

GROWING GREEN FINANCE



About TheCityUK

TheCityUK is the representative body for the UK-based financial and related professional services industry. In the UK, across Europe and globally, we promote policies that drive competitiveness, support job creation and ensure long-term economic growth. The industry contributes nearly 11 per cent of the UK's total economic output and employs over 2.2 million people, with two thirds of these jobs outside London. It is the largest tax payer, the biggest exporting industry and generates a trade surplus greater than all other net exporting industries combined.

About the Centre for Climate Finance & Investment at Imperial College Business School

The Centre for Climate Finance & Investment undertakes cutting-edge research on how capital markets are responding to global climate change. Building on Imperial College London's international reputation for multi-disciplinary analysis, the Centre is helping investors and policymakers overcome the lack of clarity about risk and return in clean energy, low-carbon technologies, and green infrastructure. Our mission is to help shape a global energy transformation through the fusion of business, technology and an entrepreneurial mindset.

GROWING GREEN FINANCE

14 NEW GREEN BONDS LISTED ON THE LSE IN 2016

45 GREEN BONDS LISTED IN TOTAL



RAISING AROUND **\$12BN**

THE UK HAS

\$61.8BN

GREEN BONDS IN ISSUANCE

9% OF THE GLOBAL TOTAL



THE UK'S GREEN INVESTMENT BANK HAS INVESTED IN MORE THAN

100

GREEN INFRASTRUCTURE PROJECTS TOTALLING

£3.4BN



UK, US, CHINA AND FRANCE =

70%



OF GLOBAL GREEN BOND ISSUANCE

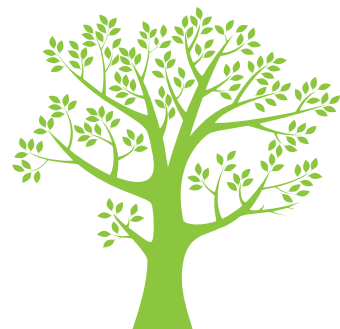
IN THE UK

121 ENERGY PROJECTS HAVE BEEN FUNDED VIA ENERGY CROWD FUNDING PLATFORMS



GLOBAL LABELLED GREEN BOND ISSUANCE

\$3BN
IN 2011



\$95BN
IN 2016

CONTENTS

FOREWORD	5
EXECUTIVE SUMMARY	6
DEFINING GREEN FINANCE	7
INSTITUTIONS AND MARKETS	11
THE UK'S ROLE	17
BIBLIOGRAPHY	21

FOREWORD

To many finance practitioners, the phrase ‘green finance’ bears strong resemblance to the talk about ‘emerging markets’ 20 years ago: they are terms that everyone seems to be discussing, but few know exactly what they mean. As fields of investment, they have a sense of newness and urgency, despite being fairly well-established. And there is the inevitable fear that they may just be a passing fad...

But just as emerging markets entered the mainstream of investing over the past two decades, we believe green finance is destined to become a core element of global capital markets. It is already exciting interest among market participants and policymakers. It’s now time for the entire financial services industry to understand what exactly green finance encompasses and why it is growing in importance to the sector. As detailed in this report, green finance is not charity and it’s not about hand-outs or subsidies. Rather, it uses the age-old premise of risk and return in the private sector to solve some of the world’s most pressing challenges.

This report, the first output of an ongoing collaboration between our institutions, offers a practical definition of green finance and describes its major markets. Our research explores the UK’s pioneering role in green finance and the opportunity that the UK has to remain a leader in this area. We hope our partnership serves to help make green finance increasingly mainstream in the years ahead.



Charles Donovan

Director, Centre for Climate Finance and Investment
Imperial College Business School
Imperial College London



Anjalika Bardalai

Chief Economist & Head of Research
TheCityUK

EXECUTIVE SUMMARY

- ▶ TheCityUK and Imperial College Business School are undertaking joint research to understand the key enablers for growing the UK green finance market. This report seeks to bring clarity to the question of what constitutes green finance, an important and fast-growing sector in financial services.
- ▶ Building upon past work in this area, we have developed a consensus definition for green finance and applied it to specific financial products with the intention of increasing knowledge of this market among market participants, regulators and the government.
- ▶ The bulk of green finance activity is rooted in conventional finance markets: debt and equity. Within these markets, there is considerable crossover and many institutions are active in both these markets.
- ▶ Green bonds are the most well-known type of green finance and the UK plays a vital role in this market. There are currently 45 green bonds listed on the London Stock Exchange (LSE) that have raised around \$12bn in seven different currencies.
- ▶ The UK has played a key role in the development of the global green finance industry. The UK's Green Investment Bank was one of the world's first green banks and has played an important role as an investor in more than 100 green infrastructure projects.
- ▶ The UK has the world's fourth-largest amount of green bonds with \$61.8bn in issuance, accounting for 9% of the global total. China is the global leader, followed by the US and France.
- ▶ London is well-placed to play a leading role in green finance because of its well-developed financial and related professional services ecosystem and clusters of environmental expertise. The possibility of combining different innovative areas, such as FinTech, with green finance presents an opportunity for the UK to be able to offer a new level of global leadership in this area.

DEFINING GREEN FINANCE

'Green' in the context of finance

Despite the growing importance of green finance within financial markets, the question of what is 'green' in the context of finance remains mired in confusion. While many definitions for green finance have been put forward over the past decade, market participants have, to date, failed to coalesce around a single interpretation.

In one respect, such diversity of opinion is unavoidable. Like any term that gives collective meaning to individually-held values, what it means to be 'green' has an inherently subjective component. Nonetheless, for green to become a widely appreciated attribute of investment, there must be a shared set of standards.

This section seeks to facilitate greater standardisation by examining the areas of controversy among existing definitions of green. Based on a review of the literature, we have arrived at a proposed new definition of green finance that synthesises existing strands of thinking. Building upon others' contributions, the definition set out below seeks to strike a balance between simplicity, practicality, and integrity.

