

# GREEN FINANCING

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# 1.

## EXECUTIVE SUMMARY

“ Governments, including China, are now seeking to progressively encourage green financing in their domestic marketplaces. With the expansion of green financial products and market regulation maturation, more funds are projected to be infused into green projects globally and in China.

From a global perspective, green financing is progressively being utilised as a catalyst in the transition towards a greener economy because it provides the necessary financial support for the development of green projects, including green real estate.

To preserve energy and natural resources, people, governments and corporations around the world are now cooperating more closely together to generate more sentience, establish 'green' associated bodies and associations, ratify laws and provide green financing. Given the built environment's massive involvement in the diminution of natural resources and hastening of climate change, many more property owners and users, today, are also convivial to the idea of going 'green', and many have incorporated green technology on and in their buildings to garner energy and natural resources and/or conserve energy and natural resources.

Ahead in the short to medium term, the built environment will continue to be one of the foremost emitters of greenhouse gases and will be a large contributor to global warming. As a greater number of people, governments and businesses understand this, so more newly built buildings (and existing buildings) around the world, and in China, will be obliged to install green technology systems that both garner and preserve energy and natural resources in the future.

Given the steadfastness of many governments around the world, including the Chinese government, to environmental sustainability and the advancement of green building development, we can anticipate a growing proportion of the built environment to be green in the future. In conjunction with this, from the commercial real estate viewpoint, as more building owners and space users start to comprehend the many advantages that certified green commercial real estate can provide, including financial benefits, so this mainspring will make sure green commercial office, retail, industrial and hotel space is set to increase in popularity in the years to come.

So as to buttress the development of a sustainable economy, including a green built environment, governments, including China, are now seeking to progressively encourage green financing in their domestic marketplaces. With the expansion of green financial products and market regulation maturation, more funds are projected to be infused into green projects globally and in China.

Lastly, with China's built environment in mind, as Quasi-REITs and two green CMBSs have been efficaciously launched, we envisage more green real estate projects in the region to exploit of these types of green financing mechanisms in the future.

# 2.

# REPORT INTRODUCTION

This report comprises of  
**four main sections**



**A background section**

Which discusses the growing importance of green financing and the drivers for implementing this form of financing globally and in Mainland China

Which examines the green financing systems and approaches implemented thus far in regions around the world

**An international green financing scene section**



**A section focusing on the green financing scene in Mainland China**

Which studies the initiatives implemented thus far as well as the prospects for the green financing sector in the region in the future

Which looks at green building development, its importance and how green financing can be put to good use to support a green built environment globally and in China

**A green real estate section**



# 3.

## GREEN FINANCING - A GENERAL BACKGROUND



**Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.**

What's the single best way to cut greenhouse gas emissions? Eat less meat? Reforest the Amazon? Peddle your way to work?

None of these. According to the Economist, the answer is to produce fundamentally enhanced air-conditioners.

Air-conditioners contribute to greenhouse gas emissions in two ways: one, by the electricity they consume and; two, by their use of 'F gases' as refrigerants, which when they leak are potent contributors to global warming.

By some estimates, including the International Energy Agency, replacing refrigerants, which cause atmospheric damage, would lesson greenhouse gases by around 90 billion tonnes by 2050. Making units more energy efficient could raise that total twofold. On the other hand, if half the world stopped eating meat, this would save just 66 billion tonnes. Moreover, replanting two-thirds of lost rainforest would save just 61 billion tonnes and a one-third rise in cycle journeys would save just 2.3 billion tonnes.

Air conditioners might be the single best way to reduce greenhouse gas emissions but when we piece together the overall picture, today, it is now collectively acknowledged that over consumption is leading towards the hasty diminution of the world's natural resources. It is also recognised that ensuing climate change from the overuse of natural resources is impacting the natural balance of nature.

According to the leading global environmental authority, the United Nations Environmental Programme (UNEP), pollution, natural resource depletion and passive impact from climate change have resulted in substantial economic costs. Globally, the current growth and development model is gradually approaching the earth's environmental sustainability limit.

Other international organisations have taken action to combat climate change by encouraging and championing sustainable economic transition. For example, the G20 has incorporated the phrase "strong, sustainable and balanced growth" into its overall strategic goal.



Many international agreements have also been signed to promote sustainable development. The most significant recent one was the Paris Agreement, the aim of which includes:

**“Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.”**

In China, as investment-driven development has been the norm and high-profile pollution incidents triggered public concern, China is now placing greater emphasis on sustainable development and the quality of economic growth than ever before.

China’s green economy, as characterised by green, circular (i.e., the implementation of resource reuse and recycling) and low-carbon development, has emerged as a crucial concept for sustainable development and is playing an essential role in the country’s economic transition. China’s 12th Five-Year Plan, released in 2011, identified green development and sustainability as a key economic development guideline. Since then, China has formally stepped on the green economy development path. Looking to the future and according to President Xi’s report at 19th CPC National Congress, in order to promote green development, China will create a market-based system for green technology, develop green finance and spur the development of energy-saving and environmental protection industries as well as clean production and clean energy industries.

More particular and with reference to “Guideline for Establishing the Green Financial System” released by the government in China in 2016, green financing represents those financial services provided for economic activities that support environmental improvement, mitigation of climate change and more efficient use of resources. Green financing is thus an indispensable component of China’s green economy. On the one hand, it upholds sustainable development by financing projects related to environment protection and sustainable development. On the other hand, it

provides opportunities by facilitating the growth of high-potential green industries. It does this by helping to accelerate technological innovation and upgrading, and by creating green business opportunities for the financial industry.

Having attained significant growth, green financing is expected to further develop and play a more constructive role in assisting economic transformation both globally and in China.

From a global perspective, at the G20 Summit in Hangzhou in 2016, seven broad financing sector criteria were established to “enhance the ability of the financial system to mobilise private capital for green investment”. Following this green development direction, G20 members have endeavoured to build their green financing systems by reallocating capital, improving risk management and enhancing disclosure of environmental costs. Almost all members have taken measures to support the development of local green bonds markets and 70% of members have provided a strategic policy framework (Table 1).

In part, resulting from the G20 initiative and with increasing national level action and international cooperation, green financing growth exploded in 2016 and 2017. During this time, a wide spectrum of green financing products were launched. Green bonds and green credit, in particular, gained investor favour. Taking green bonds as an example, in 2016, with a 92% growth rate, the scale of the global green bonds market almost doubled. What’s more, in 2017, issuance increased by 78%, taking the total market size to US\$160.8 billion (Figure 1).

As stated by the UNEP, China has firmly established itself as a global leader in green financing, with both domestic policies and international leadership bringing real progress. For example, China has become the second largest green bond issuer globally. In 2017, total green bond issuance from China increased by 4.5% y-o-y, reaching RMB248.6 billion (US\$37.1 billion) (Figure 2).

**Table 1:**

**G20 members – The seven broad financial sector criteria to scale up green financing and the members which have met each criteria (July 2017)**

Source: Climate Bond Initiative, Cushman & Wakefield Research

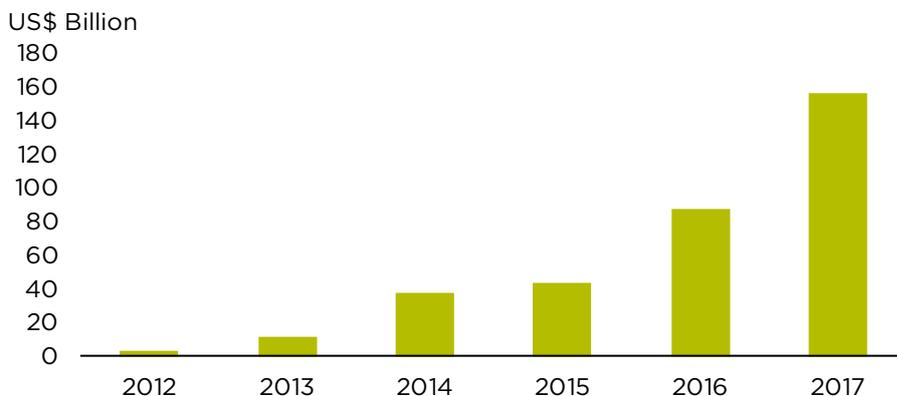
<b>G20 Member</b>	<b>1. Provide strategic policy signals and framework</b>	<b>2. Promote voluntary principles for green finance</b>	<b>3. Expand learning networks for capacity-building</b>	<b>4. Support the development of local green bond markets</b>	<b>5. Promote international collaboration to facilitate cross-border investment in green bonds</b>	<b>6. Encourage and facilitate knowledge-sharing on environmental and financial risk</b>	<b>7. Improve the measurement of green finance activities and their impact</b>
Argentina	✓			✓			
Australia	✓			✓			
Brazil				✓	✓	✓	
Canada	✓			✓	✓		
China	✓	✓	✓	✓	✓	✓	✓
France	✓	✓		✓	✓	✓	
Germany	✓		✓	✓		✓	
India	✓			✓	✓		
Indonesia	✓		✓	✓		✓	
Italy	✓			✓			
Japan				✓			
Mexico	✓			✓	✓		✓
Russian Federation				✓		✓	
Saudi Arabia			✓				
South Africa	✓			✓	✓		
South Korea		✓		✓			
Turkey				✓			✓
UK	✓		✓	✓	✓	✓	✓
US				✓		✓	
EU	✓			(N/A)	✓		
International	✓	✓	✓	✓		✓	✓

Lastly, apart from creating a domestic green financing market, China has been actively exporting green investment best practices. Taking the Belt and Road (B&R) Initiative as an example, in May 2017, President Xi proposed the establishment of an international coalition focused on green development along the B&R. The vast development plan, together with various green B&R projects, will surely provide a huge opportunity for the green financing market. With this in mind, Chinese banking giant, the Industrial and Commercial Bank of China (ICBC), took the lead by listing a US\$2.1 billion B&R Green Climate Bond on the Luxemburg Green Exchange (LGX) in October 2017.

**Figure 1:**

**The rapidly growing global green bond market (Labelled green bonds only) (2012–2017)**

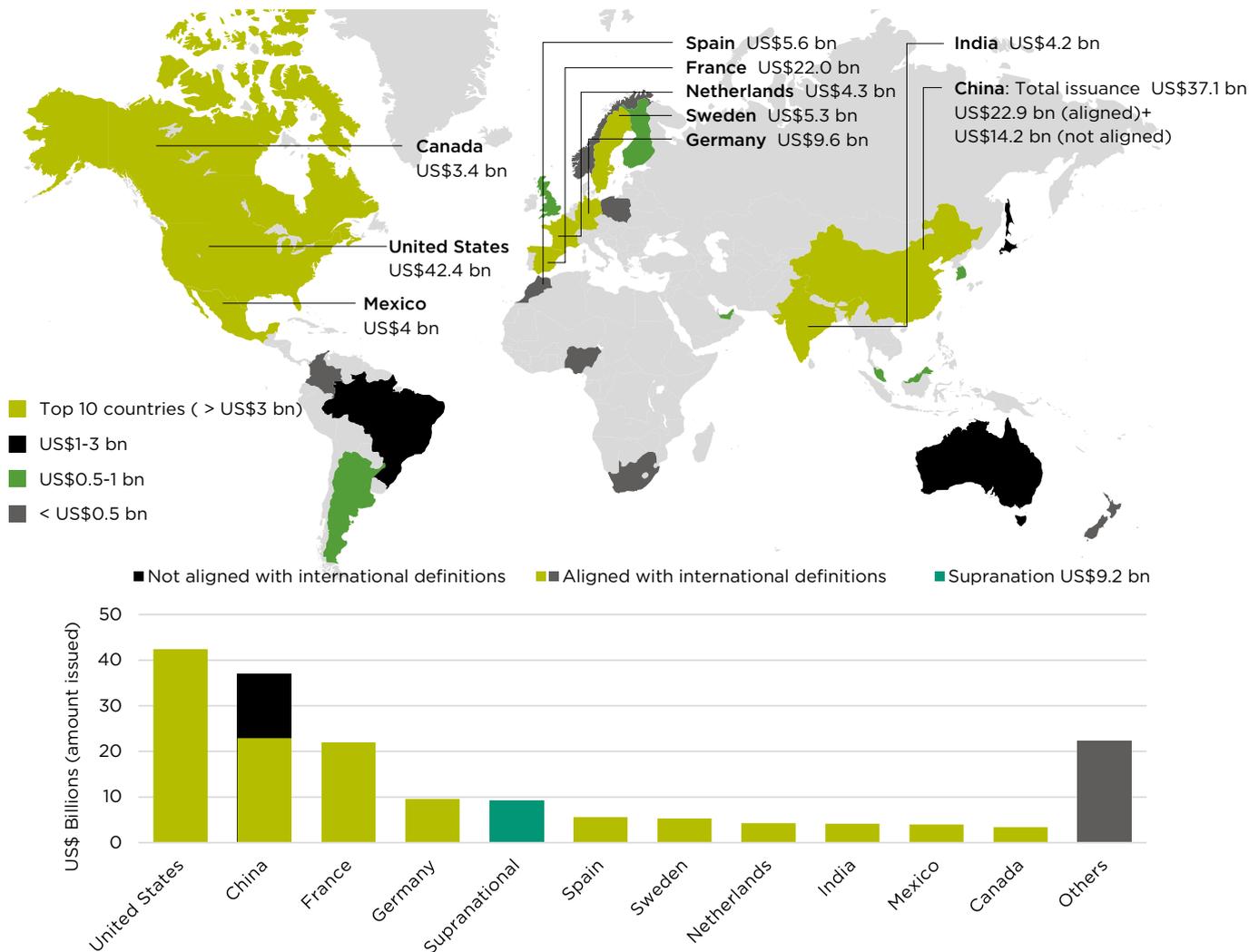
Source: Climate Bond Initiative, Cushman & Wakefield Research



**Figure 2:**

**The global green bond market and China's contribution to green bond issuance (2017)**

Source: Climate Bond Initiative, China Central Depository & Clearing Co., Ltd., HSBC, British Embassy Beijing, Cushman & Wakefield Research



# 4.

## GREEN FINANCING - THE INTERNATIONAL SCENE



The green bond market achieved dramatic growth in 2016 and in 2017 and this growth is set to continue with green bond issuance in 2018 expected to reach US\$250 billion, a 60% increase from 2017.

