TECHNICAL REPORT

BANCO BPM GREEN BOND

Bologna, July 2021

Technical Report

Together to the next level

TABLE OF CONTENTS

1. INTRODUCTION

“The Group shall be sensitive to protection of the environment as a primary asset. To this end, it shall guide its choices, […], in order to ensure compatibility between economic initiatives and environmental requirements in accordance with the regulations in force.”

Banco BPM, Code of Ethics

1.1. OBJECTIVES

Banco BPM engaged CRIF S.p.A. to assess a residential mortgage portfolio's eligibility for green bond issuance.

Chapter 1 provides an overview of the European and Italian steps towards energy efficiency. Indeed, a description of the past and current critical legal references is provided, together with an introduction linking the real-estate market, financial sector, and energy efficiency.

Chapter 2 describes the applied eligibility criteria following the Green Bond Principles 2018 (GBP 2018), the Climate Bond Initiative (CBI) and the Taxonomy (Regulation (EU) 2020/852).

Finally, the third chapter assesses Banco BPM's portfolio eligibility by applying the above criteria.

The present technical report reflects CRIF's independent opinion.

1.2. THE EUROPEAN AND ITALIAN TRANSITION TO ENERGY-EFFICIENCY

The European Commission declares that *the building sector is crucial for achieving the EU's energy and environmental goals. At the same time, better and more energy efficient buildings improve the quality of citizens' life while bringing additional benefits to the economy and the society.* Real estate is the most consuming energy sector (around 40%), and it is responsible for approximately 36% of the actual European greenhouse emissions.[1]

One of the first European steps to integrate national energy policies is represented by the *2020 Climate and Energy Package* drafted by the European Council in 2007.

In 2010, the Energy Performance of Buildings Directive (EU EPBD 2010/31) introduced the necessity of a minimum set of requirements regarding both new and existing buildings. The European Member States, according to this Directive, are responsible for setting the national minimum standards.

A new energy policy framework was published in 2019 to move forward from the Energy Union Strategy (2015) while drafting a National Energy and Climate Plan (NECP) for 2021-2030. The so-called *Clean Energy for All Europeans* package has set three main energy targets by 2030:

- At least 40% cuts in greenhouse gas emissions;
- At least 32% renewables in energy consumptions;
- At least 32.5% more efficient in energy use.

In 2019, the European Commission launched the *European Green Deal*: a plan to comply with the United Nations' sustainable goals and the Paris Agreement (2015), reducing the net greenhouse emissions to zero by 2050. With this regard, the real-estate sector is crucial: 75% of the existing stock is inefficient[2] , and only 1% of buildings undergo retrofitting interventions every year. According to the *Renovation Wave for Europe – Greening our buildings*., the renovation rate is expected to double in the next ten years.

The N*extGenerationEU* plan is a temporary European instrument designed to boost the recovery post-COVID-19 pandemic. Among other key objectives, the package focuses on climate change with 30% of the overall amount of funds, i.e. € 250 billion, representing the highest share ever of the European budget destined for environmental and climate targets.

[1] https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en
[2] European Commission, Renovation Wave

The Italian *National Energy and Climate Plan* (NECP) was provided to the European Commission in December 2019:

Italy is fully aware of the potential benefits inherent to the increased availability of renewables and energy efficiency, connected to the reduction in polluting and climate-changing emissions, improvements in energy security, and economic and employment opportunities for families and the production system. It intends to follow this path with conviction, with an approach that increasingly focuses on citizens, including in their capacity as prosumers, and businesses, small and medium-sized enterprises.[3]

Table 1 – Comparison between EU and Italian 2020 & 2030 energy targets

	2020 OBJECTIVES		2030 OBJECTIVES	
	EU	**ITALY**	**EU**	**ITALY**
RENEWABLES ENERGIES (RES)				
Share of energy from RES in the final gross consumption	20%	17%	32%	30%
Share of energy from RES in the final gross consumption in the transport sector	10%	10%	14%	22%
Share of energy from RES in the final gross consumption for heating and cooling			+1.3% per year (indicative)	+1.3% per year (indicative)
ENERGY EFFICIENCY				
Reduction in primary energy consumption compared to the PRIMES 2007 scenario	-20%	-24%	-32.5% (indicative)	-43% (indicative)
Final consumption savings as a result of obligatory energy efficiency systems	-1.5% per year (without transport sector)	-1.5% per year (without transport sector)	-0.8% per year (with the transport sector)	-0.8% per year (with the transport sector)
GREENHOUSE GAS EMISSIONS				
Reduction in GHG vs 2005 for all plants subject to ETS rules	-21%		-43%	
Reduction in GHG vs 2005 for all non-ETS sectors	-10%	-13%	-30%	-33%
The overall reduction in greenhouse gases compared to 1990 levels	-20%		-40%	
ELECTRICITY INTERCONNECTEDNESS				
Level of electricity interconnectedness	10%	8%	15%	10%
Electricity interconnection capacity (MW)		9.285		14.375

Source: CRIF elaboration from Italian Integrated National Energy and Climate Plan, 2019

The EU sets an indicative reduction goal of -32.5%, around ten basis point lower than the Italian one. This result suggests the importance of effective measures trimming the existing average gap between Italy's energy-efficient policies and many other European countries.

