GERMAN GREEN BONDS

UPDATE AND OPPORTUNITIES

In collaboration with Deutsche Börse – May 2017

Climate Bonds INITIATIVE

German issuers have been amongst pioneers in the market since the first green bonds were issued by Landwirtschaftliche Rentenbank and NRW.BANK in 2013. Germany is now the 4th largest source of issuance globally and 2nd in Europe.

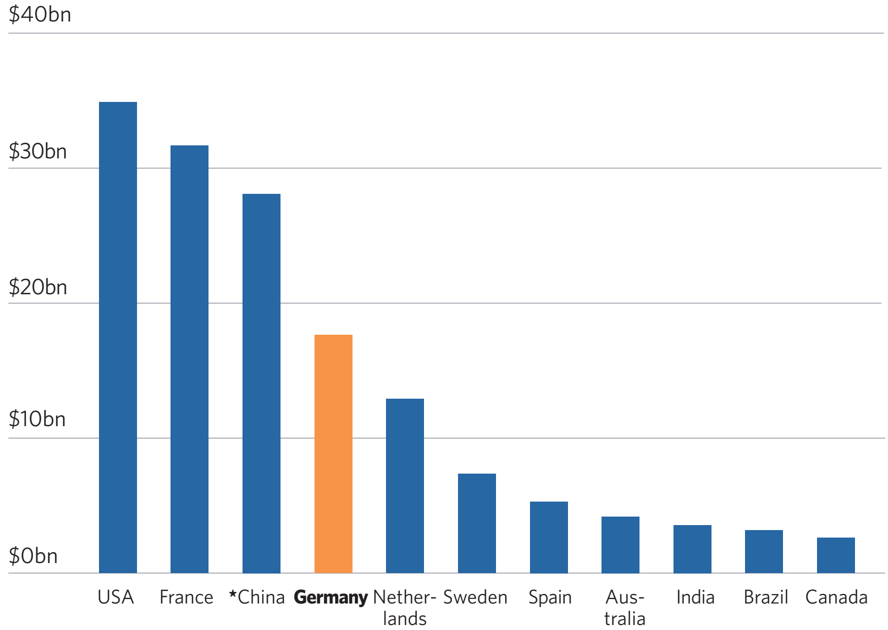
The strength and growth of the German green bond market has been a highlight of the global and European green bond market with leadership from state-backed institutions, a strong policy backdrop and a large bond market.

The entire German market, however, currently consists of only 8 issuers, of which just 2 are corporates. Given the strength of German energy policy and its industrial sector, our view is that there is significant potential for growth from domestic issuers. This paper outlines progress to date and highlights options for development.

The market is underpinned by a strong banking sector with over 80% of issuance to date coming from development, state-owned or commercial banks including KfW (see page 3) and NRW.BANK, the state development bank of North-Rhine Westphalia.

Annual issuance grew from USD0.5bn in 2013 to USD5.5bn in 2015. 2017 looks set to break records with issuance already at USD2.9bn.

Country comparison: total outstanding (10 May 2017)



*Only includes bonds in line with CBI taxonomy are shown.
Total figure outstanding from Chinese issuers if bonds financing coal, large scale hydro etc. are included = $41.5bn

