

Impact investing and green ABS: creating a market of the future



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Future proof

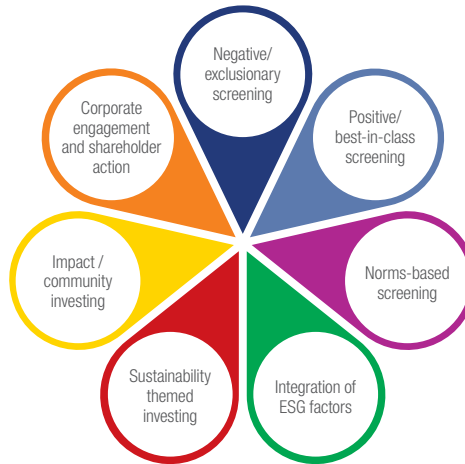
Impact investing – in which environmental, social and governance considerations are paramount – is now firmly on the agenda of governments, supranational bodies and financial institutions across the world. In the wake of the landmark Paris Agreement on Climate Change at the end of 2015, it is unsurprising that most of the initial focus has been on investments to improve the environment. This SCI research report* examines the resulting acceleration in green bond issuance, as well as the role that securitisation is playing in creating a market of the future that is backed by a wide range of green and socially sustainable collateral.

Chapter one: Introduction

There can be no doubt that sustainable development – particularly in vital areas of human activity, such as energy, water supply, transportation and housing – has become an increasingly important theme in global investment, and that trend is certain to continue (see *Exhibit 1*). Impact investing, in which environmental, social and governance (ESG) considerations are paramount (see *Exhibit 2*), is now firmly on the agenda of governments, supranational bodies and financial institutions across the world. In the wake of the landmark Paris Agreement on Climate Change at the end of 2015, to which 195 countries were signatories, it is not surprising that most of the initial focus has been on investments to improve the environment.

The spectacular growth in the worldwide market for green bonds over the past two years is clear confirmation of the direction in which markets are being driven (see *Exhibit 3*). Issuance of these instruments is on course to exceed US\$120bn this year, compared with a total of just US\$3bn five years ago. Although

Exhibit 1: Sustainable Investment – Investor Activities and Strategies



Sources: Fitch Ratings, GSIA

green bonds still account for only a small fraction of the overall global bond market, in Q217 they increased to 3% of all bonds issued.

Some now believe that, with appropriate levels of government and multilateral support, the annual market for green bonds is set to expand by a further order of magnitude to around US\$1trn within the next five years. Even this sum – which is generally considered to be the minimum annual investment that will be needed to make a substantive contribution to addressing the problem of climate change – would still represent just 1% of the outstanding US\$100trn market for sovereign, corporate and financial bonds.

It is also self-evident that the senior unsecured (balance sheet) instruments that have dominated the green bond market up to this point – accounting for well over 95% of green bonds issued to date – will not be able to sustain that level of activity in the medium to longer term. This is because the banks, corporates and multilateral lenders that have been issuing these bonds at such an impressive rate since the end of 2015 will all ultimately run up against limits of what their balance sheets can support.

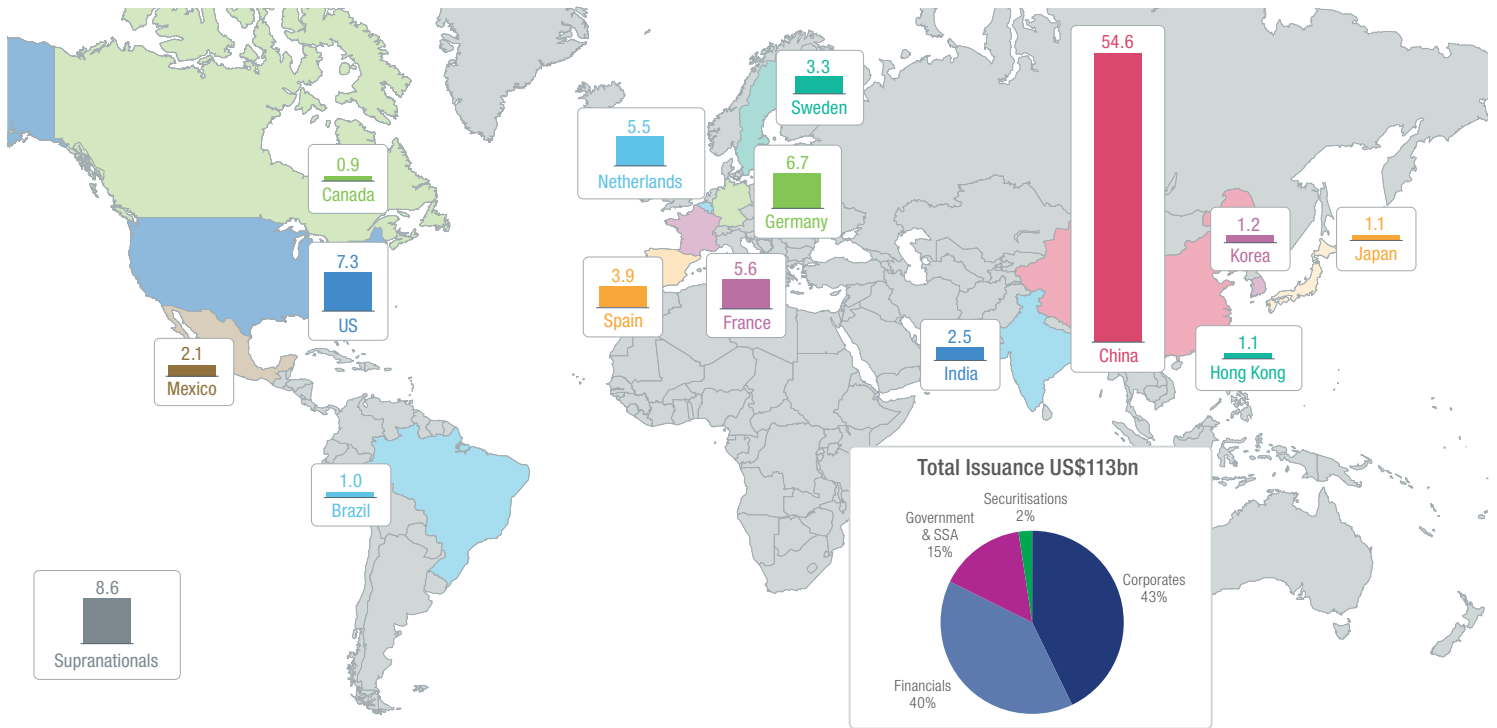
The same is true of the capacity of most governments to issue green sovereign debt.

Exhibit 2: Impact Investing Spectrum by Sonen Capital

Traditional investing	Responsible impact investing	Sustainable impact investing	Thematic impact investing	Impact first investing	Philanthropy
Competitive returns	ESG risk management	ESG opportunities	Maximum-impact solutions		
Seeks financial returns regardless of Environmental, Social or Governance (ESG) factors	Investments are screened out based on ESG risk	Sustainability factors and financial returns drive investment selection	Targeted themes and financial returns drive investment selection	Social and environmental considerations take precedence over financial returns	Financial returns disregarded in favor of social and environmental solutions
	Potential screens: Tobacco Alcohol Weapons Gambling Pornography Nuclear energy	Factors considered: Carbon footprint Resource use Waste reduction Compensation Product safety Gender equality	Solutions for: Climate change Population growth Urbanization Water scarcity Food systems	Support for: Innovation & risk taking Proof of concept/plots Enabling environments Commercial Capital leverage	

Source: Sonen Capital, www.sonencapital.com/impact/methodology, © 2016

Exhibit 3: Green Bonds – Geographic and Sector Diversity



Sources: Bloomberg, Fitch Ratings

With a few notable exceptions, such as China and Norway, the main ones are currently constrained by huge – and mounting – gross national debts that are close to 100% of their GDP.

For the bond markets to play a decisive role in raising the trillions of dollars that is required to meet sustainability objectives (social as well as environmental), they will therefore need to do so through a mechanism that allows pension funds, insurance companies and other institutional investors around the world to plough the vast volumes of capital that they control into green and other sustainable assets directly – rather than indirectly through the entities that have historically built and financed them. Securitisation is a well-established financing tool that could clearly enable this process to take place and many of those at the forefront of promoting the current market for green bonds are certainly looking for it to morph into a much larger one for green ABS within the next decade or so.

“One of our medium-term objectives is to build on the current interest in green bonds to create appetite for ABS,” confirms Sean Kidney, director of the Climate Bonds Initiative. “That will be a critical growth market for us.”

The market for green ABS remains, however, very much in its infancy. Green ABS

accounted for less than 5% of the US\$81bn green bond market last year. The total still represented a 50% increase on the US\$2bn recorded the previous year, however, and – more importantly – there have also been developments over the past 18 months to suggest that a much greater expansion of the market over the next two to three years is now a realistic expectation.

ABS transactions – residential solar roof-top installations – have fallen away.

Inclusion of Toyota’s third big green-labelled securitisation – a US\$1.6bn issue – to raise funding to finance purchases of its hybrid and electric vehicles raised the total to US\$4.6bn, but this is somewhat misleading. The assets securitised in the Toyota deal (as with the company’s two previous transactions in 2014

“One of our medium-term objectives is to build on the current interest in green bonds to create appetite for ABS”

While there have been a few dozen small privately placed transactions (mostly involving solar power assets) in the US and Europe, only one platform for publicly marketed deals with repeat issuers has really emerged to date – that backed by property assessed clean energy (PACE) loans in US. US PACE securitisations accounted for around half the US\$3bn of genuine green ABS issuance in 2016, while volumes in the other asset class that spawned publicly marketed green

and 2015) were pools of general auto loans, so the deal really just extended the green-bond principle.

There has also been a handful of green ABS issues elsewhere that have broadened both the market’s geographical reach and the range of assets that have been securitised. In March this year, for example, the Guiyang Transportation Company in China approved an RMB2.65bn (US\$390m) transaction that saw it become the fifth Chinese entity to

“Green RMBS is an ideal asset class to spur market development, given the size of the mortgage market”

launch a green ABS deal, after Industrial Bank, Gezhouba Group, Xianjing Goldwing and Wuxi Communications Industry Group. The Guiyang issue was the largest green Chinese ABS deal to date and it boosted the overall value of such transactions so far to the equivalent of US\$1.4bn.

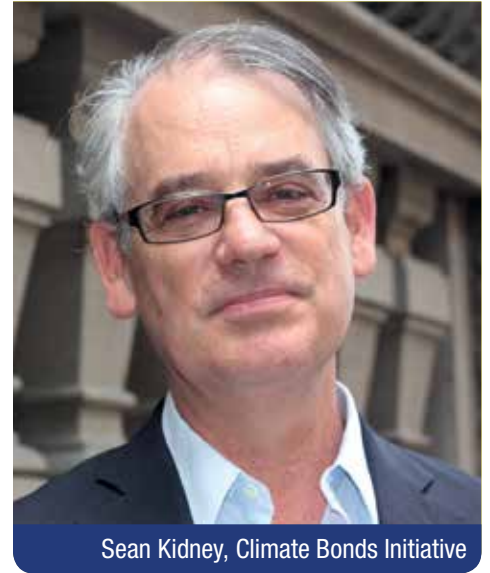
Meanwhile, the Brazilian pulp and paper group Suzano Papel raised BRL1bn (US\$294m) in November 2016 from a securitisation that was the first green bond to be issued in the local currency. Perhaps the most significant development over the period, however, was the launch of the world’s first truly green RMBS by the Dutch lender Obvion in July 2016.

For this is a development that could potentially pave the way for a massive expansion of green securitisation over the next decade and beyond. As Kidney at the Climate Bonds Initiative points out: “Green RMBS is an ideal asset class to spur market development, given the size of the mortgage market.”

The balance-sheet restrictions that will inevitably start to inhibit issuance of vanilla green bonds at some point and the increasing scope of green ABS deals – albeit still on

a small and gradual scale – has given rise to some impressive forecasts for how big the market could become. The OECD, for example, estimates that by 2035 annual ABS issuance for funding just three categories of environmental projects – renewable-energy schemes, energy-efficiency initiatives and low-emission vehicles – could reach US\$385bn. In the near term, however, the market remains a fledgling one and a great deal more work will be necessary on the part of governments, regulators, issuers and investors, if it is to come close to meeting the OECD’s ambitious expectations.

