

A research publication by DZ HYP | November 2024

THE GERMAN PFANDBRIEF MARKET 2024 | 2025

Current developments in the context
of falling interest rates

dzhyp.de

TABLE OF CONTENTS

2	Preface
4	Market developments
4	The restrictive monetary policy is taking its toll
7	The long shadow of CBPP3 on the covered bond market
10	Better issuance climate, but not yet good
16	Second U-turn for interest rates since 2022
19	Pfandbrief ratings remain at a high level
21	Market for sustainable Pfandbriefe
21	Current developments
24	Different perspectives on the topic of sustainability
33	Pfandbrief overview
34	Imprint
39	DZ HYP Locations

PREFACE

Dear Ladies and Gentlemen

The European Central Bank started the second interest rate turnaround within two years by lowering the key interest rates over the summer 2024. At the same time, the German economy is not growing anymore. In this environment, the market for residential real estate in Germany is slowly starting to recover. With the mortgage pfandbrief, German banks have a proven instrument to refinance their real estate lending business.

In this study, we look at the market for pfandbriefe, which now has a volume outstanding of over 400 billion Euro, in some detail and from a variety of perspectives. The small but steady growth in recent years has been driven primarily by mortgage pfandbriefe. Who are the investors and why are pfandbriefe an interesting investment? This study also addresses these questions.

Sustainability remains important, including for the covered bond market. We therefore provide detailed background information on the requirements for green and social pfandbriefe and categorise national industry standards into various international frameworks such as the EU taxonomy. In addition, we explain how the market for sustainable covered bonds has developed in recent years.

“The German Pfandbrief Market 2024/2025” is also available in German. All current reports are available on our website www.dzhyp.de/en/about-us/market-research.

Kind regards

DZ HYP

November 2024

- » **Central banks are heralding with interest rate cuts the second U-turn since 2022, but an expansionary monetary policy is not to be expected.**
- » **Mortgage pfandbriefe fuelled growth in the first half of 2024, with the market growing to a total of EUR 403.4bn.**
- » **Sustainable pfandbriefe celebrated their tenth birthday in September 2024.**

Summary

The US Federal Reserve began its cycle of interest rate cuts in September 2024 with a large step of 50 basis points, a few months after the European Central Bank (ECB). The monetary policy of both central banks is expected to gradually become less restrictive in the coming months. However, a shift towards an expansive monetary policy is not expected by the end of 2025.

The volume of new pfandbrief issues appears to be normalising in 2024, following a number of special factors in previous years that drove primary market activity in one direction or another. In addition to the ECB's third covered bond purchase programme, these special factors certainly included the targeted longer-term refinancing transactions. The pfandbrief market grew to a volume of EUR 403.4bn as at 30 June 2024. The volume of public sector pfandbriefe remained almost constant at EUR 102bn, while mortgage pfandbriefe continued to provide slight growth impetus. Mortgage pfandbriefe reached an outstanding volume of EUR 300bn by the end of June 2024. The total volume of the liquid benchmark segment rose to EUR 205bn at the end of June 2024.

In September 2014, the first sustainable pfandbrief was issued, which was also the first ever sustainable covered bond. This still relatively young market segment therefore celebrated its tenth birthday in September 2024. With a share of around 10 per cent of new issues, sustainable covered bonds are still a rather scarce commodity and popular with investors. In our opinion, they are likely to remain so. Compared to conventional covered bonds, they have a somewhat broader investor base because they also reach investors who only invest in sustainable assets. However, this advantage of sustainable covered bonds have still not translated into significant spread premiums. The fact that sustainable and conventional pfandbriefe are trading at a similar spread level means, from an investor's perspective, that Green and Social Pfandbriefe are currently available at a bargain price.

MARKET DEVELOPMENTS

The restrictive monetary policy is taking its toll

In 2022, many central banks on both sides of the Atlantic pushed up their key interest rates in large steps to counter high inflation. Inflation rates have since fallen significantly and central banks have recently started to reduce their key interest rates again. Nevertheless, the restrictive monetary policy in the western industrialised countries is likely to have contributed to the fact that the global economy has cooled down and is currently only growing at a below-average rate. There are other reasons for this besides the interest rate trend.

Firstly, there is the world's largest economy, the United States of America (USA), where there have been fears of recession in recent years against the backdrop of rapidly rising interest rates. So far, the strong state of the US labour market in particular has prevented the economy from slipping into recession. However, this economic pillar appears to have cracked in the third quarter of 2024. The creation of new jobs slowed in the summer months. At the same time, the number of vacancies fell and the unemployment rate rose. Overall, the surplus of vacancies has therefore been reduced, meaning that the supply of labour and demand for labour from companies are once again better balanced. The overheating on the US labour market caused by the labour shortage has thus subsided. With an unemployment rate of just over 4 per cent, full employment still prevails in the US. However, the unexpected rise in the unemployment rate during the summer months gave many market participants cause for concern. Overall, the economists at DZ BANK expect growth in the USA to weaken in the second half of the year due to lower consumer demand. At the same time, however, growth rates are likely to remain slightly positive.

GLOBAL ECONOMY FAILS TO GAIN MOMENTUM AND RECOVERY IN THE EUROZONE FALTERS GROSS DOMESTIC PRODUCT GROWTH

Figures in per cent	2023	2024f	2025f
Eurozone	0.4	0.7	1.2
Germany	-0.2	0.1	0.9
France	1.1	1.2	1.1
Italy	1.0	0.7	1.1
Great Britain	0.1	1.1	1.3
Switzerland	1.3	1.1	1.6
USA	2.5	2.4	1.8
Canada	1.2	1.1	1.8
Japan	1.7	0.2	1.2
Australia	2.0	1.1	2.1
China	5.2	5.2	4.2
India	7.8	7.3	7.4
Turkey	5.1	3.0	2.8
Brazil	2.9	3.0	2.5
World	3.0	3.1	3.2

Source: Feri, LSEG, Oxford Economics, f = DZ BANK forecast

The economy in China, the world's second largest economy, remains divided. Domestic demand has long been burdened by a property crisis, which has also had a severe impact on private consumption. The measures taken by the Chinese government have not yet led to a stabilisation of the property sector. Meanwhile,

High interest rates are not the only reason for below-average growth

Economic concerns in the USA

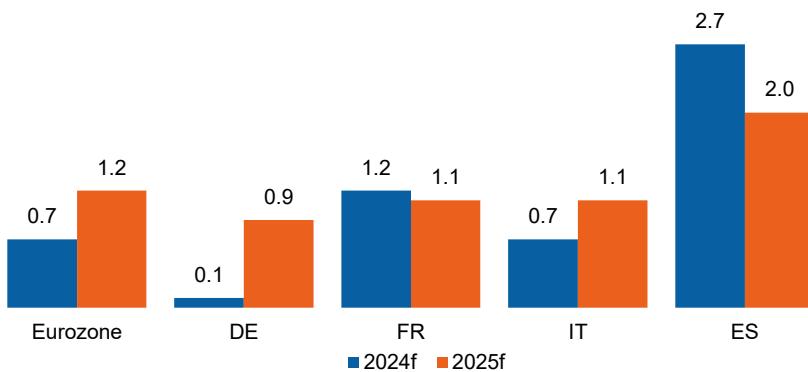
Weak domestic economy and strong exports in China

demand for housing and construction activity continue to decline. In contrast to these negative factors for the Chinese economy, foreign trade is making a positive contribution to economic growth. Against the trend of stagnating global trade, China has been able to significantly increase its exports and expand its share of global markets. This has been helped by price discounts that China's exporters can grant thanks to state subsidies. At the same time, China's imports are currently doing little more than trading water, which is further improving its net exports. However, import demand is not only burdened by the sluggish domestic economy and weak consumption. China is increasingly trying to become independent of foreign suppliers and replace them with its own products. This is particularly true in the high-tech and automotive sectors. Overall, the economists at DZ BANK have come to the conclusion that the downward pressure on Chinese economic growth will increase in the coming quarters. DZ BANK's economic experts expect gross domestic product (GDP) to grow by only 4.2 per cent in 2025, compared to 5.2 per cent in 2024. The comparatively high growth in the current year is primarily due to exports.

Germany is the third largest economy in the world and therefore an economic heavyweight within the European Union (EU) and the eurozone. However, the German economy is currently weak and lagging behind other European economies such as France, Italy and Spain. It is not just one cog that is jamming in the German growth gearbox. Rather, it is a triad of private consumption, investments and exports, none of which have really gained momentum in the current year. In contrast, the labour market is a ray of hope. The ongoing increase in employment, measured by the number of jobs, is supporting private consumption. Due to wage increases in recent months and the now lower inflation rate, consumer demand from private households could pick up again in future and thus help the economy in Germany.

Germany lags behind other European economies

**GERMANY WITH BELOW-AVERAGE GROWTH WITHIN THE EUROZONE
GROWTH IN GROSS DOMESTIC PRODUCT IN PER CENT**



Source: DZ BANK, f = forecast

The sluggish economy in Germany is also slowing economic development in the eurozone. The economists at DZ BANK nevertheless expect a moderate recovery in the eurozone in 2025, which will benefit from slightly more positive economic development in the major EU member states such as France, Italy and Spain. The moderate recovery in Germany should also make a positive contribution in 2025. However, a significant economic upturn in the eurozone is not expected in 2025. Positive growth impetus is also likely to come from private consumption at European level. The construction industry as a whole is unlikely to pick up significantly next year, even if lower inflation and falling interest rates have a positive effect.

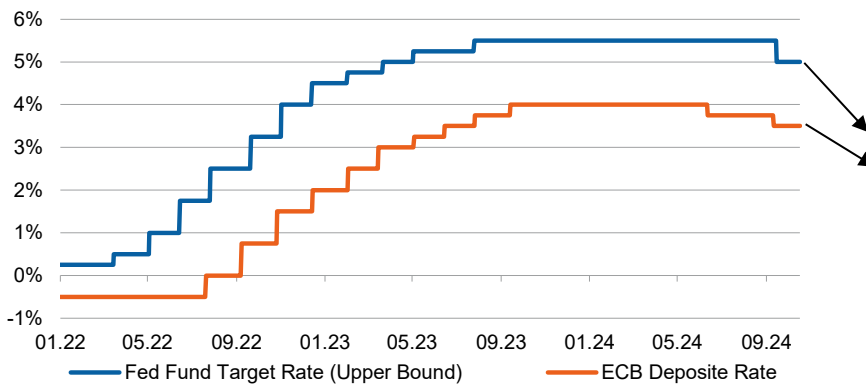
Moderate recovery in the eurozone in 2025

ECB has started to cut key interest rates before the Fed

The US Federal Reserve (Fed) began its cycle of interest rate cuts in September 2024 with a large step of 50 basis points, three months after the ECB. Following this decision, its key interest rate level is still significantly higher than the European key interest rate. This means that US monetary policy is currently still more restrictive than in the eurozone. The interest rate analysts at DZ BANK assume that the Fed will reduce its key interest rates by 25 basis points at each meeting of the Board of Governors of the Federal Reserve System until March 2025 to a level of 4.25 per cent. After that, the US monetary authorities are likely to slow down the pace and only lower their key interest rates by 25 basis points each quarter, resulting in an interest rate corridor for the Fed Fund Rate of 3.25 to 3.5 per cent by the end of 2025. This interest rate level should then be compatible with a neutral monetary policy.

Central banks aim for neutral interest rates

ECB BEGAN ITS RATE CUTS IN SUMMER 2024, FED LIKELY TO LOWER ITS KEY INTEREST RATE SLIGHTLY FASTER THAN THE ECB UNTIL MARCH 2025



Source: Bloomberg, DZ BANK

Compared to the Fed, the ECB started raising its key interest rates later in 2022 and did not increase its interest rate level as much as its American counterparts. At the same time, the ECB started lowering its key interest rates somewhat earlier in 2024, giving it a little more time overall to implement the realignment of its monetary policy. The ECB's deposit rate was reduced in two steps of 25 basis points each to 3.25 per cent in September and October 2024. In addition, as previously announced, the interest rate for the main refinancing operations has only been 15 basis points above the deposit rate since September, which is intended to increase its monetary policy significance of ECB's deposit rate. According to the interest rate analysts at DZ BANK, the ECB will reduce its deposit rate in several steps of 25 basis points per quarter to 2.25 per cent by the autumn 2025. The 2 per cent mark is currently regarded as the lower end of a neutral key interest rate level for the ECB's deposit rate. Accordingly, with a level of 2.25 per cent, the deposit rate should still be in neutral territory, which would limit the risk of fuelling inflation in the eurozone through an overly expansive monetary policy. The respective interest rate reduction cycles on both sides of the Atlantic could therefore come to an end at the end of 2025.

Interest rate reduction cycles could be completed by the end of 2025

The ECB's monetary policy is expected to gradually become less restrictive in the coming months. However, a shift to an expansive monetary policy is not to be expected by the end of 2025, and certainly not a monetary policy as expansive as before the rise in interest rates in 2022. The effects of the expansive monetary policy at that time, which also included large-scale bond purchases (including covered bonds), can still be felt on the covered bond market.

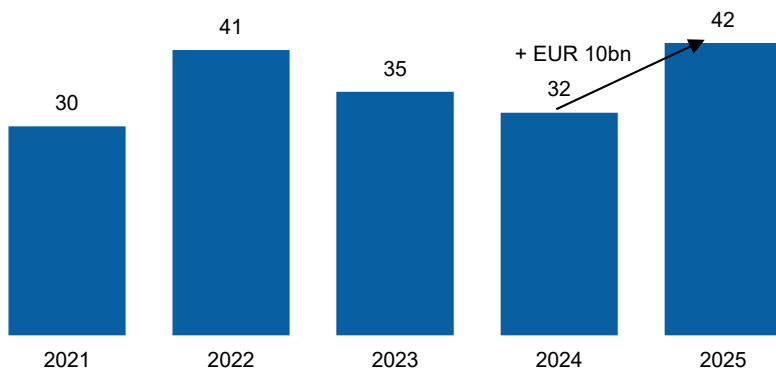
Effects of bond purchases before 2022

The long shadow of CBPP3 on the covered bond market

On 3 September 2024, the ECB once again published figures on its third covered bond purchase programme (CBPP3). The ECB has not been buying covered bonds since July 2023, so its CBPP3 portfolio is continuously shrinking. So far, so familiar. What is new is that the ECB announced at the beginning of September that in future it will publish the upcoming maturities for a rolling period of 24 months. Previously, it was only 12 months in advance. In September, the ECB presented figures up to and including July 2026 (see here). In the period from September 2024 to July 2026 inclusive, EUR 69.5bn of maturities are due in the CBPP3 portfolio. According to the ECB, EUR 42.3bn of this will already be due in 2025. In comparison: in previous years, this figure was EUR 32.2bn (full year 2024) and EUR 35.1bn (full year 2023). The maturity volume in the CBPP3 portfolio will therefore increase. The CBPP3 portfolio totalled EUR 261.9bn at the end of August 2024 and will shrink to EUR 192.4bn by July 2026 according to the ECB's figures. As a reminder, the CBPP3 portfolio peaked at just under EUR 304bn in January 2023, shortly before CBPP3 reinvestments were first reduced and then completely discontinued in July 2023.

CBPP3 portfolio shrinks to EUR 192.4bn by July 2026

SIGNIFICANT INCREASE IN CBPP3 MATURITIES IN 2025
MATURITIES IN THE CBPP3 PORTFOLIO IN EUR BN



Source: ECB, DZ BANK

In our opinion, the reduction of the CBPP3 portfolio will take a long time. The ECB had announced that the covered bonds in the CBPP3 portfolio would be held until maturity and not sold on the secondary market beforehand. In the case of the first covered bond purchase programme (CBPP1), the wind-down took around 13 years, calculated from the start of the programme in July 2009 until July 2022, when the CBPP1 portfolio fell to zero. The ECB does not provide detailed information on the maturity profile of the CBPP3 portfolio. However, we suspect that the ECB may also hold a few covered bonds with maturities of up to 30 years. At the same time, the biggest steps in the portfolio reduction are likely to take place over the next few years. The more time that passes, the less the repayments into the CBPP3 portfolio are likely to progress. If the CBPP3 holdings are not actively reduced through bond sales, as announced by the ECB, we therefore believe that there will probably still be covered bonds in the CBPP3 portfolio in 2050.

