Impact assessment Eligible Asset Portfolio NN Group

Project:	Impact assessment Eligible Asset Portfolio NN Group
Subject:	Avoided CO_2-emission calculation
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Status:	Final

As requested by NN Group, CFP Green Buildings compared the CO_2-emission of a specific, energy-efficient group of residential real estate (in this document indicated as Eligible Asset Portfolio[1] [2]) to that of a comparable group of residential real estate with an average energy-efficiency (indicated as "Reference" or "Reference Group"[3]). The objective of this analysis is to report the positive impact of the green residential real estate of NN Group. This document outlines the results of this analysis.

Preface
NN Group N.V. ("NN Group" or "the Group") is a financial services company, operating in 20 countries with a strong presence in Europe and Japan. NN Group has approximately 18 million customers, is listed on Euronext Amsterdam and employs more than 15,000 people.

Climate change represents an urgent and potentially irreversible threat to livelihoods and the well-being of society. To mitigate the worst effects, we must transition to a low-carbon economy, limiting the global temperature to 1.5°C as part of the 2015 Paris Agreement. The latest science shows that emissions will need to reach net-zero around 2050 to meet this goal and prevent the worst impacts of climate change. As a financial institution, NN Group recognises that it has an important role to play in promoting the low-carbon transition especially through their investments. Therefore, NN Group has committed to strive for a net-zero greenhouse gas emissions investment portfolio by 2050. This is a key initiative under the strategic commitment Society: we contribute to the well-being of people and the planet. The Group's climate change strategy focusses both on decarbonising the portfolio consistent with the Paris goals and increasing allocations to green investments.

To underline their ambition, NN Group has endorsed various pledges and commitments, such as the Commitment of the financial sector to the Dutch Climate Agreement (Klimaatakkoord), and the Paris Aligned Investment Initiative Net Zero Asset Owner Commitment.

Energy label comparison
Figure 1 shows the distribution of the energy labels of NN Group Eligible Asset Portfolio and the registered energy labels in the Netherlands for residential buildings. In the NN Group Eligible Asset Portfolio, all objects have a registered energy label A. As per end of 2020 there are 1.217.535 registered energy labels with an A rating in the Netherlands.[4] This is 15,5% of all buildings in the Netherlands (7.815.000 buildings as per end of 2020[5]). The NN Group Green Loan Portfolio also takes the year of construction into account as criterion for the selection of the portfolio. This because the Dutch Building Regulation sets out energy efficiency requirements for different building types. As an example, the Dutch Building Code 2000 requires an EPC score of at least 1,0. Over time the Dutch Building Regulation

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[1] When referring to the Eligible Asset Portfolio in this document, we refer to Dutch Residential Green Buildings only, so not the other Eligible Assets, as defined in the Sustainability Bond Framework by NN Group.
[2] The Eligible Asset Portfolio consists of 27.192 objects and covers 21% of the total portfolio on the NN Group insurance entities' balance sheets of Dutch mortgages originated and/or serviced by our own banking business. The Eligible Asset Portfolio represents 29% of the total outstanding amount of the of the total portfolio as mentioned above.
[3] The Reference Group is an anonymised portfolio from several clients from CFP Green Buildings, which contains about 140.000 comparable buildings.
[4] Source for EPC labels: http://www.ep-online.nl/
[5] Source: Kadaster. The Dutch Land Registry and Mapping Agency.

becomes more stringent in terms of energy-efficiency and sustainability requirements for new buildings. The year of construction that is used as selection criterion is 2005. 12,5% of the total Dutch housing stock are residential buildings with an energy label A and built after 2005. Because NN Group has chosen to use both criteria (building year and EPC A), buildings in the Eligible Asset Portfolio belong to the top 12,5% most energy-efficient buildings of the Dutch real estate market.
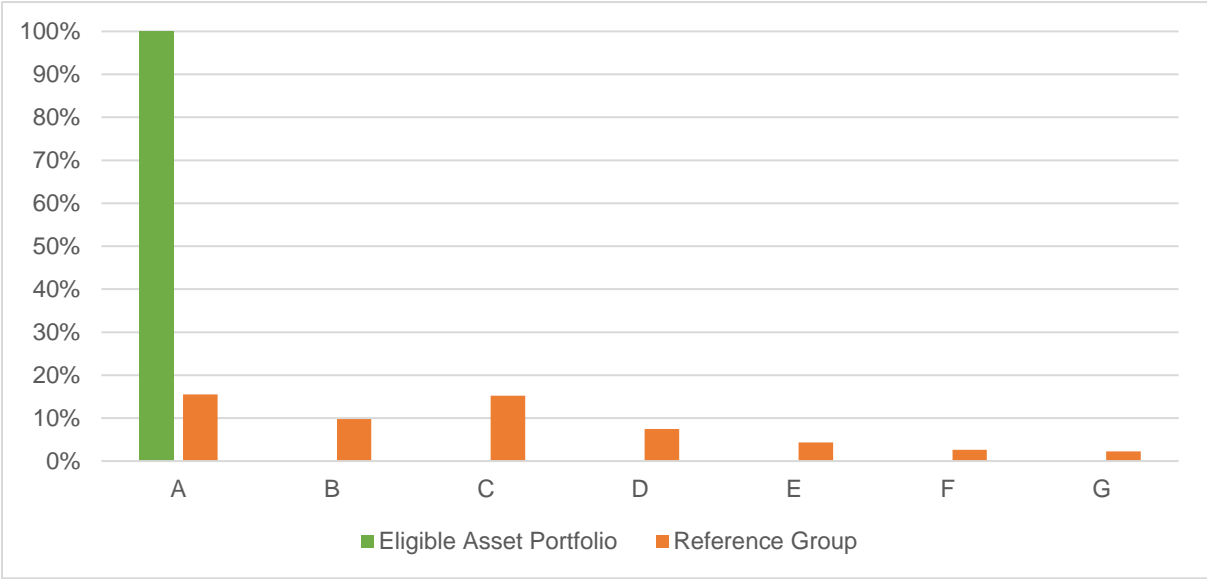