[3] Integrated National Energy and Climate Plan, December 2019, pag.4, NECP

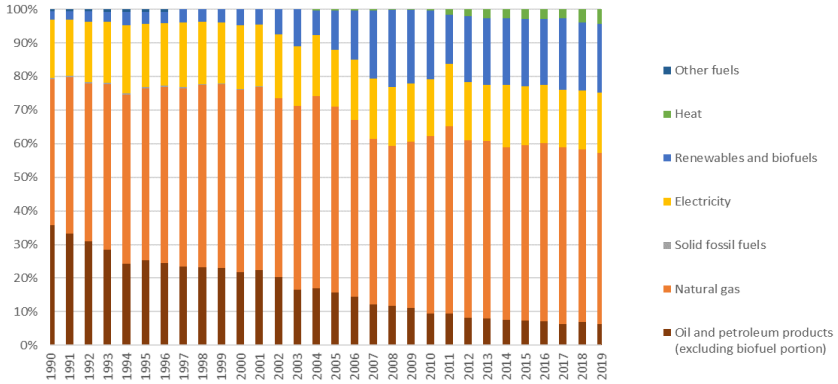
1.3. ENERGY EFFICIENCY AND THE REAL ESTATE MARKET

The 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.*[4]

In recent years, global CO_2 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). However, according to IEA (International Energy Authority, 2020), energy-efficient measures do not offset increasing energy demand, especially for the real-estate sector.

As shown in **Figure 1**, in the last years, households' usage of renewables and biofuels sources increased from 2005, leading to 21% consumption in 2019. Electricity and gas use remain relatively stable on average, 18% and 52% respectively. Oil and petroleum households' consumption dramatically decreased over time, passing from around 36% in 1990 to 6% in 2019.

Figure 1 – Households final energy consumption by fuel



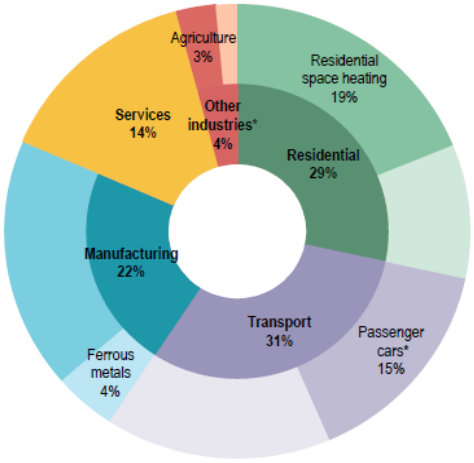
Source: CRIF elaboration on Eurostat data

According to the IEA report on Energy Efficiency Indicators (2020 ed.), **Figure 2** highlights how 29% of the Italian energy end-uses by sector is linked to the residential sector. At the same time, considering the residential energy consumption, a significant role is played by heating systems (66%) combined with water heating (12%) and

[4] IEA, 2020

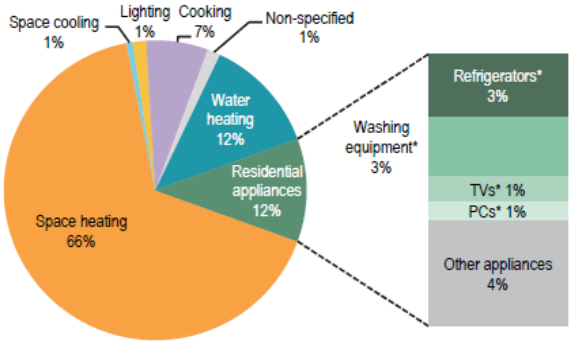
residential appliances (12%). Space cooling and lightning count for 1% each while cooking contribution is about 7% as in **Figure 3**.

Figure 2 – Italian energy end-uses by sector in 2018



Source: IAE, 2020

Figure 3 – Total final energy for the Italian residential sector by end-use in 2018



Source: IAE, 2020

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 2** provides an overview of the TSC for the *construction of new buildings.* At the same time, **Table 3** relates to the *renovation of existing buildings* and **Table 4** on *acquisition and ownership of buildings*.

Table 2 – 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 m2, 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 m2 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 3 - 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 4 - 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. ITALIAN LEGISLATION ON ENERGY EFFICIENCY CERTIFICATION

1.5.1. NATIONAL POLICIES ON ENERGY EFFICIENCY

The recent history of the Union's policies on carbon emissions reduction and energy efficiency is mainly related to two agreements:

- Kyoto Protocol (1997). European Union and member states committed to making a considerable contribution to the process of decarbonisation of the economy;
- Paris Agreement (2015). 196 Parties signed a legal agreement to limit global warming, i.e. the increase of the global average temperature of 2.0°C (preferably 1.5°C) compared to the pre-industrial level.

One of the first European steps to integrate national energy policies is represented by the *2020 Climate and Energy Package* drafted by the European Council in 2007. The targets have been transformed into national legislation of the Member States since 2009. For example, the Italian target on the introduction of renewables sources was set at 17% compared to the final gross energy consumption to be achieved before 2020.