OUR DEFINITION

Green finance matches sources of funding to new capital and operating expenditures that generate measurable progress towards the achievement of a well-recognised environmental goal.



Figure 1: Literature review: summary of prominent definitions of green finance and green investment

Source ¹	Summary of Definition	Definition Boundary/ Notes
Bergedieck et al. (2011)	"... that green finance definitions feature many similarities, including obvious sectors such as renewable energy and green buildings, as well as differences regarding specific sectors such as nuclear power, noise abatement, and carbon capture and storage, reflecting the country-specific nature of definitions."	The authors note that the definition of green finance given by an actor is often heavily dependent on their purpose. The authors describe a bottom-up approach for estimating green finance that begins at a project-level assessment.
CLC (2016)	They describe green finance as an object that sits between the finance system and the environment. They concur with the G20 green finance study group definition.	Concurrent with G20 definition.
Eyraud et al. (2011)	They define green investment to be "the investment necessary to reduce greenhouse gas and air pollutant emissions, without significantly reducing the production and consumption of non-energy goods."	This definition only includes climate-related investment and not a greater range of goods and services that provide a benefit to the environment. Their boundary may be consistent with what others call 'climate finance'.
G20 Green Finance Study Group (2016)	"...financing of investments that provide environmental benefits in the broader context of environmentally sustainable development."	In addition to a broad range of activities that provide an environmental benefit, they also include financing of activities that internalise environmental externalities.
Höhne (2012)	"...financial investments flowing into sustainable development projects and initiatives, environmental products, and policies that encourage the development of a more sustainable economy." They split green finance into three categories: green energy, climate mitigation and 'other'.	Broadly, goods and services which contribute to a sustainable economy. They also include some activities such as water sanitation within environmental activities. They include climate finance as existing within green finance activities.
Inderst et al. (2012)	Broad definition of green investments as assets that can be described as green. Investing defined as the act of "committing capital or money to an endeavour[...] with the expectation of receiving future profit". They argue that the greenness of a given good or service is easier to deduce than for an economy-level assessment.	Does not provide a hard and fast definition of 'green' and argues that green can be determined on a case by case basis for goods and services. Some forms of environmental, social and governance (ESG) are included in this definition.
Lindenberg (2014)	A three-part definition that includes: 1) the financing of private and public green investments, 2) the financing of public policies, and 3) components of the financial system that deal specifically with green investments.	'Green' includes environmental goods and services as well as protection, minimisation and compensation of damages to the environment. Climate finance is defined as an aspect of green finance.
PwC (2009)	"...financial products and services, under the consideration of environmental factors throughout the lending decision making, ex-post monitoring and risk management processes, provided to promote environmentally responsible investments and stimulate low-carbon technologies, projects, industries and businesses."	They include environmental responsibility in a much broader vision of being green. Finance is considered to be the products and services that are environmentally responsible.
Volz et al. (2015)	"...all forms of investment or lending that take into account environmental impact and enhance environmental sustainability."	A very expansive definition that also includes environmentally responsible investment.
Zadek et al. (2013)	"The overall capital cost of the transition to a green economy, such as reducing greenhouse gas emissions, increasing resilience, securing food systems and managing of water, forest, transport and waste systems." Their definition of green finance similarly describes itself as a cost and includes "operational costs such as project preparation and land acquisition costs".	Their green boundary includes mitigation and adaptation activities related to climate change and sustainability. However, it is unclear whether this definition includes other environmental objectives (e.g. promoting biodiversity).

¹ See bibliography for full list of sources.

What are the major definitions so far?

The Organisation for Economic Co-operation and Development (OECD), in its review of green finance, acknowledged the difficulty of pinning down a single definition and documented a broad set of views.² Building upon their work and acknowledging more recent contributions, we have summarised green finance definitions in Figure 1.

LITERATURE REVIEW SUMMARY

Points of commonality among definitions:

- Authors appear united in including both private and public sources of capital in green finance, as well as including both debt and equity securities.
- Climate finance is generally held to be a subset of green finance that deals specifically with carbon abatement/mitigation and adaptation to climate change.

Points of difference among definitions:

- Coverage of the climate finance umbrella term varies greatly; for instance, some definitions include information technologies, while others focus on heavy industry and infrastructure.
- Some definitions are derived from the type of activity (e.g. solar energy), whereas others are tied to effect of the activity (e.g. carbon dioxide emissions reductions).
- There is little consensus regarding distinctions between environmental, social, and governance (ESG), socially responsible investing (SRI), climate finance, and various forms of 'responsible investing'.

Building a shared understanding

Chief among the tensions at play in defining green finance is a dilemma between coverage and integrity. An ideal definition must be extensive enough to include the broad range of activities that generate environmental benefit, yet narrow enough to exclude financings that make trivial contributions towards environmental improvement. On a more technical level, our review has also revealed divergent views about whether to define green finance by the type of activity (e.g. renewable energy) or the end impact (e.g. greenhouse gas reductions).

As is conventional, we define finance as the study of investments. Finance activities include all forms of debt and equity securities as well as insurance and derivatives. In this sense, the definition tracks closely with the one put forward by the G20.³ There is, however, a crucial distinction. We do not include government policies that put a price on environmental externalities (e.g. emissions trading) in our definition of green finance. Our view on this matter and a brief overview of emissions trading is provided on page 15.

² Inderst, G., Kaminker, C. & Stewart, F., 'Defining and measuring green investments: implications for institutional investors', (2012)

³ G20 Green Finance Study Group, 'G20 Green Finance Synthesis Report', (2016)

With respect to what is green, we started with the consensus principle that positive environmental impacts must be quantifiable. But while measurability is clearly important, it is not sufficient in and of itself. For market participants to have certainty about claims of being green, there must be assurance that the scale of impact is, relative to the size of the investment, consistent with a well-recognised target or goal. Regarding climate change, for example, consistency could be linked to a limit on greenhouse gas emissions required to achieve the UN Framework Convention on Climate Change (UNFCCC) Paris Agreement.

