



MünchenerHyp

Impact Reporting 2020

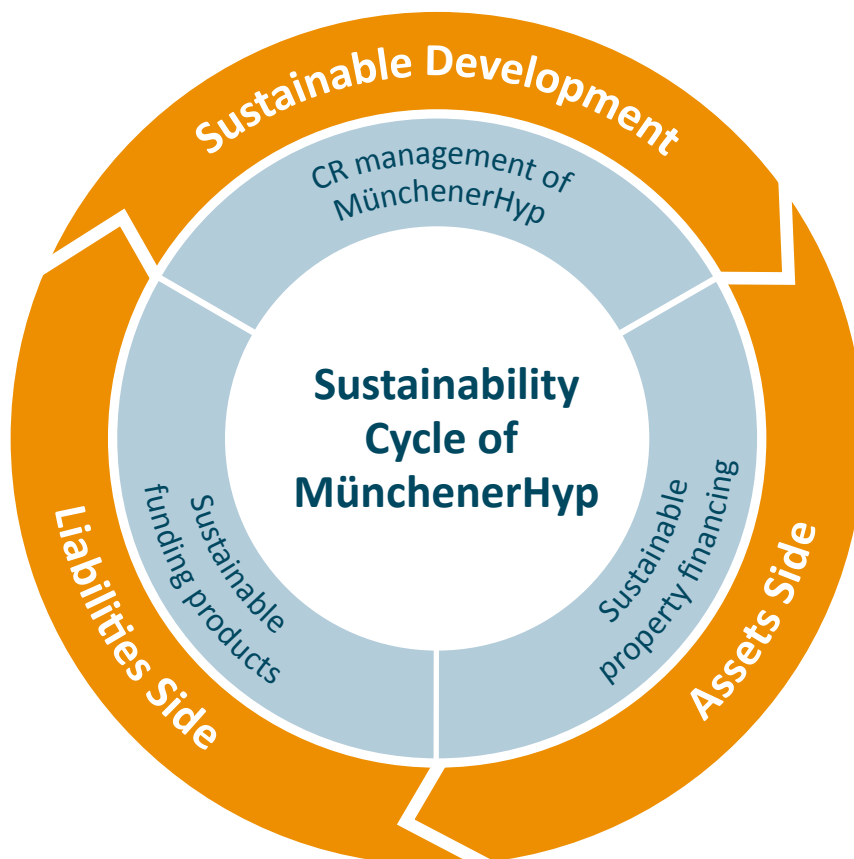


Sustainability at MünchenerHyp

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 its 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 June 30th, 2020:

- 5,618 green loans and
- 30 commercial loans with sustainable certifications.



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.

Sustainability 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.

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

In 2020, the Green Bond Framework has been 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 May 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.

MünchenerHyp's commitment on the product side and in refinancing is characterized by the further development and introduction of sustainable products, participation in national working groups (vdp Green Pfandbrief Working Group), and cooperation at the international level (Energy Efficient Mortgage Initiative, or EEMI for short). MünchenerHyp has thus set a forward-looking course with regard to the effects of change in society, the environment, and the economy.



Transparency

As of the impact reporting date of June 30th, 2020, the Bank's total green portfolio amounted to EUR 2,174.7 million. The number of properties is divided between 55.1% and 5,618 green retail loans. A further 44.9% and 30 properties are attributable to sustainable commercial real estate lending. In addition to the annual impact reporting, Münchener Hypothekbank 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 June 30th, 2020 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 June 30 th , 2020	net present value June 30 th , 2020	risk-adjusted pv* June 30 th , 2020
ecological ESG Pfandbrief	500,000	511,888	494,568
cover pool retail assets	765,178	1,141,926	992,921
cover pool commercial assets	683,462	1,073,092	999,685
over-collateralisation	948,640	1,703,130	1,198,038

* 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 June 30 th , 2020		< 30%	30% – 60%	> 60%*
		€ thousand	€ thousand	€ thousand
cover pool	retail	27,188	390,481	347,509
	commercial	0	85,887	597,575