In 2017, the Ministry of Economic Development and Ministry of Environment, Protection of Natural Resources and Sea published the *Towards a circular economy model in Italy – Framework and strategic positioning document* to define an institutional framework on the circular economy also addressing climate change risk, in line with the Paris Agreement.

In 2019, as a result of the coming EU Green New Deal, the NADEF (2019)[5], updating the Economic and Finance Document 2019, provides ad-hoc measures and incentives to achieve environmental objectives and lift the circular economy's implementation. Coherently, two investment funds have been established to support the urban renovation, energy conversion and use of renewables.

To boost investment by local authorities, with effect from 2020 a fund assigned to municipalities for initiatives involving energy efficiency, sustainable local development and the security of infrastructure and public buildings will be in place.[6]

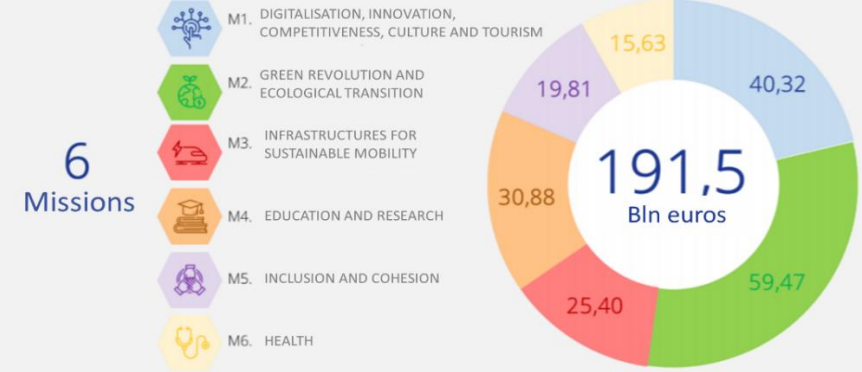
[5] Available at: http://www.dt.mef.gov.it/modules/documenti_it/analisi_progammazione/documenti_programmatici/def_2019/NADEF_2019__FINALE.pdf

[6] INECP, 2019

Furthermore, Legislative Decree 73/2020, introducing EU Directive 2018/2002 (modifying EU Directive 2012/27 on energy efficiency), fosters new measures to enhance energy efficiency and increment national energy savings. Moreover, the Decree extends the goal of cumulate final energy savings from 1 January 2021 to 31 December 2030.

One of the main consequences of the recent COVID-19 crisis is the need for a massive recovery plan to support the real economy. With this regard, the EU Recovery Plan was announced in December 2020. It will represent the highest EU long-term budget ever granted, equal to around €1.8 trillion to support the post-COVID-19 recovery.
According to the Italian Government strategic plan[7] published on 23 April 2021 (Piano Nazionale di Ripresa e Resilienza – PNRR), €191,5 billion will be allocated over six pillars, as shown in **Figure 4.**

Figure 4 – Budget allocation of the RRF's budget



Source: The Recovery and Resilience Plan: Next Generation Italia, 2021

Overall, €59.46 bln will be destined for the Green Revolution and the Ecologic Transition. According to this pillar, M2C3 on energy efficiency and building's retrofitting weights for €15.36 bln distributed as shown in **Table 5.**

Table 5 – List of measures related to the M2C3

INTERVENTIONS/MEASURES	TOT (€ bln)
Energy-efficient interventions for public buildings	€1,21 bln
Energy-efficient and seismic interventions for private buildings	€13,95 bln
Installation of district heating systems	€13,95 bln

Source: CRIF elaboration on RRP Italia

[7] Available at:
https://www.governo.it/sites/governo.it/files/PNRR_0.pdf

1.5.2. FISCAL INCENTIVES FOR ENERGY EFFICIENCY: THE SUPERBONUS 110%

Moving forward in the context of the post-COVID-19 crisis, the economic recovery plan with particular attention to the EU *Renovation Wave* will foster new investments in energy-efficient buildings, creating at the same time new workplaces, especially in the context of SMEs. The Italian INECP is intended to support fiscal incentives' level off for energy efficiency and retrofitting interventions to accelerate the national renovation rate. The *Superbonus 110* allows the deduction of 110% of the incurred expenses for energy efficiency and seismic risk reduction interventions on a building and installing new 'green' energy sources as photovoltaic panels and charging electric vehicles systems. Additionally, the tax deduction can be replaced in the form of an invoice discount: the tax credit is now transferable to other subjects as the supplier of the interventions and financial institutions (e.g. banks, insurance companies). This exceptional measure was intended to last one year only, but the Government has confirmed the extension of its validity until 31 December 2022.

1.6. 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.

