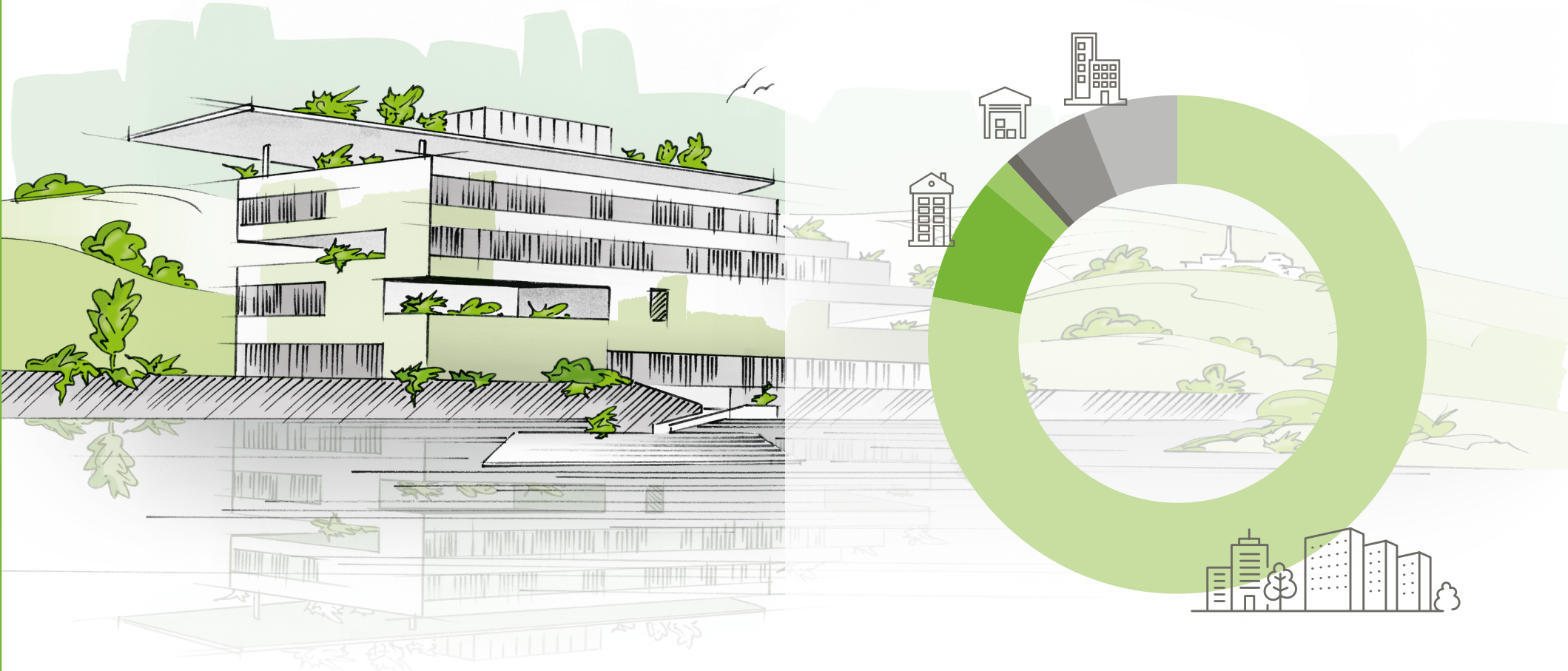


pbb  
Green Bond Impact Report  
2023

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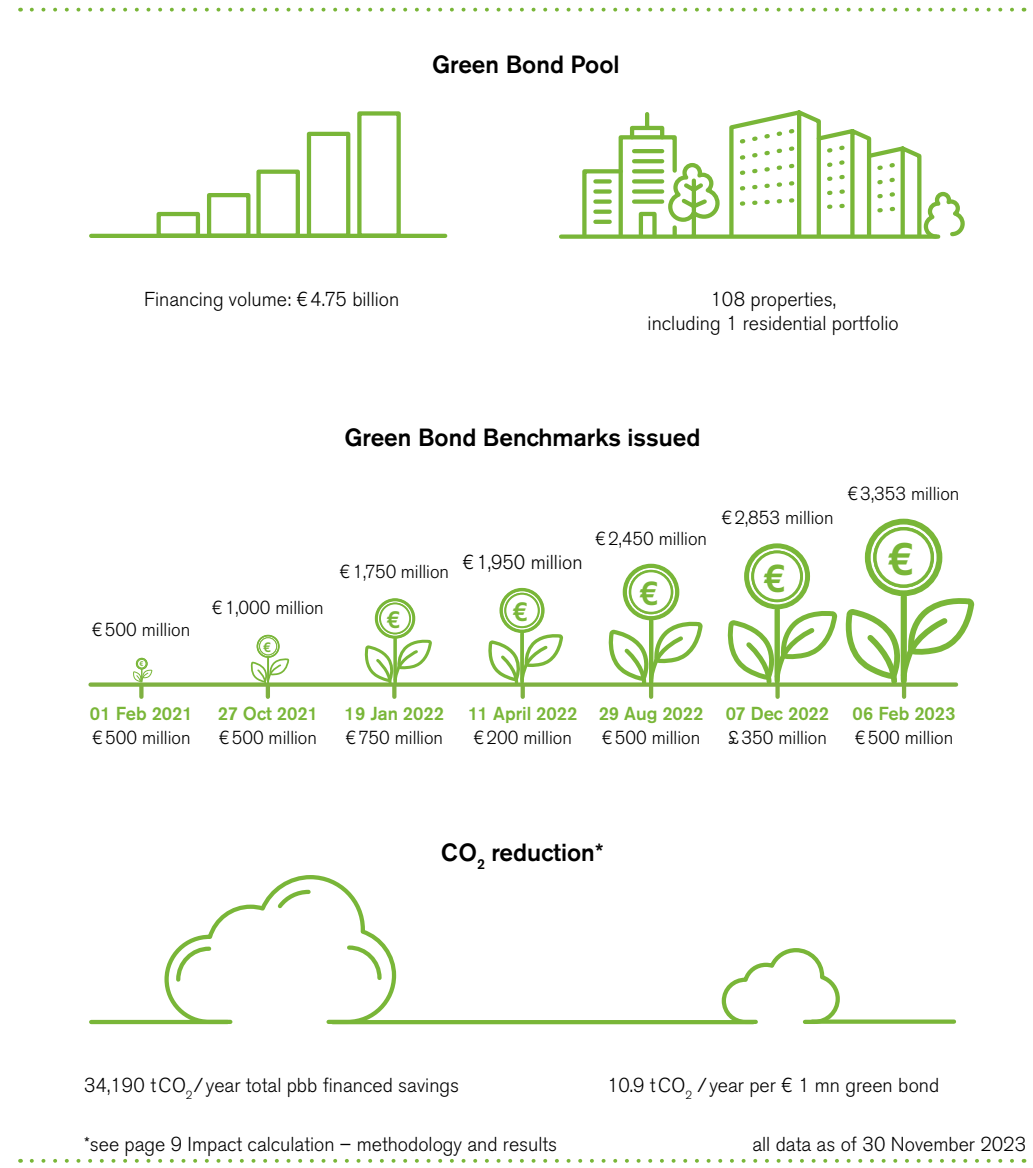
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# Foreword

In the context of a world that is rapidly changing and characterised by the effects of climate change, it is our responsibility as companies in the property sector to actively contribute to achieving the Paris climate goals. The recent World Climate Change Conference in Dubai (COP28) once again emphasised that **we are facing a turning point**: Measures must be taken actively and with vigour to promote a sustainable and future-oriented property sector.

Implementing ecological practices in property development is much more than just a social responsibility – it is also a strategic necessity. After all, taking ecological factors into account not only influences the environment, but also the **long-term value of property investments**. The global agreements reached in the course of COP28 emphasise the urgency of continuing to align our business model consistently and strategically with ESG principles.

In 2021, pbb Deutsche Pfandbriefbank adopted its first ESG strategy, which initially defined ESG targets and was ultimately underpinned by qualitative KPIs (Key Performance Indicators) and KRIs (Key Risk Indicators). In the years that followed, this strategy was refined and further developed with the aim of creating the greatest possible data transparency as a basis for future ESG strategies and management. On this basis, pbb recently implemented a comprehensive **ESG management concept** for the portfolio and for the pbb's operations, which centres on achieving the climate targets that have been set. The levers here are the ecological footprint resulting from internal processes, pbb's social footprint and, above all, the CO<sub>2</sub> emissions resulting from the property loan portfolio. The first step was to define targets for new and existing business to increase property financing classified as sustainable. In order to have a measurable impact on



limiting global warming, pbb is currently developing a **transition plan** for the decarbonisation of the real estate loan portfolio, which shall include a scientifically derived pbb climate pathway until 2050 with interim targets, decarbonisation levers and concrete measures. In this context, pbb aims to increase the new business volume of green loan-eligible assets [according to the criteria of pbb's green loan framework](#) among the financed real estate properties to 32% by 2025, and to increase the share of green loan-eligible assets in the overall portfolio to over 30% by 2026. By the end of 2023, pbb had already analysed around 75% of the existing portfolio for this purpose and assessed the sustainability of the financed properties.