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

Cover assets by maturity

maturity	June 30 th , 2020 € thousand retail cover pool	June 30 th , 2020 € thousand commercial cover pool
≤ 0.5 year	0	9,474,000
> 0.5 year and ≤ 1 year	385,082	0
> 1 year and ≤ 1.5 years	0	0
> 1.5 years and ≤ 2 years	137,673	7,140,000
> 2 years and ≤ 3 years	375,000	69,642,404
> 3 years and ≤ 4 years	214,057	195,079,107
> 4 years and ≤ 5 years	292,200	97,609,317
> 5 years and ≤ 10 years	45,596,922	263,391,814
> 10 years	718,176,105	41,125,000



Cover assets by volume

volume	June 30 th , 2020 retail			June 30 th , 2020 commercial		
	€ thousand	in %	number loans	€ thousand	in %	number loans
up to 300,000 €	625,277	81,72	3,659	0	0.00	0
more than 300,000 € up to 1mn €	139,901	18,28	351	0	0.00	0
more than 1mn € up to 10mn €	0	0.00	0	16,614	2.43	2
more than 10mn €	0	0.00	0	666,848	97.57	25
Total	765,178	100.00	4,010	683,462	100.00	27

Cover assets by region

countries and regions	June 30 th , 2020 retail		June 30 th , 2020 commercial	
	€	in %	€	in %
Baden-Württemberg	143,023,861	18.69	0	0.00
Bavaria	318,011,890	41.56	67,047,014	9.81
Berlin	1,304,712	0.17	56,830,907	8.32
Brandenburg	662,800	0.09	0	0.00
Bremen	458,400	0.06	0	0.00
Hamburg	8,986,938	1.17	0	0.00
Hesse	21,314,543	2.79	127,543,489	18.66
Mecklenburg-Western Pomerania	1,090,028	0.14	0	0.00
Lower Saxony	81,681,224	10.67	0	0.00
North Rhine-Westphalia	106,327,383	13.90	34,183,750	5.00
Rhineland-Palatinate	26,441,108	3.46	0	0.00
Saarland	5,085,957	0.66	0	0.00
Saxony	10,251,370	1.34	0	0.00
Saxony-Anhalt	3,702,781	0.48	0	0.00
Schleswig-Holstein	34,205,705	4.47	0	0.00
Thuringia	2,629,083	0.34	0	0.00
France	0	0.00	56,100,000	8.21
UK	0	0.00	98,993,033	14.48
Luxembourg	0	0.00	31,400,000	4.59
The Netherlands	0	0.00	62,970,000	9.21
Austria	0	0.00	41,125,000	6.02
Spain	0	0.00	69,957,600	10.24
USA	0	0.00	85,649,245	5.46
Total – all states	765,177,783	100.000	683,461,642	100.000



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 cover pool 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 € million June 30 th , 2020		liabilities
cover pool retail	765.2	500.0	ecological ESG Pfandbrief
cover pool commercial	683.5		
over-collateralisation	948.6		
number of green loans: total 5,648; retail 5,618; commercial 30			
retail not in cover pool	432.7	288.5	green senior bonds
commercial not in cover pool	293.4	0	green CP
balance not in cover pool	467.6		
available green portfolio	1,386.2		

MünchenerHyp would like to thank the Wuppertal Institute for Climate, Environment and Energy for the pleasant and constructive cooperation.

Brief summary | April 2021

Impact analysis of the MünchenerHyp Green Portfolio #2020

Results of the evaluation of greenhouse gas emissions avoided through the green mortgage loan programme and certified commercial buildings

Authors:

Jens Teubler, Felix Buchborn, Lynn Wagner

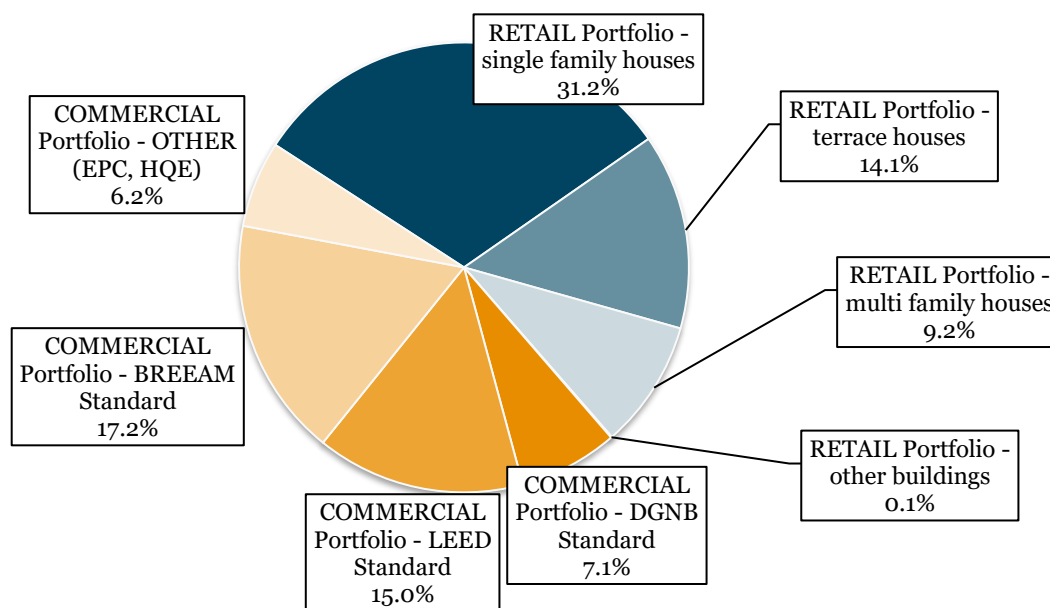
On behalf of



MünchenerHyp

On behalf of Münchener Hypothekenbank e.G. (MünchenerHyp hereafter), Wuppertal Institute has analysed the impact of the bank’s Green Mortgage Loan Programme as well as the financing of certified commercial buildings, which are already partly re-financed by the *ESG Pfandbrief* (EUR 500m) as well as *green senior bonds* (EUR 289m)¹. Overall, EUR 2,175m were assessed (reporting date 30th June 2020) of which EUR 2,146m (99%) could be quantified in terms of potential GHG emission reductions². Certified commercial buildings make up 46% or EUR 976m of the analysed assets (see next figure).

Loans in the Portfolio analysed in this report (EUR 2,146m)*



*note: sum of shares equals 100.1% due to rounding of small values

The loans cover new and refurbished buildings with high energy efficiency standards that are expected to avoid greenhouse gas (GHG) emissions compared to current heating standards in Germany and other countries in Western-Europe and the USA. The eligibility of the underlying green bond framework³ as well as the current asset pool has been verified by ISS-ESG⁴. Buildings financed under the retail green mortgage programme achieve heating standards of 70 kWh per square-metre and less (55 kWh from May 2020 onward). Commercial objects in the asset pool are certified with top level DGNB, BREEAM, LEED, HQE or EPC standards.

The report at hand estimates GHG savings based on heating energy used and saved in the portfolio on an annual basis⁵. The results are calculated with bottom-up models for heat savings in buildings. Reference for GHG savings is the current heat demand in the buildings stock and the GHG emissions of the current energy provision (see annex for details on methodology).

¹ https://www.muenchenerhyp.de/sites/default/files/downloads/2020-11/green_reporting_30_06_2020.pdf for final allocation reporting

² Some assets in the retail portfolio could not be sufficiently analysed in terms of physical values and financial shares.