### Sources of capital

With the increasing development of the green financing market, both public and private funds are being mobilised for investments into a diverse range of green projects, including but not limited to renewable energy, low-carbon transport, water efficiency, waste management and sustainable living. Funds that particularly focus on projects that support green initiatives are recognised as green funds. From a global perspective, green funds have served as a catalyst in the transition towards a greener economy because they provide the necessary financial support for green projects from the R&D stage to the eventual commercialisation stage.

Capital for green funds mainly stems from the following sources:

- o Local and national governments;
- o Financial institutions that take on environmental responsibility and community development;
- o Non-profit foundations with an environmental

mission;

- o Green grants offered by the business sector, and;
- o Individual investors.

However, on a global scale, green projects still face some fundraising issues, such as higher funding costs, longer maturity, lower returns and higher risks. On this note, the key to realising the greater development of green financing is to lower funding costs and to establish comprehensive risk management systems. Governments should take the lead on this to ensure sufficient resource allocation to support green projects.

### Governments, international organisations and corporates drive the growth of green financing

#### Government action

Many governments today have actively engaged in the transition to a green economy. Apart from

direct funding, to mobilise private capital for green investments and to ensure that all green capital flows to qualified green projects, governments have adopted various schemes to regulate the green financing market and to encourage green initiatives.

Taking the Dutch government as an example, a comprehensive tax incentive scheme called Green Fund Scheme has been established. This scheme comprises:

- o **A Green Projects Scheme – that designates eligible green projects;**
- o **A Green Institutions Scheme – that imposes requirements for green funds or green banks, and;**
- o **Tax incentives for individuals.**

In the case of certified green banks, the interest rate paid out is usually lower than the market rate, meaning that they can in turn invest the funds in green projects at a lower interest rate. Besides, for each green investor, he or she can enjoy a tax exemption on the capital gain for up to about 55,000 euros. Green investors also pay less income tax on their green capital. Thus, the tax incentives motivate these investors to accept a lower interest rate or dividend on their green investments. Since the scheme's inception, it has been estimated that the decrease in carbon dioxide emissions from 2001 has been about 0.5 million tons per year... with this figure set to significantly increase given the growing number of projects

included in the scheme.

### **International green organisation action**

For major international green organisations, not only do they advise many governments around the world on their executive process for developing a green and sustainable economy (by referencing a number of binding international environment agreements, such as the Paris Agreement), but these organisations also facilitate collaboration and peer-to-peer learning by holding summits, conferences, seminars and workshops and issuing subsequent guidelines.

For example, the Sustainable Stock Exchange (SSE) has served as an international learning platform for stock exchanges around the world to enhance corporate transparency and performances on ESG (environmental, social and corporate governance) issues and to encourage sustainable investment. Since this initiative, a number of partner exchanges have made a voluntary public commitment to promote improved ESG disclosure and performance among listed companies so as to promote a sustainable and transparent capital market worldwide.

Both the Shanghai Stock Exchange and the Shenzhen Stock Exchange are partner exchanges of the SSE. In particular, the Shanghai Stock Exchange has contributed to SSE

Green Finance Guide and has participated in the Green Finance Initiative event held in Bonn in 2017.

### **Corporate action**

Corporates around the world are increasingly dedicating greater effort and resources to greening their businesses. This trend is highly associated with a greater emphasis on environmental accountability that measures a corporate's environmental cost in terms of resource use, climate change, land use, biodiversity and pollution. Improving the corporate environmental footprint could well translate to increased sales of goods and/or services due to favourable public opinion on the company's environmental stance.

According to Nielsen's global survey on Corporate Social Responsibility (CSR) conducted in 2015, 66% of respondents were willing to pay more for products and services that came from companies which were committed to positive social and environmental outcomes resulting from how they operate as a business. This percentage is likely to increase further with the continued growth in public awareness on the importance of environmental protection.

Additionally, environmental accountability has been incorporated into the CSR programmes of many corporates. Those companies that take their CSR programmes seriously today quite often enjoy a higher share



price. Also, as green financing comes more into play in the future, it will be those corporates which have entrenched and robust CSR programmes and green business platforms which will be better able to secure green financing loans to fund their green projects for the years to come.

When looking at the global green financing system today, there are largely two broad financing vehicles which can be used and they are:

- o Green bonds, and;
- o Green credit.

## 1. The global green bond market

### An overview

Green bonds are fixed income securities that use the proceeds to fund environmental projects. In 2007, the European Investment Bank (EIB) and World Bank issued an AAA-rated green bond, marking the establishment of a global green bond market. In November 2014, Vasakronan, a Swedish property company, issued the first corporate green bond. Since then, more corporates have actively issued green bonds and have taken advantage of this global platform to fund green projects. Large corporate issuers include SNCF, Berlin

Hyp, Apple, Engie, ICBC and Credit Agricole. As mentioned in the background section, the green bond market achieved dramatic growth in 2016 and in 2017 and this growth is set to continue with green bond issuance in 2018 expected to reach US\$250 billion, a 60% increase from 2017.

### The characteristics of the global green bond market

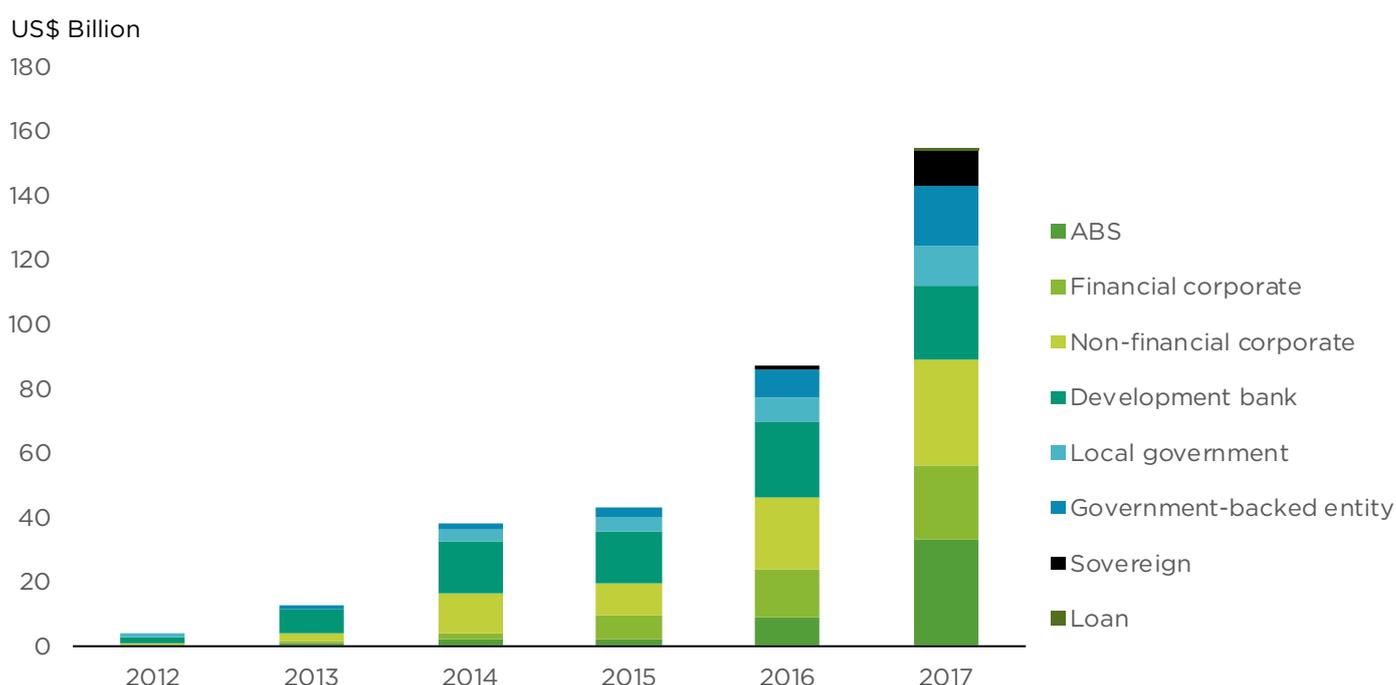
#### 1. Asset backed securities (ABS), sovereign and sub-sovereign green bonds witnessed strong growth

ABS enjoyed significant growth in 2017 (Figure 3).

Fannie Mae, in particular, directly contributed to this growth by boosting MBS issuance off the back of its Multifamily Green Initiative program. The Fannie Mae Multifamily Green Initiative aims to “improve energy and water efficiency, enhance financial and environmental sustainability, and extend the useful life of multifamily housing stock financed by Fannie Mae”. Thus, this Green MBS package is backed by multifamily properties that are either certified as green buildings or improved for better energy and water efficiency. Owners of multifamily properties are also required to report annual Energy Star scores for purpose of energy performance

**Figure 3:**  
**Issue types in the global green bond market (2012–2017)**

Source: Climate Bond Initiative, Cushman & Wakefield Research



tracking over the life span of the loan. Following on from this and looking to the future, it is expected that property-backed green bond volumes will increase in time given the greater visibility of agency MBS products, such as issued by Fannie Mae.

As for sovereign and sub-sovereign organisations, (including development banks and government-backed entities), these bodies issued about US\$110 billion in green bonds in 2017, representing 68% of the total amount issued. Of note, France, singularly issued a record-breaking EUR9.7 billion sovereign green bond in 2017. Sovereign green bonds are usually distributed on a country-wide basis and cover major infrastructure projects, including the expansion of metro networks, public bus systems, green urban housing public cycle routes and more. For example, from funds raised via government green bonds, starting from 2017, the Hong Kong government has allocated at least US\$500 million to electricity-saving projects and the procurement of energy saving equipment.

Following on, we expect more sovereign and sub-sovereign green bonds to be issued throughout the rest of 2018 and onwards. Many European and African countries such as Belgium, Sweden, Morocco and Kenya are joining or about to join the bandwagon of this type of green bond issuance in 2018.

## 2. The renewable energy sector dominates but low carbon buildings and energy efficiency have seen record growth

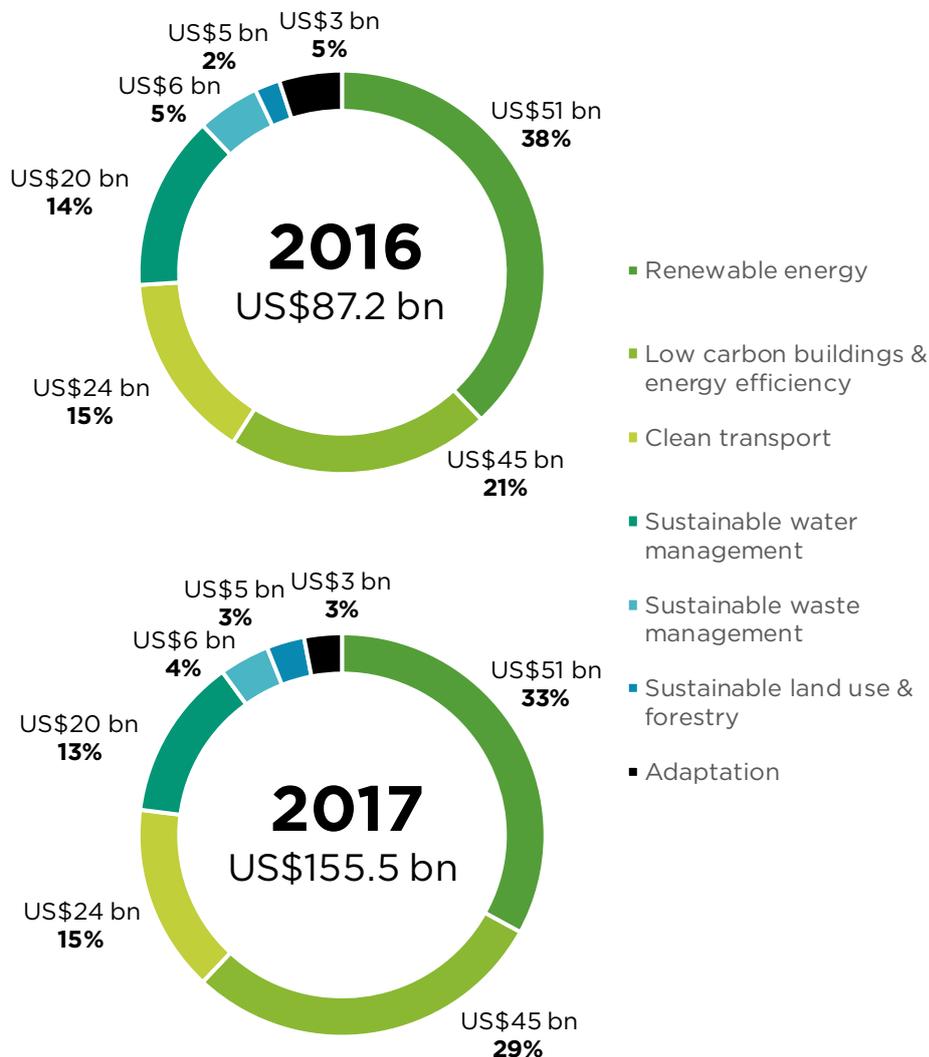
When examining green bond proceeds, in 2017, the renewable energy sector received the largest amount (Figure 4).