Winding down of the CBPP3 portfolio will slow down over time

OVERVIEW OF THE ECB'S COVERED BOND PURCHASE PROGRAMMES

Date	Event
July 2009	Start of purchases under CBPP1, the programme was limited to twelve months from the outset.
July 2010	End of purchases under CBPP1, covered bonds with a total volume of around EUR 61bn were purchased.
November 2011	Start of purchases under CBPP2, the duration of the programme was also limited to twelve months from the outset.
November 2012	End of purchases under CBPP2, covered bonds with a total volume of around EUR 16bn were purchased.
September 2014	The ECB announces its bond purchase programme (APP), with CBPP3 as one of the first components. There was no time limit on the purchases under CBPP3.
October 2014	The ECB begins its purchases under CBPP3.
March 2018	Originally the ECB generally issued an order of 50 per cent of the expected new issue volume for new issues eligible for purchase (primary market order). This percentage was reduced for the first time in March 2018 and gradually reduced to 5 per cent by January 2019.
January 2019	Net new purchases under CBPP3 were reduced to zero. Only the cash flows from maturing bonds were reinvested.
End of October 2019	Net new purchases are resumed under CBPP3. The primary market order is raised again to 40 per cent. By the end of June 2022 - i.e. over a period of more than three years - almost EUR 51bn in net new covered bonds had been purchased.
March 2020	ECB launched its Pandemic Emergency Purchase Programme (PEPP) to counteract the effects of the coronavirus pandemic on the eurozone economy.
March 2022	As part of the PEPP, the ECB had also purchased covered bonds with a total volume of around EUR 6bn. Net new purchases under the PEPP were discontinued at the end of March 2022. The reinvestment of maturing bonds in the PEPP portfolio is expected to continue until the end of 2024.
April 2022	The ECB is reducing its primary market order for CBPP3 to 30 per cent and was gradually reduced to zero at the beginning of March 2023.
July 2022	The volume of net new purchases in the APP has varied over time. Since July 2022, net new purchases have been reduced to zero - for the second time in the history of the APP. From July 2022 to February 2023, the cash flows from maturing bonds were fully reinvested. The last bond in the CBPP1 portfolio was redeemed in July 2022. Shortly afterwards, in September 2022, the CBPP2 portfolio fell to zero.
March 2023	The ECB is reducing its reinvestments from maturing bonds by EUR 15bn per month (figure relates to the APP as a whole). CBPP3 was also affected by this. CBPP3 purchases were reduced to around EUR 2bn to EUR 2.5bn per month.
July 2023	The ECB discontinues its CBPP3 purchases completely.
July 2050	If the bonds in the CBPP3 portfolio are not actively sold, there should still be a small CBPP3 holding on the ECB's balance sheet in 2050.

Source: European Central Bank, DZ BANK

Conclusion on the ECB's covered bond purchases

In a scientific study, it was shown that liquidity on the secondary market improved in the short term at the start of the purchase programme. However, after around half a year - i.e. from 2015 - the negative effects on market liquidity prevailed (see "Long-term liquidity effects of large-scale asset purchase programmes: Evidence from the euro covered bond market" in the September 2023 issue of *International Review of Economics & Finance*). In the initial phase of CBPP3, we believe that investors are likely to have used the opportunity to reduce some of their covered bond positions. As a result, turnover increased and so did market liquidity. The longer the programme ran, the greater became the stock effect of the CBPP3 purchases. As the ECB holds the purchased bonds until maturity, each purchase by the ECB means an effective contraction of the market. In our view, there is little hope of an improvement in liquidity for the affected bonds unless the issuers tap these bonds. Most of the affected bonds are likely to have a very low, or the run coupon, so we consider a broad wave of taps of these bonds to be very unlikely. Fortunately, market liquidity has been unaffected by CBPP3 purchases since 2023.

In addition to the undoubtedly negative impact on market liquidity, the conclusion regarding CBPP3 is that it is also proof that the ECB has supported the (covered bond) market in difficult times. The central bank has thus continued what it started in 2009 with CBPP1, even if CBPP3 was certainly not initially intended primarily to support the covered bond market. Rather, CBPP3 was motivated by monetary policy and the covered bank bonds were an effective means to an end in order to achieve the ECB's monetary policy objectives at the time. Nevertheless, the CBPP3 purchases are likely to have supported the covered bond market in difficult phases and saved it from worse during the coronavirus pandemic, for example. So if another

CBPP3 has weighed on market liquidity**CBPP3 was motivated by monetary policy, but also acted as support for the market**

existential crisis hits the market, we believe there is a high probability that the ECB will help again. This is not only of great importance for the general market development, but also for the credit ratings of international rating agencies. These honour the ECB's interest in covered bonds with rating uplifts in their methodologies. For example, Moody's & Co regularly use this or similar arguments to justify the increase in the starting point for the covered bond rating.

ESG reporting on the CBPP3 portfolio

On 25 June 2024, the ECB published its second report with climate-related financial information on its securities holdings for monetary policy reasons, which for the first time also includes information on the carbon footprint of the CBPP3 portfolio (see here). The report also includes the covered bonds purchased by the ECB as part of the Pandemic Emergency Purchase Programme (PEPP). By publishing climate-related data on its securities portfolios, the central bank says it aims to lead by example, improve transparency and support the efforts of regulators and other stakeholders to reduce gaps in climate data and reporting.

To analyse the climate risks of covered bonds, the central bank relied on issuer-specific carbon emissions data. An analysis based on the climate exposure of the cover assets was not possible due to a lack of data availability. However, the ECB is working with the supervisory authorities and data providers to improve the availability of emissions data at cover pool level and also refers to a corresponding mandate from the EU Commission to the European Banking Authority (EBA). As soon as the availability and quality of the data allow, the ECB will also include the CO₂ emissions of the cover pools in its analysis.

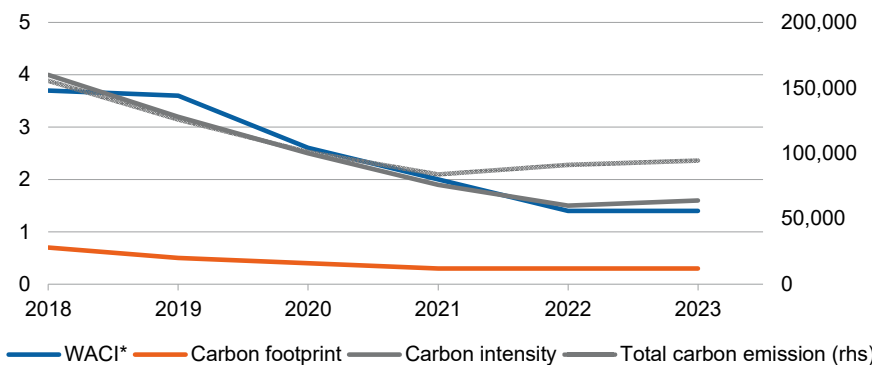
Overall, covered bond holdings are on a decarbonisation path, according to the central bank. The corresponding key figures declined in the period from 2018 to 2023. The share of green covered bonds in the CBPP3 and PEPP portfolio has increased slightly in recent years and, at 3.1 per cent at the end of 2023, is slightly higher than their share in the entire CBPP3-eligible covered bond universe (2.9 per cent). Green covered bonds are defined by the ECB as bonds that comply with the Green Bond Principles of the International Capital Market Association (ICMA). In contrast to corporate bonds, the ECB has not set itself any targets for reducing the CO₂ emissions of covered bonds.

Central bank wants to set a good example

Analysis at cover pool level as soon as data is available

ECB is on a decarbonisation path

DEVELOPMENT OF THE MAIN KEY FIGURES FOR COVERED BONDS (CBPP3 AND PEPP)
LHS.: TONNE OF CO₂ EMISSIONS PER MILLION EUROS, RHS.: TONNE OF CO EMISSIONS



Source: ISS, Carbon4 Finance, World Bank, Bloomberg, ECB calculations (see ECB report "Climate-related financial disclosures of Eurosystem assets held for monetary policy purposes and of the ECB's foreign reserves" of 25 June 2024 (page 36)), WACI = Weighted Average Carbon Intensity

We believe that the central bank is anything but satisfied with the availability of climate-related data on the cover pools. Given the announcement to work with regulators and data providers on the availability of issuance data at cover pool level, we believe this should mean that covered bond issuers will be asked to provide this data sooner rather than later. Issuers using the harmonised reporting format (HTT) would already have the option of voluntarily publishing various climate-relevant information on the buildings financed by mortgage loans, such as the energy certificate or energy consumption and CO₂ emissions. In our view, however, very few issuers have made use of this option to date. The data is currently mainly published by banks that have already issued green covered bonds. However, we assume that the ECB would like to have climate-related data on their cover pools from all issuers as far as possible.

ECB likely to exert pressure to improve data quality

Many banks face tangible problems when implementing ESG reporting. In many cases, the desired data is not even available to the banks, particularly in the case of older mortgage loans that were granted ten years ago or more. A lot of data from the existing business would have to be collected retrospectively, which would probably also require the co-operation of the borrowers. However, cooperation cannot be enforced by the banks. The data problem is therefore unlikely to be solved ad hoc, but will probably only be resolved gradually by the banks systematically collecting the relevant ESG data in their new business.

Climate data is not always available

Better issuance climate, but not yet good

Let's move on from the global climate to the issuance climate, which has improved for German pfandbrief banks in June 2024 compared to December 2023, according to a survey conducted by the Association of German Pfandbrief Banks (vdp) among its member institutions on the sentiment in the primary market for pfandbriefe and unsecured bank bonds. The results of the survey are summarised in the "vdp Issuance Climate Index" and were last published on 26 June 2024 (see here). The issuance climate index was presented for the first time in December 2022 and has been updated every six months since then. The calculated sentiment indicator, which can range from +100 (very good issuance climate) to -100 (very poor issuance climate), currently stands at -11 (December 2023: -23) for pfandbriefe and -14 (December 2023: -21) for unsecured bank bonds. The vdp members therefore still appear to be experiencing a slight headwind on the primary market. However, the situation has improved overall compared to December 2023. Banks' subdued lending business and, above all, the general interest rate trend were still cited as potential negative factors. We suspect that the uncertainty among market participants triggered by the early parliamentary elections in France in June 2024 has not made it any easier for pfandbrief banks with their new issues.

vdp Issuance Climate Index improved recently, but issuers are still experiencing headwinds

VDP ISSUING CLIMATE FOR PFANDBRIEFE HAS RECENTLY IMPROVED AGAIN SCORE VALUES FROM -100 TO +100 POSSIBLE, A NEGATIVE VALUE INDICATES A GLOOMY ISSUANCE CLIMATE

	June 2024	December 2023	June 2023	December 2022
Score for pfandbriefe	-11	-23	-14	-10
Score for unsecured bank bonds	-14	-21	-29	-26
Total score	-12	-22	-21	-17

Source: Association of German Pfandbrief Banks, DZ BANK

In October 2024, the vdp also reported that, despite the current challenging issuing climate, new pfandbriefe with a total volume of EUR 44.7bn were issued in the first nine months of 2024. This is 2 per cent more than in the same period last year. However, the pfandbrief market is drawing on a very active first half of the year and appears to be slowly losing momentum in the third quarter 2024. Every year, the summer break on the primary market usually ends around mid-August, and this year was no exception. And as is so often the case, it was once again German pfandbrief banks that opened the market for large-volume new euro issues. However, issuers have not yet managed to keep the momentum from the first half of the year into the third quarter. Unsecured and subordinated bank bonds (new issues in euro benchmark format) performed better than covered bonds (including pfandbriefe) on the primary market in the first half of September. In terms of the composition of new pfandbriefe from 2024, the vdp reported that mortgage pfandbriefe, at EUR 33.2bn, were unsurprisingly well ahead of public sector pfandbriefe, which accounted for EUR 11.0bn. According to the vdp, ship pfandbriefe had a new issue volume of a bit more than EUR 0.5bn in the period mentioned. According to our calculations based on data from Bloomberg, new covered bonds in the euro benchmark format (including taps) accounted for EUR 25.5bn from January to September 2024 inclusive and EUR 0.75bn for covered bonds in the sub-benchmark format. Compared to the same period of the previous year, there has thus been a decline in both bond formats. In our opinion, this suggests that private placements played a greater role in the first eight months of the current year than in 2023.

New issue volume growing ever more slowly

**FOCUS REMAINS ON MORTGAGE PFANDBRIEFE
NEW ISSUE VOLUME OF GERMAN PFANDBRIEFE IN EUR BN**

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Mortgage pfandbriefe	29.1	40.4	35.1	36.8	43.2	42.0	40.2	45.8	67.3	51.5	33.2
Public sector pfandbriefe	15.3	15.5	10.4	11.9	7.2	11.2	19.1	18.3	14.2	13.8	11.0
Ship & aircraft pfandbriefe	1.4	2.2	0.0	0.0	0.0	1.8	0.5	0.6	0.8	0.4	0.5
Total	45.9	58.1	45.4	48.8	50.4	55.0	59.8	64.7	82.3	65.7	44.7

Source: vdp, DZ BANK, figures for 2014 and up to 2023 relate to the year as a whole, figures for 2024 from the beginning of the year up to and including September.

Overall, it should be noted that the volume of new pfandbrief issues appears to be normalising in 2024, following a number of special factors in previous years that drove primary market activity in one direction or another. In addition to CBPP3, these special factors certainly included the targeted longer-term refinancing operations (TLTRO III). The last tranche of TLTRO loans must also be repaid by the end of 2024. At the beginning of September 2024, a total of EUR 76.5bn was still outstanding, of which, according to the ECB, EUR 47.3bn had to be repaid either on schedule or early at the end of September. This means that only around EUR 29.2bn remains to be repaid by the banks in December 2024. By then, the banks' mountain of debt to the ECB, which once peaked at over EUR 2.1tr, will have been completely repaid.

One-off effects have repeatedly influenced the volume of new issues

Data from various sources all point in the same direction

The Deutsche Bundesbank's figures in the table below relate to the entire German pfandbrief market. They therefore differ slightly from the data published by the vdp because, as we understand it, the vdp relies on data from its members for new issues, although not all German pfandbrief banks are represented in the association. According to the German Bundesbank, the volume of new issues in the first half of 2024 totalled around EUR 36bn, slightly higher than the EUR 34 bn in the first half of 2023.

New issue volume of around EUR 36bn in the first half of 2024

2024 IS LIKELY TO FALL SHORT OF THE HIGH GROSS NEW ISSUANCE VOLUME OF 2023

New issuance volume in EUR bn	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024*
Mortgage, ship and aircraft pfandbriefe	43	35	37	43	44	41	44	72	50.4	27.5
Public sector pfandbriefe	16	10	12	7	11	19	18	14	13.6	8.4

Source: Deutsche Bundesbank, DZ BANK, * Data for 2024 up to and including 30 June

In the following, we use figures from the Deutsche Bundesbank, the vdp and data that we have collected from information from issuers and Bloomberg. As already mentioned, the data from the various sources do not completely match. However, we consider the overlap to be large enough to derive a few general statements.

According to Deutsche Bundesbank, the volume outstanding rose to EUR 395bn at the end of 2023. The vdp already reported EUR 400bn at this time. In the first half of 2024, the pfandbrief market grew to a volume of EUR 403.4bn as at 30 June 2024.

The volume of public sector pfandbriefe remained constant at EUR 102bn, while mortgage pfandbriefe continued to provide slight growth impetus. Mortgage pfandbriefe reached an outstanding volume of EUR 300bn by the middle of the year. The outstanding volume of ship pfandbriefe fell to EUR 1.3bn. The last aircraft pfandbrief to date was repaid in 2019; since then, this refinancing instrument has not been utilised again by any issuer.

