



Green Bond Allocation & Impact Report

2023

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Green Finance at Aareal Bank

ESG is fundamental to our business and therefore part of our corporate strategy

In the process of sustainable transformation of economy and society, we aim to support customers and investors on their 'Road to Paris' and further strengthen our own ambitions.

With deep ESG integration in business, credit, investment, risk and refinancing strategies, we have established the preconditions for setting up our green product portfolio and want to continuously develop it further in the interests of our stakeholders.

With our 'Green Finance Framework - Liabilities', we have created a mandatory frame that enables us to ensure the high quality of our green refinancing products in compliance with strict market standards. This was also confirmed by our external partner Sustainalytics, which assessed our framework and the underlying green qualification criteria as 'credible and impactful' in the course of a Second Party Opinion (SPO).

Additionally, Aareal Bank has obtained a Second Party Opinion from Sustainalytics to underline the validity of the results in our Allocation & Impact Reporting for 2023.

In addition to the regular publication of the allocation of our green asset pool used for green refinancing activities since 2022, the following report now also provides our stakeholders with an in-depth insight into its impact for the first time. Through the targeted calculation and inclusion of specific impact KPIs, such as CO₂ avoidance and energy savings, we want to further increase transparency towards our stakeholders and show that the composition of our green asset pool meets strict criteria.

Each bond issue within this framework invites open discussion and engagement with investors about the progress made and the way forward.

Aareal Green Finance
Framework - Lending

Aareal Green Finance
Framework - Liabilities

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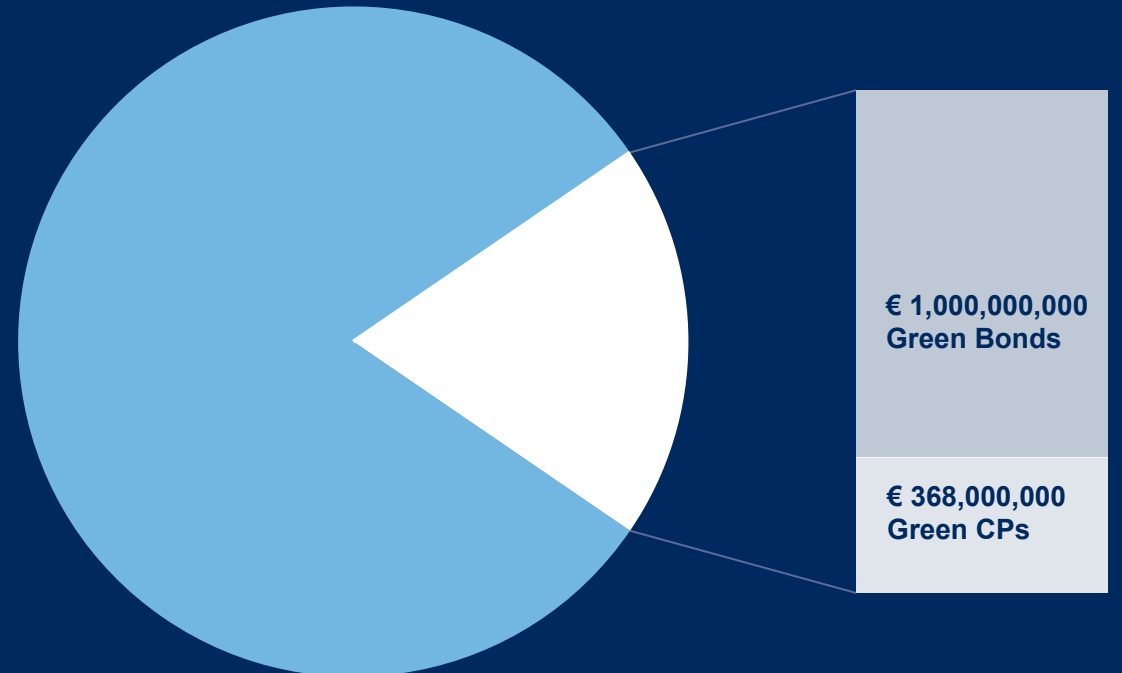
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Allocation Report

A total of approximately € 1.3 billion in green European commercial paper (also referred to as “CP”) was issued for funding purposes in the reporting period under the Multi-currency Commercial Paper Programme. Due to a further diversified and optimized funding mix there were no uncovered benchmark transactions and hence no green benchmark issues in 2023 needed. In total, around € 1.4 billion in green funding instruments were outstanding as of December 31, 2023 (see graphic opposite). These include € 1 billion in green bonds.

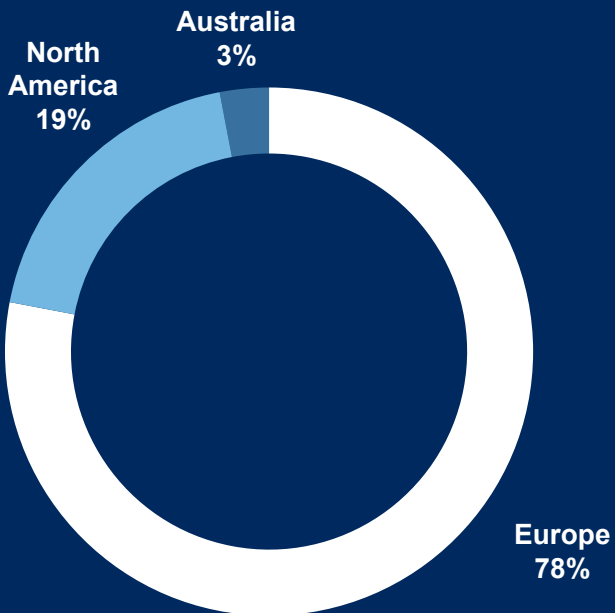
The green asset pool amounted to approximately € 5.8 billion as at December 31, 2023. As a result, all issuing proceeds from the green funding instruments could be allocated to green assets (in line with the Aareal Green Finance Framework – Liabilities). This provides comfortable headroom for further green funding activities. Breakdowns of the overall green asset pool by region, building type and qualification criteria are given on the following pages.