It should also be noted that proceeds allocated to low carbon buildings and energy efficiency rose 2.4 times from 2016 and accounted for 29% total allocation of green

**Figure 4:**

### Allocation of green bond proceeds in the global green bond market (2017)

Source: Climate Bond Initiative, Cushman & Wakefield Research



bond proceeds in 2017, globally. According to the Climate Bond Initiative, this category is primarily made up of labelled green bonds going to finance green buildings. With the overall built environment providing a huge opportunity for greenhouse gas abatement, in the long run, it is expected that green bonds for low carbon buildings and the energy efficiency sector will make up around 40% of the global green bond market. This percentage may further increase given even greater awareness of the need for green buildings in the future.

## 2. The global green credit market

### An emerging market on the rise

While more and more green bonds are issued to support environmental and sustainability initiatives, the green credit system has somewhat lagged behind of late. Although it has taken some time for the market to pick up, 2017 proved to be a watershed year, with more corporates in particular applying for green credits. Understanding the importance of aligning itself with sustainability initiatives, Philips, for

example, signed an agreement with a consortium of 16 banks for a new EUR1 billion revolving credit facility with an interest rate that will be dependent on the company's annual sustainability performance. Presently, two sets of principles lay the foundation for the global green credit market. One is the CERES principles, which aim to "protect the earth, using energy and resources wisely and sustainably, minimising waste, and selling safe products and services". The other is the Equator Principles (EPs), which is a widely adopted "risk management framework for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making". 93 financial institutions (incl. 2 Chinese banks) in 37 countries have adopted the EPs.

Additionally, in order to provide a standardised reference point for the budding wholesale green loan market and to promote consistency across financial markets, in March 2018, the Green Loan Principles (GLPs) were jointly launched by the Loan Market Association and the Asia Pacific Loan Market Association. Of note, GLPs state that qualifying loans must be utilised to finance or refinance green projects. This serves as the "fundamental determinant of a green loan". Relevant projects can range from harnessing renewable energy to building offices that meet recognised standards or certifications.

Signees to those agreements not only agree to provide high-level management support for environmental activities, but also better assess, mitigate, and monitor credit and reputation risks associated with sustainable development projects. Currently, there are a number of types of green retail credit products circulating in the global market and some are:

- o Home mortgages (e.g., energy efficient mortgages and eco-

home loans);

- o Commercial building loans (e.g., green loans for new condominiums);
- o Home equity loans (e.g., loans for solar panel installation);
- o Auto loans (e.g., green auto loans);
- o Auto fleet loans (e.g., loans to promote fuel efficiency), and;
- o Green credit cards (e.g., Rabobank's Climate Credit Card and BarclayBreathe Card).

Out of this group of products, of particular note are the green home mortgages. With future demand for this green credit product expected to be high, some financial institutions in developed economies have launched a number of green home mortgage products. For example, in Australia, individuals can

apply for a green home mortgage at a discounted interest rate if their eco-home can satisfy certain environment and energy related criteria (Table 2). This home loan plan can also cover small-scale retrofits of green appliances to second hand homes or new builds.

When looking at the overall picture, green credits offer distinctive benefits, such as accessibility to a wider range of borrowers and carrying clear financial incentives and with this, the green credit market is expected to broaden significantly over the coming years.

### Green credit systems in Germany and in the U.S.

After decades of development, the green credit system in Germany is now comparatively mature when

**Table 2:**  
**Two green home mortgage loan examples from Australia**

Source: Alison Potter from CHOICE, Cushman & Wakefield Research

Bank	Regional Australia Bank	Maleny Credit Union
Minimum Amount (AUD)	500	0
Interest Rate Discount	1.25% discount off the standard variable interest rate	0.15% discount off the Advantage Plus Home Loan during the loan life
Criteria	<p><b>The house needs to pass minimum state environmental standards and have one of these features:</b></p> <ul style="list-style-type: none"> <li>o Grey water treatment system</li> <li>o Solar power system (with PV)</li> <li>o Wind turbine</li> <li>o Micro hydro system</li> <li>o Double-glazed windows</li> </ul> <p><b>And two of these:</b></p> <ul style="list-style-type: none"> <li>o Solar hot water</li> <li>o Rain/storm water tank</li> <li>o 5 star+ gas or electric heating</li> <li>o External awnings</li> </ul>	<p><b>At least three of these features:</b></p> <ul style="list-style-type: none"> <li>o Solar, gas or heat pump hot water system</li> <li>o Solar power</li> <li>o Rainwater tanks (minimum 1000L)</li> <li>o Eaves not smaller than 600 mm on eastern and western walls</li> <li>o Insulated walls</li> <li>o Installing low emissivity glass (glass with low radiation ability)</li> </ul>



balanced with other regions. The main contributing factor to this situation is the German government's active participation in the development of green credit products. The government-owned development bank, KfW Bankengruppe (KfW), now provides financial subsidies to environmental projects via the capital market and commercial banks, therefore maximising the effects of government subsidies. In detail, the German government grants discount loans to green credit projects. For projects that demonstrate good environmental protection and energy saving performance, they can enjoy a concessional loan rate of less than 1% for 10 consecutive years. The interest rate difference between the market rate and concessional rates is subsidised by the central government.

By injecting a small amount of green funding to the market, the government in Germany has successfully mobilised and directed a large amount of public and private capital to environmental protection and energy saving projects. In 2014, up to EUR36 billion in loans was issued by KfW for environmental protection and renewable energy projects. What's more, KfW has also actively been involved in the global green credit market. Thus far, the bank has lent EUR6 billion green projects in China, which include energy saving commercial buildings.

Meanwhile, the EPs have also been widely accepted by the German banking industry, which has further facilitated the popularity of green lending in the country. In the credit approval process, projects are now categorised in accordance with the EPs and the Environmental, Health, and Safety (EHS) Guidelines. Therefore, associated social and environmental risks are well assessed and managed.

By taking these initiative, Germany has not only demonstrated its commitment to sustainable development but has also gained new business opportunities in the international financial market.

The U.S., as a global leader in green financing, has also accumulated much experience in developing a green credit market. Unlike Germany, where a policy bank has taken the lead, the U.S. government has supported the development of a green credit market by establishing an underlying legal foundation. Since the 1970s, the U.S. Congress has passed a series of laws concerning environmental protection, such as pollution treatment and waste management. According to current regulations, financial institutions that have credit lending businesses are required to take environmental responsibility. Guided by the regulations, these institutions are also encouraged to adopt the CERES principles or the EPs and to set up their internal multi-party mechanisms to manage environmental affairs.

The Bank of America is a representative organisation among a large number of U.S. financial institutions that have green credit businesses. It has launched a US\$20 billion green business development project, which aims to reduce energy consumption and develop new technologies for controlling greenhouse gas emissions. The bank has also established a fund that provides loans to companies that commit to green services or to building energy-saving office buildings. At the same time, it has organised crowd funding for environmental friendly projects, which effectively connects ordinary people with environmental protection. Lastly, concession loans were granted to those families that have made an effort to reduce their environment footprint.

# 5.

## GREEN FINANCING - THE SCENE IN MAINLAND CHINA



In 2017, a total of 181 bonds amounting to RMB248.6 billion (US\$37.1 billion) were issued, strengthening China's position as a key player in the global green bond market.

### Drivers for developing green financing in China

As mentioned previously, green investments have played a significant role in driving sustainable development within China's economy. Taking supply-side structural reform as an example, to establish a low-carbon industrial system, substantial green investments have been put in place to replace obsolete production facilities with smart and green production systems.

According to the Climate Bond Initiative and the International Institution for Sustainable Development, China needs to invest at least RMB2 trillion to RMB4 trillion annually to meet environmental commitments and conduct green transformation. Private capital is expected to contribute between 85%

to 90% of this required investment. To mobilise private capital to support the green economy, a series of reforms in the banking sector, the insurance sector and the capital market have been implemented. Financial institutions now can offer a comprehensive portfolio of green financing products, including green credit, green bonds, green trusts, green insurance, etc.

### Development of green financing in China

Since the release of the "Guideline for Establishing the Green Financial System" in 2016, China has made a great effort to shift investment patterns and to green the entire financial system.

Reforms have been carried out in the following four areas:

- o Established and improved legal frameworks to complete top-level design;
- o Released a series of policies to develop and regulate the green financing system:
  - o Strengthened green credit policies in the banking sector;
  - o Provided incentives to grow the market for green securities, including green bonds, and;
  - o Expanded the scope of green insurance and strengthened environmental liability insurance regulations, etc.
- o Established green credit rating system, risk management system and information infrastructure for environmental costs, and;
- o Improved cooperation and information sharing between environmental, financial and industrial regulators and third-party institutions.

**Figure 5:**

**Timeline – China green financing and green bond policies (2015–2018)**

Source: Climate Bond Initiative, Cushman & Wakefield Research



To explore suitable green financing development models against a diverse local background, China has established five pilot zones in Zhejiang, Jiangxi, Guangdong, Guizhou and Xinjiang. In the pilot program, financial institutions were given incentives to provide credit and special funds for environmentally friendly industries and to establish new financing mechanisms, including emission trading and water use permits.

In 2017, a total of 181 bonds amounting to RMB248.6 billion (US\$37.1 billion) were issued, strengthening China’s position as a key player in the global green bond market.

onshore, out of which the interbank market made up 69% and the two stock exchanges (Shanghai and Shenzhen) accounted for 13% (Figure 6).

**The characteristics of China’s green bonds**

**1. Onshore market domination**

In 2017, an overwhelming 82% of China’s green bonds were issued

The major players in the onshore interbank market in 2017 were commercial banks and other financial institutions under the supervision of the People’s Bank of China. The exchange market players consisted of listed and non-listed corporate issuers.

**China’s Green Bond**

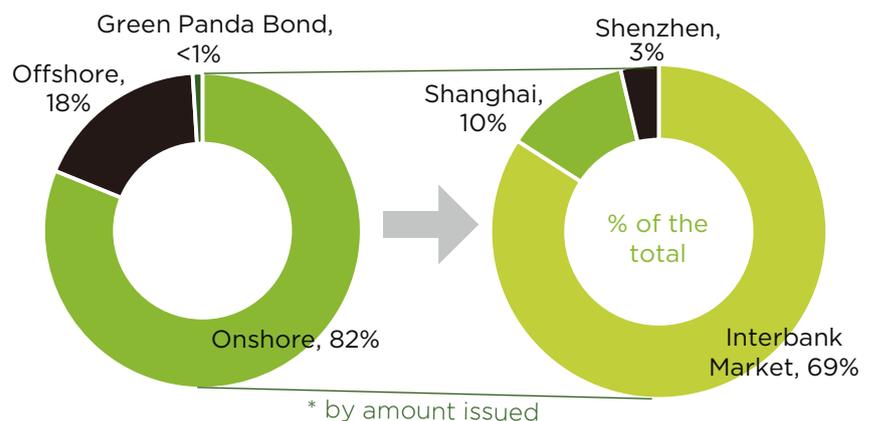
**An overview of China’s green bond market**

The US\$300 million green bond issued by China Goldwind in July 2015 marked China’s entry to global green bond market. This bond was almost five-times oversubscribed, representing investors’ strong interest towards China’s green bond market. Since then, over the past few years, the Chinese government has used a series of policy levers to promote green bonds to finance environmental projects, which has significantly motivated institutions and investors to actively participate in the green bond market (Figure 5).