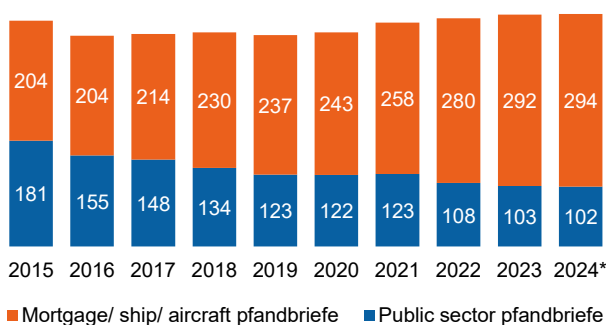
Mortgage pfandbriefe continue to stimulate growth

Liquid benchmark pfandbriefe remain on course for growth

The share of pfandbriefe in the euro benchmark format (issue volume of at least EUR 500m) increased slightly to 52 per cent of the total volume outstanding in the first half of 2024. The total volume of this liquid market segment thus rose to EUR 205bn at the end of June 2024. At the same time, the volume of sub-benchmark Pfandbriefe (issue volume of at least EUR 250m but less than EUR 500m) remained at the previous year's level of around EUR 16bn. We have only included publicly placed, syndicated new issues in these figures. The sub-benchmark market niche is currently dominated by Finnish, Austrian and German banks.

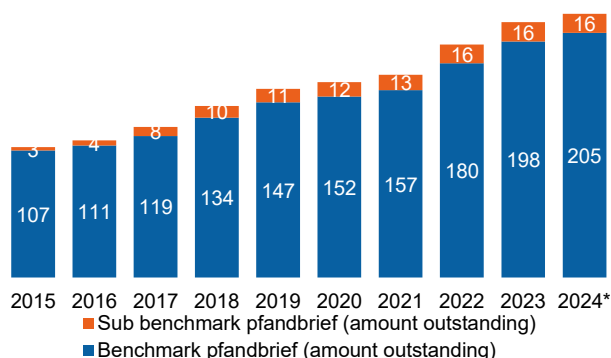
Market segment for liquid benchmark pfandbriefe is growing

MORTGAGE PFANDBRIEFE REMAIN ON COURSE FOR GROWTH DESPITE LOW LEVEL OF NEW BUSINESS VOLUME OUTSTANDING IN EUR BN



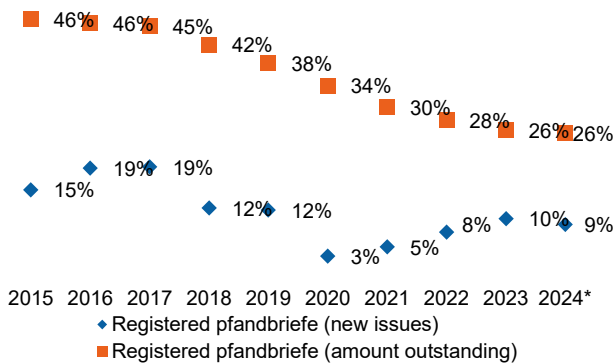
Source: Deutsche Bundesbank, DZ BANK, * Data for 2024 as at 30 June 2024

GROWTH PRIMARILY IN LIQUID PFANDBRIEFE WITH A FOCUS ON THE EURO BENCHMARK FORMAT VOLUME OUTSTANDING IN EUR BN



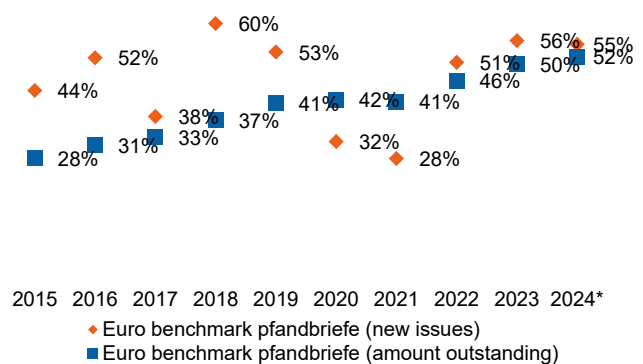
Source: Bloomberg, DZ BANK, * Figures for 2024 as at 30 June 2024, figures relate exclusively to publicly placed (syndicated) new pfandbrief issues

THE SHARE OF REGISTERED PFANDBRIEFE IN THE VOLUME OUTSTANDING STABILISED AT 26 PER CENT



Source: Deutsche Bundesbank, DZ BANK, * Data for 2024 as at 30 June 2024

EURO BENCHMARK PFANDBRIEFE GAIN SHARE OF OUTSTANDING VOLUME



Source: Bloomberg, Deutsche Bundesbank, DZ BANK, * Data for 2024 as at 30 June 2024

Compared to other countries, the market segment for German benchmark pfandbriefe is characterised by the fact that there are a particularly large number of different issuers. In 2024, 21 German banks have already issued pfandbriefe in benchmark format. In 2022 and 2023, there were 17 and 19 issuers respectively. This makes Germany by far the largest segment of the 99 benchmark issuers from 20 countries that have come to the market so far in 2024 (as at 22 September 2024). By comparison, eleven issuers from France have issued benchmark covered bonds so far, nine from Italy, seven from Austria and only three from Canada. The flip side is that the volumes per issuer in Germany lag behind those of French or Canadian banks, for example. Although there are fewer issuers there, they generally bring very high volumes of new issues to the market year after year.

21 euro benchmark issuers come from Germany

At the same time, the share of registered pfandbriefe (namenspfandbriefe) stabilised at 26 per cent after years of decline. At the latest with the interest rate turnaround in 2022, when many central banks quickly raised their key interest rates, investors for registered covered bonds appear to be gradually returning to the market, meaning that the share of registered covered bonds in the new issue volume has risen again slightly compared to the low point in 2020.

More registered pfandbriefe again

Foreign currency pfandbrief with very low market share

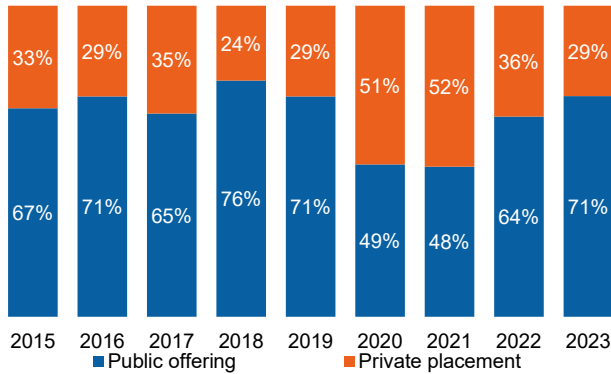
According to the vdp, the euro remained by far the main issuing currency for German pfandbrief banks in 2023. The share of new pfandbrief issues in foreign currency was just 3 per cent in 2023, the same as in the previous year. This low figure is not unusual, even in the longer term. In the past ten years, the share of new pfandbrief issues in foreign currency never exceeded 12 per cent. The typical pfandbrief investors are based in the eurozone and are therefore likely to have a preference for the single European currency.

Pfandbriefe in foreign currency play only a minor role

Among the foreign currencies, the US dollar and the pound sterling have taken centre stage for German pfandbrief banks in recent years. These foreign currency pfandbriefe were primarily issued by banks that also write corresponding lending business in these currencies. The Swiss franc has become more attractive as an issuing currency for issuers since 2022, and not just for German pfandbrief banks. As a result, there has recently been more activity on the primary market in this currency area, even if the overall volume of new issues is manageable compared to the euro.

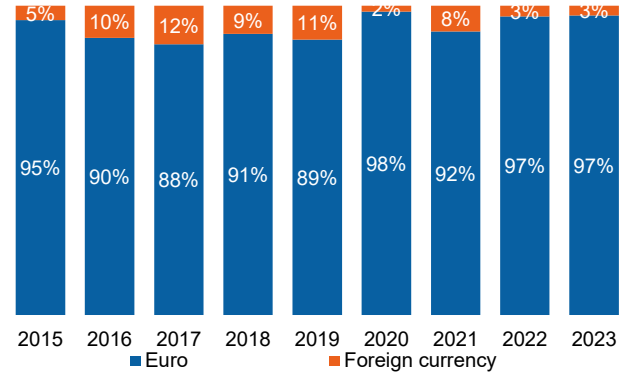
Importance of the Swiss franc increased recently

**SHARE OF PUBLICLY PLACED PFANDBRIEFE NORMALISES AFTER THE TWO CORONAVIRUS YEARS
DISTRIBUTION OF ALL NEW PFANDBRIEF ISSUES**



Source: vdp, DZ BANK

**EURO IS BY FAR THE MOST IMPORTANT ISSUING CURRENCY FOR GERMAN PFANDBRIEF BANKS
DISTRIBUTION OF ALL NEW PFANDBRIEF ISSUES**

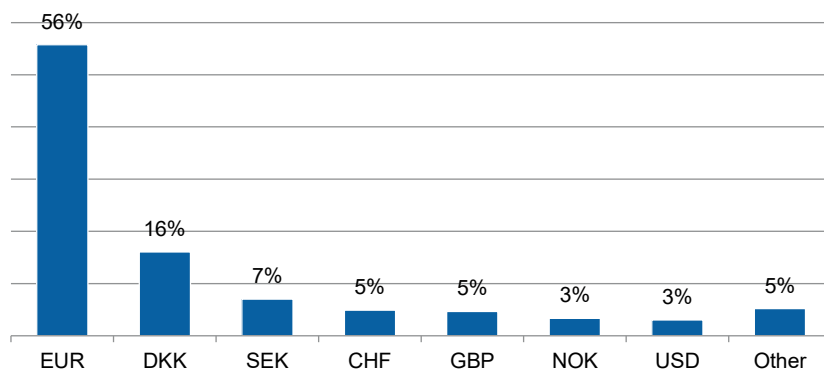


Source: vdp, DZ BANK

In terms of the global covered bond market, according to our calculations based on figures from Bloomberg and the European Covered Bond Council, the euro had a market share of 56 per cent of all new issues in 2023. The next most important issuing currencies were the Danish krone, the Swedish krona and the Swiss franc. Only then came the British pound. The new issue volume of covered bonds denominated in Norwegian krone was even slightly ahead of the US dollar in 2023. These figures underline the fact that many issuers have a preference for their home currency in order to better reach their domestic investor base. The euro is probably the only currency in the covered bond market that is also very important for issuers from countries outside the eurozone, because the investor base for covered bonds in the eurozone, and not least in Germany, is very ready.

Euro is the most important issuing currency

**EURO DOMINATES THE GLOBAL COVERED BOND MARKET AS THE ISSUING CURRENCY
DISTRIBUTION OF THE GLOBAL GROSS NEW ISSUANCE VOLUME (ALL COVERED BONDS)**



Source: Bloomberg, European Covered Bond Council, as at 31.12.2023

Domestic investors of great importance for pfandbrief banks

The charts below show how important the domestic investor base is. For the order books of euro benchmark covered bonds, we have analysed information on the proportion of investors from the DACH region (investors from Germany, Austria and Switzerland). There is also information on the proportion of German investors. However, these are not always available separately and are often only taken into account in the DACH region. In order to have a broad data basis, we therefore

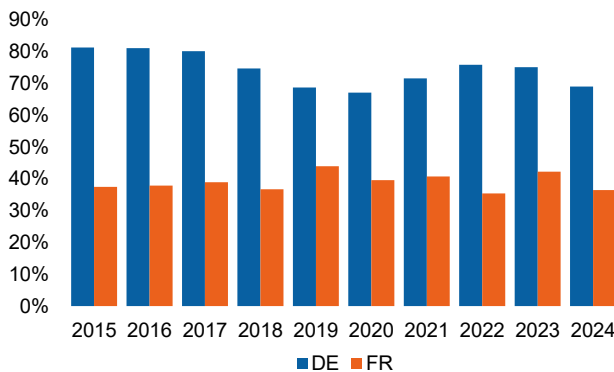
Importance of domestic investors using the example of Germany and France

analyse the DACH region, where the share of German investors is by far the largest. The share of French investors in the order books of euro benchmark new issues is usually shown separately.

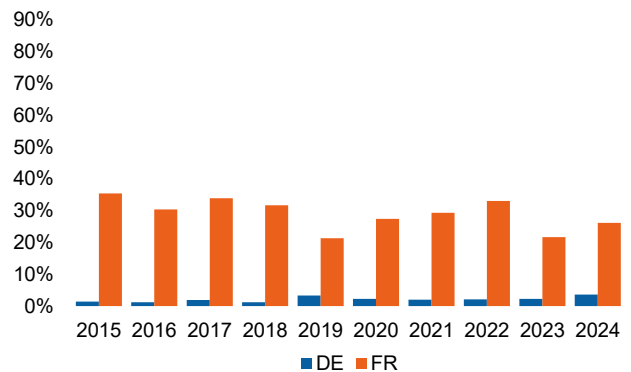
The share of DACH investors in the case of German pfandbriefe is very high with annual averages of 67 to 81 per cent between 2015 and 2024, making them the dominant investor group. In contrast, investors from France only play a minor role for German pfandbrief banks at 1 to 4 per cent. The DACH region is home to a significant proportion of investors for covered bond issuers worldwide (in relation to euro benchmark covered bonds, although the few exceptions confirm this rule). Accordingly, DACH investors also account for a notable share of 35 to 44 per cent of French covered bonds, which even exceeds the share of French investors, who generally account for 22 to 35 per cent in the respective annual averages. These figures for the two largest country segments in the market for euro benchmark covered bonds are only anecdotal evidence of how important domestic investors are for covered bond issuers. Investors from the DACH region are not only important for German pfandbrief banks, but are relevant for all issuers of euro benchmark covered bonds worldwide.

Strong investor base for pfandbriefe and international covered bonds in Germany

**SHARE OF DACH INVESTORS IN PFANDBRIEFE SIGNIFICANTLY HIGHER THAN IN FRENCH COVERED BONDS
SHARE OF INVESTORS FROM THE DACH REGION IN THE ORDER BOOK FOR EURO BENCHMARK NEW ISSUES, ANNUAL AVERAGES**



**DOMESTIC INVESTOR BASE FOR FRENCH COVERED BONDS SIGNIFICANTLY LOWER THAN FOR PFANDBRIEFE
SHARES OF INVESTORS FROM FRANCE IN THE ORDER BOOK FOR EURO BENCHMARK NEW ISSUES, ANNUAL AVERAGES**



Source: IGM, Bloomberg, DZ BANK, data for 2024 up to and including 31 August, DACH = Germany, Austria, Switzerland, DE (FR) = new issues by German (French) banks

Source: IGM, Bloomberg, DZ BANK, data for 2024 up to and including 31 August, DE (FR) = new issues by German (French) banks

Pfandbriefe with a volume of EUR 66bn in the CBPP3 portfolio

Thanks to its CBPP3 purchases, the ECB has become probably the largest covered bond investor. The CBPP3 portfolio is gradually being reduced. Despite the reduction in covered bond holdings, according to our calculations based on figures from the central bank, the ECB is likely to still own German covered bonds with a volume of around EUR 66bn in its CBPP3 portfolio alone (as at 31 March 2024). This is around EUR 6bn less than at the end of the first quarter of 2023. In the case of CBPP3-eligible new issues, such as those from Germany and France, the lack of ECB demand since 2023 has been compensated for by a higher proportion of banks and, in some cases, asset managers. We suspect that the proportion of banks would have systematically increased anyway, mainly due to regulatory incentives. For example, the minimum liquidity ratio (LCR) was introduced in 2015, which requires banks to cover net cash outflows for the next 30 days with liquid assets. Euro benchmark covered bonds that fulfil certain requirements, for example with regard to their ratings, can be used by banks as high-quality assets (HQLA) for their liquidity reserve. A systematic increase in demand from banks for euro benchmark covered

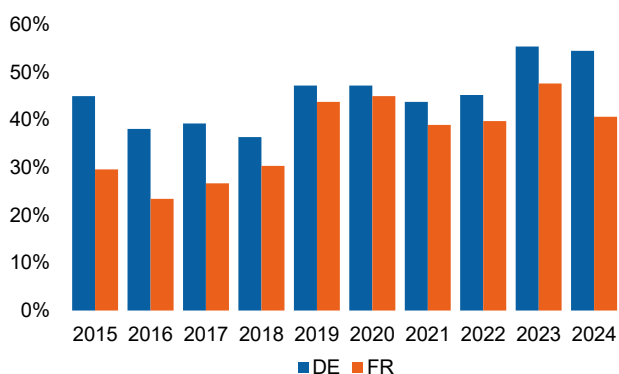
Banks have regulatory incentives to buy covered bonds

bonds would therefore not be surprising. This effect is difficult to quantify, however, because it was overshadowed by the CBPP3 purchases between 2015 and 2023. In our opinion, the figures on LCR-eligible new issues in the euro benchmark format do provide some evidence in favour of this thesis. Before 2014, the share of banks in the order books of these covered bonds was between 35 per cent and 40 per cent. In 2023, this share was significantly higher at an average of 57 per cent.

