MünchenerHyp

Impact Reporting 2019

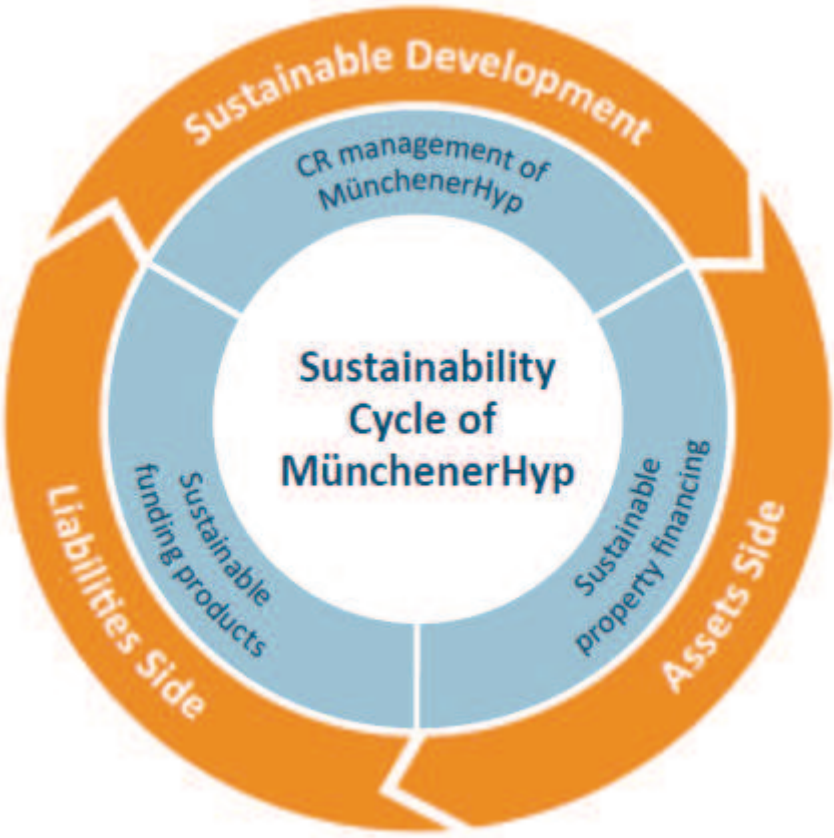
Sustainability at MünchenerHyp

As early as 2014, Münchener Hypothekenbank eG pioneered the issue of the first sustainable ESG Pfandbrief in Germany. MünchenerHyp's business strategy is guided by the concept of sustainable management and the sustainable Pfandbrief was therefore a logical step. Following the launch of the ESG bond, the Bank has consistently anchored sustainability in our core business, which includes social and ecological responsibility.

In addition, MünchenerHyp has excluded business activities in certain critical sectors. These include controversial areas of business such as:

- Gambling
- Pornography
- Armament
- Tobacco
- Alcohol
- Uranium mining

The focus of our sustainability management is on our core business, as the leverage for implementing the goals of sustainable development is greatest in this area. The Bank regards our sustainability activities in our core business as a cycle under which sustainable real estate financing is carried out on the assets side, which in turn is refinanced sustainable on the liabilities side. MünchenerHyp's sustainability management is a constant source of new impetus for this development.



MünchenerHyp has developed various sustainability loans for its private customers that cover ecological and social aspects in line with our holistic understanding of sustainability.

The good demand is reflected in the portfolios as per 30 September 2019:

- over 4,500 green loans and
- over 1,000 family loans.

The high granularity of the Bank's overall loan portfolio is therefore also reflected in the green portion of the portfolio to the delight of investors.

The high number of new loans in the sustainable categories of green loans and family loans also demonstrates the success MünchenerHyp has achieved by developing its own products. On the asset side, the sales channels of the Volksbanken and Raiffeisenbanken were considerably expanded with our own tailor-made, sustainable products and many new decidedly sustainable investors were gained on the bond side.