Our definition of green finance does not specify the environmental goal to be met. Ultimately, it is up to market participants to judge whether the environmental impact enabled by green finance is a sufficient improvement over the status quo. With respect to drawing a boundary around green finance (as opposed to, for example, sustainable finance), it is the explicit link to environmental goals that creates the source of distinction. As it would be impossible to be entirely prescriptive about which environmental goals should be achieved via green finance, it is incumbent upon market participants to identify them explicitly. Crucially, sponsors must also demonstrate how the investments enabled by green finance are consistent with achievement of the stated goal(s). These twin acts of transparency are, in our view, the most important test of green integrity.

APPLYING OUR GREEN FINANCE DEFINITION: A WORKED EXAMPLE

To indicate how our definition of green finance could be applied in practical terms, a recent bond issuance by Repsol SA, a multinational energy company serves as an example. In May 2017, Repsol issued a five-year, €500m bond to help finance energy efficiency improvements in petroleum and petro-chemical refineries. The issuance attracted significant controversy about whether the bond should be accepted by investors as green.⁴

The definition of green finance introduced in this report would lend itself to three key tests:

- 1) Is the instrument financing new expenditures?
- 2) Are the environmental impacts measureable?
- 3) Are the actions consistent with the achievement of a well-recognised environmental goal?

In the Repsol example, only two of the three key tests are passed:

- 1) Yes – the expenditures relate to new projects at specific Repsol facilities.
- 2) Yes – the expected benefits are precise and have been reliably measured.⁵
- 3) No – there is nothing to substantiate consistency with the achievement of a well-recognised environmental goal. The bond finances incremental improvements that satisfy Repsol's internal goals for GHG reduction. While the sponsor correctly notes that energy efficiency is an element in achieving the Paris Agreement's two-degree target, neither the company, nor its second opinion provider, has provided information about whether the investments make Repsol's operations consistent with such a target.⁶ The company provides CO2 reduction figures for eligible projects, but does not demonstrate the relative contribution to a two-degree target, nor make any mention of the global energy system transition required.

In summary, an application of our definition would find that the recent Repsol bond is not green finance.

⁴ Chasan E, First Green Bonds sold by an Oil Giant find willing investors, Bloomberg, (August 2017), available at: <https://www.bloomberg.com/news/articles/2017-05-22/first-green-bonds-sold-by-an-oil-giant-find-willing-investors>

⁵ Vigeo Eiris, Second Party Opinion on the Sustainability of Repsol's Green Bond, (August 2017), available at: https://www.repsol.energy/imagenes/global/en/repsol_greenbond_second_party_opinion_tcm14-71044.pdf

⁶ *ibid.*

INSTITUTIONS AND MARKETS

The two main green finance markets are aligned with the two main conventional finance markets: debt and equity. Within these markets, there is considerable institutional crossover, since many institutions are active in both debt and equity markets. In addition, alternative finance – a broad market category still in rapid development – comprises both debt and equity sub-segments; alternative green finance is discussed separately (page 16).

Debt instruments

Green loans

Green loans enable businesses and individuals to borrow money for capital and operating expenditures that generate measurable progress towards the achievement of a well-recognised environmental goal.

Examples of UK-based banks that have embarked on green lending in the UK include:

- Royal Bank of Scotland (RBS), which lent more than £1bn to green energy projects in 2016.⁷
- Santander UK, which provides senior project finance debt from £3m to £30m of project cost in the renewable energy sector for onshore wind farms and solar parks. It also participates in larger syndicated loan facilities.⁸
- Lloyds Bank, which has launched a £1bn fund for commercial real estate green lending to support its clients' sustainability investments; the intention is to reduce CO2 emissions from their real estate assets. This fund will provide margin improvements of up to 20 basis points on new borrowing requirements of £10m and over.⁹

Green bonds

According to the 'Green Bond Principles' set out by the International Capital Markets Association, green bonds are "any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance...green projects"; this definition is in wide use. Categories of eligible green projects include renewable energy, energy efficiency, sustainable waste management, sustainable land use, biodiversity conservation, clean transportation, and climate change adaptation.

Green bonds on the LSE

As of June 2017, there were 45 green bonds listed on the LSE in seven different currencies.¹⁰ The first listing was in 2007; green bonds listed on the LSE have raised a total of \$12.1bn. The currencies in which funds have been raised are detailed in Figure 2.

Figure 2: Current LSE green bonds fundraising by currency

Source: LSE and TheCityUK calculations

Currencies	Funds raised in currency	US dollar equivalent of amount raised at date of issue
US dollar	5,587m USD	\$5,587m
Euro	2,190m EUR	\$2,509m
Swedish krona	19,260m SEK	\$2,419m
Pound sterling	650m GBP	\$1,021m
Indian rupee	23,150m INR	\$349m
Chinese renminbi	1,100m CNY	\$175m
Mexican peso	750m MXN	\$44m

⁷ The Energyst, 'RBS invested £1bn in green energy projects in 2016, touts LED lighting loans', (August 2017) Available at: www.theenergyst.com/rbs-invested-1bn-in-green-energy-projects-in-2016-touts-led-lighting-loans

⁸ Santander, 'Renewable Energy Sector', (August 2017), available at: www.santander.co.uk/sectors/renewable-energy

⁹ Trucost, 'Lloyds Bank launches first of its kind £1bn green lending fund for commercial property', (August 2017), available at: www.trucost.com/trucost-news/lloyds-bank-launches-first-kind-1bn-green-lending-fund-commercial-property

¹⁰ All UK green bond listings are on the LSE given that the only other UK exchanges are futures and options exchanges (London Metal Exchange and ICE Future (formerly LIFFE))

Global green bond issuance

According to the OECD, global labelled green bond issuance has risen significantly from \$3bn in 2011 to \$95bn in 2016.¹¹ From 2007-2012 bonds were mainly issued by multilateral institutions such as the World Bank, the European Investment Bank (EIB) and the International Finance Corporation (IFC), along with a few local-government funding agencies, municipalities and national development banks.