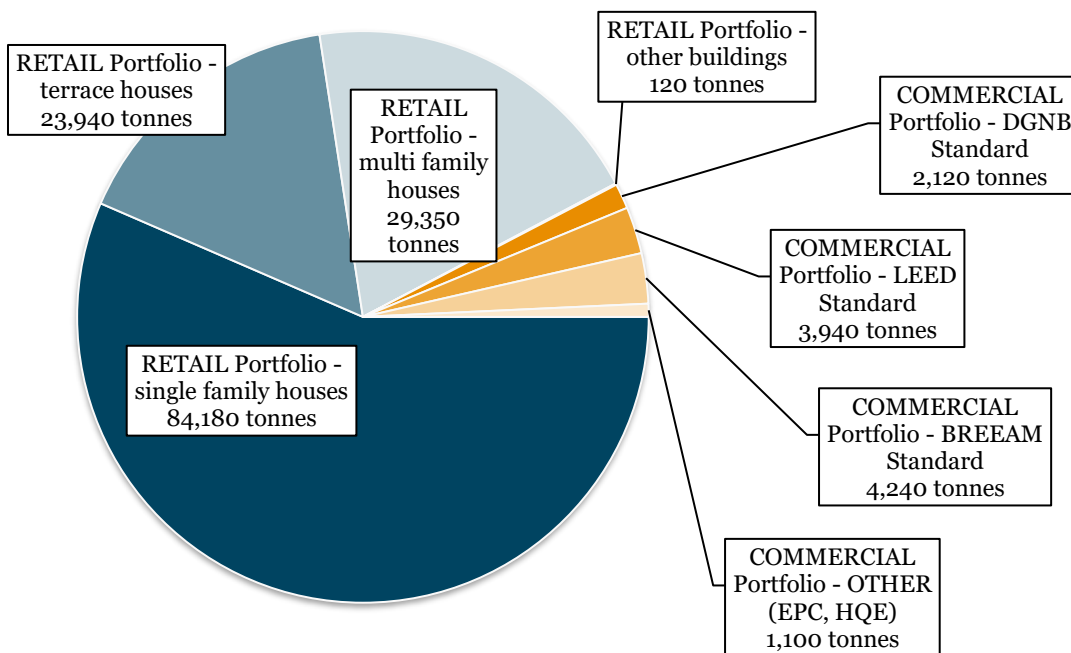
³ https://www.muenchenerhyp.de/sites/default/files/downloads/2020-12/Green_Bond_Framework_en_final.pdf

⁴ https://www.muenchenerhyp.de/sites/default/files/2020-11/30102020_MHB_SPO.pdf

⁵ Effects of electricity use, building construction, renovation and demolition have not been investigated.

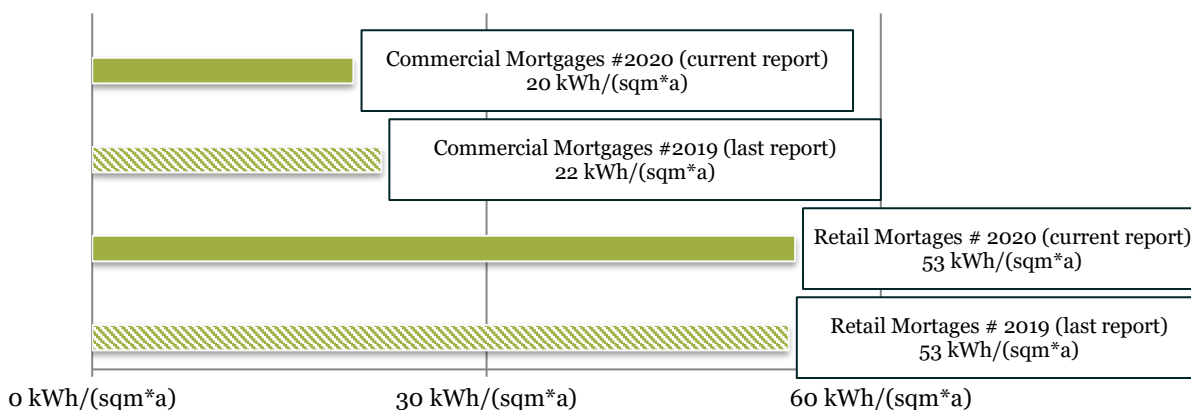
It has been estimated that the buildings investigated will avoid greenhouse gas emissions of 408 kilotons CO₂ equivalents until the end of their loan term. The MünchenerHyp finances these buildings with an overall share of approximately 37% on average, thus inducing savings of 149 kilotons CO₂-equivalents (see figure below).