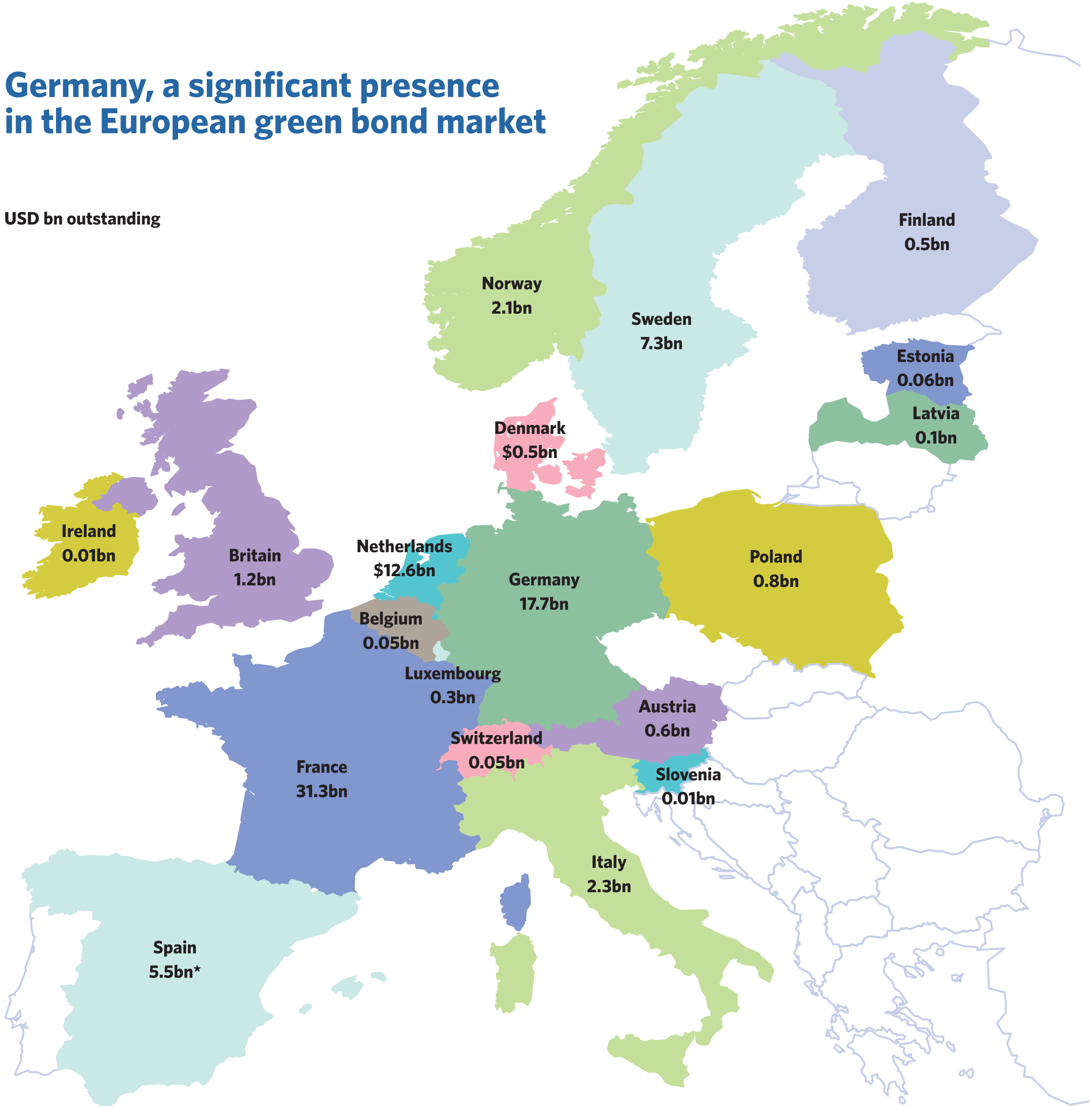
German green bond issuers

Issuer	Total Issued USD	Bonds issued	Certification / Second opinion	Active since	Issuer type	Use of proceeds
KfW	12.8bn	11	CICERO	July 2014	Development Bank	Renewable energy
NRW.BANK	2bn	4	Oekom	November 2013	Govt agency	Mixed
Berlin Hyp	1.1bn	2	Oekom	May 2015	Financial	Low-carbon buildings
Senvion	881m	2	None	April 2015	Corporate	Renewable energy
Nordex	626m	1	CBI / Oekom	March 2016	Corporate	Renewable energy
Deutsche KreditBank	500m	1	CBI / DNV GL	June 2016	Financial	Renewable energy
L. Rentenbank	88m	2	None	August 2013	Govt agency	Renewable energy
MEP Werke	32m	1	CBI / Oekom	January 2017	Financial	Renewable energy
State of North-Rhine Westphalia (NRW)	(>4bn)**	3	Oekom	December 2014	Sub-sovereign	Sustainability bond

**(not included in total figures)

Germany, a significant presence in the European green bond market

USD bn outstanding



* Note USD3bn of Iberdrola bonds attributed to Spain as the country of risk. The bonds were issued by a Netherlands-registered subsidiary.