Green Asset Pool & Green Funding as of 31.12.2023

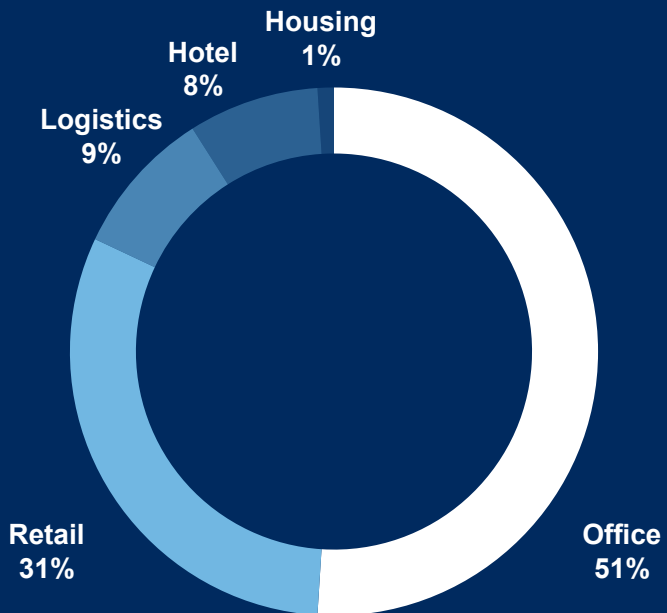


Breakdowns of the overall green asset pool by region, building type and qualification criteria