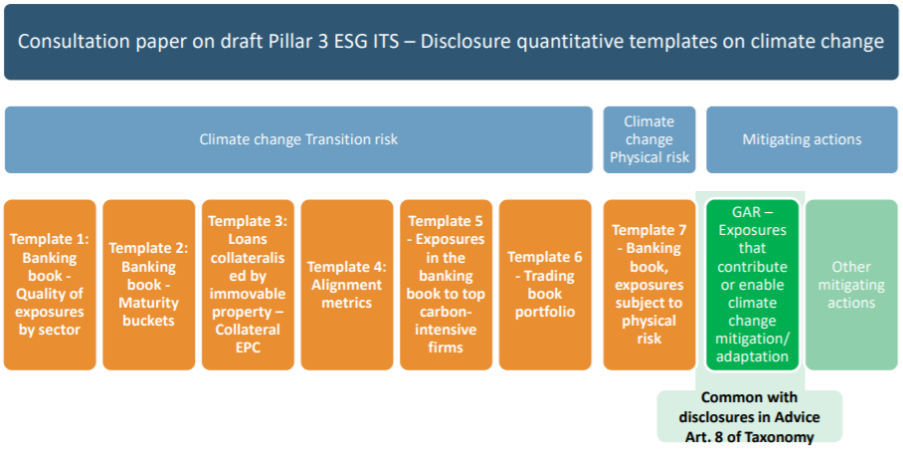
With this regard, on 1 March 2021, the European Banking Authority (EBA) published *a consultation paper on draft implementing technical standards (ITS) on Pillar 3 disclosures on Environmental, Social and Governance (ESG) risks. The draft ITS put forward comparable disclosures that show how climate change 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 precisely 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 5**.

Figure 5 – 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

1.7. 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 were 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.

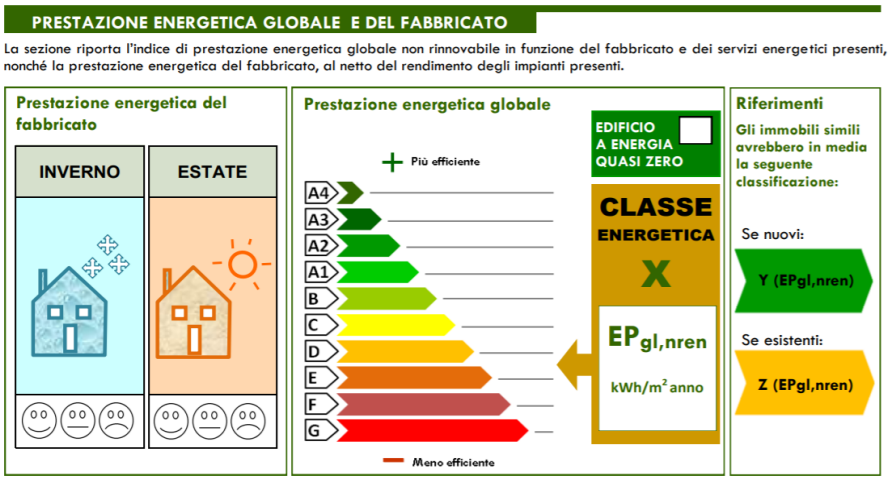
Overall, in 2016, the Italian real estate market counts for over 19 million buildings owned by individuals consists of principal residences and more than 13 million ancillary buildings (e.g. garage) over 57 million dwellings[8].

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.

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 6**.

[8] Agenzia delle Entrate, 2019, Available at: https://www.agenziaentrate.gov.it/portale/documents/20143/2239117/1.+Lo+stock+immobiliare+in+Italia+analisi+degli+utilizzi.pdf/138b6e74-f5a5-f574-c16c-7d6bee248b06

Figure 6 – Building's Energy Performance format



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

In addition to the energy label, several energy indicators are automatically computed by the software implemented during the assessment by the valuer.

At first, the EPC class is assigned because of several steps and computations:

1. The non-renewable PED ($EP_{gl,nren,rif,standard}$) of a *reference building* is derived after having provided 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.[9]

2. The non-renewable PED ($EP_{gl,nren}$) of the building under assessment. The $EP_{gl,nren}$[10] provides information about the kilo-wattage of energy required by the property under standard conditions per every square meter of floor space heated over a year. Additionally, the $EP_{gl,nren}$ is calculated under the hypothesis of a building equipped with a minimum set of prerequisites[11]. The $EP_{gl,nren}$ is defined as:

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

[9] See the Decree 26/06/2015, national criteria and technical norms (UNI/TS 11300), EU Directive 2010/31;
[10] Expressed in kWh/m²
[11] The Italian law applies to public buildings from the 1st of January 2019 and from the 1st of January 2021 for all the other types of buildings

In particular, the above formula considers:

- non-renewable primary energy demand for winter heating and air conditioning ($EP_{H,nren}$ and $EP_{C,nren}$);
- 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 (not included for residential buildings) ($EP_{L,nren}$);
- non-renewable primary energy demand for the transport of people and things (not included for residential buildings) ($EP_{T,nren}$).

3. Computing the ratio between (2) and (1), the energy class is assigned following the scheme in **Figure 7**.

Figure 7 – 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*)

1.7.1. NZEB buildings

The above mentioned EPBD Directive 2010/31/EU also introduces Nearly-Zero-Energy-Building (NZEB).

