

TECHNICAL REPORT

BANCA POPOLARE DI SONDRIO

GREEN BOND FRAMEWORK



Bologna, 30/06/2021

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1. INTRODUCTION

1.1. OBJECTIVES

Banca Popolare di Sondrio engaged CRIF S.p.A. to identify the eligible *Green Buildings* underlying a portfolio of loans and mortgages related to the acquisition, construction and renovation of residential and commercial properties, in line with the EU environmental objective of climate change mitigation and energy savings.

Chapter 1 provides an overview of the Italian real estate market, focusing on energy efficiency and the Energy Performance Certificate (following *EPC*). In contrast, Chapter 2 describes the eligibility criteria identified for both the Italian residential and non-residential building stock.

Finally, Chapter 3 assesses Banca Popolare di Sondrio's portfolio eligibility.

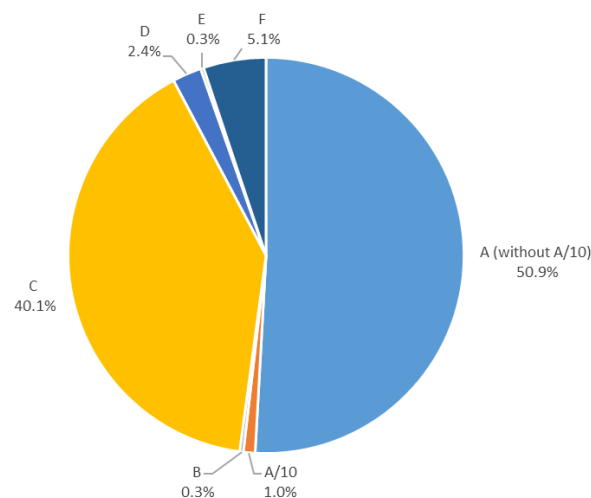
The present technical report reflects CRIF's independent opinion.

1.2. ITALIAN BUILDING STOCK

1.2.1. RESIDENTIAL

According to *Agenzia delle Entrate*¹ (2020), around 50% of the Italian building stock consists of residential buildings (35,834,817 properties), while the remaining 50% regards the non-residential properties (e.g. commercial, industrial), as shown in **Figure 1**². Overall, labelled properties 'A' are residential, excluding 'A/10' buildings categorised as private offices. On the other hand, considering non-residential properties, labelled 'B' includes urban buildings as public offices, hospitals, schools and museums. In contrast, 'C' properties, counting for around 27 million buildings, regards stores, warehouses, beach resorts and garages, while 'D' includes hotels, theatres, factories, and industrial buildings. 'F' labelled buildings are urban entities not already defined. Overall, 176,416 buildings, representing 0.3% of the stock, are for public use.

Figure 1 – Distribution of the Italian building stock in 2019



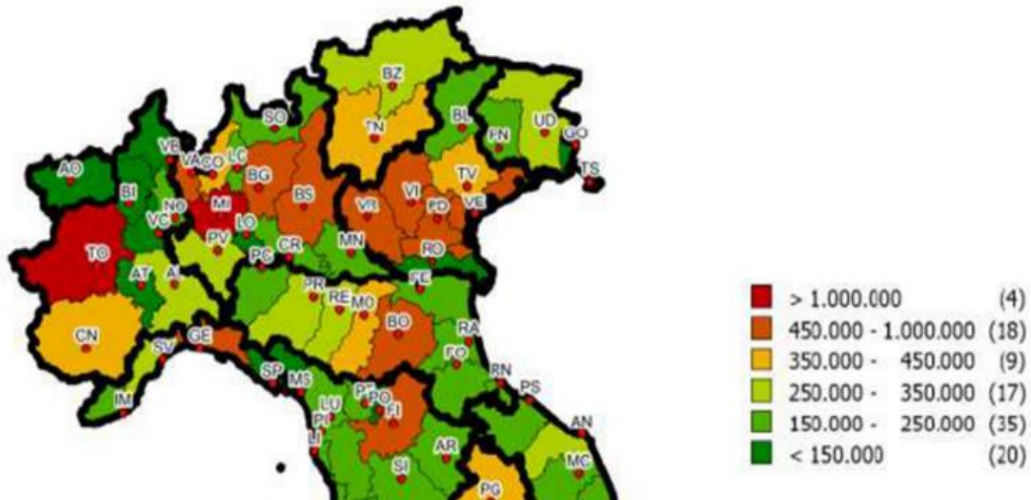
Source: CRIF elaboration on Agenzia delle Entrate, 2020

¹ Agenzia delle Entrate, Statistiche catastali 2019, July 2020. Available at: <https://www.agenziaentrate.gov.it/portale/web/guest/schede/fabbricatiterreni/omi/pubblicazioni/statistiche-catastali>

² A: Destinazione ordinaria residenziale, A/1-A/2-A/3-A/4-A/5-A/6-A/7-A/8-A/9-A/11
A/10: Destinazione ordinaria uffici e studi privati, A/10
B: Destinazione ordinaria, B/1-B/2-B/3-B/4-B/5-B/6-B/7-B/8
C: Destinazione ordinaria, C/1-C/2-C/3-C/4-C/5-C/6-C/7
D: Destinazione speciale, D/1-D/2-D/3-D/4-D/5-D/6-D/7-D/8-D/9-D/10
E: Destinazione particolare, E/1-E/2-E/3-E/4-E/5-E/6-E/7-E/8-E/9
F: Immobili che non producono reddito, F/1-F/2-F/3-F/4-F/5-F/6-F/7

Accordingly, focusing on the residential sector only, **Figure 2** provides an overview of the Italian stock distribution per buildings' numerosity at a provincial level with particular attention to the northern area and Lombardia region where the Banca Popolare di Sondrio's buildings portfolio has a higher representation.

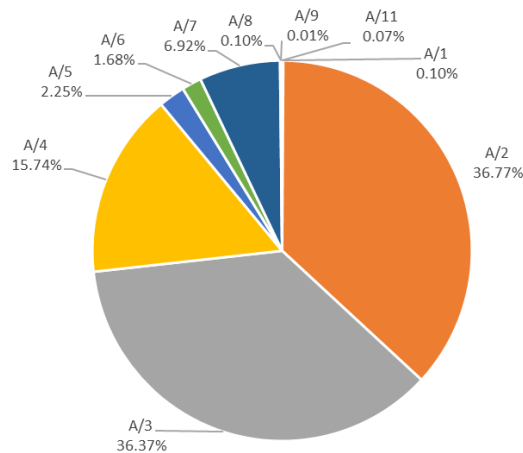
Figure 2 – Distribution of the Italian residential building stock at a provincial level



Source: CRIF elaboration on Agenzia delle Entrate, 2020

In contrast, **Figure 3** shows the distribution of buildings with cadastral category 'A' (without 'A10'), according to 2019.

Figure 3 - Distribution of the Italian residential building stock per cadastral category in 2019



Source: CRIF elaboration on Agenzia delle Entrate, 2020

Overall, **Table 1** provides differentiation of residential buildings following *Categorie Catastali*.

Table 1 – Description of buildings’ type according to cadastral category

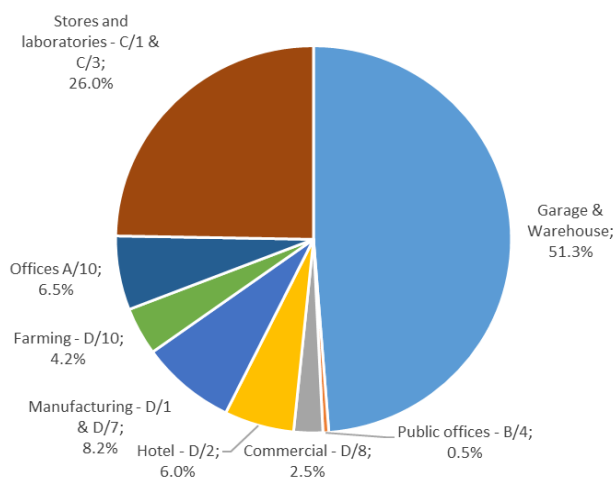
Cadastral category	Description
A/2, A/3, A/4, A/5	low and standard quality properties (mainly apartments)
A/1, A/9	high-quality properties
A/6	rural buildings
A/11	typical local buildings
A/7, A/8	villas

Source: CRIF elaboration

1.2.2. NON-RESIDENTIAL

Moving to the non-residential stock, **Figure 4** shows the distribution of the Italian properties according to the different types of buildings (and relative cadastral categories)³.

Figure 4 – Distribution of the Italian non-residential building stock by property type



Source: CRIF elaboration on Agenzia delle Entrate, 2021

³ Agenzia delle Entrate, Rapporto Immobiliare 2021 – Immobili a destinazione terziaria, commerciale e produttiva, May 2021. Available at: <https://www.agenziaentrate.gov.it/portale/web/guest/schede/fabbricatiterreni/omi/pubblicazioni/rapporti-immobiliari-non-residenziali>

More than half of the non-residential buildings consist of warehouses and garages (51.3%), while stores weigh 26.0%. Private offices represent 6.5% of the stock under analysis. **Table 2** focuses on their geographical distribution.