Financed Potential GHG savings until end of term (148,990 tonnes)



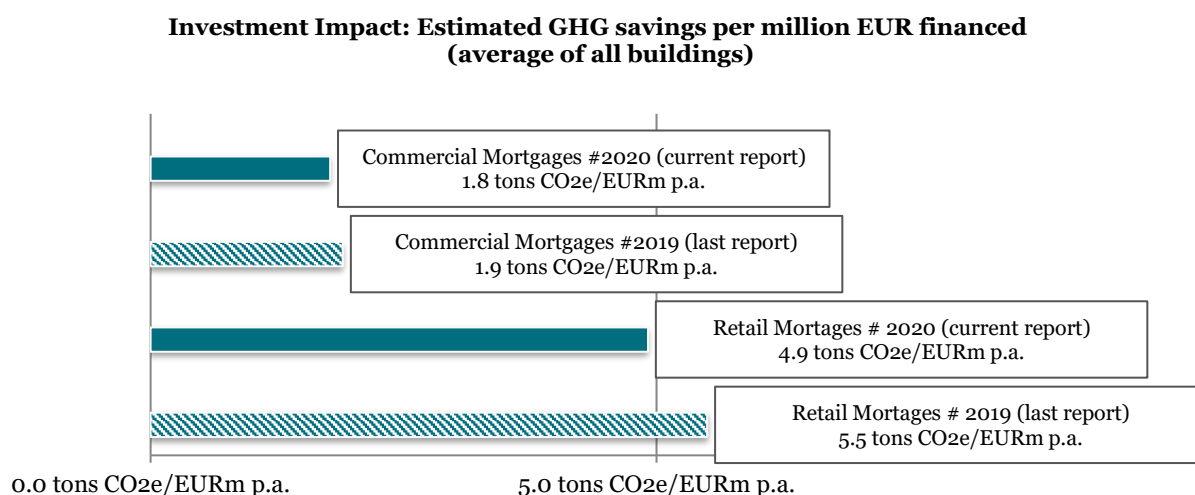
It is also possible to evaluate the efficiency of the impacts (see figure below). On average, annual energy savings for the buildings in the portfolio amount to 20 kWh per square metre (kWh/sqm*a) for commercial mortgages and 53 kWh per square-metre for retail mortgages (building efficiency compared to the current building stock).

Energy Savings: Estimated Heat Savings per Building (average of all buildings)



From the point of view of investments into the loan programme (only financed impacts), 1.7 tons of CO₂-equivalents are saved per year and million Euro for commercial mortgages (CO₂e/EURm p.a.), compared to 4.9 tons for retail mortgages (see figure below).

In total (all assessed loans combined), 3.5 tons of CO₂-equivalents are saved per year and million Euro invested in 2020.



The retail buildings perform quite similar compared to the findings in the last report (2019). The decreased investment impact (4.9 versus 5.5 tons GHG per million EUR and year) stems mainly from the lower share of financing by MünchenerHyp (36% on average compared to 58%). For commercial buildings, both energy savings and investment impact are slightly lower compared to the 2019 findings. There is no single parameter responsible for this effect. In some cases, new and more accurate data was applied (e.g., in regard to the actual heated areas of the buildings) while changes in the overall portfolio play their part as well (e.g., new assets in countries with better energy standards in the buildings stock). However, it is likely that heat savings are going to decrease continuously in the coming years anyway, because less and less buildings with high heating demands need to be replaced or renovated.

Retail Mortgage Loans

The Retail mortgages analysed in this report are financed with a share of approximately 36% (EUR 1,170m) on average and a credit period of 23 years. The majority of loans continue to finance new and refurbished single-family homes (57%). The loans induce GHG savings of ca. 5.7 kilotons per year or 138 kilotons until the end of loan term. However, all buildings are expected to save further GHG emissions until the end of their lifetime.

Many of the buildings might also have more GHG efficient heating systems installed in the future, thus inducing further emissions savings compared to the building stock and its conventional fossil fuel 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), generating further GHG savings compared to the reference buildings. These additional effects and their impacts on GHG savings have been considered partially in an additional scenario in this report (see p. 4).

Non-Residential Mortgage Loans

The commercial mortgages assessed in this report account for approximately EUR 977m. With an estimated financed share of 51% on average, these loans help to induce GHG savings of 1.7 kilotons per year or 11 kilotons until the end of loan term.

The effects were calculated based on estimations for heat savings without considering electricity efficiency. Reference data for comparison was drawn from the EU building database that contains heating demands on a per country basis without considering different building types and construction periods⁶. It is assumed that the actual GHG savings for these buildings are higher compared to the conservative approach in the report at hand because the data base only provides energy demands in the buildings stock from 2011 onward. In addition, and by comparison with retail buildings, only one type of heating system was used for each building and its reference in the stock.

