

TECHNICAL REPORT

BANCA POPOLARE DI SONDRIO

POSITIVE CARBON IMPACT



Bologna, 12/07/2022

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1. EMISSIONS METHODOLOGY

This section provides an overview of CRIF's methodology to estimate avoided CO₂ emissions of Banca Popolare di Sondrio's green buildings portfolio (following 'Portfolio').

The assessment relies on four pillars:

- Calculation of buildings' related greenhouse gas emissions;
- Identification of a national benchmark;
- Calculation of portfolio positive impact;
- Reporting measures.

1.1. Calculation of buildings' greenhouse gas emissions

The calculation of GHG emissions of Banca Popolare di Sondrio's Green Buildings consists of three approaches:

1. The CO₂ emissions are available through a valid Energy Performance Certificate (following 'EPC'). In Italy, EPCs provide this information in a standard format. Estimated CO₂ emissions result from an automatic computation by professional software in line with existing national legislation on energy efficiency and the characteristics of the assets as provided by the real estate valuer.

This approach is implemented for the larger share of the Portfolio.

2. The estimation of CO₂ emissions is the result of a data management process through an automatic algorithm implementing the Primary Energy Demand.

This approach is executed for a small portion of the Portfolio for which the EPC label and Primary Energy Demand are available but not CO₂ emissions due to lack of data provided by regional energy cadasters.

3. The CO₂ emissions are available as a result of estimation through an algorithm owned by CRIF implementing the property's physical characteristics (e.g., construction year, building type, geolocalisation, etc.).

1.2. Identification of a National benchmark

To address the problems related to the lack of building energy efficiency data through regional energy cadasters, the Ministerial Decree on 26/06/2015 introduced a new national database, SIAPE, managed by ENEA. The SIAPE database represents the most important available data pool on the energy efficiency of Italian real estate stock, and CRIF has identified it as the data source for national benchmarks.

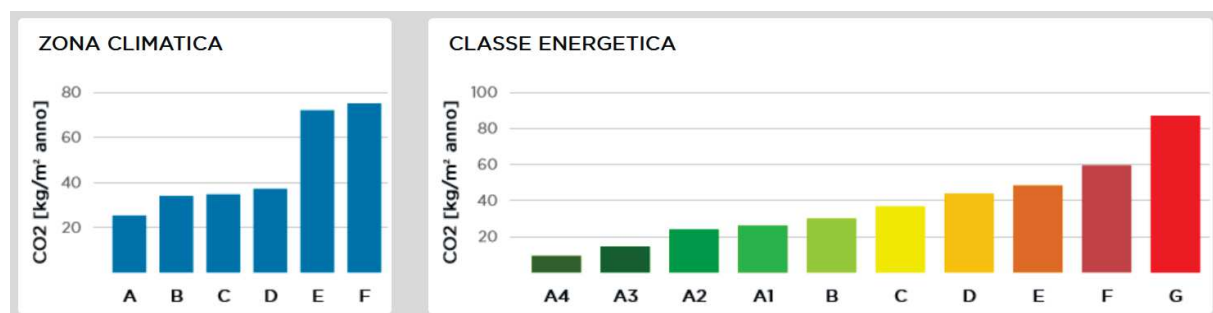


Figure 1 – Residential Buildings - Average of emissions for climate zone (zona climatica) and EPC label (classe energetica) from SIAPE portal