A climate management concept for our property financing is crucial as it offers a systematic approach to reducing environmental impact. Through our product range, we promote energy-efficient technologies, the use of renewable energies and sustainable construction methods, both for existing properties and as part of the transformation towards more sustainability of a property, which helps to reduce the ecological footprint and also contributes to cost efficiency and long-term value retention. As a (re-)financing partner to the property sector, pbb not only promotes environmental responsibility through such a concept, but also strengthens the **resilience of the property sector** to climate-related challenges.



By integrating and continuously developing an ESG strategy and systematically focusing on ESG factors, we emphasise our commitment to sustainable action. We also endeavour to provide our clients with the best possible services in implementing this strategy. Together with project developer Groß & Partner, pbb founded the consulting company **Eco Estate** in 2023, which advises clients and investors in the development of holistic solutions on the way to the **sustainable transformation** of their properties.

Since 2021, Green Bonds have played a key role for pbb in realising all these initiatives by significantly helping to drive the green transformation while making a significant contribution to covering the full spectrum of sustainable products. This enables us to fulfil our responsibility for a sustainable transformation of the real estate sector while satisfying the growing interest in sustainable investments.

Our efforts have also received positive external recognition: the ESG rating agency **MSCI** recently **upgraded pbb's ESG rating** to the highest rating level, AAA. From MSCI's perspective, improved corporate governance practices were the main reason for this. In a sector comparison, this puts pbb in the top 5% of

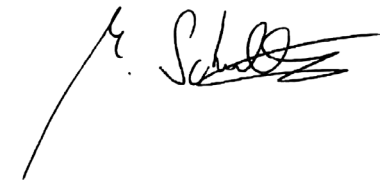
banks rated by MSCI. We therefore not only set ourselves **ambitious targets**, but also endeavour to back them up with **concrete measures** and corresponding financial resources. This enables us to create long-term value for our stakeholders in addition to complying with international standards.

Green transformation of properties is therefore more than just a commitment to the environment – it offers opportunities for long-term value creation. Together, we are shaping a sustainable future – for the industry, the society and the environment.

Yours sincerely,



Dr Pamela Hoerr  
Members of the Management Board



Marcus Schulte



# Sustainable Finance – from green loans to green bonds

The real estate industry needs to embrace a sustainable economy and prepare for changing legislation, taxation and markets. With “Eco Estate” we help our clients to develop a concrete, long-term plan for a sustainable and valuable real estate portfolio by transforming existing properties into green buildings. Our advice goes far beyond energy consulting and ESG due diligence. We take a holistic technical view of properties and help to develop measures and concepts to maintain their value and operate them economically, taking into account the E, S and G criteria. Measures to reduce energy consumption and increase efficiency are harmonised and can be implemented in an economic step-by-step plan. We also support customers in achieving specific CO<sub>2</sub> reduction, CRREM pathway, certification, and taxonomy compliance targets effectively.

As we align our business activities with ecological and social criteria as well as good corporate governance standards, our focus in our core business lies on Sustainable Finance, i.e. granting green loans and issuing green bonds. There is as of yet no established standard for green loans in the market. Therefore, pbb has developed a Green Loan Framework geared towards two elements: a proprietary scoring model that builds on the EU Taxonomy, or fulfilment of the requirements set forth in the EU Taxonomy. The pbb scoring model allows for the assessment of real estate using specific criteria derived from the taxonomy; from a defined score upwards, real estate qualifies for green lending.

## **Scoring model or EU Taxonomy for green loans**

pbb's scoring model considers three crucial dimensions: the energy efficiency of buildings, building certifications, and additional sustainability criteria, ensuring a comprehensive evaluation.

With its Green Loan Framework, pbb deliberately includes more than just the energy efficiency of a building as prerequisite for a green loan. Low final energy consumption is thus a necessary criterion, but not the only factor.

## **pbb applies ICMA Green Bond Principles to issue green bonds**

The issuance of green bonds also requires a framework. The ICMA Green Bond Principles have become the standard here. pbb's Green Bond Framework follows the ICMA Green Bond Principles. A Green Bond Committee selects the properties and unanimously decides which loans to add to the reference portfolio.