This report first covers the accelerating progression of the green bond market – and the emergence in parallel of embryonic ones for social and sustainability bonds – and attempt to assess which segments of it might also most readily lend themselves to asset-backed issuance in the near term. It then examines the progress of the US market for PACE transactions and assesses what scope it has for further expansion – both in the US and elsewhere – along with the role it could play in the growth of other asset classes, such as RMBS, in creating a much larger ABS market



Sean Kidney, Climate Bonds Initiative

of the future that is backed by a wide range of green and socially sustainable collateral.

The next chapter explores the reasons behind the slowdown in US solar roof-top securitisations and assesses the outlook for an asset class that was one of the first to spawn the concept of green ABS. The following chapters take a detailed look at two recent deals – Obvion’s ground-breaking RMBS issue and a synthetic risk transfer transaction by Credit Agricole that freed up US\$2bn of capital for additional green lending – that promise to have a big impact on taking the market forward. [SCI](#)



SPONSORED STATEMENT

Green with envy – green securitisation is taking over

By Huub Mourits, global head of structured finance services, TMF Group

The renewable energy (wind/solar), energy efficiency and low-emission vehicles securitisation (green securitisation) market continues to grow globally and more issuers and investors are jumping into the asset class. For this article, I would like to set the scene around renewable, sustainable energy and low carbon-related securitisation and take a closer look at some key next steps I envision for green bonds and developments around international expansion of the Property Assessed Clean Energy programme.

Green bonds have matured, the asset class has outgrown the infancy phase and it's here to stay, supported by US\$55bn issuance in the first half of 2017 already.

According to the OECD (Quantitative framework), an amount of US\$620bn- US\$720bn per annum is needed for 'low-carbon investments' via securitisations. However, the report does not speculate what portion will be labelled green securitisation, but we anticipate it will be significant.

“PACE has been so successful in the US that it has begun attracting attention around the world”

Apple Inc issued several green bonds this and last year, fuelling corporate involvement in the asset class. The PACE securitisation market in the US is growing; the programme has proved so popular that similar schemes are launching internationally.

Setting the scene - do the benefits outweigh the challenges?

Let's not beat around the (green) bush; being active in the green securitisation space does wonders for how others perceive you – the so-called 'green appeal'. But it doesn't stop there; issuers can also benefit from opening up a new investor base, since it will attract

'green' investors. This is especially interesting for issuers who themselves are not necessarily considered green.

For investors, investing in renewable energy securitisations means diversifying their investment portfolio, opening it up to a new, different risk and return profile. Moreover, investors can benefit from a healthy return on their investment and also contribute to a positive social and environmental development at the same time.

The above shows some obvious benefits associated with green securitisation. The other side of the coin is that there are also some challenges we need to look at. I'll elaborate on two obvious ones.



First of all, green securitisation is a relatively new phenomenon; it's an asset class with a limited (untested) track record. Therefore, both issuers and investors need to be meticulous in, respectively, how they set up the securitisation (making sure it benefits them, but also protects investors) and in which securitisations to invest (making sure the projects are sufficiently green, with a risk profile they feel comfortable with).

Second, innovation in, for example, the renewable energy space is moving at a rapid pace (no pun intended). Issuers and investors both run the risk that the asset they issued on and invested in is outdated the minute the renewable energy project is completed.

For example, if one securitises a solar panel portfolio, chances are that after installing the panels on your roof, a new generation is already on its way – one that is more efficient and offers a better return. So what is stopping a property owner from quitting the lease of his panels because he wants to switch to Elon Musk's Tesla Solar Roof? That is a risk we need to be aware of.

“The green bonds market has matured. However, there is still much to be developed and changed for green bonds to really take off”

On a side note, Tesla recently issued a bond without labelling it 'green', as Tesla believes that by now everyone knows Tesla stands for green, so why bother to call it green.

This and much more has to be looked at by both issuers and investors before going green and jumping on the green energy securitisation train.

PACE is crossing the ocean

PACE has been so successful in the US – we anticipate originations for 2017 will hit the US\$4bn mark – that it has begun attracting attention around the world. PACE-like projects are under development in Canada, while in Australia the Environmental Upgrade Agreements (EUA) programme has already funded over A\$20m of sustainable improvements. In Cape Town, South Africa, a PACE programme is also on its way.

In Europe, some countries have already been experimenting with energy efficiency financing programmes, with Germany and France taking the lead. Meanwhile, the European Commission has investigated a

possible PACE-like package for Europe, aimed at households.

Europe would be fertile ground for an energy efficiency financing programme. The EU has ambitious clean energy and CO2 emission reduction targets for 2030 and 2050, while the majority of European real estate is currently not energy efficient, but will be in use well into and after 2050. A gap exists for market-based solutions to the problem.

Europe has two problems to tackle before adopting a PACE-like programme:

1. The region should further develop and adapt EU-wide and member state policies on energy efficiency financing
2. European citizens and commercial property owners should be involved more, to build demand for self-financed energy efficiency improvements to properties.

The European real estate market is ideally-suited for a PACE-like programme, and the funds and political will both exist. We believe it is increasingly likely that PACE – or something like it – will cross the Atlantic.

The future of green bonds

The green bonds market is shaping up to be a matured asset class. However, there is still much to be developed and changed for green securitisation (ABS) bonds to really take off.

ICMA has launched a set of Green Bond Principles (GBP) on a voluntary basis, which has been adopted by over 100 issuers and investors. I believe this is a great initiative that needs to be followed up quickly by a global set of standards, based on the GBP. Unified and clear regulation is needed.

The industry needs a set of rules to follow when it comes to determining how green a green bond – or actually, the project financed by the bond – really is. Green bond issuers and investors need an enforceable and well-defined set of rules around green project evaluation to measure the impact on the environment. This will require harmonisation of existing guidelines and regulations within and between regions; for example, between Europe and China.

China is the biggest green bond issuer in the world. There are clear rules and

regulations, and the government is pushing this with clear, top-down, regulations.

However, clear rules and regulations aren't everything; we also need clear unified criteria. Recently a Chinese green bond was issued to finance a coal power plant project – which is not really something I would call 'green'.

In Europe, there is no standard set of regulations. The European Commission is looking into how the green finance market in Europe should be regulated, but the outcome is still up in the air.

Obviously, the rules should focus on transparency, while providing issuer flexibility and incentives to issue green bonds. Furthermore, a unified set of rules and criteria will hopefully contribute to the comparability between green bonds as well.

We also need scaling. To further develop the market, corporates and governments should become more involved as green bonds issuers.

From a securitisation/ABS perspective, we have seen a few green auto ABS from Toyota and Hyundai and from the RMBS side, we have seen Obvion with the first green RMBS (certified under the Climate Bonds Standard) in Europe. All are great examples, but we need more of them to really step up to ultimately diversify the investment options. What about green (SME) CLOs, securitising loans for charging devices for your electric/hybrid car or loans for batteries that store green energy?

To further fuel the market, we need new products around green bonds, and exchange-traded funds (ETFs) could be a nice option for this. They would open the market to a much wider audience, and spark further innovation and maturing of the asset class.

And last but not least, a bigger difference in pricing is needed between green and 'normal' bonds. The price discrepancy could be a big benefit for issuers and it would ignite their interest in issuing more green bonds. This could be accomplished by lowering the risk rates; meaning lower capital charges or specific tax exemptions on qualified green securitisations and providing an incentive to open the market beyond institutional investors.

Need more information?

TMF Group has been involved with green securitisation/ABS since the sector was established. We've run point on a number of big ticket PACE deals in the US and on numerous wind and solar projects originating from Africa to Asia and Latin America. If you would like to know more about this asset class, corresponding structures and TMF Group's solutions for administering transactions and solving oversight challenges, please contact us. [SCI](#)

Chapter two: From strength to strength

Green bonds

The green bond market continues to go from strength to strength (see *Exhibit 4*). According to a recent report by Moody's, 2Q17 saw US\$32.2bn of green bonds issued – the record to date for a three-month period – which the rating agency says represented a 66% increase on the comparable quarter of last year and puts the market on track to achieve at least US\$120bn of fresh issuance for the full year (a 28% increase on the volume it recorded for 2016).

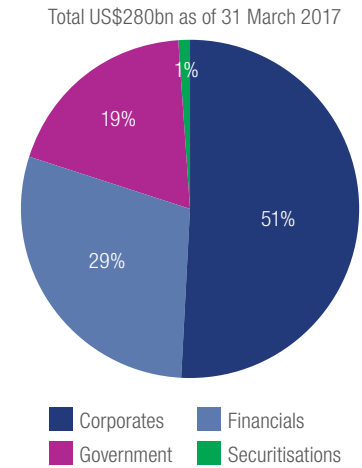
The Climate Bonds Initiative (whose statistics differ slightly from the rating agency's) believes the total this year could actually be considerably higher – over US\$130bn – as more sovereign governments enter the market and a substantial backlog of Chinese deals from the People's Bank of China, among others, that have already been approved finally come to market (see *Exhibit 5*). Argentina, Singapore, Switzerland and Slovenia all became first-time issuers over the first half of 2017 and that there are more “encouraging signs” coming out of Africa – with Nigeria expected to launch an inaugural issue before year-end and Kenya setting up a working group to accelerate the process there.

On top of the impressive growth in the numbers over the first six months of 2017, there have also been other developments in the market that augur well for its continuing further growth in the longer term. One of these has been a significant further diversification in the designated use of proceeds.

For although renewable-energy and energy-efficiency projects still account for the largest share of issuer commitments – 48% of the bonds by value that have been issued so far this year – clean transportation, sustainable water management and pollution control/prevention each account for more than 10% of the total. Meanwhile, green buildings, biodiversity and eco-efficient products recorded smaller, single-figure percentage shares.

A further sign of the market's growing maturity has been an increase in the number of transactions that are seeking external reviews or second opinions (see *Exhibit 6*). In Q2, for example, Moody's reported that 77% of green bonds issued carried some form of third-party verification, whether from specialist consultancy firms such as Sustainalytics or rating agency assessments (such as its own Green Bond Assessment programme). Despite continuing resistance to such third-party endorsement in the US municipal

Exhibit 5: Outstanding Green Bonds by Sector



Sources: Bloomberg, Fitch Ratings

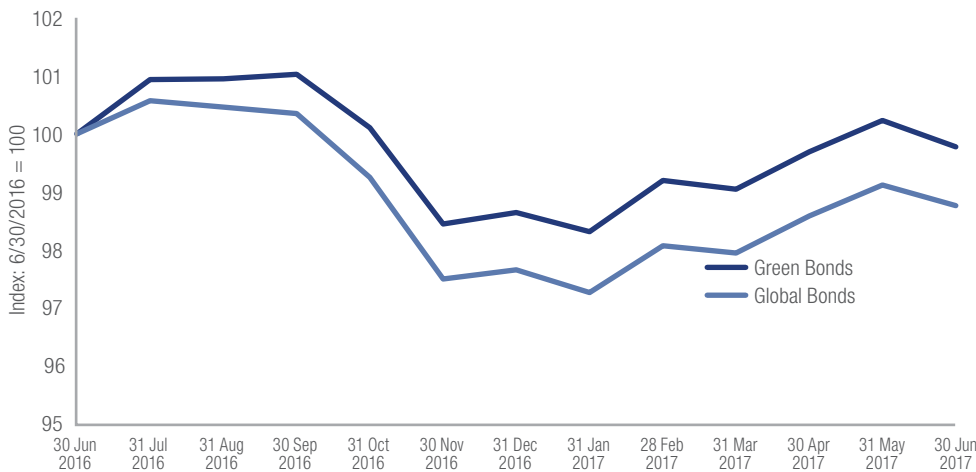
bond market, the overall proportion of US transactions that carried such external reviews also rose – to 55% in terms of the number of issues and 70% by dollar value – in the second quarter.

Standardisation

Meanwhile, the past 12 months have seen further efforts to improve international harmonisation of green bonds – in respect of eligible use of funds, external reviews, certification schemes and other standards. Although there are some regional differences that are unlikely to be universally acceptable and that any global framework will need to recognise – China's inclusion of projects to curb the emissions of coal-fired power plants as an eligible use of proceeds being an obvious case – there is a strong and growing desire among issuers everywhere to secure international acceptance for their offerings. The overwhelming majority (78%) of the 38 green bonds that 26 different Chinese issuers brought to market in the first half of this year, for example, were aligned with both international and domestic definitions of the instruments.

