



GILBERT
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GREEN FINANCE TAKING ROOT

FUNDING AUSTRALIA'S TRANSITION
TO A LOW CARBON ECONOMY

2017

GTLAW.COM.AU

The image shows a landscape with several wind turbines. A large blue rectangular overlay covers the upper portion of the image, containing text. The background shows a sunset or sunrise sky with soft colors, and a dirt road winding through a green, hilly area at the bottom.

OVERVIEW

THE 2015 PARIS AGREEMENT IS THE WORLD'S FIRST COMPREHENSIVE CLIMATE AGREEMENT. TO DATE IT HAS BEEN RATIFIED BY 144 COUNTRIES, INCLUDING AUSTRALIA. ALL SIGNATORIES HAVE AGREED TO ENHANCE THE IMPLEMENTATION OF THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE THROUGH:

- a. "Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.
- b. Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production.
- c. Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development."

Countries furthermore aim to reach "global peaking of greenhouse gas emissions as soon as possible".

1 GILBERT + TOBIN

Gilbert + Tobin is at the cutting edge of innovation and advances in all aspects of the financial and commercial markets, advising on the most complex arrangements and assisting clients to develop their insights and make strategic, timely decisions.

As part of our ongoing monitoring of market best practice, we keep abreast of promising product developments. Most recently, we have been following opportunities for investors to fund green projects using a suite of new instruments, including green bonds, specialised insurance products and fintech. This briefing provides a current snapshot of the green finance market, as well as leading insights into the challenges and opportunities that it creates.

- + We are actively engaged with investors who have mandates for investing in the green sector.
- + We are collaborating with key market players to facilitate the development of opportunities for investment into green projects, globally.
- + We are advising renewable energy clients on their options for accessing potential new pools of capital via green financing.
- + We can help issuers to structure green bonds, including assisting them through a 'green' certification process.
- + We are continually updating our knowledge through our informed global network.

2 BACKGROUND

THE RECENT AND RAPID RISE IN ENVIRONMENTALLY RESPONSIBLE OR ‘GREEN’ INVESTING – INCLUDING FUNDS MANDATED TO MAKE GREEN INVESTMENTS – HAS CREATED A CONSIDERABLE NEW POOL OF GLOBAL CAPITAL SPECIFICALLY TARGETING GREEN PROJECTS. THE GROWTH IN RESPONSIBLE INVESTING COINCIDES WITH THE FOLLOWING DEVELOPMENTS, WHICH HAVE THE POTENTIAL TO HARNESS THIS GROWTH:

- + There is an expanding pipeline of green projects to be funded. A wide range of options for funding these projects are being investigated, ranging in complexity from traditional project finance loans, philanthropic or public contributions and equity on the one hand, to green bonds, structured products, blended finance, insurance products and green digital finance on the other hand.
- + Companies are coming under increasing pressure to substantively address their environmental, social and governance (ESG) risks. Australian publicly listed companies must now disclose whether they have any material exposure to ESG risks and if they do, how they manage or intend to manage those risks. Recently, it has also been advanced that as part of their fiduciary duties, company directors should now be alert to the foreseeable risks of climate change.

IN THIS ARTICLE, WE REVIEW THE IMPLICATIONS OF THESE DEVELOPMENTS, AS WELL AS SOME BROADER ISSUES SHAPING AUSTRALIA’S GREEN FINANCE SECTOR. WHILE SOME OF THESE ISSUES ARE UNIVERSAL, OTHERS ARE UNIQUE TO THE AUSTRALIAN MARKET. WE ALSO CANVAS SOME RECENT FINANCIAL INNOVATIONS UNDERPINNING THE FUTURE OF THE GREEN FINANCE MARKET GLOBALLY, AND THE IMPLICATIONS OF THESE FOR AUSTRALIA.

3 DEFINITIONS – WHAT’S IN?

Green finance comprises:

- + the financing of public and private green investments (including preparatory and capital costs) in the following areas:
 - environmental goods and services (such as water management or protection of biodiversity and natural landscapes).
 - prevention, minimization and compensation of damage to the environment and to the climate (such as energy efficiency or dams).
- + the financing of public policies (including operational costs) that encourage the implementation of environmental and environmental-damage mitigation or adaptation projects and initiatives (for example feed-in-tariffs for renewable energies).
- + components of the financial system that deal specifically with green investments, such as financial instruments for green investments and structured green investment funds, including their specific legal, economic and institutional framework conditions.

4 WHAT TYPES OF PROJECTS ARE FUNDED BY GREEN FINANCE?

Projects in the following sectors can generally be funded by green finance:



adaptation (e.g. flood defence, bio-system adaptation)



sustainable land management (e.g. sustainable agriculture, forestry, offset schemes)



carbon capture & storage, energy efficiency (e.g. cogeneration, smart grid)



low carbon transport (e.g. urban rail/metro, electric, hybrid)



environmental protection (e.g. pollution control, prevention and treatment, landscape conservation)



waste management (e.g. recycling, biogas)



low carbon buildings (e.g. green products & materials, low energy ventilation)



water (e.g. water efficiency, waste-water treatment)



renewable energy (e.g. hydropower, bioenergy, geothermal, ocean/wave power, solar and wind energy)

Within this universe of potential projects, renewable energy, low carbon transport and low carbon buildings currently attract the biggest share of the global green capital pool. Having said this, we are starting to see investors shift their attention to other sectors, including land use and waste management. A summary of these key sectors follows.

4.1 RENEWABLE ENERGY

The Australian Renewable Energy Agency defines renewable energy as energy which can be obtained from natural resources that can be constantly replenished. These include bioenergy, geothermal, hydropower, ocean/wave power, solar and wind energy. They can also include hybrid or complementary technology for storage, management or delivery of energy sources to consumers.

The global renewable energy market is still relatively immature. While investment in solar and wind power has grown in recent years, reaching a record USD270bn in 2015, such investment declined by roughly 16% to USD226bn in 2016, largely due to reduced equipment costs. A substantial body of literature has examined the scale of investment in solar and wind power needed to achieve climate change mitigation goals in particular. It suggests that to meet the agreed international target of limiting global warming to 2°C above pre-industrial temperatures, the global investment needed in solar and wind power facilities alone is roughly USD500bn per year over the next twenty-five years. This is almost double the current rate of investment in this sector.

Australia's contribution to the global investment effort has not been that significant to date. However there have been some encouraging developments on this front. Australian investment in renewable energy projects tripled from AUD8bn to AUD24bn between 2014 and 2015. 2017 is looking equally positive, with over 20 major renewable energy projects already in the pipeline for Australia, comprising AUD5bn of new investment and potentially 3000 jobs, just in the first quarter of this year.

4.2 WASTE MANAGEMENT

With half of the global population currently living in cities – a figure estimated to reach 75% by 2050 – cities are key to successfully reducing emissions from the waste sector at scale. The World Bank projects that municipal solid waste streams will double worldwide by 2025, placing increasing pressure on cities to provide sustainable waste management services.

Waste management is inherently a local issue and local leaders often have both the power and willingness to address climate risks and air quality issues related to waste. Cities require a significant share of their municipal budget to properly manage solid waste and need cost-effective solutions to affordably implement good waste management practices.

Applying a lifecycle approach to waste management has the potential to contribute a significant reduction in global greenhouse gas emissions whilst offering meaningful health, poverty reduction and job creation benefits to cities.

4.3 AGRICULTURE, FORESTRY, AND OTHER LAND USE (AFOLU)

Managing land in a sustainable manner offers a range of climate and developmental benefits. Agricultural land and forests can be managed to actively store carbon. This can include retaining water tables, optimising natural resource availability, stabilising weather patterns and conserving biodiversity. In addition, the AFOLU sector is responsible for removing just under 5% of greenhouse gas emissions by sequestering atmospheric carbon. Conversely, AFOLU emissions, largely the result of deforestation and over-intensive agriculture, are responsible for over 24% of global greenhouse gas emissions (largely CO₂ and methane).

While carbon credit markets have been mooted as a mechanism to harness the potential value in this sector, progress has been sporadic. A credit issuance mechanism linked to forest conservation known as 'Reduced Emissions from Deforestation and Degradation' (REDD) was supported in the United Nations Framework Convention on Climate Change talks from 2010 to 2015, but has since been replaced by language mandating a watered-down sustainable development mechanism. However, there are new moves afoot to progress the REDD framework. Following a renewed public consultation on the framework, the United Nations-backed Green Climate Fund (GCF) is exploring a revised process for tropical countries to apply for results-based payments for REDD schemes. The entry of the GCF into this area could be transformative.

Green financing is being actively explored in the land use sector but is facing headwinds caused by unstable project revenue flows and broader financial uncertainty in the sector. However, recent commentary has noted that making strategic linkages to water projects may offer an additional risk buffer, which will be of interest in coming years.

Sustainable land use is a particularly significant environmental concern for Australia, both on and off-shore. The impact of farming practices on the Great Barrier Reef is well documented, and has been targeted by the Australian government as an area to incentivise more sustainable land use practices through the provision of equity finance and low interest loans in support of the following:

- + clean energy projects that reduce runoff of pollutants, fertiliser and sediment.
- + the installation of more energy and water efficient irrigation systems, pesticide sprayers and fertiliser application systems.
- + coastal sewage treatment plants to reduce ocean outfalls with efficient pumps, biogas electricity generation and next generation waste water treatment.



4.4 LOW CARBON BUILDINGS AND TRANSPORT

The building sector accounts for 24% of Australia's indirect GHG emissions, about 137 Mt CO₂ equivalent in 2007–08. Just over half the sector's emissions (13% of indirect emissions) are from residential buildings, while the rest are from commercial buildings.

The greenhouse gas impacts of this sector largely arise from onsite energy generation, burning fuels for heat in buildings or cooking in homes. The construction or redevelopment of low carbon buildings to address this issue has the potential to make a material contribution to Australia's transition to a low carbon economy.

Transport is also a significant contributor to global greenhouse gas emissions, the second largest after electricity generation. It is responsible for 16% of total Australian greenhouse gas emissions.

According to the International Energy Agency, USD3.732tr of global investment in additional transport investment and USD5,914tr in additional building sector investment will be required between now and 2030 to achieve the rapid decarbonisation needed to limit global temperature rises to 2°C in a business as usual scenario. This amounts on average to USD187bn per year for the transport sector, and USD296bn per year for the building sector.

5 TYPES OF GREEN FINANCE

5.1 PROJECT FINANCING

Project financing is primarily a vehicle for assembling a consortium of investors, lenders and other participants to finance, on a nonrecourse or limited recourse basis, large-scale infrastructure projects. Under the nonrecourse model, lenders are repaid only from the cash flow generated by the project or, in the event of complete failure, from the value of the project's assets. Under the limited recourse model, lenders will also have limited recourse to the assets of a parent company sponsoring the project. In addition to debt, a share of the project will be funded from equity.

Project finance is an attractive source of funding for renewable energy and other green projects. Little or no up-front equity is often required - the security for the loan comes from future project cash flows. In addition, costs can be spread over the project lifetime, funding the high up-front cost of debt-financing from the positive cash flows generated during operations. Some prominent examples of recent Australian renewable energy projects funded through project finance structures include EPYC Pty Ltd's Jupiter Wind Farm in New South Wales and the two large-scale solar farms in Queensland, Clare Solar Farm and Lilyvale Solar.

Notwithstanding the capacity for project finance to successfully fund green projects, there are a number of challenges that green projects face when accessing this funding, which conventional energy projects do not need to navigate. One of the issues is the financial cost of the technology used in renewable energy projects. Although this has reduced significantly, it is still higher than the cost of generation technologies using fossil fuels. Renewable energy projects are also more vulnerable to changes in government policies or regulatory frameworks, which they are often dependent on for support (for example, the Australian renewable energy target (RET) scheme). These often require detailed regulatory planning and protections for both sponsors and lenders.