NZEB buildings are characterised by a nearly zero balance between energy consumptions and energy production: *The nearly zero or very low amount of energy required should be covered to a very significant extent from renewable sources, including sources produced on-site or nearby.*

At the same time, *as concrete numeric thresholds or ranges are not defined in the EPBD, these requirements leave room for interpretation and thus allow Member States to define their nearly zero-energy buildings (NZEB) in a flexible way taking into account their country-specific climate conditions, primary energy factors, ambition levels, calculation methodologies and building traditions.*

In Italy, the NZEB requirements are introduced by the Legislative Decree 26/06/2015 "Requisiti Minimi". Indeed, all the new constructions under public ownership must comply with NZEB technical requirements starting from 2019. Furthermore, the same criterium applies to all the other types of buildings since 1 January 2021.
Nevertheless, some virtuous regions decided to anticipate the scheduled deadlines. For instance, the Emilia-Romagna region has applied the NZEB requirements since 2017 for public buildings and 2019 for the other types. Accordingly, the Lombardia region since 2016.

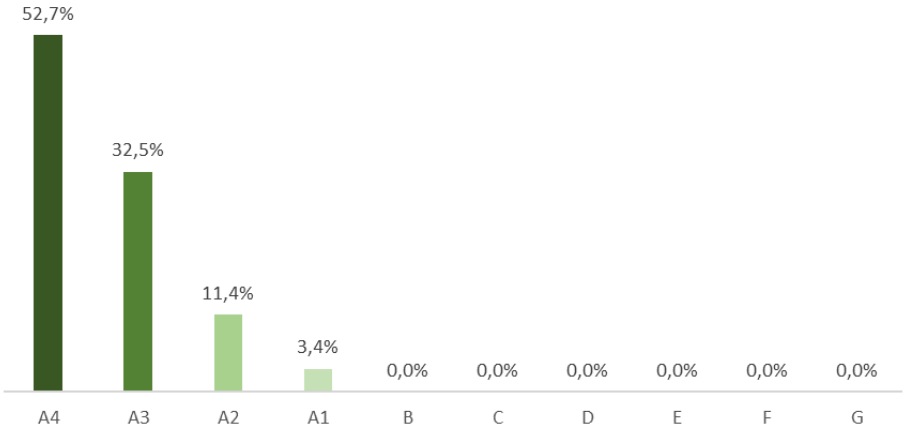
The current EPC format shown in **Figure 6** presents a dedicated box for the NZEB information (*EDIFICIO A ENERGIA QUASI ZERO*).

As of today, according to the SIAPE, in Italy, 7,831 buildings are NZEB:

- 7,498 residential properties;
- 333 non-residential properties.

Figure 8 shows the distribution (%) of the EPC related to NZEB filtering for residential buildings only.

Figure 8 – Distribution of NZEB residential buildings per EPC class



Source: CRIF elaboration on SIAPE data

2. ELIGIBILITY CRITERIA

2.1. MARKET REFERENCES

The applied methodology to select eligible energy-efficient buildings part of the Banco BPM portfolio relies on Climate Bonds Taxonomy (2019). Indeed, it represents a market reference in establishing buildings proxies to identify eligible buildings for the issuance of Green Bonds.

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 Criteria[12].

The CBI Taxonomy (2019) identifies three assets according to the *Buildings* section[13]:

- 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* gCO_2/m_2 *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)*[14].

[12] 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
[13] Climate Bond Taxonomy – A guide to climate aligned assets & projects, Climate Bond Initiative, pag.11, November 2019
[14] https://www.climatebonds.net/standard/buildings

Accordingly, two methodologies for establishing building proxies[15] (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/label awarded.*

Option A relies on the existence of data and statistics on the emission performance of buildings. Thus, 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.*[16]

[15] Available at:
https://www.climatebonds.net/files/files/Methodology%20for%20Establishing%20Proxies.pdf

[16] 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 RESIDENTIAL MARKET: CRIF'S APPROACH

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

The analysis presented in this chapter represents a fundamental premise in identifying the eligible buildings within the BancoBPM portfolio, as described in **Chapter 3**.

CRIF performed the following analysis related to the Italian building stock:

- Residential buildings according to the EPC distribution;
- Residential buildings according to the construction year.

2.2.1. CRITERION 1: TOP 15% ENERGY-EFFICIENT RESIDENTIAL BUILDINGS USING EPC LABELS AS A PROXY

This section aims to identify the top 15% of the Italian buildings stock by analysing EPC data gathered in the SIAPE portal by ENEA, representing the most critical data source in Italy concerning building's energy efficiency.

In Italy, the energy cadasters gathering Energy Performance Certificates (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 their buildings.
To address the problems related to the lack of national energy efficiency data, the Ministerial Decree 26/06/2015 introduced a new national database. Following Section 8.1.2 of Annex 1, the Italian regions have to upload the gathered EPCs by the end of March every year. ENEA[17] is the body entitled to manage the SIAPE system.

As shown in **Figure 9**, 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.

[17] https://www.enea.it/it

Figure 9 – 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. Two additional regions are updating data, Valle d'Aosta and Molise.

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.