The executive committee on Green Bond Principles at the International Capital Markets Association took a significant further step towards defining global standards for green bonds in June, when it updated its broadly

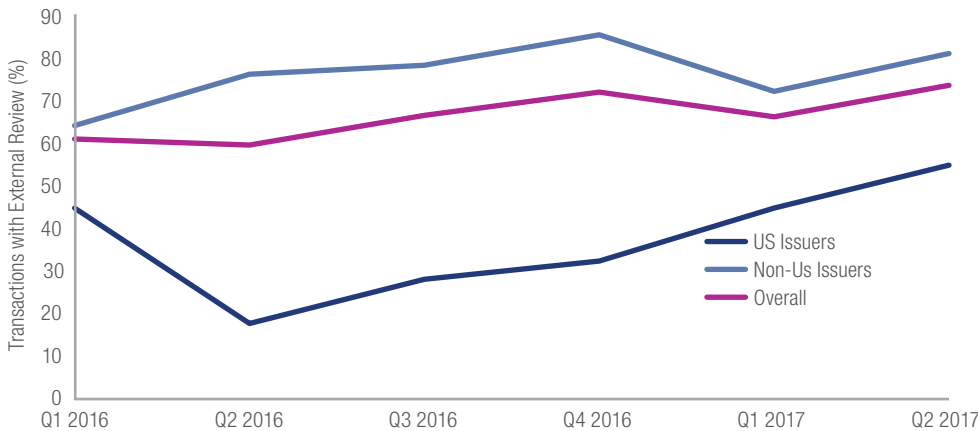
Exhibit 4: Green Bond Returns Outperform Global Bonds over the Past 12 Months



Both indices recalibrated 30 June 2016=100, with local currency used for indexing purposes to limit the effects of currency conversion rates on bond returns.

Sources: Moody's Investors Service, BofA Merrill Lynch Green Bond Index (Ticker = GREN) and BofA Merrill Lynch Global Broad Market Index (Ticker = GBMI)

Exhibit 6: Number of Green Bond Transactions with an External Review on the Rise



External reviews come in the form of consultant reviews, verifications, certifications or rating agency assessments, such as Moody's Green Bonds Assessment (GBA).

Sources: Moody's Investors Service, Climate Bonds Initiative, Environmental Finance, Dealogic, Bloomberg, MSRB Electronic Municipal Market Access, various issuer websites, OANDA currency converter

accepted – if still voluntary – framework for the instruments. The committee made three key changes to the existing principles: it expanded the criteria for green projects, suggested issuers present a more ‘holistic’ view of their green strategies (rather than simply identify single projects) and introduced additional guidance for impact reporting designed to promote a more uniform approach to this important follow-up procedure.

The committee also introduced guidelines for Social Bond Principles for instruments to raise funding for projects with socially desirable outcomes (such as affordable housing) and for ‘sustainability bonds’, where the intention would be to spend the proceeds on a mix of green and social projects. The definition of social projects is currently divided into six broad categories that cover most areas of human endeavour: affordable basic infrastructure (which includes clean drinking water, sewerage systems, sanitation and transport); access to essential services (healthcare, education and vocational training, and finance); affordable housing; employment generation through SME financing and microfinance; food security; and socio-economic advancement/empowerment.

Social bonds

The market for social bonds is still in its infancy compared with that for green bonds – issuance in the second quarter of this year totalled just US\$3.5bn, according to Dealogic figures – and questions remain over important issues, such as project qualification and the feasibility of impact reporting. There are also concerns in some quarters that social

bonds could compete for investor funds with green bonds and stall momentum in the latter market. Despite these potential growing pains, however, most believe that social bonds will ultimately provide greater choice and diversification for impact investors by offering them a wide range of opportunities beyond projects that are focused on the environment.

As well as the update to ICMA guidelines, the past year has seen some important further initiatives by national and supranational authorities to improve harmonisation of standards. The European Commission's High-Level Expert Group on Sustainable Finance, which was set up in December 2016 as part of the Commission's commitment to the Paris Climate Agreement, proposed in its interim report in July that the EU should seek to establish its own “standard and label” for green bonds as an urgent priority.

Earlier in the year, meanwhile, the stock exchange regulators in China – which remains the largest national global issuer of green bonds to date – and India both issued new guidelines for the instruments (see **Box 1**).

The only potentially negative development for the market over the past year has been the decision by the Trump Administration

to withdraw the US from the 2015 Paris Agreement on Climate Change in 2020 (the earliest date it can do so under the agreed procedures). Despite the political controversy that the move aroused, however, it is unlikely to have that serious an impact either on the expansion of climate-change initiatives across the US or the country's issuance of green bonds.

For hundreds of the public authorities – from state governments down to small municipalities – large and small corporations, universities and other bodies across the US have indicated a firm intention to continue pursuing green agendas. While current federal support for some of these programmes is no doubt helpful, there is no reason to believe that its withdrawal will have a decisive effect on the overall push in the country for a lower-carbon environment.

The evidence of the past 18 months suggests that further significant growth of the green bond market over the next five years is all but assured. But if it is to attain annual issuance levels equivalent to around US\$1trn a year within that timeframe – which is what many environmental advocates maintain will be the minimum global investment necessary to make a material difference to climate change – the market will almost certainly need to demonstrate that green bonds provide a cheaper source of funding than non-green alternatives and that it can support large-scale ABS issues.

Pricing

On the issue of pricing, there is no firm evidence yet in favour of green bonds, although there are some encouraging signs. The most comprehensive study on the subject to date was an analysis that the Climate Bonds Initiative published in August that looked at the pricing date for 62 green bonds issued between the beginning of January 2016 and the end of March this year (see **Exhibit 7**).

While the study could not find conclusive evidence that green bonds priced tighter than plain vanilla equivalents, there was equally no evidence that that the asset class as a whole commanded a new issuance premium (some green issues came in cheaper than vanilla counterparts, some around the same price and others more expensive). The one notable

“The evidence of the past 18 months suggests that further significant growth of the green bond market over the next five years is all but assured”

statistic, however, was that 71% of the bonds had tightened more than their corresponding indices within 28 days of issue – suggesting there was stronger demand for green issues than the market in general over this period.

“We’ve already escaped the drawback of a new-issue premium and you can now see that the price of these instruments tightens significantly after they are issued,” says Kidney.

Further anecdotal evidence that green bonds may have a pricing benefit came more recently at the end of August, when the ‘Big Six’ UK energy utility SSE issued a €600m bond to part-refinance its £1.1bn portfolio of onshore wind farms (either in operation or under construction) in the UK and Ireland. The bond was the largest green issue from a UK corporate yet, and it carried a coupon of just 0.875% – the lowest that SSE had ever achieved in the senior unsecured market. The company noted that the strength of investor demand for the issue had enabled it to price at the tight end of guidance and confirmed it was now looking at more green issues to help finance its offshore wind assets and onshore energy infrastructure.

Electric vehicles

As to which sections of the green bond market have the potential to produce substantial flows of large-scale ABS transactions over the next five years, Kidney identifies two areas – loans for vehicles and housing. In both cases, however, would-be issuers face a real challenge to assemble enough eligible collateral to support a deal of benchmark size.

Box 1: Chinese guidelines

The China Securities Regulatory Commission issued a new set of guidelines in March to cover the issuance of green bonds by companies listed on the country’s stock exchange. The CSRC initiative followed similar moves at the end of last year by the People’s Bank of China (the country’s central bank) and the National Development and Reform Commission for the different sections of the market that they respectively cover.

While there were some differences between the PBoC and NDRC guidelines – which the government has promised to harmonise later this year – the CSRC adopted the tighter criteria for judging green projects that the central bank had proposed. The CSRC guidelines also included a restriction that green bond issuers should “not be those who are high polluters or who are in industries that conflict with national industrial planning policy” – marking the first time that a regulator has specified such an ‘ESG filter’ for the instruments. Furthermore, the market

regulator stated that green bonds should be a priority in establishing links with overseas stock exchanges.

The Securities and Exchange Board of India, meanwhile, published a circular at the end of May that laid down its disclosure requirements for the issuing and listing of green debt securities. The circular defined eight broad eligible categories for the proceeds of such issues – renewable energy, clean transportation, sustainable water management, climate change adaption, energy efficiency (including green buildings), sustainable waste management, sustainable land use and biodiversity conservation.

It also specified a number of additional requirements for the offering documents of green issues. These include a statement on environmental objectives, details of the decision-making process for determining project eligibility and a system for tracking the subsequent deployment of funds.

For although the last few years has seen an unprecedented drive to develop and market electric cars – it would have been hard to imagine even five years ago that a UK government would now be proposing to ban the sale of new petrol-engined and diesel-engined vehicles from 2040 onwards – individual auto manufacturers have still not sold anywhere near enough electric cars for this purpose. That was the main reason why

Toyota securitised portfolios of general auto loans in 2014, 2015 and 2016 to raise a total of US\$4.6bn to on-lend to customers wanting to buy its electric and hybrid models.

Given the rate at which sales of electric cars are currently increasing, however, the situation should be different in two years’ time and enable the first securitisations of green auto loans to come forward. “As fleets [of electric vehicles] ramp up, you will see it start to happen,” maintains Kidney.

The same is true in the market for RMBS, comfortably the largest asset class in the ABS universe, accounting for around two-thirds of an outstanding market of almost US\$10trn. Notwithstanding the launch of two green RMBS issues over the past 14 months by the specialist Dutch lender Obvion, the big problem in the Netherlands and elsewhere is that too few of the properties on which lenders are advancing loans today (let alone in their historical portfolios) are sufficiently energy efficient to qualify as green collateral – which is hardly surprising, given the average age of most European housing stock.

As with auto loans, the position also improves as more new homes are built to environmental standards that make them eligible (a large green RMBS deal is anticipated soon in the Australian state of New South Wales, where all new housing has had to be compliant since 2010). To realise the full potential for RMBS to raise funding for green lending, however, a vast programme of environmental upgrades to older homes will almost certainly be required. [SCI](#)

Exhibit 7: Green Bonds Pricing Difference Comparisons

Pricing difference exists

Some indicators show differences between green and vanilla bonds

- **Spread performance** compared to a corresponding broad market bond index: seven (7) days after announcement date, 70% of green bonds had tightened more than their corresponding index, 71% after twenty-eight (28) days. This suggests that green bonds within our sample perform better than the market within the first 28 calendar days.
- **USD corporate green bonds** within our sample priced on average 22.2bps tighter than Initial Price Talk (IPT) when compared to corporate vanilla bonds (16 to 17bps) issued during the same period.
- **Green bonds tend to attract** a broader range of investors including those looking to comply with ESG focused mandates.

No pricing difference exists

Some indicators show green bonds behave in line with vanilla bonds

- **Average oversubscription** in our sample is 3 times. Oversubscription of 3-4 times is not unusual in the corporate bond market.
- **EUR corporate green bonds** in our sample price on average 13.4bps tighter than IPT. This is within the normal range of 13-14bps for vanilla bonds over the same period.
- **Spread performance:** 70% of green bonds had tighter spreads 7 days after announcement date, 63% 28 days after*. Bonds often tighten in the immediate secondary market.
- **The Greenium** – some green bonds in the sample priced inside their own credit curves, some priced on their own credit curves, and some priced outside their own credit curves. This is broadly comparable to vanilla bonds.

* Swap spreads used for EUR denominated, US Treasury spreads used for USD-denominated.

Sources: Climate Bonds Initiative, International Finance Corporation

SPONSORED STATEMENT

PACE: a strong investment for a stronger global economy

By Rasool E. Alizadeh, head of capital markets at Ygrene Energy Fund

International investment in energy efficiency is currently at its highest level ever. In fact, according to a recent survey by Fortune Global 500 company Johnson Controls, over 70% of global respondents plan to increase their investment in energy efficiency and renewable energy versus just 42% in 2013.

