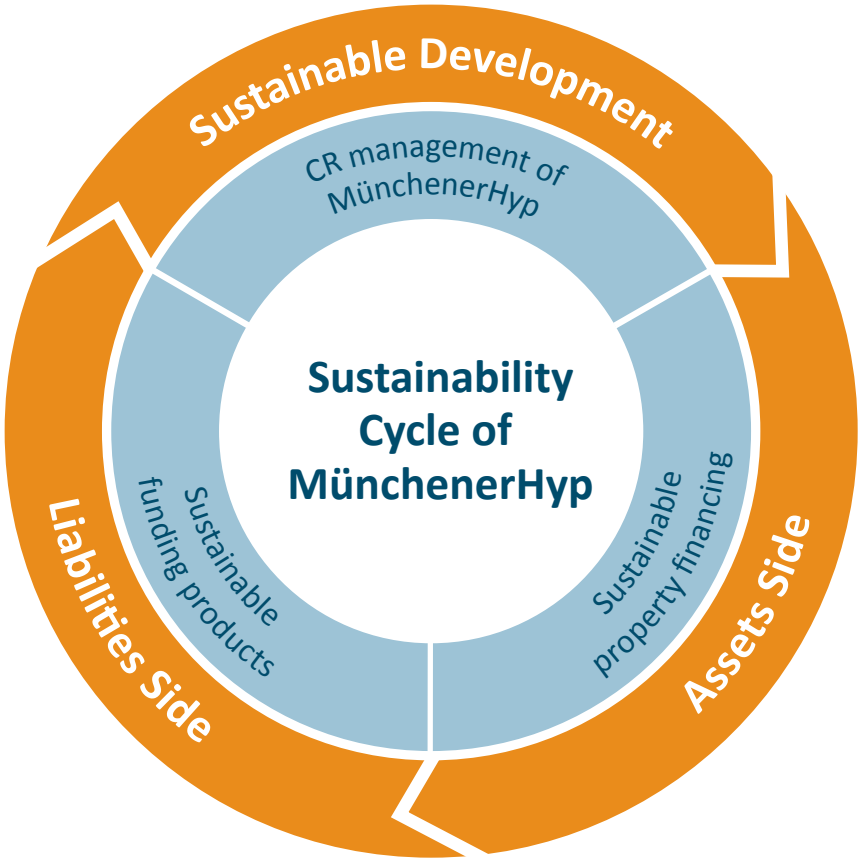
MünchenerHyp

Impact Reporting 2021

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.

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'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 (BVR, vdp working group on green Pfandbriefe, and the Association for Environmental Technology, VfU), and work at the international level (Energy Efficient Mortgage Initiative, or EEMI for short). MünchenerHyp has thus set the course for the future with regard to the effects of change in society, environment and economy.

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 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.
In the case of commercial real estate, the Bank has aligned itself with very high standards for sustainable certificates.

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

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 primary energy demand of 70 kWh/sqm (till April 2020) *and* residential buildings in Germany with maximum annual primary energy demand of 55 Wh/sqm (since May 2020) *or* old and new KfW promotional programmes for energy-efficient construction *or* Top 15 % of national building stock by energy performance in Switzerland or Minergie Certificate *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

The granting of interest rate discounts for green loans, even up to a term of 30 years, reflects MünchenerHyp's commitment to sustainability with a long-term focus, which is in line with the objectives of the EU Sustainable Finance Action Plan.

When granting sustainability loans in the commercial sector, the properties must have a recognized sustainability certificate with additional minimum criteria or meet strict energy efficiency requirements.

