ING Green Bond Impact Report 2021

Financial Year 2021

do your thing

ING Group Green Bond Impact Report

31 December 2021

Eligible project category (h)	Number of loans/ addresses	Eligible portfolio (€m) (i)	Share of total ING DiBa Green Covered Bond Financing[1] (j)	Share of total Green Senior Bond and Deposit Financing[1] (k)	Eligibility for Green Bonds (l)	Total installed capacity of Renewable Energy in MW (m)	Pro-rata installed capacity of Renewable Energy in MW (m)	GHG emissions avoided in tons of CO_2/year (m)
Green Residential Buildings								
ING DiBa	22,069	3,218	100.00%	16.70%	100%	n/a	n/a	41,630
Green Commercial Buildings								
ING Bank NV	15,850	4,851	0.00%	41.15%	100%	n/a	n/a	44,191
Renewable Energy	**209**	**4,968**	**0.00%**	**42.15%**	**100%**	**38,454**	**5174**	**3,474,657**
Total	**38,128**	**13,037**			**100%**	**38,454**	**5,174**	**3,560,478**

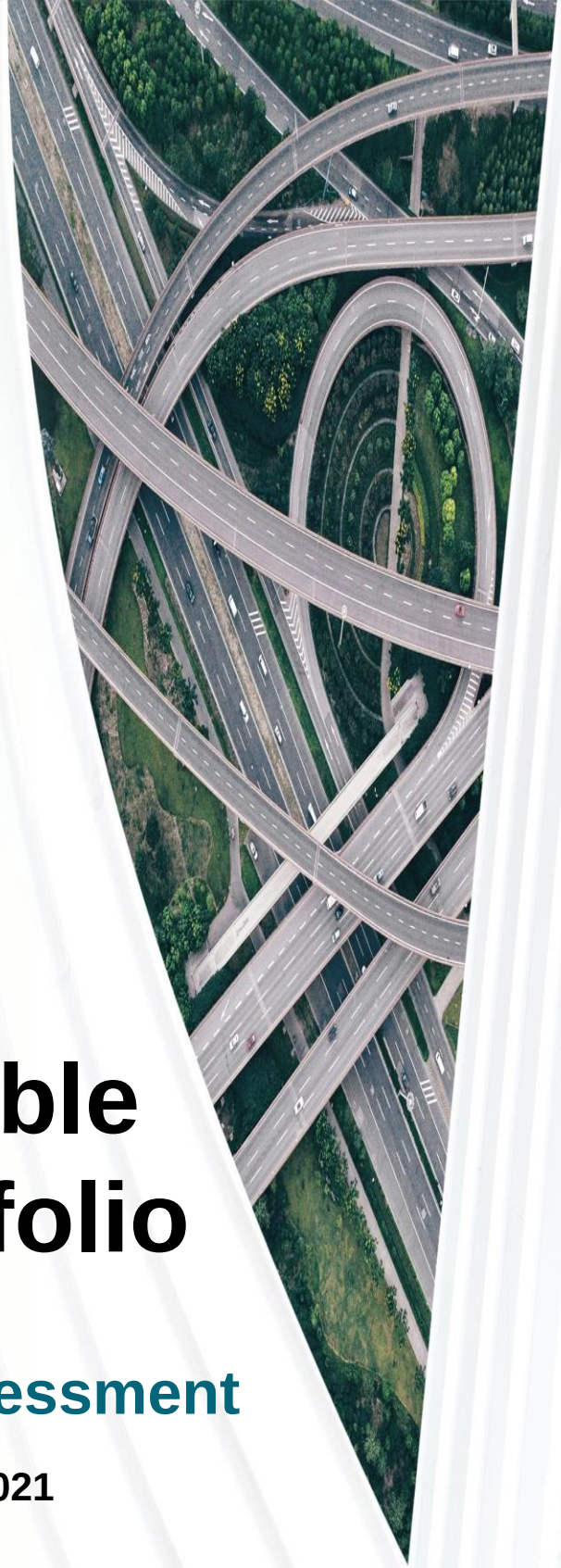
Impact per m € calculations		
CB ING DiBa	p/€m impact tons of CO_2/year	**12.94**
ING Group Senior	p/€m impact tons of CO_2/year	**300.69**