**Figure 6:**

**Composition of China’s green bond issuance (2017)**

Source: Climate Bond Initiative, China Central Depository & Clearing Co., Ltd., HSBC, British Embassy Beijing, Cushman & Wakefield Research



With the adjustment of China's green bond standards to align with international practices, it is expected that the scale of offshore bond issuance will grow quickly as offshore bond issuance helps to attract foreign investors and helps to raise money overseas.

## 2. ABS is a new opportunity in the green bond market

Although large financial institutions made up the largest proportion (47%) of total issuance in 2017, this percentage did drop from the 2016 level, which was 73%. Even though large commercial banks are now regular issuers, in 2017, more local and regional commercial banks participated in the issuance when compared to the year before (Figure 7).

What's more, green asset backed securities (ABS), in terms of their share of total China green bond issuance, witnessed a triple rate growth, from 1.7% in 2016 to 5.9% in 2017. The growth of ABS in China is expected to facilitate the development of the green building sector in China, especially in the case of small-scale green projects. For China's emerging green bond market, institutional investors require a minimum bond issuance size of US\$100 million, which can be a hurdle for energy efficiency retrofits and upgrades that are usually valued between US\$1 million and US\$10 million. In this case, ABS, as an aggregation instrument, can bundle together small-scale green assets and thus meet investor deal size requirements.

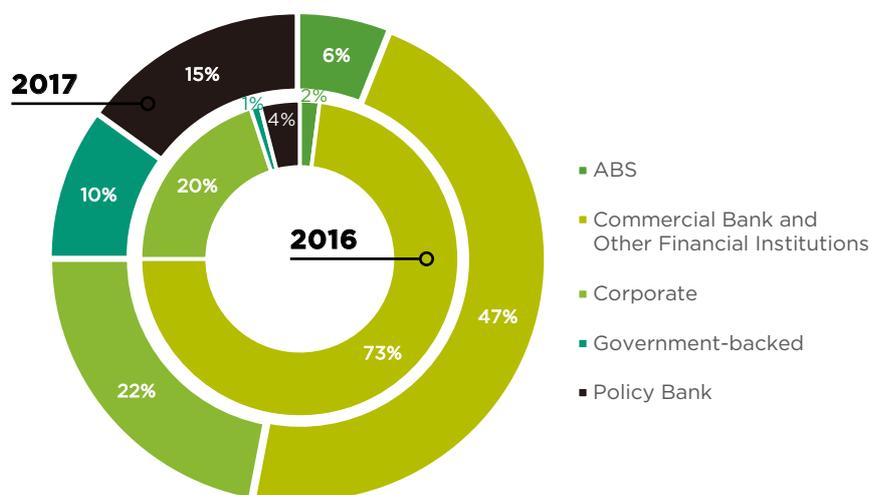
## 3. Large growth potential for energy efficiency/low carbon buildings

Energy-related green bonds in China accounted for 22% in terms of use of proceeds, the largest among all categories in 2017. Low carbon transport ranked second, with a 19% share of the total (Figure 8).

It should be noted that energy efficiency or low carbon footprint buildings only made up a 12% share of green bond proceed use in China

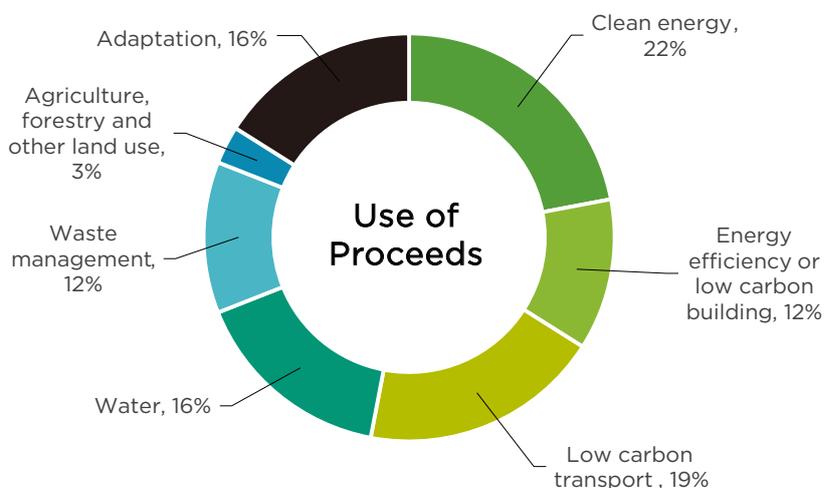
**Figure 7:**  
**China's green bond issuance (2016 and 2017)**

Source: Climate Bond Initiative, China Central Depository & Clearing Co., Ltd., HSBC, British Embassy Beijing, Cushman & Wakefield Research



**Figure 8:**  
**Use of green bonds proceeds in China (2017)**

Source: Climate Bond Initiative, Cushman & Wakefield Research



in 2017. Meanwhile, according to a study conducted by Tsinghua University in 2014, construction activity and operation of buildings accounted for about 16% and 20% of total energy consumption in China, respectively.

Ahead, the greening of the building industry in China is critical for controlling total energy consumption within the cap of 5 billion tons of 'coal equivalent', which is an essential goal set within the country's 13th Five-Year

Plan. It is expected that more green bonds will be issued in the future, which will target energy efficiency and low carbon emissions in the country's real estate sector.

## Future development of China's green bond market

### 1. The Bond Connect Scheme enables more cross-border capital flow into China's green bond market

According to Climate Bonds, although China has achieved a leading position in the global green bond market, only 4% of China's green bonds were foreign-owned, which was quite low compared with the 10% foreign ownership rate for Japan and the 43% foreign ownership rate for the U.S. To encourage greater cross-border green bond trading and to diversify the investor base, from a policy aspect, China will harmonise the domestic credit rating and green standards with international practices and will encourage green bond issuance through the Bond Connect Scheme.

The Bond Connect Scheme provides foreign investors with a convenient channel to invest in China's onshore market by removing some investment hurdles and by enabling direct trading with eligible onshore dealers. Currently, all green bonds in the onshore secondary bond markets are tradable under the Bond Connect Scheme. Moreover, in terms of new issuance, policy banks in China took the lead in 2017 by launching primary green bonds through the Bond Connect Scheme. It is expected that a growing number of Chinese green bond issuers will follow suit as they look to gain foreign capital for deployment into green projects in China.

## 2. More green bond indices to be launched

China's green bond indices have emerged in response to the fast-paced development of China's green bond market. This mechanism enables investors to track green bond performance and thus review investment portfolios in an efficient way. In 2016 and 2017, six indices that exclusively focused on green projects were launched (Table 3). They were:

- o The China Green Bond Index;
- o The Green Bond Select Index;
- o The China Climate-aligned Bond Index;
- o The CIB Green Bond Index;

**Table 3:**

### Scale and composition of the four major China green bonds indices (31 December 2017)

Source: Climate Bond Initiative, China Central Depository & Clearing Co., Ltd., HSBC, British Embassy Beijing, Cushman & Wakefield Research

Index	Number of constituent bonds	Total outstanding amount (RMB trillion)	% of the proceeds allocated to green projects
China Green Bond Index	755	2.45	93.65
China Green Bond Select Index	623	2.25	94.65
China Climate-aligned Bond Index	268	1.30	99.99
CIB Green Bond Index	95	0.27	96.11

- o The CUFE-CNI Green Bond Index Series, and;
- o The SSE Green Corporate Bond Index.

Ahead, we expect more index-linked structured products (even green bond exchange traded funds (ETF)) to be launched in the coming years, which will further encourage investment and improve liquidity. Meanwhile, as some green indices, such as the CUFE-CNI Green Bond Index Series, are displayed in both domestic and overseas stock exchanges, they are expected to make China's green bond market more accessible and will help facilitate greater cross-border capital flow between China and other regions.

## China's Green Credit

### An overview of China's green credit market

The China Banking Regulatory Commission (CBRC) released its "Green Credit Guideline" in 2012 to encourage financial institutions to focus on green credit as a way to effectively fend off environmental and social risks, and to assist in the transformation to a green economy.

Under this Guideline, financial institutions are required to:

- o Strengthen credit approval management;
- o Identify, measure, monitor and control environmental and social risks associated with their credit activity;
- o Establish an environmental and social risk management system, and;
- o Improve relevant credit policies and process management.

Since then, financial institutions now may not grant credit to clients whose environmental and social performance fails to meet the compliance requirements.

The launch of the green credit system now allows the Chinese government to implement environmental protection through financial means and measures. By establishing an environmental threshold, high energy consumption and high pollution projects can no longer secure funding, which has significantly demotivated and constrained investment in these types of projects. The implementation of green credit also forces corporations to bear economic losses for environmental damages. As a result, corporations now have to take corporate social responsibility seriously during their daily operations. Additionally, the establishment of the green credit system provides China's banking

industry with transformation opportunities.

Currently, green loans in China mainly support two kinds of green projects:

- o **Projects and services centred on energy saving and environmental protection, including energy saving buildings and green buildings (76.72% by outstanding volume), and;**
- o **The manufacturing of energy saving products, new energy products and new energy automobiles (23.28% by outstanding volume) (Figure 9).**

Moreover, according to the CBRC, at the end of June 2017, the outstanding green credit stemming from 21 major Chinese banks stood at RMB8.22 trillion (US\$1.3 trillion), up from RMB5.2 trillion at the end of 2013 (Figure 10).

### China's green credit market on a healthy development track

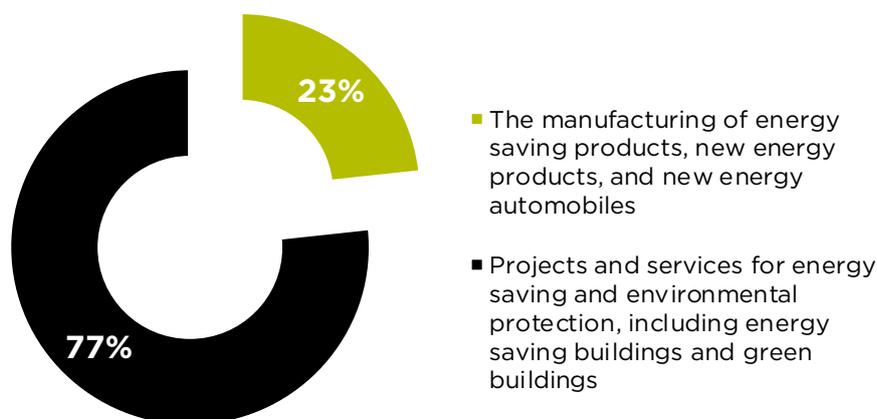
Among the targeted projects and services for energy saving and environmental protection in China in 2017, green transportation, renewable and clean energy and water efficiency projects gained the largest amount of green lending (Figure 11).

Those projects have helped achieve substantial environmental benefits. As of the end of June 2017, assuming current usage levels, all projects supported by green credit have helped to reduce 215 million tons of standard coal and 491 million tons of carbon dioxide emissions annually. This is equivalent to the amount of carbon dioxide reduced by the Three Gorges Hydropower Station during its eight years of operation.

Meanwhile, the green credit bad loan rate remained at a low level. At the end of June 2017, the non-performing loan ratio for loans targeting energy conservation and environmental protection projects and services was only 0.37%, which was about 1.32 percentage points lower than that for other types of loans.

