Green Evaluation:

# Why Corporate Green Bonds Have Been Slow To Catch On In The U.S.

**February 4, 2019**

Legend has it that Oscar Wilde once said "Children begin by loving their parents; after a time they judge them; rarely, if ever, do they forgive them" Some kids blow through those wild(e) stages rather quickly.

A while ago, the young son of one of the authors of this commentary wanted to know more about the work his dad did. The analyst replied that he covers the power industry and—---as simply as he could-—explained how the electric grid worked. Unsatisfied, the son persisted: "But what do you make?" The analyst responded that he evaluated companies and the ones he considered less risky should be able to pay less to borrow money. "I assist in the efficient allocation of capital", he concluded, satisfied with the response. The son nodded and left the room. Then from the living room his pre-teen voice came wafting through. "You're right Mom, he does not do anything!"

That conversation sets the context to our commentary. After the analyst shared that exchange with his peers, the authors of this report set up an informal discussion forum to exchange industry ideas, if only to address professional existential crisis misgivings. However, we think that intermediaries such as rating agencies do get a cross-sectional view with a perspective that could improve market efficiency.

One such recent discussion has been the limited market size and growth of North American corporate green bond issuances despite the willingness of most issuers to consider sustainable financing in the capital mix (we have used green, sustainable financing, and other terms somewhat interchangeably. Please see the sidebar for precise definitions). In this commentary, we discuss why we think non-financial North American corporate (NFC) sector green issuances still lag our expectations, and what could provide a potential fillip to these issuances.

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## Key Takeaways

- Although corporate debt issuers in North America are increasingly willing to consider sustainable financing as part of their capital funding, green bonds are still only a very small share of the mix.
- While it will require lower borrowing yields in a sustained way to increase green bond issuance, the evidence of a 'green premium' vis-à-vis plain vanilla debt is only anecdotal, and so far appears inconsistent and statistically insignificant.
- Moreover, many green bonds have cross-default clauses with an issuer's traditional bonds, so a default in any of them will trigger a default in all of them. We believe this risk to green bonds can be mitigated through project financed ring-fenced vehicles.
- In the absence of a ring-fenced solution, we believe that the green differentiation should come through operational performance where green assets can exploit a unique attribute that conventional assets cannot.

## What Are Green Bonds?

Fundamentally, a green bond is a fixed-income instrument where proceeds or revenue streams connected to the bond are allocated to projects that benefit the environmental sustainability.

More formally, The International Capital Markets Association (ICMA), the secretariat of the Green Bond Principles (GBP), defines green bonds as "any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible Green Projects that are aligned with the four core components of the GBP": 1) use of proceeds, 2) process for project evaluation and selection, 3) management of proceeds, and 4) reporting.

Effectively, the convention in the market to be a green bond involves 1) the issuer labelling its debt green and 2) aligning with the GBPs. Eligible green projects include those for renewable energy, energy efficiency, pollution prevention and control, eco-efficient and/or circular economy adapted products, production technologies and processes, green buildings, terrestrial and aquatic biodiversity conservation, and clean transportation.

Yet the absence of a universally accepted global framework means there is a lack of standardization and regulation in the green bond market, which poses risks to investors. For instance, some areas of climate bonds taxonomy in China are currently ineligible, and therefore excluded from the Climate Bonds Initiative (CBI) database. However, this concern shows signs of diminishing as green bond issuance increases and international harmonization initiatives grow.

### Market size

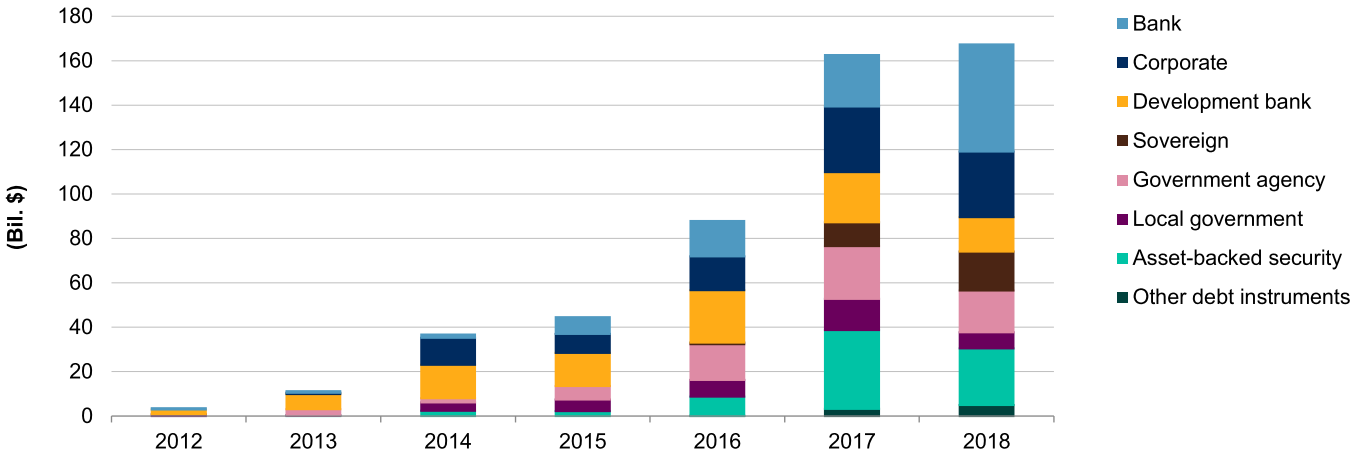
According to the CBI, global green bond issuances skyrocketed to over $167 billion in 2018, up from a mere $13 billion in 2013. In fact, strengthening green bond market fundamentals have fueled a 70% compound annual growth rate over those five years. The increase demonstrates the rapid development of new green markets as market fundamentals drove the expansion of the