Case-study: Additional Effects from Modernisation

The following table estimates the effects of additional measures like the replacement of oil heating or higher buildings certificate standards. By comparison, current analysed commercial buildings save 7% of the primary energy demand compared to the EU buildings stock (2011-2014) while the scenario here assumes savings of 50%.

In this optimistic scenario, financed savings of 180 kilotons CO₂-equ. could be achieved (compared to 149 kilotons).

Type	Additional Measure	Additional financed energy savings [GWh/a)	Additional financed GHG savings (t CO ₂ e/a)
Retail	Replacement of oil heating systems	none	655
Commercial	Higher Efficiency Standards	8.6	2,205
Total	-	8.6	2,860

Outlook

The report at hand estimated potential avoided GHG emissions in a robust manner and based on improved portfolio data compared to the last report. However, the remaining data gaps still required a number of assumptions that influence the results (as shown by the case-study). As part of this project Wuppertal Institut is discussing with the issuer how data accuracy and standardisation of calculation methods can be improved even further.

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

⁶ By comparison: retail buildings were assessed using a German building typology with 4 building types and 12 construction periods each.

Annex – Results, Methods and Data

The following results are presented in accordance with the current *Harmonized Framework for Impact Reporting* (ICMA, December 2020)⁷. The impact analysis is confined to the avoidance of greenhouse gas (GHG) emissions during the loan period of the buildings. They refer to the Global Warming Potential over 100 years (GWP 100a) in form of CO₂-equivalents for all GHGs according to the characterisation factors in the IPCC reports (Intergovernmental Panel on Climate Change).

Energy Efficiency (EE)	Assessed Amount (assessed value in the portfolio)	Share of Financing (of assessed amount)	Eligibility for green assets	EE Component (estimate)	Loan Period (weighted average)	ex ante estimates during use phase of buildings					
						Annual Energy Savings (heat)		Reduced/Avoided annual GHG emissions (heat)		Absolute annual GHG emissions (heat) ¹	
Portfolio – heat savings	million EURO	%	% of assessed amount	% of assessed amount	In years	GWh/a		In 1.000 tonnes of CO ₂ -equivalents		In 1.000 tonnes of CO ₂ -equivalents	
						100%	financed	100%	financed	100%	financed
RETAIL Portfolio - single family houses	668.7	33.9%	100%	not applicable	25.3	41.43	14.05	9.82	3.33	6.37	2.16
RETAIL Portfolio - terrace houses	301.6	40.0%	100%	not applicable	20.5	12.29	4.92	2.91	1.17	1.70	0.68
RETAIL Portfolio - multi family houses	197.7	37.3%	100%	not applicable	23.6	14.06	5.25	3.33	1.24	1.75	0.65
RETAIL Portfolio - other buildings	1.5	80.7%	100%	not applicable	23.7	0.026	0.021	0.006	0.005	0.009	0.007
TOTAL EE (RETAIL)	1,170	35.7%	100%	not applicable	23.3	67.8	24.2	16.1	5.7	9.8	3.5

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 (assessed value in the portfolio)	Share of Financing (of assessed amount)	Eligibility for green assets	EE Component (estimate)	Loan Period (weighted average)	ex ante estimates during use phase of buildings					
						Annual Energy Savings (heat)		Reduced/Avoided annual GHG emissions (heat)		Absolute annual GHG emissions (heat) ₂	
Portfolio – heat savings	million EURO	%	% of assessed amount	% of assessed amount	In years	GWh/a		In 1.000 tonnes of CO ₂ -equivalents		In 1.000 tonnes of CO ₂ -equivalents	
						100%	financed	100%	financed	100%	financed
COMMERCIAL Portfolio - DGNB Standard	153.2	37.2%	100%	not applicable	6.3	3.28	1.22	0.85	0.33	1.56	0.98
COMMERCIAL Portfolio - LEED Standard	321.9	42.8%	100%	not applicable	7.3	3.85	1.65	1.21	0.54	7.52	2.35
COMMERCIAL Portfolio - BREEAM Standard	368.8	71.9%	100%	not applicable	6.3	3.70	2.66	0.96	0.67	3.43	2.03
COMMERCIAL Portfolio - OTHER (EPC, HQE)	133.1	51.6%	100%	not applicable	5.9	1.856	0.957	0.215	0.186	0.800	0.717
TOTAL EE (COMMERCIAL)	977	51.0%	100%	not applicable	7.4	12.7	6.5	3.2	1.7	13.3	6.1