Table 2 – Geographical distribution of the Italian non-residential building stock⁴ in 2020

Area	Tertiary – Commercial buildings							Manufacturing D/1 & D/7	Farming D/10	Total
	Private offices A/10	Stores & laboratories C/1 & C3	Garage and warehouses	Public offices B/4	Credit institutions D/5	Commercial D/8	Hotel D/2			
North-West	30.4%	24.2%	23.8%	27.3%	34.9%	30.3%	22.4%	31.8%	23.1%	25.1%
North-East	22.9%	15.7%	14.4%	19.3%	25.2%	21.9%	23.6%	25.9%	34.8%	17.4%
Centre	20.9%	21.9%	19.3%	18.1%	20.1%	18.3%	23.9%	17.8%	17.1%	19.8%
South	17.4%	27.0%	29.4%	21.0%	12.5%	22.1%	19.9%	17.4%	13.8%	26.1%
Islands	8.4%	11.2%	13.1%	14.4%	7.3%	7.4%	10.2%	7.1%	11.2%	11.6%
Italy	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: CRIF elaboration on Agenzia delle Entrate, 2021

⁴ *North-West*: Liguria, Lombardia, Piemonte, Valle d'Aosta
North-East: Emilia-Romagna, Friuli Venezia Giulia, Veneto
Centre: Lazio, Marche, Toscana, Umbria
South: Abruzzo, Basilicata, Calabria, Campania, Molise, Puglia
Islands: Sardegna, Sicilia

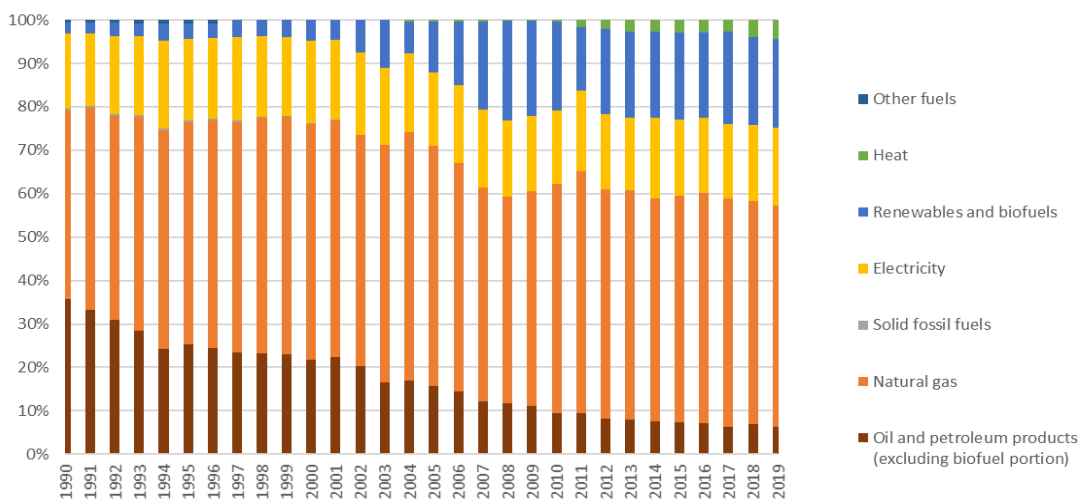
1.3. ENERGY EFFICIENCY AND THE REAL ESTATE MARKET

Real estate represents a strategic arena where energy-efficient measures can impact achieving CO2 reduction target. *The buildings and buildings construction sectors combined are responsible for over one-third of global final energy consumption, and nearly 40% of total direct and indirect CO2 emissions. Energy demand from buildings and buildings construction continues to rise, driven by improved access to energy in developing countries, greater ownership and use of energy-consuming devices, and rapid growth in global buildings floor area.*⁵

In recent years, global CO₂ emissions related to buildings have risen due to several factors primarily associated with an increasing energy demand for heating and cooling systems (e.g. air-conditioning), driven by climate change conditions (and extreme weather events).

With this regard, considering the Italian residential market, **Figure 5** shows how households’ consumption of renewables and biofuels sources increased from 2005, leading to 21% in 2019. Electricity and gas use remain relatively stable on average, 18% and 52%, respectively, while oil and petroleum dramatically decreased over time, passing from around 36% in 1990 to 6% in 2019.

Figure 5 – Households final energy consumption by fuel



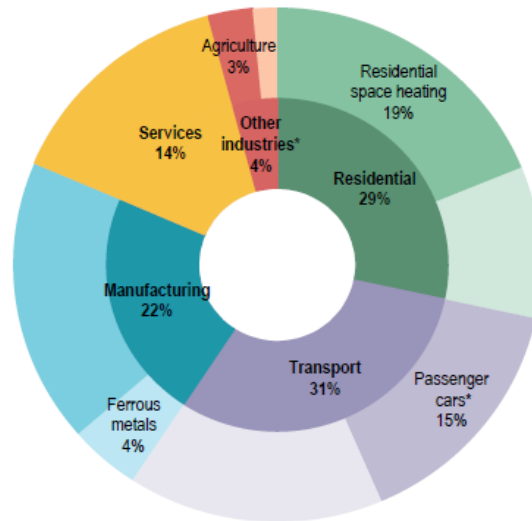
Source: CRIF elaboration on Eurostat

According to the International Energy Agency (IEA) report on Energy Efficiency Indicators (2020), **Figure 6A** highlights how 29% of the Italian energy end-uses by sector is linked to the residential sector. At the same time, considering

⁵ International Energy Agency, World Energy Outlook, October 2020. Available at: <https://www.iea.org/reports/world-energy-outlook-2020>

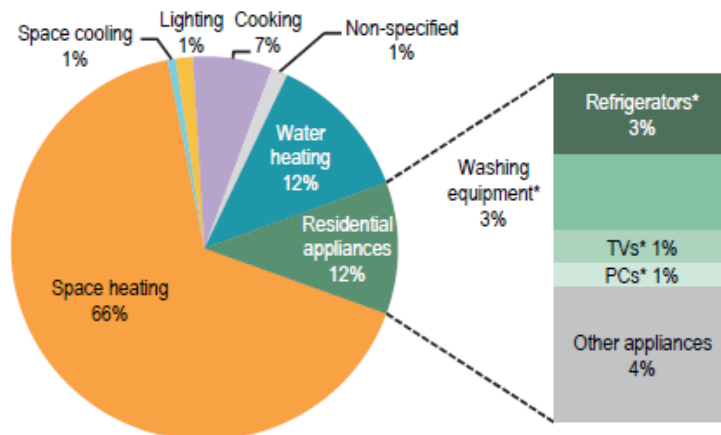
the residential energy consumption, a significant role is played by heating systems (66%) combined with water heating (12%) and residential appliances (12%), as in **Figure 6B**.

Figure 6A – Italian energy end-uses by sector (2018)



Source: IEA, 2020

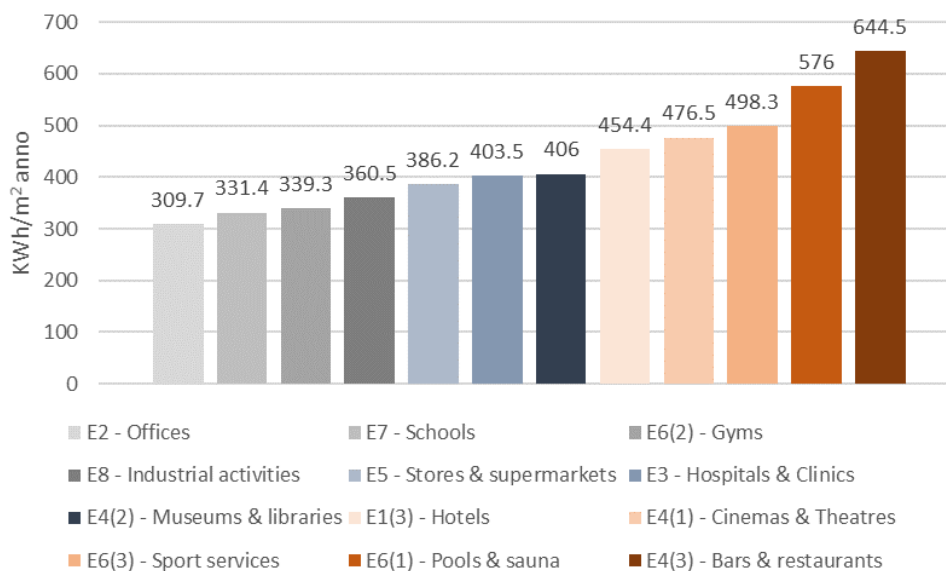
Figure 6B – Total final energy for the Italian residential sector by end-use (2018)



Source: IEA, 2020

On the other hand, focusing on the non-residential sector, **Figure 7** shows the average $EP_{gl,nren}$ per destinazione d'uso⁶ (excluding E.1(1), E.1(2)) for EPCs released in 2015-2020.

Figure 7 – Average $EP_{gl,nren}$ of non-residential buildings for EPCs issued in 2015-2020



Source: CRIF elaboration on SIAPE

As described in **Section 1.7**, the $EP_{gl,nren}$ is a parameter that synthesises the energy demand of the building about non-renewable sources of energy.