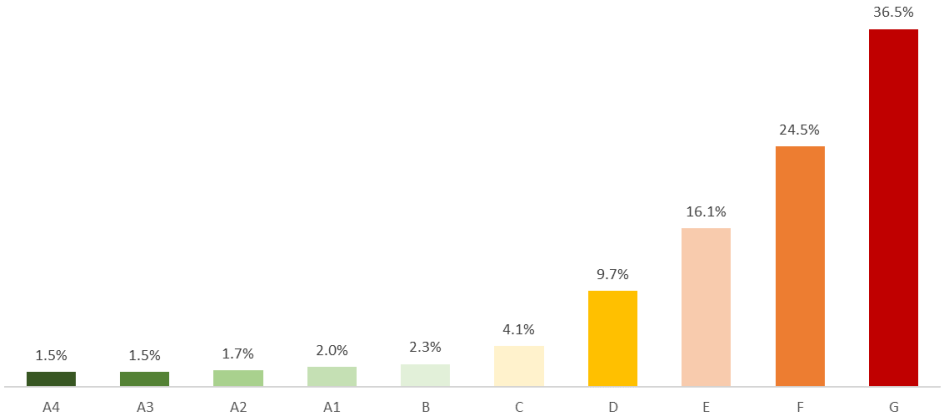
Following the analysis conducted by CRIF on the SIAPE database to derive the top 15% of the existing stock are provided.

At first, a filter to identify residential buildings[18] 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 10 shows the distribution of EPCs, while **Figure 11** identifies the top 15% of properties.

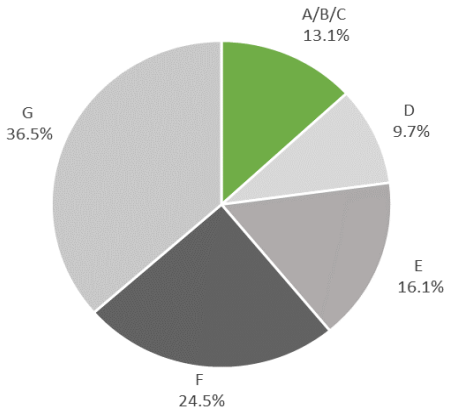
[18] DPR 412/93. *Destinazione d'uso in: E1(1) - abitazioni adibite a residenza con carattere continuativo, E(1) bis – collegi, luoghi di ricovero, case di pena, caserme, conventi and E1(2) - abitazioni adibite a residenza con occupazione saltuaria*

Figure 10 – Distribution (%) of EPCs for residential buildings



Source: CRIF elaboration on SIAPE data

Figure 11 – Identification of the top 15% among EPCs classes

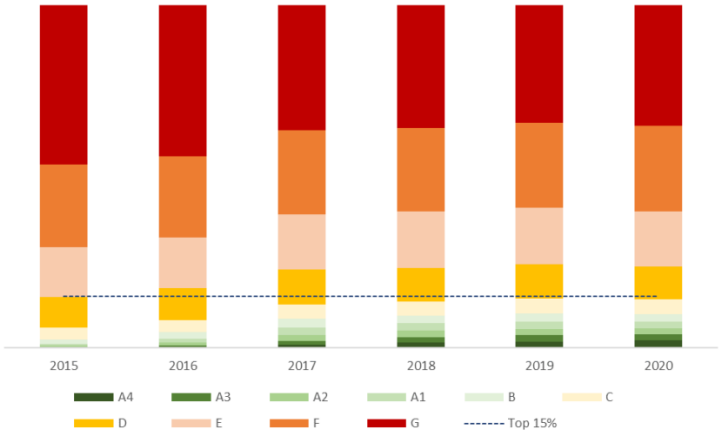


Source: CRIF elaboration on SIAPE data

More than one-third of the data pool consists of G labelled buildings. Besides adding EPC F, more than half of the dataset is represented, while A4 and A3 properties weigh 1.5%. With this regard, adding EPCs A (i.e. 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 12** provides the distribution of EPCs per year of certificate issuance.

Figure 12 – Distribution (%) of EPCs per year of issuance



Source: CRIF elaboration on SIAPE data

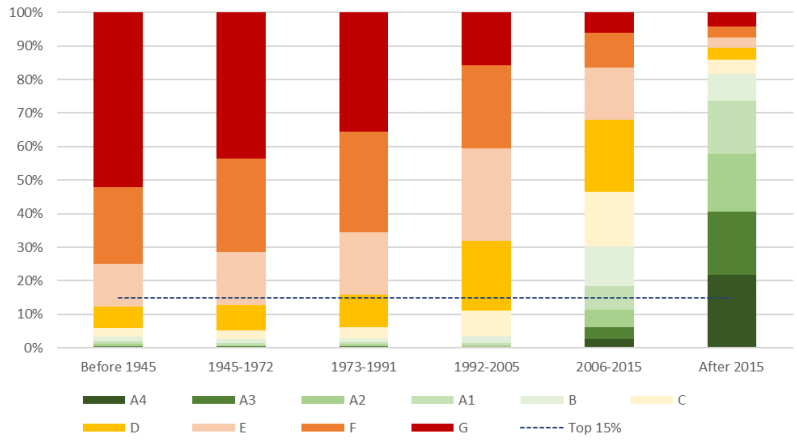
As a result, the sum of EPC labels A (including A4/A3/A2/A1), B and C proves to be below the set threshold at 15% (blue dotted line) in every observation's year.