In addition, while major infrastructure projects often suffer from slow, costly, and uncertain project development and approval processes, at times these can be exacerbated for green projects for multiple reasons, not least because they are often located in environmentally and socially sensitive areas.

The small scale of some green projects can also create funding difficulties, and often require government funding or grants to ensure their commercial viability. Economies of scale in due diligence can be significant, and financial institutions may be more reluctant to consider small projects.

New risk transfer products and credit enhancement instruments may need to be developed before project finance will be more readily available to some smaller and more high-risk green projects. Wider reforms in the policy and regulatory framework and in building institutional capacity are also needed. In the meantime, some green projects have turned to a range of other funding sources, including the sources discussed below.

5.2 GREEN BONDS

a. What is a 'Green Bond'?

A green bond is a fixed-income debt instrument and, like any other bond, offers a financial return. However, its distinguishing feature from so-called vanilla bonds is that it is issued for the specific purpose of funding new or existing sustainable projects or other uses beneficial to the natural environment. The issuer may be a government, multilateral entity, or a corporation, who agrees to repay the bond plus an agreed interest rate over a defined term.

Significantly for investors, green bonds aren't just bonds that happen to fund a green project. The 'greenness' of the projects they fund is generally audited by a recognised independent party, and verified as adhering to a particular green standard.

Having said this, there is technically nothing preventing bonds that have not been through an external verification process, or that aren't particularly environmental but want to be seen that way, from self-identifying as green bonds. Our view, however, is that the market would not take kindly to this type of mislabelling, creating downstream problems for any issuers found to be taking this approach.

b. What is the current state of the green bond market?

The market for green bonds is growing rapidly. Reliable estimates show that the global volume of green bonds had grown from less than AUD5bn in 2010 to more than AUD150bn by 2016. Australia has come fairly late to the party, having only issued its first green bonds in 2014. However, growth has been quick, with significant diversification of issuers, from banks to corporates to universities (see table 2 for a summary of Australian green bonds issued to date).

The reason for the rapid growth of this market appears to be two-fold:

- + ESG risks are being considered increasingly material in the market. Attitudes are shifting to proactive management of these risks within investment portfolios, preferentially targeting 'green' or 'ethical' investments.

For example, early Australian adopter, Hunter Hall, uses negative screening to exclude any ethically non-compliant stocks from their portfolio. Global investment house, Alliance Bernstein and Australian wealth manager, Colonial First State, take this one step further, quantifying ESG risks within their investment research and decision making, considering issuers past, current or anticipated ESG behaviour as material to expected future returns.

International examples of the investment community pushing traditional 'blue chip' companies to consider the sustainability of their business include initiatives such as the United Nations-backed Principles for Responsible Investment, and the engagement by the Institutional Investors Group on Climate Change (IIGCC) with large fossil fuel companies. IIGCC has requested that capital allocation decisions made by the boards of major mining companies give clear and demonstrable consideration to climate change. While envisaged as a group to support constructive dialogue between investors and the big miners, the message is clear: the future for the mining sector needs to be green.

- + There is an increased flow of government and international public capital to 'green banks', and similar specialist funds and corporations. These banks and similar entities are mandated to accelerate deployment of private capital into clean energy and low carbon initiatives. For example:
 - the Clean Energy Finance Corporation (CEFC), established by the Australian Government to support green finance initiatives, has been a major investor in each Australian green bond issuance to date.
 - the UK Green Investment Bank (GIB) has recently shared their ESG screening methodology with private investors considering a green bond issuance in Morocco.
 - the Green Climate Fund (GCF) has been established through the United Nations climate change framework, with a target of bringing USD100bn of funds under management, with USD10.7bn committed so far.

c. Why invest in, or issue, a green bond?

Investor perspective

Increasingly, funds are being launched with green or socially beneficial investment mandates. Rather than conducting extensive (and expensive) due diligence on the green credentials of an investment, a bond that is labelled as green can provide investors with an increased level of comfort that an investment in the bond will be aligned with their mandate.

Investors are also inclined to use green bonds to balance their risk across a larger number of projects, which enables them to better manage concentration risk, whilst maintaining liquidity.

Issuer perspective

The expanding market for green investments is underpinned by significant investor demand. From our research, we expect this growth to continue or even accelerate, given recent levels of oversubscription in green bond issuance and the arrival of new entrants, particularly China.

Companies seeking to finance a green project through issuing green bonds will benefit from this investor demand, and at the same time, gain access to new pools of money and greater investor diversification.

This type of issuance also gives a company an opportunity to demonstrate its 'green' credentials in a business environment where stakeholder demands for responsible and sustainable business practices are growing. Green bond issuance will boost a company's reputation as an environmentally conscious organisation and enhance its brand.

d. If you want to issue a green bond, how does it actually work?

The first step is to select the project or use of proceeds that is to be associated with your green bond, with a view to ensuring continued investor commitment, and the delivery of expected returns over the life of the bond.

The next step is to develop or choose a framework, including a set of principles and standards, against which the greenness of the bond can be assessed by investors, based on the intended use of proceeds.

The economic terms of the bond are then finalised and the bond issued subject to the selected green framework. Continuous monitoring of the use of proceeds against the applicable green framework is critical to maintaining investor confidence.

e. Where can I find the rules for Green Bonds?

The rules for green bonds generally depend on the jurisdiction in which the issuer is established. The leading example of a highly regulated market is the Chinese one. Green bonds issued in the Chinese interbank market must comply with the People's Bank of China green bond guidelines on eligible assets, management of proceeds and disclosure. The 'green' label needs to be approved by the People's Bank of China before the green bond is issued. China's macroeconomic management agency, the National

Development and Reform Commission, has also published a set of green bond guidelines which mandate eligible asset criteria for green bond issuance by the Chinese state-owned enterprise sector.

Other jurisdictions draw on a hybrid approach involving the creation of voluntary guidelines by regulators to support the development of green bond markets, without requiring compliance. For example, a number of countries including Japan are currently developing such frameworks. In India, green bond issuance guidelines have already been published by its securities regulator. The French government has created guidelines aimed at supporting mutual funds that invest in the green bond market, and the Bank of England is developing a green bond terms sheet containing standardised terms and conditions for green bonds.

Australia is at the non-regulated end of the spectrum, with currently no government guidelines or binding frameworks. A bond is labelled green at the issuer's discretion, with voluntary adoption of market principles, standards and use of external reviews.

f. If you're an issuer or an investor, which tools should you use to structure or assess the greenness of a bond, and why?

There is no universally accepted framework for assessing the greenness of a bond. However, a range of tools is available to provide issuers with best practice guidelines for disclosure, reporting and monitoring use of proceeds, and to help investors to assess the environmental credentials of a bond. We summarise some of the more commonly used evaluation tools below.

Equator Principles

The Equator Principles currently offer the most recognised benchmark for green finance, but only cover the sustainability impact of project finance. Following an update in 2013, financial institutions that have signed up to the Equator Principles are now required to apply the standards to project-related corporate loans and project-related bridge loans, as well as advisory mandates.

Although bank signatories to the Equator Principles continue to voluntarily extend the application of the Equator Principles beyond their new requirements, they have not been widely adapted for use with other types of green finance, including the bond market. Having said this, they do have potential application to green project bonds (see discussion on these instruments below).

Green Bond Principles

In 2014, there was an industry-led move to standardise the principles and frameworks used by issuers to assure the alignment of their bonds with green mandates. This resulted in the development of the Green Bond Principles (GBPs) by Bank of America Merrill Lynch, Citi, Crédit Agricole Corporate and Investment Bank and JPMorgan Chase. Oversight of the GBPs has since transitioned to the International Capital Markets Association.

The GBPs serve as voluntary guidelines to encourage transparency, disclosure and integrity in the development of the green bond market. The GBPs include recommendations for issuers to obtain independent third party verification that their bonds are aligned with its core principles, as well as second party reviews.

Independent third party verification

While there are a number of standards in the market against which green bonds can be verified, most green bonds issued by Australian entities to date have been certified under the Climate Bonds Standard (CBS). The CBS is being positioned as a leading global certification framework following its launch in 2011 by the London-based NGO, the Climate Bonds Initiative (CBI).

New entrants to the green bond market will generally structure their green bond issuance to comply with the GBPs, and obtain third party certification of compliance based on the CBS or other independent standards. As the CBS framework is fully aligned with the GBPs, an independent third party verification that a bond is compliant with the CBS framework also amounts to confirmation that the bond is compliant with the GBPs.

Entities providing independent third party verification services against the CBS certification framework, or other climate standards, include DNV-GL, EY, KPMG, CICERO, Vigeo, Oekom and Sustainalytics.

Second party reviews

The GBPs also encourage issuers to obtain a second party review. Unlike the independent third party verification process, a second party review is generally completed by an organisation which has developed their own standards, which may or may not be aligned with the GBPs. For example, the Norwegian think-tank CICERO provides second party reviews of green bonds according to its 'shades of green' framework, whereby bonds are ranked as 'dark, medium and light' green depending on their contribution to a low-carbon economy. Although CICERO's framework is aligned with the GBPs, it provides a more in-depth analysis in certain areas.

More recently, rating agencies have begun offering second party review services against new criteria they have developed to evaluate the greenness of bonds (see further discussion below).

TABLE 1: MAJOR FEATURES OF THE EQUATOR PRINCIPLES, GBPS AND CBS, INCLUDING THE DIFFERENT ROLES THAT THEY PLAY.

	Equator Principles (EPs)	The ICMA Green Bonds Principles (GBPs)	Climate Bonds Standard (CBS)
Snapshot: history and description	<p>The EPs are a voluntary risk management framework for financial institutions (known as Equator Principles Financial Institutions or EPFIs) who sign up to them.</p> <p>They are not a tool for assessing green bonds, but have been developed to ensure that projects that EPFIs finance or advise on are developed in a way that is socially responsible and reflects sound environmental management practices.</p> <p>They are expressly limited in their scope to apply to (1) project finance, (2) project finance advisory services, (3) project-related corporate loans and (4) bridge loans that are intended to be refinanced by (1) or (3).</p> <p>The four major Australian banks have signed up to the EPs, along with over 80 other financial institutions across 37 countries, representing all major regions.</p> <p>Click here for more information.</p>	<p>First drafted in January 2014, the GBPs are voluntary process guidelines for the following four core components:</p> <ul style="list-style-type: none"> + Use of proceeds + Process for project evaluation and selection + Management of proceeds + Reporting <p>They are designed to:</p> <ul style="list-style-type: none"> - promote transparency and integrity in the development of the green bond market. - provide issuers with guidance on the key components involved in launching a credible green bond. - aid investors by promoting reporting on the environmental impact of their green bond investments. - assist underwriters by moving the market towards expected disclosures, which will facilitate transactions. <p>Click here for more information.</p>	<p>Established in 2014, the CBS is the key part of a broader certification scheme in place for issuers to certify their bonds as green.</p> <p>Once a bond has been certified, this should make it easier for investors to assess whether the bond is genuinely green.</p> <p>The CBS framework allows issuers to obtain CBS certification on a pre-issuance or post-issuance basis. However, if a pre-issuance certificate is obtained the issuer must engage the same third party verifier for a post-issuance review.</p> <p>Click here for more information.</p>