The shift in the importance of bank investors in relation to central banks and other public institutions is discussed in more detail below for Germany and France. The share of CBPP3 purchases by the ECB in the order books of new issues up to 2023 is not precisely known. However, it can be seen that the share of central banks and public institutions in the order books for German pfandbriefe and French covered bonds was also above average in the years in which the ECB bought particularly intensively on the primary market. A direct comparison of Germany and France in the charts below also shows that the share of central banks and public institutions was higher for French covered bonds than for pfandbriefe. The share of this investor group remained noticeably higher for French covered bonds than for pfandbriefe even after the end of the CBPP3 purchases. After the ECB stopped buying as much for CBPP3 and later, from 2023, not at all on the primary market, the gap was closed by banks, among others, as already mentioned. The proportion of bank investors is very high for both German and French issuers, but noticeably higher in the case of German pfandbriefe. In our view, the pfandbrief banks thus compensated for the lower demand from central banks and public institutions on the primary market to a greater extent with investors from the banking sector.

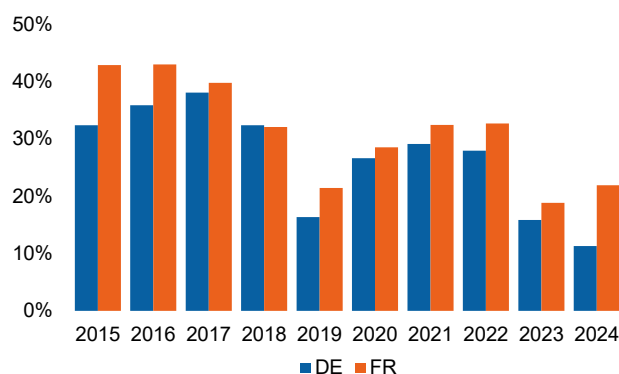
Banks closed the gap left by the lack of CBPP3 purchases

RISING SHARE OF BANKS IN THE ORDER BOOKS FOR PFANDBRIEFE
SHARE OF BANKS IN THE ORDER BOOK FOR EURO BENCHMARK
NEW ISSUES, ANNUAL AVERAGES



Source: IGM, Bloomberg, DZ BANK, data for 2024 up to and including 31 August, DE (FR) = new issues by German (French) banks

HIGHER SHARE OF CENTRAL BANKS IN THE ORDER BOOKS OF
FRENCH BANKS COMPARED TO PFANDBRIEFE
SHARES OF CENTRAL BANKS AND PUBLIC INSTITUTIONS IN THE
ORDER BOOK FOR EURO BENCHMARK NEW ISSUES, ANNUAL
AVERAGES



Source: IGM, Bloomberg, DZ BANK, data for 2024 up to and including 31 August, DE (FR) = new issues by German (French) banks

Second U-turn for interest rates since 2022

The rise in yields that began in 2022 is likely to have prompted many investors who had turned their backs on covered bonds and the pfandbrief market during the period of negative yields to return. However, yields have already peaked again, meaning that the second U-turn for interest rates since 2022 is already in full swing. However, despite yields falling again in the meantime, the returning investors have remained in the covered bond market.

Investors have returned to stay

The euro swap rate curve is still very flat and is not normally shaped everywhere. Swap rates are currently highest at the short and long ends. At the belly of the curve, swap rates are around 10 to 12 basis points lower than the two-year swap rate (as at September 2024). According to the interest rate experts at DZ BANK, the curve will normalise step by step over the next few months. This means that yields for shorter maturities will be lower than for longer maturities again. However, the swap curve will remain flat over the next twelve to fifteen months. According to DZ BANK's interest rate analysts, the yield spread between the two- and ten-year swap rates (2/10 spread) will be just 30 basis points towards the end of 2025. The 2/5 spread will only reach around 15 basis points at the same time. However, the yield curve in the maturity range of one to ten years will probably return to normal across the board by the end of 2025 if the forecast quoted is correct.

Normalisation of the swap curve by the end of 2025 according to the DZ BANK forecast

DZ BANK FORECAST FOR EURO SWAP RATES: CURVE NORMALISES GRADUALLY UNTIL THE END OF 2025

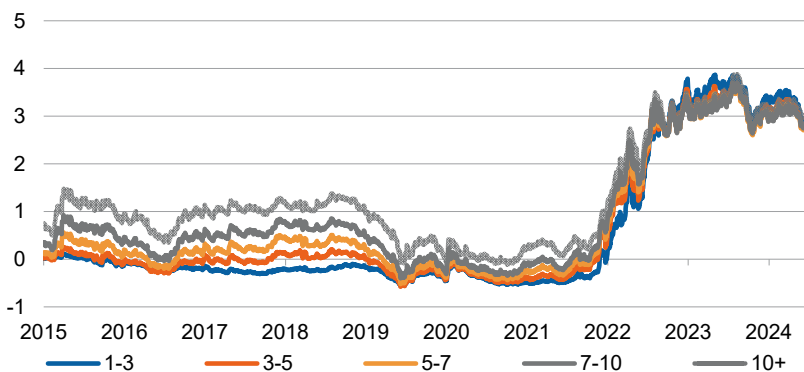
Figures in per cent	13.09.2024	+ 3 months	+6 months	+12 months	31.12.2025
1 year	2.87	2.85	2.70	2.40	2.25
2 years	2.45	2.45	2.20	2.15	2.35
3 years	2.33	2.46	2.20	2.18	2.41
4 years	2.30	2.48	2.21	2.26	2.46
5 years	2.30	2.50	2.25	2.30	2.50
6 years	2.31	2.48	2.25	2.31	2.54
7 years	2.32	2.49	2.27	2.35	2.57
8 years	2.34	2.50	2.28	2.38	2.60
9 years	2.36	2.50	2.28	2.40	2.63
10 years	2.39	2.45	2.25	2.40	2.65

Source: Bloomberg, DZ BANK

Pfandbrief yields are likely to track the movement in the swap curve. Yields on the German covered bond market began to fall towards the end of 2023 (measured by the sub-indices by maturity for Germany in the iBoxx € Covered Index). This trend continued until autumn 2024, although there were the odd counter-movements in yields. Based on Markit data for the iBoxx € Covered Index and its sub-indices, the yield curve for German pfandbriefe is currently very flat for short to medium maturities and then follows a normal, i.e. rising, trajectory. The normalisation of the pfandbrief yield curve is almost complete as of September 2024.

Flat curve for short to medium terms

**YIELD CURVE IS CURRENTLY VERY FLAT FOR SHORT TO MEDIUM MATURITIES
YIELDS IN PER CENT, SUB-INDICES BY MATURITY IN YEARS FOR GERMAN PFANDBRIEFE IN
THE IBOXX € COVERED INDEX**

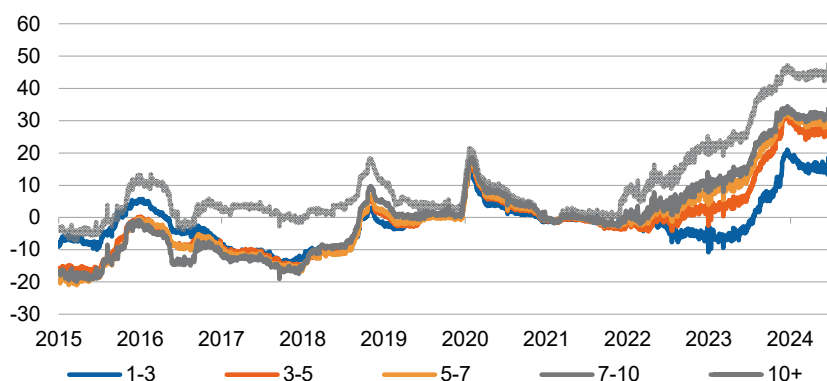


Source: Markit, Bloomberg, DZ BANK, as at 18.09.2024

One component of the pfandbrief yield is the premium over the swap curve (swap spread). The swap spreads of German pfandbriefe within the iBoxx € Covered Index increased until spring 2024 and then moved sideways, with repeated spread widening of a few basis points up and down. As spreads widened, swap spreads in the medium maturity range became more differentiated. As a result, the swap spread curve of the pfandbrief market has now also returned to a normal shape again, even if the curve is still relatively flat for maturities of three to ten years (based on the sub-indices by maturity for German Pfandbriefe in the iBoxx € Covered Index, as at September 2024).

Swap spreads have become more differentiated in the medium maturity range

SPREAD INCREASE FROM AUTUMN 2023 TO EARLY 2024 RESULTED IN A SIDEWAYS MOVEMENT
SWAP SPREAD (Z-SPREAD) IN BASIS POINTS, SUB-INDICES FOR GERMAN PFANDBRIEFE FOR VARIOUS MATURITY BANDS (IN YEARS) IN THE IBOXX € COVERED INDEX



Source: Markit, Bloomberg, DZ BANK, as at 18.09.2024

Widening of swap spreads in spring 2024

In February 2024, investors once again became increasingly concerned about commercial real estate (CRE) financing from banks after a US regional bank in this business segment reported an unexpectedly high impairment (risk provisioning) at the end of January 2024. A year earlier, US regional banks had already caused unrest on the market for bank bonds, which had also affected covered bonds at the time. In February 2024, the focus of interest was particularly on banks that specialise in commercial real estate financing and also have significant US CRE exposure. The risk premiums of the pfandbriefe of these issuers rose significantly in February 2024 and disproportionately compared to other pfandbrief banks. In contrast, the swap spreads of other major German pfandbrief issuers recorded hardly any above-average spread widening compared to the iBoxx € Covered Index. Even though the drastic widening of spreads remained limited to a few issuers, there was a noticeable increase in risk aversion among investors towards covered bonds with CRE exposure. As a result, the swap spread of the iBoxx € Germany Covered Index increased by a whopping 5 basis points between the end of January and 19 February 2024, underperforming the market as a whole at the time. Ultimately, the CRE issue receded into the background after a few weeks and the spread trend calmed down again.

Focus on CRE exposure returned to the agenda at the beginning of 2024

Overall, it should be noted that the swap spreads of other pfandbrief banks were not infected by the widening spreads of the CRE specialised lenders. In our opinion, this is not a matter of course. CRE exposures are the rule rather than the exception in cover pools for mortgage pfandbriefe from German issuers. CRE financing abroad is also not uncommon, although both the scope of CRE exposure and the degree of international diversification can vary significantly from bank to bank. In February

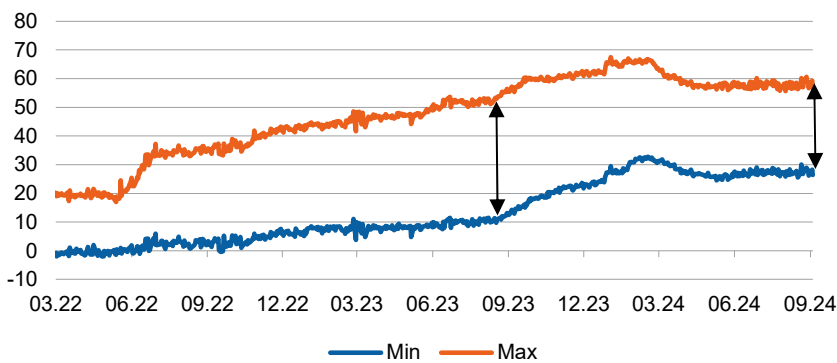
CRE exposures is not uncommon in German cover pools

2024, investors reacted particularly sensitively to CRE financiers that were not part of a larger financial network and at the same time operated a business model with a strong international focus.

Ultimately, all mortgage pfandbriefe are subject to the same strict requirements of the German Pfandbrief Act, which contains several protective mechanisms for investors, such as the mortgage lending value concept and the mortgage lending value limit of 60 per cent. Despite these safety nets, investors differed significantly in terms of their spread expectations. This actually only confirms our thesis that the end of CBPP3 purchases has created more room for differentiation in risk premiums. This example also shows that - as we expected - the volatility of swap spreads can be significantly higher without the stabilising CBPP3 purchases than when with active CBPP3 purchases. We would book both under the normalisation of conditions on the covered bond market and see this less as a vote of no confidence by investors in the pfandbrief per se.

Strong spread differentiation and higher volatility come as no surprise

LESS DIFFERENTIATION IN RISK PREMIUMS AT THE MACRO LEVEL BETWEEN THE COUNTRY SUB-INDICES IN THE IBOXX € COVERED INDEX SWAP SPREADS IN BASIS POINTS



Source: Bloomberg, Markit, DZ BANK, as at 18.09.2024, 17:00h
Min (Max) = lowest (highest) swap spread for a country sub-index in the iBoxx € Covered Index (based on eurozone countries excluding Ireland)

However, the greater spread differentiation that took place in the microcosm of the covered bond market cannot be observed within the eurozone at the macro level for the country sub-indices in the iBoxx € Covered Index in 2024. There, the swap spreads of the various sub-indices have moved towards each other over the past twelve months. This means that the countries with the highest and lowest average risk premiums were no longer as far apart in September 2024 as they had been in the twelve months previously. The decisive factor for this development is likely to have been the demand behaviour of investors, who have apparently preferred covered bonds with higher risk premiums in recent months.

Risk premiums of the country segments in the iBoxx € Covered Index moved towards each other

Pfandbrief ratings remain at a high level

In September 2024, Moody's published a total of 41 ratings for covered bonds from Germany. This puts Moody's clearly ahead of Fitch with a total of eleven ratings and S&P with a total of seven ratings. Mortgage Pfandbriefe dominate at all three agencies. Public sector pfandbriefe are the second strongest asset class. In Germany, there are still old pfandbrief programmes that are protected by the Act on Pfandbriefe and Related Bonds of Public-Sector Banks (ÖPG). We have grouped these programmes together with DZ BANK Briefe and Deutsche Bank's structured

Rating agencies predominantly award top marks for German pfandbriefe

covered bond programme under "Other covered bonds" in the table below. In terms of ratings, the top grades AAA (64 per cent at Fitch and 86 per cent at S&P) and Aaa (93 per cent at Moody's) dominate. Due to the increasing number of issuers issuing publicly placed pfandbriefe in benchmark or sub-benchmark format, the number of pfandbrief ratings has risen slowly step by step in recent years (especially for savings banks).

**MOODY'S IS AHEAD OF FITCH AND S&P IN TERMS OF RATINGS FOR GERMAN PFANDBRIEFE
NUMBER OF PFANDBRIEF RATINGS, AS AT 24.09.2024**

	Mortgages pfandbriefe	Public sector pfandbriefe	Ship pfandbriefe	Other covered bonds*	AAA/Aaa	AA+/Aa1	AA/Aa2	AA/Aa3
Fitch	7	2	0	2	7	4	0	0
Moody's	26	12	1	2	38	2	0	1
S&P	4	1	0	2	6	1	0	0

Source: Rating agencies, DZ BANK, * other covered bonds including DZ BANK Briefe, pfandbrief programmes in accordance with ÖPG and Deutsche Bank's structured covered bond programme (Alpspitze)

The three rating agencies mentioned are likely to be the most important in the global covered bond market and the pfandbrief market. In addition to the three major agencies, there are also Morningstar DBRS and Scope Ratings, whose covered bond ratings are also recognised and accepted by the ECB. However, Morningstar DBRS and Scope Ratings have currently published significantly fewer pfandbrief ratings than Moody's, Fitch or S&P, which is why we have refrained from presenting them in detail in the comparative overview above.