Sustainable Loan Criteria

In MünchenerHyp's Green Bond Framework, the suitability criteria for loans in private and commercial real estate lending are set out in writing.

Retail	Commercial
Green loans	Certified environmental loans
Criteria	
residential buildings in Germany with maximum annual energy demand of 70kWh/sqm or from 2020 onwards residential buildings in Germany with maximum annual energy demand of 55kWh/sqm or residential buildings that obtained an energy performance certificate with a minimum energy performance labelled "B" (on a scale from H to A+) Info: Grandfathering for green loans granted since November 2015	DGNB (min. Gold or Platinum) or BREEAM (min. Very Good, Excellent or Outstanding) or LEED (min. Gold or Platinum) or HQE (min. Excellent oder Exceptional) or BREEAM NL (min. 40% or better) or Energy Performance Certificate (EPC) (min. Level A or better) or Top 15% of national building stock by energy performance

In 2019, the Green Bond Framework was updated and the Bank set new targets and introduced new sustainable funding products. The range of products was expanded to include senior preferred and senior non-preferred bonds. And as an innovation, a green commercial paper was also introduced to the money market. For all three products, the use of funds is attributed to green assets.
From 2020, MünchenerHyp will implement stricter criteria for the green loan. The annual primary energy demand per square metre will be reduced from 70 kWh to 55 kWh, which represents a further approximation to the requirements of the EU taxonomy.

The reduction in interest rates for green loans up to a term of 30 years reflects MünchenerHyp's long-term commitment to sustainability, which is one of the objectives of the EU taxonomy.

The further development and introduction of sustainable products, participation in national working groups (vdp Green Pfandbrief Working Group) and participation at

international level (Energy Efficient Mortgage Initiative, EEMI for short) characterise MünchenerHyp's dynamism on the product side and in refinancing. The course is thus set for the effects of change on society, the climate and economy.

Transparency

As of the impact reporting date of 30 June 2019, the Bank's total green portfolio amounted to EUR 1,630.7 million. The number of properties is divided between 47.3% and 3,783 green retail loans. A further 52.7 % and 21 properties are attributable to sustainable commercial real estate lending.
In addition to annual impact reporting, Münchener Hypothekenbank eG offers investors a comprehensive service for the green portfolio on a quarterly basis based on the requirements of §28 PfandBG.
The following charts show the details of the green portfolio in the cover pool at the reporting date of the impact reporting as at 30 June 2019 according to the following criteria:

- portfolio breakdown
- loan to value ratio
- maturity
- volume
- region

outstanding ecological ESG Pfandbriefe and related cover assets

€ thousand	nominal value	net present value	risk-adjusted pv*
	June 30, 2019	June 30, 2019	June 30, 2019
ecological ESG Pfandbrief	500,000	506,418	530,914
cover pool retail assets	466,957	534,022	614,557
cover pool commercial assets	520,717	732,366	773,308
over-collateralisation	**487,674**	**759,970**	**856,951**

*) stress test applying the dynamic approach in accordance with section 5 (1) no 1 Pfandbrief-Net Present Value Directive (PfandBarwertV)

cover assets by loan to value ratios

LTV as per 30/06/2019		< 30%	30% - 60%	> 60%*
cover pool		€ thousand	€ thousand	€ thousand
	retail	19,169	247,059	200,729
	commercial	0	31,400	489,317

*in the category loan to value >60% only the cover pool eligible part up to 60% is reported