green bond market with new types of issuers, geographies, and the emergence of green loans, green mortgages, and green derivatives.

The main reason for greater green bond issuance is that investor demand has increased, and issuers are using innovative sustainability strategies to meet that demand. Issuers have increasingly tapped the green bond market to offer fixed-income investors risk-adjusted returns with environmental impact, while those investors let it be known that they would consider further opportunities to invest green. In fact, industries with a significant carbon footprint could see more issuance as they signal that they are now actively working to mitigate their environmental impact. Despite the Trump Administration's decision to withdraw the U.S. from the Paris Agreement, we see an ongoing global political push to address climate change.

Chart 1

**Annual Green-Labeled Issuance By Issuer Type**




Source: Climate Bonds Initiative.



While there has been a dramatic increase in annual green bond issuances globally over the past five years (see chart 1), the gradual tightening of monetary policies in Europe and the U.S. is triggering a shift in the credit cycle and contributed to a 3% to 4% decline in global absolute fixed-income issuance. This also affected green bonds, but did not keep them from growing slightly by 3% in 2018—far less than initially projected. (Please see the link below for our annual update, "Green Finance: Modest 2018 Growth Masks Strong Market Fundamentals For 2019", published Jan. 29, 2019).

Nevertheless, we expect growth to slow down compared to the rapid 85% growth we saw in 2017, as issuers and investors take time to absorb the acceleration that has occurred in the market over the last years. Moreover, growth rates also slowed somewhat in 2018 because rising interest rates weighed on all debt issuance. The rise of social and ESG-linked corporate note/bond issues—roughly $30 billion to $35 billion in 2018—might also have affected green bond issuance as issuers sought to support broader sustainability agendas. When viewed alongside social and sustainability bonds, which emerged in a significant way in 2017, the combined market for self-labeled sustainable instruments exceeded $200 billion.

## Corporate Green Bond Issuers

A number of corporate sectors have had reasonable success issuing green debt. Green bond issues in shipping, autos, airlines, cement, and selectively from the metals, mining, and hydrocarbon (oil & gas, chemicals etc.) industries, have all played an important role in the transition to sustainability. To underscore this slow but incessant advance towards sustainability, we highlight some of the major issuances in the regulated utility sector, not only because we're familiar with it, but also because corporate green bond issues in the U.S. are overrepresented by the renewable energy and regulated utility sectors.