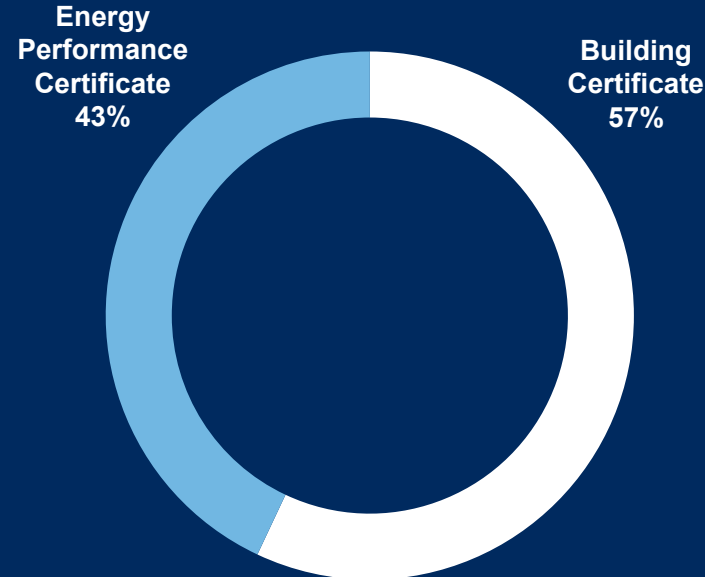
Green Asset Pool by region



Green Asset Pool by type of building

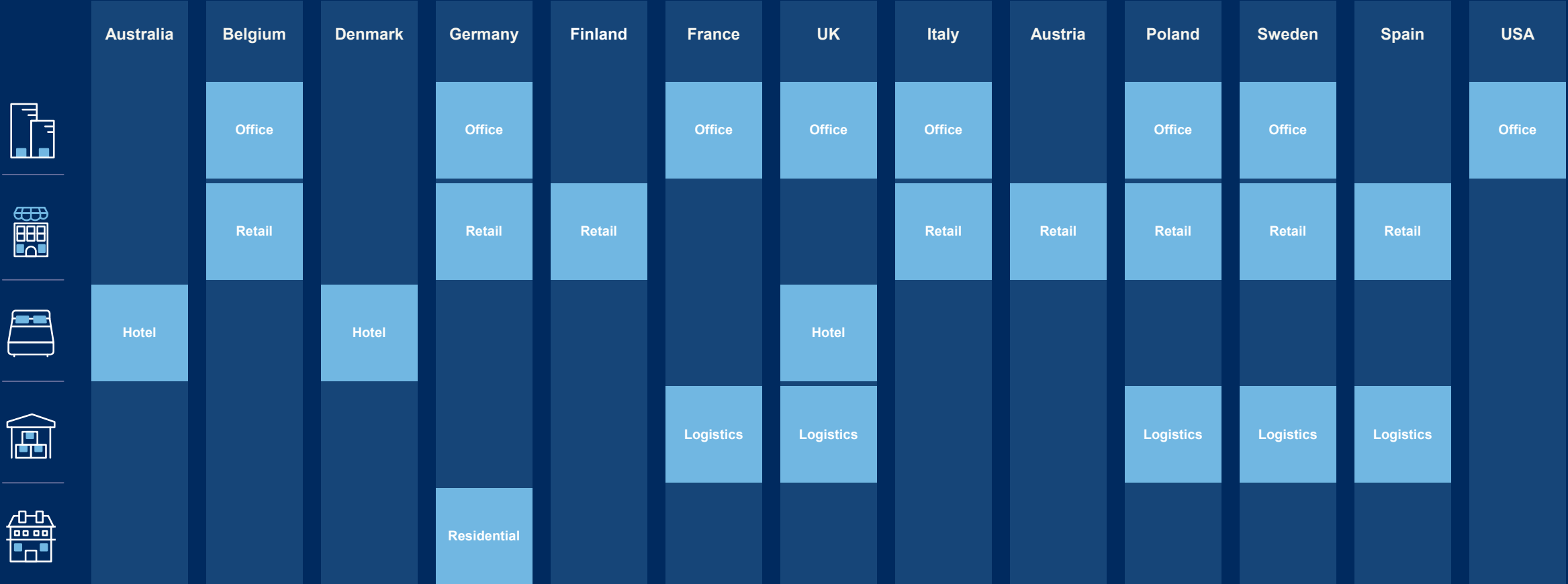


Green Asset Pool by qualification criterion



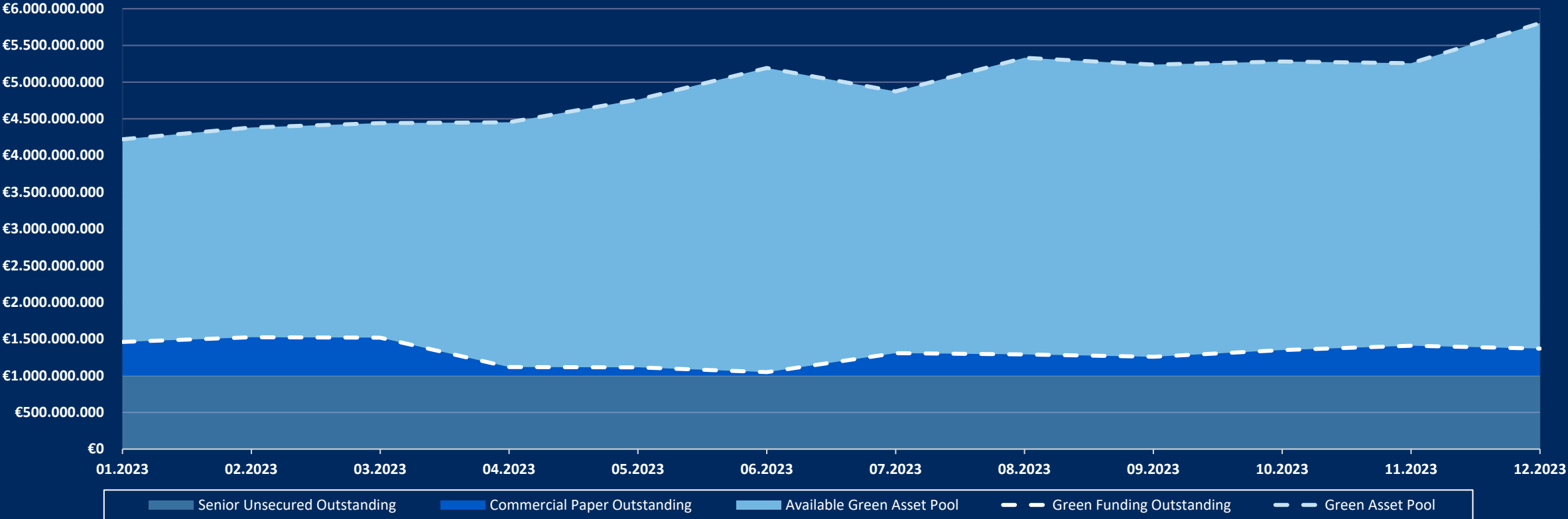
Figures audited as part of the limited assurance review of the non-financial report for the financial year 2023.

Overview of the overall green asset pool divided by region and building type



Development in the 2023 financial year

The following chart shows the outstanding green funding volume compared to the asset pool during the course of the year 2023, The light blue area shows the additional green asset pool available at any given time.



Overview of Green Liabilities

List of Green CPs issued in 2023

Start	End	Notional	Ccy	ISIN
06.01.2023	06.03.2023	25,000,000.00	USD	XS2574380403
09.01.2023	06.04.2023	210,000,000.00	EUR	XS2575583047
11.01.2023	06.04.2023	190,000,000.00	EUR	XS2576251412
20.01.2023	22.05.2023	50,000,000.00	EUR	XS2580209364
01.02.2023	01.08.2023	15,000,000.00	USD	XS2583647594
28.02.2023	03.05.2023	40,000,000.00	EUR	XS2595035077
06.03.2023	06.09.2023	10,000,000.00	USD	XS2596334867
25.04.2023	25.10.2023	20,000,000.00	EUR	XS2616341801
02.05.2023	02.06.2023	15,000,000.00	EUR	XS2619324747
29.06.2023	01.09.2023	30,000,000.00	EUR	XS2645715611
04.07.2023	04.10.2023	165,000,000.00	EUR	XS2647338982
05.07.2023	05.09.2023	15,000,000.00	EUR	XS2647851976
07.07.2023	07.12.2023	50,000,000.00	EUR	XS2649170698
24.08.2023	24.10.2023	5,000,000.00	EUR	XS2674555540
08.09.2023	08.03.2024	18,000,000.00	EUR	XS2680717258
26.09.2023	26.03.2024	15,000,000.00	EUR	XS2697471709
04.10.2023	04.04.2024	5,000,000.00	EUR	XS2700997773