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cover assets by maturity

maturity	June 30, 2019 retail cover pool	June 30, 2019 commercial cover pool
<= 0.5 year	0	0
> 0.5 year and <= 1 year	0	0
> 1 year and <= 1.5 years	0	9,474,000
> 1.5 years and <= 2 years	193,495	0
> 2 years and <= 3 years	194,410	7,140,000
> 3 years and <= 4 years	139,131	70,658,447
> 4 years and <= 5 years	130,402	93,388,871
> 5 years and <= 10 years	30,110,270	298,930,907
> 10 years	436,189,130	41,125,000

cover assets by volume

volume	June 30, 2019 retail			June 30, 2019 commercial		
	Tsd. €	in %	Anzahl Darlehen	Tsd. €	in %	Anzahl Darlehen
up to 300,000 Euros	402,585	86.21	2,381	0	0.00	0
more than 300,000 Euros up to 1mn Euros	64,372	13.79	164	0	0.00	0
more than 1mn Euros up to 10mn Euros	0	0.00	0	16,614	3.19	2
more than 10mn Euros	0	0.00	0	504,103	96.81	16
Total	**466,957**	**100.00**	**2,545**	**520,717**	**100.00**	**18**

cover assets by region

Länder und Regionen	June 30, 2019 retail		June 30, 2019 commercial	
	€	in %	€	in %
Baden-Württemberg	90,175,321	19.31	0	0.00
Bavaria	184,095,381	39.42	67,600,473	12.98
Berlin	776,360	0.17	96,730,000	18.58
Brandenburg	336,600	0.07	0	0.00
Bremen	129,600	0.03	0	0.00
Hamburg	5,275,524	1.13	0	0.00
Hesse	12,555,949	2.69	90,541,157	17.39
Mecklenburg-Western Pomerania	737,357	0.16	0	0.00
Lower Saxony	55,290,296	11.84	0	0.00
North Rhine-Westphalia	68,122,486	14.59	34,743,750	6.67
Rhineland-Palatinate	15,543,470	3.33	0	0.00
Saarland	2,492,303	0.53	0	0.00
Saxony	5,752,522	1.23	0	0.00
Saxony-Anhalt	1,405,398	0.30	0	0.00
Schleswig-Holstein	22,687,669	4.86	0	0.00
Thuringia	1,580,602	0.34	0	0.00
Austria	0	0.00	41,125,000	7.90
Spain	0	0.00	43,557,600	8.36
Luxembourg	0	0.00	31,400,000	6.03
The Netherlands	0	0.00	29,370,000	5.64
United Kingdom	0	0.00	85,649,245	16.45
Total - all states	**466,956,838**	**100.00**	**520,717,226**	**100.00**

In order to ensure transparency for the entire green portfolio and not only for assets that are already booked into the cover pool, investors are regularly informed about the growth of the entire portfolio and thus not only the eligible part of sustainable loans is shown.
This means that every investor is kept up-to-date on the steady growth of Münchener Hypothekenbank's sustainable loans at short intervals. The following is a breakdown of the portfolio as of the impact reporting date:

assets	notional value in EUR m 30.06.2019		liabilities
cover pool retail	467.0	500.0	ecological ESG Pfandbrief
cover pool commercial	520.7		
over-collateralisation	487.7		
number of green loans: total 3,804; retail 3,783; commercial 21			
retail not in cover pool	304.3	0.0	green senior bonds
commercial not in cover pool	338.7		green CP
balance not in cover pool	643.0		
available green portfolio	**1,130.7**		

MünchenerHyp thanks you for the pleasant and interesting cooperation with the Wuppertal Institute for Climate, Environment and Energy.

Brief summary | November 2019

Impact analysis of the MünchenerHyp ESG Pfandbriefe Q2-2019

Results of the evaluation of greenhouse gas emissions avoided through the Green Mortgage Loan Programme

Authors:

Jens Teubler, Manuel Bickel, and Lena Hennes

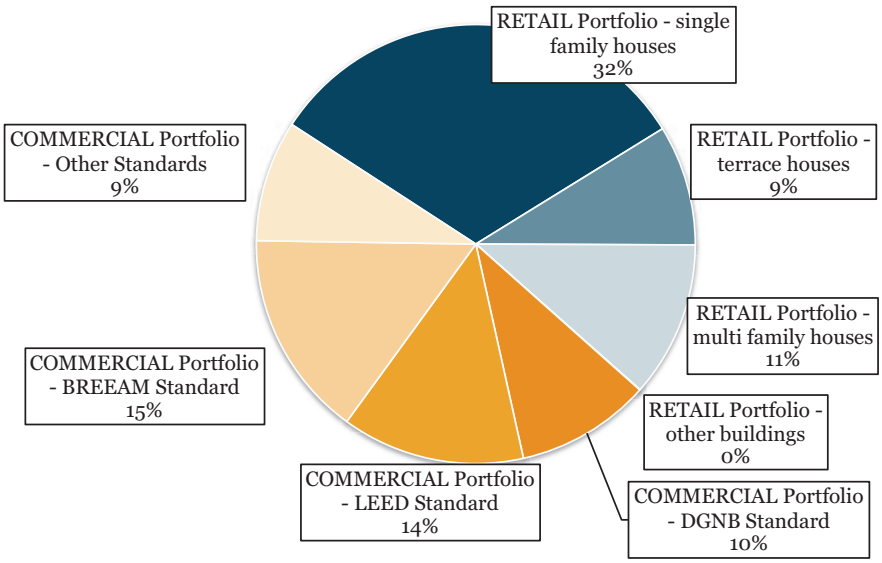
On behalf of

MünchenerHyp

Wuppertal Institut

On behalf of MünchenerHyp, Wuppertal Institute has analysed the impact of its Green Mortgage Loan Programme, which is also partly re-financed by the ESG Pfandbrief with a volume of EUR 500m. However, impacts in this report refer to an eligible loan portfolio of EUR 860m for retail mortgages and EUR 781m for commercial mortgages.

Loans in the Portfolio analysed in this report (EUR 1,641m)

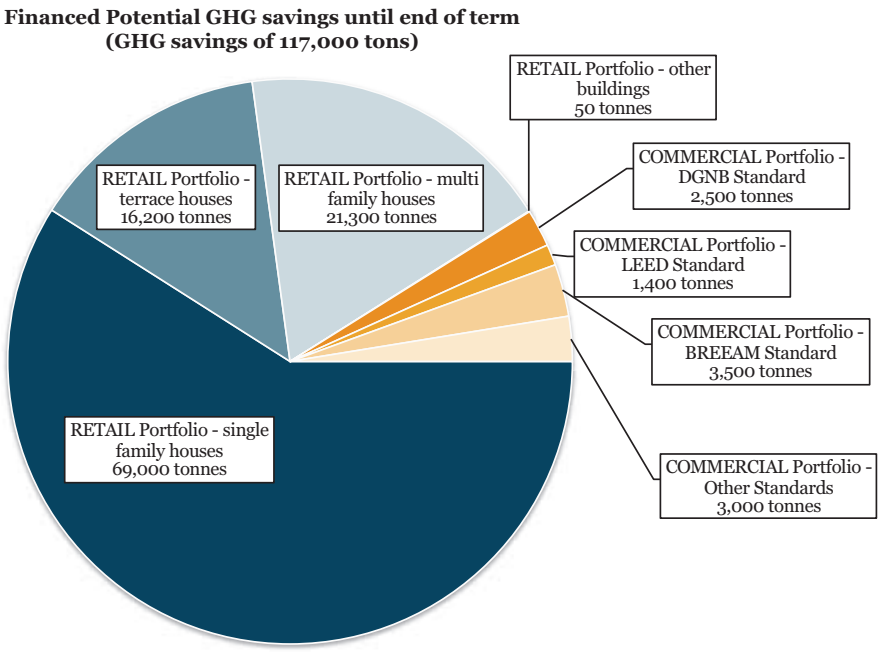


The loans cover new and refurbished buildings with high energy efficiency standards that are expected to avoid greenhouse gas (GHG) compared to current heating standards in Germany and other European countries. The eligibility of the underlying green bond framework[1] as well as the current asset pool has been verified by ISS-Oekom[2]. Buildings for the retail mortgage programme achieve heating demands of 70 kWh/(sqm*a) and less, while commercial mortgages refer to certified buildings with very good or excellent DGNB, BREEAM, LEED, HQE or EPC standards.