2.2.2. CRITERION 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 13**.

Figure 13 – Distribution (%) of EPCs per year of construction

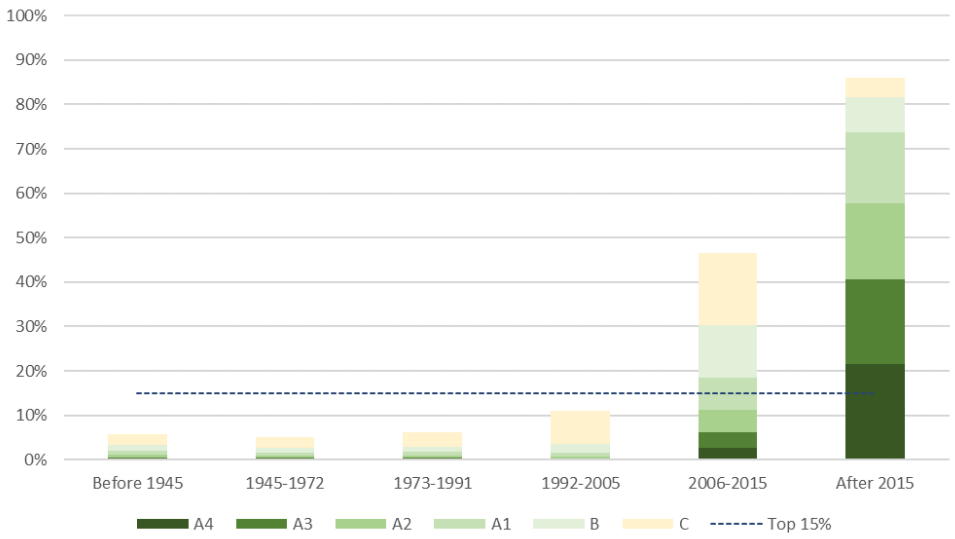


Source: CRIF elaboration on SIAPE data

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 10/1991[19] 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 14** focuses on the variation of A, B and C EPC classes over time.

Figure 14 – Distribution (%) of EPC classes per construction year



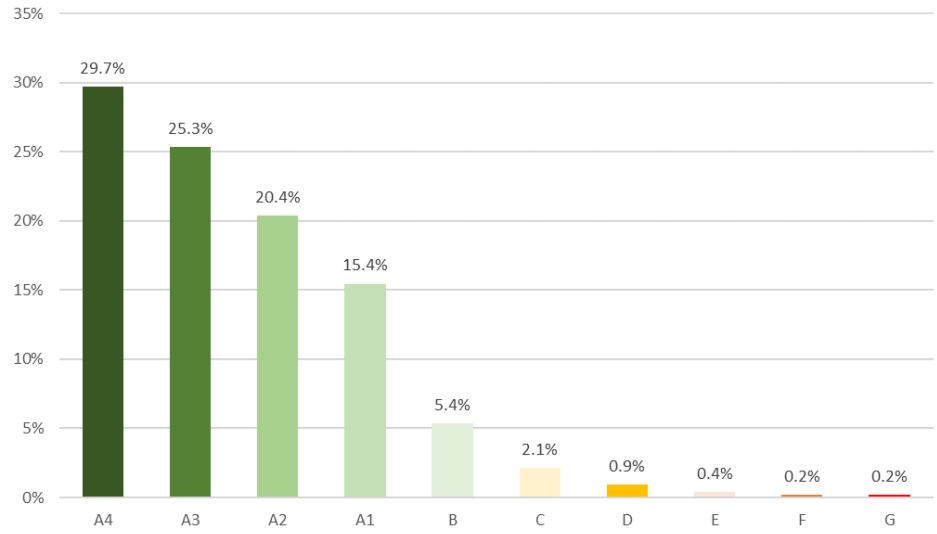
Source: CRIF elaboration on SIAPE data

Finally, filtering on new residential properties built after 2015 only, **Figure 15** 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.

[19] https://www.gazzettaufficiale.it/eli/id/1991/01/16/091G0015/sg

Figure 15 – Distribution (%) of EPC labels for new residential buildings in 2016-2020



Source: CRIF elaboration on SIAPE data

3. BANCO BPM PORTFOLIO ANALYSIS

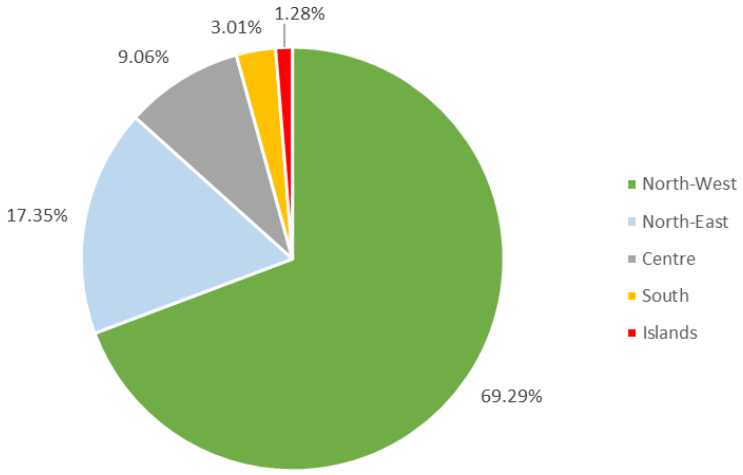
In the first section, the analysis focuses on the mortgages' underlying assets providing information on properties' geo-distribution, year of construction's distribution and energy efficiency.
On the other hand, the second section focuses on applying the eligibility criteria provided in Chapter 2 on the Banco BPM portfolio.