So, why the surge? Besides the clear public health benefits and improvements to community resilience, property owners are taking a longer look at ways to save on their bottom line – and finding that energy efficiency upgrades can have a significant impact towards that goal. As costs continue to decline, the financial markets continue to find creative solutions and conduct sophisticated diligence to find opportunities to finance this movement through the capital markets.

PACE as an economic driver

Property Assessed Clean Energy (PACE) financing is one tool that plays a vital role in not only reducing energy consumption, but is also making energy-efficiency and renewable energy upgrades an accessible and affordable reality for thousands across the US. PACE financing for micro-infrastructure investment solves upfront cost barriers by providing 100% of the project costs upfront, which are then repaid over time through an assessment on the property owner's tax bill. The PACE assessment covers all fees and labour costs associated with these projects and bundles the cost into one line on a borrower's property tax bill through a simple process.

Since 2007, PACE has helped more than 160,000 families in the US upgrade their homes, creating or supporting an estimated 30,000 local jobs and driving over US\$5bn in economic impact. In addition, PACE has already contributed to the savings of more than 10 billion gallons of water and carbon emissions reduction of more than four million metric tons.

Few, if any, public policy solutions in America has achieved similar results. Because of PACE's innovation and impact, it was named one of the top 20 "world-changing" ideas by Scientific American magazine.

“PACE has attracted circa US\$3.7bn of private capital – at no expense to taxpayers – and invested in these energy efficiency projects”

Continuing to build and strengthen a successful consumer programme

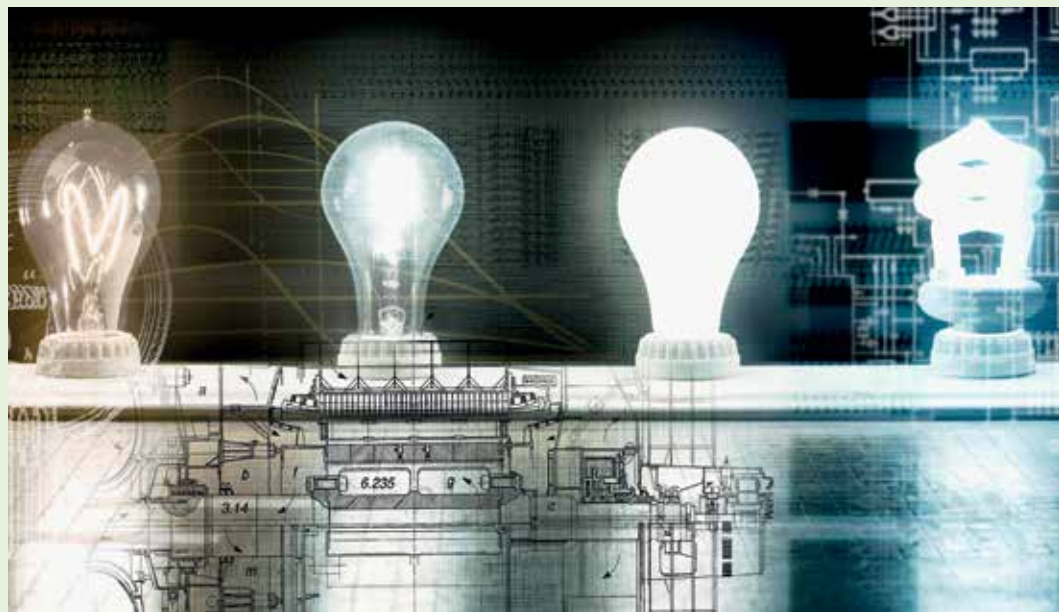
In 2016, the nation's leading PACE providers worked with the Department of Energy on best practices for residential PACE. These policies strengthened consumer disclosure, project underwriting and contractor standards, and the industry is now working with legislators on additional state and federal consumer protection legislation.

Ygrene Energy Fund, one of the nation's leading providers of residential, multifamily and commercial property PACE financing, helped to usher in some of the first consumer protections, to ensure we provide safe, easy and flexible means for property owners to affordably make improvements to homes and

businesses, reduce carbon emissions and protect our planet for future generations. As a result of bipartisan support and consumer confidence in the programme, PACE-enabling legislation has already been approved in 33 states – with more expansion opportunities on the horizon. The industry continues to evolve and Ygrene continues to build its business, brand and reputation by focusing on operational excellence, building infrastructure, regulations to standardise best practices in the industry and responsible business growth.

Steady growth in PACE investment

PACE has attracted circa US\$3.7bn of private capital – at no expense to taxpayers – and invested in these energy efficiency projects.





These investments continue to increase year-over-year as we've observed more institutions and investors gradually enter the marketplace.

All bonds associated with PACE are purchased through private investors and any cashflow delinquencies or defaults caused by non-payment by property owners of their PACE payments are borne entirely by the bond buyers (private investors), not by the bond issuers (government). In 2016, the asset class

nearly 15,000 jobs, resulting in over US\$750m in successful securitisation placements.

As the first triple-A rated programme in the industry, Ygrene continues to identify the right investment opportunities to maintain its level of growth and expand the clean energy economy. Ygrene continues to offer the industry's most diversified PACE assets, with notes secured by over 40,000 assessments on both residential and commercial properties in California and Florida.

most efficiently placed transactions. While diversifying its capital resources, Ygrene continues to focus on expanding the investor base and growing its rating agencies to accommodate a larger market, as volumes in origination are expected to steadily grow.

Ygrene was the first company to offer both residential and commercial PACE assets in the same securitisation and has achieved Moody's Investors Service Green Bond Assessment rating of GB1 (Excellent) on all public transactions. Ygrene also received global recognition for the first triple-A rated, together with Green Bond-certified PACE securities as unique to the industry.

As clean energy expands, energy efficiency investment will play a big role – and the world is already responding. Ygrene has entered the public markets with efficient pricing to help lower cost of PACE financings, thereby making green projects more affordable to property owners across the credit spectrum.

The International Energy Agency estimates worldwide energy efficiency investment of over US\$220bn and recent research estimated US\$86bn in US investments in 2015 – a 50% increase from 2011. Presenting another viable option like PACE is ideal for investors looking to support global environmental goals and get involved in the ever-growing energy efficiency market. [SCI](#)

“As clean energy expands, energy efficiency investment will play a big role – and the world is already responding”

expanded as multiple issuers had successful transactions in the ABS markets. The size, ratings, participation and frequency of each transaction have improved as spreads and all-in costs have compressed, even as benchmarks continue to widen in the US ABS markets.

All told, Ygrene investments have generated nearly US\$1bn in completed energy efficiency, renewable energy, water conservation, seismic and hurricane protection, and climate resiliency property improvements across 355 US cities. These efforts have created and sustained

By increasing its volume of Florida originations, Ygrene has improved the diversification of its pool, now offering an assessment mix comprised of 56% California and 44% Florida assets. Ygrene's capital markets expertise combined with a transparent approach has helped investors, lenders and rating agencies gain a better understanding of the PACE industry and the Ygrene platform.

Ygrene has established a transparent relationship with all lending partners and investors, with the goal of achieving the

Chapter three:

Gathering PACE

Property assessed clean energy

Of the two asset classes that have really led the development of green securitisation up to this point – certainly in terms of publicly marketed deals and repeat issuers – PACE loans have unquestionably made the more significant progress over the past 18 months. Renovate America, which opened the market with its inaugural issue in 2014, closed its eleventh ABS deal in August this year and has now raised well over US\$2bn from asset-backed investors through its Home Energy Renovation Opportunity (HERO) programme. HERO is now easily the largest ABS platform in the world that is exclusively issuing green bonds, and further issues can be expected before year-end as Renovate has set itself a target of originating at least US\$1bn of PACE loans over the whole of 2017.

The earlier of the two transactions that Renovate America launched this year, HERO Funding 2017-1, was notable for being the company's first issue to secure ratings from three different agencies (Kroll, DBRS and Morningstar) and also for being the first of its issues to attain triple-A ratings for the most senior bonds in the deal. The company, meanwhile, expanded the HERO programme beyond the boundaries of California in July 2016 into Florida, where its initial offering to home owners is covering cities – including Orlando – and counties that contain more than 1.3 million housing units.

Two more originators of PACE loans have also emerged as repeat ABS issuers within the past 12 months. One has been Ygrene Energy Fund, which has brought three more deals totalling over US\$450m to the market since November 2016. Its first ABS issue was a US\$150m private placement with a large insurance group back in July 2015.

One of the follow-up deals was a second private placement with the same private investor, but the other two issues were publicly marketed transactions that were sold to multiple investors in the 144a market (see **Box 2**). Both deals were backed by PACE loans originated in Florida, as well as California.

Ygrene increased the size of the warehousing facility that it uses to originate its PACE loans from US\$250m to US\$410m in April – with CIT Bank joining the three existing lenders,

Deutsche, Nomura and SunTrust Robinson Humphrey – and the company is planning to close two more issues before the end of October.

Rasool Alizadeh, Ygrene's head of capital markets and treasury, says the first will be another private deal worth US\$100m, while the second will be the company's largest transaction to date – a public issue of up to US\$300m in size. He hopes that a key feature of the impending public deal would be a rating from one of the major rating agencies.

This would mark the first time that one of the three big legacy rating agencies rates a PACE issue, and Alizadeh explains that – although not certain at this stage – Ygrene viewed the move as an important step in its strategic plan to establish a quarterly issuance programme (possibly as soon as next year). He adds that a rating from one of the major rating agencies would not only broaden the company's investor base, but also enable it to price its offerings potentially tighter than before.

“The progress of PACE programmes over the past year is perhaps all the more remarkable considering the headwinds that their promoters have faced during that time”

The third serial issuer of PACE-backed ABS deals to have emerged is Renew Financial, which brought its first US\$50m transaction to market back in September 2015, but has stepped up its programme significantly over the last 14 months with three more issues totalling just over US\$460m since June 2016. Renew Financial also expanded its RenewPACE programme beyond California into Florida in September 2016, and its most recent – and largest – US\$223m Renew 2017-1 issue in April this year was backed by collateral in both states.

Headwinds

The progress of PACE programmes over the past year is perhaps all the more remarkable considering the headwinds that their promoters have faced during that time.

Renovate and Ygrene have had to fight court actions this year that challenged the legality of their operations (see **Box 3**), while more recently a Wall Street Journal analysis of data from the Californian Association of County Treasurers suggested that there had been an alarming rise in property-tax defaults on PACE-assessed properties in 40 counties in California in 2016-2017. The figures show that the number of households missing two consecutive payments had increased to 1,100 from 245 the previous year (although the overall number of PACE assessments also roughly tripled over that time).

Both problems arose in part over concerns about affordability and transparency. Residential PACE loans are expensive, with an average interest rate of between 7% and 8%, and the widespread practice of using household contractors to market them to home owners has given rise to allegations that some have been pressed to sign up to

arrangements that have either not been fully explained to them or which they cannot afford.

While the three leading PACE providers insist that their marketing practices comply fully with consumer-law requirements in the states where they operate, there are legislative moves underway at both state and federal level to regulate the sector more closely. These measures should align PACE assessments more closely with other classes of consumer debt and, by doing so, help programmes to expand further.

The biggest impediment to a rapid nationwide expansion of residential PACE assessments, however, remains the continuing refusal of the Federal Housing Finance Agency to allow the two agencies that dominate the US home mortgage market – Freddie Mac and Fannie Mae – to acquire loans on properties

Box 2: Ygrene appetite

Ygrene Energy Fund brought its first public securitisation to the market on 15 November 2016, alongside a second private placement. The US\$184m issue in the 144a market was split between US\$179.48m of senior class A notes and US\$5m of junior class B bonds and backed by a pool of around 7,750 PACE loans on residential and commercial properties in California and Florida (with Californian assets accounting for approximately 80% of the collateral).

The issue was notable for being the first PACE ABS transaction to secure a triple-A rating for its senior bonds, from one of the two rating agencies that rated it (Morningstar). Moody's also assigned the deal its highest-ranking Green Bond-1 designation.

Appetite from investors was robust, with over a dozen asset managers and insurance companies ultimately buying the bonds.

Ygrene followed the deal up four months later with a slightly smaller (US\$176.5m) second public issue in March, which offered investors US\$171.3m of senior class A and US\$4.7m of class B notes. Again, the collateral was a mix of PACE assessments on properties in California and Florida, with residential loans accounting for approximately 95% of the total.