Start	End	Notional	Ccy	ISIN
05.10.2023	05.01.2024	5,000,000.00	EUR	XS2701589603
10.10.2023	10.11.2023	15,000,000.00	EUR	XS2703613583
10.10.2023	02.04.2024	170,000,000.00	EUR	XS2703724810
23.10.2023	12.12.2023	10,000,000.00	EUR	XS2709318393
23.10.2023	23.01.2024	35,000,000.00	EUR	XS2709370048
24.10.2023	27.12.2023	5,000,000.00	EUR	XS2710058145
24.10.2023	24.01.2024	10,000,000.00	EUR	XS2710058574
24.10.2023	23.02.2024	10,000,000.00	EUR	XS2710062337
31.10.2023	12.12.2023	10,000,000.00	EUR	XS2713229925
31.10.2023	31.05.2024	15,000,000.00	EUR	XS2713327695
02.11.2023	30.01.2024	20,000,000.00	EUR	XS2714421810
06.11.2023	05.01.2024	15,000,000.00	EUR	XS2715840083
13.11.2023	27.11.2023	5,000,000.00	EUR	XS2719999257
20.11.2023	16.02.2024	25,000,000.00	EUR	XS2724594796
21.11.2023	21.12.2023	15,000,000.00	EUR	XS2724974600
06.12.2023	06.06.2024	15,000,000.00	EUR	XS2732264515
12.12.2023	12.01.2024	5,000,000.00	EUR	XS2734734085
27.12.2023	27.02.2024	5,000,000.00	EUR	XS2740944785

Outstanding Green Bonds

Start	End	Notional	Ccy	ISIN
25.07.2022	25.07.2025	500,000,000.00	EUR	DE000AAR0355
17.01.2022	18.04.2028	500,000,000.00	EUR	DE000AAR0322

Light blue columns show green funding instruments maturing during the year 2023.

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Sustainable by conviction

Selected Eligible Assets

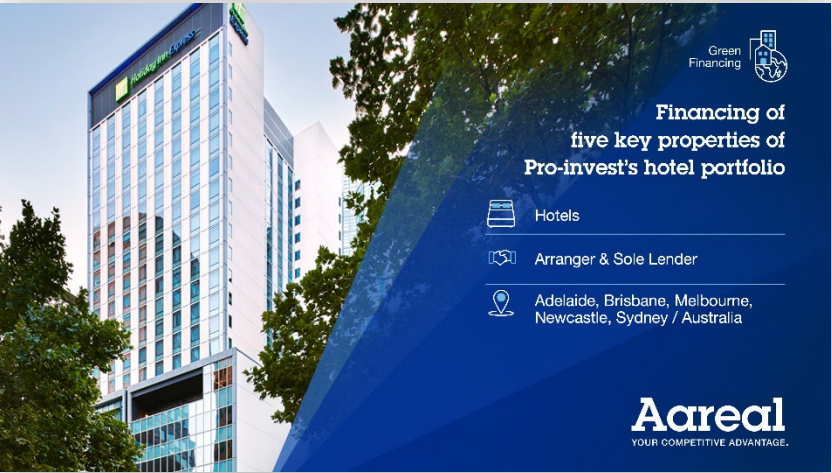



Green Financing 

Financing of Villa Copenhagen


-  Hotels
-  DKK 769,000,000 (EUR 103,000,000)
-  Arranger, Facility & Security Agent
-  Copenhagen, Denmark

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Green Financing 

Financing of five key properties of Pro-invest's hotel portfolio

-  Hotels
-  Arranger & Sole Lender
-  Adelaide, Brisbane, Melbourne, Newcastle, Sydney / Australia

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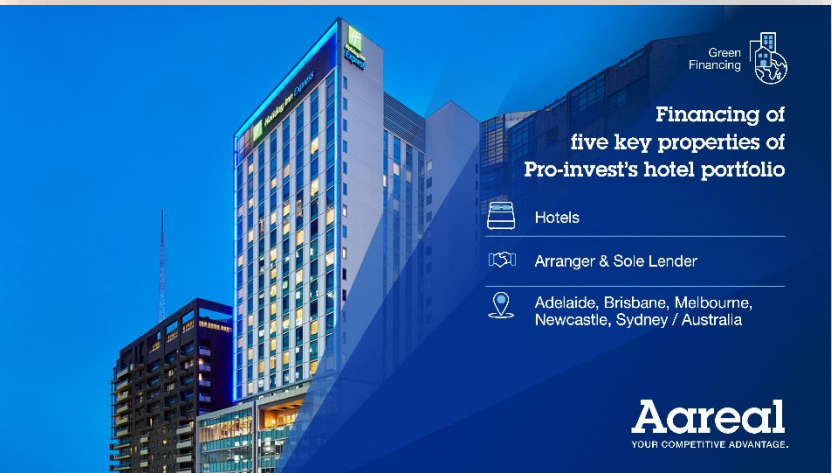