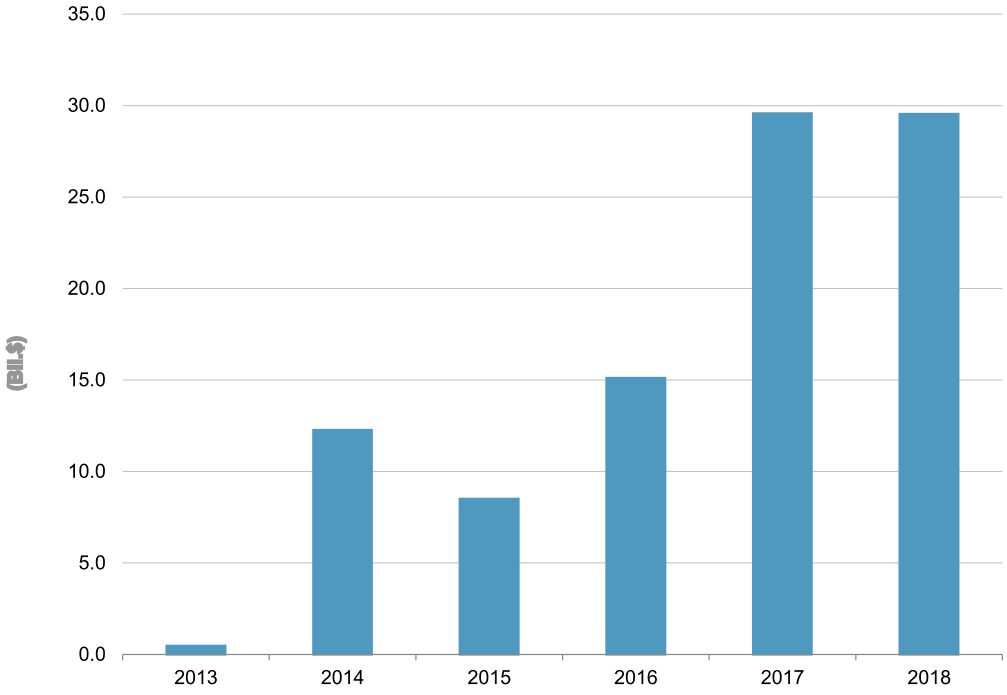
For instance, in 2015 Southern Power Co. issued a $1 billion series of green bonds, becoming the first investment-grade power producer in the U.S. to offer this type of security to support its investments in green generation. In 2016, it backed up its initial success with a second and third issuances of €1.1 billion and $900 million in July and November 2016, respectively, becoming the largest corporate issuer of green bonds in the U.S. at that time.

After a relative lull, we saw notable activity in 2018. DTE Electric Co. priced its inaugural offering in May 2018, with $525 million 30-year bonds (at a competitive fixed coupon of 4.05%). The company claimed it was the fifth investment-grade energy company in the U.S. to issue green bonds. In November, Duke Energy Carolinas LLC said that it had completed an issue of $1 billion in green bonds. Similarly, Dominion Energy Inc. priced its inaugural green issue in 2018.

However, it isn't just utilities issuing large-sized green bonds. Apple Inc. offered $1 billion in bonds to finance its clean energy projects in 2016. In 2017, the company conspicuously issued another $1.5 billion, around the time the U.S. withdrew from the Paris Agreement, making the technology giant one of the largest issuers of dollar denominated green bonds.

Chart 2

**Non-Financial Corporate Green Bond Issuance, By Year**



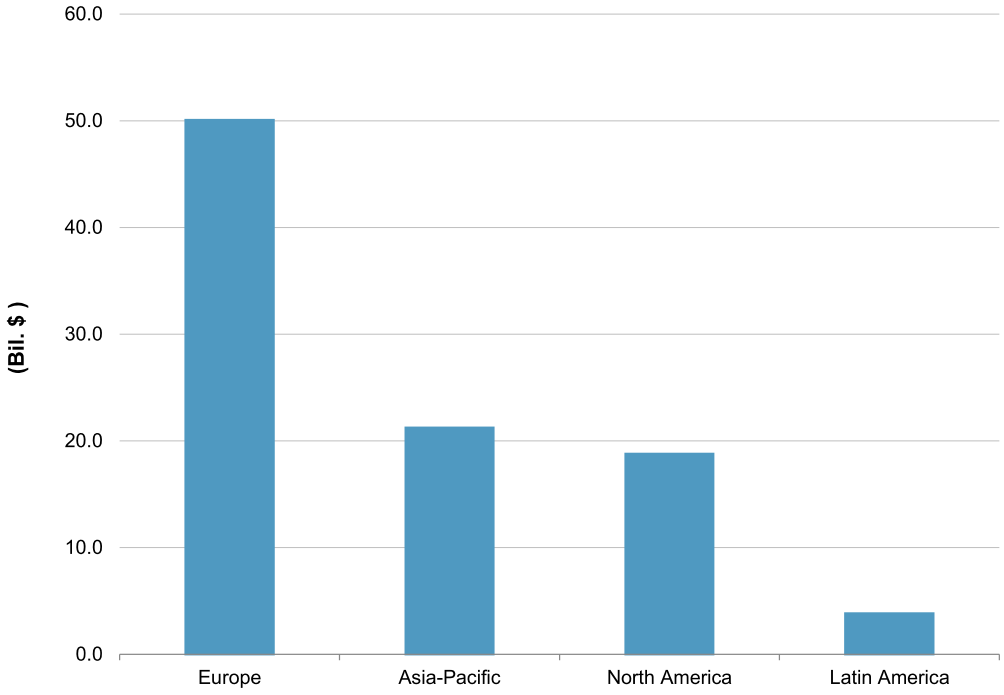

Source: Climate Bonds Initiative



However, the non-financial corporate sector underperformed in 2018 with green issuance marginally down year-over-year (see chart 2). One reason we're not seeing more green issues is that many companies that would like to issue them feel unsure about market acceptance. The range of assets widely accepted as green is still limited, which makes issuers cautious about financing new asset classes in the green bond market. In particular, much of the paperwork involved in raising a green bond is not included in the formal legal documentation when the bond is sold. As a result, companies seeking to raise green-labelled finance often avoid the U.S. market over fears that should their green debt not meet the country's stricter legal standards, they would be vulnerable to challenges under, say, the New York state law.