⁶ Destinazione d'uso:

E.1 - Edifici adibiti a residenza e assimilabili:

E.1(1) – abitazioni adibite a residenza con carattere continuativo

E.1(2) – abitazioni adibite a residenza con occupazione saltuaria

E.1(3) – edifici adibiti ad albergo, pensione ed attività similari

E.2 – Edifici adibiti ad uffici e assimilabili

E.3 – Edifici adibiti a ospedali, cliniche o case di cura e assimilabili

E.4 – Edifici adibiti ad attività ricreative, associative o di culto e assimilabili

E.5 – Edifici adibiti ad attività commerciali e assimilabili

E.6 – Edifici adibiti ad attività sportive

E.7 – Edifici adibiti ad attività scolastiche a tutti i livelli e assimilabili

E.8 – Edifici adibiti ad attività industriali ed artigianali e assimilabili

1.4. EU TAXONOMY AND THE REAL ESTATE MARKET

On 21 April 2021, the European Commission published the text of the EU Taxonomy Climate Delegated Act to *establishing technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.*

Construction and real estate activities represent a fundamental economic category to pursue the objectives related to carbon emission reductions. Indeed, *The economic activities in this category could be associated with several NACE codes, in particular F41.1 and F41.2, including also activities under F43, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.*

In the present report, the attention poses to those actions needed to mitigate climate change effects. Indeed, Annex I focuses on the technical screening criteria (TSC) related to *substantial contribution to climate change mitigation and do no significant harm* ('DNSH') different activities. Accordingly, **Table 3** provides an overview of the TSC for the *construction of new buildings*. At the same time, **Table 4** relates to the *renovation of existing buildings* and **Table 5** on *acquisition and ownership of buildings*.

Table 3 – Substantial Contribution to Climate Change Mitigation: *Construction of new buildings*

Construction of new buildings	Substantial Contribution to Climate Change Mitigation
1	The Primary Energy Demand (PED), defining the energy performance of the building resulting from the construction, is at least 10 % lower than the threshold set for the nearly zero-energy building (NZEB) requirements in national measures implementing Directive 2010/31/EU of the European Parliament and of the Council. The energy performance is certified using an as built Energy Performance Certificate (EPC).
2	For buildings larger than 5000 m ² , upon completion, the building resulting from the construction undergoes testing for air-tightness and thermal integrity, and any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients. As an alternative; where robust and traceable quality control processes are in place during the construction process this is acceptable as an alternative to thermal integrity testing.
3	For buildings larger than 5000 m ² 286, the life-cycle Global Warming Potential (GWP) of the building resulting from the construction has been calculated for each stage in the life cycle and is disclosed to investors and clients on demand.

Source: Delegated Act of the EU Taxonomy for sustainable activities

Table 4 – Substantial Contribution to Climate Change Mitigation: *Renovation of existing buildings*

Renovation of existing buildings	Substantial Contribution to Climate Change Mitigation
1	The building renovation complies with the applicable requirements for major renovations. Alternatively, it leads to a reduction of primary energy demand (PED) of at least 30 %.

Source: Delegated Act of the EU Taxonomy for sustainable activities

Table 5 – Substantial Contribution to Climate Change Mitigation: *Acquisition and ownership of buildings*

Acquisition and ownership of buildings	Substantial Contribution to Climate Change Mitigation
1	For buildings built before 31 December 2020, the building has at least an Energy Performance Certificate (EPC) class A. As an alternative, the building is within the top 15% of the national or regional building stock expressed as operational Primary Energy Demand (PED) and demonstrated by adequate evidence, which at least compares the performance of the relevant asset to the performance of the national or regional stock built before 31 December 2020 and at least distinguishes between residential and non-residential buildings.
2	For buildings built after 31 December 2020, the building meets the criteria specified in Section 7.1 of this Annex that are relevant at the time of the acquisition.
3	Where the building is a large non-residential building (with an effective rated output for heating systems, systems for combined space heating and ventilation, air-conditioning systems or systems for combined air-conditioning and ventilation of over 290 kW) it is efficiently operated through energy performance monitoring and assessment.

Source: Delegated Act of the EU Taxonomy for sustainable activities

Intending to identify those buildings in a bank’s portfolio eligible for a Green Bond issuance, acquisition and ownership, and renovations sections will play a fundamental role in the next future.

1.5. EPC AND FINANCIAL DISCLOSURE

The EPC represents an objective and complete technical instrument that provides crucial information related to the energy performance of the buildings underlying mortgage contracts granted by financial institutions.

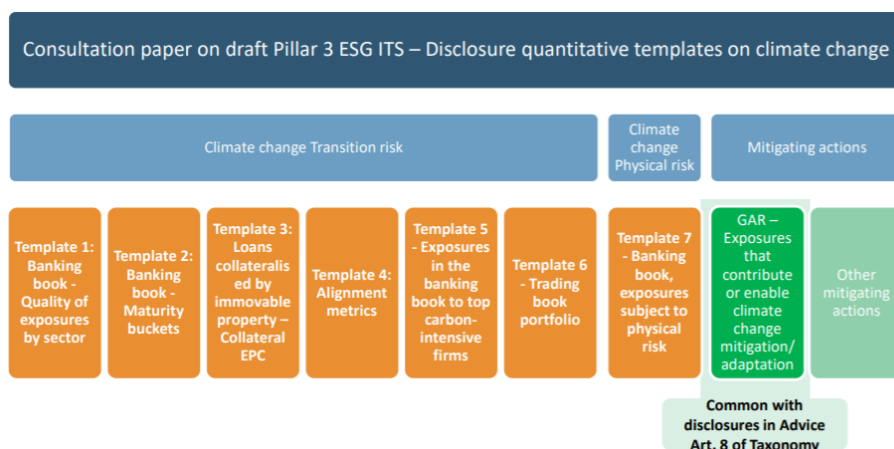
With this regard, on 1 March 2021, the European Banking Authority (EBA) published *a consultation paper on draft implementing technical standards (ITS) on Pillar 3 disclosures on Environmental, Social and Governance (ESG) risks. The draft ITS put forward comparable disclosures that show how climate change may exacerbate other risks within institutions’ balance sheets, how institutions are mitigating those risks, and their green asset ratio on exposures financing taxonomy-aligned activities, such as those consistent with the Paris agreement goals.*

In line with this, disclosure of information on ESG risks is a vital tool to promote market discipline, allowing stakeholders to assess banks’ ESG related risks and sustainable finance strategy.

Accordingly, the necessity of gathering EPCs serves to provide the stakeholders with an overview of the assets’ energy performance for which the financial institutions hold a mortgage. Indeed, Article 23.b of the consultation paper reports that *for their real estate portfolios, including loans collateralised by commercial and residential real estate, and repossessed real estate collaterals, information on the energy efficiency of the underlying real estate collaterals, including distribution of collaterals by energy performance certificate (EPC) label.*

Coherently, Annex I focuses on the templates on ESG risks disclosures. Template 3 requests to provide the distribution of EPCs related to the collaterals, as shown in **Figure 8**.

Figure 8 – Proposed quantitative templates for consultation paper by EBA on Pillar 3, ESG disclosures



Source: Public consultation on draft technical standards on Pillar 3 disclosures of ESG risks, EBA, 2021

1.6. ITALIAN EPC LABELLING SCHEME

In Europe, the normative framework for assessing the buildings' energy performance belongs to the Energy Performance of Buildings Directive (EPBD). *The EPBD aims to promote the improvement of the energy performance of buildings within the European Union, taking into account outdoor climatic and local conditions, as well as indoor climate requirements and cost-effectiveness.*

Since 2002, three versions of the EPBD are published:

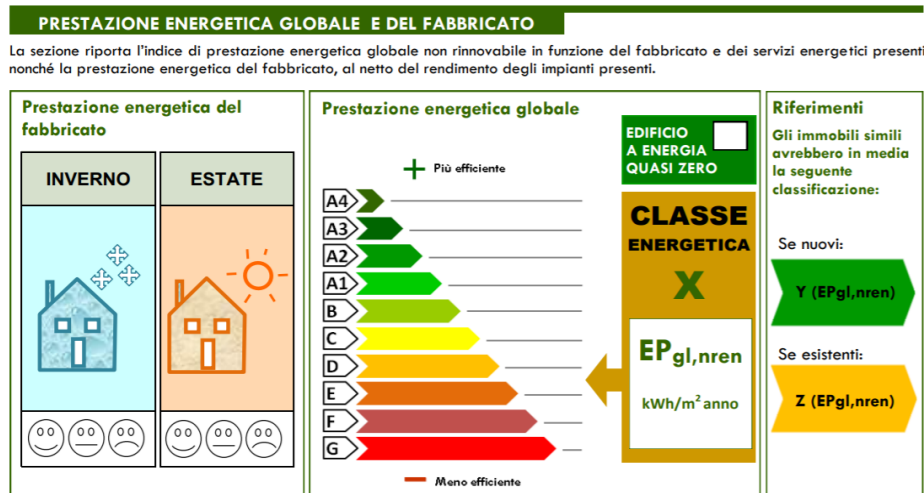
1. Directive 2002/91/EC;
2. Directive 2010/31/EU;
3. Directive 2018/844/EU.

Indeed, the revision of 2018 introduced the obligation for Member States to disclose the national calculation methodology without forcing them to apply those standards provided in the Directive 2010/31/EU. This approach requires the Member States to explain existing divergences of the national application from the Directive.

The first Italian National Energetic Plan was introduced in 1991, while the energy label (ACE - *Attestato Certificazione Energetica*) in 2005 due to the introduction of the EPBD Directive 2002/91 (ENEA, 2020). Nowadays, the energy performance assessment of a building produces a new energy label (EPC), the APE – *Attestato Prestazione Energetica*, according to rules set in the Italian Directive 26/06/2015 (*Requisiti Minimi*). The Energy Performance Certificate is mandatory for rent, acquisition, construction of a new building and energy renovation (retrofitting process).

In this context, based on the existing methodology, the energy performance is defined through a ranking from A4 (the most efficient) to G (the least efficient), as shown in **Figure 9**.