Green Financing 

Financing of Villa Copenhagen




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Green Financing 

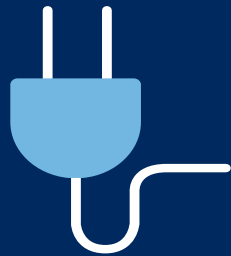
Financing of five key properties of Pro-invest's hotel portfolio

-  Hotels
-  Arranger & Sole Lender
-  Adelaide, Brisbane, Melbourne, Newcastle, Sydney / Australia

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Impact Report Summary

DREES &
SOMMER



166,436 MWh

Energy Savings per year
(Aareal Bank share)



28,612 t

CO₂ savings per year
(Aareal Bank share)



2.1 – 18.6 t¹⁾

CO₂ savings
per € mn invested per year
(Aareal Bank share)

On the next page, an overview of the impact analysis of the eligible green properties included in Aareal Bank's green asset pool as at December 31, 2023 will be given. Aareal Bank has commissioned Drees & Sommer to conduct the assessment to ensure highest quality standards concerning the applied methodology.

¹⁾ Depending on property type, excluding residential

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Impact Results for Aareal Bank's Green Asset Pool

Management Summary / Green Bond Real Estate Portfolio – Harmonized Framework

Low Carbon Buildings	Date of Issuance	Type	Signed Amount ¹⁾	Share of Total Portfolio Financing ²⁾	Annual final energy savings ³⁾	Annual final energy savings ⁴⁾ (Aareal share)	Annual final energy savings ⁵⁾ per € mn invested	Annual CO ₂ emissions avoidance ⁶⁾	Annual CO ₂ emissions avoidance ⁷⁾ (Aareal share)	Annual CO ₂ emissions avoidance ⁸⁾ per € mn invested
Unit	[dd.mm.yyyy]	[–]	[EUR]	[%]	[MWh/year]	[MWh/year]	[MWh/€ mn year]	[tCO ₂ /year]	[tCO ₂ /year]	[tCO ₂ /€ mn year]
Aareal Bank AG	31.12.2023	Low Carbon Building	5,781,061,643	100	380,230	166,436	28.8	65,973	28,612	4.9
Residential	31.12.2023	Low Carbon Building	49,046,709	0.8	23,991	9,228	188.1	5,499	2,140	43.6
Office			2,963,973,632	51.3	96,700	33,075	11.2	17,305	6,210	2.1
Retail			1,785,374,266	30.9	74,561	28,386	15.9	15,816	5,814	3.3
Logistics			538,668,382	9.3	162,544	79,301	147.2	20,757	10,005	18.6
Hotel			443,998,653	7.7	22,434	16,446	37.0	6,597	4,444	10.0

1) Legally committed signed amount by the issuer for the portfolio or portfolio components eligible for green bond financing.

2) Portion of the total portfolio cost that is financed by the issuer.

3) Final energy savings calculated using the difference between the energy consumption of the building and the national building stock benchmarks.

4) Final energy savings calculated using the difference between the energy consumption of the building and the national building stock benchmarks adjusted with the financing share.

5) Final energy savings adjusted with the financing share divided by signed amount.

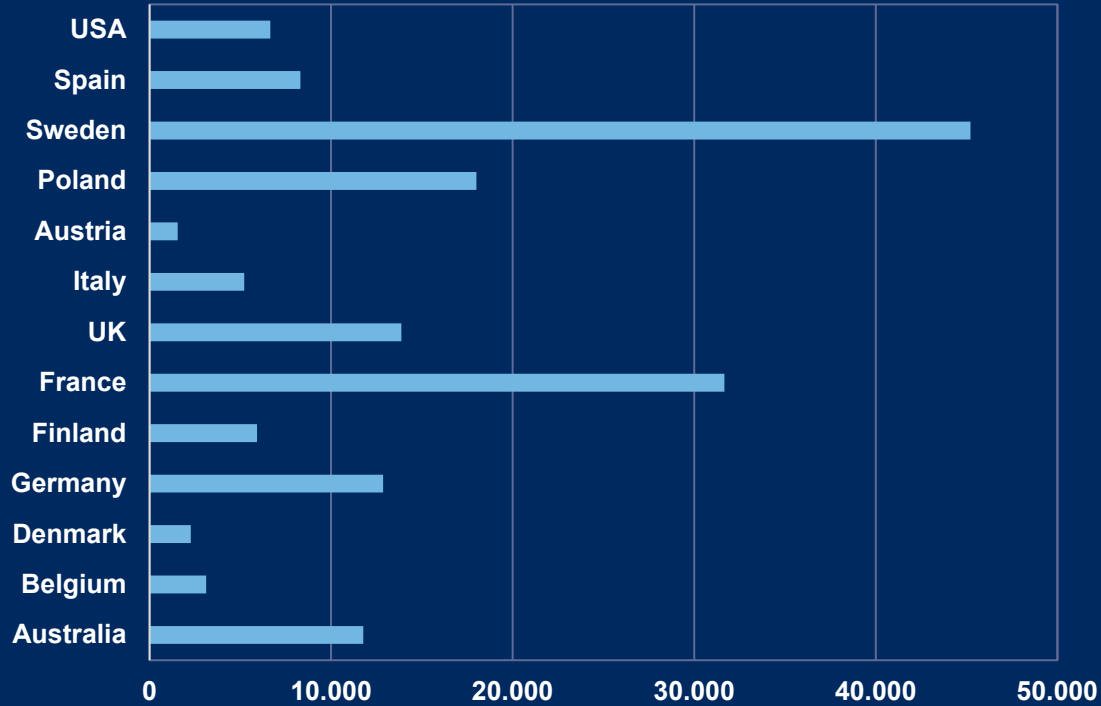
6) Greenhouse gas emissions avoidance determined by multiplying the final energy savings with the carbon emissions intensity.

