www.climatebonds.net

Disclaimer: The information contained in this communication does not constitute investment advice in any form and the Climate Bonds Initiative is not an investment adviser. Any reference to a financial organisation or debt instrument or investment product is for information purposes only. Links to external websites are for information purposes only. The Climate Bonds Initiative accepts no responsibility for content on external websites. The Climate Bonds Initiative is not endorsing, recommending or advising on the financial merits or otherwise of any debt instrument or investment product and no information within this communication should be taken as such, nor should any information in this communication be relied upon in making any investment decision. Certification under the Climate Bond Standard only reflects the climate attributes of the use of proceeds of a designated debt instrument. It does not reflect the credit worthiness of the designated debt instrument, nor its compliance with national or international laws. A decision to invest in anything is solely yours. The Climate Bonds Initiative accepts no liability of any kind, for any investment an individual or organisation makes, nor for any investment made by third parties on behalf of an individual or organisation, based in whole or in part on any information contained within this, or any other Climate Bonds Initiative public communication