MünchenerHyp has also defined controversial business areas for the commercial sector. If the borrower, the beneficial owner or the (main) tenant are connected with the following businesses, the granting of a sustainability loan is excluded:

- Coal/fossil energy (companies that generate more than 30% of their revenue from coal extraction or power generation, or from the extraction of oil from oil sands)
- Armaments (companies that produce or trade in controversial weapons (mines/anti-personnel mines, cluster bombs, nuclear/biological/chemical weapons, ammunition containing uranium))
- Tobacco (companies that derive more than 5% of their turnover from tobacco)
- Gambling (companies operating controversial forms of gambling, i.e. casinos, betting shops, gambling halls, manufacturing of gambling machines; state-owned casinos are allowed)
- Red light (companies with revenues from pornography or prostitution)
- Environmental violations (companies related to serious environmental violations)
- Human rights (companies related to human rights violations)

The following is the structure of the portfolio as of the impact reporting date:

assets	notional value in € million June 30th, 2021		liabilities
cover pool residential	1,121.1	500.0	ecological ESG Pfandbrief
cover pool commercial	766.1		
over-collateralisation	1,387.2		
number of green loans: total 7,566; thereof residential 7,523; thereof commercial 43			
residential not in cover pool	518.4	1,375.9	green senior bonds
commercial not in cover pool	310.0	0	green CP
balance not in cover pool	-547.5		
available green portfolio	**839.7**		

Sustainable refinancing of green assets

In 2021, the Green Bond Framework was updated. In the process, the bank set new targets and also introduced new sustainable refinancing products. Green AT1 and green Tier2 were added to the range. As an innovation, a green term deposit was also introduced as a product variant in the money market. For all three products, the use of funds is attributed to green assets and the green bond framework meets the requirements of the ICMA Green Bond Principles.

Sustainable refinancing can draw on the following sustainable products in the money and capital markets:

- Green AT 1
- Green Tier 2
- ESG Pfandbriefe and green Pfandbriefe
- Green Senior Bonds (Preferred and Non-Preferred)
- Green Commercial Paper (CP)
- Green Customer Deposits
- Green term deposits

On the liabilities side for refinancing, there were 14 sustainable bonds outstanding in EUR and CHF as of the reporting date. The total outstanding volume amounts to just under EUR 1.9 billion.

Transparency and Reporting

In order to ensure transparency for the entire green portfolio and not only for assets that are already in the cover pool, investors are regularly informed about the growth of the entire portfolio, which means that not only the proportion of sustainable loans that are eligible for the cover pool is shown. In this way, every investor is kept up to date at short intervals on the steady growth of Münchener Hypothekenbank's sustainable loans.

Our website contains the following information for investors:

- Green Bond Framework
- Second Party Opinion
- Impact Reporting
- Allocation Reporting
- ESG Pfandbrief Reporting (based on §28 PfandBG)

As of the impact reporting date of June 30th, 2021, the Bank's total green portfolio amounted to EUR 2,715.6 million. The number of properties is divided into 7,523 green residential loans and 43 properties are attributable to sustainable commercial real estate lending[1].

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 June 30th, 2020 according to the following criteria:

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

[1] *Three commercial loans were reported retrospectively for impact reporting purposes*

Outstanding ecological ESG Pfandbriefe and related cover assets

€ thousand	nominal value June 30th, 2021	net present value June 30th, 2021	risk-adjusted pv* June 30th, 2021
ecological ESG Pfandbrief	500,000	510,441	491,957
cover pool residential assets	1,121,145	1,550,339	1,355,074
cover pool commercial assets	766,121	1,154,830	1,122,141
over-collateralisation	**1,387,266**	**2,194,728**	**1,985,258**

** 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 30th, 2021		< 30 %	30 % – 60 %	> 60 %*
		€ thousand	€ thousand	€ thousand
cover pool	residential	39,646	561,293	520,206
	commercial	0	85,318	680,803

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

Cover assets by maturity

maturity	June 30th, 2021 € thousand residential cover pool	June 30th, 2021 € thousand commercial cover pool
≦ 0.5 year	190,226	0
> 0.5 year and ≦ 1 year	136,199	7,140,000
> 1 year and ≦ 1.5 years	0	47,967,446
> 1.5 years and ≦ 2 years	372,695	26,321,911
> 2 years and ≦ 3 years	328,783	233,293,843
> 3 years and ≦ 4 years	292,200	87,606,424
> 4 years and ≦ 5 years	6,500,498	132,784,907
> 5 years and ≦ 10 years	79,239,724	189,881,907
> 10 years	1,034,084,519.00	41,125,000