7) Greenhouse gas emissions avoidance determined by multiplying the final energy savings with the carbon emissions intensity adjusted with the financing share.

8) Greenhouse gas emissions avoidance adjusted with the financing share divided by signed amount.

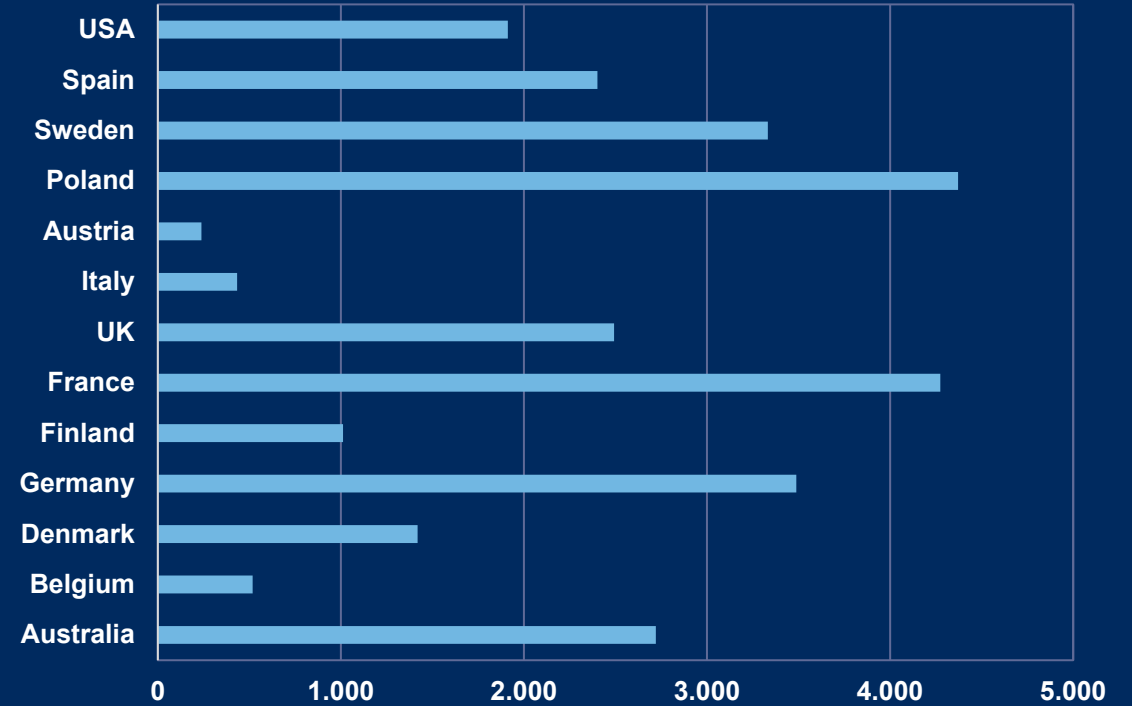
Breakdowns of environmental and final energy savings by country

Assessed Portfolio – Final energy Savings absolute



Final energy saved in MWh/year

Assessed Portfolio – Carbon Savings absolute

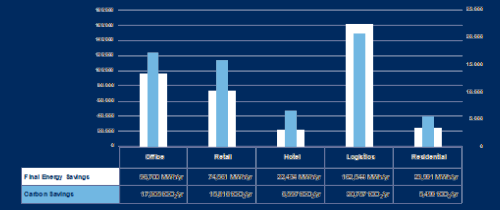
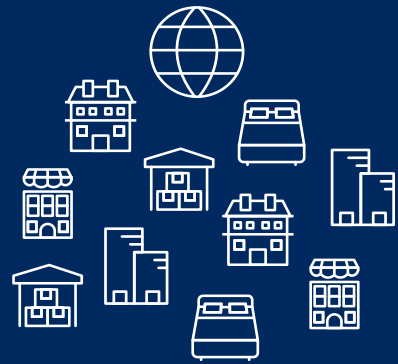


CO₂-Emissions avoided in tCO₂/year

Methodology

General overview

Impact reporting



Impact = Benchmark - Specific Value of Green Property

Portfolio

Evaluated Portfolio

Impact (kWh & CO₂)

Process for impact evaluation

The following procedure was applied to determine the CO₂ savings financed by Aareal Bank in cooperation with Drees & Sommer:

1. Portfolio Assessment

Asset data validation and input process verification to ensure consistency, quality and structural integrity of each green eligible asset.

2. Determination of specific end energy consumption and CO₂ emissions for each green eligible asset

The applied methodology by Drees & Sommer is explained in more detail in the methodology section on the following pages.