Portfolio based green bond report in accordance with the ICMA Harmonized Framework for Impact Reporting (version June 2019)

(h)	Eligible category
(i)	Signed amount represents the amount legally committed by the issuer for the portfolio or portfolio components eligible for Green Bond financing
(j)	This is the share of the total portfolio cost that is financed by the issuer for green covered bonds
(k)	This is the share of the total portfolio cost that is financed by the issuer for green senior bonds
(l)	This is the share of the total portfolio costs that is Green Bond eligible
(m)	Impact indicators

1. Green covered bonds are allocated solely to green residential buildings situated within the covered bond entity (ING DiBa) and Green Senior Bonds are allocated to all Use of Proceeds categories (minus any green residential buildings already allocated to Green Covered Bonds). Green Covered Bonds will be allocated to assets within the covered bond cover pool. For Senior Green Bonds, ING may allocate towards Eligible Green Loans situated within its subsidiaries as per the guidance laid out in the Green Bond Principles 2021 regarding pledged assets (https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/The-GBP-Guidance-Handbook-June-2021-140621.pdf).

Guidehouse
Outwit *Complexity*



ING Renewable Energy Portfolio

Climate Impact Assessment

Portfolio as of December 31, 2021

ING

April 08, 2022

ING RENEWABLE ENERGY PORTFOLIO

CLIMATE IMPACTS – PORTFOLIO AS OF 31 DECEMBER 2021

By the Numbers

Total ING portfolio (M€)[1]
4,968

Number of projects[1]
209

Annual avoided emissions (megatons CO_2eq)[2]
3.5

Average avoided emissions per Euro invested ($kgCO_2eq/€$)[2]
1.0

Avoided emissions[2] are equal to…

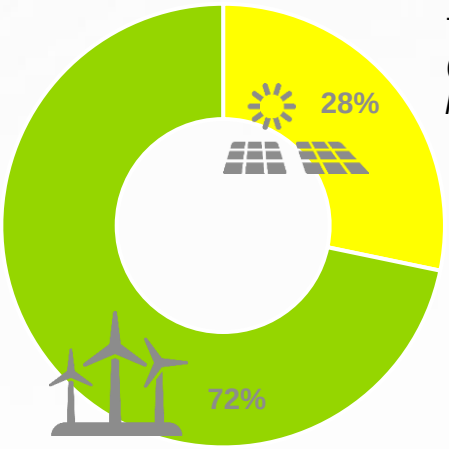
Passenger flights London to New York
2.6 million

Reduction in global beef consumption
57 kton

Key Findings

- ING is financing **5,174 MW** of renewable power projects[1]
- The annual avoided emissions for the operational portfolio was **3.5** megatons CO_2eq, or an average **1.0** $kgCO_2eq$ per euro invested[2]

Avoided Emissions by Technology[2]