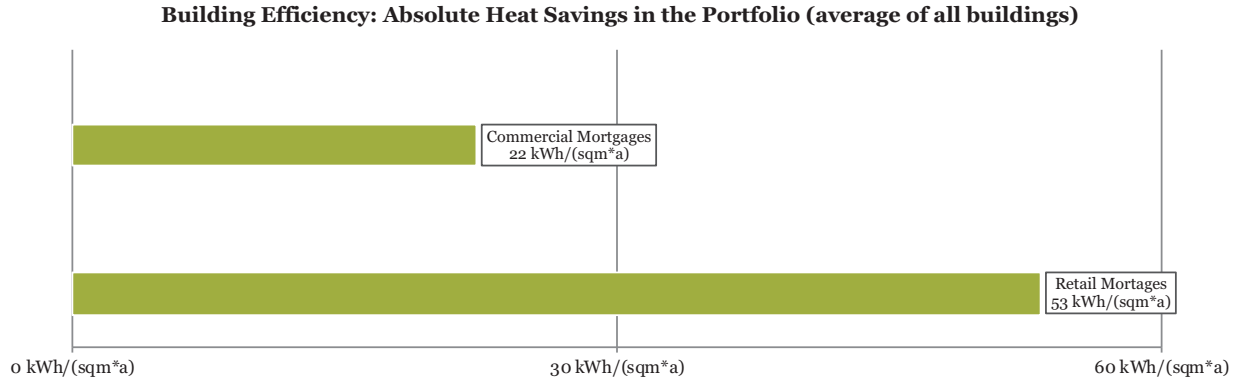
The report at hand estimates GHG savings based on heating energy savings during the use of the buildings on an annual basis[3]. The results are calculated with bottom-up models for heat savings in buildings. Reference for GHG savings are the current heat demand for buildings in stock and the GHG emissions of the energy provision.

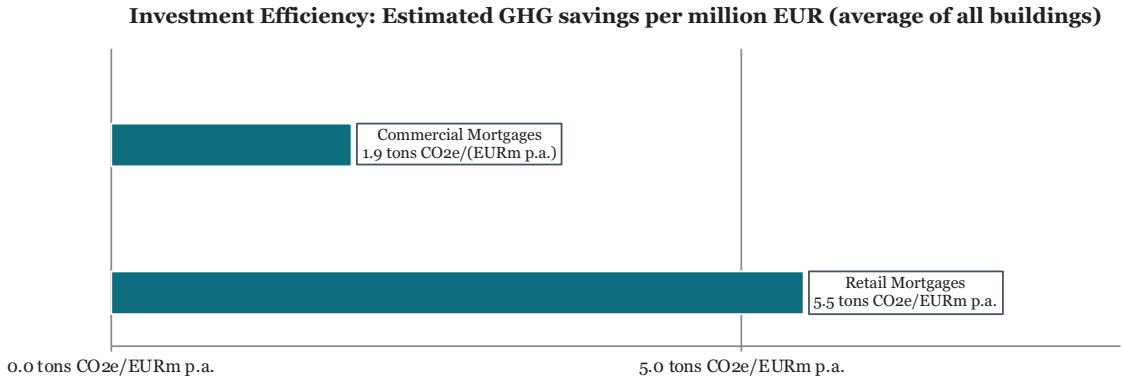
It has been estimated that the buildings investigated will avoid greenhouse gas emissions of 200 kilotons CO_2 equivalents until the end of loan term. The Münchener Hyp finances these buildings with an overall share of approximately 59%, thus inducing savings of 117 kilotons (see next figure).