Chart 3

**Green Bond Issuance Since 2013, By Region**




Source: Climate Bonnds Initiative



While EU corporates carried this segment of the market in 2018, green bond uptake has been notably underwhelming in the U.S. Since 2013, North American non-financial companies have issued only about $19 billion of labelled green debt (see chart 3), which in our view is far below how much green debt they could issue.

To understand the impediments in North American growth, we asked market participants why corporate sector green issuances have not grown at a faster pace.

## The Issuer's Perspective

For issuers, the rationale for considering green bonds in the financing mix is straightforward. If there is a meaningful pricing benefit, then the incremental costs of higher disclosures and reporting demands make sense.

Several academic and institutional studies have found that green bonds trade at tighter levels than comparable vanilla bonds in the secondary market, suggesting that investors may be prepared to pay a premium in order to invest in a socially responsible way. However, in the U.S., there is only limited evidence of green bonds pricing at significantly tighter levels in primary markets. The evidence for a green premium—the 'greenium'—remains anecdotal and inconsistent.

In its periodical review of green bond pricing in the primary market through the second quarter of

2018, the Climate Bonds Initiative (CBI) found that green bonds attracted a larger oversubscription than vanilla bonds, and also tightened by about four basis points (bps) more—compared to initial price talk (IPT)—than their vanilla equivalents. However, the sample was small and did not fully correct for different issuers, issue sizes, or liquidity. Regardless, issuers we spoke with were not sure whether they would consider green over non-green issuances because of a 10-15 basis point difference in debt financing. Some even argued that the costs of compliance and reporting eroded the difference.

We also think that the greenium has not been significant in the U.S. because about 95% of green issuers are investment-grade companies where spreads between rating categories are typically narrower, especially in a low interest rates environment. Among lower-rated issuers, there is room for a bigger greenium, as the spread differences between various credit rating categories are larger. We think the spread difference between green and vanilla bonds will likely be larger as interest rates rise and a broader swath of the credit spectrum issues green bonds.

Some issuers have told us that despite GBP creating a common understanding of what a green bond is and is not, its directives can still prove controversial. First, the green label generally focuses on the issue and its use of proceeds, rather than the rest of the business of the issuer. Many investors are unwilling to buy green bonds from a company in an industry known for its pollution. An example of this is the $500 million issue by Repsol S.A. in May 2017. While the bond issue satisfied the GBP, and eligible projects were approved by Vigeo, an independent reviewer, the CBI refused to include the issue in its green bond listing because the idea of green bonds from a Spanish oil and gas company that operates with fossil fuels was troubling. We believe a high level of transparency about the use of funds is imperative for overcoming such issues. As companies in environmentally suspect industries look to decarbonize and devote a greater proportion of their debt to this end, green bond labelling can aid their efforts.

## Green, Sustainable, Or Social: What's In A Name?

Although we have used the terms green, social, and sustainable somewhat interchangeably when we talk about this class of debt, each type of bond serves a specific purpose—though those purposes can be closely related.

- Green Bonds: These are any type of bond where the proceeds will be applied exclusively to finance or refinance projects with clear environmental benefits, and which are aligned with the four core components of the GBP.

- Social Bonds: These bonds finance projects that directly aim to address or mitigate a specific social issue and/or seek to achieve positive social outcomes, especially but not exclusively for a target population. Social project categories include affordable basic infrastructure, access to essential services, affordable housing, employment generation, food security, or socioeconomic advancement and empowerment.

- Sustainability Bonds: These are bonds where the proceeds will be exclusively applied to finance or refinance a combination of Green and Social Projects and which are aligned with the four core components of the GBP and/or SBP.

These distinctions are important in socially responsible investing, an investment strategy that seeks to consider both financial return and social good, even as total return remains the primary mandate. Environmental, social, and governance factors are used to negatively or positively screen specific companies or sectors that a fund manager is considering

Nevertheless, given advancing regulations, there are clearly larger environmental, social, and governance (ESG) risks associated with vanilla bonds. We believe that regulations should make green issuers more profitable, thereby providing cheaper financing through a traditional risk assessment. As a result, we believe that over time issuer ratings, rather than issue ratings, will reflect this risk. We believe the original intention of YieldCos in the U.S. was to provide just such pure plays. While we believe that difference will increasingly be captured in the issuer's ESG assessment, that discussion is not the purview of this commentary.