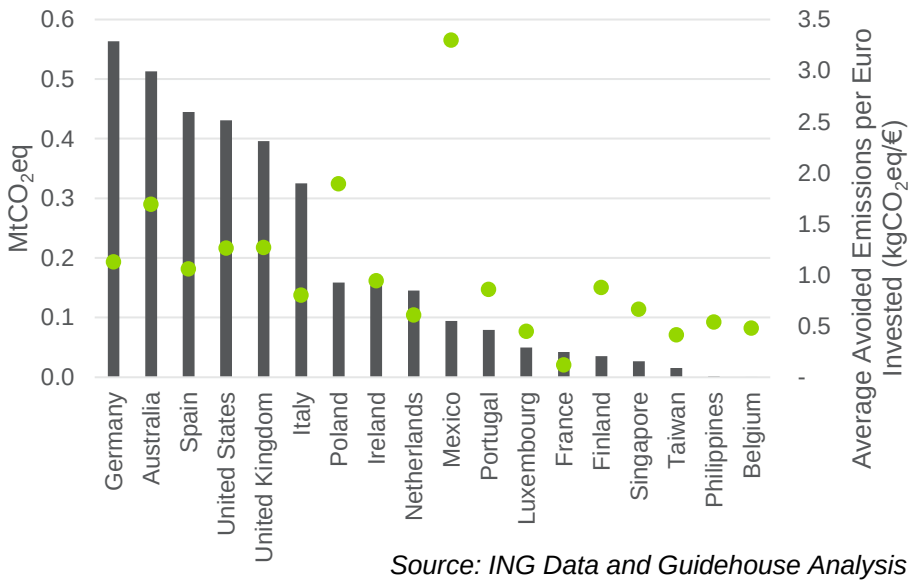


Total avoided emissions (kton CO_2eq) *(number of operational projects in parentheses)*

Wind	2,493 (108)
Solar	981 (50)

There are an additional **17 wind** projects and **34 solar** projects under construction.

Avoided Emissions in megatons CO2eq (Bars) and Average Avoided Emissions per Euro Invested (Dots) by Project Country[2]



Source: ING Data and Guidehouse Analysis

1 Includes projects that are operational and those under construction
2 All calculations related to avoided emissions are for operational projects only. Projects under construction are excluded.

Guidehouse Outwit Complexity

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ING RENEWABLE ENERGY PORTFOLIO
CLIMATE IMPACTS - METHODOLOGY

Introduction

ING Bank contributes to sustainability by financing projects that accelerate its clients' transition to a low-carbon economy. By financing projects that reduce the need for carbon intensive technologies on the electricity grid, ING can contribute to a low-carbon economy and help its clients' contribution as well. Such renewable energy projects diversify the grid and reduce the need for electricity generated by fossil fuel technologies (such as natural gas, coal or oil).

Guidehouse was appointed to calculate the positive climate impacts of ING's renewable energy portfolio. The positive climate impacts are expressed by the avoided greenhouse gas (GHG) emissions from solar and wind projects financed through ING.

Methodology

The method used to calculate the avoided GHG emissions for ING's portfolio is based on PCAF's *Global GHG Accounting and Reporting Standard for the Financial Industry*[1] and the *IFI Approach to GHG Accounting for Renewable Energy Projects*.[2]

Guidehouse measured the climate impacts from ING's renewable energy portfolio by calculating the avoided GHG emissions from loans and investments in projects financed through ING. The avoided GHG emissions were calculated by:

- Taking the estimated or actual electricity production of the project, measured in MWh, multiplied by a country specific emission factor.
- The country specific emission factor is the operating margin (OM). The OM represents the marginal generating capacity in the existing dispatch hierarchy that will most likely be displaced by the project. The OM is used in the methodology because the assessment is backward looking in the sense that it measures the avoided emissions over the previous financial year.
- In cases where the estimated electricity production was not provided by ING, production is calculated by multiplying (1) the annual load hours of wind, solar or hydro by (2) the project capacity (MW).
- In most cases, ING does not finance the entire project, therefore the avoided emissions are adjusted by the share (%) that is financed by ING. This attribution share is calculated by taking (1) the amount currently outstanding on the deal and dividing by (2) the original deal size amount[3].
- Projects under construction are excluded from annual avoided emissions calculations
- The calculations are valid based on the portfolio as of December 31st, 2021.

[1] https://carbonaccountingfinancials.com/files/downloads/PCAF-Global-GHG-Standard.pdf
[2] IFITWG_Methodological_approach_to_common_dataset.pdf (unfccc.int)
[3] Equity was not available for projects; attribution was calculated using debt values only