	Equator Principles (EPs)	The ICMA Green Bonds Principles (GBPs)	Climate Bonds Standard (CBS)
Certification Process	<p>There is no certification requirement. Instead, there are 10 EPs that signatories voluntarily adopt:</p> <ol style="list-style-type: none"> 1. Review and categorisation. 2. Environmental and social assessment. 3. Applicable environmental and social standards. 4. Environmental and social management system and equator principles action plan. 5. Stakeholder engagement. 6. Grievance mechanism. 7. Independent review. 8. Covenants. 9. Independent monitoring and reporting. 10. Reporting and transparency. <p>EP 7 requires EPFIs to engage independent consultants to assess EP-compliance in respect of projects with potentially significant adverse environmental impacts.</p>	<p>There is no certification requirement. Instead, issuers voluntarily commit to the GBPs applicable to their selected project.</p> <p>The GBPs nevertheless recommend that issuers use external reviewers to confirm the alignment of their green bonds with the key GBPs, which could include certification of a green bond against an external green assessment standard (such as the CBS).</p> <p>The GBPs also provide template reports that issuers can use to help inform market participants of the alignment of a green bond with the GBPs.</p>	<p>The CBS differ from the GBPs and EPs in that it is a certification system, rather than a set of broad integrity principles.</p> <p>The certification system requires the issuer to engage an approved (third party) verifier to perform certain pre and post-issuance checks. Pre-issuance checks require verification that the projects to be financed by the bond proceeds are eligible under the CBS, and that the issuer has established internal processes and controls to keep track of how the bond proceeds are used and to produce regular reports.</p> <p>Post-issuance, the verifier which performed the pre-issuance checks must be re-engaged to confirm that the bond conforms to certain post-issuance requirements such as the proceeds going towards an eligible project and the environmental objectives of the board.</p>

	Equator Principles (EPs)	The ICMA Green Bonds Principles (GBPs)	Climate Bonds Standard (CBS)
Compliance monitoring	<p>EP 9 requires EPFIs to retain experts or appoint independent consultants to assess underlying project compliance with the EPs and ensure ongoing monitoring and reporting after financial close and over the life of the relevant loan.</p> <p>EP 10 prescribes minimum annual reporting requirements for EPFIs, which require them to report publicly on their EPs implementation processes and experiences.</p>	<p>The GBPs recommend (but do not require) that an issuer have the features of its green bond, or the environmental sustainability of the underlying project, independently verified by an auditor or other third party.</p> <p>In addition, issuers with the ability to monitor the green performance of the underlying projects are encouraged to include this information in their regular reporting. The GBPs provide a template impact report for this purpose.</p>	<p>Compliance is monitored through post-issuance reporting by the issuer to the CBS board and to investors, at least annually.</p> <p>Reporting requires a brief description of the project and the amounts disbursed as well as its expected impact.</p>
How difficult is compliance for the issuer?	<p>The EPs have a broader footprint on the EPFIs than the GBPs, and potentially have a greater compliance burden, depending on the ESG risk profile of the project in question.</p>	<p>The core GBPs are focussed on assessing green bonds, and so are narrower than the EPs, with arguably a correspondingly lighter compliance burden.</p>	<p>Relatively easy. The CBS provides clear sector-specific eligibility criteria and compliance instructions. The standards are inherently easier to comply with than the comparatively broad principles-based approach underlying the GBPs and EPs.</p> <p>The mandatory independent verification process makes the issuer more accountable for compliance than it would be under the equivalent GBPs and EPs.</p>

	Equator Principles (EPs)	The ICMA Green Bonds Principles (GBPs)	Climate Bonds Standard (CBS)
What are the consequences of non-compliance?	There are no direct consequences of non-compliance with the EPs. Reputational damage is the biggest risk to non-conforming EPFIs.	There are no direct consequences of issuer non-compliance under the GBPs. However, the reputational damage to the issuer would be considerable in a market where the credibility of issuers is so important.	<p>Although the CBS is a set of voluntary standards, there are consequences if an issuer does not adhere to them.</p> <p>If a project is no longer conforming, the issuer must disclose this within one month to the CBS board, at which point the board may suggest corrective action.</p> <p>If that corrective action is not taken within a reasonable time frame, the CBS board may revoke the certification.</p> <p>In addition, the CBS board can request a further independent verifier’s report if non-conformance is alleged by an investor.</p>
Benefits for issuers	A ready-made, broad environmental policy for the organisation issuing the bond.	Issuers should find a more receptive green investor base if their bonds are aligned with the GBPs.	Independent certification delivers a recognisable ‘quality stamp’. This provides strong reputational benefits for issuers.
Benefits for investors	Long term credibility, as the principles are recognised and respected.	Provides a minimum basis for determining whether the bonds are aligned with investor mandates.	Confidence in the detailed and independently certified standard.
Disadvantages for issuers	The EPs do not expressly contemplate green bonds, so are not fit for purpose as a green bond standard. Having said this, the EPs have potential application to green project bonds. Additionally, EPFIs may find it easier to issue green bonds than banks who are not signatories to the EPs.	Less transparency for investors where voluntary independent third party review or certification is not obtained. This could affect investor confidence.	<p>Certification is time consuming and there is a risk to non-compliance.</p> <p>Certification, monitoring, verification and reporting impose additional costs.</p> <p>Reputational risk if a standard’s credentials are challenged or there is a non-compliance finding.</p>

	Equator Principles (EPs)	The ICMA Green Bonds Principles (GBPs)	Climate Bonds Standard (CBS)
Disadvantages for investors	Not bond-specific.	These are voluntary principles only, which do not currently spell out material requirements for the type and nature of activities, nor do they mandate a certain threshold of environmental benefits. Voluntary adherence gives investors a lower level of comfort unless it is accompanied by an external certification approach.	Potential for revocation of certification presents commercial risks, including a sell-down risk if the green certification is revoked.
Costs	<p>Costs of establishing the internal processes and controls to meet EPs commitments.</p> <p>There is also a minimal annual fee payable by EPFIs to cover the costs of administering the EPs.</p>	<p>Costs associated with establishing the internal processes and controls to align with the GBPs.</p> <p>Discretionary external costs associated with engaging third parties to assess and monitor compliance.</p>	<p>Costs are largely internal and associated with establishing the internal processes and controls to satisfy the CBS standards.</p> <p>There are also external costs associated with engaging verifiers for certification and periodic monitoring, plus CBS registration fees (one tenth of a basis point of the bond principal).</p>



g. Ongoing Developments

The evolving green bond market faces a range of specific challenges and barriers to its further growth including policy and regulatory factors, market conditions and financing trends. We have canvassed a few of these below.

Undersupply of bonds

Green bond markets are considered to have a 'champagne' problem of more market demand than supply at present. For example, a EUR7bn green bond issuance by the French government in February 2017 attracted nearly EUR23bn in bids. This strong appetite for green bonds is driven by a number of factors, including investor demand for ethical assets carrying lower risks than standard project financing opportunities.

Inadequate pipelines of bankable green projects

The undersupply of green bonds is partly driven by a shortfall in the volume of green projects in the pipeline. One possible solution to this mismatch between demand and supply is for the market to support the issue of sustainability or ESG bonds, where proceeds finance a mixed portfolio of green assets and non-green assets. The next step for these issuers is to grow the green assets to the point where they can be refinanced entirely through the green bond market.

Lack of experience and familiarity with new technology leveraged by green projects also forms a major barrier to supply. Policy makers, financiers and potential project sponsors are unable to assess the feasibility, viability and risks of projects with confidence and, consequently, are reluctant to develop these. This lack of capacity and expertise can lead to a failure to develop a pipeline of bankable projects, even where suitable opportunities exist. In turn, the lack of such a pipeline means that expertise and capacity in green projects is more difficult to develop.

Political uncertainty

Investor appetite in the Australian market has been dampened due to inconsistent political messaging around the desirability of renewable energy projects. Whilst the CEFC was established with much fanfare by the Labor Government in 2012, by 2013 it was slated for abolition by the incoming Coalition Government, led by Tony Abbott. Further spooking investors, in 2014, the Australian Treasurer described wind turbines as "utterly offensive", and questioned their economic performance. However, a backflip in 2015 saw the Coalition Government issue a reprieve for the CEFC. Mixed messages like these from the government have led to investor hesitation in supporting

Australian clean energy initiatives, though there does appear to be a more consistently supportive view emerging in 2017.

Economic

The economics surrounding green bonds and plain vanilla bonds for issuers are essentially the same. On the positive side, the proceeds of green bonds are used to improve the environment. On the negative, there are additional monitoring, reporting and verification costs associated with this asset class that are not yet reflected in pricing.

However, this could change if investors commence valuing the ESG component of their investment in addition to the traditional bond yield. For this to occur, investors will need to have certainty over the integrity of this additional green value. Although the market is yet to see any material price premium paid by investors in the context of a primary issue, there is a growing trend towards tighter secondary market pricing, which may be underpinned by investor recognition of this green value.

Interestingly, there is potential for the economics of green bonds to be more competitive than traditional bonds in the context of project and structured financing. For example, Australian financial services provider FlexiGroup has recently issued a second round of secured green bonds as part of a standard securitised issuance and attracted a tighter margin than the identically structured vanilla tranche. In addition, a 2016 high-yield Indian issuance by the Greenko Group into Singapore had a similar pricing result.

Lack of green bond indices

The growth of the green bond market in its earlier years was constrained by the absence of benchmark green bond indices. This affected demand by many institutional investors with mandates to only invest in 'benchmark-eligible' financial products. The first green bond benchmark indices emerged in 2014. By the end of 2015 there were four green bond indices; the Bank of America Merrill Lynch Green Bond Index, the Barclays MSCI Green Bond Index, the S&P Green Bond Index and Green Project Bond Index and the Solactive Green Bond Index. Fund managers investing in mainstream indices can now invest in a range of climate-aligned bonds in the Transport, Energy, Buildings and Industry, Waste and Pollution, Water, and Multi-Sector themes. In addition, investment products are starting to be built around these indices, with State Street launching a tracker fund linked to the Barclays MSCI green bond index.

Certification Standards

The nascent state of existing certification standards is a less immediate, but certainly relevant concern. As the market matures, the validity and marketability of the various standards will alter, but at this stage, a few different standards are being used. The market leader in Australia is the CBS, though this is not consistently used by offshore issuers, particularly in the large Chinese market.

'Greenness'

Another emerging issue is the degree to which coal-based initiatives are accredited under the various schemes. For example, the Chinese 'Green Bond Endorsed Project Catalogue' standard mandated under the People's Bank of China, takes a comparatively broad view of what green bonds can be used for, incentivising those projects reducing pollution in addition to those mitigating climate change. This means that so-called 'clean coal' initiatives and bus fleet developments are both considered qualifying projects for green bonds, in contrast to most other standards.

Most recently, the Australian Government has suggested coal projects should be admissible under CEFC investment policies. CEFC investment policies require the CEFC to apply commercial rigour when making investment decisions and at present, carbon capture and storage plants or super critical coal-fired power stations would unlikely be considered commercially viable.

h. Australian Issuances

Australia's green bond market opened in 2017 with a flurry of activity. National Australia Bank was the first issuer out of the blocks with a debut Euro denominated green bond issue on 7 March. This was followed by 4 debut domestic green bond issuers in quick succession, namely Queensland Treasury Corporation, the Commonwealth Bank, the Investa Office Fund and the finance arm of the Investa Commercial Property Fund. In addition, there was a second round issuance of asset-backed green bonds by FlexiGroup.

The inaugural issuances by the Investa Office and Commercial Property Funds are notable for being the first AUD green bonds issued by a non-financial corporate, and the first certified issuance by an Australian property entity in any jurisdiction. They bring the total number of AUD green bond issuances by an Australian issuer this year to 6, which is more than the total number of Australian issuances for the entire 2016 calendar year. Whilst there is limited information on other forthcoming Australian issuances for 2017, it seems likely that we will see more and larger issuances, both from the banks and from corporates, as funds for renewable energy projects continue to be sought. 'Green' building developments are also likely to be a major focal area.