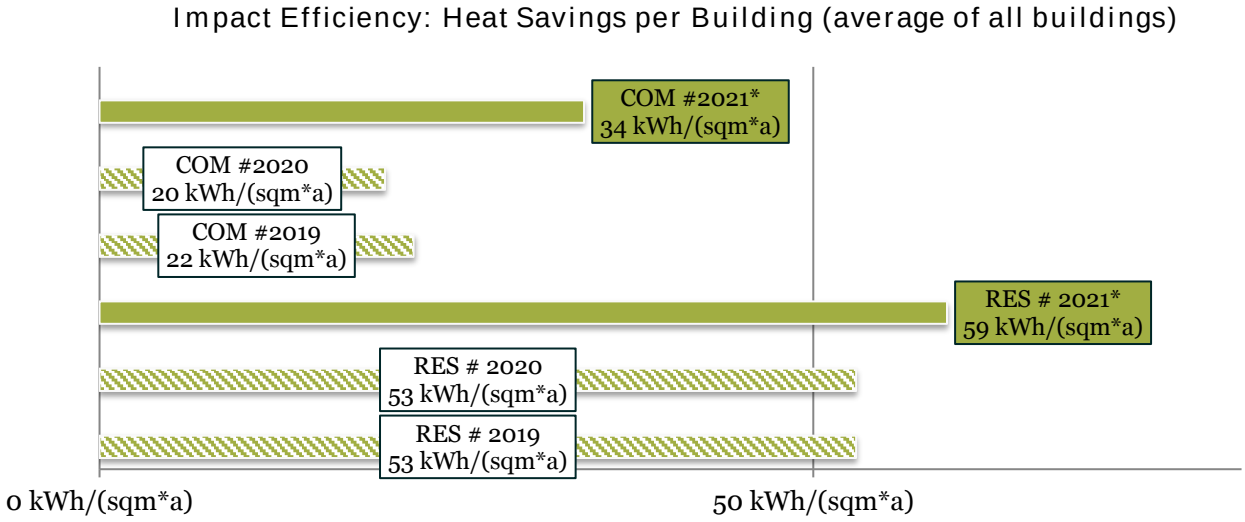
Cover assets by volume

volume	June 30th, 2021 residential			June 30th, 2021 commercial		
	€ thousand	in %	number loans	€ thousand	in %	number loans
up to 300,000 €	908,098	81.00	5,252	0	0.00	0
more than 300,000 € up to 1mn €	213,047	19.00	542	0	0.00	0
more than 1mn € up to 10mn €	0	0.00	0	22,198	2.90	3
more than 10mn €	0	0.00	0	743,924	97.10	27
Total	**1,121,145**	**100.00**	**5,794**	**766,121**	**100.00**	**30**