Figure 1: Distribution of energy labels Eligible Asset Portfolio and residential buildings in the Netherlands

Methodology

The CO_2-emission of 27.192 objects, as selected by NN Group, is determined by using the calculated energy consumption of these objects. The energy usage is based on 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. In this study, the calculated energy consumption of the reference was determined based on data from Centraal Bureau Statistiek[6] (CBS) and CFP.

The electricity consumption and natural gas consumption on household level can be converted to CO_2 emissions by using standard conversion factors. Within the Netherlands, the Dutch government created a widely accepted and uniform list with grid emission factors: www.co2emissiefactoren.nl. The Partnership for Carbon Accounting Financials, or PCAF, has chosen to use grid emission factors related to the direct emissions, expressed under column TTW value[7] on www.co2emissiefactoren.nl.[8] Whenever the origin of the consumed electricity is unknown, the emission factor for electricity from an undefined energy source should be used.The factor for electricity is updated regularly to reflect changes in the Dutch electricity mix. This leads to the following emission factors:

CO_2-emission - natural gas
The CO2-emission of Dutch natural gas is 1,785 kg/m^3.[9]

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[6] The Dutch national statistical office. https://www.cbs.nl/en-gb

[7] Tank to Wheels (TTW) are the direct emissions of an activity. In this case, the direct emissions of the energy usage.

[8] PCAF is a global partnership of financial institutions that work together to develop and implement a harmonized approach to assess and disclose the greenhouse gas (GHG) emissions associated with their loans and investments.

[9] Source: https://www.co2emissiefactoren.nl with TTW emission for natural gas in kg/CO2 per m^3

CO₂-emission - electricity
The CO_2-emission of Dutch electricity is 0,405 kg/kWh.[10]

Energy consumption

Table 1 shows the calculated energy consumption of the Eligible Asset Portfolio. The calculated energy consumption is 102 million kWh electricity each year and 35 million m^3 natural gas each year. This corresponds to an energy consumption of 26 kWh per squared meter (in terms of electricity) and 9,1m^3 per squared meter (in terms of gas).

To calculate the total energy consumption in kWh, the natural gas consumption in m^3 needs to be converted to kWh. One m^3 natural gas is equal to 9,769 kWh. Therefore, the gas consumption of 9,1m^3 per squared meter is multiplied by 9,769 kWh, which results in a consumption of 89 kWh per squared meter. The total calculated energy consumption is therefore 115 kWh per squared meter[11].

	Electricity consumption (kWh)	Natural gas consumption (m^3)
Consumption	101.639.132	35.426.305
Consumption per m^2	26	9,1

Table 1: Calculated energy consumption Eligible Asset Portfolio

CO₂-emission

Table 2 shows the CO_2-emisions of the Eligible Asset Portfolio and the Reference Group, based on the calculated energy consumption. The total CO_2-emission of the Eligible Asset Portfolio is 104.400 ton CO_2 per year. The Reference CO_2-emission is 144.568 ton CO_2 per year.

	CO₂-emission Eligible Asset Portfolio (ton CO₂)	CO₂-emission Reference (ton CO₂)	GHG emissions Avoided (ton CO₂)
Residential building	*104.400*	*144.568*	*40.168*

Table 2: CO₂-emission Eligible Asset Portfolio compared to Reference

Conclusion

The following conclusions are drawn from this study:

- Based on the calculated energy consumption, the Eligible Asset Portfolio has a CO_2-emission that is 40.168 tons per year lower than the reference, which is a difference of 28%.
- Total energy consumption is calculated at 115 kWh/m^2.
- Based on the official and calculated energy labels and year of construction, buildings in the Eligible Asset Portfolio belongs to the top 12,5% most energy-efficient buildings of the Dutch real estate market.

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[10] Source: https://www.co2emissiefactoren.nl with TTW emission for electricity (unknown) in kg/CO₂ per kWh
[11] This reflects the sum of 26 kWh per squared meter plus 89 kWh per squared meter