¹ Absolute annual emissions have been 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

4 different building types in 12 different construction periods were differentiated for the building stock of retail mortgages (SFH, MFH, TH, other). Heating data for building stock is based on the European Database for residential buildings TABULA⁸. The actual energy demand as well as the year of construction of the buildings in the asset pool were provided by MünchenerHyp. GHG intensity factors (GHG emissions per kWh energy consumed) for each energy source are based on a recent report by the German Federal Environmental Agency UBA⁹.

Method and Data for Non-Residential Mortgages

Due to data gaps (on individual buildings as well as from statistics), savings for non-residential mortgages have been calculated differently. As the available data on individual buildings varies strongly, two types of differentiation procedures had to be applied: (1) clustering of buildings with comparable data availability and (2) differentiating potential heat saving effects due to the building certificate.

The methodology is described separately in the following groups of buildings with DGNB (German Sustainable Building Council), LEED (Leadership in Energy and Environmental Design), BREEAM (Building Research Establishment Environmental Assessment Methodology and BREEAM Netherlands), and OTHER (HQE – High Quality Environmental standard, EPC –Energy Performance Certificate) building certificates.

⁷ see <https://www.icmagroup.org/sustainable-finance/impact-reporting/>

⁸ see <http://webtool.building-typology.eu/#bm>

⁹ see <https://www.umweltbundesamt.de/en/publikationen/emissionsbilanz-erneuerbarer-energetraeger>

For DGNB certificates, the primary energy consumption of the buildings could be extracted from data provided in the available building certificates. Where primary energy included electricity, 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 UBA¹⁰ 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 Database¹¹ was used. Where no information on the heating system was available, the factor for a gas heating in Germany was used (conservative assumption).

LEED, BREEAM and OTHER certificates were handled in a comparable manner. However, as some certificates would not include data on the primary energy demand, the standards themselves were used as reference whenever that data was not available.

The minimum energy savings to be achieved for being certified under LEED (savings of 8% for renovation and 14% for new construction) were assumed to be achieved with respect to the reference building¹². Since no data on reference buildings were provided in the certificates, the national averages in the EU Building Database were used. Where no information on the heating system was available, the factor for a gas heating in Germany was used.

A typical best practice example as described in the BREAM standard, achieves energy savings of 18% with respect to the reference building¹³. For the reference building and emission factors the EU Building Database and the UBA factors were used.

OTHER standards include a mix of different standards. For some of the buildings data on the primary energy demand was available (handling according to DGNB, LEED and BREEAM). 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 (HQE, EPC) certificates, the average share of savings achieved in the whole portfolio was used for these buildings as a proxy.

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 (aside from coal heating), it is reasonable to assume that these systems are replaced first during the modernisation of a building (or are not installed in new buildings). To simulate this effect, the heating mix has been adjusted accordingly in our scenario (e.g., increasing the share for gas heaters from 44 to 61%). As a result, GHG emissions per kWh of heat in the portfolio are reduced from 237 g CO₂-equ. to 210 g per kWh (thus improving avoided emissions by an additional 27 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 2050¹⁴. 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 of the non-residential sector. For comparison, the average saving ratio calculated in the standard case is 7% and the highest ratio 58%.

¹⁰ https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2017-10-26_climate-change_23-2017_emissionsbilanz-ee-2016.pdf