Corporates and banks entered the market in 2013. Although this marked a turning point for this market segment, growth in corporate issuance has remained more subdued than growth in issuance by public-sector institutions and multilaterals. In 2016, Chinese banks and US sub-sovereigns were the main drivers of issuance growth. Late 2016 and early 2017 also saw the first-ever sovereign green bond issuances (by Poland and France). Green bond new issues rose by 36% in the first half of 2017.

The EIB—which pioneered green bonds in 2007—is the world's largest issuer of green bonds, with over €15bn raised across 11 currencies as of end-2016.¹² Germany's KfW development bank and the World Bank are also leading global green bond issuers.

In the UK, the LSE saw 14 new green bonds listed in 2016, which raised \$5.1bn.

Financial institutions' green bond involvement

Banks invest as well as issue in the green bond market. For example:

- Three of the top five issuers in the first half of 2017 were banks: the EIB, KfW and Bank of Beijing.

- HSBC has issued its own €500m green bond supporting projects including wind farms, solar plants and sustainable waste facilities in ten countries, including the UK. The projects include wind farms in six European countries (including the UK); 'smart' meters for gas and electricity in the UK; and solar projects in the Czech Republic and South Africa. HSBC is committed to investing \$1bn according to the OECD.¹³
- Barclays has invested £1bn in green bonds, and is committed to investing another billion.¹⁴
- Credit Agricole is committed to investing €2bn by end of 2017 and Deutsche Bank is committed to investing €1bn in green bonds.¹⁵

The insurance industry invests in green bonds. For example:

- Zurich, which has a green bond portfolio of over \$2bn, has invested in over 120 green bonds from 75 issuers in seven currencies.¹⁶
- AXA has invested €1bn in the green bond market and also has its own AXA WF Planet Bonds fund, a green bond fund.¹⁷
- Aviva has pledged to increase its holdings of green bonds.¹⁸

Green bond index funds offer another way of gaining exposure to this asset class. For example, the World Bank's IFC is investing \$325m in such a fund, intended to focus on investments in emerging markets, in partnership with Amundi, a France-based asset manager. Fund manager BlackRock launched such a fund in March 2017; this fund tracks the Bloomberg Barclays MSCI Global Green Bond Index.¹⁹

¹¹ OECD, 'Mobilising Bond Markets for a Low Carbon Transition', (2017)

¹² European Investment Bank, 'Climate Awareness Bonds', (August 2017), available at: www.eib.org/eib.org/investor_relations/cab/index.htm

¹³ OECD, 'Mobilising Bond Markets for a Low Carbon Transition' (2017) and HSBC, 'Green finance in action', (August 2017), available at: www.hsbc.com/news-and-insight/insight-archive/2016/green-finance-in-action

¹⁴ Barclays, 'Barclays reaches £1 billion green bond target and commits to a further billion', (2015), available at: www.newsroom.barclays.com/r/3268/barclays_reaches_1_billion_green_bonds_target_and_commits

¹⁵ OECD, 'Mobilising Bond Markets for a Low Carbon Transition' (2017)

¹⁶ Zurich, 'Zurich's green bond investment surpasses USD 2 billion – what are they really worth?', (August 2017), available at: <https://zurich.com/en/knowledge/articles/2017/08/using-our-investment-management-expertise-to-increase-resilience>

¹⁷ Investment Europe, 'AXA IM launches green bond fund', (August 2017), available at: www.investmenteurope.net/regions/france/axa-im-launches-green-bond-fund

¹⁸ OECD, 'Mobilising Bond Markets for a Low Carbon Transition', (2017)

¹⁹ Citywire, 'BlackRock launches green bond index fund', (August 2017), available at: www.citywire.co.uk/wealth-manager/news/blackrock-launches-greenbond-index-fund

Evaluating green assets

In recent years an extension of the debt-rating industry has emerged to evaluate green bonds and green assets. According to the Climate Bonds Initiative, around 60% of bonds labelled green have received an external review over the past few years.

Unlike traditional services—such as sovereign-debt ratings, which assess the quality of the issuance as measured by the ability (and willingness) of the issuer to service the debt—green asset rating is broader in scope and typically takes account of the environmental impact of

the project that the debt issuance finances. The following section provides a non-exhaustive overview of the leading providers of this service, but because the current evaluation methods measure different things, the overview does not endorse one ratings provider over another.

Of the three main credit-rating agencies, Moody's and Standard & Poor's (S&P) are discussed below. Fitch is the outlier among the three in that it does not provide external ratings, but does rate green bonds "based on the underlying credit risk in line with relevant sector criteria"—i.e., the traditional credit-rating service applied to green bonds.

CICERO: 'SHADES OF GREEN'

Cicero, a Norwegian climate-research institute, evaluates bonds upon request using a 'shades of green' methodology. Introduced in 2015, this methodology (which does not represent a credit rating) reflects "the climate and environmental ambitions" of bonds. Dark green shading means that Cicero believes it provides long-term environmental solutions, whereas light green implies short-term improvements only.

MOODY'S: GREEN BONDS ASSESSMENT

Moody's, one of the main providers of conventional debt ratings, scores green bonds on an organisational basis (considering factors such as quality of staff and strategy setting); evaluating the green use of proceeds; disclosure on the use of proceeds; management of proceeds; and ongoing reporting and disclosure on the environmental projects funded by the issuance. The overall assessment grades are from GB1 (Excellent) to GB5 (Poor). The assessment began in 2016 and does not represent a credit rating.