Figure 9 – Building’s Energy Performance format



Source: Italian Decree 26/06/2015 (*Requisiti Minimi*)

In addition to the energy label, several energy indicators are automatically derived during the property assessment.

At first, the EPC class is assigned as a consequence of several steps and computations:

1. The $EP_{gl,nren,rif,standard}$ of a *reference building* is derived after providing specific input information related to the building under assessment. Indeed, the *reference building* has the same features as the assessed building in terms of geometry, location, exposition, and use but supported by standard technologies as defined by law.⁷
2. The $EP_{gl,nren}$ of the building under assessment. The $EP_{gl,nren}$ ⁸ provides information about the kilo-wattage of energy required by the property under standard conditions per square meters of heated floor per year. Overall, the $EP_{gl,nren}$ is defined as:

$$EP_{gl,nren} = EP_{H,nren} + EP_{C,nren} + EP_{W,nren} + EP_{V,nren} + EP_{L,nren} + EP_{T,nren}$$

In particular, the above formula considers:

- non-renewable primary energy demand for winter heating and air conditioning ($EP_{H,nren}$ and $EP_{C,nren}$);

⁷ See the Decree 26/06/2015, national criteria and technical norms (UNI/TS 11300), EU Directive 2010/31

⁸ Expressed in kWh/m²

- non-renewable primary energy demand for hot sanitary water ($EP_{W,nren}$);
 - non-renewable primary energy demand for ventilation ($EP_{V,nren}$);
 - non-renewable primary energy demand for artificial lighting (included for non-residential buildings) ($EP_{L,nren}$);
 - non-renewable primary energy demand for the transport of people and things (included for non-residential buildings) ($EP_{T,nren}$).
3. Computing the ratio between (2) and (1), the EPC class is assigned following the scheme in **Figure 10**

Figure 10 – Italian EPC label thresholds

	Classe A4	$\leq 0,40 EP_{gl,nren,rif,standard (2019/21)}$
$0,40 EP_{gl,nren,rif,standard (2019/21)} <$	Classe A3	$\leq 0,60 EP_{gl,nren,rif,standard (2019/21)}$
$0,60 EP_{gl,nren,rif,standard (2019/21)} <$	Classe A2	$\leq 0,80 EP_{gl,nren,rif,standard (2019/21)}$
$0,80 EP_{gl,nren,rif,standard (2019/21)} <$	Classe A1	$\leq 1,00 EP_{gl,nren,rif,standard (2019/21)}$
$1,00 EP_{gl,nren,rif,standard (2019/21)} <$	Classe B	$\leq 1,20 EP_{gl,nren,rif,standard (2019/21)}$
$1,20 EP_{gl,nren,rif,standard (2019/21)} <$	Classe C	$\leq 1,50 EP_{gl,nren,rif,standard (2019/21)}$
$1,50 EP_{gl,nren,rif,standard (2019/21)} <$	Classe D	$\leq 2,00 EP_{gl,nren,rif,standard (2019/21)}$
$2,00 EP_{gl,nren,rif,standard (2019/21)} <$	Classe E	$\leq 2,60 EP_{gl,nren,rif,standard (2019/21)}$
$2,60 EP_{gl,nren,rif,standard (2019/21)} <$	Classe F	$\leq 3,50 EP_{gl,nren,rif,standard (2019/21)}$
	Classe G	$> 3,50 EP_{gl,nren,rif,standard (2019/21)}$

Source: Italian Decree 26/06/2015 (*Requisiti Minimi*)

2. ELIGIBILITY CRITERIA

2.1. MARKET REFERENCES

The applied methodology to select eligible energy-efficient buildings part of the Banca Popolare di Sondrio's portfolio relies on Climate Bonds Taxonomy (2019). Indeed, it represents a market reference in establishing buildings proxies to identify eligible buildings for the green covered bonds issuance.

The Climate Bonds Taxonomy identifies the assets and projects needed to deliver a low carbon economy and gives GHG emissions screening criteria consistent with the 2-degree global warming target set by the COP 21 Paris Agreement [...] and has benefited from the input of hundreds of technical experts from around the world. It can be used by any entity looking to identify which assets and activities, and associated financial instruments, are compatible with a 2-degree trajectory. First released in 2013, the Climate Bonds Taxonomy is regularly updated based on the latest climate science, emergence of new technologies and the Climate Bonds Standard Sector Criteria⁹.

The CBI Taxonomy (2019) identifies three assets according to the *Buildings* section¹⁰:

- Commercial Buildings (e.g. offices, hotels, retail buildings, public buildings, educational buildings, healthcare buildings);
- Residential Buildings (private dwellings and multifamily residential buildings);
- Other building types (e.g. data centres, stations, and related buildings for eligible transport, industrial buildings).

The CBI Taxonomy also defines a *Screening Indicator* for the first two asset types, i.e. Commercial and Residential buildings, as the *emissions footprint in the top 15% of emissions performance in the local market or a substantial reduction in gCO₂/m₂ because of upgrade or retrofit*. With this regard, considering residential buildings, *existing instruments such as local building codes, energy rating schemes (e.g. US Energy Star) and energy labelling schemes (e.g. Energy Performance Certificates in the EU) are leveraged as emission performance proxies (using the proxy methodology)¹¹.*

⁹ Climate Bond Taxonomy – A guide to climate aligned assets & projects, Climate Bond Initiative, November 2019. Available at: https://www.climatebonds.net/files/files/CBI_Taxonomy_Tables-Nov19.pdf

¹⁰ Climate Bond Taxonomy – A guide to climate aligned assets & projects, Climate Bond Initiative, pag.11, November 2019

¹¹ <https://www.climatebonds.net/standard/buildings>

Accordingly, two methodologies for establishing building proxies¹² (2016) for the identification of the top 15% most energy-efficient buildings are provided:

- A. *Benchmarking against local market emissions performance;*
- B. *The proportion of total ratings/labels awarded.*

Option A relies on the existence of data and statistics on the emission performance of buildings. Identifying the local top 15% bucket represents the starting point for drafting an *emission performance trajectory* that declines towards zero emissions in 2050.

Conversely, Option B offers a solution in case of a lack of emission performance's data. The identification of the top 15% relies on the adoption of the national scheme as a benchmark where the analysis is supported by solid *evidence to demonstrate that the rating or label is in the top 15% of all ratings or labels awarded under the scheme (that predominantly rates buildings on energy efficiency/emissions).*

Furthermore, the Technical Annex to the TEG Final Report (2020) suggests addressing the best-in-class *by benchmarking the top 15% of the existing national stock*. This rate is intended to decline while approaching the 2050 decarbonisation targets.

In particular, considering the climate change mitigation actions, in case of acquisition and ownership of buildings, TEG clarifies that *the calculated performance of the building must be within the top 15% of the local existing stock in terms of operational Primary Energy Demand, expressed as kWh/m² year. Alignment with this Criterion can be demonstrated by providing adequate evidence comparing the performance of the relevant asset to the performance of the local stock built before 31 December 2020. Such evidence should be based on a representative sample of the building stock in the respective area where the building is located, distinguishing at the very least between residential and non-residential buildings. The area can be defined as a city, a region or a country. Certification schemes such as EPCs may be used as evidence of eligibility when adequate data is available to demonstrate that a specific level (e.g. EPC A) clearly falls within the top 15% of the respective local stock.*¹³

¹² Available at:

<https://www.climatebonds.net/files/files/Methodology%20for%20Establishing%20Proxies.pdf>

¹³ TEG Final report on EU Taxonomy: Technical Annex, pag. 388. Available at:

https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes_en.pdf

2.2. ENERGY EFFICIENCY AND REAL ESTATE MARKET: CRIF'S APPROACH

This chapter describes how CRIF analysed the Italian building stock to identify those properties belonging to the top 15% of the most energy-efficient buildings using the EPC labelling as a proxy.

The analysis presented in this chapter represents a fundamental premise in identifying the eligible buildings within the Banca Popolare di Sondrio's portfolio, as described in **Chapter 3**.

CRIF's analysis is related to the Italian building stock according to:

1. EPC distribution:
 - 1.1. Residential buildings;
 - 1.2. Non-residential buildings.
2. Construction year as a proxy for the residential buildings without EPC.

This section aims to identify the top 15% of the Italian buildings stock, both residential and non-residential, by analysing EPC data gathered in the SIAPE portal by ENEA, representing the most critical data source in Italy regarding energy efficiency in the real estate market.

In Italy, the energy cadasters gathering EPCs are managed under the regional jurisdiction. Accordingly, EPCs' data are not publicly accessible for all the Italian regions. With this respect, Lombardia, the Province of Trento (Trentino Alto-Adige) and Friuli-Venezia Giulia represent those regions providing open access data related to the energy efficiency of the buildings located on their territory.

To address the problems related to the lack of building's energy efficiency data, the Ministerial Decree on 26/06/2015 introduced a new national database, SIAPE, managed by ENEA, where contributing regions are required to upload the gathered EPCs by the end of March every year.

As shown in **Figure 11**, not all the Italian regions contribute to the SIAPE database. Indeed, the blue areas identify the energy cadasters providing EPCs' information while the grey ones are not. In yellow, the regions that are currently working on the upload of their data (Valle d'Aosta and Molise).

Figure 11 – Map of the Italian regions contributing to the SIAPE database



Source: SIAPE, ENEA

The SIAPE has collected 1,938,348 EPCs issued in 2015-2020 from 12 regions when writing the present report. Overall, 85.4% of the records belong to residential buildings and 14.6% to non-residential ones. This result is consistent with the evidence of the last Italian census in 2011 when residential buildings represented 89% of the stock against the 11% of non-residential buildings.