TABLE 2: SUMMARY OF GREEN BOND ISSUANCES BY AUSTRALIAN ISSUERS TO DATE

Green and Climate Bonds in Australia						
Name	Issue Amount	Issue Date	Sector	Verifier	Terms	Extra Information
Stockland Trust Management Ltd	EUR 300m	Oct 2014	Green star rated retail, commercial, residential and retirement living projects	Green bond framework, KPMG	7 yr, 1.5%, A-	Click here for more information.
National Australia Bank	AUD 300m	Dec 2014	Wind and solar	CBS, DNV.GL	7 yr, 4%, AA-/Aa2	Click here for more information. Click here for more information.
Hallett Hill No. 2 Wind Farm	AUD 206m (USD 98.8m; AUD 76m)	Mar 2015	Wind	Not known, DNV.GL	12 yr, T+175bps (USD 98.8m)/ T+185bps (AUD 76m), BBB	Click here for more information.
ANZ Bank	AUD 600m	Jun 2015	Low carbon buildings, wind and solar	CBS, EY	5 yr, 3.25%, Aa2e/AA-	Other locations: New Zealand (7%) & Asia (16%). Click here for more information.
FlexiGroup	AUD 50m	Apr 2016	Solar	CBS, DNV.GL	1.37 WAL, 1m BBSW + 1.50%, Aaa/AAA	Click here for more information.
Westpac	AUD 500m	May 2016	Low carbon buildings – commercial and wind	CBS, EY	5 yr, 3.1%, Aa2/AA-	Click here for more information. Click here for more information.

Green and Climate Bonds in Australia

Name	Issue Amount	Issue Date	Sector	Verifier	Terms	Extra Information
Treasury Corporation Victoria	AUD 300m	Jul 2016	Low carbon buildings, wind, solar, water and low carbon transport	CBS, DNV.GL	5 yr, 1.75%, Aaa/AAA	Click here for more information.
Monash University	AUD 218m	Dec 2016	Low carbon buildings – commercial and solar	CBS, EY	15 yr, 17.5 yr and 20 yr, NAIC-1 / GB1	Click here for more information.
FlexiGroup	AUD 50m	Feb 2017	Solar	CBS, DNV.GL	1.49 WAL, 1m BBSW + 1.27%, Aaa/AAA	Click here for more information.
National Australia Bank	EUR 500m	Mar 2017	Solar, wind and low carbon transport	CBS, DNV.GL	5½ yr, MS+ 23bps, Aa2/AA-	Click here for more information.
Queensland Treasury Corporation	AUD 750m	Mar 2017	Solar and low carbon transport	CBS, DNV.GL	7 yr, 3%, AA+/Aa1	Click here for more information.
Commonwealth Bank	AUD 650m	Mar 2017	Wind, low carbon buildings – commercial, low carbon transport	CBS, EY	5 yr, 3.25% (AUD 450m) and 3m BBSW + 92bp (AUD200m), Aa2/AA-	Click here for more information.
Investa Office Fund	AUD 150m	Mar 2017	Low carbon buildings	CBS, EY	7 yr, 4.26%, BBB+	Click here for more information.
Investa Commercial Property Fund (through its finance arm, ICPF Finance)	AUD 100m	Apr 2017	Low carbon buildings	CBS, EY	10 yr, semi-annual fixed coupon of 4.25%, A-	Click here for more information.

5.3 GREEN PROJECT BONDS

Green project bonds provide a means for infrastructure or renewable energy project developers to attract long-term debt financing from the international or domestic bond markets. This can be done by creating a special purpose vehicle, supported by a degree of equity from a sponsor (often pooled from project developers). Based on an assessment of the financial viability of the underlying projects, a credit rating can be secured for the vehicle, and if it is sufficiently high, bonds can be issued.

Both the US and Canadian Capital Markets have welcomed large green project bond issuances to fund solar assets, such as the USD1bn Solar Star Funding transaction in 2013 and the CAD613m Grand Renewable Solar transaction, also in 2013. North America remains the most active region with 18 solar projects financed via green project bonds as at December 2016, out of 33 globally.

With 13 offerings to-date, Europe is the second largest region by volume to support the issue of green project bonds to finance solar assets. Outside North America and Europe, the funding of solar projects through the issue of green project bonds is less common, although they are starting to emerge in Asia. In 2015, the JPY3bn green project bond offering to fund Aomori-Misawa, a 10MW operating solar farm, was the first capital markets transaction for an Asian solar project. It was followed the same year by the JPY6.2bn Canadian Solar Portfolio offering of green project bonds to fund a 21MW PV solar project.



5.4 GREEN PROPERTY BONDS

Green property bonds are issued to support investment in greenhouse gas abatement in the building and construction sector. Their label derives its name from the use of bond proceeds, which are generally allocated to fund the construction or redevelopment of low carbon buildings. According to the CBI, they are expected to make up to 40% of the green bond market in the medium term, assuming investors have confidence that low carbon buildings will make a genuine contribution to global efforts to transition to a green economy.

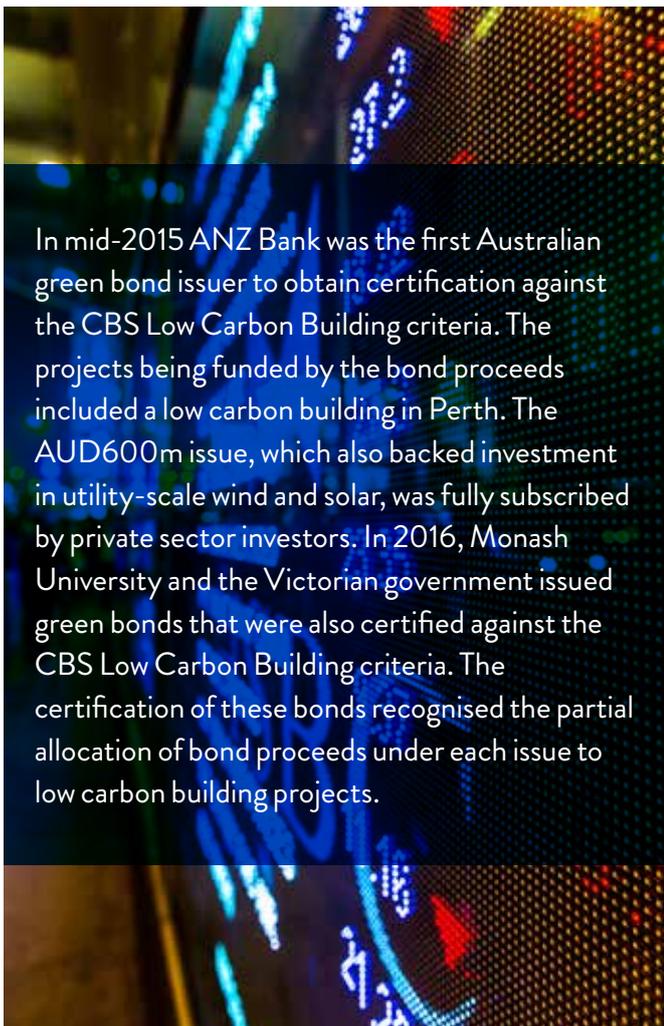
The growth of this market is supported by issuers having the option to have third parties verify their bond against the CBS Low Carbon Building criteria. This criteria requires bond proceeds to be applied to fund any of the following three asset classes, based on its emissions performance targets, which will vary for each bond according to when it is issued and its term:

- + **Commercial/ buildings** – expected to be in the top 15% of emissions performance in a given city, based on their assessment against target emissions performance trajectories for office buildings in selected markets, that are necessary to achieve zero emissions by 2050.
- + **Residential buildings** – expected to be in the top 15% of emissions performance in a given city, based on local building codes, energy rating schemes (e.g. US Energy Star) and energy labelling schemes for residential buildings (e.g. Energy Performance Certificates in the UK).
- + **Upgrade projects** – building improvements that achieve emission reductions of 30% to 50% (depending on bond term) from a baseline.

A CO2 Target Calculator on the Climate Bonds Initiative website enables issuers to ascertain whether emissions performance targets for commercial buildings have been satisfied (<https://www.climatebonds.net/standard/buildings/commercial/calculator>).

“ THESE EMISSIONS PERFORMANCE TRAJECTORIES ARE AN IMPORTANT STEP FOR OUR INDUSTRY, AS AUSTRALIAN BUILDING OWNERS AND INVESTORS NEED CONFIDENCE THAT THEIR INVESTMENT DECISIONS ARE IN LINE WITH A PATHWAY TOWARDS ZERO CARBON

Jorge Chapa of the Green Building Council of Australia.



In mid-2015 ANZ Bank was the first Australian green bond issuer to obtain certification against the CBS Low Carbon Building criteria. The projects being funded by the bond proceeds included a low carbon building in Perth. The AUD600m issue, which also backed investment in utility-scale wind and solar, was fully subscribed by private sector investors. In 2016, Monash University and the Victorian government issued green bonds that were also certified against the CBS Low Carbon Building criteria. The certification of these bonds recognised the partial allocation of bond proceeds under each issue to low carbon building projects.

5.5 GREEN COVERED BONDS

The first labelled green covered bond, meaning a bond with dual recourse to the issuer and a cover pool of assets, was issued by real estate and mortgage bank BerlinHyp in May 2015. The EUR500m bond received a positive reception, and was four times oversubscribed. Since this first issue, a number of other green covered bonds have been issued, including the first green covered bond issued by a Chinese entity. This was by the Bank of China in September 2016. We expect to see more green covered bonds backed by mortgages for low carbon buildings over the next few years.

5.6 GREEN ASSET-BACKED SECURITIES

Asset-backed securities are bonds or notes backed by financial assets, such as a loan, lease or receivable other than real-estate or a mortgage. The first issuance of green asset-backed securities (**Green ABS**) was by Hannon Armstrong in December 2013. The USD100m Green ABS is due to mature in December 2019 and is backed by 100 individual energy efficient infrastructure installations.

Another example of a landmark Green ABS is the first municipal ABS. This was issued by the Hawaii State Department of Business, Economic Development and Tourism (DBEDT) in November 2014. The USD150m AAA-rated green ABS was issued in two tranches and backed by a Green Infrastructure Fee, which was to be applied to the bills of electricity customers of the Hawaiian state utilities. Proceeds went to support the DBEDT's Green Energy Market Securitisation programme, to provide loans to consumers to fund the installation of solar PV panels and solar storage, advanced inverters and monitoring devices.

In the US, Green ABS issuers have securitised energy-efficient consumer loans, hybrid car loans and monthly household utility payments – although not all have carried official green certification.

Australia saw its first Green ABS in 2016, when FlexiGroup launched an issuance that included a AUD50m tranche backed by loans for residential roof-top solar power systems. FlexiGroup issued a second round of Green ABS in March 2017 backed by the same type of loans.

5.7 GREEN MORTGAGE-BACKED SECURITIES

Mortgage-backed securities (MBS) are a type of asset-backed security secured by a mortgage or collection of mortgages. An institution such as a bank originates or purchases a portfolio of mortgages, bundles them together and sells the securitised package to investors.

In the case of Green MBS, the proceeds of the issue are used to fund loans secured by mortgages over property which meets or is developed in accordance with green standards.

The first Green MBS was issued by Fannie Mae in 2012. This product possesses most of the characteristics of an MBS described above, however, rather than bundling the mortgages, the Fannie Mae Green MBS is a fixed-income single asset security generally backed by one loan and one property. As of May 2017, Fannie Mae has issued 178 Green MBS.

Fannie Mae's Green MBS are backed by home loans subject to one of three initiatives:

- + The 'Green Rewards' product feature, which provides additional loan proceeds to borrowers who commit to installing capital improvements that target a 20% or more reduction to the whole property's annual energy or water use by including up to 50% of projected energy and water savings in the loan underwriting.
- + The 'Green Preservation Plus' program, which provides additional loan proceeds by allowing up to an 85% Loan-to-Value, Debt-Service-Credit-Ratio up to 5 basis points lower than standard rates and access to property's equity amount equal to investments in efficiency, if energy and water-saving improvements are equal in value to 5% or more of the original loan mortgage amount.
- + The 'Green Building Certification Pricing Break', under which better pricing is available to 'ENERGY STAR' and 'LEED' rated properties than is available under non-green loans.