Cover assets by region

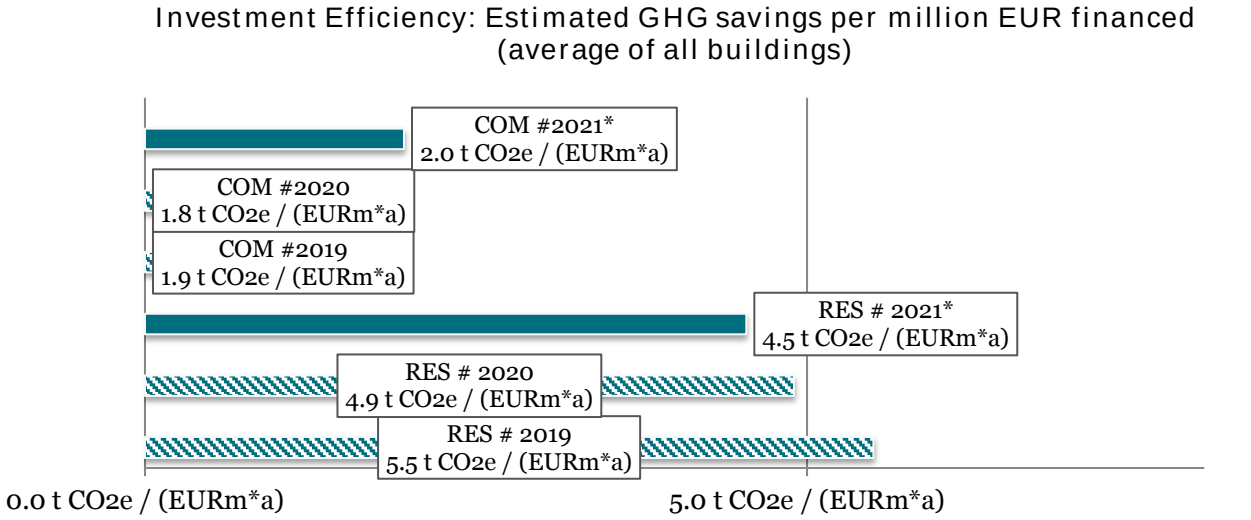
countries and regions	June 30th, 2021 residential		June 30th, 2021 commercial	
	€	in %	€	in %
Baden-Württemberg	210,459,168	18.69	0	0.00
Bavaria	453,509,992	41.56	66,478,008	9.81
Berlin	3,505,919	0.17	56,830,907	8.32
Brandenburg	1,460,320	0.09	0	0.00
Bremen	554,772	0.06	0	0.00
Hamburg	13,719,374	1.17	0	0.00
Hesse	33,612,149	2.79	145,178,490	18.66
Mecklenburg-Western Pomerania	1,552,862	0.14	0	0.00
Lower Saxony	120,379,962	10.67	0	0.00
North Rhine-Westphalia	148,464,609	13.90	34,183,750	5.00
Rhineland-Palatinate	46,160,603	3.46	0	0.00
Saarland	7,292,293	0.66	0	0.00
Saxony	16,552,476	1.34	0	0.00
Saxony-Anhalt	8,365,601	0.48	0	0.00
Schleswig-Holstein	51,558,282	4.47	0	0.00
Thuringia	3,996,461	0.34	0	0.00
France	0	0.00	56,100,000	8.21
UK	0	0.00	95,530,498	14.48
Luxembourg	0	0.00	31,400,000	4.59
The Netherlands	0	0.00	64,176,000	9.21
Austria	0	0.00	41,125,000	6.02
Spain	0	0.00	100,917,600	10.24
USA	0	0.00	74,201,186	5.46
Total – all states	**1,121,144,845**	**100.000**	**766,121,438**	**100.000**

MünchenerHyp would like to thank the Wuppertal Institute for Climate, Environment and Energy for the pleasant and constructive cooperation. In dialog, we continually find starting points for improving the data quality for determining CO_2 emissions and preparing for future requirements.



** Results from the current report are based on improvements for reference data and methodology. They are not fully comparable to previous results.*

From the point of view of investments into the loan programme (only financed impacts), 2.0 tonnes of CO2-equivalents are saved per year and million Euro for commercial mortgages (t CO2e / (EURm*a)), compared to 4.5 tonnes for residential mortgages (see figure below). In total, 3.5 tonnes of CO_2-equivalents are saved per year and million Euro invested in 2021 (compared to also 3.5 tonnes in 2020).



* Results from the current report are based on improvements for reference data and methodology. They are not fully comparable to previous results.

The annual financial performance of residential buildings has decreased over three periods of reporting (8% compared to the previous report), although building efficiency as well as share of financing has improved. The main reason for the decline is an increase in apparent building costs[5]. On average, residential buildings in the portfolio have 16% higher total costs in 2021 than 2020 on a square-metre basis.

[5] This effect is responsible for 7% decrease in investment efficiency.

It is likely that heat savings are going to decrease continuously in the coming years, because less and less buildings with high heating demands need to be replaced or renovated. In addition, GHG savings decrease not only due to smaller efficiency gains but because the energy systems itself will become more climate-friendly over time as well.

Residential Mortgage Loans (RES)

The residential mortgages analysed in this report are financed with a share of approximately 45% (EUR 1,631m) on average and a credit period of 25 years. The majority of loans continue to finance new and refurbished single-family homes (60% of buildings). The loans induce (financed) GHG savings of ca. 7.4 kilotonnes per year or 183 kilotonnes until the end of loan term (in reference to the building stock in the TABULA[6] dataset). However, all buildings are expected to save further GHG emissions until the end of their lifetime.

Some buildings might 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.