**Morningstar DBRS and Scope
Ratings are also active in the
pfandbrief market**

MARKET FOR SUSTAINABLE PFANDBRIEFE

Current developments

In September 2014, Münchener Hypothekbank issued the first sustainable pfandbrief, which was also the first ever sustainable covered bond. This still relatively young market segment could celebrate its tenth birthday in September 2024. The new issue volume of sustainable pfandbriefe and covered bonds was exactly EUR 13bn as at 20 September 2024. This figure only includes euro-denominated covered bonds with a volume of at least EUR 250m that were publicly placed (syndicated). This means that this year's new issue volume is slightly below the comparable figure for the same period last year. In the first eight months of 2023, sustainable covered bonds with a volume of more than EUR 16bn have already been issued.

The share of sustainable covered bonds in all new benchmark issues was around 10 per cent in the first eight months of 2024, slightly below the figure for 2023 as a whole. In a longer-term historical comparison, this figure is nevertheless quite high. The highest share of sustainable covered bonds in the new issue volume of euro benchmark covered bonds observed to date was just under 17 per cent in 2021. However, in our view, this figure is an upward outlier, as the new issue volume in that year was very low overall (due to one-off effects).

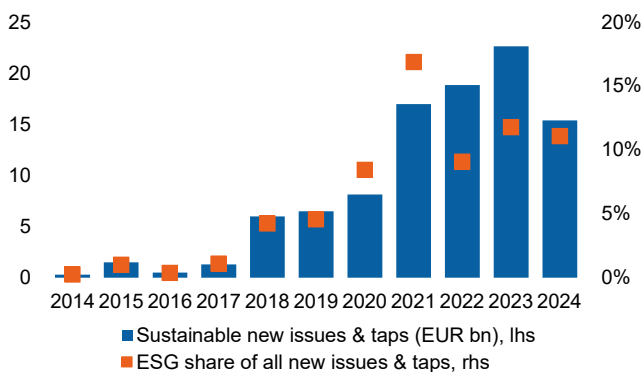
Compared to the market for unsecured bonds, however, the covered bond market is still lagging far behind. The share of sustainable new issues of senior and subordinated bank bonds was close to 23 per cent in the years 2021 to 2023. Although sustainable new issues in the market for unsecured bank bonds got off to a weak start in 2024, they have since caught up again, with their share levelling off at around 20 per cent in mid-September. Banks therefore appear to prefer to issue their sustainable bonds in an unsecured format.

Ten years of sustainable pfandbriefe

Share of new issues around 10 per cent

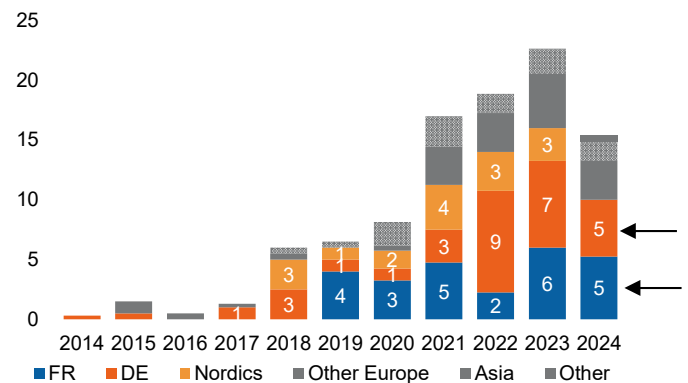
More activity in the market for sustainable unsecured bonds

SOLID NEW ISSUE VOLUME IN 2024 AFTER RECORD YEAR 2023
FIGURES IN EUR BN (RHS), IN PER CENT (LHS)



Source: Bloomberg, DZ BANK, figures for 2024 as at 26.09.2024, figures relate to euro-denominated covered bonds with an outstanding volume of at least EUR 250m

MOST SUSTAINABLE NEW ISSUES TO DATE HAVE COME FROM GERMANY AND FRANCE
GROSS NEW ISSUANCE VOLUME IN EUR BN



Source: Bloomberg, DZ BANK, figures for 2024 as at 26.09.2024, figures relate to euro-denominated covered bonds with an outstanding volume of at least EUR 250m

Germany and France remain the two country segments with the highest volumes. Compared to the two very strong previous years, the issuing activity of the German pfandbrief banks has fallen slightly so far in 2024. With new issues with a volume of EUR 4.75bn, German issuers are slightly behind of French covered bond issuers up to 26 September 2024. At EUR 27.3bn, sustainable covered bonds from Germany

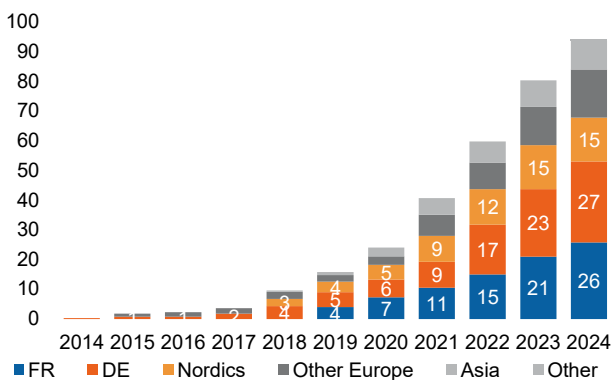
Germany is the largest country segment in the market for sustainable covered bonds

are also ahead of their French counterparts at EUR 25.8bn in terms of volume outstanding at this time, making them the largest country segment. The share of sustainable pfandbriefe in the total amount outstanding of German pfandbriefe was around 7 percent as at 30 June 2024.

The growth rate for the outstanding volume of sustainable covered bonds is currently still well into positive territory at 14 per cent. However, this figure has fallen sharply compared to the previous year, even though the market is still growing briskly. This is normal for young market segments. In addition, hardly any sustainable covered bonds have matured in recent years. Although the volume of maturities in the market for sustainable covered bonds will increase systematically in future. As early as 2025, EUR 11.5bn will be due for repayment (in comparison: only EUR 3bn in 2023 and only EUR 1bn in 2024). This means that growth in sustainable covered bonds is likely to slow noticeably in the coming years if the volume of new issues remains at a similar level.

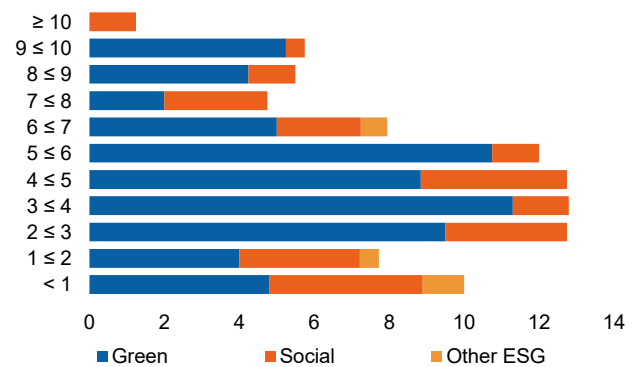
Lower market growth in future

OUTSTANDING VOLUME OF SUSTAINABLE PFANDBRIEFE CONTINUES TO GROW, BUT GROWTH RATES ARE DECLINING
VOLUME OUTSTANDING IN EUR BN



Source: Bloomberg, DZ BANK, figures for 2024 as at 26.09.2024, figures relate to euro-denominated covered bonds with an outstanding volume of at least EUR 250m

MATURITY PROFILE OF SUSTAINABLE COVERED BONDS
Y-AXIS: CURRENT RESIDUAL MATURITIES IN YEARS,
X-AXIS: VOLUME OF MATURING ESG COVERED BONDS IN EUR BN

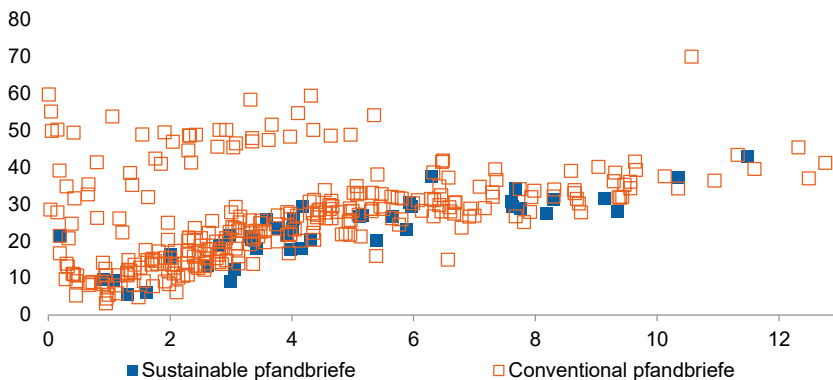


Source: Bloomberg, DZ BANK, as at 26.09.2024, figures relate to euro-denominated covered bonds with an outstanding volume of at least EUR 250m

With a share of around 10 per cent of new issues, sustainable covered bonds are still a rather scarce commodity and popular with investors. In our opinion, this is likely to remain the case. Compared to conventional covered bonds, they have a somewhat broader investor base because they also reach investors who have only invested in sustainable assets. However, these advantages of sustainable covered bonds have still not translated into a significant spread premium. It is true that the order books for sustainable covered bonds fill up somewhat faster than those of their conventional or grey counterparts and sometimes the order books even swell to an above-average volume. However, a premium in the form of a spread discount for sustainable covered bonds is rarely discernible on the secondary market. The same applies to Green or Social Pfandbriefe. As can be seen in the chart below, there was no significant spread difference between sustainable and grey pfandbriefe in September 2024.

Broader investor base for sustainable pfandbriefe

**NO SIGNIFICANT SPREAD DIFFERENCE BETWEEN SUSTAINABLE AND GREY PFANDBRIEFE
INDICATIVE SWAP SPREADS IN BASIS POINTS**



Source: Bloomberg, DZ BANK, as at 26.09.2024, 17:00h

The fact that sustainable and conventional pfandbriefe are trading at a similar spread level means that, from an investor's perspective, Green and Social Pfandbriefe are currently available at a bargain price. From the issuer's point of view, on the other hand, there are no savings in refinancing costs due to the sometimes arduous additional work associated with sustainable cover assets in the form of additional reporting obligations, for example. However, a sustainable pfandbriefe can be used to address a larger group of investors, which is an advantage when placing a new issue.

Trading sustainable pfandbriefe without a significant surcharge

Advantages of sustainable pfandbriefe

Many investors already attach great importance to sustainability criteria and some even invest their money exclusively in sustainable assets. Pfandbrief banks therefore reach a broader investor base with Green or Social Pfandbriefe compared to their conventional counterparts, which is an advantage when placing new issues. However, issuers also take on a lot of additional work with their sustainable pfandbriefe. The sustainable cover assets must not only fulfil the requirements of the Pfandbrief Act, but also certain green or social criteria. In order to identify corresponding sustainable cover assets, relevant data must already be collected and analysed when the loan is granted. The data is needed for additional sustainability reports and for the ESG reporting of the pfandbrief programme. Perhaps the high workload and the challenging qualification criteria according to the Pfandbrief Act and the company's own sustainability standards at the same time are the reasons why only 14 credit institutions are currently issuing sustainable pfandbriefe (out of a total of 83 pfandbrief banks as of 20 September 2024). However, this is still two more than a year ago. The interest on the part of pfandbrief issuers is likely to be there in principle. However, in recent years, many German banks have preferred to issue their new green issues in unsecured format or as subordinated bonds. With these bond formats, they can also utilise sustainable assets that would not be suitable as cover assets for their pfandbriefe. In 2024, the new issue premiums for sustainable unsecured bank bonds have also been on average around 1 to 1.5 basis points lower than for conventional new issues since the beginning of the year (even though there is no significant spread difference in the secondary market – similar to covered bonds). Unsecured sustainable bonds therefore offer issuers a small refinancing advantage in this respect, which is not always the case in the covered bond market.

German banks increasingly issued unsecured bonds in the sustainability format

One way to overcome the challenges of the double qualification criterion for sustainable pfandbriefe would be the sustainable-linked bond format. With these sustainable bonds, the issuer promises to achieve certain sustainability targets within a set timeframe. If these targets are not achieved within the promised period, the issuer may have to pay a higher coupon. In principle, pfandbriefe could also be issued in a sustainable-linked format. So far, no pfandbrief bank has done so. The vdp standards stipulate that sustainable pfandbriefe must be collateralised with corresponding assets. This means that the loans used to finance sustainable projects must also be cover assets for the pfandbriefe. This principle is not observed by all issuers in Europe. In Spain, for example, there are banks that have sustainable covered bonds outstanding but whose cover pools do not have any sustainable assets or the sustainable cover assets do not reach the volume of the outstanding cédules. However, as far as we are aware, the issue proceeds have been channelled into sustainable financing that is in the issuer's loan book.

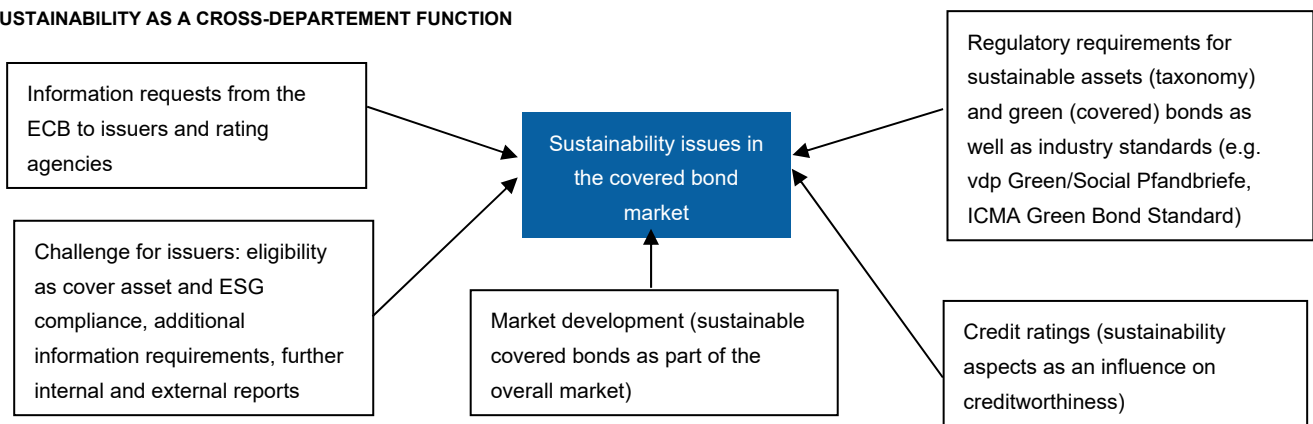
vdp standard requires collateralisation of sustainable pfandbriefe with qualified cover assets

Different perspectives on the topic of sustainability

The market for sustainable pfandbriefe, which can be described using data on new issues, outstanding volume, new issue premiums and similar, is one facet of the sustainability issue that touches on other areas of the banking business. In the following, we would therefore like to provide a brief overview of other aspects of the sustainability issue, such as market standards and what they mean for the lending business.

Fundamental aspects of sustainable pfandbriefe

SUSTAINABILITY AS A CROSS-DEPARTEMENT FUNCTION



Source: DZ BANK

With regard to market standards, the vdp has criteria for Social Pfandbriefe and Green Pfandbriefe in Germany. Both are based on the principles of the International Capital Market Association (ICMA) for sustainable bonds. In the case of Social Pfandbriefe, according to the vdp, the financed projects must offer added social value, whereby this is derived from the United Nations Sustainable Development Goals (SDGs), which include the following areas in particular:

Industry standards of the vdp for German pfandbriefe

- » Financially viable basic infrastructure (e.g. clean drinking water, sewerage, transport and energy)
- » Access to basic social services (e.g. healthcare, education and vocational training)
- » Affordable living space

- » Job creation through the financing of small and medium-sized enterprises and microloans
- » Food safety
- » Socio-economic development and empowerment

The issuer of a Social Pfandbrief undertakes to provide regular (at least annual) information on its social cover assets (including an impact study). The programme for Social Pfandbriefe must also be assessed on an ongoing basis by an independent external third party (Second Party Opinion, SPO) in accordance with vdp requirements. This task is usually performed by an ESG rating agency.