[1] aee https://www.muenchenerhyp.de/sites/default/files/downloads/2019-08/MuenchenerHyp_Green_Bond_Framework_2019_e.pdf
[2] see https://www.muenchenerhyp.de/sites/default/files/downloads/2019-08/20190731_ISS-oekom_Muenchenerhyp_SPO.pdf
#[3] Effects of electricity use, building construction and demolition have not been investigated.



It is also possible to evaluate the efficiency of each loan category. On average, energy savings for the buildings in the portfolio amount to 22 kWh per square metre for commercial mortgages and 53 kWh per square metre for retail mortgages (building efficiency compared to the building stock). From the point of view of investments into the loan programme, 1.9 tons of CO2-equivalents are saved per year and million Euro for commercial mortgages, compared to 5.5 tons for retail mortgages (see the next two figures).





Retail Mortgage Loans

Retail mortgages are financed with a share of approximately 58% (EUR 860m) and a credit period of 22.7 years. The majority of loans were used to finance new and refurbished single-family homes (61%). The loans induced GHG savings of ca. 4.7 kilotons per year or 106.7 kilotons until the end of term. However, all buildings are expected to save further GHG emissions until the end of the lifetime of the buildings.

By comparison with the presented results, many of the buildings might also make use of more GHG efficient heating systems, thus inducing additional savings compared to the building stock and its conventional heating mix. In addition, some buildings might also exhibit a higher efficiency in terms of electricity use (e.g. with help of efficient lighting or by producing solar energy), inducing further GHG savings compared to the reference buildings.

Non-Residential Mortgage Loans

The commercial mortgages in the portfolio account for approximately EUR 781m. With an estimated financed share of 60%, these loans help to induce GHG savings of 1.5 kilotons per year or 10.8 kilotons until the end of term.

The effects were predominantly calculated based on assumptions for heat savings without considering electricity efficiency, because actual building data was not available or could be found in statistics. In addition, and by comparison with retail buildings, only one type of heating system was assumed for each building and its reference in the stock. It is therefore assumed that the actual GHG savings for these buildings are considerable higher compared to the conservative approach in the report at hand.

Case-study: Additional Effects from Modernisation

The following table estimates the effects if additional measures like the replacement of oil heating or higher standards for buildings certificates are taken into account (at least 50% less energy compared to the building stock). In this optimistic scenario, financed savings of 145 kilotons CO_2-equ. could be achieved (compared to 117 kilotons).

Type	Additional Measure	Additional energy savings [GWh/a)	Additional GHG savings (t CO_2e/a)
Retail	Replacement of oil heating systems	none	375 (financed)
Commercial	Higher Efficiency Standards	10.2	2,560 (financed)
Total	**-**	**10.2**	**2,935 (financed)**

Outlook

The report at hand estimated potential avoided GHG emissions in a robust manner, but with help of conservative estimates in case of lack of data. Future impact reporting should therefore focus on the provision of more accurate building data to account for additional effects from modern heating systems or higher efficiency gains in particular for commercial buildings.

The annex shows the result in detail according to the current ICMA framework. It also provides a brief summary of the methods and data used for calculation.

Annex – Results, Methods and Data

The following results are presented in accordance with the current „Harmonized Framework for Impact Reporting“ (ICMA, June 2019)[4]. The impact analysis is confined to the avoidance of greenhouse gas (GHG) emissions during the use phase of buildings. They refer to the Global Warming Potential for 100 years (GWP 100a) of energy sources in the German heating mix and heat sources in other countries (including upstream processes).