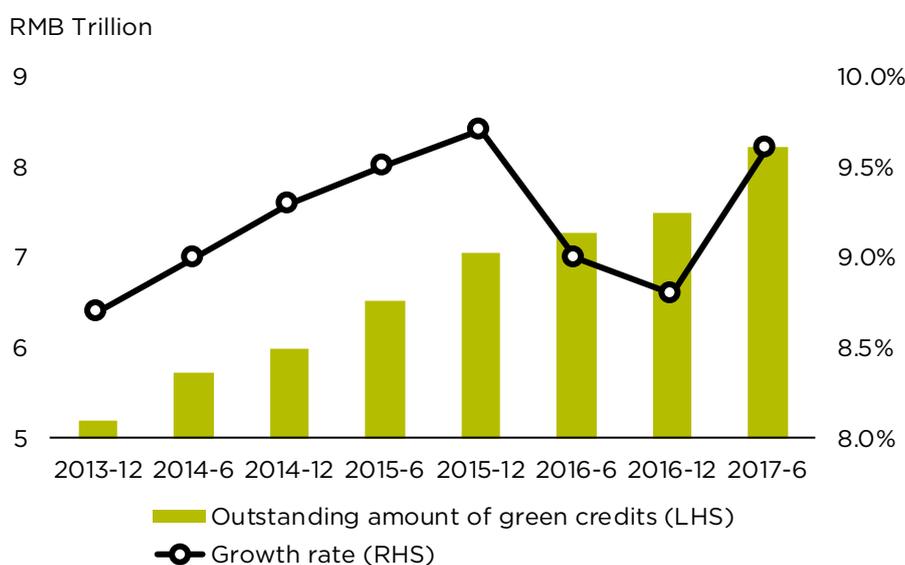
**Figure 9:**  
**Use of green loans in China (2017)**

Source: China Bond Rating Co., Ltd., Cushman & Wakefield Research



**Figure 10:**  
**The outstanding amount and growth rate of China's green credit market (December 2013 — June 2017)**

Source: Wind, CBRC, Industrial Bank's Research, Cushman & Wakefield Research



For the next step, as stated by the CBRC, a better understanding of the overall performance of green credit stemming from 21 major banks will be disclosed on CBRC's website on a semi-annual basis, therefore establishing a regular and more comprehensive information disclosure mechanism. Information that will be disclosed will not only be the outstanding volume but also the

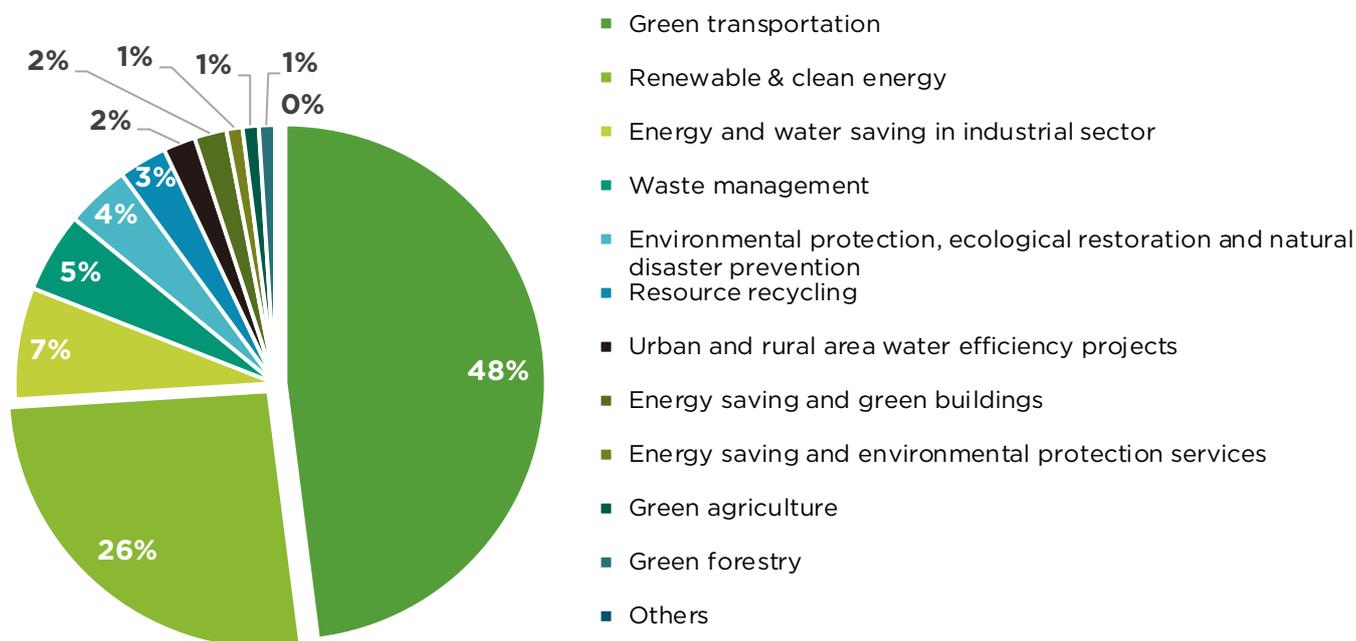
energy saving and carbon dioxide reduction amount measured against seven environmental benefit indicators.

### The future development of China's green credit market

China's green credit market still has room to further mature. Firstly, rules and regulations on green credit

**Figure 11:**  
**Composition of green lending in China (2017)**

Source: China Bond Rating Co., Ltd., Cushman & Wakefield Research



can be further strengthened. At the current stage, regulations are more guideline-oriented and are not exacting in terms of enforcement. Additionally, there is no agreed industry standard or assessment mechanism as each commercial bank is presently adopting its own standard to assess green projects and approve green loans.

To facilitate the future development of China's green credit market, effort should be made in the following areas:

- A relevant accountability system should also be established so that the duties and rights of each party involved in green credit issuance can be clearly stated;
- An information sharing platform among commercial banks, corporates and the Environmental Protection Bureau should be established to relieve any information asymmetry issues;
- Innovation in the green credit sector should be encouraged. This can be done by expanding

**the range of green projects covered by green credit and by developing individual green credit products. Of note, green home loans or green mortgage, which has gained widespread popularity in developed countries, can be a direction for diversifying China's green credit products. Green home loans encourage borrowers to buy, build or improve their home in an environmentally friendly way. Just like the Australian green home loan mentioned in the previous section, financial institutions may offer discounted rates or lower fees to people investing in homes that have a prescribed combination of sustainable features.**

In China, although the green mortgage sector has not fully gotten off the ground, it has already grabbed the attention of the government, financial institutions and ordinary individuals. Liaoning Province, one of the first movers, has piloted a system to encourage

individuals to purchase green homes by raising the loan limit and the reducing mortgage rate. For those who apply for public housing funds with the intention to purchase homes certified to China two-star green building rating, their loan limit can be raised by 20%, and at the same time, the down payment ratio and mortgage rates will be reduced to some degree.

Ma'anshan Rural Commercial Bank (MRCB), a bank headquartered in Anhui Province, also launched a green mortgage loan targeting individuals who would like to purchase green homes. Under the bank's lending scheme, qualified green home loan borrowers can enjoy a preferential interest rate that is granted based on the green certification of the property. Considering the raising awareness of environmental protection among the public, with effective financial incentives, the market size of green credit products in China is expected to achieve significant growth after the introduction of more individual-oriented products in the near future.

# 6.

## GREEN FINANCING - GREEN REAL ESTATE GLOBALLY AND IN MAINLAND CHINA



More people recognise the economic and productivity value that green buildings bring to property owners and tenants, along with the energy and water benefits to the environment, which is driving the green building industry's growth". - John Mandyck, Chief Sustainability Officer at United Technologies Corporation.

With the assistance of green financing, by improving energy use efficiency and resource usage, green commercial real estate buildings and spaces can reduce or eliminate any negative impact on the environment. Going one step further, some green commercial buildings and spaces are able to generate their own energy, reduce resource usage and increase biodiversity with the installation of, say, a solar energy system, a rainwater collection system, green roofs and living walls - therefore, positively influencing the environment.

### Green real estate - Globally

**“More people recognise the economic and productivity value that green buildings bring to property owners and tenants, along with the energy and water benefits to the environment, which is driving the green building industry's growth”. - John Mandyck, Chief Sustainability Officer at United Technologies Corporation.**

Green commercial buildings and spaces have won growing attention and wide popularity among property investors, developers and users across the globe and it is not just because of concern for the environment. For property developers, there is also a business case - green buildings provide higher effective rents and higher

selling prices, as stated in “The Economics of Green Building” by Eichholtz, Kok, and Quigley. Additionally, due to relative supply scarcity of and growing popularity for green commercial buildings, rental is generally further pushed up, inducing a large premium.

In China, for example, the median for rent premium on LEED Grade A office buildings is also often above average market rentals, thus demonstrating the commercial advantage that green buildings have over standard office buildings in attracting value enhancing tenants. Moreover, a strong tenant profile and higher rentals drive up green building investment returns and thus their capital value (Please see box text).

# Green commercial buildings and their impact on property rentals and capital values

## Shanghai Grade A office market example

With green commercial buildings and spaces positively affecting user workplace quality, wellbeing and productivity, it is not surprising to find that green commercial buildings enjoy solid user demand levels. With users demanding this space and willing to pay for it, it is also not surprising to find that rental and capital value premiums enjoyed by green commercial building owners are strong. But how much stronger are they when compared to non-green commercial buildings? To find out, one test case we can use is the Shanghai Grade A office market.

To date, the Shanghai Grade A office market has a total stock of 10.9 million sq m. Out of this, green certified Grade A office buildings make up 5.8 million sq m, or 53.2% of total stock. In terms of timeline development, notably, the city's green Grade A office stock dramatically rose 9.1-fold from 2012 to 2018. Moreover, most future office projects in Shanghai are planned to be green.

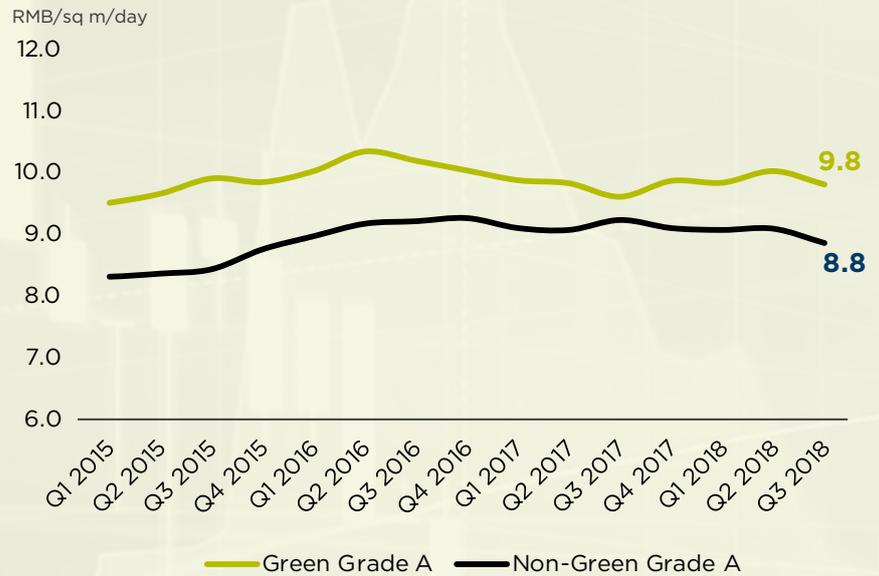
When we examine recent quarterly average citywide rental comparisons between green and non-green Grade A offices in Shanghai, we can clearly see that green Grade A office rentals have performed better than in non-green Grade A offices over the last three years (Figure 12).

When we look at the last quarter (Q3 2018) in particular, we can see the average citywide rental for office projects with a green certification in Shanghai was RMB9.8 per sq m per day, or a whole 11.4% higher than that for non-green Grade A office buildings.

What's more, over the long term, the higher rental premiums enjoyed by green Grade A office landlords in Shanghai can amount to a substantial amount of total rental income over and above what a similar spec non-green Grade A building in the same location could achieve. In this example, we selected a Grade A office with LEED certification and a non-green Grade A office within the same area in Shanghai's Pudong New Area.

**Figure 12:**  
Shanghai green Grade A office and non-green Grade A office rental (Q1 2015-Q3 2018)

Source: Cushman & Wakefield Research



**Table 4:**  
Shanghai green Grade A office vs Shanghai non-green Grade A office - Five year rental difference (Q3 2018)

Source: Cushman & Wakefield Research

Case: Green	Case: Non-Green
RMB9.5/sq m/day	RMB8/sq m/day
x	x
365 days	365 days
x	x
30,000 sq m	30,000 sq m
x	x
5 years	5 years
<b>= RMB520,125,000</b>	<b>= RMB438,000,000</b>
<b>= RMB520,125,000 - RMB438,000,000 = RMB82,125,000</b>	

The average rental for the selected non-Grade A office was RMB8 per sq m per day, while the average rental for the selected green Grade A office building was RMB9.5 per sq m per day (Table 4).

Using a hypothetical five-year hold

period and a total building GFA of 30,000 sq m, we can then calculate that a landlord of a green Grade A office would be able to receive a gain of RMB82,125,000 over a similar spec Grade A office building in the same location during the same time period.

Stronger user demand, solid user profiles and higher rentals also have a positive effect on the capital values enjoyed by green commercial buildings. Using the Shanghai Grade A office again as an example, we can see that over the past three years on average, green Grade A offices in the city have registered a higher capital value when compared to non-green Grade A offices. In Q3 2018, the average citywide capital value for non-green Grade A office buildings reached RMB 69,680 per sq m, while the figure of green Grade A office buildings achieved RMB 76,411 per sq m, a 9.7% difference (Figure 13).

**Figure 13:**

**Shanghai green Grade A office and non-green Grade A office capital value (Q3 2015–Q3 2018)**

Source: Cushman & Wakefield Research



The bottom line is another factor, which green commercial buildings and spaces, financed by green financing, can help to better protect. A recent report by the World Green Building Council revealed that one key benefit for green buildings is lower operating costs, especially in terms of energy costs and total lifecycle costs. The cost saving can be as much as between 13% for green retrofit projects and 15% for new green buildings (Table 5).

What's more, to address shareholders' concern about a corporate's environmental footprint and to implement and enhance a CSR programme, many occupiers are willing to establish their workplaces in green commercial buildings, or build their own independent green workspace. By doing so, many are even positively affecting their company's share price.