This second public issue secured the same ratings for its senior debt from Morningstar and Kroll (triple-A and double-A respectively) and a single-A rating on its subordinated bond, along with the same green bond designation from Moody's. The one notable difference was that Kroll upgraded its rating on the junior tranche to single-A from the triple-B it assigned to the subordinate bonds on the previous transaction.

that carry PACE assessments. It had been hoped that after the Federal Housing Administration published its final guidelines for insuring PACE-assessed properties in July 2016 that the FHFA (which became the conservator for Freddie Mac and Fannie Mae after both were threatened with bankruptcy in 2008) would also relax its stance. One year on, however, the FHFA seems to be as intransigent on the matter as ever.

Superior ranking

The chief concern for both the FHA and the FHFA is that the superior ranking of PACE assessments (as part of the property tax) to the mortgage on a property represents an unacceptable risk to the US taxpayer in

a default scenario, if the proceeds from a subsequent enforced sale are insufficient to repay both loans. The FHA's final guidelines specified that a "paramount" condition for it to provide cover on PACE-assessed homes was that this super-priority lien (in a default situation) could only apply to delinquent payments on the PACE assessment and not the entire loan. The guidelines also insist that a default on the mortgage could not accelerate full repayment of the PACE assessment.

As these conditions would limit the exposure of mortgage providers and their insurers on the super-priority lien to no more than a few thousand dollars at worst, many

DBRS, who has worked on all the Renovate America deals. "I would be very surprised, frankly, if any state legislature was to approve residential PACE at the moment."

Commercial programmes

The FHFA, of course, can exert no influence over PACE assessments for commercial and industrial buildings – or ABS transactions supported by them – and it is perhaps surprising that no-one has yet launched a PACE deal supported by exclusively commercial collateral. The absence of such a transaction to date might seem all the more inexplicable, given that active commercial PACE programmes are

“I would be very surprised, frankly, if any state legislature was to approve residential PACE at the moment”

were optimistic that the FHFA would issue similar guidelines. The conservator of the two federal agencies has not budged on the issue, however, and its stance theoretically prevents around 80% of the US residential mortgage market from taking advantage of PACE programmes.

There is evidence that the FHFA's stance has not in practice proved to be the insuperable obstacle to financing home purchases that this might suggest. Recent figures show that a high percentage of home owners – no doubt eager to secure a sale – have been prepared to prepay the PACE assessments on their homes. While this step is necessary to sell to a buyer accessing a mortgage backed (in one way or another) by Freddie Mac or Fannie Mae, home owners are presumably recovering the cost (or most of it) from the additional value that a PACE assessment puts on a property.

The FHFA's continuing opposition has nevertheless had one indisputable negative impact on the expansion of residential PACE programmes – it has potentially inhibited more states from enacting legislation necessary to allow them to proceed. Only three states – California, Florida and Missouri – have yet put such legislation in place, and analysts who follow the market closely believe that possibly more are likely to follow their example if a solution with the FHFA is reached.

"I think it has clearly presented a barrier to residential PACE assessments in new states," says Lain Gutierrez, senior credit analyst at

underway in over 30 states, while their residential equivalents are still confined to the three mentioned above.

Despite their vastly greater geographical availability, however, the overall volume of C-PACE loans is still nowhere near that of their residential counterparts. This partly reflects the longer timescales that commercial deals inevitably involve – 12- to 18-month lead times are not uncommon – as a result of the greater complexity of the projects. Another factor is that companies tend to have more options than individual home owners when it comes to financing such investments.



Lain Gutierrez, DBRS

Box 3: Inflation complaints

Property owner Michael Richardson launched a lawsuit in the US District Court in Los Angeles against Renovate America and its public bond-issuing partners in November last year, which claimed that excessive fees and other charges levied by the company had inflated the PACE assessment on his property for a new roof, windows and other improvements from the sum of US\$43,159 that he had agreed to pay to US\$48,777. Two other home owners subsequently joined his action.

Their complaints argued that Renovate America had breached two US Federal statutes, the Truth in Lending and Homes Ownership Equity Protection Acts, and they sought to attain class-action status by claiming that there were over 5,000 other home owners who would have suffered similar hikes in PACE assessments (although the court never granted their action this status). In July this year, however, a US District Court judge dismissed the claims on the basis that the federal laws in question apply to consumer debt and not the property tax assessments on which Renovate America and other PACE providers rely to enable home

owners to pay for environmental improvements to their property.

Judge André Birotte ruled that under Californian law, a tax-assessment lien on a property does not constitute a personal loan and remanded all remaining claims back to state court, where it remains to be seen whether the plaintiffs decide to reassert them.

Ygrene was also hit with a federal lawsuit in March this year, although the basis of this complaint was the company's claim that owners would not have to repay their PACE loans if they sold or refinanced their properties. The action alleged that this was misleading, as it was practically "impossible or near impossible" for home owners to do either without prepaying the PACE loan – and incurring penalties for doing so – because Fannie Mae and Freddie Mac would not buy home loans on properties encumbered with PACE assessments.

Another federal judge in the US Northern District Court of California dismissed most of the plaintiff's claims in this case on 26 July, on grounds that they were either inapplicable under the cited Acts or for lack of evidence.

grown to the extent it has over the period has been no mean achievement. With total originations expected to exceed US\$4bn by the end of 2017 – and the overall volume of PACE-backed securitisations not far behind – it is now firmly established on the radar of ABS investors. How quickly it will continue to expand from now on will clearly depend on regulatory developments, and the three leading originators have not given up hope of working out a compromise with the FHFA. But even without any progress on that front, the market should still set new records for green ABS issuance this year and in 2018.

Broadening horizons

The PACE concept also seems set to spread beyond the borders of the US. Pilot projects are already underway in Canada, Australia and more recently South Africa, while the European Commission is evaluating the possibility of introducing an EU-wide programme to enhance the environmental performance of residential buildings that is based on the same principles.

While some European countries (such as the UK) would require significant changes in legislation before they could introduce PACE

After more than two years of frustrated expectation, however, there are signs that a C-PACE transaction could at last be just around the corner. DBRS, for example, is currently developing a methodology for rating C-PACE deals.

"I think portfolios have now reached the point where securitisations are possible," confirms one sector analyst.

The publicly marketed Ygrene deals have already included small percentages of commercial loans in their collateral (3.6% in the deal launched earlier this year) and Alizadeh also believes that the launch of a first exclusively C-PACE securitisation is only a matter of time. He points out that the additional risks of such a deal would be broadly similar to those in a CMBS transaction,

“I believe there’s appetite there for a stand-alone commercial PACE deal, and I think we may see one come to market before the end of this year”

which experienced ABS investors would be able to understand and evaluate.

"I believe there's appetite there for a stand-alone commercial PACE deal, and I think we may see one come to market before the end of this year," he says.

Considering the challenges that PACE programmes have faced in the US over the past year, for the asset class to have

programmes, Spain is one that would not and could become the first enabler of PACE loans in Europe. GNE Finance, a firm that advises on clean-energy projects, is currently working with the municipal authorities in Olot, a small environmentally conscious Spanish city about 110km to the north of Barcelona, to introduce a pilot PACE scheme for Olot's 30,000 residents that would run from next year until 2021. [sci](#)



Chapter four: Flow slow-down

Solar ABS

Contracts for residential roof-top solar installations were one of the two asset classes that pioneered ‘green’ securitisation, with SolarCity’s inaugural issue in November 2013. But the deal flow has slowed since mid-2016, after which only three further transactions have come to market.

The decline in issuance owed much to the acquisition of SolarCity – which had dominated the market with six deals launched up to April 2016 – by the electric vehicle manufacturer Tesla. While the takeover did not close until November, its terms were agreed in August and SolarCity did not attempt to market any further deals from that point on.

What role securitisation will play in SolarCity’s future development remains unclear at this stage, as Tesla’s leading shareholder and ceo, the billionaire Elon Musk, decides how best to integrate the two distinct green businesses. However, Tesla’s announcement in the first week of August that it was planning to raise US\$1.5bn in the senior unsecured market to help finance the ramp-up production of its Model 3 electric car – and for “general corporate purposes” – suggests that SolarCity securitisations are unlikely to resume any time soon.

While three other roof-top installation companies – Solar Mosaic, Sunnova and Sunrun – have launched individual transactions since then (Sunrun had issued a previous deal in early 2016), none of them have yet shown an intent to issue with the same frequency as SolarCity.

Customer preference

There are various reasons for this slow-down in activity, one of which has been a change in customer preference. Home owners are no longer so interested in the power purchase agreements (PPAs) or leasing arrangements

have to factor tax-equity structures into their deals (non-profitable installation firms could benefit from the available tax breaks when PPAs and leases were the collateral), this change will bring the roof-top solar companies into more direct competition with other loan options for financing green home improvements, including PACE. “They’re all really refocusing their models at the moment to compete with the other offerings that are out there,” comments a senior executive at one of the PACE programmes. “Solar panels, for example, are currently among the top five home improvements that we finance.”

“They’re all really refocusing their models at the moment to compete with the other offerings that are out there”

that backed all but one of the SolarCity securitisations and are now keener to take out personal loans to finance the installation of solar panels themselves.

Although loan portfolios should be simpler to securitise because issuers would no longer

Solar Mosaic, which launched its inaugural US\$138.95m securitisation in February, adopted a loan strategy from the outset and – having originated a loan portfolio of over US\$1bn – began work on a second ABS deal in June (see *Exhibit 10*). It would consequently seem to be

Exhibit 8: Key Performance Drivers of Solar Loans and other ABS Collateral Types

	Mid-Ticket Equipment Loans	Refi Private Student Loans	Closed-End Second Lien Mortgages	Solar Loans	Unsecured Consumer Loans (MPL)
Borrower Credit Quality	Strong obligors	Super prime and prime borrowers	Primarily homeowners	Prime borrowers, all homeowners	Prime and near prime borrowers
Term	4 to 5 years	Up to 20 years	Up to 30 years	Up to 20 years	3 to 5 years
Utility/Incentive to Repay	Use of equipment as collateral	Not dischargeable	Lien on property	Incentive to save money on electricity bills	No utility after receiving loan
Sponsor/Servicer Operational Risk	Generally tested and have gone through a stressed economic environment	Untested servicing platform that typically relies on proprietary software	Generally tested and have gone through a stressed economic environment	Specialty finance company that is unrated or lowly rated, serviceable by 3rd parties	Untested platform; serviceable by 3rd parties
Fraud Risk	Low fraud risk	Low fraud risk	Low fraud risk	Less susceptible to borrower identity fraud, but higher risk of fraud from contractors	Increased risk owing to the online application process
Legal and Regulatory Risk	Low legal and regulatory risk	Low legal and regulatory risk	Low legal and regulatory risk	Risk of changes to net metering	True lender risk; high cost loans
Availability of Data	Relatively long length of historical data	Approximately 4 years; proxies available	Relatively long length of historical data	Limited historical data; few proxies	7 years
Technology Shock Risk	Limited uncertainty over development of new equipment	Not applicable	Not applicable	Uncertainty over development of new solar panels	Not applicable
Recoveries	Medium	Medium	Medium	Low	Low

Source: Moody’s Investors Service

the company that is currently best placed to take on SolarCity's mantle as lead issuer in the asset class, at least in the near term.

The US\$255m ABS deal that Sunnova launched in April, by contrast, was backed by a portfolio of almost 14,000 PPAs and leases, and the company (along with Sunrun and other roof-top installers) is now revising its business model to take account of the growing consumer preference for loans (see *Exhibit 8*).