## The Investor's Perspective

The main motivation for most green bond investors is to contribute to a transformation towards a more sustainable society. There are clearly also 'feel good' and marketing elements involved, as fund managers who invest in something that is labelled green are considered to be environmentally responsible.

For investors, however, finding the greenium can still be the equivalent of finding a unicorn. We think this is because there is a supply and demand mismatch. The supply of green bonds has increased dramatically as issuers find opportunities within current guidelines to brand their bonds as green. On the other hand, dedicated global green bond funds have not grown at the same pace. In other words, while green bonds receive attention from both 'dedicated' and 'conventional' investors, the former group is still not very large compared to the growth of the outstanding green bond issuances, and we think this might partly explain why the price difference between green and vanilla bonds remains limited.

This premium, however, could increase and be sustained because investors have increasingly started screening for green bond credentials. An investor, for instance, might consider a coal-burning U.S. utility that is now undertaking a transformational change. Pension funds in California, Canada, and Europe are developing rules that would make this sort of screen more common. In fact, European green bonds tend to achieve more spread tightening in the immediate secondary market compared to U.S. dollar-denominated green bonds. We attribute this dynamic to the fact that investors in European funds typically place greater emphasis on the associated benefits of green bond ownership and that fund managers there operate under a degree of regulatory pressure, absent in the U.S., to show their contribution to building a low-carbon economy.

A number of asset managers we spoke to said that they were willing to put in larger orders for green issues to support environmental responsibility. However, they emphasized that they still have to meet their total return objectives. They were not willing to accept significantly tighter spreads, even if the bond is green. In other words, 'impact' investing (i.e. dedicated investing) has not yet taken off in a big way in North America, and impact investing funds (as opposed to socially responsible funds) are the only ones with a mandate to generate a measurable, beneficial, social, or environmental impact alongside a financial return—even if those returns are somewhat lower. The main motivation for their limited partners and investors is to make a real impact that contributes to building a more sustainable society.

Investor reticence about green bond investments may change, however. Investors representing over $180 trillion of assets under management have signed on to the United Nations Principles of Responsible Investing (PRI) and therefore have committed to integrating ESG aims in their investing. Investing in green bonds is one way to do this.

There are other challenges still. A green bond could involve investing in improvements of otherwise not-so-green activities. For instance, many investors advised us that they were unwilling to invest

in green offerings from a YieldCo because they also have conventional businesses, and the funds raised through green offerings get comingled in the company's general revenues. This issue is typically addressed through the "management of proceeds" tenet of the GBP that recommends net proceeds of the green bond are credited to a sub-account or otherwise tracked to ensure proceeds are allocated to green purposes. Green bonds for older projects also raise questions for some investors. In one recent green offering, for example, the issuer was raising funds to refinance renewable capital spending over the past three years. Investors typically prefer financing of new projects, rather than reimbursing companies for investments already made.

We think the boards of socially responsible funds are beginning to signal more forcefully what they want. Fund managers are increasingly being asked to invest in projects with more than just the 'feel good' factor. The boards want fund managers to 'demonstrably show' that they are making green investments. We see regulatory developments driving some of these changes in Europe, as investors are being required to include green bonds in their portfolios for compliance purposes. In France, for example, under Article 173 of the Energy Transition law, investors must report how their investments are contributing to the Paris Agreement's target of keeping the global temperature rise to less than 2C. In addition, the EU is currently reviewing ESG-related disclosure requirements for investors as part of the sustainable finance action plan.

To sum up, investors we have spoken to pointed out that the expectation of a significant pricing differential between green and vanilla offerings is flawed. They said that most green bonds issued thus far have cross-default clauses with the issuers' vanilla bonds. Many do not have seniority either and are pari passu with vanilla debt. Hence, a default in any bond will trigger a default across all bonds. Without differences in seniority and ranks, green bond investors share the same risk with vanilla bondholders, but at a lower return.

Yet, green companies are generally less exposed to transition risk and are more sustainable over the long term. So some form of legal structuring could benefit green investors. One way this could work is to insulate green bonds from the issuer risk. Issuers can potentially accomplish this by using green bonds in project financings. However, in the absence of a ring-fenced solution, a green differentiation should come through operational performance where green companies can exploit a unique attribute that conventional assets cannot provide.