In February 2017, Fannie Mae issued its first Real Estate Mortgage Investment Conduit (REMIC) tranches backed exclusively by Green MBS collateral. The REMIC, comprising two exclusively Green MBS tranches along with two non-green tranches, was valued at over USD1bn. The tranches were guaranteed with respect to the full and timely payment of interest and principal.

Although there is no anecdotal evidence that Green MBS have the capacity to price tighter than equivalent non-Green MBS, studies have been made on the performance of green mortgages which suggest that they perform well above non-green mortgages. For example, a 2013 report by the University of North Carolina – Center for Community Capital indicates that default risks are on average 32 percent lower in US 'ENERGY STAR'™ rated homes than other homes, controlling for other loan determinants. A borrower in an 'ENERGY STAR'™ rated residence is also 25 per cent less likely to prepay the mortgage. In addition, it is possible that houses built to higher efficiency standards may maintain higher property values relative to the market, however this is yet to be established.

It will be interesting to see whether the results of this and similar studies become more widely acknowledged and if so, whether investors will start to place a value on MBS backed by green collateral, resulting in tighter pricing for Green MBS (compared to equivalent non-green MBS) in the primary issuance market.

None of the Green MBS issued by Fannie Mae have received CBS certification or a second party opinion. However, the first European Green MBS issued by Rabobank subsidiary Obvion in July 2016 (Green Storm 2016) was CBS certified by Sustanalytics and received a GB1 ("Excellent") rating from Moody's. The EUR500m issuance was initially oversubscribed, with allocations ultimately determined by an assessment of the investors' green credentials. To qualify for inclusion in the mortgage pool, the secured properties needed an Energy Performance Certificate rating the property "A" or "B" by the Netherlands Enterprise Agency, or if built before 2002, a definitive Energy Performance Certificate of "C" or higher, with demonstrated 30% improvement in terms of energy efficiency compared to an average home from the same building period.

So far, issues of Green MBS have been limited to residential mortgages. As demand grows among commercial tenants for green commercial buildings, so too will the opportunities grow for the development of a Green CMBS market.

(a) Table of Green MBS Issuances

MBS						
Name	Issue Amount	Issue Date	Sector	Certification standard/ Independent Review	Terms	Extra Information
Fannie Mae Green MBS (178 issuances to date)	USD 0.865m – 181.5m	May 2012 – Jan 2017	ENERGY STAR rated residential projects	All securities are backed by ENERGY STAR conditional mortgages	5 – 30 yr	Click here for more information.
Obvion Green Storm 2016	EUR 500m	Jul 2016	Residential loans on energy-efficient homes	CBS, Sustainalytics	5 yr	Click here for more information.
Fannie Mae GeMS Guaranteed REMIC	USD 612m	Feb 2017	ENERGY STAR rated residential projects	Unverified, however, all securities are backed by ENERGY STAR conditional mortgages	Expected: 6.06 (tranche A1) 9.82 (tranche A2)	Click here for more information.



5.8 BLENDED FINANCE

a. General

The term ‘blended finance’ has been coined in the green investment sphere to describe funding models that use public sources of funding to stimulate and reduce barriers to private sector investment. Private investors do not typically fund the construction of rural roads in Africa or vaccination drives in villages, even though the returns on such investments are often enormous. That is because the returns are either hard to monetise, or the risks are too great for the private sector to tolerate. The point of blended finance is to use public or charitable funds to remedy those problems, allowing private money to flow to places and projects it would usually consider to be too risky.

According to a World Economic Forum survey of 74 blended-finance vehicles, this ‘honey trap’ is working: every dollar of public money invested typically attracts a further \$1-20 in private investment. The survey indicates that the key attraction of the blended finance model for private sector investors, is the access it gives them to responsible investments in high-growth markets, while offering early-stage project risk mitigation. The report estimated that there is around USD25.4bn in total capital in the responsible investment funds they analysed.

Importantly, the focus of blended finance is to use public funds to mobilise additional private capital, not to replace it. This may be via concessional loans, or use of private funds to buffer costs, and is often termed ‘crowding in’, or in other words, growing the overall funding pie. On the flip side, an increased overall sectoral value increases its attractiveness to commercial investors, recognising greater liquidity and a greater range of investment options.

Debt and equity investors crowded in from the private sector can help close financing gaps for specific public projects, bringing more of these to fruition. Guarantees are particularly effective at crowding in new private sector financing from multilateral development banks, national development banks and similar government agencies.

The increasing prominence of blended finance contrasts, however, with a still limited body of evidence, analysis and good practice in this area, as well as a number of concerns, including the risks of public monies being invested in commercial transactions with the private sector, the risk of financial incentives driving development priorities and a still greater level of debt being shouldered by developing countries. Having said this, in developed countries, this model shows great potential, particularly in the context of scaling renewable energy and environmental investment.

b. Green Finance Applications

Green projects are particularly suited to blended finance, with approximately one in five blended finance facilities established to support clean energy projects. In this context, the GCF is promoting blended finance for green projects through four financial instruments: concessional loans, equity, grants and guarantees. This is a similar model to that of the CEFC who also use government capital to stimulate investment in renewable energy, low-emissions and energy efficient projects and technologies in Australia.

There is much still to be done. A common language and comfort around risk and alignment on expected returns needs to be found before this model can really take root in the green finance sector. However, this is a model that Australia might adapt for domestic conditions, and is already being piloted via the CEFC.

BLENDED FINANCE CAN CROWD IN PRIVATE FINANCE IN ANY OF THREE WAYS:



leveraging capital by reducing risks and guaranteeing investments, or by supplementing private investment with grant financing to create incentives for the private sector.



enhancing impact by bringing into play skillsets, knowledge and resources dedicated to development.



increasing returns in line with expectations by helping to improve the investment climate in key markets.

5.9 INSURANCE MARKETS

As risk managers, risk carriers and investors, the insurance industry has the potential to play a strategic role in supporting growth in green finance. Insurance promotes actions that prevent and mitigate risk. Beyond providing financial resilience, insurance can also act as an enabler of solutions that drive social and environmental sustainability. Moreover, insurers can support sustainable development through investment across asset classes and geographies.

UN climate change talks have yielded the Warsaw International Mechanism, which seeks to address the potential for loss and damage from climate change impacts, mandating development of two particularly relevant action areas:

- + enhancing the understanding of, and promoting, comprehensive risk management approaches (assessment, reduction, transfer, retention), including social protection instruments and transformational approaches, in building long-term resilience of countries, vulnerable populations and communities.
- + encouraging comprehensive risk management via the dissemination of information related to financial instruments and tools that address the risks associated with the adverse effects of climate change to facilitate finance in loss and damage situations.

Insurance instruments may include: comprehensive risk management capacity with risk pooling and transfer; catastrophe risk insurance; contingency finance; climate-themed bonds and their certification; catastrophe bonds; and investment approaches to making development climate resilient.

The insurance industry is taking climate risk seriously. Major re-insurance company, Munich Re has launched the Munich Climate Insurance Initiative, establishing a holistic climate risk management strategy, incorporating insurance solutions.

The insurance council of Australia's board also stated in 2016 that the domestic industry will focus upon:

- + reducing disaster vulnerability through insurance and implementing localised defensive infrastructure.
- + developing risk transfer products that incentivise emission reductions solutions to be brought to market.

ACRE AFRICA, CLIMATE RISK INSURANCE FOR FARMERS

ACRE Africa has developed a diverse portfolio of agricultural insurance products to match African rural farmers' varying access to inputs, credit, aggregators and contracts. The agricultural insurance products developed allow financial institutions, agribusinesses, cooperatives, input companies, NGOs, and farmers to mitigate a range of agricultural risks. Through aggregators, ACRE Africa serves a wide range of crop and dairy farmers, from smallholders with a quarter of an acre to large-scale farmers with 1000 acres or more.

They have three main product categories to fit a wide range of risk profiles. These include:

- + **Weather Index Cover** – uses weather data to approximate the on-farm experience. Unlike traditional agricultural insurance, which relies on expensive field visits to assess losses, ACRE Africa uses daily rainfall data monitored by satellites or automated weather stations. Thanks to correlated indices and tailored levels of coverage, insurance products become affordable for many small farmers. Clients can, for example, select to cover certain growing phases, the whole season or a particular severity of losses.
- + **Hybrid Index and Multi-Peril Crop Insurance (MPCI) Cover** – this combined insurance product enables clients to insure their crop against risks beyond their control, including drought, storms, pests, and diseases. The hybrid Index and MPCI covers the germination phase of the crop cycle, excluded in traditional, indemnity-based MPCI covers. With the addition of the weather index cover, the hybrid cover offers more comprehensive coverage of the crop from planting to harvest.
- + **Livestock Cover** – an indemnity product for dairy cows that insures against death from accidents and selected diseases. Gestation cover is also available specifically for calving cows. This protects the farmers from losses occasioned by pregnancy losses.

5.10 GREEN DIGITAL FINANCE

Green digital finance refers to financing the growing field of financial technology (fintech) that has direct or indirect environmental benefits. As the United Nations Environmental Program (UNEP) notes, “fintech covers everything from mobile payment platforms to high-frequency trading, and from crowdfunding and virtual currencies to blockchain.” While not trying to cover the field in this section, we felt it important to recognise and briefly explore the nascent and no doubt important role of this sector.

With digital finance regularly disrupting traditional business models in the financial sector, as well as re-purposing existing financial systems, environmental organisations are excited by the potential for digital finance to create opportunities for environmental impact through harnessing technology.

a. Who is doing green digital finance?

Those currently involved in green digital finance can be broadly divided into:

- + innovators, such as green fintech companies.
- + sponsors, such as countries and multilaterals, seeking to secure leadership opportunities in this sector.

b. Fintech companies

A number of exciting fintech initiatives are developing in the green sector. These include:

- + GreenSync, an Australian entity, is leading the Decentralised Energy Exchange (deX) project which is aiming to establish a software based market place trading the value of energy between consumers, businesses, communities and network utilities. Currently, consumers who generate and store energy through rooftop solar panels and battery storage units are unable to actively participate in the energy market and contribute to maintaining the reliability of our grid. Coordinating and trading decentralised renewable energy has the potential to circumvent the so-called ‘trade off’ between reliability, stability and cost associated with high renewable adoption in the energy mix. Funded by the Australian Renewable Energy Agency the project is commencing pilots in Victoria and the Australian Capital Territory in June 2017.

- + M-KOPA, a Kenyan entity which provides affordable solar home power systems to low-income households. The systems use embedded technology that monitors and meters their usage. An initial deposit is made, and customers then pay daily instalments via a mobile money service until their balance is paid off. Once their balance is paid off, the customer owns the system outright. This pay-as-you-go system replaces the need for a loan to finance the large purchase of equipment. M-KOPA is on target to be in 1 million homes in Kenya by 2018.
- + Abundance Investment in the UK, a peer-to-peer platform, which enables individuals to make direct investments in renewable energy projects from £5 upwards. This is enabled via signing up to an online trading account on the company’s website. As of May 2017, it has mobilised over UKP39m.
- + Scaling the technology used by ACRE Africa (discussed above) through a combination of the ‘internet of things’ (IoT), blockchain and artificial intelligence offers the potential to insure an estimated 1.5 billion smallholder farmers in the developing world against increasing volatile weather conditions.



BROOKLYN MICROGRID – CASE STUDY.

A community micro-grid that effectively bypasses utility companies and allows its subscribers to collect and trade solar power on the micro-grid via blockchain technology.

