crelan

Impact assessment Crelan Green Buildings Portfolio Belgium

Project: Impact Assessment Crelan Green Buildings Portfolio Belgium

Subject: Reduced CO_2-emission calculation

Date: October 2025

Status: Final

As requested by Crelan, CFP Green Buildings has been tasked to compare the greenhouse gas emissions[1] of a specific, energy-efficient group of mostly residential Real Estate (in this document indicated as Crelan Green Buildings Portfolio[2]) to that of a comparable group of real estate with an average energy efficiency (indicated as "Reference" or "Reference Group"[3]). The objective of this analysis is to demonstrate that the selected buildings belong to the top most sustainable buildings in Belgium. This document outlines the results of this analysis.

The Eligible Green Building Portfolio

A total of 27,547 assets have been selected by Crelan [Green Bond Framework.pdf (crelan.be)](Green Bond Framework.pdf) as eligible for Crelan's Green Buildings Portfolio.

Crelan's Green Buildings Portfolio consist of either:

1) loans for buildings with EPC ≥A or belonging to the top 15% of the national stock or regional building stock expressed as operational Primary Energy Demand (PED) and demonstrated by adequate evidence, as required by the EU Taxonomy
2) loans for buildings with energy performance of at least 10% lower than the local threshold set for nearly zero building (NZEB) requirements.

To determine the top 15% of sustainable regional building stock, Crelan has developed a methodology stipulated in their Green Bonds Asset Selection Methodology report[4] which takes into account the European and regional regulations on energy performance, as well as publicly available data on building stock and energy consumption.

For the region of Flanders, the following eligibility criteria apply: loans for residential buildings with EPC A or loans granted for new constructions with the first loan drawing as from 2017. For Wallonia, the eligibility criteria are: loans for residential buildings with EPC A or B or loans granted for new constructions with the first loan drawing as from 2014. For the Brussels region, the applicable eligibility criteria are: loans for residential buildings with EPC A or B or loans granted for new constructions with the first loan drawing as from 2018.

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[1] Greenhouse gas emissions are calculated in CO_2-equivalent, which will be referred to as CO_2 throughout this document.

[2] When referring to the Eligible Asset Portfolio in this document, we refer residential buildings in Flanders, Brussels and Wallonia.

[3] The Reference Group represents the average CO_2-emissions of residential buildings in the Brussels, Flanders and Wallonia regions, taking the floor area of the eligible assets into account.

[4] Green Asset Selection Methodology_June2023.pdf (crelan.be)

Group Composition

The group composition of the 27,547 objects is shown in Table 1. Residential buildings have the largest footprint, with 97% of total square meters. Some identified assets were omitted from the group composition as they were land only assets containing no buildings.

Property type	#	m^2	Footprint %
Residential	27,266	2,997,433	97%
Retail	3	162	<1%
Office	151	33,062	1%
Storage & Distribution	117	50,378	2%
Community, conference, restaurant	9	1,216	<1%
Hotel	1	774	<1%
Total	**27,547**	**3,083,024**	**100%**

Table 1: Group composition Crelan Green Buildings Portfolio.

Methodology

Crelan Green Buildings Portfolio

One of the key data points required to calculate the expected CO_2-emissions of the 27,547 selected objects is the size of these assets expressed in m^2. As this data was not readily available by Crelan, these data points were sourced from the Belmap database via GIM[5] utilising address matching methods to source building data based on the addresses provided by Crelan. The majority of the database was able to be matched with an address within the Belmap database to enrich the data with the assets' m^2. The remainder of the data was enriched with the median calculated area per property type for each of the eleven provinces. If there were insufficient datapoints to calculate a reliable average (<10 assets), then the median for that property type within the region or the country was applied.

In this study, the CO_2-emissions of 27,547 objects, as selected by Crelan, was determined using the calculated energy consumption of these objects.

The energy usage (kWh) for the assets in Crelan's Green Buildings Portfolio is calculated based on the algorithms and benchmarks from the expert system of CFP Green Buildings. CFP's Expert system is a database consisting of actual energy data of buildings. A section of this anonymised data provides live energy data derived from CFP's Energy Monitoring projects.

Table 2 shows the calculated real energy consumption of the Crelan Green Buildings Portfolio. This includes all energy sources used to heat and operate the buildings. The calculated energy consumption for the eligible assets is 331 million kWh. The total calculated energy intensity is 107 kWh per m^2.

Region	Total energy (kWh)	Energy intensity (kWh/m^2)
Brussels	10,931,698	102
Wallonia	134,704,675	110
Flanders	184,933,814	106
Total	330,570,188	107

Table 2: Energy consumption Crelan Green Buildings Portfolio

The CO_2-emissions in this report were calculated with the Belgium market standard conversion factors, derived from CO_2emissiefactoren.be. The applied factors are illustrated in Table 3 below.