S&P: GREEN EVALUATION SERVICE

S&P started its green evaluation service in April 2017. The service measures the green impact of assets and is independent of credit ratings. Sectors covered are renewable energy, energy efficiency, green transportation, environmentally compliant buildings, fossil fuel projects, nuclear, and water. S&P evaluates the governance and transparency of financings from an environmental point of view. It will then either estimate an asset's expected lifetime environmental impact in its area, or its likely level of resilience to natural catastrophes, depending on the project.

Equity

Listed green equities

Listed green equities refers to the shares of a company, traded on a stock exchange, whose business activities generate measurable progress towards well-recognised environmental goals. In the UK, all such listings are on the LSE. There are 38 green companies which have raised a combined \$10bn in London, including 14 renewable investment funds.²⁰

Green exchange traded funds (ETFs)

An ETF is an investment fund traded on stock exchanges. An ETF holds assets such as shares, commodities or bonds, and its value tracks that of the underlying asset or basket of assets.

Green ETFs on the LSE

There are currently three clean ETFs listed on the LSE:

1. iShares Global Clean Energy Undertakings for Collective Investment in Transferable Securities (UCITS) ETF

This mirrors the return of the S&P Global Clean Energy Index. The index is composed of around 30 of the largest publicly-traded clean energy producers.

2. PowerShares Global Clean Energy UCITS

This follows the WilderHill New Energy Global Innovation Index and is based on stock prices of companies which supply cleaner and generally renewable energy and technologies.

3. Amundi MSCI World Low Carbon UCITS ETF

This tracks the MSCI World Low Carbon Leaders strategy index. In turn this reflects the performance of the MSCI World index, but excludes high carbon-emissions-intensity companies and companies owning the largest amount of carbon reserves per dollar of market capitalisation.

The ETFs comprise companies that generate renewable energy, develop clean-energy technologies and conduct carbon emission reduction.

YieldCos

YieldCos are holding companies for operational clean energy assets, such as windfarms and solar power stations. YieldCos have a relatively high dividend payout ratio and do not typically undertake new project development. Through YieldCos, shareholders gain exposure to a diversified set of proven assets, with the goal of limiting investment risk.

Previous analysis undertaken by Imperial College Business School's Centre for Climate Finance & Investment demonstrated that UK YieldCos offers superior risk-adjusted returns to a range of indices, including the FTSE 100, FTSE SmallCap, and FTSE oil & gas.²¹

Six renewable YieldCos have listed in London since 2013 with a collective market capitalisation in excess of £2.2bn.²²

²⁰ Green Finance Initiative, 'Facts and Figures', (2017)

²¹ Thisismoney.co.uk, 'YieldCos aim pay steady dividends cut risks', (August 2017), available at: www.thisismoney.co.uk/money/investing/article-4245028/YieldCos-aim-pay-steady-dividends-cut-risks

²² Green Finance Initiative, 'Facts and Figures', (2017)

EMISSIONS TRADING

Emissions trading programmes do not fit under our umbrella definition of green finance because they are not a form of investment. While emissions trading does influence costs and revenues for a business and may stimulate certain types of investment, they are neither a form of financing nor a mechanism of capital allocation.

The UK is currently part of the EU emissions trading system (ETS), the world's biggest carbon market. The EU ETS operates across the EU as well as Iceland, Liechtenstein and Norway, setting a cap on the total amount of certain greenhouse gases to be emitted by each Member State. Member States in turn allocate tradeable emissions allowances to its regulated companies. As described by the European Commission;

*"After each year a company must surrender enough allowances to cover all its emissions, otherwise heavy fines are imposed. If a company reduces its emissions, it can keep the spare allowances to cover its future needs or else sell them to another company that is short of allowances."*²³

The EU ETS covers the following sectors: power and heat generation, energy-intensive industries, commercial aviation, and aluminium production. The scheme is now in its third phase, running to 2020. However, the UK's continuing participation in the EU ETS is uncertain at the time of writing due to the on-going Brexit negotiations. Future UK-EU trade agreements could include the continuation of existing pan-European mitigation efforts, in which case, the UK's membership of the EU ETS may be required.

Green private equity

Private equity has been formally defined as "a form of finance provided in return for an equity stake in potentially high growth companies and infrastructure businesses."²⁴

The return on investment is based on an increase in the value of the business funded, realised upon exit when the investor sells the stake via a public listing or share purchase agreement. A growing number of private equity firms are participating in the funding of unlisted green infrastructure, such as energy storage facilities and offshore windfarms. In unlisted infrastructure, investors take direct ownership of assets rather than gaining financial exposure to those assets through an exchange-traded investment vehicle or publicly-listed company.

Venture capital is a sub-sector of private equity focusing on start-up and early-stage companies.

Green-focused private equity (and venture capital) firms invest specifically in companies whose businesses make a positive environmental impact. Although reliable estimates for aggregate investments in green private equity do not exist, examples of UK-based activity in this sector are presented below.

Unlisted infrastructure

The Pensions Infrastructure Platform (PiP) has so far committed more than £1bn in investments in UK infrastructure. Although not all of the investments are in green infrastructure, PiP has had significant involvement in this area—for example, acquiring UK operational solar power stations.

Growth private equity

Based in London, Riverstone runs the world's largest private equity fund dedicated exclusively to renewable energy investment. To date, the firm has committed over £3bn of equity to the sector.

Venture capital

UK-based ETF Partners is an example of a venture-capital firm that has a strong emphasis on environmental sustainability as its core investment theme. The firm has committed capital to more than 15 companies in the clean technology sector.

²³ European Commission, 'The EU Emissions Trading System (EU ETS)', (August 2017), available at: www.ec.europa.eu/clima/policies/ets_en

²⁴ British Private Equity & Venture Capital Association, 'Examining Private Equity's Place in Investors' Portfolios', (October 2015)

Alternative green finance

Alternative finance is the provision of finance outside the scope of conventional bank lending and debt and equity finance. It is a broad term, and has been used to include markets and instruments such as private placements, securitisation, and peer-to-peer lending, among others.²⁵

We define alternative green finance as the application of alternative finance markets and instruments, capital, and operating expenditures that generate measurable progress towards the achievement of well-recognised environmental goals. The market is still a niche one, and the analysis below focuses on green crowdfunding as one example of recent trends.