## The Trader's Perspective

If impact investing fund managers are at one bookend, speculative traders are generally at the other--they don't care about sustainability if it means lower returns. Traders, in our view, also don't have a temperate zone; they are either possessed by an idea, or are not interested in it at all. So thinking about green bonds in a way that interests them is a good test of the success they can have in the market.

Our discussions with traders were typically short. Broadly, they evinced no specific interest in green bonds. However, they advised us that they would get very interested if they could trade a derivative, or a physical product, that is uniquely linked to green bonds.

## In Search Of Something Unique

For green bonds to make a big impact on investments borrowing yields need to be consistently lower. That would reward eligible companies with cheaper financing, thereby providing incentives for green investments.

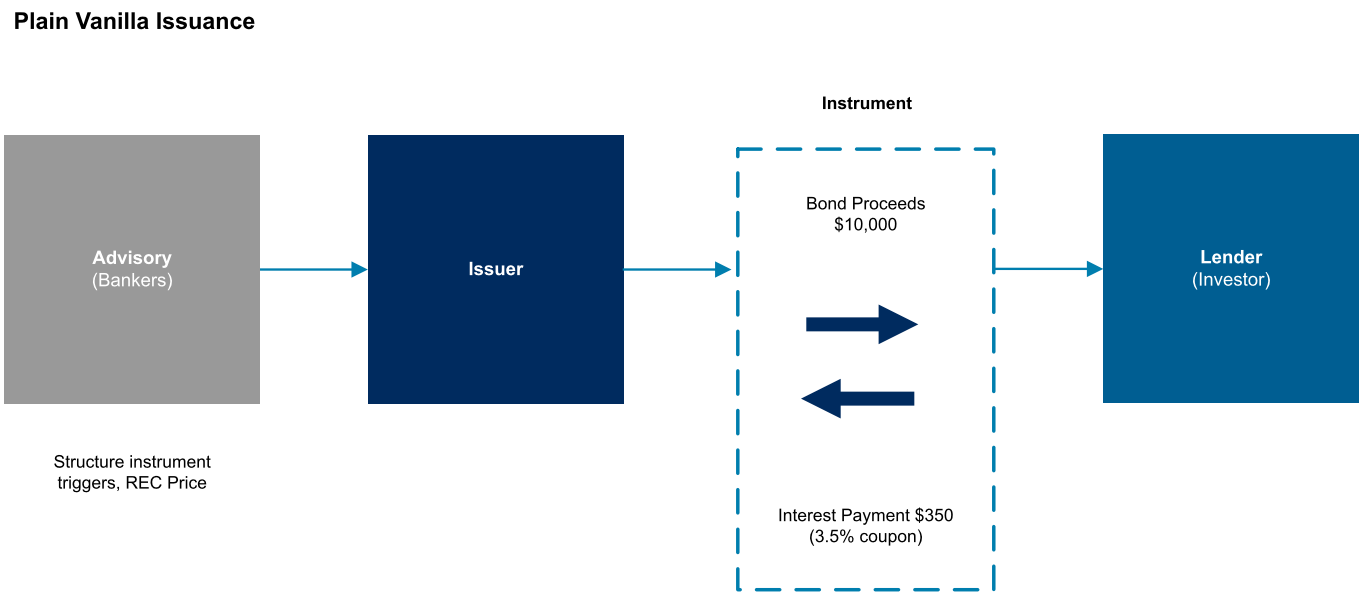
We caught on to two big themes in our discussions with market participants that shed light on the

paucity of green issues in North America. One is that managers of large green funds want to show their boards that they are investing in green assets. The other is that traders will have an incentive to trade these bonds if the bonds have a unique attribute that only green investments can deliver. If issuers could deliver such a bond the market, we believe, could broaden considerably.

We see such a debt instrument in an energy market like California, which also has an active renewable energy certificates/credits (REC) market (albeit in some flux given the PG&E bankruptcy and potential rejecting/renegotiation of supply contracts). REC's are tradable, non-tangible energy commodities that represent proof that 1 MWh of electricity was generated from an eligible renewable energy resource. RECs represent the environmental attributes of the power produced from renewable energy projects and are typically sold separately from commodity electricity. RECs simply incentivize carbon neutral renewable energy by providing a production subsidy to electricity generated from renewable sources. Retirement occurs when a REC is used by the owner of the REC. Use of the REC may include, but is not limited to, (1) use of the REC by an end-use customer, marketer, generator, or utility to comply with a statutory or regulatory requirement, (2) a public claim associated with a purchase of RECs by an end-use customer.

In our hypothetical debt instrument, we will use these REC's as the unique green differentiation that comes through operational performance. We show a simplified chart of a plain vanilla debt instrument in the following diagram. Here, we've shown a hypothetical $10,000 debt offering and the attendant annual cash flows, assuming a 3.5% coupon.