There is a strong precedent for external review and certification with all but two issuers receiving second opinions or 3rd party certification – 97% by value of issuance. This is a positive signal to other German issuers looking to join the market. Of reviewers, CICERO accounts for the majority of issuance by value as it is the sole opinion provider for KfW.

The market for Climate Bonds Certification is growing with 3 of the 8 regular issuers receiving certification. The first German issuer to receive certification was Nordex in 2016 followed shortly thereafter by Deutsche Kreditbank and MEP Werke.

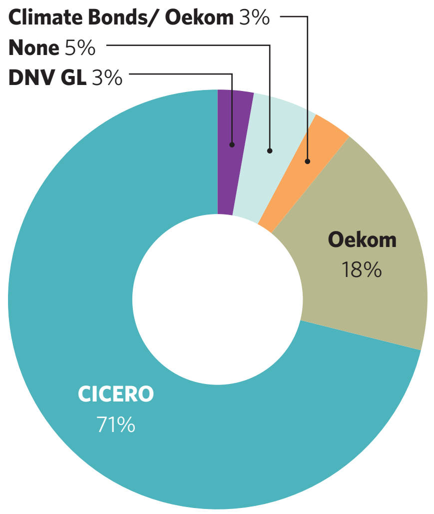
The Climate Bonds Standard as well as external reviews have been instrumental in ensuring international investor confidence in the green credentials of the market.

German investors play an important role in the market globally with large investors including: KfW (EUR1bn commitment to buy green bonds), Union Investment (green bond fund launched in 2017), NRW.BANK (EUR200m portfolio), Allianz (green bond fund launched in 2015).

German intermediaries have shown leadership in providing essential market infrastructure and services. This includes the first ever green bond index from German index company Solactive in early 2014. Solactive also recently helped to bring the first green bond ETF from VanEck to US market in early 2017.

German underwriting banks such as Commerzbank, Deutsche Bank, DZ Bank, LBBW and Unicredit have also been active in facilitating deal flow as underwriting banks.

Strong precedent for external verification



German issuers have shown leadership in issuing a range of new debt instruments with four different instruments issued to date despite there only being 8 issuers in the market. Aside from senior unsecured transactions there has also been a green Schuldschein (Nordex), green Pfandbrief or covered bonds (Berlin Hyp) and a green loan (MEP Werke). The incredible diversity of instruments is unusual in the market and indicates that Germany could take a lead on debt instrument deployment. New instruments are important as a proof of concept for other issuers and can potentially open the market further.

Renewable energy accounts for 87% of proceeds raised by German green bond issuers – particularly in wind and solar. This includes all of the KfW bonds. To date, only 8% of total proceeds were directed to low-carbon buildings, raised by Berlin Hyp. The diverse nature of the overall German economy is not well-reflected in the green bond market indicating that there is untapped domestic potential.

Germany could show leadership in growing the green covered bond market through Pfandbrief and covered bonds. Both can help to unlock finance in debt capital markets for small-scale low-carbon assets such as mortgages for green buildings.

Covered bonds are backed by a cover pool of mortgage loans (property as collateral) in addition to the issuer's creditworthinesss. Pfandbrief are a type of covered bond specific to Germany and are generally secured by mortgages for real estate, ships or aircraft.

Berlin Hyp issued the first green pfandbrief in 2015 to finance real estate loans for buildings that meet green building standards.

A further step would be to develop guidelines for green assets and green tagging tools to facilitate the identification of loans eligible for green cover pools.

Guidelines and regulations governing eligible loans are not new to the pfandbrief market which is already governed by a strict set of regulations in order to maintain the high credit rating of these products.

The European Mortgage Federation (EMF) and European Covered Bond Council (ECBC) are already taking further steps to promote green securitisation of mortgages by launching an Energy Efficient Mortgages Initiative to develop a standardised energy efficient mortgage based on preferential rates.