Crowdfunding is defined by the Financial Conduct Authority (FCA) as, “a way in which people and businesses (including start-ups) can try to raise money from the public to support a business, project, campaign or individual.”

According to the second European Alternative Finance Industry Report, the European online alternative finance market, including crowdfunding and peer-to-peer lending, grew 92% in 2015 to €5.43bn. The UK accounts for around 81% of the European online alternative finance market.²⁶

There are four types of crowdfunding, which are defined by the European Crowdfunding Network as:

- **donation-based** – a donor contract without existential reward
- **reward-based** – purchase contract for some type of product or service
- **lending** – credit contract, credit is being repaid plus interest
- **equity** – shareholding contract, shares, and equity-like arrangements.

The donation-based and reward-based models are outside the scope of financial services. Within the finance universe, green debt crowdfunding involves a credit contract where credit is repaid plus interest for a green project. Conversely, green equity crowdfunding involves a shareholding contract, shares or revenue sharing in a green business.

The green crowdfunding market is relatively fragmented; some green crowdfunding platforms focus specifically on renewable energy and infrastructure projects. Examples include Abundance (£42m raised as of June 2017) and SunFunder (\$25m invested). Other platforms focus on a broader range of socially responsible projects, including green projects. Finally, some general crowdfunding platforms host green projects (typically under an ‘Environment’ category) alongside other projects.

In the UK, 121 energy projects have been funded via crowdfunding across five energy crowd funding platforms, providing an average return of 7.36%.²⁷

²⁵ See, for example, TheCityUK and Ares & Co, ‘Alternative Finance for SMEs and Mid-market Companies, (October 2013)

²⁶ European Crowdfunding Network, ‘2nd European Alternative Finance Industry Report unveils a strong growth trend’ (August 2017), available at: <http://eurocrowd.org/2016/09/06/2nd-european-alternative-finance-industry-report-unveils-strong-growth>

²⁷ Green Finance Initiative, ‘Facts and Figures’, (2017)

THE UK'S ROLE

A global pioneer

The UK has played a key role in the development of the green finance industry. According to research by the OECD, there are 13 green investment banks or similar entities globally which are detailed in Figure 3.

Figure 3: Green investment banks or similar entities

Source: OECD²⁸

Name	Location	Year of Formation
NATIONAL		
Malaysian Green Technology Corporation	Malaysia	2010
UK Green Investment Bank	UK	2012
Clean Energy Finance Corporation	Australia	2012
Green Fund	Japan	2013
Technology Fund	Switzerland	2014
STATE		
Connecticut Green Bank	Connecticut, USA	2011
California CLEEN Center	California, USA	2014
Green Energy Market Securitization	Hawaii, USA	2014
New Jersey Energy Resilience Bank	New Jersey, USA	2014
NY Green Bank	New York, USA	2014
Rhode Island Infrastructure Bank	Rhode Island, USA	2015
COUNTY		
Montgomery County Green Bank	Maryland, USA	2015
CITY		
Masdar	Masdar, UAE	2006

The UK Green Investment Bank (GIB) was created by the UK government in 2012 with £3.8bn of capital to support the transition to a green economy and to 'crowd in' private sector finance. By March 2017, the GIB had deployed approximately £3.4bn via 100 direct investments and seven funds across offshore wind, waste/biomass, onshore renewables and energy efficiency.

THE UK GREEN INVESTMENT BANK

Following a privatisation process launched in 2016, the GIB was sold to Australia's Macquarie Group in August 2017 for £2.3bn, generating a profit of £189m for the UK government. The rationale for privatisation was that public-sector ownership had demonstrated the viability of the GIB concept, which could be accelerated by larger volumes of private capital. The investment banking arm of Macquarie has integrated the GIB's origination teams, creating an enlarged renewable finance unit targeting further investment in the UK and internationally. Macquarie partnered with UK pension fund USS to acquire certain GIB assets.

The UK government created a 'special share' held by independent trustees to protect the GIB's green objectives. Macquarie has publicly committed to maintaining the GIB's target of £3bn of new investment in green energy projects over the next three years.

The GIB has taken a leadership role in green impact reporting and targets a 'double bottom line' of financial and environmental returns. By 2016, its activities had reduced 4.8m tonnes of CO₂ emissions (equivalent to taking 2.2m cars off the road) and generated over 20 terawatt hours of renewable power (enough to power 4.9m homes).²⁹

²⁸ OECD, 'Green Investment Banks, Scaling Up Private Investment in Low Carbon, Climate Resilient Infrastructure', (2016)

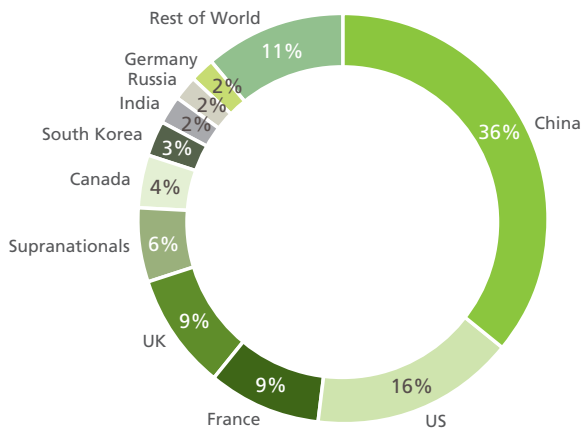
²⁹ UK Green Investment Bank, 'Annual Report and Accounts 2015-16', (2016)

Leading role in the global green finance sector

According to the Climate Bonds Initiative, the UK has the world’s fourth-largest amount of green bonds with \$61.8bn in issuance, accounting for 9% of the global total. China has 36% (\$246bn), the US 16% (\$111bn) and France has 9% (\$63.9bn). The majority of issuance in the UK is from Network Rail, which is using funds raised through bond issuance for rail modernisation and expansion. Issuance in the UK is quite concentrated; at \$40.3bn, Network Rail issuance accounts for roughly two-thirds of total UK green bonds.