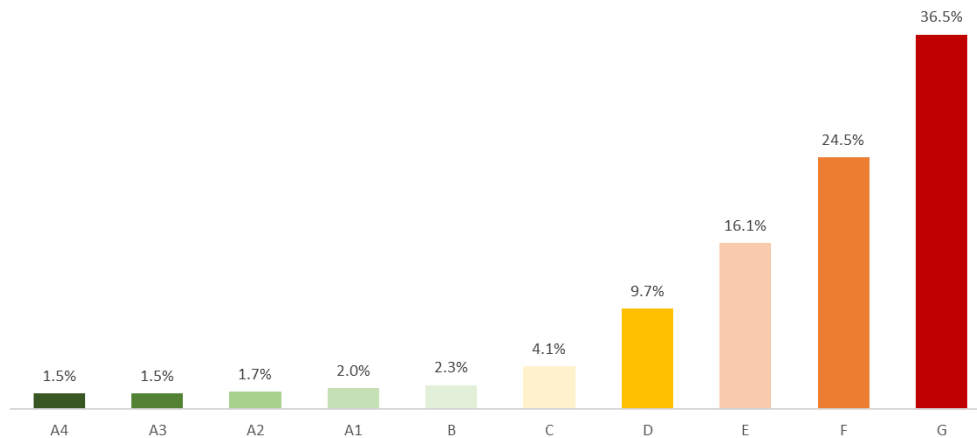
2.2.1. CRITERION 1.1: TOP 15% ENERGY-EFFICIENT RESIDENTIAL BUILDINGS USING EPC LABELS AS A PROXY

At first, a filter to identify residential buildings¹⁴ only is applied, slightly reducing the SIAPE data pool to 1,654,445 EPCs. Nevertheless, The SIAPE dataset is still robust in terms of dimension and provides a good representation of the buildings' distribution according to the Italian regions.

Figure 12 shows the distribution of EPCs, while **Figure 13** identifies the top 15% of properties.

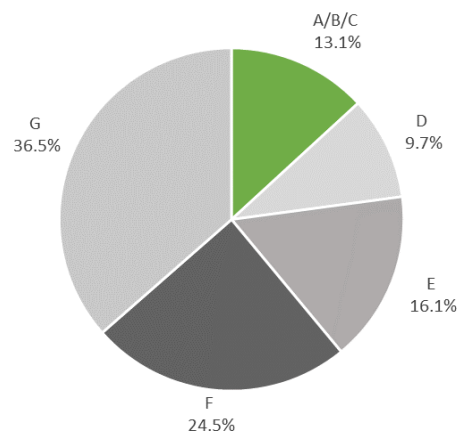
¹⁴ DPR 412/93. Destinazione d'uso in: E1(1) - abitazioni adibite a residenza con carattere continuativo, E(1) bis – collegi, luoghi di ricovero, case di pena, caserme, conventi and E1(2) - abitazioni adibite a residenza con occupazione saltuaria

Figure 12 – Distribution (%) of EPCs for residential buildings



Source: CRIF elaboration on SIAPE data

Figure 13 – Identification of the top 15%

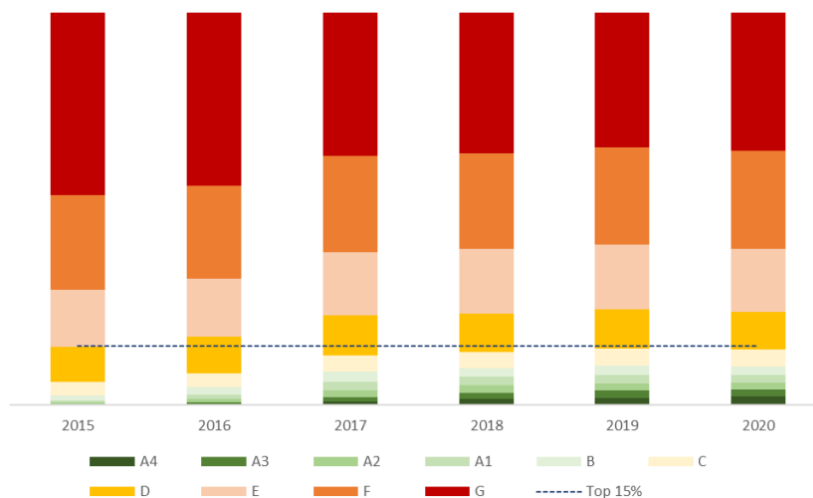


Source: CRIF elaboration on SIAPE data

More than one-third of the data pool consists of G labelled buildings. Besides adding class F, more than half of the dataset is represented, while A4 and A3 properties weigh 1.5%. With this regard, adding EPC A (containing A4, A3, A2, A1), B and C the 13.1% of the pool is identified. As a result, A, B and C labelled Italian residential properties can be considered to align the top 15% of the Italian stock's most energy-efficient buildings. Despite the 1.9% gap of the existing data from the threshold, adding D labelled properties does not guarantee the alignment with the top 15% (22.8% vs 15%), and for that reason, it is not possible to include this EPC class as a proxy.

Furthermore, **Figure 14** provides the distribution of EPCs per year of certificate issuance.

Figure 14 – Distribution (%) of residential EPCs per year of issuance



Source: CRIF elaboration on SIAPE data

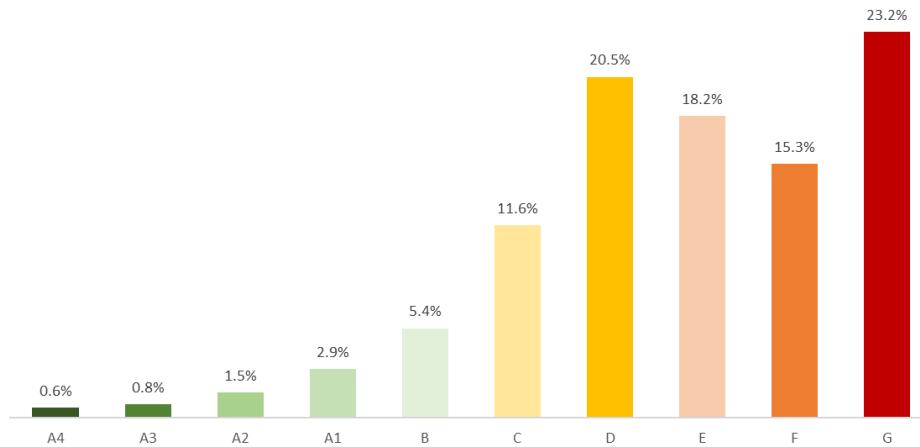
As a result, the sum of EPC labels A (including A4, A3, A2, A1), B and C proves to be below the set threshold at 15% (blue dotted line) in every observation's year.

2.2.2. CRITERION 1.2: TOP 15% ENERGY-EFFICIENT NON-RESIDENTIAL BUILDINGS USING EPC LABELS AS A PROXY

Secondly, the analysis focuses on the non-residential buildings' pool comprising 283,903 EPCs in 2015-2020. As for Criterion 1.1, the sample proves to be robust and consistent. Overall, according to SIAPE, the non-residential sector shows about 50% of the EPCs belonging to intermediate energy-efficient classes, i.e. between E and C. This result also suggests that non-residential buildings offer the right pre-requisites to boost retrofitting processes and energy-efficient interventions.

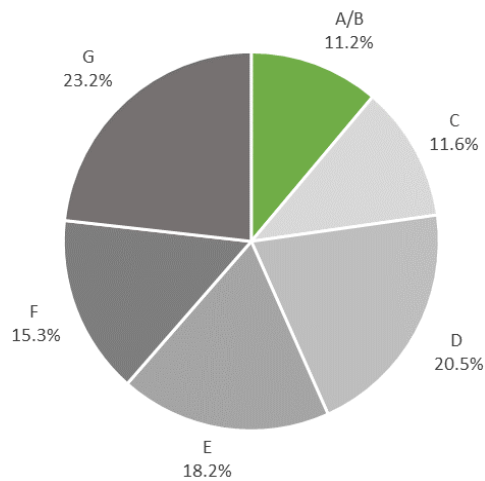
Figure 15 shows the distribution of EPCs, while **Figure 16** identifies the top 15% of properties.

Figure 15 – Distribution (%) of EPCs for non-residential buildings



Source: CRIF elaboration on SIAPE data

Figure 16 – Identification of the top 15%

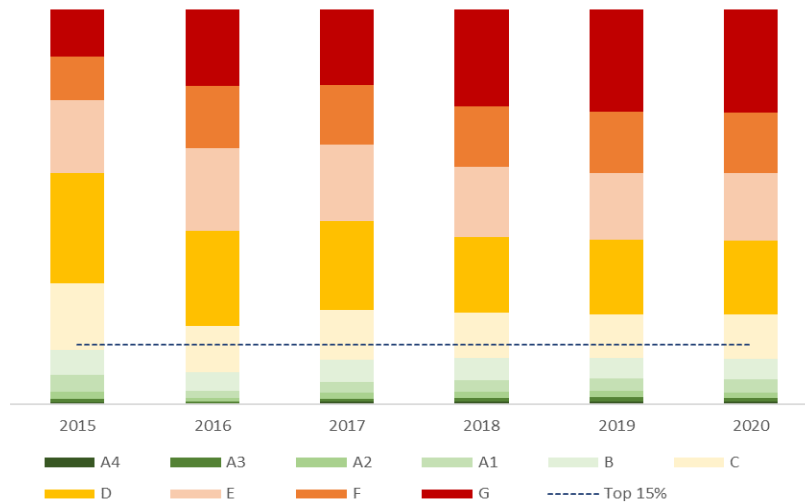


Source: CRIF elaboration on SIAPE data

In contrast with the previous analysis, adding C labelled buildings would imply reaching a rate of 22.8% while only considering EPC classes A and B, the threshold of 15% is respected, examining 11.2% of the whole distribution.