Berlin Hyp introduced pricing incentives into its green building lending for eligible businesses in 2016.

Spotlight on KfW

The entrance of KfW to the green bond market in 2014 was arguably the biggest breakthrough for the German market.

Total issuance from KfW has amounted to over USD12bn, accounting for 71% of German issuance to date.

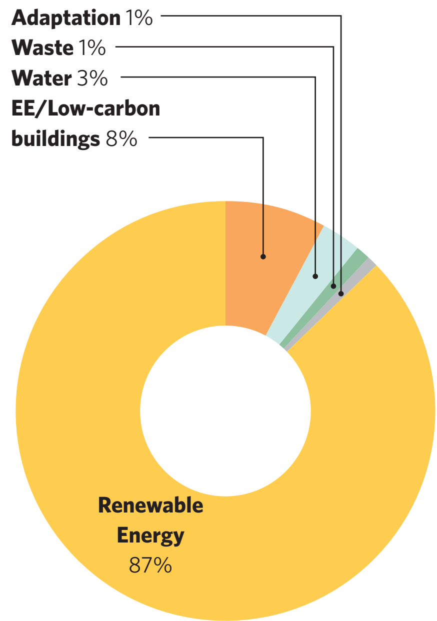
We need more KfWs!

Institutions like KfW are essential for kickstarting bond markets which usually requires a high-grade "anchor" and liquid issuance, typically government - or development bank.

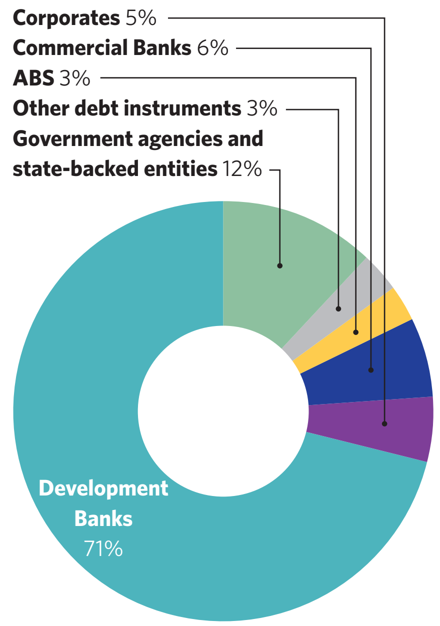
Globally, KfW is one of the largest 10 issuers to date, issuing in 5 different currencies and with an average issue size of over USD1bn. More recently, it issued a landmark EUR2bn green bond.

KfW is also using its prominent position in the market to promote the harmonisation of standards across the market by taking part in "Green Bonds - Harmonised Framework for Impact Reporting" with the World Bank and other development banks[2].

87% proceeds financing renewable energy



Split of market by issuer type



A strong policy backdrop

Germany has a history of progressive policy on green initiatives and its energy transition strategy **Energiewende** is one of the most ambitious climate strategies in the world. The policy may have big implications for the green bond market through its goal to increase renewables to 80% of power consumption by 2050 (currently 29.5%).

Germany began its **presidency of the G20** in December 2016 following on from China. As part of this, Germany has launched the GreenInvest platform to engage developing countries on green finance. GreenInvest will focus on: greening foreign direct investment, exploring the role of financial technology in advancing green finance, and enabling developing countries to participate in international cooperation to accelerate green finance[3].

While the direct implications for green bonds are unclear as of yet, the importance of green finance within the G20 has been a positive for the growth of the global green bond market through China's 2016 leadership.

Wider developments in Germany also include the initiation by the Association of German Public Banks (VÖB) of the **Green Bond Initiative Germany.**

The initiative includes an expert dialogue with stakeholders from the German market.

Furthermore, the German state of Hessen has stated its intention for **Frankfurt to become a green finance hub for Europe** and to create a **Green Finance Cluster.**

Outlook for the German market

While the growth of the green bond market has been impressive, without KfW, it would be significantlhy smaller. Our view is that the potential is huge. The fundamentals are already in place: a large bond market, a strong policy backdrop, a large manufacturing sector and base of potential issuers.