Figure 4: Top 10 countries for climate aligned bonds

Source: Climate Bond Initiative³⁰



According to the Climate Bonds Initiative, global green bond issuance in the first half of 2017 was \$55.8bn; it is expected to reach \$130bn in 2017 as a whole.³¹ The five largest green bond issuers in the first half of 2017 were France (\$7.6bn), the EIB (\$2.8bn), German development bank KfW (\$2.5bn), government-owned Bank of Beijing (\$2.2bn) and Dutch electricity company TenneT (\$2.2bn). Issuance from non-financial corporates almost doubled compared to the year-earlier period. Nevertheless, although there was record issuance in Q2 2017, green bond transactions represented just 3% of global bond market transactions in that quarter.

The UK’s status as a green finance pioneer was further illustrated by the EIB issuing the world’s first green bond in 2007, which was listed on the LSE. The bond tracked the performance of the FTSE4GoodEnvironmental Leaders 40 Index, an index designed to identify European companies with leading environmental practices. There are currently 45 green bonds listed on the LSE that have raised around \$12.1bn in 7 different currencies according to the LSE. The LSE launched dedicated green bond segments in 2015.³² The LSE has seen a number of other firsts in green bond finance, underlining its global importance; these include:

- In March 2017, the National Bank of Abu Dhabi issued the first green bond from the gulf region raising a total of \$587m.
- In November 2016, Bank of China issued the first Chinese green covered bond, raising \$500m.
- In October 2016, MuniFin (provider of financial services to Finland’s local government and public housing sector) listed Finland’s first green bond, raising \$500m.
- In June 2016, Axis Bank (Indian private sector bank) listed Asia’s first climate bonds certified green bond by a bank.
- In March 2015, the IFC issued the first renminbi-denominated green bond.³³

³⁰ Climate Bond Initiative, ‘Bonds and Climate Change: the State of the Market in 2016’, (2016)

³¹ Climate Bonds Initiative, Global Green Bonds Mid-Year Summary, (2017)

³² London Stock Exchange, ‘London Stock Exchange launches dedicated green bond segment’, (2015)

³³ London Stock Exchange, ‘Green Bonds Factsheet’, (April 2017)

The UK's role as a future green finance leader

Green bonds are the best known segment of green finance. This is likely to remain the case given the market's relatively long history and the greater familiarity it therefore enjoys among investors, policymakers and the public relative to other green finance instruments. Although UK-based institutions have been involved in some prominent green bond issuances and have played a key role in the development of this market, recent data show that they have ranked behind institutions from France and the US in terms of the volume and value of deals. According to data compiled by Environmental Finance, the top five green bond lead managers by value in the first eight months of 2017 were Credit Agricole, Bank of America Merrill Lynch, Citigroup, BNP Paribas and JP Morgan; the leading UK banks in this space, HSBC and Barclays, ranked seventh and eighth respectively (although ranked by number of deals, HSBC ranks joint-second, with Citigroup).³⁴

TheCityUK has noted that "the UK's position as a leading financial centre will continue to be challenged by both traditional international and European centres, centres in high-growth markets and specialist centres."³⁵ The green bond market is an example of a segment in which international competition is intensifying. Similarly, in the equity space, the Luxembourg Stock Exchange is the world leader in issuance of green securities, having launched the Luxembourg Green Exchange (LGX) in 2016. LGX had a global market share of nearly 50% of listed green bonds, measured by issuance amount.³⁶ These recent data serve as a reminder that the UK must continue to build on its strengths in order to retain its competitiveness in innovative new areas of financial services.

One critical feature of the further development of the green finance sector will be the increasing recognition that green financial instruments offer a compelling business and financial proposition in their own right, separate from the positive social and environmental benefits they offer. The UK's global financial and related professional services

leadership and its wide-ranging ecosystem means that it is well-placed not only to offer the whole range of green finance products and services, but also to demonstrate and promote this proposition through the intersection of corporates, and financial and related professional services firms.

For green finance to maximise its impact, segments beyond green bonds will need to develop further. London is well placed to play a leading role in the sector's transformation. London provides a rare combination of traditional financial services expertise across the whole financial services ecosystem and specialised clusters of green expertise. For example, the UK is already a leader in innovative areas like FinTech and alternative finance. According to research by EY, the UK's FinTech sector employed over 60,000 people and generated around £6.6bn in revenue in 2015, close to a third of the global total.³⁷ Alternative finance is also a rapidly growing area in the UK. According to the Cambridge Centre for Alternative Finance and Nesta, the industry grew by 84% in 2015 to £3.2bn.

Similarly, the UK can be a leader in green finance, another innovative area. Additionally, the possibility of combining different innovative areas, such as FinTech and green finance, presents an opportunity for the UK to be able to offer a new level of global leadership in this area. Given that climate change is fundamentally an international challenge, green finance is a sector that may lend itself particularly well to cross border transactions. In this area too, the UK plays a leading global role. The UK is the world's leading exporter of financial services; its financial services trade surplus of \$97bn in 2015 was more than twice that of the US, which recorded the next largest trade surplus in financial services. Other examples of the highly international nature of the UK's financial and related professional services industry are the fact that London is the leading centre for international arbitration, and the UK, powered by London, is the global leader in FICC trading, cross-border lending and specialty commercial insurance, and consistently occupies a top three position across other major globally mobile business lines.³⁸

³⁴ Environmental Finance, 'Green Bond Database', (August 2017, available at: www.greenbonddata.org/)

³⁵ TheCityUK, 'A vision for a transformed, world-leading industry, (July 2017)