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[5] Data | GIM

Applied GHG emission factors[6]

Natural gas	0.237	kg CO_2e /kWh
Electricity	0.167	kg CO_2e /kWh
Wood pellets	0.215	kg CO_2e /kg
Oil	2.640	kg CO_2e /litre
Coal	2.31	kg CO_2e /kg

Table 3: Belgian CO_2-emission factors

Across the three distinct regions within Belgium – Brussels, Wallonia and Flanders – the energy mix and therefore emission factor for every kWh varies. Using the emission factors from Table 3, a blended emission factor was calculated per region by taking into consideration the energy source split across the region for space and water heating within buildings and the portion of the building's total energy consumption which is attributed to heating.

Utilising the greenhouse gas emission factors per fuel type listed in Table 3 and the fuel splits per region, a blended emission factor per kWh was calculated for each region as stipulated below in Table 4. The relevant emission factor was then applied to each asset in the Crelan Green Buildings Portfolio, multiplied against the calculated kWh consumed per building to determine the asset's CO_2-emissions.

CO_2 emissions per kWh per region

Brussels	0.227	kg CO_2e per kWh
Wallonia	0.229	kg CO_2e per kWh
Flanders	0.21	kg CO_2e per kWh

Table 4: Blended emission factors per kWh

Reference Group

In this study, the calculated energy consumption of the Reference Group was determined based on data from open government sources and databases and CFP[7].

Buildings in Brussels consume an average of 220 kWh/m²/year[8], while buildings located in Wallonia or Flanders are, on average, less energy efficient, consuming 404[9] and 347[10] kWh/m²/year.

Belgium's average CO_2 emissions per square meter per region are calculated based on these sources, and the emissions shown in Table 5. These averages are regularly updated as the public sources are also updated regularly. The numbers used for the calculations in this report are given in the table below[11].

CO_2 emissions per m² per region

Brussels	49.838	kg CO_2e per m²
Wallonia	92.527	kg CO_2e per m²
Flanders	72.933	kg CO_2e per m²

Table 5: Average emissions per region

In order to determine the CO_2-emissions for the reference group, the reference emissions for each asset in the Crelan Green Buildings Portfolio was calculated by multiplying the m² by the relevant factor above in Table 5.

CO_2-emission – Estimated positive impact

Table 6 shows the total CO_2-emissions of the Crelan Green Buildings Portfolio and the reference group based on the calculated energy consumption and the blended emission factors. The total CO_2-emission of the Crelan Green Buildings Portfolio is 72,165 tonnes of CO_2 per year. The Reference Group CO_2-emission is 246,370 tonnes of CO_2 per year. This is a reduced amount of 174,205 tonnes of CO_2 per year.

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[6] Source: CO_2emissiefactoren.be (co2emissiefactoren.be) using the emission factor for grey electricity unknown, WTW.

[7] The reference group has the same floor area as the eligible objects. The CO_2-emissions are calculated by CFP algorithms taking into account the energy usage of all residential buildings in Brussels, Wallonia and Flanders.

[8] Aandacht voor langetermijndoelstellingen appartementsgebouwen (be-reel.be)

[9] Consommation résidentielle d'énergie - État de l'environnement wallon

[10] Energiescore van bestaande woningen | Vlaanderen.be

[11] The emission factors of Table 3 are used.

GHG Emission Crelan Green Buildings Portfolio (tonnes CO_2)	GHG Emission reference group (tonnes CO_2)	GHG Emission reduction (tonnes CO_2)
72,165	246,370	174,205

Table 6: CO_2-emission Crelan Green Buildings Portfolio compared to Reference Group

The Crelan Green Buildings Portfolio is therefore estimated to emit 174,205 tonnes of CO_2 less than the Reference Group, which is a reduction of 70,7%.

Conclusion

The following conclusions are drawn from this study:

- Based on the calculated real energy consumption, the Crelan Green Buildings Portfolio has a CO_2-emission that is 174,205 tonnes per year lower than the reference group, which is a reduction of 70,7%.
- The primary energy consumption is calculated at 107 kWh/m^2 for the whole portfolio.
- The current indexed loan to value of the Crelan Green Buildings Portfolio is 35%. The total financed emissions under the mortgage loan receivables are 25,371 tonnes CO_2 per year.[12]
- All buildings in the Crelan Green Buildings Portfolio meet the EU Taxonomy Substantial Contribution to Climate Change Mitigation by meeting the eligibility criteria stipulated in the Crelan Green Bonds Asset Selection Methodology (June 2023).

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[12] The current indexed loan to value of the Crelan Green Buildings Portfolio is based on the most recently available revaluation of the buildings provided by Stadium (Stadim, your reliable guide to real-estate strategy and valuation).