When we consider green commercial buildings and spaces through the support of green financing, we also need to take into account the wellness and wellbeing of the users. Green certified commercial buildings or spaces certainly promote these. With benefits like better ventilation, natural lighting,

**Table 5:**

**Green projects: A decrease in operating costs (2012 and 2015)**

Source: DODG Data & Analytics, United Technology, Saint-Gobain, US Green Building Council, Regen Network, Cushman & Wakefield Research

Benefit	New Green Building		Green Retrofit Response	
	2012	2015	2012	2015
Decreased Operating Costs Over One Year	8%	9%	9%	9%
Decreased Operating Costs Over Five Year	15%	14%	13%	13%

lower toxin levels and views to the outdoor, green commercial buildings tend to help improve employee wellness, satisfaction and, ultimately, productivity (Figure 14).

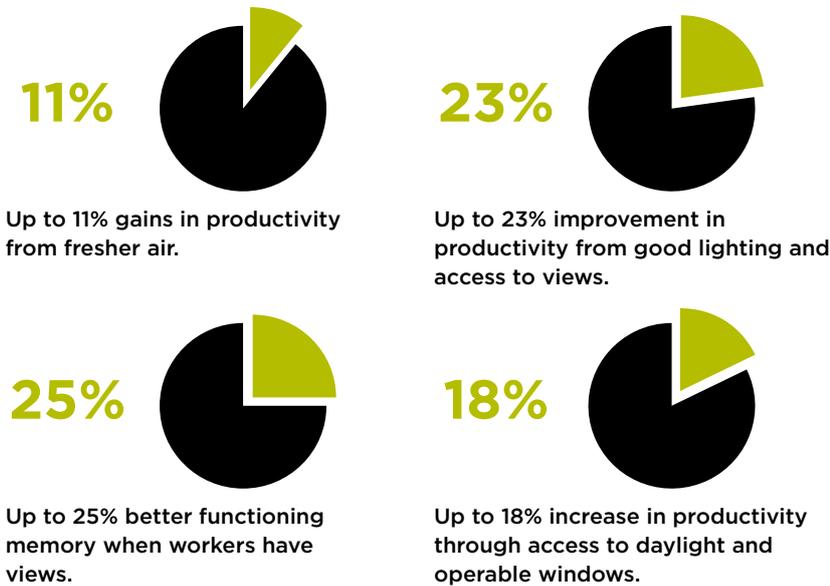
Sick leave, absenteeism and employee turnover are also generally reduced when employees work in green commercial buildings and spaces. This is good for companies looking to improve employee attraction and retention rates.

Building low-carbon and climate-resilient cities, and individual green commercial buildings within their environs that add value to developers, investors and users, is essential. At the same time, however, green technology is constantly changing. To reduce carbon emissions and, at the same time, drive value, it is not just a case of the commercial built environment to simply adopt and incorporate green technology. Assisted by green

**Figure 14:**

**Green commercial buildings and spaces help improve employee productivity**

Source: World Green Building Council, Cushman & Wakefield Research



financing, it is essential to adopt the very latest technology that pushes the envelope in term of energy efficiency and sustainable energy and resource usage.

**New green technology**

When we break down what sustainability and green technology means in the context of green-building, it is about harvesting energy and natural resources (e.g., solar energy and water) and conserving energy and natural resources for use in the built environment. In practice, the harvesting of energy and natural resources is generally conducted on the outside of buildings, whereas the conservation of energy and natural resources is usually carried out within a building's interior.

With greater awareness of the importance of sustainability at both the government level and the grassroots level, buoyed by green financing, the latest new green technology is expected to be an important element within the global built environment in the extended

future. Here, we consider two green technologies used for energy and natural resource harvesting and two for energy and natural resource conservation.

**Building exterior - Energy and natural resource harvesting**

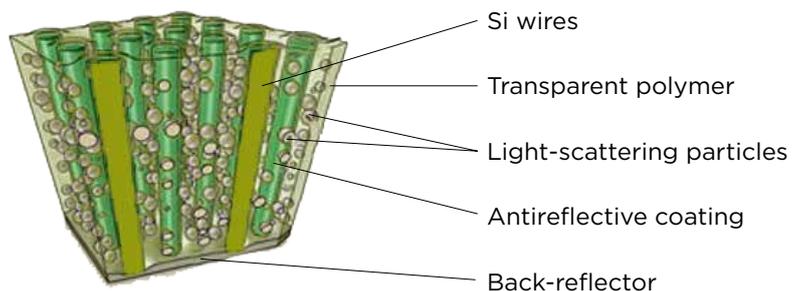
**Solar energy harvesting**

The solar power industry has been innovating of late, and some of this

**Figure 15:**

**Hairy solar panel components**

Source: The Sietch Community, Cushman & Wakefield Research



innovation can now be installed and applied to good effect within the built environment. Two innovation examples include hairy solar panels and infrared spectrum solar panels.

**Hairy solar panels**

Hairy solar panels are an outcome of nanotechnology and are named as such for the tentacle-like fibres that extend from the exterior of the panel. They utilise light-absorbing nanowires on a carbon-nanotube fabric (Figure 15).

The beauty of the incorporated nanowires is that they have the capacity to absorb more energy from the sun than widely used silicon can, which will allow for more efficient solar energy harvesting.

**Infrared spectrum solar panels**

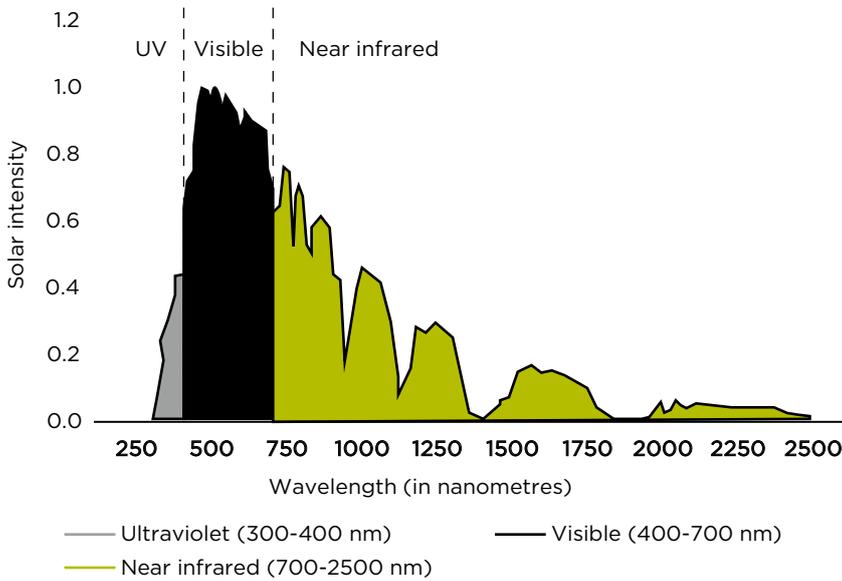
The solar energy collected by solar panels of today is derived fully from the visible spectrum, which leaves much of the light spectrum unexploited (Figure 16). New research and the addition of new materials (vanadium and titanium) to solar semiconductors could result in solar panels in the future being able to trap some of the infrared spectrum and transform it into electricity.

**Rainwater harvesting**

Rainwater harvesting is one of the

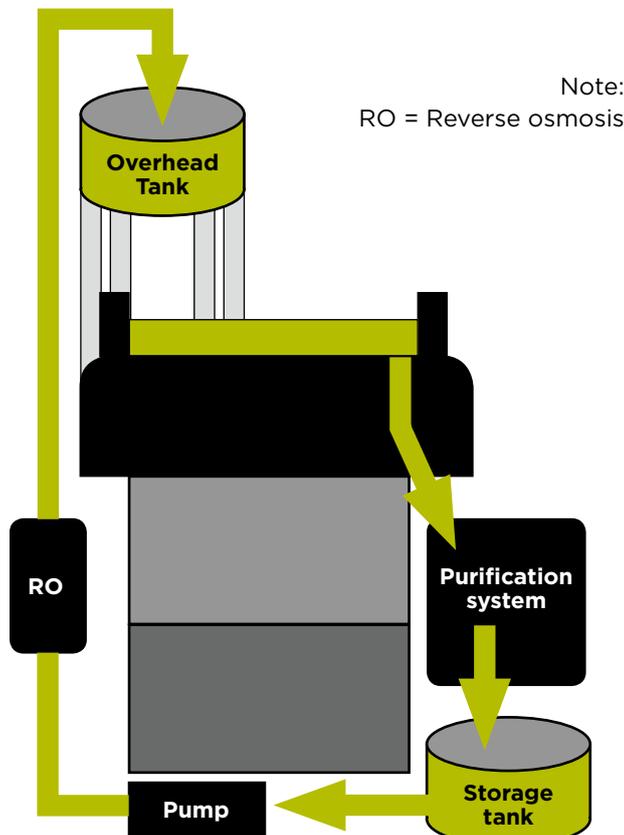
**Figure 16:**  
**Sunlight spectrum solar intensity**

Source: Quora, Cushman & Wakefield Research



**Figure 17:**  
**An example of a rainwater harvesting system**

Source: jalharvest, Cushman & Wakefield Research



best ways to usefully utilise natural rainwater, which would otherwise be wasted (Figure 17).

This is especially the case in the urban environment where concrete and buildings are at their densest. In this environment, when rainwater falls, it usually runs into drains and flows away to another locality or is lost forever. When harvested and retained by a building, rainwater can be used for restrooms and for watering plants and vegetation. The collected rainwater can even be filtered and purified so that it is safe for drinking.

Rainwater harvesting systems differ around the world, depending on the size and the technology used. All systems, however, have a dual aim: to save rainwater and ensure it is used for the best purpose.

General rainwater harvesting systems have an initial filter, where rainwater is passed through a sand filter. This removes dust and dirt. This water can be used for restroom flushing and for plant irrigation purposes. For drinkable water to be generated, further filtration is needed.

In the case of harvesting systems integrated into high rise commercial buildings, the height of a building can be an advantage as the water can be collected and stored at height and fed to the rest of the building by the force of gravity alone.

### Building interior - Energy and natural resource conservation

#### Lift system energy conservation

A regular lift system comprises a lift unit, a machine to power the lift unit as it travels up and down and a counterweight. The counterweight is intended to equalise the weight of a half-full lift unit. Thus, the counterweight is heavier than an unfilled or partially filled lift unit, but lighter than a nearly full or

completely full lift unit.

This disparity allows the lift unit to use the natural force of gravity to go up when partially full or not full at all or to go down when nearly full or completely full. When the lift unit is nearly full or completely full and the direction required is to go up, then energy is needed to power the lift unit upwards. Also, when empty or partially filled and the direction required is to go down, energy is again needed to power the lift unit down (Figure 18).

When the lift unit uses the force of gravity, the machine to power the lift unit produces electricity much in the same way as a generator. In regular lift systems, the electricity produced is dissipated as heat via resistors, forming waste-heat loads in the building.

However, today there are lift systems, like Otis's ReGen, which try to conserve this energy and make it work within the same system. Otis reckons, by implementing this system, energy savings of up to 75% can be delivered when compared to regular lift systems. What's more, the energy saved can be fed back into the building's electrical grid where it can be used to power other plant and machinery in the same building.

### Greywater/blackwater conservation

Greywater can be defined as all wastewater produced by households or commercial buildings from sources, such as sinks, showers, baths, washing machines or dish washers. Blackwater, on the other hand, can be defined as all wastewater derived from toilets, which likely contains pathogens.

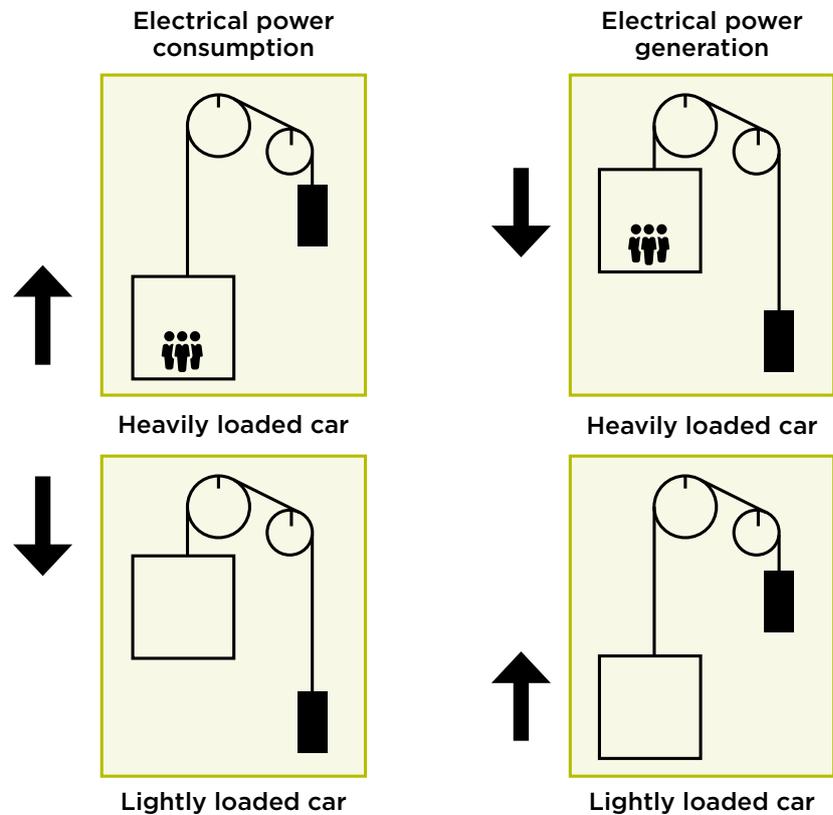
Greywater conservation systems and blackwater recycling systems can operate as independent standalone systems or as combined systems (Figure 19).