Legal action

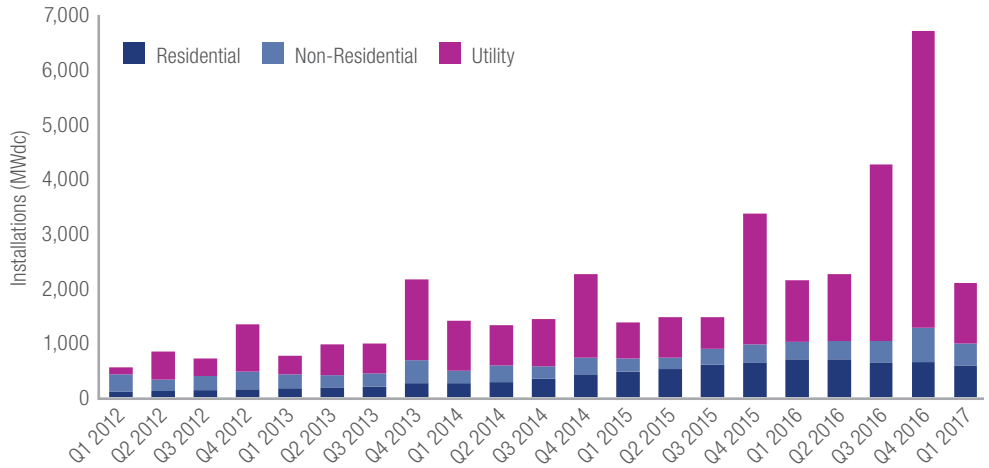
A second – and potentially much more damaging – brake on activity in the sector has been a legal action calling for tariffs on cheap imported solar panels. Suniva, a Chinese-owned manufacturer of solar cells and panels based in Georgia that entered Chapter 11 bankruptcy proceedings in April, lodged a petition at the end of that month with the US International Trade Commission that sought the imposition of price controls on imported products – a US\$0.78/MW floor price for crystalline silicon PV modules and a US\$0.4/W tariff on imported cells. A second US manufacturer SolarWorld subsequently joined the action as co-petitioner towards the end of May.

The ITC notified the other 163 members of the World Trade Organisation at the end of May that it was launching an investigation into the case and it will now make a determination by 22 September as to whether subsidised low-cost imports have caused injury to Suniva (and other domestic manufacturers). If it concludes that is the case, it will recommend remedies – which could include tariffs, volume limits and other measures – by 13 November.

It would then be up to President Trump's Administration to accept, amend or reject the ITC's recommendations. It is easy to understand why the industry is watching the proceedings with some apprehension, given President Trump's firm – and frequently stated – views on putting American industry first.

If Suniva and SolarWorld succeed in their

Exhibit 9: US Quarterly PV Installations Q1 2012-Q1 2017



Source: SEIA/GTM Research

action – which would see the prices of solar panels revert to 2012 levels – there is little doubt that the impact on the entire solar sector in the US would be devastating.

A report from the industry consulting firm GTM Research in June forecast that if the petitioners' demands were met in full, new

hurt the market for residential installations as well.

“The economics of solar could certainly be impacted dramatically by these tariffs, which would virtually double the cost of panels,” confirms Tracy Rice, senior credit analyst at Moody's.

“The economics of solar could certainly be impacted dramatically by these tariffs, which would virtually double the cost of panels”

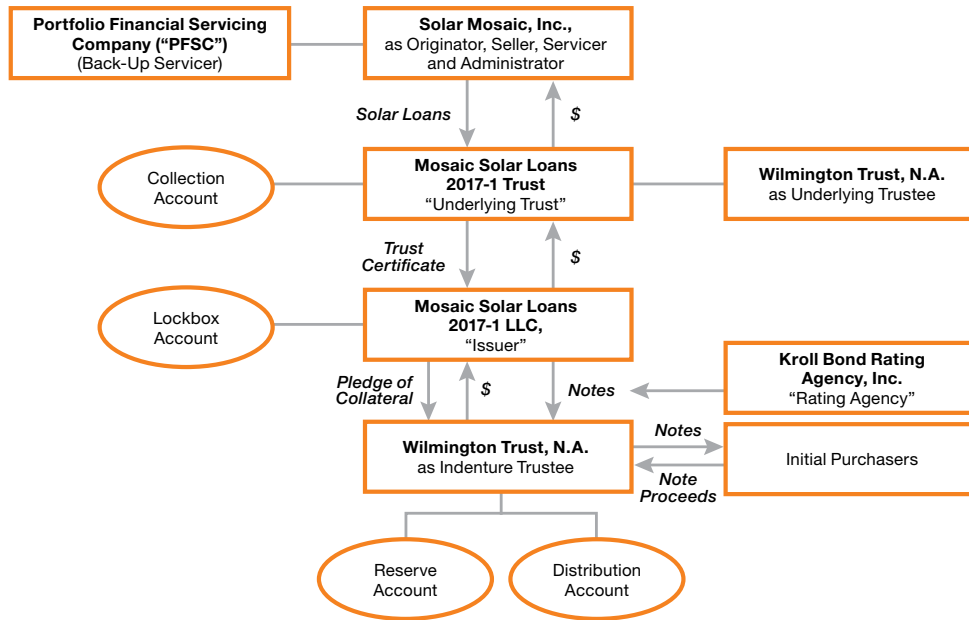
solar installations between 2018 and 2022 would drop by over 60% from the currently projected 72.5GW to just 25GW (see *Exhibit 9*). Although GTM points out that utility-scale solar projects – the economic viability of which now depends in most cases on being cost-competitive with natural-gas alternatives – would be the worst hit, the impact on the relative cost of solar energy would certainly

The wider implications for US jobs, however, could yet swing the final verdict in the industry's favour. For while it is self-evident that foreign manufacturers can significantly undercut their US counterparts on cost, the imposition of tariffs could well lose more jobs than it saves.

According to the US Solar Energy Industries Association, only around 38,000 of the



Exhibit 10: Solar Mosaic 2017-1 Structure



Source: Kroll Bond Rating Agency, Inc.

estimated 260,000 US solar jobs are currently in the manufacturing side of the sector. The association warns that many more in other areas of the business would be at risk if the price controls are introduced.

Aggregation issues

There has, meanwhile, been little progress on securitising portfolios of either commercial

and industrial roof-top installations – where aggregating a sufficient volume of assets remains a challenge – or the securitisation of utility-scale solar projects. As the latter will continue to account for around two-thirds of the PV capacity installed annually in the US up to 2022, persuading utilities to adopt this method of funding remains a key challenge for the ABS market.

Although large independent power producers and utilities have invested heavily in wind, solar, geothermal and other sources of renewable energy, none of them have so far sought to finance these developments through ABS to any meaningful extent. The loss of investor confidence in yieldcos – the vehicles structured to funnel maximum profits to investors, into which a number of IPPs placed their large-scale solar projects – from 2015 onwards had been expected to lead some to consider securitisation as an alternative means of financing. But this has not happened yet.

There is, meanwhile, little incentive for investment-grade utilities to look beyond the senior unsecured bond markets for their funding needs, while the Federal Reserve’s quantitative easing measures keep interest rates at record lows.

A further factor may be wariness among ABS investors towards deals that are backed by single large renewable-energy assets (or a portfolio containing a small handful of projects). Difficulties that arose with the two whole-business Breeze securitisations of offshore wind farms in Europe more than 10 years ago seem to have cast a long shadow in this respect. Although the development of more reliable wind-turbine technology and the emergence of a market in weather derivatives would now largely overcome the problems that the Breeze issues experienced, investors appear to prefer deals with more granular collateral.

Elsewhere in the world, however, there have been some encouraging moves regarding roof-top solar securitisation. In Australia, for example, the consumer and SME loans provider FlexiGroup launched two certified green tranches – backed by solar roof-top loans – as part of wider ABS issues in 2016 and 2017. The green tranches priced 5bp and 3bp tighter respectively than the transactions’ other comparable triple-A bonds. [SCI](#)

“A further factor may be wariness among ABS investors towards deals that are backed by single large renewable-energy assets”



Chapter five: Renewables rival

RMBS

A market for green RMBS has the potential to rival that for renewable-energy securitisation in size. RMBS accounts for around two-thirds of the US\$9.8trn global market for all ABS, about 86% of which is based in the US. Although the overwhelming majority of historical RMBS collateral is unlikely to be eligible to back green issues, just 10% of it could still create a market worth several hundred billion dollars.

As most of the new housing that will be built from now on – certainly in the leading European countries, North America and large parts of Asia – will be sufficiently energy-efficient to qualify as green collateral, there would now seem to be a strong case for lenders to recycle capital from existing green assets in their mortgage portfolios into more of the same through appropriately designated RMBS programmes. Although the proposition has been widely discussed over the past two years, however, the first green RMBS issue did not emerge until Obvion – a wholly owned subsidiary of Rabobank since 2012 – issued

“Loans to SMEs should be another decent source of green ABS collateral, as a growing number of companies are now seeking to be ‘good corporate citizens’”

its landmark €500m transaction in July last year (see *Box 4*).

Green STORM 2016 stood out because it securitised a pool of entirely green mortgage loans (see *Exhibit 11*). This distinguished it from some previous large consumer loan securitisations that were labelled ‘green ABS’, but in actuality just extended the green-bond principle by committing the funds raised from standard ABS issues for green lending. The deal also demonstrated that it was both feasible and economically viable for such a financial institution to segregate a portfolio of green assets from a wider loan book.

The inclusion of energy labels in Dutch mortgage documentation since the beginning

of last year will make it more straightforward for lenders to identify green assets among a general portfolio of residential home loans, and a few other specialised mortgage companies in the Netherlands – and elsewhere – are currently planning to launch similar deals.

“I know that a few others are looking at it as well,” says Huub Mourits, the global md for structured finance at the Amsterdam-headquartered professional services firm TMF Group. He adds that loans to SMEs should be another decent source of green ABS collateral, as a growing number of companies are now seeking to be “good corporate citizens”.

For banks at present, however, the continuing availability of ultra-low cost funding from the European Central Bank means that securitisation is simply not currently an attractive option for raising finance. So, until the ECB raises its rates – a move that is probably still a year away – the biggest source of mortgage lending and other loans across Europe will have no immediate incentive to pursue green RMBS.

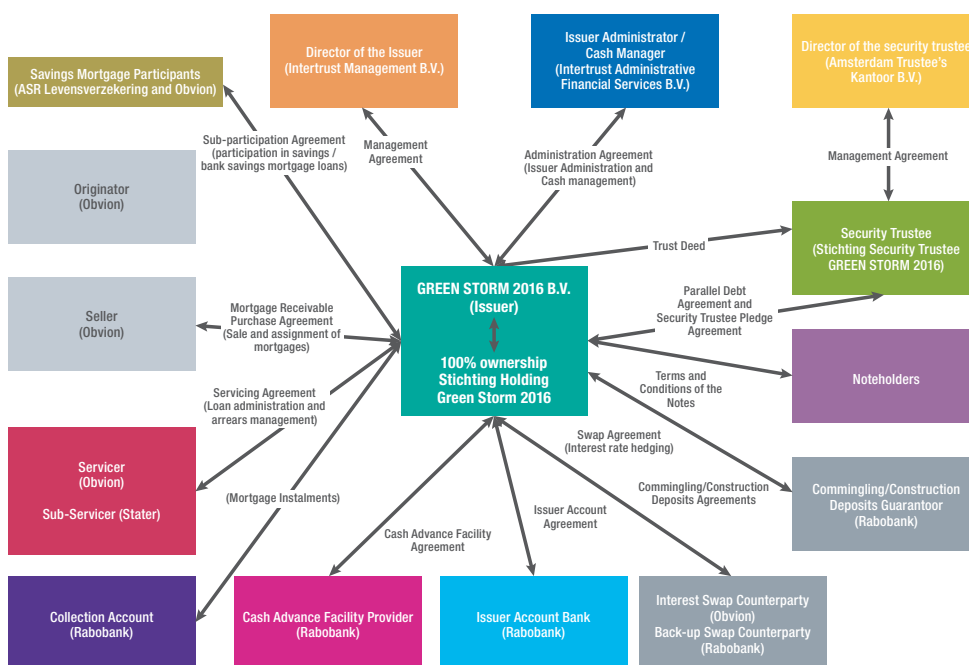
Kidney at the Climate Bonds Initiative notes there are nevertheless initiatives underway at banks and other providers of consumer finance to devise IT programmes that can rapidly scan existing portfolios of all types of loan and “tag” the green assets within them.

Structural challenges

While the impact of central bank quantitative easing policies can be viewed as a short-term impediment to the development of green RMBS, the market also faces a structural challenge that will take longer to address. Both Green STORM 2016 and the €550m Green STORM 2017 follow-up issue that Obvion closed at the end of May this year highlight the problem – the limited availability of appropriate housing stock.