A large base of potential issuers

We estimate the potential for growth to be over EUR36bn based on outstanding bonds in climate-aligned sectors. In particular, the following sectors show strong potential:

- **Renewable energy and utilities: >EUR6bn**
Germany has a strong manufacturing sector with a number of pureplay renewable energy manufacturers as well as pureplay green utilities. Bonds outstanding from renewable energy utilities alone amounts to over EUR5.4bn.

- **Transport: >EUR20bn**
Germany has a huge rail and public transport network. Debt from Deutsche Bahn alone is over EUR20bn much of which is linked to new and existing rail infrastructure.

There is further potential from Germany's automobile industry which could follow the lead from auto manufacturers such as Toyota and Hyundai issuing ABS for auto loans for electric and low-emission vehicles.

- **Sub-sovereign bonds: >EUR10bn**
Sub-sovereign states in Germany could act as a huge source of potential issuance as they issue bonds to finance regional climate plans. Bonds issued by states and sub-sovereigns currently amount to well over EUR50bn outstanding with potential for issuance in public transport, water networks and public buildings.

- **Green Pfandbrief: >EUR5bn**
Germany has the largest building stock in the EU and a target to make its building stock largely carbon neutral by 2050[3].

At the same time, the strong German pfandbrief market is recovering after the financial crisis - pfandbrief for real estate mortgages now amount to over EUR200bn outstanding with EUR35bn issued in 2016[4].

The ambitious 2050 targets for green buildings could mean that a large percentage of new issuance could qualify as green pfandbrief with the proportion increasing as 2050 approaches. A conservative estimate is that 15% of mortgages could currently qualify as green mortgages, making annual issuance potential in excess of EUR5bn.

Five Action Points for German market participants

1. Sovereign and sub-sovereigns: issue demonstration green bonds
2. Investors: signal demand for corporate and asset-backed issuance
3. Corporate and banking sector: join the market and facilitate deal flow
4. Policy-makers: support standards and green regulatory reform
5. Central banks: strong signals to build confidence for both issuers and investors

Action points for Germany

The German market is poised for growth. The State has already played a central role through issuance from KfW and local development banks. Now, for the market to reach its much larger potential, key action is required from a range of market participants.

1. Sovereign and sub-sovereigns: issue demonstration issuance following on from the pioneering role of KfW and the State of NRW to stimulate the sub-sovereign market. Large states with bond programs, such as Berlin, are prime candidates.

A sovereign green bond from Germany would be a pivotal step for the global green bond market given the importance of German Bunds as a global benchmark.

2. Investors: signal demand for corporate and asset-backed issuance by commiting to green bond portfolios and funds.

3. Corporate issuers: use green bonds to finance capital raising plans learning lessons from pioneer issuers to understand the process and eligible assets.

The finance sector should leverage its importance within Europe to support the development of guidelines for green pfandbrief and green securitisation. Banks could act as both issuer and underwriter to facilitate deal flow and boost Frankfurt's plans to become green financial cluster.

4. Policy-makers and financial market legislators: support standards - e.g. by participating in the work of the ECBC/EMF on green mortgages. German regulators have a particular role to play in sharing experience from regulations in the pfandbrief market.

5. Central banks should send strong market signals such as those from the Bank of England. The BoE has recommended green bonds as a climate investment opportunity for asset managers and insurance firms.

1. http://treasury.worldbank.org/cmd/pdf/InformationonImpactReporting.pdf
2. http://unepinquiry.org/latest-news/german-g20-presidency-launches-greeninvest-platform/#sthash.Awxg75iF.dpuf
3. https://unfccc.int
4. https://www.pfandbrief.de/cms/_internet.nsf/tindex/en.htm

The Climate Bonds Initiative is an investor-focused not-for-profit, mobilizing debt capital markets for a rapid transition to a low-carbon economy.

All source data from Climate Bonds Initaitive, Bloomberg LLP. and Thomson Reuters.

Design: Godfrey Design

Climate Bonds Initiative

Deutsche Börse Group

Prepared by Climate Bonds Initiative.

Supported by Deutsche Börse

www.climatebonds.net