³⁶ Luxembourg Green Exchange, 'The world's leading platform for sustainable finance', (August 2017), available at: www.bourse.lu/lgx

³⁷ EY, 'UK FinTech: On the cutting edge', (2016)

³⁸ For further detail see TheCityUK, 'Financial and related professional services: meeting the challenges and delivering opportunities', (August 2016)

Strong and forward-looking regulation will also be important for the sector's development. The quality of financial and related professional services regulation is one of the UK's competitive advantages in this industry, and this is as true for new areas like green finance as it is for conventional products and services. The Bank of England is working to support the UK's key role in green finance, and co-founded and is co-chairing the G20 Green Finance Study Group which it started in December 2015 with the People's Bank of China.³⁹ The Group's mandate is to "identify institutional and market barriers to green finance and, based on country experiences, develop options on how to enhance the ability of the financial system to mobilise private capital for green investment." The Bank of England also engages with financial firms which face climate related risks—such as parts of the insurance industry—seeking to support an orderly market transition to a lower carbon economy.

In December 2016 the Prudential Regulation Authority joined a group of insurance regulators to form the Sustainable Insurance Forum, an initiative to strengthen regulators' knowledge of sustainability challenges.

The UK's impending exit from the EU is likely to have a significant impact on UK-based financial and related professional services. The exact nature and scale of the impact will depend on the precise terms of the exit – in particular, the regulatory outcomes and the agreed market access between the UK and EU. At this stage, a range of outcomes is still possible, with the potential to impact business lines differently.⁴⁰ Whatever the outcome, however, "Brexit is a catalyst for the UK and the industry to recalibrate its international positioning."⁴¹ This recalibration includes not only the potential for changes in emphasis in various international trade and investment relationships, but also the potential for the UK to enhance its global leadership in new and growing industry segments such as green finance.

³⁹ Bank of England, 'Climate change, green finance and financial stability', (August 2017), available at: www.bankofengland.co.uk/Pages/climatechange.aspx

⁴⁰ For further detail see TheCityUK, 'A vision for a transformed, world-leading industry', (July 2017)

⁴¹ Ibid.

BIBLIOGRAPHY

- Bergedieck, L., Maheshwari, A. & Ugaz, F.A. 'Green Finance: A bottom-up approach to tracking existing flows', (2011)
- CLC, 'Globalising Green Finance: the UK As an International Hub', (2016)
- Climate Bonds Initiative, 'Bonds and Climate Change, the State of the Market in 2016', (July 2016)
- EIB, 'Green Bond Market Development and EIB', (2016)
- European Commission, ec.europa.eu/clima/policies/ets_en (2017)
- EY, 'UK FinTech: On the cutting edge', (2016)
- Eyraud, L. et al., 'Who's Going Green and Why? Trends and Determinants of Green Investment', (2011)
- G20 Green Finance Study Group, 'G20 Green Finance Synthesis Report', (2016)
- Golub, S.S., Kauffmann, C. & Yeres, P., Defining and Measuring Green FDI, 'An exploratory review of existing work and evidence', (2011)
- Green Finance Initiative, 'Facts and Figures', (2017)
- Höhne, B.N. et al., 'Mapping of Green Finance Delivered by IDFC Members in 2011', (2012)
- Inderst, G., Kaminker, C. & Stewart, F., 'Defining and measuring green investments: implications for institutional investors', (2012)
- Lindenberg, N., 'Definition of Green Finance', (2014)
- London Stock Exchange, 'Green Bonds Factsheet', (April 2017)
- London Stock Exchange, 'Green Bonds Presentation', (December 2016)
- Moody's Investors Service, 'Green Bonds Assessment (GBA)', (30 March 2016)
- OECD, 'Green Investment Banks, Scaling Up Private Investment in Low Carbon, Climate Resilient Infrastructure', (2016)
- OECD, 'Mobilising Bond Markets for a Low Carbon Transition', (2017)
- PWC, 'Exploring Green Finance Incentives in China', (2009)
- S&P Global Ratings, 'S&P Global Ratings Green Evaluation: Time to Turn Over a New Leaf?', (2017)
- UN, 'Green Finance Progress Report', (2017)
- Volz, U. et al., 'Introduction. In Financing the Green Transition: How to make Green Finance Work in Indonesia', (2015)
- Wang, Y. & Zhi, Q. 'The Role of Green Finance in Environmental Protection: Two Aspects of Market Mechanism and Policies' Energy Procedia, (2016)
- World Bank, 'World Bank green bonds reach \$10 billion in funding raised for climate finance', (7 April 2017)
- Zadek, S. & Flynn, C., 'South-Originating Green Finance: Exploring the Potential', (2013)

TheCityUK Research:

For content enquiries, further information about our work or to comment on our programme/reports, please contact:

Anjalika Bardalai, Chief Economist and Head of Research

anjalika.bardalai@thecityuk.com

+44 (0)20 3696 0111

Justine Lovatt, Economic Research Analyst

justine.lovatt@thecityuk.com

+44 (0)20 3696 0112

TheCityUK

TheCityUK, Salisbury House, Finsbury Circus, London EC2M 5QQ

www.thecityuk.com

MEMBERSHIP

To find out more about TheCityUK and the benefits of membership visit

www.thecityuk.com or email us at membership@thecityuk.com

This report is based upon material in TheCityUK's possession or supplied to us from reputable sources, which we believe to be reliable. Whilst every effort has been made to ensure its accuracy, we cannot offer any guarantee that factual errors may not have occurred. Neither TheCityUK nor any officer or employee thereof accepts any liability or responsibility for any direct or indirect damage, consequential or other loss suffered by reason of inaccuracy or incorrectness. This publication is provided to you for information purposes and is not intended as an offer or solicitation for the purchase or sale of any financial instrument, or as the provision of financial advice.

Copyright protection exists in this publication and it may not be produced or published in any other format by any person, for any purpose without the prior permission of the original data owner/publisher and/or TheCityUK. © Copyright September 2017