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GREEN FINANCE

IMPACT REPORTING FOR ING-DIBA AG

RESIDENTIAL PORTFOLIO GERMANY

07.04.2022

Claudio Tschätsch

Lavinia Namur

DREES & SOMMER

GREEN BOND IMPACT REPORT ING-DIBA AG

German residential real estate portfolio - Harmonized Framework

Low Carbon Buildings	Date of Issuance	Type	Signed Amount[a]	Share of Total Portfolio Financing[b]	Eligibility for green bonds[c]	Average portfolio lifetime[d]	Annual final energy savings[e]	Annual CO2 emissions avoidance[f]
Unit	*[dd.mm.yyyy]*	*[-]*	*[EUR]*	*[%]*	*[%]*	*[years]*	*[MWh/year]*	*[tCO2/year]*
ING-DiBa AG Green Bond	*31.12.2021*	*Low Carbon Building*	*3.218.243.551*	*100,0*	*100*	*8,5*	*176.398*	*41.630*
Einfamilienhaus (freistehend)	31.12.2021	Low Carbon Building	1.735.717.018	53,9	100	9,4	108.100	25.512
Zweifamilienhaus			52.333.606	1,6	100	7,3	4.110	970
Reihenhaus			279.267.884	8,7	100	7,3	16.023	3.781
Eigentumswohnung			744.263.719	23,1	100	7,3	26.049	6.148
Doppelhaushälfte			406.661.323	12,6	100	7,2	22.116	5.219

[a] Legally committed signed amount by the issuer for the porfolio or portfolio components eligible for green bond financing.

[b] Portion of the total portfolio cost that is financed by the issuer.

[c] Portion of the total portfolio cost that is eligible for Green Bond.

[d] average remaining term of Green Bond loan within the total portfolio.

[e] Final energy savings calculated using the difference between the top 15% and the national building stock benchmarks

[f] Greenhouse gas emissions avoidance determined by multiplying the final energy savings with the carbon emissions intensity

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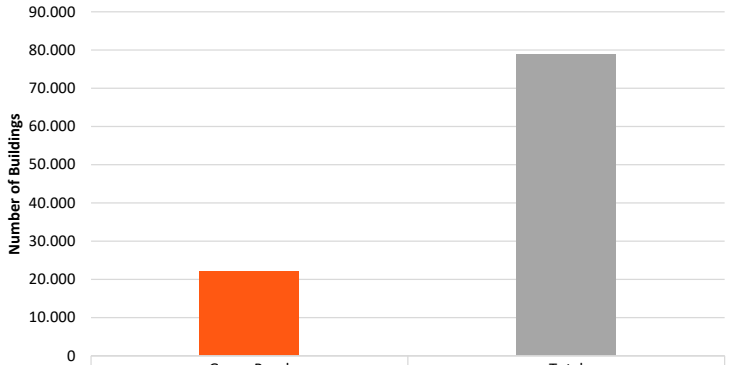
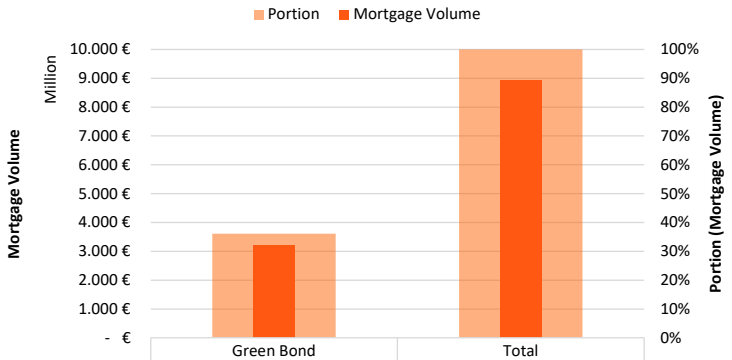
GREEN BOND IMPACT REPORT ING-DIBA AG

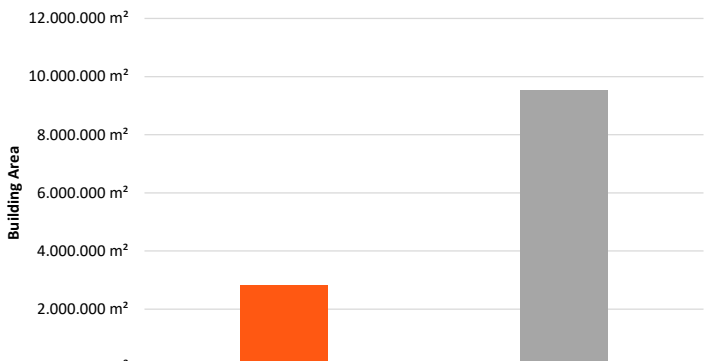
German residential real estate portfolio - Impact Reporting