## **Integral funding instrument**

Green bonds have evolved to become an integral part of pbb's funding. pbb's framework allows for the issuance of green financial instruments. As of 30 November 2023, pbb had issued green bonds exclusively in the form of senior preferred benchmarks.

An impact report for pbb's green bonds is published annually. The second party opinion of the framework and the review of the impact report is provided by Shades of Green, formerly part of CICERO, now a part of S&P Global and one of the leading players in this field.

Quarterly Reports are released shortly after each Green Bond Committee meeting. The reports furnish details on the outstanding volume of green bonds and the loans financing qualifying properties, including their characteristics such as geographic distribution, breakdown by property type and breakdown by green certifications.

### **Green Bond Framework to be continuously developed further**

As the Green Bond market is dynamic, pbb's Green Bond Framework will be regularly updated. Furthermore we will carefully monitor to what extent the bond market will gravitate towards the EU taxonomy and adjust the green bond

framework in line with market developments. The Green Bond Framework received its most recent update in May 2023. Consequently, we aim to underscore and draw attention to the most relevant as well as significant changes that have been implemented.

## Green Bond Framework 2023

All current outstanding green bonds (€ 3.13bn) have been issued under our Green Bond Framework from 2020, while new issuances from May 2023 onward will be issued under the framework from 2023. The energy performance criteria for the 2023 framework are more stringent, ensuring that all assets in the current pool meet at least the energy performance standards set by the 2020 framework.

The [2023 Green Bond Framework](#) marks a notable evolution, prioritizing sustainability and navigating the ongoing developments of the EU taxonomy. Eligible properties now strategically target economic activities contributing to UN SDG 11 and SDG 9, with a specific focus on the construction, renovation, acquisition, and ownership of buildings.

The revised Final Energy Consumption standards for properties constructed before 2021 entail reductions, such as a 12.5% decrease (equivalent to 20 kWh/m<sup>2</sup> p.a.), compared to the benchmarks established in the prior Green Bond Framework for retail and office buildings.

Alternative criteria for existing buildings include a stringent "A" level EPC standard, top-15% national building stock inclusion, and allowances for renovations leading to a 30% relative improvement in primary energy demand.

For properties built in 2021 or later<sup>1</sup>, adherence to the "Nearly Zero-Energy Building standard – 10%" or top-rated Green Building Certificates is required.

In summary, the 2023 Green Bond Framework reflects a commitment to sustainability, strategically aligning with the ongoing developments of the EU taxonomy. Differentiated criteria for buildings built before and after 2021 underscore a dynamic approach to improve environmental standards. pbb puts significant effort into advancing conformity with the EU taxonomy, and while its progress is evident, full compliance remains a set goal.

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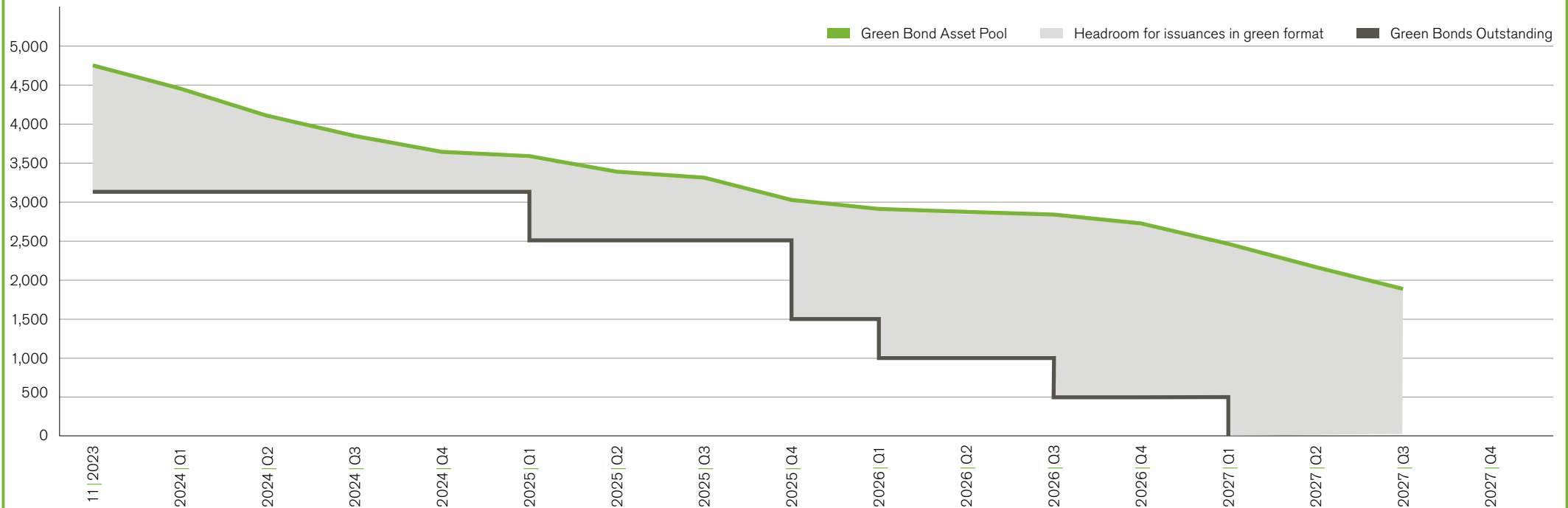
<sup>1</sup> Corresponds to the date of submission of the complete building application. This interpretation is derived from [a discussion paper](#), approved by the European Commission on the 19th December 2022, referring to the EU Taxonomy Climate Delegated Act