For only around 15% of the €3bn volume of mortgages that Obvion originates each

Exhibit 11: GREEN STORM 2016 Transaction Structure



Source: Moody's

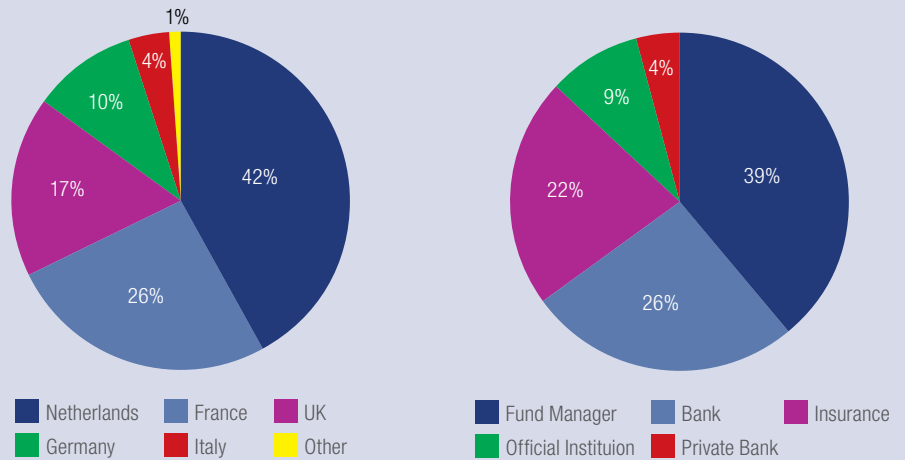
Box 4: Environmental eligibility

Green STORM 2016 was Obvion's 33rd securitisation and the first in the world to be secured exclusively by loans that meet specified standards of environmental eligibility – in this case the three highest-ranking Dutch energy performance certificates for private homes. Obvion structured the deal to be compliant with the Green Bond Principles that the International Capital Markets Association drew up in 2015, commissioning the leading compliance agency Sustainalytics to verify that it did so, and to meet the Climate Bond Initiative's low carbon standard. The deal was also subsequently assigned Moody's highest Green Bond Assessment grading of GB-1.

While the transaction was split into five tranches, only the senior triple-A rated bonds – which accounted for 96% of the total issue by value – were offered to investors. Obvion initially set aside a pool of loans totalling just over €270m to back the deal, but investor appetite was so strong – with the volume of orders placed rising to €1.2bn – that the lender increased the size of the issue to €500m (and the pool of supporting collateral to almost €600m).

The high level of demand enabled Obvion to price the senior triple-A rated bonds 5bp tighter than it had originally envisaged – at 30bp over three-month Euribor – and also to sell the deal exclusively to buyers with green investment strategies (see *Exhibit 12*). Rachele Rijk, Obvion's head of funding and balance-sheet management, said at the time that the plan was for green RMBS to become a regular feature of the STORM

Exhibit 12: Green Storm 2017 Geographic Distribution and Investor Distribution



Source: Rabobank

programme going forward, and the company closed its second green issue within a year at the end of May.

The €550m Green STORM 2017 transaction was similar in most respects to the initial deal, except that it features a revolving period before its first optional redemption date. During this period, it can acquire new loans, replacement loans and any further advances that the originator makes to existing borrowers.

Once again, investor demand for the issue was strong, with orders reaching €1.4bn the

day after price guidance was set at three-month Euribor plus 18bp. That afternoon the final terms were set at a spread of 17bp over the benchmark – a record low since the financial crisis in 2008.

Due to the prevailing negative value of the euro inter-bank rate, however, the issue had to sold at a premium of 102.4% of par with a coupon of 60bp to enable the bonds to pay the agreed terms. "It was a technical adjustment to avoid hitting that zero-coupon floor," says a source close to the process.

year are advanced on properties that would automatically qualify as green RMBS collateral under current definitions. These are houses that can obtain the top two categories of energy-performance certificate (A and B) in the Netherlands and – in effect – this stipulation means only homes that were built after 2013 can qualify. Older residential property can only be included in the collateral pools if it has undergone renovations that have improved its energy-performance certificate by at least two notches to the third category of certificate (C) or higher and represents a minimum improvement of 30% in terms of energy efficiency, compared with an average home of the same age.

Max Bronzwaer, executive director and treasurer at Obvion, says these eligibility criteria are consequently imposing an annual limit on the volume of green RMBS that the company can issue in any given year. "That's the basic problem we face as an issuer of green RMBS and it's a general problem for the

issuance of most types of green ABS – there are just not enough green assets to refinance," he explains.

He adds: "Even if we wanted to, we couldn't issue €1bn of green RMBS a year at the moment. One area we are currently working on is to try and increase the proportion of mortgages we originate on homes with the appropriate energy-efficiency improvements."

Upgrading performance

For green issues to become the norm rather than a popular exception in the RMBS market will consequently require a massive overall investment in upgrading the environmental performance of older houses. It is difficult to see how this will happen without either significant government incentives or the widespread introduction of programmes like the PACE-loans initiative in the US, which enables private borrowers to finance such enhancements and recover their outlay through an incremental charge on the

property taxes (with the subsequent increase in property values providing an adequate incentive for home owners).

It may take a little longer for green RMBS to take hold in the US, where the legacy of the subprime market – and its role in initiating the 2008 crisis – still casts a long shadow. In June, however, Freddie Mac advanced the securitisation of socially sustainable assets when it launched a first US\$292m transaction backed by tax-exempt loans from state and local housing agencies for affordable rented housing.

Robert Koontz, vp of multifamily capital markets at Freddie Mac, says this extension of the agency's securitisation programmes to offload risk to private investors – which could issue up to US\$10bn over the next year or so – is designed to boost liquidity in the affordable-housing market. This key focus of the agency's mission is also not constrained by the limits that the FHFA imposes on its lending. [sci](#)

Chapter six: Capital relief

Synthetic securitisation

Another interesting development in the area of green and socially sustainable securitisation this year was a synthetic transaction in March, through which Crédit Agricole transferred the first-loss risk on a portfolio of infrastructure loans to a US-based hedge fund to free up capital for it to lend to a range of environmentally enhancing projects. The deal saw Mariner Investment Group, a hedge fund that became a signatory to the UN-backed Principles for Responsible Investment (PRI) in August 2013, agree to invest around US\$150m in asset-backed notes that will cover initial losses on the loan portfolio.

The Premium Green 2017-2 reference portfolio consists of about 200 loans that Crédit Agricole Corporate and Investment Banking has advanced to the power, oil and gas, real estate, infrastructure, aviation, shipping and rail sectors. By reducing the potential risk of losses on the portfolio for Crédit Agricole, the synthetic securitisation meant the French bank could allocate less regulatory capital to what had become a significantly less-risky asset and this released an additional US\$2bn of lending capacity.

While Mariner has made such investments before – the firm has raised US\$1bn for

investments in synthetic securitisations and struck an initial deal with UniCredit back in 2014 – this was the first time that it put pressure on the bank involved to dedicate the freed-up capital to impact investments. Molly Whitehouse, one of the leads on the Mariner team that structured the deal, says it demonstrates that synthetic securitisation is not just an important tool for balance-sheet management, but also one that can generate real social and environmental returns. She adds that Mariner hopes Premium Green 2017-2 will be the first in a “wave of issuances of green capital notes”.

Crédit Agricole has pledged to use the US\$2bn for further lending to “several green sectors”, including renewable energy, energy efficiency loans to improve the carbon footprint of commercial real estate, public transportation, and sustainable waste and sewerage facilities. There is no contractual obligation on Crédit Agricole, however, to use the funding for green investments – the bank has merely promised to make “best efforts” to deploy the capital in this way – with a commitment to “regularly report on the composition of the new green loan portfolio and...periodically communicate on certain of the projects that have been financed as a result of this risk-transfer operation”.

Reporting

While this clearly falls short of full reporting on how the bank ultimately allocates the sum that has been released by the Mariner investment, however, it is unlikely to renege on the commitment. In the current investment climate, the reputational damage that results from ignoring such a non-binding undertaking would surely outweigh any commercial gains from deploying the capital elsewhere.

Cynics might argue that the deal will not actually make Crédit Agricole act any differently than it would have done anyway – given there is currently a large number of lucrative lending opportunities for a wide array of green and socially beneficial projects, and that the bank has already committed itself to invest US\$60bn over the next three years to help in the fight against global warming.

The transaction nevertheless seems to have at least one obvious potential benefit. If it succeeds in persuading more banks to mobilise institutional capital in this way to accept the first-loss risk on green and socially responsible loans, it will reduce both the perceived risk – and cost – of such lending. That, in turn, could have a meaningful impact on the international efforts to develop a lower-carbon economy. [SCI](#)

Chapter seven: Conclusion

While green projects and initiatives are undoubtedly at the forefront of driving the ESG investment agenda so far, the concept of impact investing goes beyond clean energy generation and energy conservation into a range of other areas that currently present serious challenges on a global scale. Sustainable agriculture and affordable basic services – such as housing, healthcare and education – are among the more high-profile of these.

Although such activities have not, in most cases, been historically associated with the

sort of investment returns that capital markets usually require, the growth of interest in impact investing across the investor spectrum over the past five years has been remarkable.

The not-for-profit Global Impact Investing Network (GIIN) points to the wide array of institutions – some of which in the past would have been expected to pursue very different investment agendas and returns – that have already bought into the concept (see *Exhibit 13*). At one end of the scale, there are banks, insurance companies, pension funds and fund managers, while at the other are the investors

who have traditionally supported social development goals – charitable foundations, NGOs and religious institutions.

The banking sector, for example, is strongly represented on the GIIN's own Investors' Council of leading impact investors, with JPMorgan, Deutsche Bank, Credit Suisse, Citi Foundation and the Goldman Sachs Urban Investment Group numbered among its 53 members.

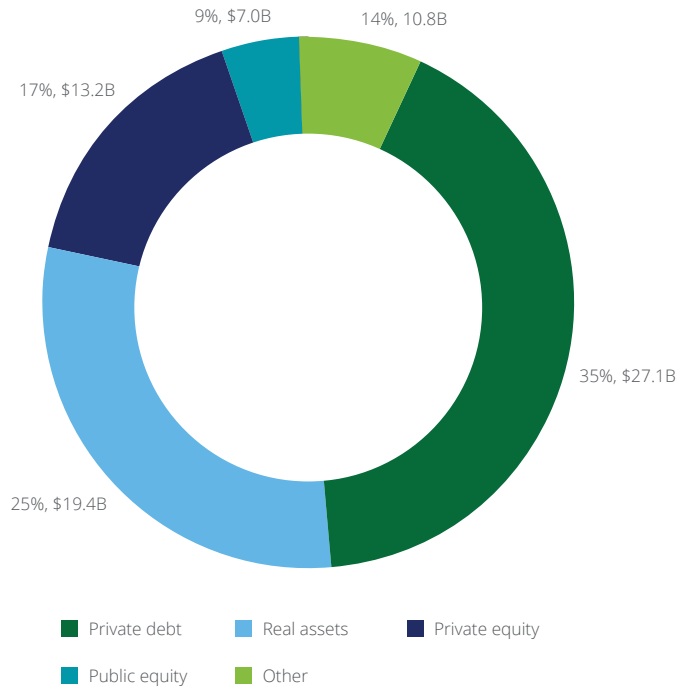
The sort of activity covered by impact investing has, of course, gone on for years (even if the term is relatively new),

if not decades. What is different now is the emergence of a growing number of collaborative initiatives – at an international level – to create deep and lasting capital market mechanisms that can support such investments on a scale that has not been seen before.

Bond markets will have to feature prominently in the process and they are already making a significant mark. According to the GIIN's online global directory ImpactBase, fixed income funds already account for almost 80 of the 400-odd funds that it currently lists as suitable products for impact investors.