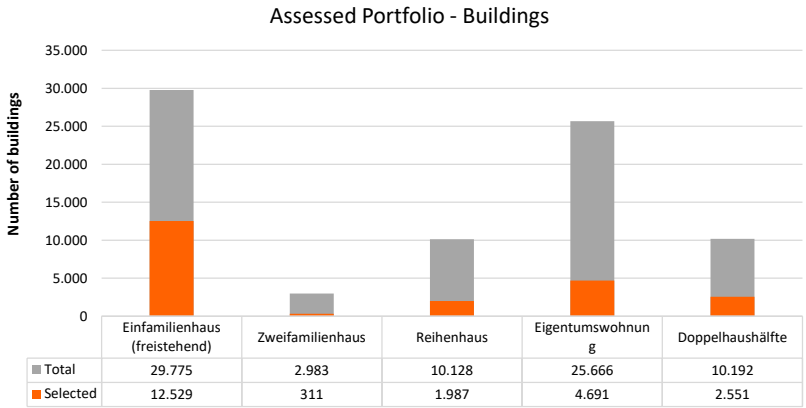
	Green Bond	Total
Amount	22.069	78.753



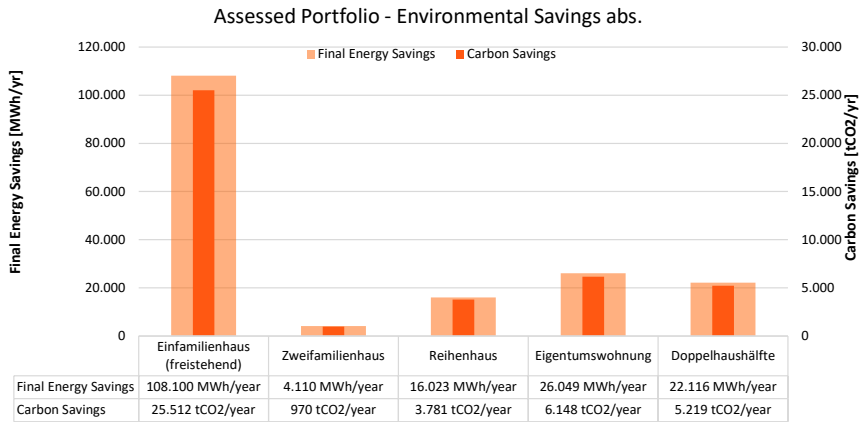
	Green Bond	Total
Portion	36%	100%
Mortgage Volume	3.218.243.551 €	8.918.926.204 €



	Green Bond	Total
Building Area	2.837.137 m²	9.541.205 m²



	Einfamilienhaus (freistehend)	Zweifamilienhaus	Reihenhaus	Eigentumswohnung	Doppelhaushälfte
Total	29.775	2.983	10.128	25.666	10.192
Selected	12.529	311	1.987	4.691	2.551



	Einfamilienhaus (freistehend)	Zweifamilienhaus	Reihenhaus	Eigentumswohnung	Doppelhaushälfte
Final Energy Savings	108.100 MWh/year	4.110 MWh/year	16.023 MWh/year	26.049 MWh/year	22.116 MWh/year
Carbon Savings	25.512 tCO2/year	970 tCO2/year	3.781 tCO2/year	6.148 tCO2/year	5.219 tCO2/year

German Green Bond Portfolio:

- Buildings: 22 069
- Exposure: 3 218 243 551 EUR (36%)
- Energy savings: 176 398 MWh/year
- Carbon emissions savings: 41 630 tCO_2/year

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LIVEABLE CITIES

HIGH-YIELD PORTFOLIOS

POWERFUL INFRASTRUCTURE

FUTURE-ORIENTED CONSULTING

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MEMO

Project:	Impact assessment ING green commercial building portfolio assessment
Subject:	CO_2-emission reduction calculation
Date:	03 May 2022
Status:	Final

As requested by ING, CFP Green Buildings compared the CO_2-emission of a specific, energy-efficient group of real estate (in this document indicated as ING green commercial building portfolio) with a comparable group of real estate with an average energy-efficiency (indicated as Reference[1]). The objective of this analysis is also to demonstrate that the selected buildings belong to the top most sustainable buildings in The Netherlands. In this document the results are shown.