# Green Bond asset pool as per 30 November 2023

In addition to the criteria described in the previous chapter, exclusion criteria such as, heating technology (no coal- or oil-powered systems), soil sealing (4% greenfield) and tenants are taken into consideration. As per 30 November 2023, the pool consisted of 108 properties, including one residential portfolio which is counted as one property, with **€ 4.75 bn** in loans. Energy performance certificates were analysed for efficiency classes for which the database is still relatively small since not all certificates provide an efficiency class. This information will be provided once the database is large enough for conducting a conclusive evaluation.

Commercial real estate loans typically run for around five years. To ensure coverage going forward, new loans will have to be added to the green bond asset pool. In line with its broader ESG strategy, pbb is confident that it will originate sufficient eligible loans in the future. According to the framework, also investments in other issuers' green bonds can serve to offset a short-term shortfall. The Green Bond Pool with a volume of € 4.75 bn exceeds the Green Bonds outstanding (€ 3.13 bn) significantly. Consequently, 100% of the proceeds from green bonds are allocated.

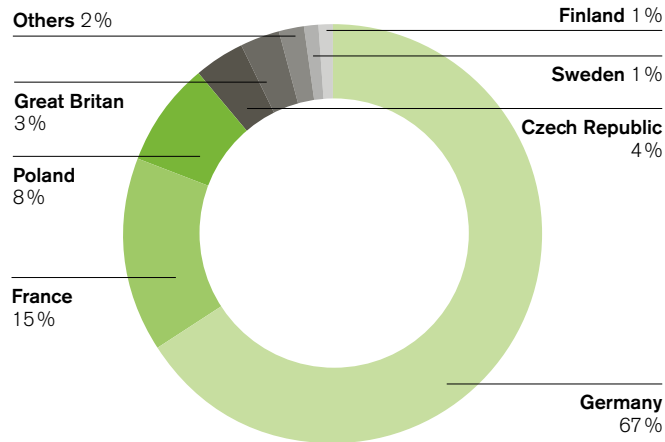
**Development of Green Bond Assets and Green Bonds outstanding (€ mn)**