Question	Answer
<p>What is a ‘micro-grid’?</p>	<p>A micro-grid is a form of distributed energy generation that can function independently from a traditional, centralised power grid. A micro-grid can enable a particular area to develop its own energy sources and power storage systems (generally via lithium-ion or flow batteries), distribute that energy to residents and businesses, and sell excess power back to local utilities.</p>
<p>How does Brooklyn Microgrid work?</p>	<p>The goal of Brooklyn Microgrid is to create an environmentally sustainable energy system by creating a market in which residents can trade energy generated from solar panels they own to other residents.</p> <p>Brooklyn Microgrid also enables residents to sell energy back to the local utility – a process known as net metering – and allows those without solar panels to purchase vouchers for green power from their neighbours. Energy is traded on energy blockchain software, created by one of the founders of Brooklyn Microgrid, Brooklyn-based energy start-up, LO3 Energy.</p> <p>Brooklyn Microgrid not only receives energy from rooftop solar, but also from the nearest conventional power plant. Homeowners without solar panels can get vouchers for ‘green’ energy from their neighbours’ PV panels. This is what energy consumers have historically been buying when they choose energy generated from renewable sources.</p> <p>The physical micro-grid, set up by Siemens Digital Grid Division, includes network control systems, converters, lithium-ion battery storage and smart electric meters.</p> <p>In the case of another hurricane like Sandy in 2012, residents on the microgrid would continue to have power for a time even during a blackout as they could switch over to battery reserves.</p>
<p>Why set up a green micro-grid?</p>	<p>A green micro-grid has an environmental function and an energy security function.</p> <p>Environmentally, the micro-grid both facilitates supporting sustainable energy – even if you don’t have solar panels – and commercially rewards those with solar panels (assuming there are willing purchasers), thus further incentivising solar energy. Further, blockchain enables the company to assure customers that they are buying renewable energy from nearby solar panels rather than from a distant aggregation of renewable resources.</p> <p>In terms of energy security, since Hurricane Sandy caused a series of blackouts across the US in 2012, the reliability of the traditional grid has been called into question. In the microgrid model, long transmission lines are not needed and can therefore not be damaged by increasingly regular extreme weather conditions. Thanks to LO3 Energy’s partnership with Siemens, the project includes a microgrid control system, allowing the electricity generated to also be directed to hospitals, shelters and community centres when needed.</p>

Question	Answer
<p>How revolutionary is this?</p>	<p>Brooklyn Microgrid has not developed any new technology of its own but rather has combined a range of existing technologies to develop a new business model for sustainable energy.</p> <p>ConEd, the New York state utility, already allows owners of solar panels to sell their excess power back to the regular grid for energy vouchers in a process called net metering. ConEd also allows everyday consumers to purchase 'green' power: They pay a slight premium for these energy types.</p> <p>However, Brooklyn Microgrid combines both these options at a local scale, allowing:</p> <ul style="list-style-type: none"> a. solar panel owners to sell their solar energy directly to local buyers at or below market rates. b. credits to be issued via a voucher scheme. These vouchers are exchanged for green energy, from both the regulator grid and the microgrid. <p>All power is still sent through existing transmission wires and infrastructure but the key difference is that the 'environmental attribute' assigned to the parcel of energy generated within the local grid can be identified using blockchain technology, enabling data sharing. The 'Transactive Grid' software platform based on Ethereum-anchored blockchain technology enables the peer-to-peer transactions, with both parties privy to the same information.</p>
<p>What is the economic incentive to participate, and therefore invest in, a green micro-grid?</p>	<p>The market for Brooklyn Microgrid comprises environmentally conscious citizens who can't access local sustainable energy, or would be willing to pay a premium for solar energy by way of the existing grid system. The incentive for producers of solar energy to participate in this market is to reap a higher return on their investment by way of selling excess solar energy. A recent similar investment opportunity in Western Sydney offered a 7% investment return.</p> <p>Blockchain also makes it feasible to do small transactions that would otherwise be uneconomic.</p>
<p>What remains to be done?</p>	<p>Brooklyn Microgrid wants to become a platform provider and market maker first, proving to bigger players, such as ConEd, that this concept can work. This means demonstrating the value of the business model and convincing utility regulators to adopt the concept.</p> <p>Brooklyn Microgrid's goal is to have 1,000 participants by 2018. It also plans to install more battery storage units and even more extensive solar panel systems. Its first transaction took place in April 2017.</p> <p>LO3 is also looking at setting up more peer-to-peer trading platforms (referred to by LO3 as 'micro-grids'), including one in Australia. However, without changes to the way in which regulated network tariffs are set, it would be difficult to set up a micro-grid similar to the Brooklyn Microgrid in Australia. This is because the Brooklyn Microgrid model relies on access to existing grid infrastructure. Regulation of tariffs for grid-supplied energy (both feed-in and withdrawal tariffs) restricts the flexibility that residents need to set the prices at which they sell and buy electricity via a micro-grid platform.</p>

c. Countries and Multilateral Bodies

A number of countries and multilateral bodies have expressed interest in steering and leveraging the emergence of green digital finance:

- + The G20 and the Financial Stability Board (an international body monitoring and making recommendations on the global financial system) are actively exploring how to develop the financial system to take greater account of environmental factors.
- + Efforts are being made to integrate aspects of existing sustainable development practice into financial system reform, development and practice in China, UK, Bangladesh, France, Brazil and Kenya, with notable policy and regulatory leadership coming from developing, not just developed, countries.
- + Zhou Xiaochuan, Governor of the People’s Bank of China, has noted that, “in China, establishing a green finance system has become a national strategy”, because of the need to finance certain profound changes in China’s economy over coming decades.
- + Mark Carney, Governor of the Bank of England, has argued that, “achieving the [UN] Sustainable Development Goals will require mainstream finance. We need to build a new system – one that delivers sustainable investment flows, based on both resilient market-based, and robust bank-based, finance.”
- + UNEP, via its joint initiative with Ant Financial Services Group (**Ant Financial**), the Green Digital Finance Alliance, has positioned itself as a convener in this space, generating useful thought leadership papers and forums.

d. The Green Digital Future

“There is potential to scale and systematize early innovations, both nationally and internationally, to effect a major redeployment of capital to finance sustainable development.”
 UNEP, 2016

However, UNEP also note that “there has been little serious analysis to date of the core and most important question that is ‘what might be the possible scaled effect of fintech on sustainable development?’” They consider that, “fintech can open up new ways to make citizens’ lifestyles more sustainable. Scaled benefits to deploying fintech can be seen from ambitious actions taken by public and private institutions. UN Women, for example, has led within the UN family in deploying fintech to ensure both equal and greater access for women in developing countries.”

Ant Financial, an affiliate company of internet behemoth, Alibaba Group, is China’s largest fintech company. Described by the Wall Street Journal in 2017 as “a juggernaut of online banking, fund management and other financial services”, the company is spearheading the Green Digital Finance Alliance with UNEP. ANT Financial President, Eric Jang, stated upon its September 2016 launch,

“Ant Financial is a strong believer in green finance. Several of our products and services have been contributing to sustainable development. Leveraging mobile internet, cloud computing and Big Data, we can encourage our hundreds of millions of users to participate in a green lifestyle...”

Financial inclusion is the most immediate contribution an operation like ANT Financial is in a position to make to the green agenda, but this could mark the beginning of a revolutionary journey engaging citizens directly in sustainable development. As the creator of one of China’s most popular mobile apps, Alipay, ANT Financial provides users with a carbon account, on top of their normal credit and savings account. The 450million users are now able to track their carbon footprint and to earn ‘green energy’ credits to those whose financial transactions least impact the environment. Their innovative strategy includes a social media component which encourages users to grow a forest of virtual trees for real world incentives, in the same way consumers can earn points or air miles via credit card transactions.

ANT FINANCIAL SERVICES GROUP

PROFILE

Value: USD60-100bn

Customers: 450m (in 2016)

Ant Financial, founded in 2014, is the only internet finance company in the Green Finance Committee established by the China Society for Finance and Banking, a research institute under China's central bank, the People's Bank of China.

Its commitment to green finance is underpinned by a two-pronged "Green Financial Strategy":

1. application of green thinking when it comes to financial innovation, so as to incentivize public participation.
2. use of these financial innovations to promote the growth of China's green economy and to proliferate green awareness.

Ant Financial is implementing this strategy across a number of fronts, including the following:

- + Ant Financial-run MYbank, an online bank, provides preferential credit for users who purchase fuel-efficient vehicles in rural areas and partners of Cainiao Logistics who switch to environment-friendly electric vehicles.
- + Ant Financial works with over 90 asset management companies to sell their green and sustainable investment products, such as public fund products that are linked with green stock indices (stock indices with a significant share of green enterprises).
- + Ant Financial launched an investment app, Ant Fortune, in August 2015. The app is designed as a one-stop platform for consumers who have limited options when it comes to managing money and investments. Its features include low entry thresholds for financial investments. The funds on offer via the platform comprise more than 80 green industry themed funds, and over 900 financial products in total.
- + In addition, Ant Financial has begun to participate in green financing, and is actively exploring opportunities for investing in green projects.

A recent example of Ant Financial's investment activity in the green sector is the equity stake that it acquired this year in Ofo, a Beijing bicycle rental company, valued at USD1bn, and the owner of over 3 million bikes in 50 Chinese cities. Ofo bikes have even recently been piloted in the UK university town of Cambridge. Interestingly, the bikes do not need physical docking stations, being locked and unlocked via an app.

Leading up to Ant Financial's investment, Ofo offered deposit-free bike rentals to those with Ant Financial's own 'Sesame Credit' rating of 650 or above. Sesame Credit gives users a score based on five dimensions of information: personal information, payment ability, credit history, social networks and behaviours, including in relation to the ruling communist party.

Furthermore, authorities in China are now developing a related government social credit scheme, similarly incorporating personal behavioural data. In 2014, The State Council, effectively China's cabinet, described social credit as an "important component of the socialist market economy system ... (for) establishing the idea of a sincerity culture".

However, this concept is not without controversy, with human rights implications, having been described as 'part financial credibility indicator and part compliance mechanism.' The Economist recently wrote a briefing on this scheme, ominously entitled 'China invents the digital totalitarian state: The worrying implications of its social-credit project'. In addition, the World Privacy Forum, has noted that there is no independent measure of accuracy to credit scores, meaning 'error rates and false readings become a big issue'.

That said, there are mixed messages on how Chinese people feel about this concept, with many choosing to display their credit scores on their online dating profiles.

In the future, Ant Financial has stated that they will develop China's green financial system and green financial instruments, promote participation among consumers and investors in green finance, and guide small and micro enterprises to practice green finance as a means to delivering on China's broader green production and consumption goals.

6 ASSESSING ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) RISK

a. Impact of ESG factors on creditworthiness

Growing investor awareness of the impact of ESG factors on the creditworthiness of companies has led to a push to embed ESG risk factors in credit assessment methodologies. Momentum for this was boosted in May 2016, when six credit rating agencies (S&P, Moody’s, China’s Dagong Ratings, Malaysia’s RAM Ratings, German firm Scope and Brazil’s Liberum Ratings) convened a forum to discuss the link between ESG and creditworthiness. The credit agencies agreed, among other things, to:

- + be transparent and publish their views on how they consider ESG factors in their credit ratings.
- + review the way ESG factors are integrated into credit analysis.

Of the six agencies, Moody’s and S&P were already considering ESG risk factors in assessing the probability of default and recoveries. The other four credit rating agencies (Dagong Ratings, RAM Ratings, Scope and Liberum Ratings) have commenced a process of engaging with investors to communicate how they incorporate ESG, and are reviewing their rating methodology to assess how ESG factors should be taken into account.

b. S&P ESG Evaluation Framework

S&P is currently developing a new stand-alone ESG assessment framework. The assessment will not result in a credit rating, but will evaluate a company’s impact on the natural and social environments it inhabits, the governance mechanisms in place and any potential losses a company may face due to exposure to environmental/social risks. Once launched, this will be the first systematic and transparent rating agency framework for evaluating the implications of ESG risks on a company.