These systems can be installed into new-build projects as

**Figure 18:**

### Lift system electrical power consumption and generation

Source: American Society of Mechanical Engineers, Cushman & Wakefield Research



well as retrofitted into existing buildings, all financed by green financing. Most combined systems include controlled, robust and comprehensive treatment processes that bring together physical, microbiological and oxidative treatments in one bundled system. By using such recycling systems, according to aquacell, property owners will be able to lessen their on-site water usage by up to 90% and take the pressure off any associated sewer infrastructure at the same time.

Green financing and new green technology combined with green securitisation can take it to the next level. Green securitisation has greatly facilitated the establishment and development of the low-carbon and climate-resilient building sector. Green securitisation has been used widely due to the following advantages:

- o It motivates private capital to invest in green building projects;
- o Green fixed assets can be liquidised;
- o It facilitate the rapid business development of green property developers;
- o Higher financing efficiency is achieved with the help of green channels in stock exchanges, and;
- o Higher-standard information disclosure is required and evident.

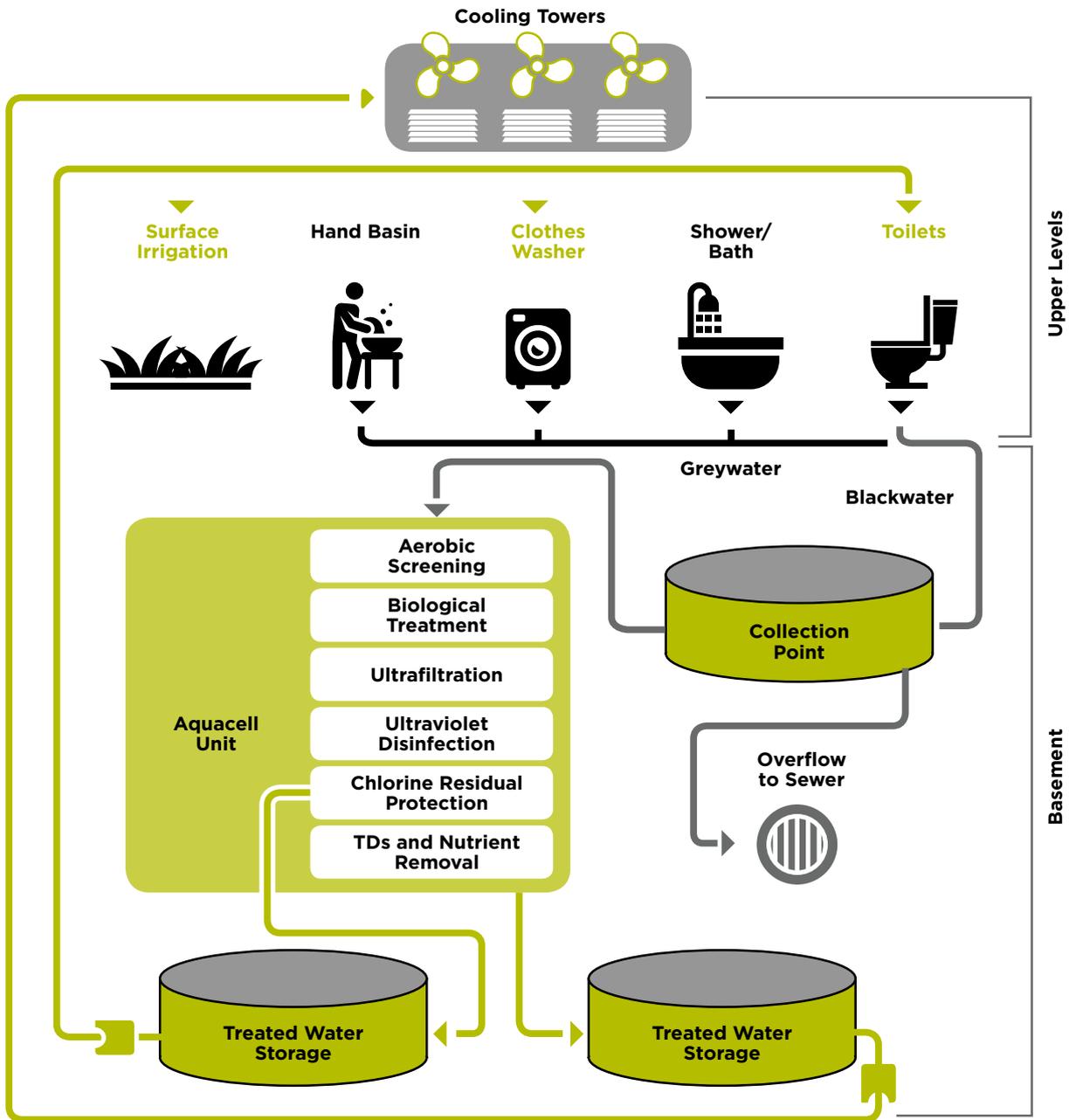
### Green REITs in the global property market

Real estate investment trusts (REITs) refer to a company that owns, operates or finances income-producing real estate. As one type of asset securitisation, a REIT is able

**Figure 19:**

**An example of a greywater/blackwater combined recycling system**

Source: aquacell, Cushman & Wakefield Research



to liquidise fixed assets by providing investors with a tradable liquid stake in real estate.

When selecting REITs, apart from location, market sector and type of property, investors now tend to evaluate REITs according to their exposure to low-carbon and energy saving buildings because it enables investors to measure the growing impact of environmental factors on building performances and investment returns.

A study conducted by National University of Singapore revealed that green buildings did positively impact both the operational and financial performances of REITs, thus presenting another business opportunity for green financing. In the U.S., for example, sustainable features associated with REIT properties offer significant pricing differentiation over conventional REIT properties. In the UK, REITs with a larger percentage of green properties on their books, gained

higher net operating income. And as governments and market incentives continuously push up demand for greener spaces, REITs, supported by green financing and with a higher proportion of green properties in their portfolios, may gain an increase in leasing market share.

Apart from favourable financial results, green REITs are also associated with more information disclosure and better transparency. In some countries, like the UK,

it is mandatory to report on environmental performance. This further enhances transparency and thus improves the overall value of the asset traded in the market.

From a global perspective, the U.S. has taken the lead in greening REITs. In November 2012, the Green Building Information Gateway (GBIG),

a green property index, was jointly launched by FTSE Group, NAREIT and the US Green Building Council. It provides a greater understanding, transparency and trackability for the green building sector and thus enables both institutional and retail investors to measure and model the risk and return of green properties. Investors can take the index and

classify the REITs listed in the index based on their holdings of green-certified buildings. Through this mechanism, investors can incorporate sustainable principles into property selections in a more convenient way and gain access to the green building sector through index-linked financial products.

Since then, many property indices have been established around the world. The IPD property index, for example, has been launched in 37 countries and provides a comprehensive insight regarding green building performance and returns. For instance, the Australian IPD green property index revealed that green office buildings continuously outperformed the general market on capital expenditure, weighted average lease expiry, vacancy rates, net operating income and investment return (Figure 20). Knowing the advantages in performance and returns, according to MSCI Inc, in the Asia Pacific regional REIT market, today an average of 24.2% of properties in Asia Pacific located REIT portfolios have a green building certification

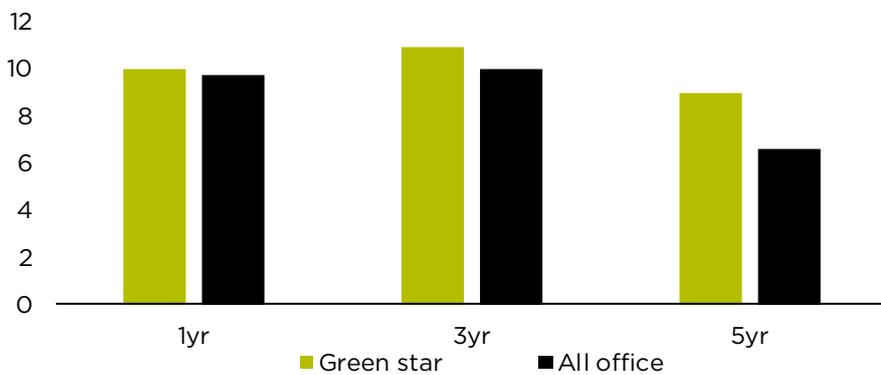
**Figure 20:**

**Green buildings in Australia – Performance and returns compared with ordinary buildings (December 2013)**

Source: IPD, NABERS, the Fifth Estate, Cushman & Wakefield Research

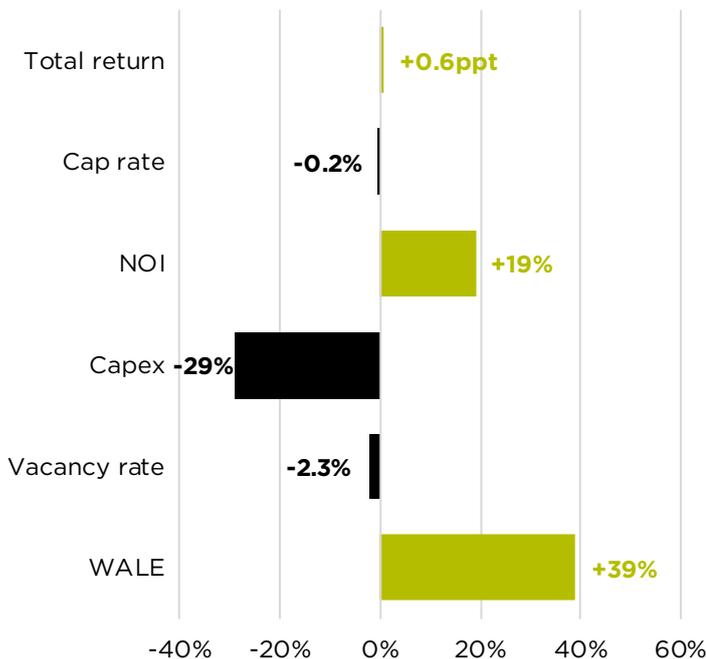
**Returns for Australia CBD office markets**

Annualised returns to Dec-13



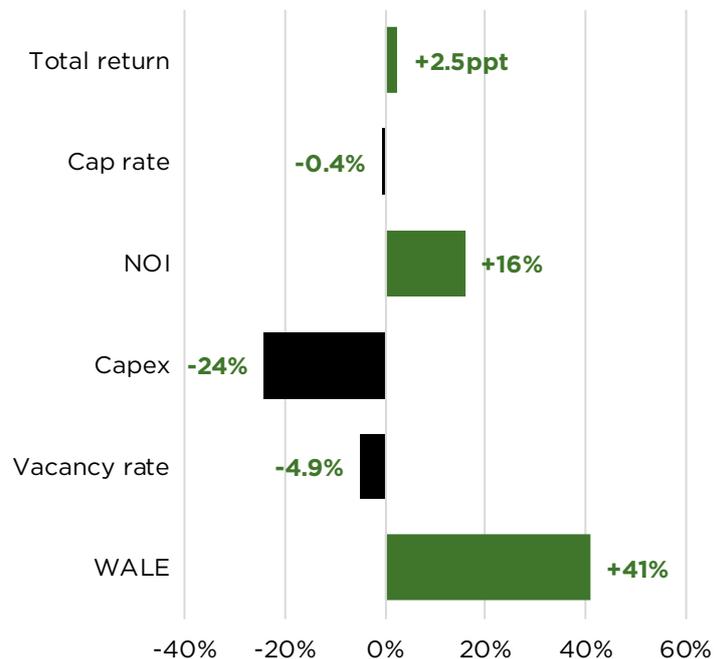
**Performance: Green star office vs All offices**

% difference as at December 2013



**Performance: High vs Low NABERS energy offices**

% difference as at December 2013



and this figure is expected to increase, in part, because of the future growth of green financing.

Today, Hong Kong and Singapore are standouts in terms of their strong commitment to develop green REITs. Currently, Hong Kong-based Link REIT is Asia's largest REIT by market capitalisation. It is committed to sustainable development and places emphasis on creating value through building healthier, environmentally-friendly and low carbon buildings. A US\$500 million green bond was issued by Link REIT in July 2016 to fund its Quayside office project in Kowloon East, which is a commercial project that is built to BEAM Plus Platinum and LEED Platinum green building standards. According to Bloomberg, the offer attracted over US\$1.65 billion in demand which was three times the amount offered, indicating investor appetite for green REIT projects.