3. Calculation of impact for a green property

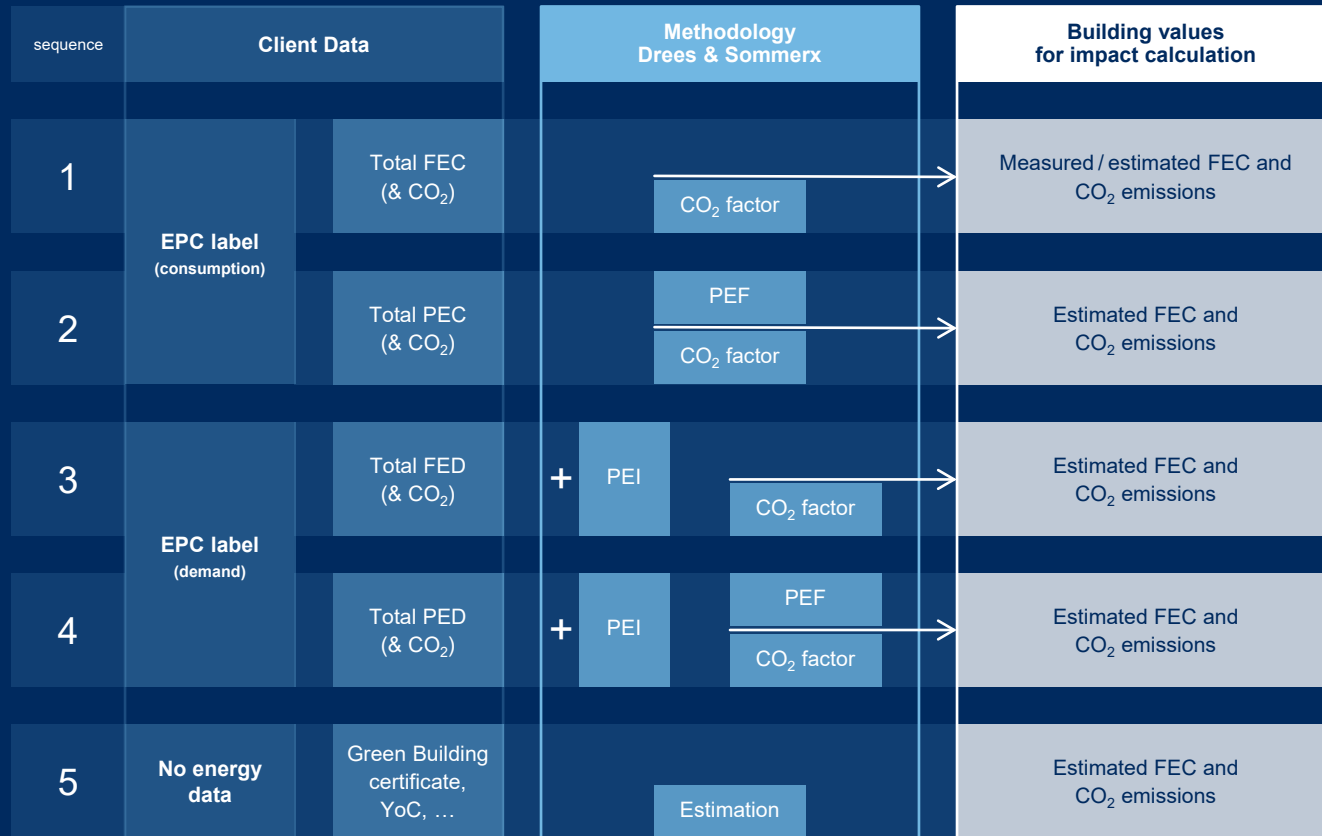
Difference between reference benchmarks and specific value for each green eligible asset. An overview of the applied benchmarks is given in the methodology section on the following pages.

4. Determination of the financed CO₂ avoidance for Aareal Bank

Consideration of the financed share of Aareal Bank in relation to the market value of the green property for the calculation of Aareal Bank's proportionate impact.

Methodology

Value of the buildings - Use of client data / determining missing values



The following methodology was selected for calculating the specific energy and CO₂ values dependent on the sequence of the green eligible asset:

Determining the value of the buildings

- Necessary for the impact calculation are the end energy consumption and the CO₂ emissions of the buildings
- For the calculation of the impact reporting, the client data is partly used directly and partly supplemented and/or converted by the respective calculation.
- The used sequence is shown in the diagram on the left (from 1 to 5).

FEC = Final energy consumption = end energy consumption in kWh/m²a
 PEC = Primary energy consumption in kWh/m²a
 PEF = Primary energy factor
 FED = Final energy demand in kWh/m²a

PED = Primary energy demand in kWh/m²a
 PEI = Partial energy indicator in kWh/m²a
 YoC = Year of Construction
 CO₂ factor in kgCO₂e/kWh/m²a, CO₂ emissions in kgCO₂e/m²a

Methodology

Impact Reporting

Impact Reporting – Calculation of the Impact

Final Energy Savings:

Difference in **Final energy consumption** between green eligible asset (EP_{GB}^*) and mean building (EP_{\emptyset}).