Chart 4



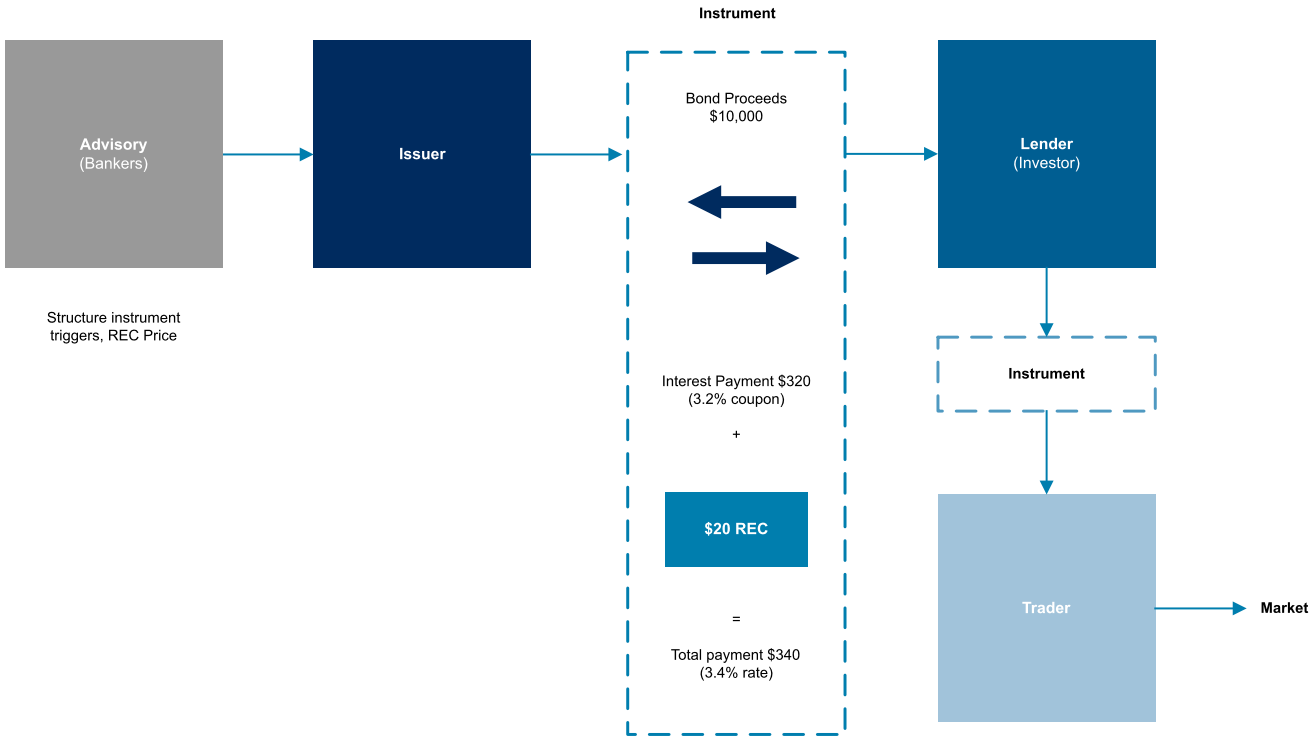

In the green bond offering in the next diagram, we've added one REC as a sweetener in the form of a detachable warrant. Since 2014, RECs in the California compliance market (bucket 1) have averaged $15.60 per MW-hour (MWh), from an annual high of $17.30 per MWh in 2018 and a low of $11.70 per MWh in 2015 (Prices, however, have run as high as $20 over the past two months.) In

our example, we assume a price of about $20 and a coupon of 3.2%, effectively giving the green bonds a tighter spread of 10 bps. (Instead of a physical REC, the warrant could be designed as a call option at a strike of $0.) The investor would receive a payment of $320 and a call on one REC annually.

This diagram is a simplification of the instrument. In practice, the warrant could be structured in several different ways. For instance, it could allow the investor a call on two RECs at a higher strike. The way it is eventually structured depends on expectations of future REC prices.

Chart 5

**Hypothetical Green Issuance**




In a way, what we've described above is similar to a commodity-linked note (CLN). A CLN is a derivative instrument that has characteristics of a debt security and a commodity-linked derivative. It typically provides for interest payments and a principal payment at maturity that is linked to the price movement of a commodity, commodity index, or commodity futures or option contract. A CLN fluctuates in value when the price of the specified commodity rises or falls.