estimates during use phase of buildings ex ante

Energy Efficiency (EE)	Signed Amount (reported nominal value)	Share of Total Project Financing (estimate)	Eligibility for green bonds	EE Component (estimate)	Loan Period (weighted average)	Annual Energy Savings (heat)		Reduced/Avoided annual GHG emissions (heat)		Absolute annual GHG emissions (heat)[1]	
Portfolio – heat savings	**million EURO**	**%**	**% of signed amount**	**% of signed amount**	**in years**	**GWh/a**		**in 1.000 tonnes of CO2-equivalents**		**in 1.000 tonnes of CO2-equivalents**	
						100%	**financed**	**100%**	**financed**	**100%**	**financed**
RETAIL Portfolio - single family houses	525.7	56.2%	100%	not applicable	24.0	21.53	12.11	5.11	2.87	3.36	1.90
RETAIL Portfolio - terraces houses	145.6	60.4%	100%	not applicable	22.6	5.00	3.02	1.19	0.72	0.95	0.56
RETAIL Portfolio - multi family houses	188.4	62.5%	100%	not applicable	18.9	7.61	4.76	1.81	1.13	0.92	0.56
RETAIL Portfolio - other buildings	0.4	65.7%	100%	not applicable	24.6	0.012	0.008	0.003	0.002	0.001	0.001
TOTAL EE (RETAIL)	**860.2**	**58.2%**	**100%**	**not applicable**	**22.7**	**34.2**	**19.9**	**8.1**	**4.7**	**5.2**	**3.0**

[1] *Absolute annual emissions refer to the average heating mix in Germany. The buildings in the portfolio might exhibit lower annual emissions than presented here due to e.g. heating systems without fossil fuel use.*

Energy Efficiency (EE)	Signed Amount (reported nominal value)	Share of Total Project Financing (estimate)	Eligibility for green bonds	EE Component (estimate)	Loan Period (weighted average)	Annual Energy Savings (heat)		Reduced/Avoided annual GHG emissions (heat)		Absolute annual GHG emissions (heat)[1]	
Portfolio – heat savings	**million EURO**	**%**	**% of signed amount**	**% of signed amount**	**in years**	**GWh/a**		**in 1.000 tonnes of CO2-equivalents**		**in 1.000 tonnes of CO2-equivalents**	
						100%	**financed**	**100%**	**financed**	**100%**	**financed**
COMMERCIAL Portfolio - DGNB Standard	163.2	35.4%	100%	not applicable	7.2	3.66	1.30	0.87	0.34	1.70	1.01
COMMERCIAL Portfolio - LEED Standard	221.5	46.2%	100%	not applicable	8.6	1.31	0.60	0.34	0.16	2.70	1.39
COMMERCIAL Portfolio - BREEAM Standard	250.2	90.2%	100%	not applicable	5.4	2.71	2.45	0.71	0.64	3.21	2.92
COMMERCIAL Portfolio - Other Standards	146.4	70.2%	100%	not applicable	8.6	2.72	1.91	0.38	0.35	1.39	1.31
TOTAL EE (COMMERCIAL)	**781.2**	**60.2%**	**100%**	**not applicable**	**7.1**	**10.4**	**6.3**	**2.3**	**1.5**	**9.0**	**6.6**

[1] *Absolute annual emissions have beend calculated using emission factors of the individual heating systems for buildings where the heating system was known and the emission factor of gas heatings in Germany where the heating system was not known.*

Method and Data for Retail Mortgages

3 different building types in 12 different timeframes for the year of construction were differentiated for the building stock of retail mortgages (SH, TH, MFH). Heating data for building stock is based on the European Database for residential buildings TABULA[5]. The actual energy demand as well as year of construction of the buildings in the asset pool were provided by MünchenerHyp. Characterisation factors for each energy source are based on a recent report by the German Federal Environmental Agency UBA[6].

Method and Data for Non-Residential Mortgages

Due to lack of data (on individual buildings as well as from statistics), savings for non-residential mortgages were calculated differently. The methodology is described separately in the following for the groups of buildings with DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen - German Sustainable Building Council), LEED (Leadership in Energy and Environmental Design), BREEAM (Building Research Establishment Environmental Assessment Methodology), and OTHER energy efficiency standards.