¹¹ <https://ec.europa.eu/energy/en/eu-buildings-database>

¹² <https://www.usgbc.org/credits/new-construction/v2009/eac1>

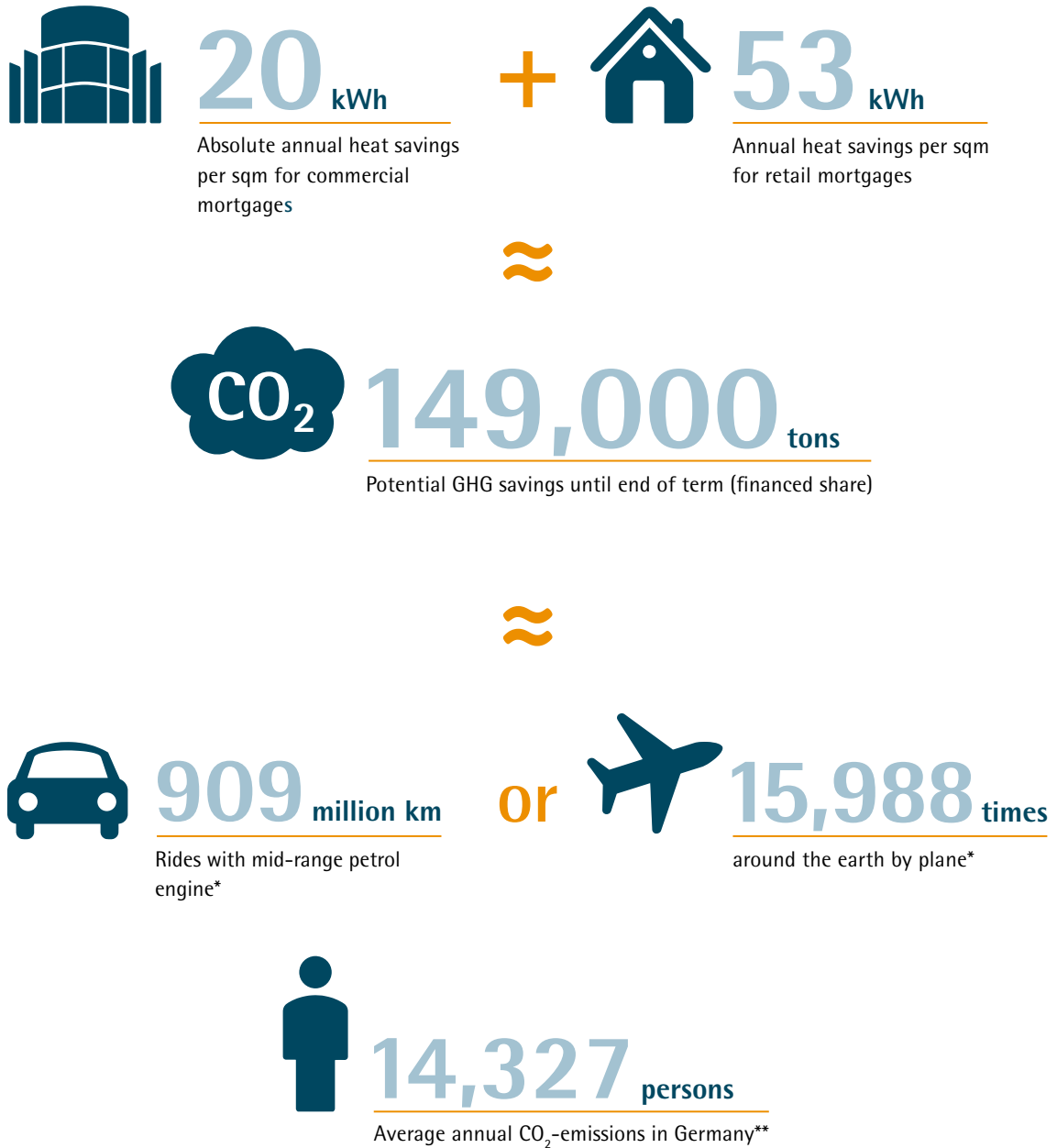
¹³ https://www.breeam.com/BREEAMInt2013SchemeDocument/content/06_energy/ene_01_reduction_of_co2_emissions.htm#Example_calculation_for_%E2%80%98good_international_practice%E2%80%99_distribution

¹⁴ https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/sanierungsbedarf-im-gebaeudebestand.pdf?__blob=publicationFile&v=3



Impact reporting

The overall impact of MünchenerHyp's green portfolio focused on energy efficiency is as follows:



» 3.5 tons Saved resp. avoided CO₂-emissions per year and Euro 1 million invested

* Calculation based on assumption 1 t CO₂ = 6,100 person km car ride or 4,300 person km flight route

** Emissions per capita in Germany (2018): 10.4 t/year



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