Investors typically have difficulty ascribing quantitative values to environmental traits that are driven, to some degree, by regulatory edict. What would make this instrument potentially difficult to structure is that even as REC prices were (surprisingly) stable between 2014 and 2018, they can be volatile in the future. REC prices tend to be set based on the marginal cost of solar relative to the market value of solar. In the past four years, REC prices likely declined and stayed relatively stable because of the drop in panel prices.

However, the market value of solar has now declined, and the marginal cost of new solar is approaching zero. When that happens, the full costs of solar must be supported by the REC. On top of this, the ITC will step down from 30% to 10% in the early 2020s, which will effectively be a 20% increase in the cost of solar. Finally, the increasing renewable requirements will likely increase demand for RECs.

What's most important here is that this instrument is structured to ensure that there is no meaningful fluctuations (or transfer of value) in payments, given that the green bond's value proposition is to reward sustainable investing through tighter spreads. Thus, a feature of the instrument could be a reset of the coupon to a lower rate if REC prices increase and sustain above a pre-determined level. This would ensure that the green bonds trade tighter than their plain vanilla counterparts. In addition, to ensure that the instrument remains a fully financial obligation, the inability to deliver an REC due to operational underperformance could require a reset in interest rates to a comparable vanilla coupon, plus a penalty for non-delivery of 'greenness'. It could also take the form of a convertible than fixed income instrument, which could work but is likely a smaller opportunity.

We note that there are challenges. The REC prices and their trading mechanism/ market liquidity vary year to year and from market to market (for example, while California REC prices are high, in certain states REC prices are small components of the overall revenue of an issuer (class 1 vs. class 2 RECs)). As the primary goal is for green bonds to trade tighter than conventional bonds, investors would need to get comfortable ascribing value to RECs, given the opacity of prices and relatively small and regional markets for RECs. However, these kind of instruments could, in turn, help provide liquidity to the REC market.

Moreover, a mechanism where the coupon could be reset, depending on the value of the RECs, may limit broader investor appetite and relegate the bonds to a niche class of investors, which won't necessarily solve the issue described upfront of lacking a large dedicated buyer universe. Nevertheless, these would serve as opportunities to expand the green markets. We believe there would still be issuers and investors interested in this, although initial issuances could require some premium pricing.

While the devil is in the details and finer elements of such an instrument will need to be ironed out, we see such an instrument as providing the following benefits:

- Issuers: Tighter spreads as demand for such green offerings continues to grow. They will be able to get lower fixed price upfront and link some of the payment to the green component of the business doing better.
- Investors: Can demonstrate to their Boards that they have green investment (due to associated RECs vs. nothing now) and thus the green bonds will have a differentiated class and more support internally leading to potentially more capital flowing in this space.
- Traders: The detachable warrants can be traded and will result in wider ownership. Since the bonds will have RECs attached and the price of RECs change, traders can trade those options separately with in a narrow range and thus secondary market just for green bond develops/ become stronger (To be clear, in some states trading is not prevalent, or is currently restricted. A liquid market could change that)
- Bankers/market consultants: Advisory services for structuring and pricing the renewable attributes of the warrant. However, they would need to add specialized groups of people who can understand the dynamic of each market and how to evaluate / trade these green characteristics.
- Regulators: A pricing mechanism that adds transparency to the market, cuts the cost of

complying with environmental mandates, and makes them more palatable politically.

While this idea linked to RECs is relatively easy to understand and monitor, not all green companies generate RECs. So we may eventually see some bonds with RECs and some with other mechanisms. For social bonds, for example, the construct would have to be something different. Here, the issuer could create an easily-monitored index linked to the underlying social performance. Although this complicates the story, we could ultimately see the development of methods to extend the REC idea to other markets or to companies without an easily tradable green component.

## Is The Future Greener?

Despite the slowdown in 2018, the market consensus is that strengthening green bond market fundamentals and growing refinancing backlogs will fuel a healthy 8% increase in labeled instruments globally in 2019, pushing issuance to around $180 billion for the year, with non-financial companies responsible for about $45 billion of the total.

Green bond issuances made up only 0.2% of all bond issuance in 2018. Moreover, as sustainable financing enters the mainstream bond market, it will be subject to the vicissitudes of the global economy. Global bond markets slowed through the second half of 2018 because of volatile market conditions. If macroeconomic troubles intensify, and if the global economy falls into recession in 2019, green infrastructure investment as well as prospects for green bond financing would be hurt. In that scenario, thinking of adding unique attributes to offerings could potentially buttress greener opportunities.

## Related Research

- In Canada, Green Bonds Are Taking Root, Jan. 30, 2019
- Green Finance: Modest 2018 Growth Masks Strong Market Fundamentals For 2019, Jan. 29, 2019

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