# Reference Portfolio: approx. € ~4.75 bn as of 11/2023

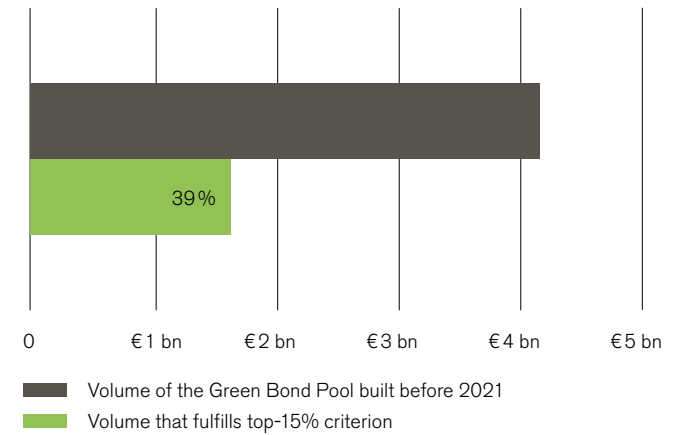
## Breakdown by regions



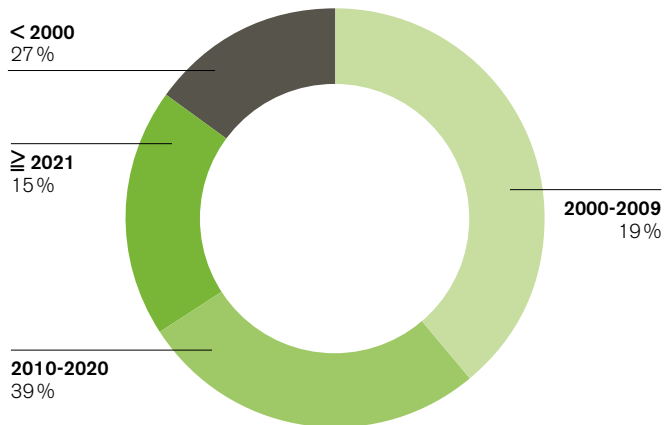
More than 80% of all properties are located in **Germany or France** with Germany accounting for the by far highest portion with 67%.

Referring to the officially published data from ["deepki"](#) a leading ESG data intelligence firm, we evaluate the Green Bond pool based on the **top 15% criterion** for final energy consumption. Almost 40% of the entire pool meets the top 15% criterion.

## Top-15% Criterion



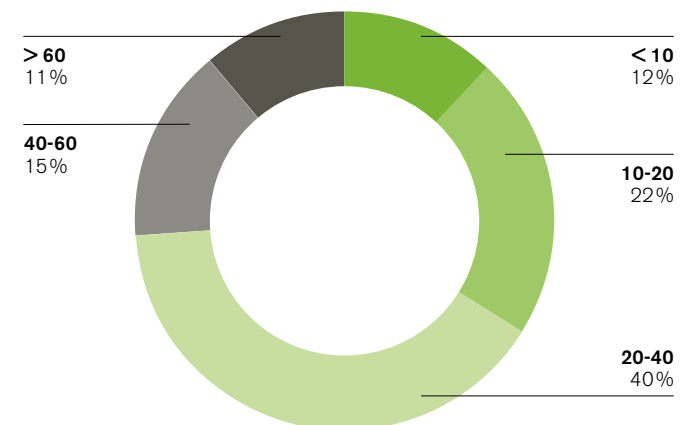
## Breakdown by year of construction



For more than half of the asset pool the construction process was completed in **2010 or later**. Only about one building out of four was built before year 2000.

The overwhelming majority (74%) of the green bond asset pool emits less than 40 kg CO<sub>2</sub>/m<sup>2</sup> p.a. **Almost 35%** of the pool emits even no more than 20 kg CO<sub>2</sub>/m<sup>2</sup> p.a.

## Breakdown by total CO<sub>2</sub> emissions in kg/m<sup>2</sup> p.a.



Discrepancies from 100% may arise due to rounding.

# Impact calculation – methodology and results

The CO<sub>2</sub> reduction emanating from properties financed by pbb is determined by comparing these properties' emissions against a benchmark representing the emissions of standard properties in the market. In the interests of transparency and traceability, methodology and results are described below. Data concerning the underlying property financings was last updated on 30 November 2023.

## Analysis of financed properties

The data on CO<sub>2</sub> emissions is taken from the energy performance certificates, which every property in the green bond assets pool is required to have. Where energy performance certificates do not contain information on CO<sub>2</sub> emissions, such emissions are calculated from primary or final energy using the formula outlined below. Calculations and reporting apply to one year.

CO<sub>2</sub> emissions for electricity and heating are recorded separately. Absent respective data in the energy performance certificates, consumption will be split in a ratio that is typical for the property type in question. The sum of these emissions yields the CO<sub>2</sub> emissions from unsustainable resources of the building. In 2022, together with KPMG pbb developed a CO<sub>2</sub> calculation tool, which is used for all properties in the regular underwriting process to avoid the financing of “stranded assets”. The tool uses average carbon intensity figures for the respective country in case of long distance heating and benchmarks the property to the net zero target of the EU by 2050.

- 
- Primary energy factors in accordance with the DIN V 18599-1 norm.
  - CO<sub>2</sub> emission factors in accordance with the following norms (publicly available sources):
    - Electricity: European Environment Agency
    - Fossil fuel-based heating: German Environment Agency (GEG 9 – building energy law)

## Benchmark definition

Data pertaining to the average energy consumption of commercial and residential buildings in individual European countries, which is required to be able to compare the properties with the standard in the market, is taken from the [Partnership for Carbon Accounting Financials](#) (PCAF). This partnership provides an approach to evaluate and disclose greenhouse gas emissions for financial institutions.