In the case of Singapore, as Singapore's first and largest listed business space and industrial REIT, Ascendas REIT has set a goal to 'reduce energy intensity by 3% on an accumulative basis over a period of five years in Singapore'. The following three strategies have been taken to achieve this goal:

- o A BCA's Green Mark Gold Plus rating or equivalent is required for all new investments in Singapore;
- o Through retrofits and renovations, all existing projects can gain at least Green Mark Certification, and;
- o Property managers should actively work with tenants to develop best practices in improving resource usage efficiency and launch the Green Tenant's Guides that include criteria such as requirements on renovation works, repair of water fittings in the toilets and use of energy-efficient light bulbs.

The strategies above have proven to be effective as energy consumption and carbon emissions within the

portfolio have seen a significant decrease. The aggregate energy intensity has actually decreased by approximately 5.8% from 248.6 kWh/sq m in 2016 to 234.2 kWh/sq m in 2017. Additionally, due to the fall in energy consumption, carbon emission intensity has in fact dropped about 6.0% from 107.4 kg CO2/sq m in 2016 to 101.0 Kg CO2/sq m in 2017.

### Green real estate – Mainland China

#### China's current green building global ranking

According to people.cn, today there are 10,927 real estate projects (or more than 1 billion sq m of combined space) that are China Three-star rated in the country. What's more, in accordance with 'World Green Building Trends 2016', a report from Dodge Data & Analytics, China is expected to see an acceleration of green building projects over the next several years, with many

expected to be supported by some form of green financing. Motivations for companies in China to develop green buildings are quite similar to other locations globally (Figure 21).

Other than China Three-star, there are many international green building certifications available to building owners and space users in China. By far the most popular is LEED, which has been adopted in 167 countries and regions around the world. Here in Mainland China, 3,500 real estate projects totaling 228 million sq m have registered for LEED certification and this makes the country the largest market outside the U.S. for LEED. What's more, as of 7 September 2018, 1,374 projects, totaling 55 million sq m of space, in 70 cities have attained LEED certification in Mainland China.

Apart from established certifications, such as China Three-star and LEED, two newer certification standards are WELL and RESET.

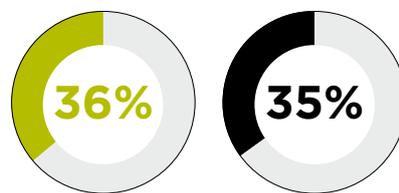
Unveiled in the U.S. in 2014, WELL

Figure 21:

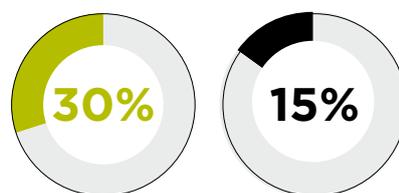
#### Major reasons for companies to drive green building

Source: Dodge Data & Analytics, Cushman & Wakefield Research

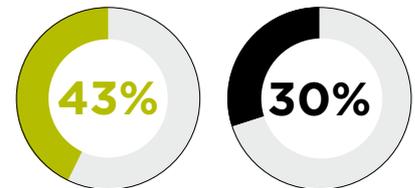
- Chinese Companies
- Global Respondents



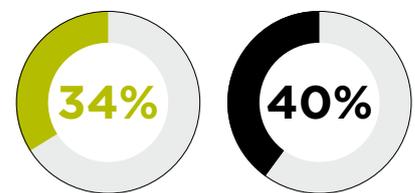
#### ENVIRONMENTAL REGULATIONS



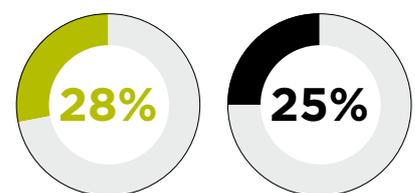
#### HEALTHIER NEIGHBOURHOODS



#### MARKET DEMANDS



#### CLIENT DEMANDS



#### RIGHT THING TO DO

looks at 'how design, operations and behaviours within the places where we live, work, learn and play can be optimised to advance human health and wellbeing'. Covering seven central wellness and wellbeing concepts, such as air, water, comfort, fitness, nourishment, light and mind, WELL is an adaptable standard.

Encompassing various types of properties, WELL has over 126 projects certified globally on its books as of 27 September 2018. In China, 23 projects have the WELL certification and by country comparison, like LEED, only the U.S. has more WELL certified projects (Table 6).

RESET, which was created and is administered by GIGA, looks at ongoing results and longstanding building user health. Indoor air quality data and information is collected via air monitors that determine levels of CO2, particulate matter, total volatile organic compounds (TVOCs), temperature and relative humidity. Results are then uploaded to the cloud and can be seen in real-time from any computer or mobile device.

RESET has 11 certified projects in China, with another 60 projects either registered or undergoing registration for RESET certification.

### Greening the building sector will require huge financing in China

Scaling up green finance will be the key to building low-carbon cities and to promote the development of green building sector in China. According to China's 13th Five Year Plan, China will develop green buildings of more than 2 billion sq m. And to meet energy efficiency goals, RMB1.65 trillion will be required to significantly scale green buildings and retrofit older houses and commercial buildings (Figure 22).

Public funds will only meet 7.3% of this financing demand, leaving an estimated financing gap of RMB1.53 trillion that could well be covered in a large part by green financing.

**Table 6:**

### The number of WELL certified property projects by country (27 September 2018)

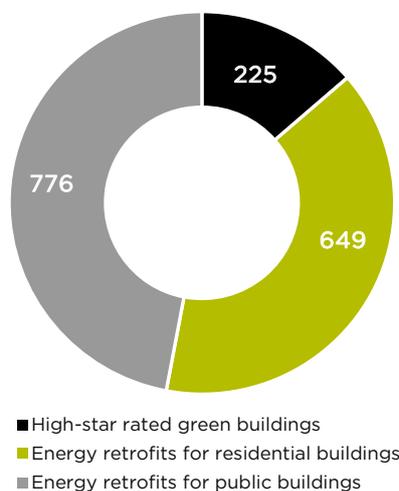
Source: IWBI, Cushman & Wakefield Research

WELL	Registration	Pre-certification	Certification
United States	279	1	55
China	121	79	23
France	54	4	7
Netherlands	48	1	0
Australia	46	4	12
United Kingdom	33	0	5
Spain	29	0	2
Canada	26	1	11
United Arab Emirates	14	0	0
Mexico	13	0	2

**Figure 22:**

### Breakdown of required investment to green China's buildings sector (RMB billion) (June 2016)

Source: Paulson Institute, Bloomberg Philanthropies, Chinese Finance Committee, China Society for Finance and Banking, Cushman & Wakefield Research



Asset securitisation (REITs, CMBS, RMBS, etc.) in China has also got off the ground and witnessed growth. Thus far, for example, two green CMBS products have been issued in China (Table 7).

Considering risk, return and green building characteristics for these

two CMBS products, they have been viewed as favourable investment instruments and thus welcomed by the market.

One other form of securitisation that has witnessed significant growth and is particularly related to the property market in China has been China's Quasi-REITs. In 2017, 35 Quasi-REIT products were launched with an issuing volume of RMB89.8 billion, increasing 169% and 153% from 2016, respectively. Thus, just in the case of the global green REITs market, in China's property market, there is also huge potential to build more green REIT assets (or in the case of China currently green Quasi-REIT assets) by utilising green financing sources and channels.

### REIT development to encourage investments in green buildings in China

After the issuance of Quasi-REITs for a couple of years, China moved one step further towards the standardisation of REITs in April 2018. In a document released by the China Securities Regulatory Commission and the country's Housing Ministry, the government expressed its strong intention to encourage the securitisation of rental projects and pilot long-awaited standard REITs, thus

kick-starting a market that could potentially be worth US\$1.8 trillion and could include many green REIT projects financed by green financing.

Following from this, in order to ensure REITs are comprised of certified green properties, appropriate regulation and supervision must be put in place. Although no specific regulation on green REITs has been launched, the China Securities Commission has issued a series of regulations regarding green securitisation, which could be appropriately adapted to serve as regulations for green REITs in the future. Currently, in China when considering general green securitisation, there are three types of green ABS products available and they are:

- o **Double Green ABS** – The qualifications for this ABS are that the underlying assets have been green certified and the resulting ABS fund raised from these assets should be solely used for the purpose of investing into green projects;
- o **Green Asset ABS** – The qualifications for this ABS are the underlying assets have to be green certified but the resulting ABS fund does not have to be directly invested into green projects. The fund can also be used to supplement the cash flow of corporates with strong green credentials, and;
- o **Green Fund ABS** – The qualifications for this ABS are the underlying assets do not have to be certified as green assets but the resulting ABS fund should be invested into green projects.

Focusing specifically on real estate, developers in China with a significant amount of green assets on their books can thus issue Double Green and Green Asset ABS products. Considering the stable and relatively high rental incomes generated by quality green buildings, developers can then, for instance, issue a Double Green ABS backed by the green buildings'

future rental income stream to raise funds for the construction and operation of future green buildings.

As for other developers, although they may possess few green underlying assets for securitisation, they can issue the Green Fund ABS product for qualified green projects. For example, to conduct an energy efficiency retrofit for existing commercial buildings, the Green Fund ABS product can be adopted as the fund will be used for green

purposes but the underlying asset does not have to be entirely green.

As stated previously, as an aggregation tool, ABS can bundle small-scale green projects together to meet investor deal size requirements, thus motivating developers that have interests in conducting step-by-step energy efficiency retrofit and in this way, so further promoting the development of green buildings in China via this green financing product.

**Table 7:**  
**Two green CMBS products in China**

Source: Cushman & Wakefield

Project name	Financial Street (1st phase) CMBS
Issuer	China Merchants Securities Co., Ltd
Issue date	May 15, 2017
Underlying asset	Financial Street Center
Rating	AAA
Scale (RMB million)	6,650
Years of maturity	12
Interest rate (%)	4.8
Green certificates	LEED Gold; China Green Building Label three-star
GFA	140 thousand sq m

Project name	Harvest Capital Management and China Energy Conservation and Environmental Protection Group Green Buildings CMBS
Issuer	Harvest Capital Management
Issue date	November 2, 2017
Underlying asset	Chengdu International Technology and Energy Saving Building
Rating	AAA
Scale (RMB million)	820
Years of maturity	12
Interest rate (%)	5.2
Green certificates	LEED Gold; China Green Building Label two-star
GFA	Total 750,000 sq m, including office assets of 710,000 sq m, retail assets of 6,000 sq m, and parking space of 34,000 sq m

# 7.

## KEY TAKEAWAYS



**With China's built environment in mind, as Quasi-REITs and two green CMBSs have been successfully launched, we expect more green real estate projects to take advantage of these types of green financing instruments in the future.**

Today, it is now universally recognised that over consumption is leading towards the rapid depletion of the world's natural resources. It is also acknowledged that subsequent climate change from the overuse of natural resources is impacting the natural balance of nature.

To conserve energy and natural resources, people, governments and corporations around the world are now working more closely together to create greater awareness, set up 'green' related organisations and enact laws. Many more property owners and users, today, are also on board with the idea of going 'green', and many have installed green technology on and in their buildings to harvest energy and natural resources and/or conserve energy and natural resources.

Looking to the near future, the built environment will remain a major emitter of greenhouse gases and be a big contributor to global warming. As people, governments and businesses become even more aware of this, so more newly built buildings (and existing buildings) around the globe, and in China, will be required to fit green technology systems that both harvest and save energy and natural resources in the future.

Given the commitment of many governments around the world, including the Chinese government, to environmental sustainability and the promotion of green building development, we can expect an increasing proportion of the built environment to be green in the future. Alongside this, from the commercial real estate perspective, as more building owners and space users begin to realise the many benefits that certified green commercial real estate can offer, including financial advantages, so this driving force will ensure green commercial office, retail, industrial and hotel space is set to grow in popularity in the years to come.

In order to support the development of a sustainable economy, including a green built environment, governments, including China, are now looking to increasingly promote green financing in their domestic marketplaces. With the expansion of green financial products and market supervision mechanism maturation, more funds are expected to be injected into green projects globally and in China.

Finally, with China's built environment in mind, as Quasi-REITs and two green CMBSs have been successfully launched, we expect more green real estate projects to take advantage of these types of green financing instruments in the future.



Innovation  
Branding  
Solution  
Marketing  
Analysis  
Ideas  
Success  
Management

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10000

8000

6000

4000

Jan

Feb

Mar

Apr

May

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To better serve our clients our China Research Team has established Centres of Excellence in various focus areas, such as Capital Markets, Industrial, Logistics and Retail. Shaun leads the Research Centre of Excellence for Greater China Occupier Research. If you have any queries related to Occupier Research in Greater China please contact:



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