Regular information and external monitoring

Green Pfandbriefe are subject to the same additional transparency requirements as Social Pfandbriefe, which also include an SPO. Green Pfandbriefe are currently dominated by mortgage pfandbriefe, and this is unlikely to change any time soon. The criteria for the cover assets of Green Mortgage Pfandbriefe were changed for the first time in 2024 following their introduction in 2019. According to the vdp, the changes include the following points:

Green mortgage pfandbriefe dominate

- » Previously, new buildings had to comply with the legal energy standards of the respective country at the time of financing. This standard has been tightened. From 2025, the building must achieve a primary energy requirement of at least 10 per cent below the country's Nearly Zero-Energy Building (NZEB) standard.
- » In future, at least energy efficiency class A will be required for commercial properties. Until now, comparative values from the federal ministries could be used as a basis. This will no longer be possible from 2025.
- » In future, energy efficiency class A will also be expected for residential properties (similarly to commercial properties). This will tighten the existing criterion, which provided for energy efficiency class B. In addition, the criterion according to which a residential property is classified as green if its energy requirement does not exceed 75 kilowatt hours per square metre will be abolished. This criterion was previously an alternative to the energy efficiency class.

In addition to the points mentioned, formal changes were also made to the regulations. The vdp has also tweaked the criteria for Green Public Sector Pfandbriefe. The definition of suitable cover assets has remained unchanged. However, formal changes were agreed to harmonise the wording of the two versions. The criteria for Green Mortgage Pfandbriefe applicable from 1 January 2025 are summarised in the figure below. The minimum standards valid at the time of issue apply to Green Pfandbriefe and can be found on the vdp's website.

Regular review of the regulations

In 2022, the vdp published separate minimum standards for Green Public Pfandbriefe. Similar to Green Mortgage Pfandbriefe, a bank may only use this designation if it fulfils the standards developed by the vdp. These include quality criteria for the green cover assets. In the case of financing for public sector buildings, the vdp applies the standards for Green Mortgage Pfandbriefe. In the case of public sector pfandbriefe, however, financing to public households or loans guaranteed by the public sector in the areas of renewable energy, energy efficiency, pollution prevention and control, biodiversity conservation, clean transport, sustainable water management and adaptation to climate change also qualify. The issue proceeds of a

Standards established for Green Public Pfandbriefe

Green Public Pfandbrief may only be used for suitable assets in the aforementioned areas. As with the other Green or Social Pfandbriefe, the criteria are to be continuously reviewed and further developed.

REQUIREMENTS FOR THE FINANCED PROPERTIES IF THE LOANS ARE TO BE USED AS ELIGIBLE COVER ASSETS FOR GREEN PFANDBRIEFE (IN ACCORDANCE WITH VDP MINIMUM STANDARDS)

The primary energy demand of new buildings in Germany and other member states of the European Union (EU) must be at least 10 per cent below the national standard for Nearly Zero-Energy Building. In non-EU countries, the national standards must be met.

At least one of the following criteria must be met for existing commercial properties:

- The commercial property can be assigned to energy efficiency class A.
- An established provider of sustainability certificate confirms that the commercial property falls into one of the provider's top categories.
- The commercial property is among the top 15 per cent of the national commercial property portfolio in terms of energy consumption/demand.

At least one of the following criteria must be met for existing residential properties:

- The residential building can be assigned to energy efficiency class A.
- Co-financing is available through KfW funding programmes for energy-efficient construction and renovation.
- The residential building is among the top 15 per cent of the national residential building stock in terms of energy consumption/demand.

The following criteria apply to the renovation/refurbishment of buildings::

- The renovation/refurbishment will achieve a reduction in energy consumption of the building of at least 30 per cent and ...
- ... the energy-efficient refurbishment will result in energy consumption/demand reaching a level that is in line with the climate targets of the European Union.
- The building is among the top 15 per cent of the national building stock in terms of energy consumption/demand.

Source: Association of German Pfandbrief Banks, DZ BANK

Green and Social Pfandbriefe are equally subject to the fact that there is no separate cover pool for them. Furthermore, a bank's sustainable pfandbriefe are of course also subject to the general provisions of the Pfandbrief Act and the relevant pfandbrief ordinances. However, the cover pools of Green or Social Pfandbrief issuers contain claims in at least the amount of their outstanding Green or Social Pfandbriefe.

Pfandbrief Act applies, no separate cover pools

The basis for sustainable pfandbriefe: ICMA guidelines

As already mentioned, Green and Social Pfandbriefe are based on ICMA's general guidelines, which are among the most important international standards for sustainable bonds (Green, Social, Sustainability; GSS). ICMA has created separate principles for the individual subject areas, which all follow the same basic idea and are revised annually. The issuers of GSS bonds voluntarily undertake to proceed in accordance with the ICMA guidelines for their sustainable bond programmes. These provide guidance on the key elements of the bond programme, with transparency recommendations at their core. The aim is to support investors by providing key information to enable them to assess the social or environmental benefits of the programme. There are four core components, which together form the first pillar of the ICMA recommendations:

ICMA demands transparency

- » The bond documentation should show how the bond proceeds are utilised. The selected financed projects should have a clear social or environmental benefit. The ICMA guidelines recognise a wide range of sustainable projects.
- » ICMA recommends that issuers publish their own Green or Social Bond Framework. This should provide information on how the issuer proceeds when selecting the sustainable projects to be financed and what objectives are being pursued. Among other things, this document should clearly state the suitability and exclusion criteria used for this purpose.
- » The use of the bond proceeds should be traceable. The issuer must ensure through an internal process that the bond proceeds are used exclusively for the sustainable projects described in the bond framework. If the bond proceeds cannot be channelled immediately into corresponding long-term projects, the issuer should explain how the money will be used in the transition phase.
- » Until the bond proceeds are fully allocated, the issuer should report annually on the utilisation of the bond proceeds. As far as possible, the projects should be specifically named and the expected effect (e.g. savings in CO₂ emissions) stated. If this is not possible (e.g. for reasons of confidentiality or due to the large number of projects), meaningful information should be provided at portfolio level.

Utilisation of the issue proceeds (Use of Proceeds)

Process for Project Evaluation & Selection

Management of Proceeds

Reporting

External control

The second pillar of the ICMA recommendations is aimed at verifying the issuer's disclosures. The external audit should relate to all four core components of the first pillar in order to achieve the highest possible level of transparency. ICMA particularly emphasises the independent review of project selection and the use of funds for its sustainability programme. The review can be carried out by an auditor or a rating agency specialising in sustainability issues, for example. According to the ICMA, the scope of independent external audits can vary. The association roughly divides the audits into four categories:

Second Party Opinion (SPO)

- » The organisation issuing the SPO should be independent of the issuer's sustainable bond programme advisor and provide an independent assessment of compliance with the ICMA guidelines.

Verification

- » An issuer can obtain independent verification based on a defined catalogue of criteria.

Certification

- » An issuer can have its sustainable bond programme certified (for example with a seal of approval or label). ICMA believes that compliance with the criteria required to obtain the label should be verified by an external third party.

Scoring/Rating

- » An issuer could also have its bonds or sustainable bond programme reviewed by an eco-rating agency or a specialised research provider, for example.

ICMA would like to see the results published

The audit by an external third party can also be limited to partial aspects. ICMA also recommends that the auditor should disclose his general experience with the topic of sustainability as well as the specific results of the audit. ICMA has developed specific forms for the publication of the results.

MIX OF GREEN AND SOCIAL BONDS AND SUSTAINABILITY-LINKED BONDS

Sometimes a clear separation along the Green Bond Principles (GBP) and Social Bond Principles (SBP) is difficult or an issuer would like to combine financing for green and social projects in a single sustainability programme. For this purpose, the ICMA has created separate guidelines to be applied to sustainability bonds. The same recommendations apply to these bonds as to GBP and SBP. An important principle for all these bonds (Green Bonds, Social Bonds or Sustainability Bonds) is that the proceeds from the bond issue can only be used to finance specific, predetermined projects. Sustainability-linked bonds, for which ICMA has created a framework in the form of guidelines, must be distinguished from this. In the case of sustainability-linked bonds, the issuer undertakes to achieve certain predefined sustainability performance targets (SPTs). This is monitored using key performance indicators (KPIs). However, the issuer is not tied to specific projects when utilising the bond proceeds.

Source: ICMA, DZ BANK

Harmonised sustainability standards through the EU taxonomy

ICMA does not specify any content standards for green or social projects. According to the ICMA, these should be developed by institutions such as the European Union (EU). In its Taxonomy Regulation, which came into force in 2020, the EU laid the foundations for general European sustainability standards. It sets out criteria for when economic activities can be considered environmentally sustainable. In our view, two key criteria are:

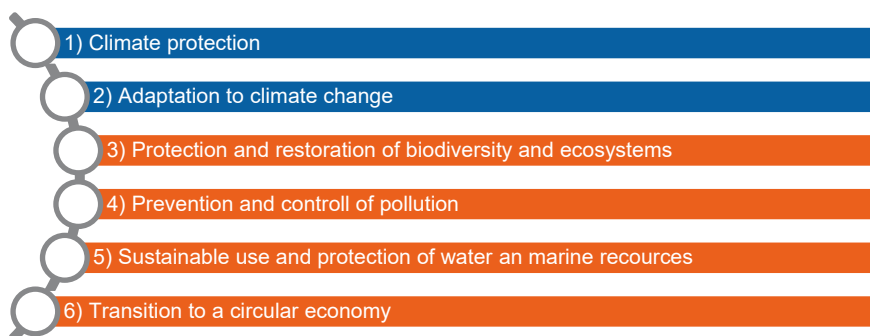
- » The activities make a significant contribution to achieving at least one of the six environmental objectives specified in the EU Taxonomy Regulation.
- » The economic activities do not lead to any significant impairment of one of the environmental objectives (Do No Significant Harm, DNSH).

In delegated acts, the EU Commission has defined the requirements and technical assessment criteria for the six environmental objectives listed in the EU taxonomy in two stages. Criteria for energy-sustainable buildings were also presented as part of the delegated acts. If a pfandbrief bank finances such buildings, these property loans would be green mortgages within the meaning of the taxonomy.

European Green Deal as a central European project

Concretisation of the evaluation criteria

ENVIRONMENTAL OBJECTIVES OF THE EU TAXONOMY REGULATION



Source: DZ BANK

Properties are recognised as taxonomy-compliant if they have a class A energy certificate or are among the top 15 per cent in terms of the primary energy demand of a country's or region's building stock. Furthermore, a maximum energy consumption of 10 per cent below the requirements for a NZEB, to be defined by each Member State, is envisaged for new buildings from 2021. However, it is not

EU criteria for green buildings

enough for a building to fulfil these ambitious criteria. A building will only be taxonomy-compliant if the above-mentioned criteria and the DNSH rule are met.

In connection with the environmental objective of climate protection, the delegated act provides for the following DNSH criteria, among others, for new buildings, the renovation of buildings and the purchase and ownership of buildings:

DNSH criteria cause headaches

- » Integration of adaptation solutions that reduce climate risks
- » Climate risk and impact analyses
- » Maximum consumption for water fittings in non-residential buildings
- » At least 70 per cent of construction and demolition waste is recyclable
- » Building design and construction technology support the circular economy and limit the amount of waste generated during construction and demolition
- » Measures to limit noise, dust and pollutant emissions during construction work
- » Soil analysis for suspected contaminated sites and limit values for hazardous substances
- » The building will not be erected in a protected area

**SUMMARY OF IMPORTANT RULES FOR TAXONOMY-COMPLIANT BUILDINGS FOR THE ENVIRONMENTAL GOAL OF CLIMATE PROTECTION
ASSESSMENT CRITERIA FOR THE BUILDING SECTOR**

Purchase and ownership of buildings built before the end of 2020*	1) Either an energy performance certificate of class A or better is available ... 2) ... or the building is among the top 15 per cent of the national or regional building stock in terms of primary energy demand (comparison with the stock of houses built by the end of 2020) Additionally for larger non-residential buildings (rated output of air conditioning and heating system > 290 kW): proof of the use of an energy management system
Construction of new buildings (built from 2021)	Primary energy requirement of the building is 10 per cent below the requirement for NZEB Additionally for buildings > 5,000 square metres: 1) Air tightness test 2) Thermal integrity test (or traceable quality control processes during the construction process) 3) Life cycle assessment of greenhouse gas emissions
Renovation of buildings	The renovation reduces the primary energy requirement by at least 30 per cent Fulfilment of the legal requirements for comprehensive renovations (major renovation)

Source: EU Commission, vdp, DZ BANK, * for buildings constructed from 2021 onwards, the requirements apply analogously to the construction of new buildings

According to the vdp, the information required for green buildings goes far beyond the data currently available for property financing. The association also criticises the excessive complexity. Furthermore, there is still a lack of databases at national and European level that could help banks to retrieve the necessary information in a standardised and structured manner. The vdp also criticises the fact that there is no weighting of the DNSH criteria. As a result, a dripping tap is given the same weight as an inspection for contaminated sites or the preservation of protected areas.

Criticism of the amount of new data that needs to be collected

BENCHMARKING FOR THE TOP 15 PER CENT CRITERION FOR REAL ESTATE

The Association of German Pfandbrief Banks (vdp) has developed a benchmarking system together with the consultancy firm Drees & Sommer with the aim of helping banks to provide evidence of taxonomy compliance for real estate financing (see, for example, vdp press release dated 12 October 2023 and the study "EU Taxonomy: Acquisition And Ownership Of Buildings"). For buildings constructed by the end of 2020, financing can be regarded as a contribution to achieving the environmental objective of climate protection if the building is among the top 15 per cent in the national or regional market in terms of primary energy demand (TOP 15). This is where benchmarking comes in, whereby a distinction is made between residential and non-residential buildings. Drees & Sommer has drawn up criteria that the TOP 15 properties must fulfil. In addition, the buildings must also fulfil the Do-Not-Significant-Harm criteria if taxonomy conformity is to be achieved. According to the benchmarking, the TOP 15 criterion is fulfilled if certificates for the energy efficiency class of the buildings can be presented, whereby - depending on the building type - different efficiency classes must be achieved as a minimum. If an energy performance certificate is not available for the building, the TOP 15 criterion would also be met if certain threshold values for the building's energy consumption per square metre are not exceeded. Individual threshold values for the TOP 15 criterion were developed for the building types residential properties, offices and logistics and retail buildings. The method is based on publicly available data and is reviewed annually.

Source: vdp, DZ BANK

European standard: Proposal for EU standards for green bonds

The European Green Bond Standard (EUGBS) essentially aims to create a standard for green bonds that are linked to the requirements of the EU taxonomy. The EUGBS sets out four basic requirements for green bonds:

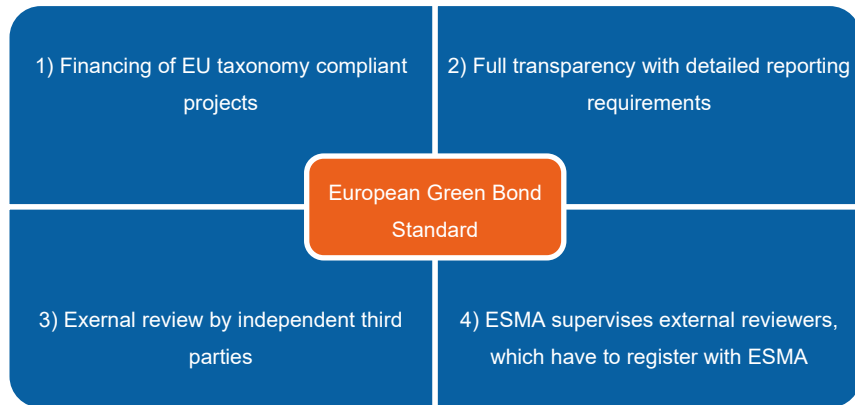
- » The issue proceeds from the bond must be channelled in full into projects that comply with the EU taxonomy. If the requirements in the delegated act on the EU taxonomy change or are tightened at a later date, the assets originally deemed to be taxonomy-compliant will be grandfathered for seven years.
- » Full transparency through detailed reporting requirements (Green Bond Factsheet, Allocation Report, Impact Report).
- » All green bonds and their taxonomy-compliant utilisation of funds must be reviewed by an external auditor.
- » Monitoring and registration of external auditors by the European Securities and Markets Authority (ESMA). Potential conflicts of interest should be reported.