PCAF data provide country- and property-specific reference values for all properties in pbb's green bond asset pool. For comparability purposes, these energy consumption values are converted into CO<sub>2</sub> values using country-specific factors reflecting a mix of electricity and heating. In the previous year's report, we utilized data from 2018, which was the latest available at that time. However, in 2023, PCAF released updated data, enabling us to incorporate more recent information and considerably tighten the benchmark values.





## Impact calculation

Finally, the green bond asset pool's CO<sub>2</sub> impact is calculated by comparing the property's emission values with the derived PCAF values. In this comparison, however, only pbb's financing share is taken into account. The CO<sub>2</sub> reductions of all properties are then added up to yield the total green bond asset pool's annual impact. As per 30 November 2023, this reduction stood at 34,190 tonnes of CO<sub>2</sub> per year. This means 10.9 tonnes of CO<sub>2</sub> were saved for every € 1 million issued bonds or 7.2 tonnes of CO<sub>2</sub> were saved per every €1 million financed, based on a total financed volume of € 4.75 billion. This is equivalent to 100,081 MWh/year of energy savings in projects financed by pbb, expressed as an alternative metric for the total financed volume.

# List of properties

Properties that were added to the GB Pool under the **Green Bond Framework 2023**

Property Type	Loan Amount in €	EPC Level / Certificate	Final Energy Consumption in kWh/m <sup>2</sup> p.a.	Heating System
Office	9,493,623	n/a	110	
Retail	25,376,181	BREEAM Very Good	66	
Residential	65,956,309	B	66	
Residential	23,564,674	B	61	
Residential	34,512,656	n/a	27	
Office	23,091,250	n/a	84	
Office	29,000,000	n/a	117	
Office	28,000,000	LEED Gold	121	
Office	18,000,000	LEED Gold	98	
Office	36,100,000	LEED Silver	119	
Office	16,736,015	n/a	98	
Office	34,813,487	n/a	73	
Office	29,350,000	n/a	57	
Office	34,288,761	BREEAM Very Good	105	
Office	37,000,000	A	120	
Office	49,900,000	C	57	
Office	38,630,613	n/a	68	
Office	27,635,121	BREEAM Excellent	69	others
Office	41,527,500	Others	119	






Property Type	Loan Amount in €	EPC Level / Certificate	Final Energy Consumption in kWh/m <sup>2</sup> p.a.	Heating System
Retail	45,012,646	BREEAM Excellent	139	
Retail	28,500,000	n/a	103	
Retail	22,000,000	A	96	
Retail	13,900,000	n/a	114	

As per 30 November 2023, the green bond asset pool comprised **108 properties**, 107 individual properties as well as one residential portfolio counted as one property. The loan portfolio accounts for €4.75 billion in financings.

78% of pbb's green bond asset pool consists of office properties. The **high share of office properties** comes as no surprise, since these properties also represent the majority of pbb's total loan book. Logistic, retail and residential properties make up 4%, 8% and 10%, respectively, of the green bond asset pool.






















The **largest individual loan** of €200 million finances an office object in Frankfurt. It was constructed in 2019 and uses near and long distance heating. With a final energy consumption of 107 kWh/m<sup>2</sup> p.a. the building is far below the threshold.




















The **aggregate final energy consumption** for more than half of the assets lies in the lower and middle clusters of below 50 and between 50 and 100 kWh/m<sup>2</sup>/year. Modern logistic properties naturally perform well in their final energy consumption given the nature of their usage. Office properties showed a broad span, and their energy consumption (as might be expected) usually rises with the age of the property.

-  Liquid Gas
-  Natural Gas
-  Electricity
-  Self generated heating
-  Near and long distance heating

# List of properties






Properties that were added to the GB Pool under the **Green Bond Framework 2020**

Property Type	Loan Amount in €	EPC Level/ Certificate	Final Energy Consumption in kWh/m <sup>2</sup> p.a.	Heating System
Office	12,475,613	n/a	112	
Office	13,768,816	n/a	93	
Residential	4,306,048	n/a	59	
Residential	11,469,147	C	94	
Residential	33,011,726	B	63	
Residential	4,863,351	n/a	63	
Residential	23,423,761	D	99	
Residential	10,194,798	B	64	
Office	9,737,226	n/a	98	
Office	15,800,000	n/a	81	
Office	6,003,633	n/a	62	
Office	19,157,391	n/a	98	
Office	80,488,400	B	85	
Office	65,000,000	DGNB Gold	109	
Office	7,974,264	n/a	121	
Office	46,649,445	n/a	115	
Office	26,884,662	n/a	140	
Office	12,644,904	n/a	116	
Office	5,109,225	n/a	155	
Office	34,955,533	C	109	
Office	134,600,000	HOE Excellent	98	