Based on proposals released to date, the framework ranks issuers on a five-point scale depending on the level of exposure the issuer has to ESG risks over the medium (2-5 years) to long term (5 years plus), and then makes an ESG assessment based on the following factors:

Factor	Description
Environmental Risk Profile	Issuers are classified according to their greenhouse gas intensity, with a high emissions intensity rating resulting in a weaker environmental risk profile as these issuers are likely to face increasing challenges in coming years. Other factors impacting environmental risk exposure are also considered.
Social Risk Profile	This factor is broken down into 4 main areas: <ul style="list-style-type: none"> + Management of human capital + Community and societal impact, responsibility and relationships + Management of customers, regulators, policymakers and industry groups + Maintenance of social licence to operate
Management and Governance	The same evaluation process used in determining a credit rating is applied here. Strategic positioning, risk management, organisational effectiveness and governance are all considered.
Environmental and Social Risk Management	This is a progressive assessment which evaluates the degree to which the issuer is managing its social and environmental risks and the likelihood that the current efforts will reduce the occurrence of potential relevant risks in the future.



c. Rating Agency Green Bond Evaluation Frameworks

In 2016, Moody’s launched a new Green Bond Assessment (GBA) evaluation and research service. The GBA service is intended to offer a consistent, standardised and transparent approach for evaluating a green bond issuer’s framework across various security types around the globe. It uses a scoring scale ranging from GB1 (Excellent) to GB5 (Poor), and involves a separate assessment from the credit rating process.

S&P launched a similar green bond evaluation tool in April 2017. As for the GBA, S&P’s Green Evaluation (GE) does not consider credit quality or take account of credit ratings. Instead, it provides a relative green impact score on instruments targeted at financing environmentally beneficial projects. The score is based on three levels of green bond classification (A, B, C) in addition to a provisional (P) classification that is contingent on further information disclosures.

Both of the assessments are aligned with the GBPs, which encourages issuers to obtain second party reviews of their green bonds. Following the release of the Moody’s and S&P frameworks, issuers now have the choice of obtaining a second party review of their green bonds by Moody’s or S&P (against their respective assessment tools) or by an independent verifier, against the CBS (or other green standard), or as Monash University did recently, obtaining both a rating agency assessment and CBS certification.

A summary of the main features of the GBA and GE evaluation tools follows.

d. Moody’s Green Bond Assessment

The Moody’s GBA defines green bonds as fixed-income securities, both taxable and tax-exempt, that raise capital for use in financing or refinancing projects and activities with specific climate or environmental sustainability purposes. It ultimately assesses the green bond issuer’s approach to managing, administering, allocating bond proceeds to, and reporting on, environmental projects. The potential for the project to achieve the stated environmental objectives are also assessed.

A SUMMARY OF THE FACTORS THAT THE GBA TAKES INTO ACCOUNT WHEN ASSESSING THESE MATTERS IS SET OUT IN THE FOLLOWING TABLE.

FACTOR	DESCRIPTION
 <p>ORGANISATION</p>	<p>The organisation’s structure, decision-making focus, framework for setting impact goals and reporting abilities are all assessed, including whether the issuer has engaged with external environmental or related experts.</p> <p>The score for this factor is made up of the following five sub-factors. When all 5 sub factors are satisfied the score for the organisation factor is 1 and if only 1 or no sub factors are satisfied the score is 5:</p> <ul style="list-style-type: none"> + Environmental governance and organization structure appears to be effective. + Policies and procedures enable rigorous review and decision making processes. + Qualified and experienced personnel and/or reliance on qualified third parties. + Explicit and comprehensive criteria for investment selection, including measurable impact results. + External evaluations for decision making in line with project characteristics.

FACTOR

DESCRIPTION



The use of proceeds are evaluated in relation to the categories of eligible projects in the GBP:

- + Renewable energy.
- + Energy efficiency (including efficient buildings).
- + Sustainable waste management.
- + Sustainable land use (including sustainable forestry and agriculture).
- + Biodiversity conservation.
- + Clean transportation.
- + Sustainable water management (including clean and/or drinking water).
- + Climate change adaptation.

The percentage of proceeds invested into a project category is very important for the overall score of this factor. Generally if fewer than 80% of the total proceeds go to an eligible project the overall GBA grade will be GB4 or GB5.



The quality and transparency of disclosures in the offering documents and any other relevant documents are also considered, and assessed against the five sub factors below:

- + Description of green projects, including portfolio level descriptions, actual and/or intended.
- + Adequacy of funding and/or strategies to complete projects.
- + Quantitative and/or qualitative descriptions for targeted environmental results.
- + Methods and criteria, both qualitative and quantitative, for calculating performance against targeted environmental results.
- + Issuer relies on external assurances including second party reviews, audits and/or third party certifications.

FACTOR**DESCRIPTION**

This factor is aimed at assessing the proceeds on the sub factors below:

- + Bond proceeds are segregated and separately tracked on an accounting basis or via a method by which proceeds are earmarked.
- + Application of proceeds is tracked by environmental category and project type.
- + Robust process for reconciling planned investments against actual allocations.
- + Clear eligibility rules for investment of cash balances.
- + Audit by external organisation or independent internal audit unit.



The nature of expected periodic updates and their frequency are evaluated, including against the following key considerations:

- + Reporting and disclosure post issuance provides detailed and timely status update on projects.
- + Ongoing annual reporting is expected over the life of the bond.
- + Disclosures provide granular detail on the nature of the investments and their expected environmental impacts.
- + Reporting provides a quantitative and/or qualitative assessment of the environmental impacts actually realised to-date.
- + Reporting includes quantitative and/or qualitative explanation of how the realized environmental impacts compare to projections at the time the bonds were sold.

Once all the relevant information has been evaluated, a grade is allocated as follows:

- + **GB1 (Excellent)** - Green bond issuer has adopted an excellent approach to manage, administer, allocate proceeds to and report on environmental projects financed with proceeds derived from green bond offerings. Prospects for achieving stated environmental objectives are excellent.
- + **GB2 (Very Good)** - Green bond issuer has adopted a very good approach to manage, administer, allocate proceeds to and report on environmental projects financed with proceeds derived from green bond offerings. Prospects for achieving stated environmental objectives are very good.
- + **GB3 (Good)** - Green bond issuer has adopted a good approach to manage, administer, allocate proceeds to and report on environmental projects financed with proceeds derived from green bond offerings. Prospects for achieving stated environmental objectives are good.
- + **GB4 (Fair)** - Green bond issuer has adopted a fair approach to manage, administer, allocate proceeds to and report on environmental projects financed with proceeds derived from green bond offerings. Prospects for achieving stated environmental objectives are fair.
- + **GB5 (Poor)** - Green bond issuer has adopted a poor approach to manage, administer, allocate proceeds to and report on environmental projects financed with proceeds derived from green bond offerings. Prospects for achieving stated environmental objectives are poor.

Assessments are reviewed annually and may be updated periodically to take into consideration changes to the application of proceeds and the environmental impacts of projects undertaken.

e. **S&P Green Bond Evaluation Tool**

Similar to the Moody’s assessment, S&P’s GE evaluation tool is not a credit rating. It aims to evaluate the governance and transparency of the relevant bond issuer and provides an analysis of the environmental impact of the projects financed by the bond proceeds over their lifetime.

When assessing environmental impacts, both climate change mitigation and adaptation projects are considered. Projects will be classified as mitigation projects if they aim to bring environmental benefits and target areas of concern, such as natural resources depletion, loss of biodiversity, pollution control, and climate change. On the other hand, adaptation projects aim to take practical steps toward reducing the exposure to and managing the impacts of natural catastrophes, such as building the resilience of communities and critical infrastructure against an increased risk of extreme weather events due to climate change.

When evaluating the environmental impacts of a project, the material stages of the project life cycle are assessed and things such as clean coal projects, total emissions, carbon dioxide reduction potential and capacity to generate low carbon electricity are particularly important.

There is a five point scoring system, ranging from E1 to E5 for mitigation bonds (bonds that finance projects which provide environmental benefits such as pollution control and climate change) and R1 to R5 for adaption bonds (bonds that finance projects which reduce the exposure and impacts of natural catastrophes), as follows:

FIVE POINT SCORING SYSTEM



**TYPE OF SCORE
AND WEIGHTING**

DESCRIPTION

15%

TRANSPARENCY

- + Focuses on the quality of the disclosure, reporting obligations and management of bond proceeds.

25%

GOVERNANCE

- + Assesses the steps that have been taken to measure and manage environmental impact of the use of proceeds of the bond, including certification, impact assessment, risk monitoring, and risk management.

60%

**MITIGATION/
ADAPTION**

Mitigation

- + Considers the key environmental impacts of the use of bond proceeds.
- + Based on determining the level of environmental impact in each category (such as technology and location) and supporting a quantitative assessment of sustainability.
- + Calculated on a net benefit basis, meaning both negative and positive environmental impacts of the project are considered relative to the appropriate local baseline.

Adaptation

- + Reflects the estimated reductions in the costs of expected damages achieved by the initiatives financed.
- + Analyses and assesses the environmental resilience benefit that may be achieved through the use of bond proceeds.

**THE SCORE CAN BE PERIODICALLY UPDATED IF THE ISSUER REPORTS
A MATERIAL CHANGE IN THE ALLOCATION OF THE PROCEEDS.**

f. Comparison of Moody’s and S&P’s green bond evaluation

Although the green bond evaluation frameworks for Moody’s and S&P both refer to the GBPs, the criteria evaluated, and the weightings given to these, are different, as seen in the table below. In broad terms, the main area of difference lies in S&P’s environmental impact evaluation based on its Mitigation/Adaption criteria. The Moody’s rating does not have an equivalent environmental impact evaluation. It focuses instead on the Use of Proceeds criteria, which are generally aligned with the GBPs.

The S&P assessment methodology is also more granular in that it offers a separate rating for mitigation bonds (E1 to E5) and adaption bonds (R1 to R5). It will be interesting to observe whether a preference for a Moody’s or S&P assessment develops amongst issuers or investors, based on these differences.

	MOODY’S	S&P GLOBAL RATINGS
 <p>CRITERIA EVALUATED</p>	<ul style="list-style-type: none"> + Organisation + Use of Proceeds + Disclosure on the Use of Proceeds + Management of Proceeds + Ongoing Reporting and Disclosure <p>Use of proceeds is the most important factor evaluated.</p> <p>The assessment is aligned to the GBPs, rather than a broad environmental impact evaluation.</p>	<ul style="list-style-type: none"> + Transparency + Governance + Mitigation/Adaption <p>Focuses on three main areas, which are broadly aligned with the Moody’s criteria, but split across three main criteria instead of five.</p> <p>Unlike the Moody’s assessment, the S&P framework includes a comprehensive environmental impact evaluation.</p>
 <p>SCORE WEIGHTING</p>	<ul style="list-style-type: none"> + Organisation – 15% + Use of Proceeds – 40% + Disclosure on the Use of Proceeds - 10% + Management of Proceeds – 15% + Ongoing Reporting and Disclosure – 20% 	<ul style="list-style-type: none"> + Transparency – 15% + Governance – 25% + Mitigation/Adaption – 60%





OVERALL RATING

MOODY'S

Five scale system:

GB1: Excellent

GB2: Very Good

GB3: Good

GB4: Fair

GB5: Poor

S&P GLOBAL RATINGS

Five scale system:

E1/R1 (80-100% total weighted score)

E2/R2 (60-80% total weighted score)

E3/R3 (40-60% total weighted score)

E4/R4 (20-40% total weighted score)

E5/R5 (0-20% total weighted score)



UPDATES

Assesses the rating every year based on reports it requests from the issuer. Depending on changes to the environmental impact of the relevant project, the rating may be changed.