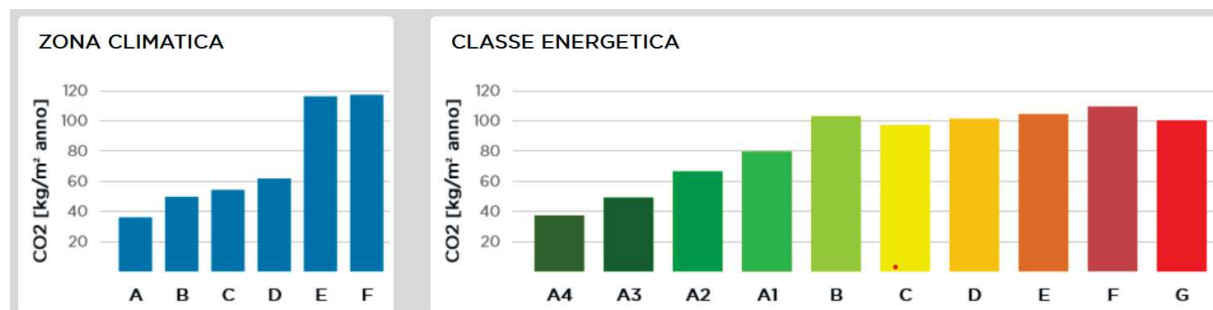


Figure 2 – Commercial Buildings - Average of emissions for climate zone (zona climatica) and EPC label (classe energetica) from SIAPE portal

1.3. Financed emissions

Intending to measure Banca Popolare di Sondrio's financed emissions for both mortgages for residential properties and commercial real estate, CRIF's methodology is in line with PCAF¹ standard. Accordingly, the following steps are followed:

1.3.1. Attribution of emissions

The first step consists of the identification of a proper attribution factor: Loan-to-value (LTV)

Thus, the attribution is equal to the ratio of the outstanding amount at the time of GHG accounting (t) to the property value at loan origination² (t₀):

$$\text{Attribution factor}_t = \frac{\text{Outstanding amount}_t}{\text{Property Value}_{t_0}}$$

The attribution factor is constantly updated by changing the numerator following the mortgage repayment plan. The denominator remains constant over time.

1.3.2. Financed emissions

The emissions of buildings are calculated as the product of a building's energy consumption and computed attribution factor as in the previous section:

$$\text{Financed emissions} = \sum_i^t \text{Attribution factor}_{i,t} \times \text{Estimated emissions}_{i,t}$$

Where, i = property in Banca Popolare di Sondrio's portfolio at time t.

¹ Available at: <https://carbonaccountingfinancials.com/files/downloads/PCAF-Global-GHG-Standard.pdf>, pag. 77-88.

² When the property value at origination is not feasible to obtain, financial institutions shall use the latest property value available and fix this value for the following years of GHG accounting (i.e., the denominator remains constant). The scope of this methodology is on-balance mortgages; off-balance are not included.

Estimated emissions' calculation relies on **Section 1.1**. In the applied methodology, no distinction is made between private or corporate mortgages.

1.3.3. Positive carbon impact

Starting from SIAPE's data, the portfolio's positive impact in terms of emission is calculated.

$$\text{Positive Carbon Impact} = [(\sum_i^t \text{Attribution factor}_{i,t} \times \text{Benchmark emissions}_{i,t}) - \text{Financed emission}] \times \text{Building surface}$$

The formula expresses the total amount of savings in kg of CO² for the guarantees under investigation, considering the attribution factor and a market benchmark.

1.4. Reporting measures

Once the emissions of every building are known or estimated (section 1.1), an analysis of all the mortgage guarantees shows portfolio performance, and the difference with the national benchmark is executed (section 1.2). Finally, the financial impact of each contract is calculated (see section 1.3), and the following impact indicators show the portfolio features in terms of energy efficiency:

- **Positive carbon impact:** It measures the positive impact of lower carbon emissions by considering the attribution factor and a benchmark. It is expressed in tons per year.
- **Positive carbon impact per million euros invested:** It measures the positive impact per million euros invested in tons per year.
- **Energy-saving:** Portfolio energy savings are calculated starting from the EPC and the national benchmark information. The measure is obtained from the difference between actual data and benchmark and multiplying the result for the surface.

Allocation (mln €)	Positive carbon impact (tons)	Positive carbon impact (tons per 1 mln €)	Square metres	Energy saving (MWh)
1,000 €	20,000	20.0	1,200,000	100,000

Table 1 – Example of portfolio impact





CRIF is a global company specializing in credit bureau and business information, outsourcing and processing services, and credit solutions. Established in 1988 in Bologna (Italy), CRIF has an international presence, operating over four continents (Europe, America, Africa and Asia).

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