Many of the buildings might also have more GHG efficient heating systems installed in the future (all buildings are assumed to be heated with gas), thus inducing further emissions savings compared to the building stock and its conventional fossil fuel heating mix. These additional effects and their impacts on GHG savings have been considered partially in an additional scenario in this report (see below).

Commercial Mortgage Loans (COM)

The commercial mortgages assessed in this report account for approximately EUR 1,122m. With a financed share of 31% on average, these loans help to induce GHG savings of 2.2 kilotonnes per year or 17 kilotonnes until the end of loan term.

The effects were calculated based on estimations for heat savings without considering electricity consumption. Reference data for comparison was drawn from the *Heat Roadmap Europe*[7] that contains heating demands on a per country basis as well as sample data for final energy shares in several European cities in the ENTRANZE[8] dataset. It is assumed that the actual GHG savings for these buildings are higher compared to the conservative approach in the report at hand because data availability was low for about 39% of the buildings (buildings of type C or D). In addition, and by comparison with retail buildings, specific heating systems were used for each building and its reference in the stock.

[6] see https://webtool.building-typology.eu/#bm

[7] see https://heatroadmap.eu/wp-content/uploads/2018/11/HRE4_D3.3andD3.4.pdf

[8] see https://www.entranze.eu/files/downloads/D3_2/ENTRANZE_WP3-D3.2_Energy-cost_matrices_Def_TERTIARY.xlsx

Case-study: Additional Effects from data accuracy

About 35% of the loans required additional assumptions in the assessment. To show this effect in lack of data availability, a best-case scenario was developed. The following table shows the effects when assuming that all buildings of type B, C and D lead on average to the same energy savings as the respective sample of type A datasets.

In this optimistic scenario, financed savings of 258 kilotonnes CO_2-equ. could be achieved (compared to 200 kilotonnnes).

Type	Additional financed energy savings	Additionial financed GHG savings	Additional Investment Efficiency	Additional estimated GHG effects over average loan period
Retail	+8.9 GWh/a	+2.1 kt CO2e/a	+27.7%	+50.7 kt CO2e
Commercial	+4.3 GWh/a	+1.0 kt CO2e/a	+45.7%	+7.0 kt CO2e
Total	+13.2 GWh/a	+3.1 kt CO2e/a	+31.8%	+57.7 kt CO2e

Outlook

The report at hand estimated potential avoided GHG emissions in a robust manner and based on improved portfolio data compared to previous reports. 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. Future reports will also investigate how taxonomy-eligibility and alignment affect the impact quantification and reporting.

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

Annex

The following results are presented in accordance with the current *Harmonized Framework for Impact Reporting* (ICMA, June 2021)[9]. In addition to the ICMA recommendations, effects are also distinguished between overall building performance (full effect) and financed outputs (financed).

The impact analysis is confined to the avoidance of greenhouse gas (GHG) emissions during the loan period of the buildings (ex-ante). They refer to the Global Warming Potential over 100 years (GWP 100a) in form of CO_2-equivalents for all GHGs according to the characterisation factors in the IPCC reports (Intergovernmental Panel on Climate Change). Although annual effects can be multiplied with the loan periods to estimate the overall performance, this should be evaluated with caution. The surrounding systems for both energy and building systems change over time with a high probability of smaller GHG emission reductions every year.

The main assumptions are directly referenced in the table. For more detail, a separate method and data paper has been prepared and will be published in February 2022.

Energy Efficiency (EE)	Signed Amount	Share of Total Portfolio Financing [1]	Eligibility for green bonds	EE Component (estimate)	Allocated Amount	Average Portfolio Lifetime	Annual Energy Savings (heat)		Reduced/Avoided annual GHG emissions (heat)			Absolute annual GHG emissions (heat) [2]	
Residential (RES) Buildings in Green Portfolio	million €	%	%	%	million €	in years	GWh/a		kt CO_2-equ. / a		t CO_2-equ. / (a*million €)	kt CO_2-equ. / a	
							full effect	financed	full effect	financed	per unit of financing	full effect	financed
Residential A - high data quality [3]	1,279	45%	100%	100%	1,279	25	63.68	28.69	14.71	6.63	5.18	6.96	3.14
Residential B - medium data quality	228	46%	100%	100%	228	25	5.38	2.46	1.24	0.57	2.49	2.05	0.94
Residential C - low data quality	5	34%	100%	100%	5	25	0.09	0.03	0.02	0.01	1.50	0.05	0.02
Residential D - estimates (no data) [4]	119	48%	100%	100%	119	25	1.85	0.89	0.43	0.21	1.73	0.92	0.44
TOTAL Residential	**1,631**	**45%**	**100%**	**100%**	**1,631**	**24.7**	**71.0**	**32.1**	**16.4**	**7.4**	**4.54**	**10.0**	**4.5**