The dedicated impact investment management firm Sonen Capital has, meanwhile, already identified 16 different categories of investment for its fixed income strategy, including water treatment and infrastructure, health services, housing and community development – which accounted for by far the largest (36%) share of its bond purchases in 2016. As a well-established tool for transferring risk and raising low-cost finance in the capital markets, securitisation will have a significant role to play in the process. [sci](#)

Exhibit 13: Breakdown of \$77.4 Billion in Impact Investing Assets



Source: Deloitte Center for Financial Services analysis of responses to the Annual Impact Investor Survey, 2016 by The Global Impact Investing Network: "Total AUM by Instrument (Full sample)." Numbers may not foot due to rounding

Appendix: Green securitisation issuance data

Date	Deal name	Class	Size (m)	Spread/coupon	WAL	MS/D/K/MO/S/F	Arranger	Originator	Type	Market
26/07/2017	HERO Funding Trust 2017-2	A1	\$91	130	5.43	AAA/AA/AA/NR/NR/NR	MS, BAML, BCG	Renovate America	PACE ABS	US
		A2	\$90.84	155	5.43	AAA/AA/AA/NR/NR/NR				
		B	\$23			NR/BBB/NR/NR/NR/NR				
19/05/2017	Green Storm 2017	A	€550	3mE+60	4.9	NR/NR/NR/Aaa/AAA/AAA	Rabo, SG	Obvion	RMBS	Europe
		B	€13.7		4.9	NR/NR/NR/Aa1/AA+/AA				
		C	€12.2		4.9	NR/NR/NR/Aa3/AA/BBB+				
		D	€12.3		4.9	NR/NR/NR/A2/BBB+/B+				
		E	€6		4.9	NR/NR/NR/Ba1/NR/NR				
24/04/2017	HERO Funding Trust 2017-1	A1	\$125.47	175	6.12	AAA/AA/AA/NR/NR/NR	MS, BAML, DB	Renovate America	PACE ABS	US
		A2	\$107	200	6.12	AAA/AA/AA/NR/NR/NR				
21/04/2017	GoodGreen Trust 2017-1	A	\$171.26	165	7.98	AAA/NR/AA/NR/NR/NR	DB	Ygrene	PACE ABS	US
		B	\$4.77	4.94%	7.98	A/NR/A/NR/NR/NR				
21/04/2017	Renew 2017-1	A	\$189.14	165	6.71	NR/AA/AA/NR/NR/NR	Natixis	Renew Financial Group	PACE ABS	US
		B	\$34.1	5.75%	3.1	NR/BBB/NR/NR/NR/NR				
11/04/2017	Helios Issuer Series 2017-1	A	\$191.75	4.94%	6	NR/NR/A/NR/NR/NR	CS	Sunnova Energy Corp	Solar ABS	US
		B	\$18			NR/NR/BBB/NR/NR/NR				
		C	\$45							
14/02/2017	Flexi ABS Trust 2017-1	A1	A\$92	1mBBSW+70	0.32	NR/NR/NR/P-1/NR/F1+	NAB, CBA	Certeqy Ezi-Pay	Consumer/credit card ABS	Australia
		A2	A\$63	1mBBSW+130	1.49	NR/NR/NR/Aaa/NR/AAA				
		A2G	A\$50	1mBBSW+127	1.49	NR/NR/NR/Aaa/NR/AAA				
		B	A\$14	1mBBSW+195	1.49	NR/NR/NR/Aa2/NR/AA				
		C	A\$16		1.49	NR/NR/NR/A2/NR/A				
		D	A\$118		1.49	NR/NR/NR/Baa2/NR/BBB+				
		E	A\$7		1.49	NR/NR/NR/Ba1/NR/BBB-				
F	A\$13									
26/01/2017	Mosaic Solar Loans 2017-1	A	\$138.95	255	4.06	NR/NR/A/NR/NR/NR	Guggenheim, BNPP	Solar Mosaic	Solar ABS	US
20/01/2017	SolarCity FTE Series 2017-A	A	\$123	4.97%	5.42	NR/NR/A-/NR/NR/NR	CS	SolarCity	Solar ABS	US
		B	\$8.75			NR/NR/BBB/NR/NR/NR				
		C	\$13.25			NR/NR/BB+/NR/NR/NR				

Continued...

Date	Deal name	Class	Size (m)	Spread/coupon	WAL	MS/D/K/MO/S/F	Arranger	Originator	Type	Market
15/12/2016	HERO Residual Funding 2016-IR (Cayman)	A1	\$89	4.50%		NR/BBB/NR/NR/NR/NR	N/K	Renovate America	PACE ABS	US
		A2	\$36	6.00%		NR/BBB/NR/NR/NR/NR				
07/12/2016	HERO Funding II 2016-4B	B	\$44.5	4.99%	2.84	NR/BBB/NR/NR/NR/NR	MS, DB, Guggenheim	Renovate America	PACE ABS	US
01/12/2016	HERO Funding Trust 2016-4	A1	\$140	155	6.47	NR/AA/AA/NR/NR/NR	MS, DB, Guggenheim	Renovate America	PACE ABS	US
		A2	\$143.63	180	6.47	NR/AA/AA/NR/NR/NR				
22/11/2016	Golden Bear Funding Notes Series 2016-R	R	\$51	5.65%		NR/NR/BBB/NR/NR/NR	Natixis	Renew Financial Group	PACE ABS	US
02/11/2016	Golden Bear Funding Notes Series 2016-2	A	\$115.33	3.16%		NR/NR/AA/NR/NR/NR	Natixis	Renew Financial Group	PACE ABS	US
28/10/2016	GoodGreen Trust 2016-1	A	\$179.48	165		AAA/NR/AA/NR/NR/NR	DB	Ygrene	PACE ABS	US
		B	\$5			A/NR/BBB/NR/NR/NR				
15/09/2016	HERO Funding Trust 2016-3	A1	\$220.24	180	6.16	NR/AA/NR/NR/NR/NR	MS, DB	Renovate America	PACE ABS	US
		A2	\$100	215	6.16	NR/AA/NR/NR/NR/NR				
		B	\$57	5.24%	2.42	NR/BBB/NR/NR/NR/NR				
22/06/2016	Golden Bear Funding Notes Series 2016-1	A	\$122.97	3.75%		NR/NR/AA/NR/NR/NR	Natixis	Renew Financial	PACE ABS	US
22/06/2016	Spruce ABS Trust 2016-E1	A	\$73.49	4.32%		NR/NR/A/NR/NR/NR	CITG	Spruce Finance	PACE ABS	US
		B	\$10.29	6.90%		NR/NR/BBB/NR/NR/NR				
08/06/2016	Green Storm 2016	A	€500	3mE+30	5	NR/NR/NR/Aaa/AAA/AAA	Rabobank	Obvion	RMBS	Europe
		B	€8		6.1	NR/NR/NR/Aa1/AA+/AA				
		C	€6		6.1	NR/NR/NR/Aa2/AA/A				
		D	€6.8		6.1	NR/NR/NR/A1/A/BBB				
		E	€5.4			NR/NR/NR/Baa3/NR/BB				
25/05/2016	HERO Funding Trust 2016-2	A	\$305.31	225	6.84	NR/AA/AA/NR/NR/NR	MS, DB	Renovate America	PACE ABS	US
02/05/2016	Toyota Auto Receivables 2016-B Owner Trust	A1	\$446			NR/NR/NR/P-1/A-1+/NR	CITG, Lloyds	Toyota	Auto prime ABS	US
		A2A	\$361	24	1	NR/NR/NR/Aaa/AAA/NR				
		A2B	\$129	1mL+25	1	NR/NR/NR/Aaa/AAA/NR				
		A3	\$490	36	2.1	NR/NR/NR/Aaa/AAA/NR				
		A4	\$134	44	3.27	NR/NR/NR/Aaa/AAA/NR				
		B	\$40			NR/NR/NR/Aa3/AA+/NR				
21/04/2016	Flexi ABS Trust 2016-1	A1	A\$91	1mBBSW+75	0.28	NR/NR/NR/Aaa/NR/AAA	NAB, CBA	FlexiGroup	Lease ABS	Australia
		A2	A\$61	1mBBSW+155	1.37	NR/NR/NR/Aaa/NR/AAA				
		A2G	A\$50	1mBBSW+150	1.37	NR/NR/NR/Aaa/NR/AAA				
		B	A\$12	1mBBSW+225	1.38	NR/NR/NR/Aa2/NR/AA				
		C	A\$14		1.38	NR/NR/NR/A2/NR/A				
		D	A\$10		1.38	NR/NR/NR/Baa2/NR/BBB				
		E	A\$8		1.38	NR/NR/NR/Ba1/NR/BB				
F	A\$13									
29/02/2016	SolarCity LMC Series V series 2016-1	A	\$52.15			NR/NR/BBB+/NR/BBB/NR	CS, GS	SolarCity	Solar ABS	US
		B	\$5.3m			NR/NR/BB+/NR/BB/NR				
05/02/2016	HERO Funding Trust 2016-1	A	\$217.5	4.05%	6.96	NR/AA/AA/NR/NR/NR	MS, DB	Renovate America	PACE ABS	US
13/01/2016	SolarCity FTE Series I series 2016-A	A	\$151.55	4.80%	5.76	NR/NR/BBB/NR/BBB/NR	CS	SolarCity	Solar ABS	US
		B	\$33.45	6.85%	5.92	NR/NR/BB/NR/NR/NR				
18/11/2015	HERO Funding Trust 2015-3	A	\$201.53	240	6.99	NR/AA/AA/NR/NR/NR	MS, DB	Renovate America	PACE ABS	US
07/08/2015	SolarCity LMC series IV 2015-1	A	\$103.5	230	6.04	NR/NR/A/NR/NR/NR	BAML, CS	SolarCity	Solar ABS	US
		B	\$20		6.52	NR/NR/BBB/NR/NR/NR				
27/07/2015	HERO Funding Trust 2015-2	A	\$159.8	190	7.58	NR/NR/AA/NR/NR/NR	DB, MS	Renovate America	PACE ABS	US
30/06/2015	Sunrun Callisto Issuer 2015-1	A	\$100	4.4%	7.06	NR/NR/A/NR/NR/NR	CS	Sunrun	Solar ABS	US
		B	\$11	5.38%	7.46	NR/NR/BBB/NR/NR/NR				
10/06/2015	Toyota Auto Receivables 2015-B Owner Trust	A1	\$355			NR/NR/NR/P-1/A-1+/NR	CA, CITG, BAML	Toyota	Auto prime ABS	US
		A2A	\$120	21	1	NR/NR/NR/Aaa/AAA/NR				
		A2B	\$280	1mL+21	1	NR/NR/NR/Aaa/AAA/NR				
		A3	\$360	25	2.1	NR/NR/NR/Aaa/AAA/NR				
		A4	\$103.75	31	3.23	NR/NR/NR/Aaa/AAA/NR				
		B	\$31.25			NR/NR/NR/A1/AA+/NR				
22/04/2015	HERO Funding Trust 2015-1	A	\$240.11	180	10.25	NR/NR/AA/NR/NR/NR	DB	Renovate America	PACE ABS	US
16/10/2014	HERO Funding Trust 2014-2	A	\$129.15	4%	10.66	NR/NR/AA/NR/NR/NR	DB	Renovate America	PACE ABS	US
24/07/2014	SolarCity Series III 2014-2	A	\$160	180	6.89	NR/NR/NR/NR/BBB+/NR	CS	SolarCity	Solar ABS	US
		B	\$41.5	5.45%	6.89	NR/NR/NR/NR/BB/NR				
02/04/2014	SolarCity LMC Series II 2014-1	A	\$70.2	230	6.6	NR/NR/NR/NR/BBB+/NR	CS	SolarCity	Solar ABS	US
11/03/2014	Toyota Auto Receivables 2014-A Owner Trust	A1	\$501			NR/NR/NR/P-1/A-1+/NR	CITG, BAML, MS	Toyota	Auto prime ABS	US
		A2	\$560	13	1	NR/NR/NR/Aaa/AAA/NR				
		A3	\$480	15	2.06	NR/NR/NR/Aaa/AAA/NR				
		A4	\$165.25	22	3.17	NR/NR/NR/Aaa/AAA/NR				
		B	\$43.75			NR/NR/NR/Aa3/AA+/NR				
06/03/2014	HERO Funding Trust 2014-1	A	\$103.8	4.75%	10.8	NR/NR/AA/NR/NR/NR	DB	Renovate America	PACE ABS	US
13/11/2013	SolarCity LMC Series I 2013-1	A	\$54.43	265	7.05	NR/NR/NR/NR/BBB+/NR	CS	SolarCity	Solar ABS	US

Source: bank research, rating agencies



Global reach
Local knowledge