Figure 17 provides the distribution of EPCs per year of certificate issuance.

Figure 17 – Distribution (%) of non-residential EPCs per year of issuance



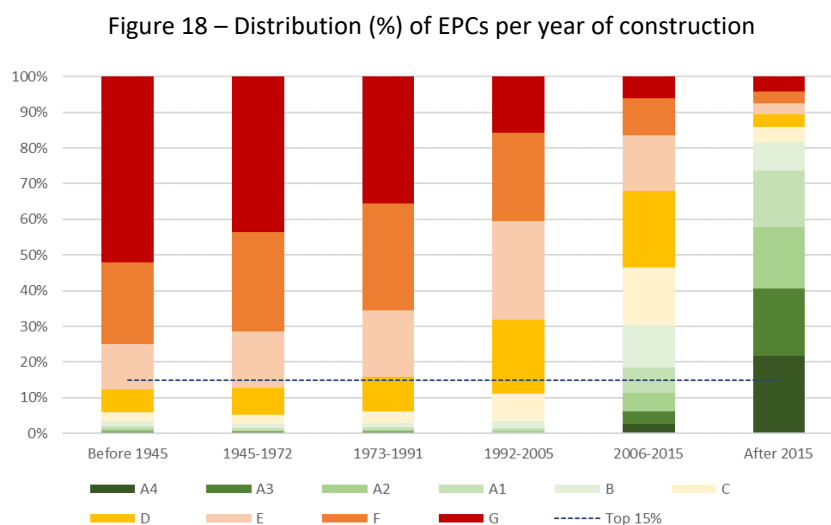
Source: CRIF elaboration on SIAPE data

As a result, as proved for the residential case, the sum of EPC labels A (including A4, A3, A2, A1) and B proves to be below the set threshold at 15% (blue dotted line) in every observation's year.

2.2.3. CRITERION 2: TOP 15% ENERGY-EFFICIENT RESIDENTIAL BUILDINGS USING THE YEAR OF BUILDING'S CONSTRUCTION AS A PROXY

The second Criterion implements the buildings' construction year as a proxy to identify the top 15% of the Italian energy-efficient properties that do not present an attached EPC.

At first, accessing the SIAPE database, the distribution of EPCs per building's construction year is derived from the certificates issued in 2015-2020 (1,654,445 EPCs), as in **Figure 18**.



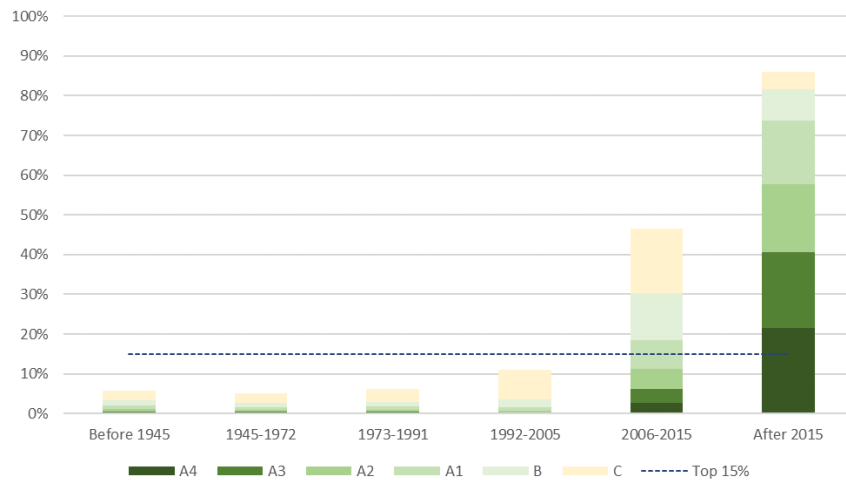
Source: CRIF elaboration on SIAPE data

Overall, the Italian stock has experienced a massive change in energy efficiency according to the construction year. For those buildings built before 1991, G and F classes weighed about 60-70%, while in 1992-2005, the energy classes C and D significantly increase their contribution. This is the first signal of a real moderate change in the real-estate sector towards energy efficiency. On the other hand, looking at the G labelled properties, the Italian Law 10/1991¹⁵ contributes to halving its contribution in the same period.

Accordingly, the legislative Decree 192/2005 introduced more severe restrictions to support energy efficiency-boosting while the Ministerial Decree 26/06/2015 also provides massive support to the transition to high energy-efficient buildings. Consequently, around 86% of residential properties built after 2015 and stored in the SIAPE data pool are A, B, and C labelled, the ones identified in the top 15% of the Italian market under criterion 1. **Figure 19** focuses on the variation of A, B and C EPC classes over time.

¹⁵ Available at:
<https://www.gazzettaufficiale.it/eli/id/1991/01/16/091G0015/sg>

Figure 19 – Distribution (%) of EPC classes per construction year

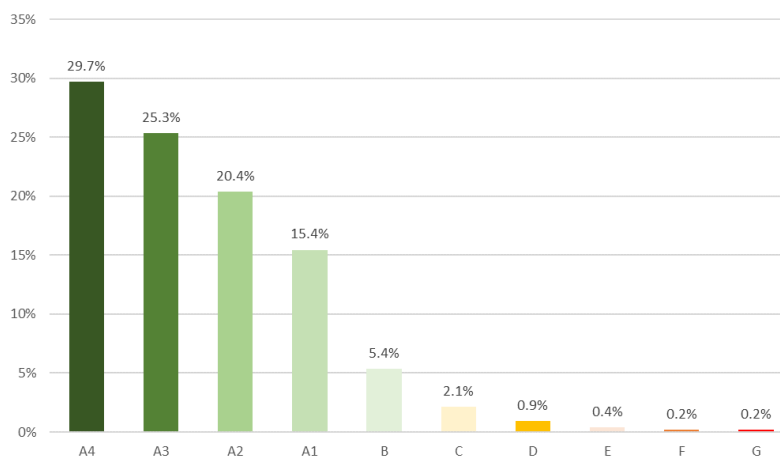


Source: CRIF elaboration on SIAPE data

Finally, filtering on new residential properties built after 2015 only, **Figure 20** shows the distribution of EPCs in the SIAPE database. An additional filter on the year of EPC issuance is applied to analyse the period 2016-2020. As a result, the perimeter is slightly lower than 5% of the entire pool of residential EPCs uploaded in the SIAPE system. This result is also coherent with the rate of new constructions concerning the Italian stock in the last years.

Overall, 98.3% of newly-built properties present an EPC equal or better to the C class.

Figure 20 – Distribution (%) of EPC labels for new residential buildings in 2016-2020



Source: CRIF elaboration on SIAPE data

3. BANCA POPOLARE DI SONDRIO PORTFOLIO ANALYSIS

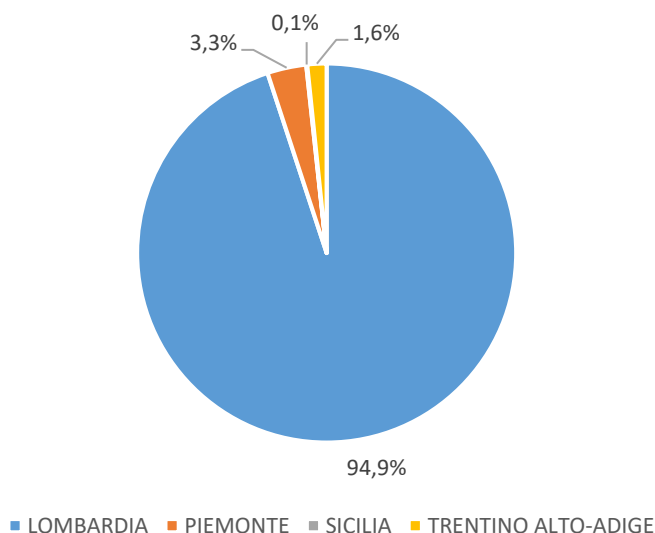
Following the criteria presented in **Chapter 2**, the 1,026 eligible loans in the Banca Popolare di Sondrio’s portfolio (following ‘Portfolio’) correspond to € 187,438,483 according to the current balance. As a result, the average amount of the eligible current Portfolio’s exposure¹⁶ is € 182,679.

In the first section, the analysis focuses on the loans’ underlying assets providing information on properties’ geo-distribution, year of construction’s distribution and energy efficiency. In contrast, the second section summarises the application of the eligibility criteria.

3.1. OVERVIEW OF ELIGIBLE BUILDINGS

Firstly, **Figure 21** provides the buildings’ distribution by region. Indeed, around 95% of the Portfolio is located in Lombardia, followed by Piemonte, with about 3% of the total. The province of Trento weighs approximately 2% while Sicilia about 0.2%.