Energy label comparison

Figure 1 shows the distribution of the energy labels of ING green commercial building portfolio and the registered energy labels in the Netherlands. In the ING green commercial building portfolio, all of the objects have a registered energy label A.

There are 1.446.791 registered energy labels with an A rating in the Netherlands. This is 15,8% of all buildings in the Netherlands (9.136.000 buildings). Therefore buildings in the ING green commercial building portfolio belong to the top 15,8% most energy-efficient buildings of the Dutch real estate market.

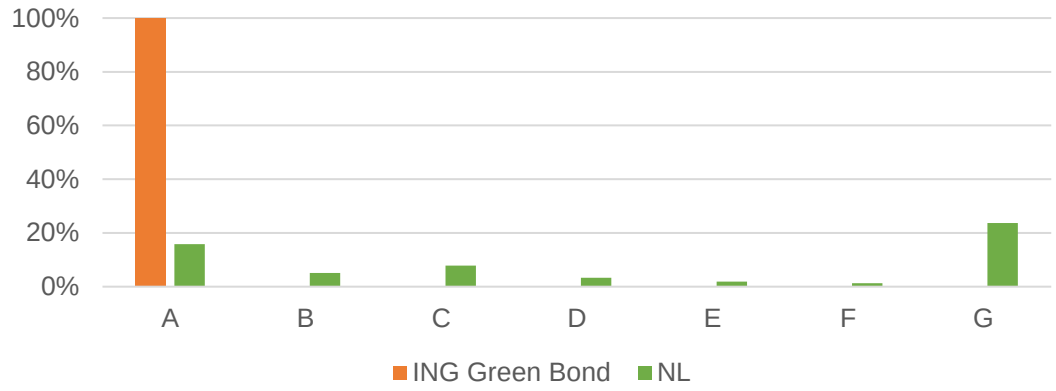

Figure 1: Distribution of energy labels ING green commercial building portfolio and in the Netherlands

Methodology

Within this study the CO_2-emissions of 15.850 objects, as selected by ING, were determined using the calculated real energy consumption of these objects. This selection is based on the selection criteria from the Green Bond Framework.

The energy usage is based on the algorithms and benchmarks from the expert system of CFP Green Buildings. This is the largest building database in The Netherlands with actual data on energy consumption and building characteristics. These algorithms and benchmarks are the same as those

1 The reference group is an anonymised portfolio from several clients form CFP Green Buildings, which contains about 140.000 comparable buildings

used in the online tool www.ingrefduurzaam.nl. In this study, the calculated real energy consumption of Dutch real estate (the Reference) was determined using this methodology.
The CO_2-emissions were calculated with the Dutch market standard conversion factors, derived from the Green Deal CO_2-Emissionfactors.

CO_2-emission - natural gas
The CO_2-emission of Dutch natural gas is 2,085 kg/m3.[2]

CO_2-emission - electricity
Values for carbon intensity, in kg per produced kWh of electricity, vary depending on assumptions made in the calculation method. In this assessment, an emission of 0,427 kg/kWh was used.[3]

Group composition

The group composition of the 15.850 objects is shown in table 1. Retail buildings have the largest footprint with 38% of total square meters. Residential buildings[4] account for 18% of the portfolio. About 33% of the portfolio are new buildings[5], 67% is refurbished to obtain an energy label A.

	#	m^2	Refurbished	New
Industry	207	602.180	155	52
Office	752	580.080	539	213
Retail	4.370	1.722.064	3.226	1.144
Residential building	9.056	799.513	4.029	5.027
Other	1.672	1.438.084	1.271	401
Total	***15.850***	***4.539.741***	***9.065***	***6.785***

Table 1: Group composition ING Green Buildings Loan Portfolio

Energy consumption

Table 2 shows the calculated real energy consumption of the ING green commercial building portfolio. Calculated real energy consumption for electricity is 322 million kWh each year and 25 million m^3 natural gas each year.