The ICMA guidelines can clearly be seen in the second and third points. In turn, the reference to the EU taxonomy clearly goes beyond the ICMA criteria in terms of content. According to the EU Commission, the EUGBS is to become the international gold standard for green bonds, to the benefit of issuers (proof of financing taxonomy-compliant projects) and investors (easier recognition of sustainable investments and thus reduction of the risk of "greenwashing"). All issuers of green bonds worldwide can voluntarily comply with the EUGBS, regardless of whether they are based inside or outside the EU.

According to our research, the proportion of ICMA-compliant sustainable covered bonds in the covered bond market is 100 per cent. Of the more than 50 issuers worldwide that have issued sustainable covered bonds in euros (issue volume of at least EUR 250m) to date, all comply with the relevant ICMA guidelines. In this respect, the ICMA guidelines can justifiably be described as a market standard.

Four basic requirements**Gold standard for green bonds:
European Green Bonds****At the moment, ICMA criteria are the
market standard**

THE FOUR CORNERSTONES OF THE EUROPEAN GREEN BOND STANDARD



Source: EU Commission, DZ BANK

The vdp aims to harmonise its requirements for Green and Social Pfandbriefe with the EU taxonomy over time. The changes to the relevant regulations adopted in 2024 are already moving in this direction. However, the vdp minimum requirements do not yet make any direct reference to the taxonomy criteria. The Green Pfandbriefe will not receive European Green Bond status soon as things stand today.

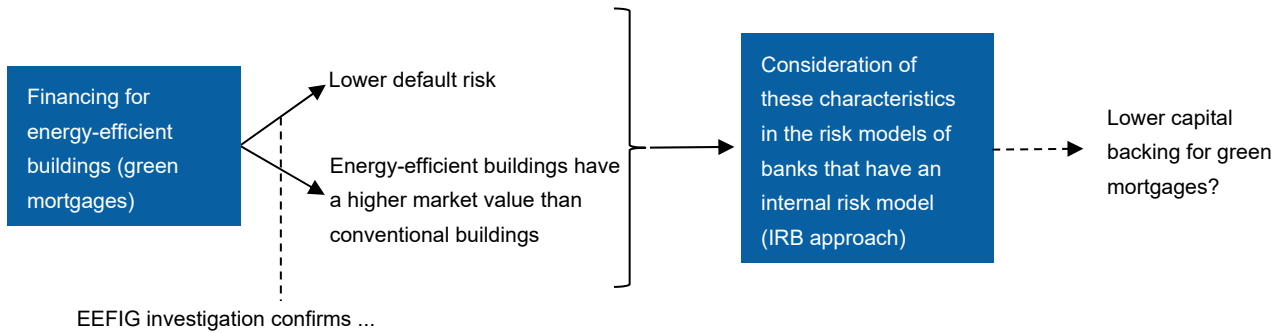
Green and Social Pfandbriefe are based on the principles of the ICMA

Sustainability and credit default risks

As part of its work, the ECB emphasises the importance of sustainability issues with regard to credit default risks. In this context, the question arises as to whether the financing of green buildings is associated with lower risks for the bank. The Energy Efficient Mortgage Initiative (EEMI) of the European Mortgage Federation has already supported several studies that have analysed the relationship between the energy efficiency of buildings and the credit risk of mortgages. A fundamental study was carried out by the Energy Efficiency Financial Institutions Group (EEFIG) on behalf of the EU Commission and published in April 2022: "The quantitative relationship between energy efficiency improvements and lower probability of default of associated loans and increased value of the underlying assets". A key finding of the study presented in the EEFIG report is a negative correlation between the energy efficiency of the building and the credit risk of the mortgage. In a nutshell: the greener the mortgage, the lower the credit risk. For its analysis, EEFIG used a data pool of almost 800,000 residential mortgages, with the lion's share of 658,000 coming from the UK. The calculations confirm that customers who finance properties with high and medium energy efficiency have a 20 per cent lower default risk than customers who have properties with low energy efficiency. This result was also found when control variables were included to take into account the effects of, for example, the borrower's income, loan terms, loan-to-value ratios and a number of variables relating to the building. The EEFIG's findings were in line with statistical analyses carried out by the EEMI in recent years using data from Italy, Portugal and the Netherlands.

The greener the mortgage, the lower the credit risk, says a recent study by EEFIG

GREEN MORTGAGES: DOES THE LOWER RISK JUSTIFY A LOWER CAPITAL ADEQUACY RATIO?



Source: DZ BANK

According to the study, energy-efficient buildings have a market price premium of up to 10 per cent compared to conventional buildings. In addition, rents of up to 5 per cent higher can be achieved when renting out green buildings. In our opinion, this reflects the energy savings associated with the use of the building, although the value-enhancing effect of green properties is likely to have increased in view of the sharp rise in energy costs following the outbreak of the war in Ukraine. EEFIG recommends that financial institutions record the energy efficiency of the buildings pledged as collateral and, as far as possible, adopt the working group's statistical approaches for analysing their own portfolios. This would enable banks to better manage their credit risks and optimise the capital backing for their mortgages. Mortgage lenders using internal risk models should therefore consider energy efficiency as a risk factor in these models. Furthermore, financial institutions should develop special credit products to (better) support customers in the energy-efficient refurbishment of buildings in future.

Green buildings have a higher market value

PFANDBRIEF OVERVIEW

EURO DENOMINATED FIXED RATE COVERED BONDS WITH AN AMOUNT OUTSTANDING OF AT LEAST EUR 250M

Issuer	ISIN	Maturity	Repayment type*	Coupon (in percent)	Amount outstanding in EUR m	Indicative z-spread in basis points	LCR category	ESG?
DZ HYP	DE000A2AAW12	06.12.2024	Soft bullet	0.050%	500	1	1	✘
DZ HYP	DE000A14J5C9	26.02.2025	Soft bullet	0.625%	250	19	2A	✘
DZ HYP	DE000A2AASB4	06.06.2025	Soft bullet	0.375%	750	6	1	✘
DZ HYP	DE000A289PC3	12.09.2025	Soft bullet	0.010%	1,000	6	1	✘
DZ HYP	DE000A2G9HE4	13.11.2025	Soft bullet	0.500%	1,000	3	1	✘
DZ HYP	DE000A3MQUY1	16.01.2026	Soft bullet	3.000%	500	6	1	✓
DZ HYP	DE000A161ZQ3	02.02.2026	Soft bullet	0.750%	875	13	1	✘
DZ HYP	DE000A14KKM9	31.03.2026	Soft bullet	0.375%	500	15	1	✘
DZ HYP	DE000A2BPJ78	16.06.2026	Soft bullet	0.500%	500	15	1	✘
DZ HYP	DE000A2AAX45	31.08.2026	Soft bullet	0.100%	500	16	1	✘
DZ HYP	DE000A2AAW53	30.09.2026	Soft bullet	0.500%	500	16	1	✘
DZ HYP	DE000A3E5UY4	26.10.2026	Soft bullet	0.010%	1,000	18	1	✘
DZ HYP	DE000A2TSDW4	15.01.2027	Soft bullet	0.010%	1,000	20	1	✘
DZ HYP	DE000A14J5J4	01.04.2027	Soft bullet	0.500%	750	21	1	✘
DZ HYP	DE000A2G9HD6	30.06.2027	Soft bullet	0.750%	500	20	1	✘
DZ HYP	DE000A351XS1	30.07.2027	Soft bullet	3.250%	500	18	1	✘
DZ HYP	DE000A2BPJ86	30.08.2027	Soft bullet	0.625%	750	22	1	✘
DZ HYP	DE000A3MQU11	29.10.2027	Soft bullet	3.000%	500	20	1	✘
DZ HYP	DE000A2TSDY0	12.11.2027	Soft bullet	0.010%	500	24	1	✘
DZ HYP	DE000A351XK8	31.01.2028	Soft bullet	3.375%	500	19	1	✓
DZ HYP	DE000A2GSP56	22.03.2028	Soft bullet	0.875%	750	23	1	✘
DZ HYP	DE000A289PA7	23.06.2028	Soft bullet	0.010%	1,000	24	1	✘
DZ HYP	DE000A351XY9	20.09.2028	Soft bullet	3.125%	500	19	1	✓
DZ HYP	DE000A289PH2	27.10.2028	Soft bullet	0.010%	1,000	27	1	✘
DZ HYP	DE000A2G9HL9	30.01.2029	Soft bullet	0.875%	750	28	1	✘
DZ HYP	DE000A3H2TQ6	20.04.2029	Soft bullet	0.010%	1,000	29	1	✘
DZ HYP	DE000A2TSDV6	29.06.2029	Soft bullet	0.050%	750	28	1	✘
DZ HYP	DE000A3MP619	21.11.2029	Soft bullet	0.750%	1,000	28	1	✓
DZ HYP	DE000A13SR38	18.01.2030	Soft bullet	0.875%	750	28	1	✘
DZ HYP	DE000A3H2TK9	29.03.2030	Soft bullet	0.010%	1,000	29	1	✘
DZ HYP	DE000A3E5UU2	15.11.2030	Soft bullet	0.010%	750	29	1	✘
DZ HYP	DE000A351XU7	28.02.2031	Soft bullet	2.750%	750	30	1	✘
DZ HYP	DE000A3825M9	30.04.2031	Soft bullet	2.625%	500	31	1	✘
DZ HYP	DE000A3MP684	30.05.2031	Soft bullet	1.625%	750	30	1	✘
DZ HYP	DE000A3MQUX3	28.11.2031	Soft bullet	2.500%	850	30	1	✘
DZ HYP	DE000A351XW3	31.05.2032	Soft bullet	3.000%	600	28	1	✘
DZ HYP	DE000A3MQUZ8	30.11.2032	Soft bullet	3.000%	750	29	1	✓
DZ HYP	DE000A3MQU45	31.05.2033	Soft bullet	3.250%	1,000	32	1	✘
DZ HYP	DE000A351XV5	28.02.2034	Soft bullet	3.125%	650	33	1	✘
DZ HYP	DE000A2NB841	17.04.2034	Soft bullet	0.875%	500	38	1	✘
DZ HYP	DE000A2TSDZ7	10.11.2034	Soft bullet	0.375%	500	40	1	✘
DZ HYP	DE000A2BPJ60	23.03.2037	Soft bullet	1.375%	250	37	2A	✘

Source: Bloomberg, DZ BANK, spread data as of 16.10.2024, 14:46h, ✓ = yes, ✘ = no, ESG = pfandbriefe secured by cover assets, which comply with certain environmental, social and/ or governmental standards, LCR = Liquidity Coverage Ratio

Imprint

This study has been carried out by DZ BANK AG, Research and Economy Division, on behalf of and in cooperation with DZ HYP AG

Published by:

DZ HYP AG

Hamburg Head Office

Rosenstrasse 2, 20095 Hamburg

Phone +49 40 3334-0

Münster Head Office

Sentmaringer Weg 1, 48151 Münster

Phone +49 251 4905-0

Homepage: www.dzhyp.de

E-Mail: info@dzhyp.de

Represented by the Board of Managing Directors:

Sabine Barthauer (CEO), Jörg Hermes, Stefan Schrader

Chairman of the Supervisory Board: Johannes Koch

Head office of the company:

Registered as public limited company in Hamburg,

Commercial Register HRB 5604 and Münster, Commercial Register HRB 17424

Competent supervisory authorities:

DZ HYP AG is subject to the supervision of the Federal Financial Supervisory Authority (60439) and the European Central Bank (ECB).

VAT ident. no.: DE 811141281

Protection schemes:

DZ HYP AG is a member of the officially recognised BVR Institutssicherung GmbH and the additional voluntary Sicherungseinrichtung des Bundesverband der Deutschen Volksbanken und Raiffeisenbanken e.V. (Protection Scheme of the National Association of German Cooperative Banks): www.bvr-institutssicherung.de
www.bvr.de/SE

Responsible for the contents:

Anke Wolff, Head of Communications,
Marketing & Events

This document may only be reprinted, copied or used in any other way with the prior consent of DZ HYP AG

I. Mandatory Disclosures for Other Research Information and further Remarks

1. Responsible Company

1.1 This Other Research Information has been prepared by DZ BANK AG Deutsche Zentral-Genossenschaftsbank, Frankfurt am Main (DZ BANK) as an investment firm.

Other Research Information is independent client information which does not contain any investment recommendations for specific issuers or specific financial instruments. Such information makes no allowance for any individual investment criteria.

1.2 The mandatory disclosures for Research Publications (Financial Analyses and Other Research Information) as well as further remarks, especially regarding the Conflicts of Interest Policy of DZ BANK Research, used methods, procedures and statistics, can be read and downloaded free-of-charge under www.dzbank.com/disclosures.

2. Competent Supervisory Authorities

DZ BANK is supervised as a credit institution and as an investment firm by:

– European Central Bank - www.ecb.europa.eu

Sonnemannstrasse 20 in 60314 Frankfurt / Main and

– Federal Financial Supervisory Authority (BaFin) - www.bafin.de

Marie-Curie-Strasse 24 - 28 in 60439 Frankfurt / Main

3. Independent Analysts

3.1 The Research Publications (Financial Analyses and Other Research Information) of DZ BANK are independently prepared by its employed analysts or by competent analysts commissioned in a given case on the basis of the binding Conflicts of Interest Policy.

3.2 Each analyst involved in the preparation of the contents of this Research Publication confirms that

– this Research Publication represents his independent specialist evaluation of the analysed object in compliance with the Conflicts of Interest Policy of DZ BANK and

– his compensation depends neither in full nor in part, neither directly nor indirectly, on an opinion expressed in this Research Publication.

4. Categories for Evaluations / Statements in Other Research Information

Not every item of Other Research Information contains a statement on a certain investment or a valuation of this investment. The categories for evaluations / statements used in Other Research Information of DZ BANK are defined as follows.

4.1 Statements on Isolated Aspects of an Investment Decision

Statements on the isolated evaluation of specific aspects that precede an investment recommendation on a financial instrument and / or an issuer - especially according to the sustainability criteria defined by DZ BANK, its defined value approach, its defined asset allocation (DZ BANK Sample Portfolio), its defined sector strategy Euro-Stoxx (DZ BANK Sector Favorites), its defined valuation of payments to beneficiaries (DZ BANK Dividend Aristocrats), its country weightings for covered bonds and its CRESTA-SCORE MODEL - are not investment categories and therefore do not contain any investment recommendations.

These isolated statements alone are not sufficient to form the basis of an investment decision. Reference is made to the explanation of the used relevant methods.

4.2 Sustainability Analysis

Issuers of shares and bonds are analysed on the basis of predefined sustainability factors and classified in isolation as ‚sustainable‘ or ‚non sustainable‘. For sovereigns, a classification as ‚transformation state‘ can be made that lies between these two classifications.

4.3 Share Indices

For defined share indices, share price forecasts are made at regular intervals. From the comparison between the current prices and the prepared forecasts on the development of such equity indices, investment recommendations that are not generally definable and that cannot be defined in advance may be developed.

4.4 Currency Areas

The assessment of an investment in a currency area is geared to the aggregate return expected from an investment in that currency area. As a rule, this aggregate return is primarily derived from the forecast change in the exchange rates. Aspects such as the general interest rate level and changes in the yield level of bonds on the relevant bond market that are possibly to be taken into consideration are also included in the assessment.

„Attractive“ refers to the expectation that an investment in a currency area can deliver an above-average and positive return over a horizon of six to twelve months.

„Unattractive „ refers to the expectation that an investment in a currency area can deliver only very low returns or even losses over a horizon of six to twelve months.