[1] *Financing of issuer compared to total building costs.*
[2] *Heating systems for buildings are not known. Absolute annual emissions as well as emission savings have been calculated using emission factor for gas heating in Germany.*
[3] *For buildings of type A, the primary energy demand per square-metre is known. All other buildings (B, C, D) achieve at least 70 kWh/(m2*a) until April 2020 and at least 55 kWh/(m2*a) from May 2020 onward as defined by the framework of the issuer.*
[4] *For buildings of type D no living area is available. The 1st Quartile of overage living area per € (total costs) in the rest of the sample was used instead.*

ex ante estimates during use phase of buildings

Energy Efficiency (EE)	Signed Amount	Share of Total Portfolio Financing [5]	Eligibility for green bonds	EE Component (estimate)	Allocated Amount	Average Portfolio Lifetime	Annual Energy Savings (heat)		Reduced/Avoided annual GHG emissions (heat)			Absolute annual GHG emissions (heat) [6]	
Commercial (COM) Buildings in Green Portfolio	million €	%	%	%	million €	in years	GWh/a		kt CO_2-equ. / a		t CO_2-equ. / (a*million €)	kt CO_2-equ. / a	
							full effect	financed	full effect	financed	per unit of financing	full effect	financed
Commercial A - high data quality [7]	517	34%	100%	100%	517	8.56	17.94	6.10	5.40	1.81	3.51	8.77	2.50
Commercial B - medium data quality	164	20%	100%	100%	164	3.59	3.69	0.71	1.02	0.21	1.28	2.25	0.42
Commercial C - low data quality [8]	192	32%	100%	100%	192	3.12	1.60	0.43	0.28	0.09	0.47	1.78	0.59
Commercial D - very low data quality [9]	249	29%	100%	100%	249	2.38	1.17	0.34	0.28	0.08	0.33	3.76	1.10
TOTAL Commercial	**1,122**	**31%**	**100%**	**100%**	**1,122**	**7.0**	**24.4**	**7.6**	**7.0**	**2.2**	**2.0**	**16.6**	**4.6**

[5] *Financing of issuer compared to total purchase price of building.*
[6] *Heating systems for buildings are known for all buildings from type A to C. In case of mixed systems, a main system is selected.*
[7] *For buildings of type A, the final energy use (fed, heat) is known. The final energy demand of type B buildings (primary energy demand is known) is calculated from the average portion of fed compared to ped (primary energy demand) in the ENTRANZE model.*
[8] *For type C and D buildings, a primary energy demand reduction of 16% is assumed (corresponds to "light renovation" on EU level).*
[9] *For buildings of type D, no heat system is known. Primary Energy Factor (PEF) of electricity is used as conservative estimate (reducing the estimate on final energy savings as a result).*

9 see https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Handbook-Harmonised-Framework-for-Impact-Reporting-June-2021-100621.pdf

Impact reporting

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

34 kWh
Annual energy savings per sqm for commercial mortgages

+

59 kWh
Annual energy savings per sqm for residential mortgages

≈

CO_2 **200,000 tons**
Potential GHG savings until end of term (financed share)

≈

1,220 million km
Rides with mid-range petrol engine*

or

21,460 times
around the earth by plane*

20,619 persons
Average annual CO_2-emissions in Germany**

» **3.5 tons** Saved resp. avoided CO_2-emissions per year and Euro 1 million invested

* *Calculation based on assumption 1 t CO_2 = 6,100 person km car ride or 4,300 person km flight route*
** *Emissions per capita in Germany (2019): 9.7 t/year*

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