[4] see https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/June-2019/Handbook-Harmonized-Framework-for-Impact-Reporting-WEB-100619.pdf
[5] see http://webtool.building-typology.eu/#bm
[6] see https://www.umweltbundesamt.de/en/publikationen/emissionsbilanz-erneuerbarer-energietraeger

For the DGNB buildings the primary energy consumption of the buildings could be extracted from data provided in the available building certificates. Where primary energy included electricity not only heat, the amount of electricity was subtracted from the stated primary energy demand for calculating the heat demand. Where emission factors were not stated in the certificates, the factors for the respective heating system as published by the UBA[7] were used. Where the energy demand of reference buildings was not provided in the certificates, the national average energy demand for non-residential buildings as published in the EU Building Database[8] was used.

For buildings certified under the LEED standard no data was available on absolute primary energy demand. The minimum energy savings to be achieved for even being certifiable under LEED, savings of 8% (renovation) or 14% (new construction) need to be achieved with respect to the reference building[9]. Since no data on reference buildings were provided in the certificates, the national averages in the EU Building Database were used. Further, as the emission factors for heating systems provided by the UBA were used.

For buildings certified under the BREEAM standard no data on primary energy demand was provided in the certificates. For estimating the energy savings, a typical best practice example as described in the standard was used that achieves energy savings of 18% with respect to the reference building[10]. For the reference building and emission factors the EU Building Database and the UBA factors were used. Where no information on the heating system was available, the factor for a gas heating in Germany was used.

OTHER standards include a mix of different standards. For some of the buildings some data on the primary energy demand was available. Where this was not the case, the data in the EU Building Database was used. Due to a lack of data on energy savings in OTHER certificates, the average share of savings achieved in the whole portfolio was used for these buildings as a proxy. Where possible, the emission factors of the UBA were used. For two heating systems (heating with electricity in France and district heating in Austria) emission factors published by the Umweltbundesamt Österreich[11] and the Öko-Institut[12] were used.

Assumptions used in the optimistic scenario

RETAIL: Replacement of oil heating systems

As heating with oil is usually considered to have the highest GHG emissions (without regard for coal heating), it is reasonable to assume that these systems get to replaced first during the modernisation of a building (or not to be used for new buildings). To simulate this effect, the heating mix has been adjusted accordingly (e.g. increasing the share for gas heaters from 44 to 61%). As a result, GHG emissions per kWh of heat are reduced from 237 g CO_2-equ. to 210 g per kWh.

COMMERCIAL: 50% Saving of heating energy

The German Federal Ministry of Economic Affairs and Energy has published various possible target corridors regarding the required energy saving ratios in buildings until 2050[13]. In the medium scenario, a 60% share of renewables in the energy mix in 2050 is assumed. In this case, energy savings in the building sector of 50% would be required to meet the climate mitigation targets. Therefore, for the optimistic scenario in this impact analysis, the saving ratio of 50% was used for the calculating possible savings in the portfolio in the non-residential sector. For comparison, the average saving ratio calculated in the standard case is 23% and the highest ratio 58%.

[7] https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2017-10-26_climate-change_23-2017_emissionsbilanz-ee-2016.pdf
[8] https://ec.europa.eu/energy/en/eu-buildings-database
[9] https://www.usgbc.org/node/1731022
[10] https://www.breeam.com/BREEAMInt2013SchemeDocument/content/06_energy/ene_01_reduction_of_co2_emissions.htm#Example_calculation_for_%E2%80%98good_international_practice%E2%80%99_distribution
[11] Umweltbundesamt Österreich (2017): Berechnung von Treibhausgas (THG)-Emissionen verschiedener Energieträger
[12] https://www.oeko.de/oekodoc/318/2007-008-de.pdf
[13] https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/sanierungsbedarf-im-gebaeudebestand.pdf?__blob=publicationFile&v=3

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