„Neutral“ refers to the expectation that an investment in a currency area can deliver low or average returns over a horizon of six to twelve months.

The aforementioned returns are gross returns. The gross return as success parameter relates to bond yields before deduction of taxes, remunerations, fees and other purchase costs. This compares with the net return of a specific investment, which is not calculated and can deliver significantly lower returns and which measures the success of an investment in consideration of / after deducting these values and charges.

4.5 The prevailing factor for the allocation of market segments and country weightings for covered bonds is the comparison between a sub-segment and all the sub-segments on the relevant market as a whole:

„Overweight „ refers to the expectation that a sub-segment can deliver a significantly better performance than all the sub-segments as a whole.

„Underweight“ refers to the expectation that a sub-segment can deliver a significantly poorer performance than all the sub-segments as a whole.

„Neutral weighting“ refers to the expectation that a sub-segment will not deliver any significant performance differences compared with all the sub-segments as a whole.

4.6 Derivatives

For derivatives (Bund futures, Bobl futures, treasury futures, Buxl futures) the arrows (↑) (↓) (↔) merely indicate the trend direction and do not contain any investment recommendation. The trend direction is derived solely from the use of generally recognised technical analysis indicators without reflecting an analyst's own assessment.

4.7 Commodities

„Upward arrow (↑)“ means that the absolute price increase expected in the next twelve months is greater than 10 percent.

„Downward arrow (↓)“ means that the absolute price decline expected in the next twelve months is greater than 10 percent.

„Arrow pointing to the right (→)“ means that the absolute price change expected in the next twelve months will lie between +10 percent and -10 percent.

4.8 Credit Trend Issuers

Based on the assessment of the rating development of the agencies and the DZ BANK CRESTA-SCORE forecast model, the following classifications apply:
 „Positive“ is given if the agencies S&P, Moody's and Fitch are expected to make a rating upgrade in the next twelve months,
 „Negative“ is given if the agencies S&P, Moody's and Fitch are expected to make a rating downgrade in the next twelve months,
 „Stable“ is given if the agencies S&P, Moody's and Fitch are expected to leave their ratings unchanged in the next twelve months
 If none of the agencies S&P, Moody's and Fitch have given a rating, no assessment is made of the credit trend for the issuer concerned.

5. Updates and Validity Periods for Other Research Information

5.1 The frequency of updates of Other Investment Information depends in particular on the underlying macroeconomic conditions, current developments on the relevant markets, the current development of the analyzed companies, measures undertaken by the issuers, the behavior of trading participants, the competent supervisory authorities and the competent central banks as well as a wide range of other parameters. The periods of time named below therefore merely provide a non-binding indication of when an updated investment recommendation may be expected.

5.2 No obligation exists to update an Other Investment Information. If an Other Research Information is updated, this update replaces the previous Other Research Information with immediate effect.

If no update is made, investment recommendations end / lapse on expiry of the validity periods named below. These periods begin on the day the Other Investment Information was published.

5.3 The validity periods for Other Research Information are as follows:

Sustainability analyses:	twelve months
Analyses according to the value approach:	one month
Asset allocation analyses (DZ BANK Sample Portfolio):	one month
Euro Stoxx Sector Strategy (DZ BANK Sector Favourites):	one month
Dividends (DZ BANK Dividend Aristocrats):	three months
Credit trend issuers:	twelve months
Share indices (fundamental):	three months
Share indices (technical / chart analysis):	one week
Share indices (technical daily):	publication day
Currency areas:	six to twelve months
Allocation of market segments:	one month
Country weightings for covered bonds:	six months
Derivatives (Bund futures, Bobl futures, treasury futures, Buxl futures):	one month
Commodities:	one month

5.4 In a given case, updates of Other Research Information may also be temporarily suspended without prior announcement on account of compliance with supervisory regulations.

5.5 If no updates are to be made in the future because the analysis of an object is to be discontinued, notification of this shall be made in the final publication or, if no final publication is made, the reasons for discontinuing the analysis shall be given in a separate notification.

6. Avoiding and Managing Conflicts of Interest

6.1 DZ BANK Research has a binding Conflicts of Interest Policy which ensures that the relevant conflicts of interest of DZ BANK, the DZ BANK Group, the analysts and employees of the Research and Economics Division and persons closely associated with them are avoided, or - if such interests are effectively unavoidable - are appropriately identified, managed, disclosed and monitored. Material aspects of this policy, which can be read and downloaded free-of-charge under www.dzbank.com/disclosures are summarized as follows.

6.2 DZ BANK organizes its Research and Economics Division as a confidentiality area and protects it against all other organizational units of DZ BANK and the DZ BANK Group by means of Chinese walls. The departments and teams of the Division that produce Financial Analyses are also protected by Chinese walls and by spatial separation, a closed doors and clean desk policy. Beyond the limits of these confidentiality areas, communication may only take place in both directions according to the need-to-know principle.

6.3 The Research and Economics Division does not disseminate Research Publications on issues of DZ BANK or on financial instruments issued by companies of the DZ BANK Group.

6.4 In principle, employees of the Research and Economics Division and persons closely associated with them may not unrestrictedly invest in financial instruments covered by them in the form of Financial Analyses. For commodities and currencies, DZ BANK has also defined an upper limit based on the annual gross salary of each employee which, in the opinion of DZ BANK, also excludes the possibility of personal conflicts of interest among employees in the preparation of Other Research Publications.

6.5 Other theoretically feasible, information-based personal conflicts of interest among employees of the Research and Economics Division and persons closely associated with them are avoided in particular by the measures explained in sub-paragraph 6.2 and the other measures described in the policy.

6.6 The remuneration of employees of the Research and Economics Division depends neither in whole nor in the variable part directly or materially on the earnings from investment banking, trade in financial instruments, other securities related services and / or trade in commodities, merchandise, currencies and / or on indices of DZ BANK or the companies of the DZ BANK Group.

6.7 DZ BANK and companies of the DZ BANK Group issue financial instruments for trading, hedging and other investment purposes which, as underlying instruments, may refer to financial instruments, commodities, merchandise, currencies, benchmarks, indices and / or other financial ratios also covered by DZ BANK Research. Respective conflicts of interest are primarily avoided in the Research and Economics Division by means of the aforementioned organizational measures.

7. Recipients, Sources of Information and Use

7.1 Recipients

Other Research Information of DZ BANK is directed at eligible counterparties as well as professional clients. They are therefore not suitable for dissemination to retail clients unless (i) an Other research Information has been explicitly labelled by DZ BANK as suitable for retail clients or (ii) is disseminated by an investment firm properly authorized in the European Economic Area (EEA) or Swiss to retail clients, who evidently have the necessary knowledge and sufficient experience in order to understand and evaluate the relevant risks of the relevant Other Research Information.

Other Research Information is authorized for dissemination by DZ BANK to the aforementioned recipients in in Member States of the European Economic Area and Switzerland.

It is neither allowed to provide Other Research Information to customers in the United States of America (USA) nor to conclude corresponding transactions with them.

The dissemination of Other Research Information in the Republic of Singapore is in any case restricted to DZ BANK AG Singapore Branch.

7.2 Main Sources of Information

For the preparation of its Research Publications, DZ BANK uses only information sources which it considers itself to be reliable. However, it is not feasible to make own checks of all the facts and other information taken from these sources in every case. If in a specific case, however, DZ BANK has doubts over the reliability of a source or the correctness of facts and other information, it shall make specific reference to this in the Research Publication.

The main sources of information for Research Publications are:

Information and data services (e.g. Reuters, Bloomberg, VWD, Markit), licensed rating agencies (e.g. Standard & Poors, Moody's, Fitch, DBRS), specialist publications of the sectors, the business press, the competent supervisory authorities, information of the issuers (e.g. annual reports, securities prospectuses, ad-hoc disclosures, press and analyst conferences and other publications) as well as its own specialist, micro and macro-economic research, examinations and evaluations.

7.3 No individual investment recommendation

Under no circumstances can or should an Other Research Information replace a specialist investment advice necessary for a specific investment. For this reason an Other Research Information cannot be used as sole basis for an investment decision.

8. Summary of used Methods and Procedures

Detailed information on generally recognized as well as proprietary methods and procedures used by DZ BANK Research can be read and downloaded free-of-charge under www.dzbank.com/disclosures.

II. Disclaimer

- This document is directed at eligible counterparties and professional clients. Therefore, it is not suitable for retail clients unless (a) it has been explicitly labelled as appropriate for retail clients or (b) is properly disseminated by an investment firm authorized in the European Economic Area (EEA) or Switzerland to retail clients, who evidently have the necessary knowledge and sufficient experience in order to understand and evaluate the relevant risks of the relevant evaluation and / or recommendations.

It was prepared by DZ BANK AG Deutsche Zentral-Genossenschaftsbank, Frankfurt am Main, Germany („DZ BANK“) and has been approved by DZ BANK only for dissemination to the aforementioned recipients in Member States of the EEA and Switzerland.

If this document is expressly marked as 'Financial Analysis' in sub-section 1.1 of the Mandatory Disclosures, its distribution to recipients is subject to the section International Restrictions of Use and these additional rules:

This document may only be brought into the Republic of Singapore by DZ BANK via the DZ BANK Singapore Branch, but not by other persons, and may only be disseminated there to 'accredited investors' and / or 'expert investors' and used by them.

This document may only be brought into the United States of America (USA) by DZ BANK and via Auerbach Grayson, but not by other persons, and may only be disseminated there to 'major U.S. institutional investors' and used by them, if it solely comprises equity research. DZ BANK is neither allowed to bring documents on debt instruments into the USA nor to conclude transactions in debt instruments.

If this document is expressly marked as 'Other Research Information' in sub-section 1.1 of the Mandatory Disclosures, its dissemination to recipients is subject to these additional rules:

It is neither allowed to provide Other Research Information to customers in the United States of America (USA) nor to conclude corresponding transactions with them.

The dissemination of Other Research Information in the Republic of Singapore is in any case restricted to DZ BANK AG Singapore Branch.

In all before named countries, this document may only be distributed in accordance with the respective applicable laws and rules, and persons obtaining possession of this document should inform themselves about and observe such laws and rules.
- This document is being handed over solely for information purposes and may not be reproduced, redistributed to other persons or be otherwise published in whole or in part. All copyrights and user rights to this document, also with regard to electronic and online media, remain with DZ BANK.

Whilst DZ BANK may provide hyperlinks to web sites of companies mentioned in this document, the inclusion of a link does not imply that DZ BANK endorses, recommends or guarantees any data on the linked page or accessible therefrom. DZ BANK accepts no responsibility whatsoever for any such links or data, nor for the consequences of its use.
- This document is not to be construed as and does not constitute an offer, or an invitation to make an offer, to buy securities, other financial instruments or other investment objects.

Estimates, especially forecasts, fair value and / or price expectations made for the investment objects analyzed in this document may prove incorrect. This may occur especially as a result of unpredictable risk factors.

Such risk factors are in particular, but not exclusively: market volatility, sector volatility, measures undertaken by the issuer or owner, the general state of the economy, the non-realizability of earnings and / or sales targets, the non-availability of complete and / or precise information and / or later occurrence of another event that could lastingly affect the underlying assumptions or other forecasts on which DZ BANK relies.

The estimates made should always be considered and evaluated in connection with all previously published relevant documents and developments relating to the investment object and to the relevant sectors and, in particular, capital and financial markets.

DZ BANK is under no obligation to update this document. Investors must inform themselves about the current development of business as well as of any changes in the business development of the companies.

During the validity period of an investment recommendation, DZ BANK is entitled to publish a further or other analysis based on other, factually-warranted or even missing criteria on the investment object.
- DZ BANK has obtained the information on which this document is based from sources believed to be essentially reliable, but has not verified all of such information. Consequently, DZ BANK does not make or provide any representations or warranties regarding the preciseness, completeness or accuracy of the information or the opinions contained in this document.

Neither DZ BANK nor its affiliated companies accept any liability for disadvantages or losses incurred as a result of the distribution and / or use of this document and / or which are connected with the use of this document.

5. DZ BANK and its affiliated companies are entitled to maintain investment banking and business relationships with the company or companies that are the subject of the analysis contained in this document. Within the limits of applicable supervisory law, DZ BANK's research analysts also provide information regarding securities-related services and ancillary securities-related services.
Investors should assume that (a) DZ BANK and its affiliated companies are or will be entitled to engage in investment banking operations, security operations or other business transactions from or with the companies that are the subject of the analysis contained in this document, and that (b) analysts involved in the preparation of this document can generally be indirectly involved in the conclusion of such business transactions to the extent permitted by supervisory law.
DZ BANK and its affiliated companies and their employees may have positions in securities of the analyzed companies or investment objects or effect transactions with these securities or investment objects.
6. The information and recommendations of DZ BANK contained in this document do not constitute any individual investment advice and, depending on the specific investment targets, the investment horizon or the individual financial situation, may therefore be unsuitable or only partially suitable for certain investors. In preparing this document DZ BANK has not and does not act in the capacity of an investment advisor to, or asset manager for, any person.
The recommendations and opinions contained in this document constitute the best judgment of DZ BANK's research analysts at the date and time of preparation of this document and are subject to change without notice as a result of future events or developments. This document constitutes an independent appraisal of the relevant issuer or investment objects by DZ BANK; all evaluations, opinions or explanations contained herein are those of the author of this document and do not necessarily correspond with those of the issuer or third parties.
Any decision to effect an investment in securities, other financial instruments, commodities, merchandise or other investment objects should not be made on the basis of this document, but on the basis of independent investment analyses and methods as well as other analyses, including but not limited to information memoranda, sales or other prospectuses. This document can be no replacement for individual investment advice.
7. By using this document, in any form or manner whatsoever, or referring to it in your considerations and / or decisions, you accept the restrictions, specifications and regulations contained in this document as being exclusively and legally binding for you.

Additional Information of Markit Indices Limited

Neither Markit, its affiliates or any third party data provider makes any warranty, express or implied, as to the accuracy, completeness or timeliness of the data contained herewith nor as to the results to be obtained by recipients of the data. Neither Markit, its affiliates nor any data provider shall in any way be liable to any recipient of the data for any inaccuracies, errors or omissions in the Markit data, regardless of cause, or for any damages (whether direct or indirect) resulting therefrom.

Markit has no obligation to update, modify or amend the data or to otherwise notify a recipient thereof in the event that any matter stated herein changes or subsequently becomes inaccurate.

Without limiting the foregoing, Markit, its affiliates, or any third party data provider shall have no liability whatsoever to you, whether in contract (including under an indemnity), in tort (including negligence), under a warranty, under statute or otherwise, in respect of any loss or damage suffered by you as a result of or in connection with any opinions, recommendations, forecasts.

DZ HYP LOCATIONS

Hamburg Head Office

Rosenstrasse 2
20095 Hamburg, Germany
PO Box 10 14 46
20009 Hamburg, Germany
+49 40 3334-0
info@dzhyp.de

Münster Head Office

Sentmaringer Weg 1
48151 Münster, Germany
Mailing address:
48136 Münster, Germany
+49 251 4905-0
info@dzhyp.de

Berlin Office

Pariser Platz 3
10117 Berlin, Germany

Hanover Office

Berliner Allee 5
30175 Hanover, Germany

Munich Office

Türkenstrasse 16
80333 Munich, Germany

Dusseldorf Office

Ludwig-Erhard-Allee 20
40227 Dusseldorf, Germany

Kassel Office

Mauerstrasse 11
34117 Kassel, Germany

Nuremberg Office

Am Tullnaupark 4
90402 Nuremberg, Germany

Frankfurt Office

CITY-HAUS I, Platz der Republik 6
60325 Frankfurt/Main, Germany

Leipzig Office

Richard-Wagner-Strasse 9
04109 Leipzig, Germany

Stuttgart Office

Heilbronner Strasse 41
70191 Stuttgart, Germany



An overview of DZ HYP's market reports to date is available here.

DZ HYP AG

**Rosenstrasse 2
20095 Hamburg
Germany
Phone +49 40 3334-0**

**Sentmaringer Weg 1
48151 Münster
Germany
Phone +49 251 4905-0**

dzhyp.de