Electricity consumption (kWh)	Natural gas consumption (m^3)
322.387.273	*24.789.574*

Table 2: Calculated energy consumption ING green commercial building portfolio

CO_2-emission

Table 3 shows the CO_2-emissions of both groups, based on calculated real energy consumption. The total CO_2-emission of the ING green commercial building portfolio is 267.885 ton CO_2 per year. The Reference CO_2-emission is 340.424 ton CO_2 per year.

CO_2-emission ING green commercial building portfolio (ton CO_2)	CO_2-emission Reference (ton CO_2)	CO_2-emission Reduction (ton CO_2)
267.885	*340.424*	*72.539*

Table 3: CO_2-emission ING green commercial building portfolio compared to Reference

[2] Source: https://www.co2emissiefactoren.nl with WTW emission for natural gas in kg/CO_2 per m^3
[3] Source: https://www.co2emissiefactoren.nl with WTW emission for electricity (unknown) in kg/CO_2 per kWh
[4] 100% of the selected buildings are owned by professional real estate investors and their residential objects are all intended to be rented out (commercially).
[5] A building is categorised as new when the construction year of the building is 2006 or later

Approximately 67% (in square meters) of the portfolio consists of refurbished buildings. Another way of calculating reduced CO_2-emissions can be done by comparing the current emissions with the original built quality emissions. Table 3 shows an overview of the calculated CO_2-emissions reduction for the refurbished buildings, compared to the theoretical original built quality based on the expected Energy Index. The total CO_2-emissions of the ING green commercial building portfolio for refurbished buildings is 182.084 ton CO_2 per year. The original built quality CO_2-emission is 216.108 ton CO_2 per year.

CO_2-emission ING green commercial building portfolio Refurbished (ton CO_2)	***CO_2-emission according to building code (ton CO_2)***	***CO_2-emission Reduction (ton CO_2)***
182.084	*216.108*	*34.024*

Table 4: CO_2-emission ING green commercial building portfolio Refurbished compared to the original built quality

Approximately 33% of the portfolio consists of non-refurbished buildings or new buildings. Table 5 shows an overview of the calculated CO_2-emission reduction for the new buildings, compared to the theoretical original built quality based on the expected Energy Index. The total CO_2-emission of the ING green commercial building portfolio for new buildings is 85.810 ton CO_2 per year. The original built quality CO_2-emission is 95.981 ton CO_2 per year.

CO_2-emission ING green commercial building portfolio New (ton CO_2)	***CO_2-emission according to building code (ton CO_2)***	***CO_2-emission Reduction (ton CO_2)***
85.810	*95.981*	*10.172*

Table 5: CO_2-emission reduction (avoided) ING green commercial building portfolio New (new buildings that were more energy-efficient than the building code required at the time of construction help to avoid CO_2-emission).

Table 6 gives an overview of the reduced CO_2-emissions according to building code for both refurbished and new buildings with a definitive energy label.

	Number	**m^2**	**CO_2-emission ING green commercial building portfolio (ton CO_2)**	**CO_2-emission Original building code (ton CO_2)**	**CO_2-emission Reduction (ton CO_2)**
Refurbished buildings	9.066	2.975.309	182.084	216.108	34.024
New buildings	6.784	1.564.305	85.800	95.967	10.167
Total	***15.850***	***4.539.614***	***267.885***	***312.075***	***44.191***

Table 6: CO_2-emission ING green commercial building portfolio compared to original building code

Conclusion

From this study the following conclusions are determined:

- Based on the calculated real energy consumption, the ING green commercial building portfolio has a CO_2-emission that is 72.539 tons per year lower than the reference, which is a difference of 21,3%.
- Compared to the original building code, the ING green commercial building portfolio has a CO_2-emission reduction of 34.024 tons per year, which is a reduction of 15,7%.
- Based on the official and calculated energy labels, buildings in the ING green commercial building portfolio belong to the top 15% most energy-efficient buildings of the Dutch real estate market.