Figure 21 - Distribution of Portfolio’s eligible properties according to the regional breakdown

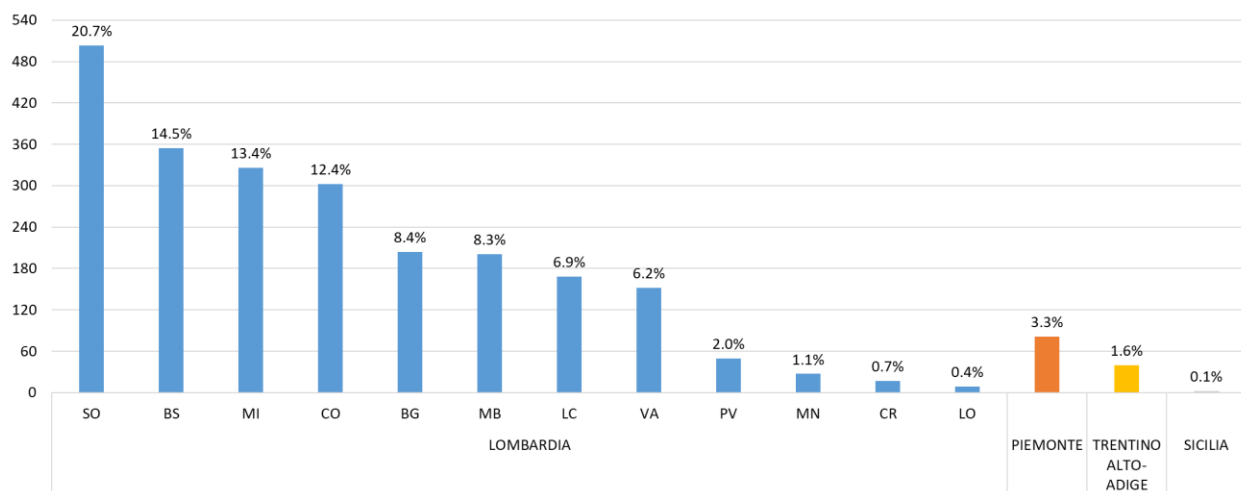


Source: CRIF elaboration on Banca Popolare di Sondrio’s portfolio

¹⁶ Data extraction: 31 May, 2021

Accordingly, **Figure 22** provides an overview of the provinces where the eligible buildings are located. Sondrio is the most represented one, with around 21% of the buildings, followed by Brescia, approximately 15%, Milano, 13% and Como, 12%. Together, these provinces weigh more than 60% of the whole Portfolio. The remaining 40% mainly consists of the other areas located in Lombardia (35%)¹⁷ and those belonging to the other regions (Piemonte, Trentino Alto-Adige, Sicilia) considered in the eligible portfolio.

Figure 22 – Distribution of eligible buildings according to the province and the region



Source: CRIF elaboration on Banca Popolare di Sondrio portfolio

Considering the significant presence of buildings located in Lombardia, a focus on the EPCs' distribution for this region is provided analysing the CENED 2.0¹⁸ database. Accordingly, **Figure 23** confirms that EPC labels A (A4, A3, A2, A1), B, and C together represents the top 15% of the regional residential stock, while **Figure 24**, focusing on the non-residential one, shows that EPC labels A and B are in the top 15%.

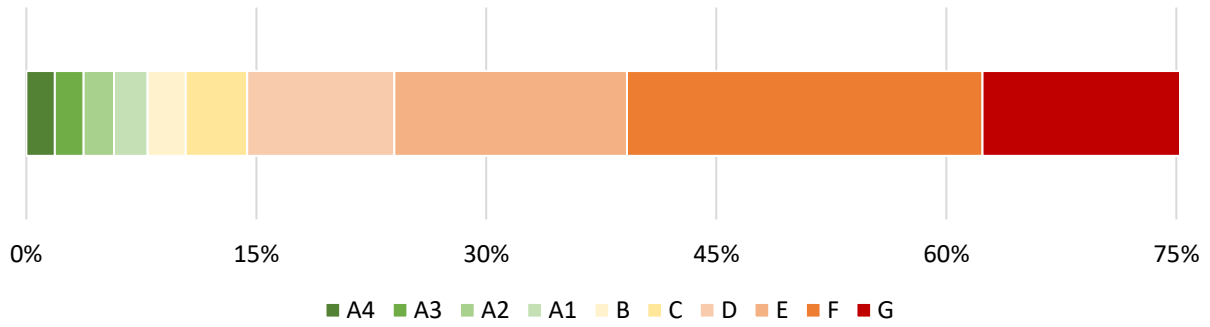
¹⁷ List of provinces located in the Lombardia region:

SO: Sondrio, BS: Brescia, MI: Milano, CO: Como, BG: Bergamo, MB: Monza e Brianza, VA: Varese, LC: Lecco, PV: Pavia, MN: Mantova, CR: Cremona, LO: Lodi

¹⁸ Available at:

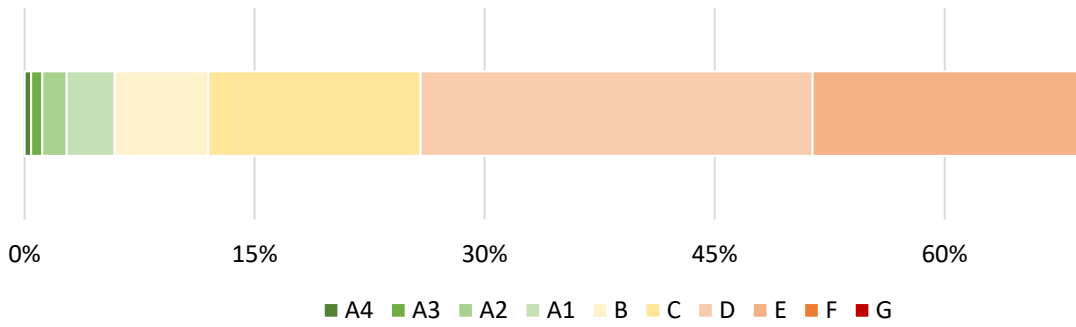
<https://www.cened.it/opendata-cened-2.0>

Figure 23 - Distribution of EPCs for residential buildings, Lombardia



Source: CRIF elaboration on CENED2.0 data

Figure 24 - Distribution of EPCs for non-residential buildings, Lombardia



Source: CRIF elaboration on CENED2.0 data

3.2. APPLICATION OF ELIGIBILITY CRITERIA

This section focuses on applying the eligibility criteria identified in **Chapter 2** on the Portfolio. Accordingly, **Table 6** provides an overview of the eligible buildings, distinguishing between residential and non-residential.

Table 6 – Overview of eligible properties per property type

Type of dwelling		Number of buildings	Current financing amount (€)
Residential	Main building	1,038 42.3%	156,619,017 € 83.6%
	adjacent lot/ building	1,343 54.7%	
Non-Residential		73 3.0%	30,809,467 € 16.4%
Total		2,454	187,428,483 €

Source: CRIF elaboration on Banca Popolare di Sondrio's portfolio

Indeed, 97% of the eligible buildings are residential. In this regard, residential properties are often sold together with non-residential buildings (e.g. garage, land, adjacent lot(s)). At the same time, residential buildings weigh 83,6% of the current eligible financing amount, while non-residential buildings 16.4%.

Table 7A focuses on the eligible financing according to the eligibility criteria. 77.7% of the Portfolio is eligible due to the attached EPC, corresponding to around €145 million. Instead, **Criterion 2** consists of about €41 mln (22.3%). Furthermore, **Table 7B** provides the same analysis, including an additional distinction based on the loans' origination year. Indeed, in accordance with Banca Popolare di Sondrio, loans granted after the 1st January 2018 only are considered for the purpose of the Green Bond issuance.

Table 7A - Overview of eligible financing per Criterion

Criterion		Number of loans	Current financing amount (€)
1. EPC	1.1 Residential (A, B, C)	752 73.3%	€114,839,007 61.3%
	1.2 Non-Residential (A, B)	35 3.4%	€30,809,467 16.4%
2. Construction year (Residential, since 2016)		239 23.3%	€41,780,010 22.3%
Total		1,026	187,428,483 €

Source: CRIF elaboration on Banca Popolare di Sondrio's portfolio

Table 7B - Overview of eligible properties per Criterion and financing origination year

Criterion		Loan origination	Number of loan	Current financing amount (€)
1. EPC	1.1 Residential (A, B, C)	2018	211	27,507,247 €
		2019	273	43,281,932 €
		2020	177	29,280,527 €
		2021	91	14,769,301 €
	TOTAL CRITERION 1.1		752	114,839,007 €
	1.2 Non-Residential (A, B)	2018	8	4,912,386 €
		2019	15	15,633,701 €
		2020	9	9,310,785 €
		2021	3	952,594 €
	TOTAL CRITERION 1.2		35	30,809,467 €
2. CONSTRUCTION YEAR (since 2016)	Residential (A, B, C)	2018	41	6,132,218 €
		2019	38	6,951,499 €
		2020	103	17,719,891 €
		2021	57	10,976,402 €
	TOTAL CRITERION 2		239	41,780,010 €
TOTAL			1,026	187,428,483 €

Source: CRIF elaboration on Banca Popolare di Sondrio's portfolio

3.3. APPLICATION OF ELIGIBILITY CRITERIA: CRITERION 1

According to TOP-15% approach, the following criteria are applied:

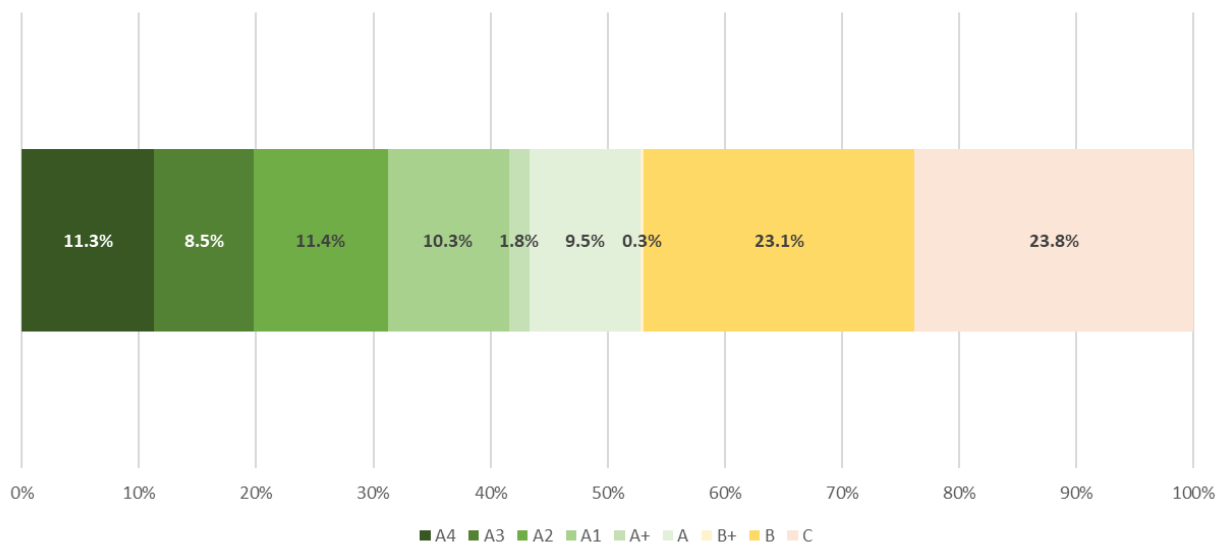
- **Criterion 1.1**, residential properties attached to EPCs ranging from A4 to C, as shown in **Section 2.2.1**;
- **Criterion 1.2**, non-residential properties attached to EPCs ranging from A4 to B, as shown in **Section 2.2.2**.

Under **Criterion 1**, only EPCs expiring after 30 June 2021 are considered.

3.3.1. ELIGIBILITY UNDER CRITERION 1.1 – RESIDENTIAL BUILDINGS

The eligible portfolio under **Criterion 1.1** consists of 752 loans corresponding to 1,795 underlying properties and €114,839,007 of residual debt. **Figure 25** summarises the EPC's distribution of the Portfolio according to the main residential properties (798), i.e. excluding adjacent lots and garages.

Figure 25 - Distribution of EPCs for eligible buildings under Criterion 1.1



Source: CRIF elaboration on Banca Popolare di Sondrio's portfolio

As the Portfolio contains buildings assessed before and after introducing the Ministerial Decree 26/06/2015 on the national guidelines for energy efficiency, EPCs 'A', 'A+' are considered separately from A4, A3, A2, A1 labels as well as 'B+' from EPC 'B'. Among the eligible buildings, around 24% are C class properties, while 23% are attached to EPC B. Conversely, EPC A ('A' and 'A+'), referring to the old criteria of EPC's issuance, weighs around 11% of the eligible

Portfolio, while Conversely, EPCs ‘A4’, ‘A3’, ‘A2’, ‘A1’, introduced after 2015, on average weigh more than 10% each with A4 at 11.3%.

Additionally, **Table 8** highlights the distribution of eligible properties under **Criterion 1.1** considering cadastral category group ‘A’, i.e. residential properties (see **Table 1**).

Table 8 - Distribution (%) of eligible EPCs under Criterion 1.1 following cadastral category ‘A’

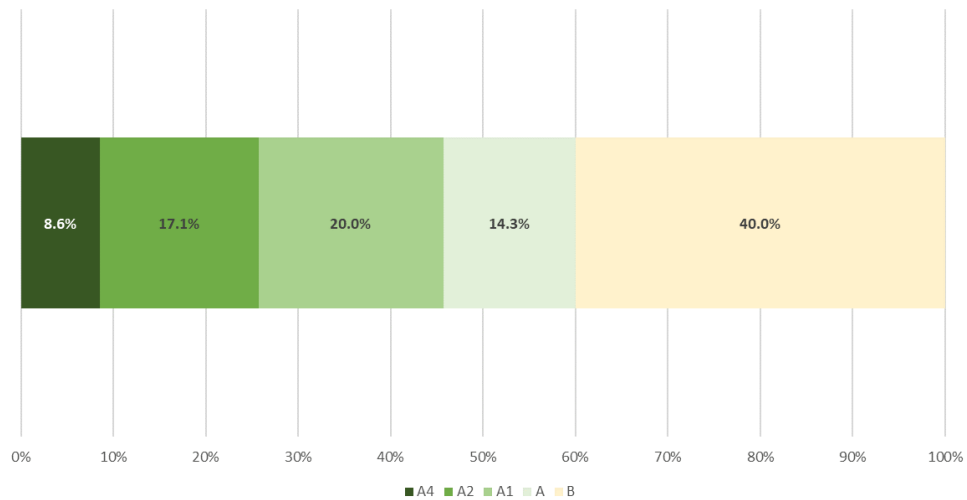
Cadastral category	A4	A3	A2	A1	A+	A	B+	B	C	TOTAL
A2	8.5%	5.9%	7.9%	7.6%	1.6%	7.4%	0.3%	15.4%	18.2%	72.8%
A3	0.1%	1.3%	2.1%	1.8%		1.6%		5.3%	3.3%	15.5%
A4	0.1%								0.6%	0.8%
A7	2.5%	1.4%	1.4%	1.0%	0.1%	0.5%		2.4%	1.8%	11.0%
TOTAL	11.3 %	8.5%	6.89%	10.3%	1.8%	9.5%	0.3%	23.1%	23.8%	100.00%

Source: CRIF elaboration on Banca Popolare di Sondrio’s portfolio

3.3.2. ELIGIBILITY UNDER CRITERION 1.2 – NON RESIDENTIAL BUILDINGS

The eligible portfolio falling under **Criterion 1.2** consists of 35 loans and 73 underlying properties. Therefore, the eligible residual financing equals €30.809.467. **Figure 26** summarises the EPC's distribution.

Figure 26 - Distribution of EPCs for eligible buildings under Criterion 1.2



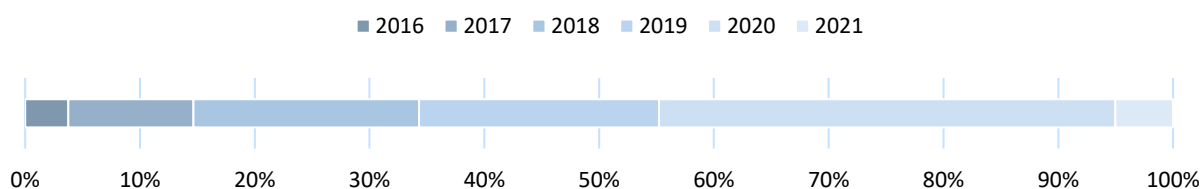
Source: CRIF elaboration on Banca Popolare di Sondrio portfolio

B labelled properties have the highest representation with 40%, followed by A1 at 20% and A2 at 17%. A4 labelled properties count for around 9% of the eligible non-residential portfolio under **Criterion 1.2**.

3.4. APPLICATION OF ELIGIBILITY CRITERIA: CRITERION 2

CRIF analysed the Portfolio under **Criterion 2**, considering both the existing law about *Requisiti Minimi* and the Italian residential stock distribution according to the construction year (since 2016). As stated in the present report, the current law prescribes the release of an EPC for new buildings. **Figure 27** shows the distribution of the Portfolio’s eligible buildings under Criterion 2 (construction year since 2016). Besides, following **Figure 23**, in 2016-2020, 98.3% of the EPCs issued for new residential buildings and uploaded in the SIAPE database ranges from C to A4.

Figure 27 – Distribution of eligible buildings under Criterion 2, built since 2016



Source: CRIF elaboration on Banca Popolare di Sondrio’s portfolio

Furthermore, **Table 9** provides an overview of the eligible dwelling’s distribution under **Criterion 2** per cadastral category (‘A’) and year of construction. The highest rate is related to new residential buildings built in 2020 with 39,7%, followed by 2019 20,9%.

Table 9 – Distribution (%) of eligible buildings under Criterion 2 per cadastral category and construction year

Type of dwelling	2016	2017	2018	2019	2020	2021	TOTAL
A2	2.9%	7.5%	13.0%	13.8%	27.6%	2.9%	67.8%
A3	0.0%	1.3%	3.8%	1.7%	3.8%	1.7%	12.1%
A4	0.0%	0.4%	0.4%	0.4%	0.0%	0.0%	1.3%
A7	0.4%	1.7%	2.5%	5.0%	8.4%	0.4%	18.4%
A8	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
TOTAL	3.8%	10.9%	19.7%	20.9%	39.7%	5.0%	100.0%

Source: CRIF elaboration on Banca Popolare di Sondrio’s portfolio

In conclusion, **Table 10** provides an overview of the distribution of the eligible loans per year of origination.

Table 10 – Distribution (#) of eligible loans and financing amount under Criterion 2 per loans' origination year

Origination Year	# loans	Current financing amount (€)
2018	8	4.912.386 €
2019	15	15.633.701 €
2020	9	9.310.785 €
2021	3	952.594 €

Source: CRIF elaboration on Banca Popolare di Sondrio's portfolio



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