S&P will update the rating if the issuer reports a material change in the use of the proceeds. However, S&P does not request additional information to support an annual assessment.

g. Dagong Global Infrastructure Credit Rating Methodology

Dagong Global Credit Rating (**Dagong**) is a Chinese credit rating agency which was founded in 1994. It is the biggest independent rating agency in China and has recently opened a European arm to service the European financial market. The company is seeking to compete with the 'big three' credit rating agencies (Moody's, S&P and Fitch Ratings) and is quickly expanding its rating services in pursuit of this goal.

In April 2016, Dagong released a new infrastructure credit rating methodology. While this is not a direct green bond assessment, it is a new credit rating methodology used specifically for financing infrastructure projects.

As part of the assessment process, the sustainability factor of the project, the impact of the project on the environment and society and the overall 'green' rating of the project are considered in the credit rating process. Although this is a not separate rating system for green bonds, it shows that environmental factors are now being included in China for credit ratings, which is important as the Chinese green bond market is currently the largest in the world.

7 LOOKING AHEAD

#1. GREEN FINANCE SECTOR SMALL BUT GROWING FAST

The Green Finance Sector is now of a scale where it can be considered a relevant subsector of the global capital markets, but still forms less than 1% of the USD100tr of bonds in the global bond market.

It is estimated that over the next 15 years, approximately USD93tr will be needed for investment in low carbon infrastructure across the world. The People's Bank of China has estimated that China alone will need to invest over USD1.5tr in green projects between 2016 and 2021, with only around 15% of the amount likely to be provided by government.

The capital markets is seen to be critical to achieving the funding task for this investment, but only if green bonds can be mainstreamed. Crafting the right package of policy and market signals including consistent disclosure, better analytics and robust definitions to avoid 'greenwashing' will be critical to the success of this next phase. Moody's has recently predicted the market in green bonds will reach a 'critical scale' in 2017, estimating an AUD206bn annual volume (based on 2016 growth rates). Although government institutions like IFC and the World Bank have paved the way, corporates are now following, with Apple issuing USD1.5bn in green bonds in 2016.

#2. GREEN FINANCE IS SHAPING INTERNATIONAL RELATIONS

Green finance is now shaping international diplomatic relations. The 2015 Paris Agreement on Climate Change signalled a shift to a low and ultimately net zero carbon economy, and stressed the importance of improving resilience to climate shocks. World leaders at the 2016 G20 Summit in Hangzhou have since recognized the urgent need to scale up green finance by referencing its importance in a G20 summit's concluding communiqué for the very first time. Also in 2016, the Chinese government launched the Green Finance Study Group, co-chaired by the UK, with UNEP as the secretariat, with the aim of developing a baseline review of the key trends, barriers to progress and practical steps that can be taken to strengthen policy signals, improve market capacity, encourage cross-border flows and deepen risk management. However, there are recent concerns about how much of a role the US intends to continue playing in this area, with mixed signals emanating from Washington DC.



#3. ESG FACTORS ARE AFFECTING CREDITWORTHINESS ASSESSMENTS, AND HELPING DETERMINE PROJECT APPETITE

There is a movement within the investment community to comprehensively link ESG issues to creditworthiness, effectively pricing-in green factors. The rationale behind this is solid, with environmental factors affecting the probability of default and of recovery. With Moody's and S&P, along with some other ratings agencies, committed to this approach, it could be considered that ESG has now gone mainstream.

The push to recognise ESG factors as material is being driven internally but also is being influenced by evolving public opinion, both in terms of how people seek to see their investments handled and also how brown projects are now perceived. For example, one of the big four Australian banks has recently updated its investment policy around coal developments, causing Australia's newest open cut coal mine, Adani, to controversially fall outside of their investment mandate. The types of projects being pursued in this space is also broadening. While the early projects largely involved low carbon infrastructure, there is increased appetite for renewable energy projects, community-driven initiatives and even, to some extent, sustainable land-use projects.

This growing appreciation of ESG risks is underpinned by the USD59tr in assets now globally invested in accordance with the UN Principles for Responsible Investment. 50 of the top 100 Australian Super funds have now signed up to these principles. Overall there were AUD23bn in 'sustainability themed investment' assets under management (or to meet investor mandates) in the Australian region in 2015, representing a significant 179% increase from equivalent figures reported in 2014 by Responsible Investment Association Australasia.

#4. GREEN FINANCE IS BECOMING EMBEDDED INTO OUR GLOBAL FINANCIAL SYSTEM

There are deeper changes across the financial system as financial regulators begin to recognise that environmental factors pose risks to the financial system as a whole. In late 2015, The Bank of England published the world's first prudential review of the climate implications for the insurance sector. Building on this work, in 2016, the Financial Stability Board established the Task Force on Climate Disclosure to deliver its goal of a more consistent reporting framework, to enable market participants to make informed decisions and avoid shocks to financial markets.



#5. AUSTRALIAN BUSINESS IS JUST ABOUT KEEPING UP WITH GLOBAL DEVELOPMENTS, BUT WILL NEED TO WORK HARD AND BE BOLD TO REMAIN RELEVANT

There have been a number of success stories with Australia's commercial development of the green sector. There is a burgeoning fintech community here, with a number of stand-out companies coming forward. Fintech, as a whole, is reported to have contributed AUD30bn to the Australian economy in 2016, and is being strongly supported by government. However, in the face of the US Silicon Valley giants, and Chinese players, particularly ANT Financial, Australian companies will need to work very hard indeed to keep up.

That said, green digital finance could be just the area for Australia to carve out a niche. There are a number of factors which should help position Australia for this opportunity, including a strong domestic appetite for blockchain and related distributed ledger technology, along with a commercial and social sector interest in models for sharing renewable power within communities. In addition, all four Australian banks have been actively involved with developing green financial products, from green bonds to 'climate-friendly' loans. The learnings and appetite within the financial sector for these new lending products, tied to new green mandated funding sources could leverage a stronger position for the Australian financial investment community across Asia and possibly beyond.

Realistically, Australia does not have the population demographics of China or the US, so will need to be intelligent about creating offerings that can be applied in a proprietary manner overseas. Australia is well placed to enter the Chinese market, particularly in relation to agriculture and related products. Green investment into organic and premium agriculture is already well advanced.

However, there are also some concepts being mooted that feel like they are lifted from the world of science-fiction.

With ultra-high-voltage direct-current (UHVDC) technology now being developed, it is no longer beyond the realms of possibility that Australia could export electricity to its neighbours from vast solar and renewable energy farms located in the great deserts of central Australia. With 220m people living in Indonesia, and Jakarta a mere 2725 km from Darwin, UHVDC technology already in use in Southern China could be harnessed to make this connection. This would require a major financing commitment, with estimates of AUD500bn needed to realise this project. However, experts are positive. Andrew Campbell, director of the Centre for Sustainable Energy Systems at Australian National University, recently commented,

"Yes, [this project] is technically formidable, and assembling the necessary geopolitical and financial architecture to make it happen won't be trivial."

He goes on to point out:

“ THIS PROJECT WOULD CATAPULT [AUSTRALIA] TO THE FOREFRONT OF THE TECHNOLOGY SAVVY AND RAPIDLY GROWING GREEN ENERGY SECTOR, GENERATING MANY THOUSANDS OF HIGH-TECH JOBS IN AUSTRALIA AND BEYOND. ”

#6. AUSTRALIAN POLITICIANS HAVE SO FAR BEEN LARGELY UNHELPFUL BUT NOW SEEM TO AT LEAST HAVE SOME FIRM POLICIES

The Australian government has taken a continuously ambiguous line on the various aspects of green finance. While recently 'saving' the CEFC from abolition, they also strongly currently back the coal industry. Often, it appears, economic development is being driven at the expense of climate change mitigation.

Equally unhelpfully, the Labor Party has recently proposed a radical 50% renewable energy target by 2030 nationwide. If this proposal were implemented, the current renewable energy target would need to rise from the current 15% of green power contributing to the energy mix up to 50% in 13 years, triggering significant questions around whether this is economically advisable or even feasible.

On the other side of the chamber, the Prime Minister recently expressed his personal disappointment when one of the big four Australian banks decided not to participate in the financing of the new open cut Adani mine in Queensland, remarking that 'coal has a big role to play for a very long time'. Although recent media reports indicate that the CEFC may be required to fund certain coal-fired power stations, outgoing CEFC CEO Oliver Yates has pointed out that the CEFC is obliged to make commercially viable investments, and that he did not 'think a [coal fired power station project] would be financeable without the government providing an indemnity as to future carbon risk... it would be very challenged as a financeable proposition'.

These positions reflect the fact that Australia is in a difficult economic situation. As the largest coal exporting nation in the world, a move away from fossil fuels and towards renewables will require significant rebalancing of the domestic economy.

Managing such a political wedge, and an ongoing ideological struggle around the verifiability of climate change itself, Australian government policy is not contributing a great deal to a stable and positive investment climate.

#7. OUTLOOK – 2020

Even larger changes are on the horizon, globally. For example, the UK has announced that it will be phasing out coal-fired power generation by 2025. In addition, fintech is rapidly advancing the democratization of green finance, so that individual savers and investors as well as corporations have the financial tools at their disposal to shift investment towards sustainability.

The GCF is a key outcome of the recent climate change talks, holding a commitment to fund USD100bn for deployment in leveraging private finance to mitigate climate change, with a resultant effect of further stimulating the global green economy. However, only USD11bn has been committed so far and current noises from world capitals, particularly Washington DC, are not encouraging.

Asian markets continue to develop, with Japan in the final stages of developing their own national green bond standard, in anticipation of an issuance by Tokyo city government later in the year. The Nigerian and Kenyan governments have also announced plans to issue a green bond in 2017.

China is going to be the major force in 2017, with large scale plans for green bond issuances being indicated. In 2016 China overtook the United States as the world's largest green-bond issuer, issuing over USD30bn green bonds. This was roughly 33% of the USD92bn global issuance value, and accounted for 65% of issuance value growth year-on-year in 2016. Although China was the top single issuer in 2016, the US remains the largest issuer to date, accounting for USD34.3bn of the outstanding market, versus USD33.6bn for China.

Australia is starting to gear up its investment in a low carbon economy. Amongst the growing pipeline of green projects, saving the Great Barrier Reef represents one of Australia's biggest environmental funding challenges to date, and we expect to see more developments in this area as investments in green projects to protect the reef build momentum.

8 CONCLUSION

In this review, we have explored how the green finance sector has been impacted by a range of, policies and developments, at individual, corporate, national and global levels. The stand out development is the commitment with which China has embraced the new ‘green paradigm’. With its unique ability to align state, private sector and individual incentives, we are witnessing massive growth and innovation in China’s green finance sector, with a definitive example in ANT Financial. Furthermore, as a central tenet of the latest Chinese ‘Five Year Plan’ policy process, green finance is set to receive a further boost.

Closer to home, Australia is increasingly driving developments in battery storage, not least in response to electricity shortfalls in South Australia. However, again, Chinese is taking a lead as its technology is being offered as the cheapest and most immediately available in addressing key aspects of the technology mix, including providing batteries.

For Australia to stay globally relevant, innovative financing, including adapting blended finance models already being deployed overseas, will be necessary to scale existing initiatives to exploit the rapidly reducing cost of renewables technology.

To stimulate inter-dependent public and private funded green projects, Australia will need access to green bonds and other structured finance instruments. This will be critical to secure its competitiveness with other leading nations at the forefront of clean-tech innovation.



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