Property Type	Loan Amount in €	EPC Level/ Certificate	Final Energy Consumption in kWh/m <sup>2</sup> p.a.	Heating System
Office	117,390,283	n/a	115	
Office	48,333,333	D	109	
Office	20,023,489	D	87	
Office	19,278,805	n/a	74	
Office	18,007,449	D	83	
Office	64,604,835	BREEAM Excellent	64	
Office	48,468,921	BREEAM Excellent	148	
Office	66,891,667	BREEAM Excellent	78	
Office	99,555,629	LEED Gold	139	
Office	11,054,662	A	44	
Office	12,313,015	n/a	108	
Office	4,925,206	n/a	66	
Office	16,669,928	n/a	127	
Office	8,524,395	n/a	123	
Office	18,753,669	n/a	116	
Office	9,424,192	n/a	127	
Office	19,000,000	n/a	50	
Office	17,000,000	n/a	139	
Office	13,245,492	BREEAM Excellent	83	

**Heating systems** mainly rely on near and long distance heating, with a share of around 68% except for gas, which makes up 19% of the pool, all other fossil fuels are excluded by definition. Electricity as a heating source is mainly used in office properties and makes up 9%.

There are **no production facilities** included and the properties/ borrowers are not involved in the production of weapons, hazardous waste, fossil fuels or chemicals and have no negative impact on biodiversity.

-  Liquid Gas
-  Natural Gas
-  Electricity
-  Self generated heating
-  Near and long distance heating






# List of properties

Properties that were added to the GB Pool under the **Green Bond Framework 2020**

Property Type	Loan Amount in €	EPC Level/Certificate	Final Energy Consumption in kWh/m <sup>2</sup> p.a.	Heating System
Office	10,587,147	BREEAM Excellent	36	
Office	9,431,345	BREEAM Excellent	20	
Office	20,756,244	n/a	143	
Office	41,282,003	BREEAM Excellent	60	
Office	150,000,000	BREEAM Excellent	158	
Office	32,637,500	n/a	105	
Office	103,500,018	B	56	
Office	40,412,136	LEED Gold	70	
Office	124,380,577	DGNB Gold	51	
Office	55,800,000	LEED Platinum	42	
Office	71,372,000	DGNB Gold	77	
Office	83,379,548	Others	120	
Office	41,750,000	n/a	64	
Office	49,500,000	DGNB Silver	131	
Office	20,538,727	n/a	105	
Office	6,500,685	n/a	53	
Office	14,395,091	n/a	135	

Property Type	Loan Amount in €	EPC Level/Certificate	Final Energy Consumption in kWh/m <sup>2</sup> p.a.	Heating System
Office	6,183,458	n/a	128	
Office	59,000,000	n/a	62	
Office	14,595,392	n/a	65	
Office	12,850,514	Others	112	
Office	44,900,000	n/a	110	
Office	9,516,164	A	82	
Office	92,000,000	BREEAM Very Good	89	
Office	92,500,000	n/a	135	
Office	150,000,000	B	156	
Office	62,218,428	LEED Gold	66	
Office	65,200,000	BREEAM Excellent	56	
Office	74,268,739	BREEAM Excellent	105	
Office	64,750,000	DGNB Gold	95	
Office	23,390,125	n/a	139	
Office	200,000,000	LEED Platinum	107	
Office	44,550,000	n/a	131	
Office	77,811,846	LEED Platinum	123	

Property Type	Loan Amount in €	EPC Level/Certificate	Final Energy Consumption in kWh/m <sup>2</sup> p.a.	Heating System
Office	148,726,835	LEED Silver	80	
Retail	97,653,542	n/a	113	
Retail	55,871,114	DGNB Platin	109	
Retail	50,000,000	BREEAM Very Good	87	
Retail	108,300,000	C	138	
Retail	31,750,000	A	116	
Logistics	50,730,000	D	61	
Logistics	31,804,895	BREEAM Good	50	
Logistics	110,738,590	DGNB Gold	35	
Residential	67,792,641	C	96	
Residential	98,193,490	n/a	32-99	

-  Liquid Gas
-  Natural Gas
-  Electricity
-  Self generated heating
-  Near and long distance heating