Example:

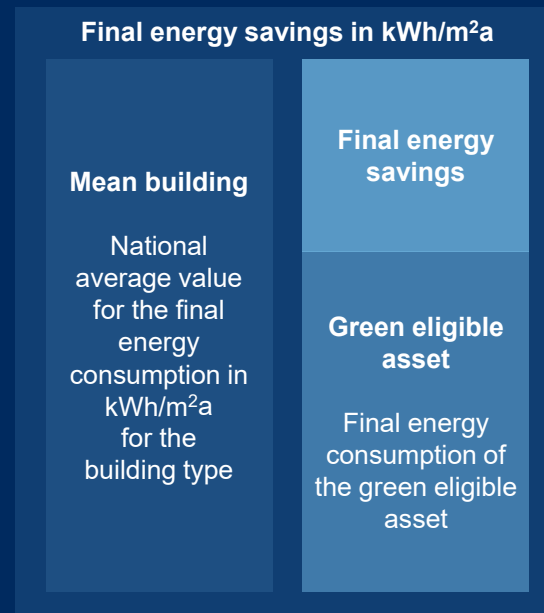
Country: Germany

Building type: residential (MFH)

$$EP_{\emptyset} = 168 \text{ kWh/m}^2\text{a}$$

$$EP_{GB} = 80 \text{ kWh/m}^2\text{a}$$

Final energy savings:
94 MWh/year



Carbon Emissions Savings:

Difference in **Carbon emissions intensity** between green eligible asset (CEI_{GB}^*) and mean building (CEI_{\emptyset}) multiplied with the area of the green eligible asset.

Example:

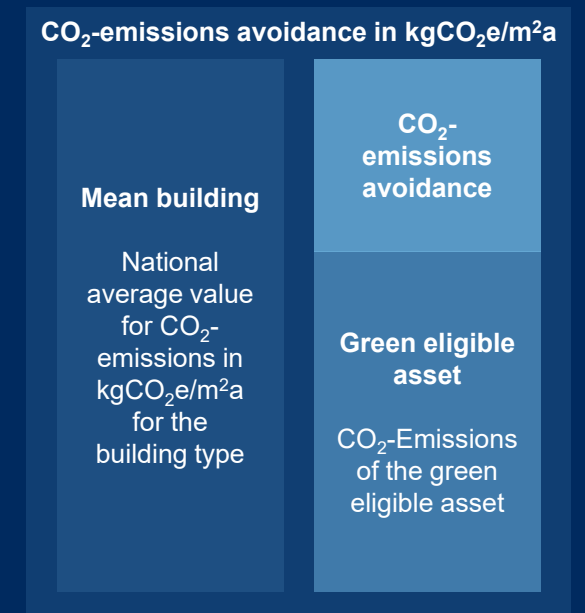
Country: Germany

Building type: residential (MFH)

$$CEI_{\emptyset} = 40 \text{ kgCO}_2\text{e/m}^2\text{a}$$

$$CEI_{GB} = 8,5 \text{ kgCO}_2\text{e/m}^2\text{a}$$

CO₂-emissions avoidance:
34 tCO₂e/a



* If data is not available, the value will be determined by Drees & Sommer, see Value of the buildings - Use of client data/ determining missing values.

Methodology

Benchmarks

The following methodology was selected for the benchmarks used:

Benchmarks calculation

- Alle benchmarks are used in the methodology of Drees & Sommer are based on public accessible data.
- For each country and usage in the portfolio, specific values are determined:
 - Residential buildings: Multi Family Houses
 - Non-residential buildings: Office, Retail, Logistics, Hotel
- For determining the Energy and CO₂ benchmarks, data sources with high quality are used. Typical data sources are for example:
 - Federal Statistical Office of the respective country
 - Public databases of buildings with/without EPC labels
 - Studies
- Based on this data, a national average value is built for:
 - Final energy consumption (FEC) in kWh/m²a
 - Primary energy consumption (PEC) in kWh/m²a
 - CO₂ emissions in kgCO₂e/m²a

Green Building Systems



Federal Statistical Office



Databases



Studies



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Appendix

Impact reporting – methodology

Eligibility criteria – EU taxonomy – Methodology to determine the top15%

Verband Deutscher Pfandbriefbanken (VDP)

The Association of German Pfandbrief Banks (vdp) commissioned Drees & Sommer to develop a methodical approach to develop a standardized methodology for implementing the funding criteria of the EU taxonomy for the environmental goal of climate change protection for non-residential and residential buildings in Germany.



The Association of German Pfandbrief Banks (vdp) is one of the five leading associations of the German banking industry (DK). It represents the most important investors in residential and commercial construction as well as the state and its institutions.

Source 1: <https://www.dreeso.com/de/unternehmen/presse/presseinformationen/details/vdp-und-drees-sommer-praesentieren-benchmarking-fuer-top-15-kriterium-bei-immobilien> (Oktober 2023)

Source 2: <https://www.dgnb-system.de/de/services/esg-verification-taxonomie/index.php>

DGNB applies the top15% study of Drees & Sommer

The German Society for Sustainable Building has implemented the EU taxonomy criteria developed by Drees & Sommer in the ESG verification.

In order to check whether real estate conforms to the criteria of the EU taxonomy, the DGNB offers its own ESG verification for the real estate sector. This is applicable to the economic activities defined in the taxonomy: new construction, renovation, acquisition and ownership. It is based on the currently available taxonomy criteria, but also includes labor and social standards as well as “good governance” of the companies involved.



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