Following the criteria presented in **Chapter 2**, the 7,083 eligible mortgages in the Banco BPM portfolio (following 'Portfolio') correspond to €914,023,389.92 total current balance. Therefore, the average amount of the eligible current portfolio's exposure[20] is €128,074.14.

3.1. OVERVIEW OF BANCO BPM'S ELIGIBLE BUILDINGS

Firstly, **Figure 16** provides the buildings' geo-distribution based on the ISTAT regional breakdown[21].

Figure 16 – Distribution of properties according to the regional breakdown



Source: CRIF elaboration on Banco BPM eligible portfolio

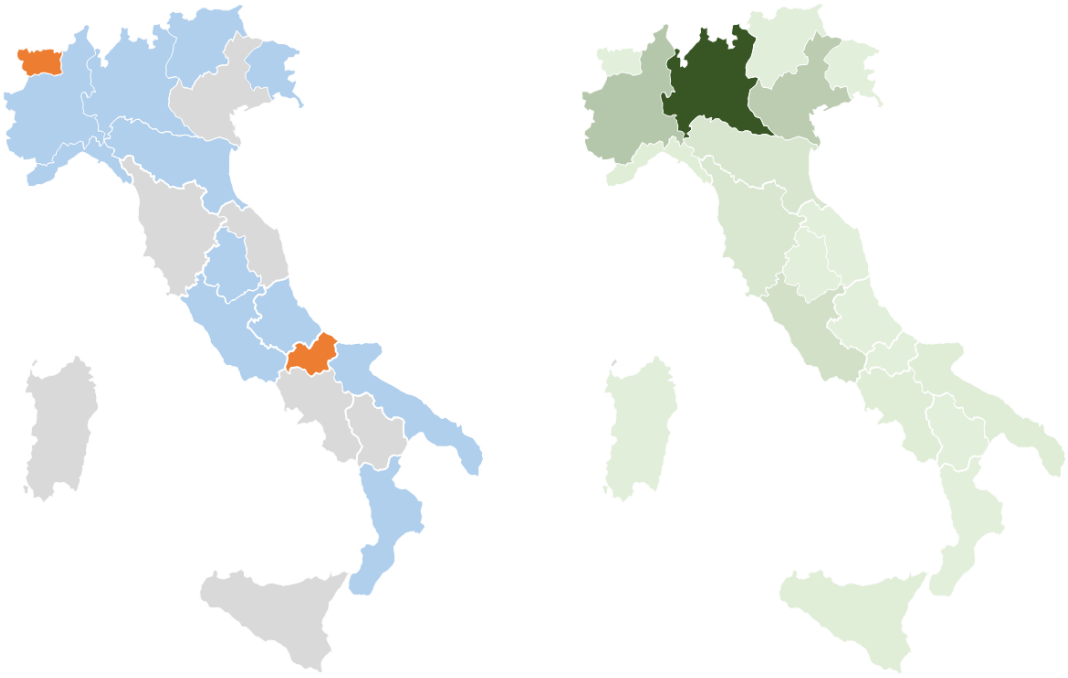
[20] At the 31st March 2021
[21] According to the ISTAT definition:
North-West: Lombardia, Piemonte, Liguria, Valle d'Aosta;
North-East: Veneto, Emilia-Romagna, Friuli-Venezia Giulia, Trentino-Alto Adige
Centre: Toscana, Lazio, Marche, Umbria
South: Campania, Abruzzo, Puglia, Molise, Basilicata, Calabria
Islands: Sardegna, Sicilia

Indeed, around 70% of the Portfolio is located in the North-West area, followed by North-East, with about 17% of the total. The central regions weigh approximately 9% while South and Islands together about 4%. Overall, the Northern regions have a massive representation, counting for 86.6%.

Lombardy is the most represented region, with around 54% of the buildings, followed by Piedmont, approximately 15% and Veneto, 13%. Looking at the central area, Tuscany weighs about 3.5% of the whole Portfolio, while Campania is the most represented in the Southern region with 1%. Finally, only 0.5% of the Portfolio belongs to buildings in Sardinia.

Comparing the eligible buildings' distribution with the SIAPE database's coverage, **Figure 17**, following Figure 16, highlights how the Northern area is the most represented in the Portfolio (right), following the EPCs distribution in the SIAPE distribution (left). Apart from the Veneto region, the North-West and North-East areas are about 75% of the uploaded EPCs attached to residential buildings in the SIAPE.

Figure 17 – Comparison between the SIAPE (left) and Portfolio (right) distribution at the regional level



Source: CRIF elaboration on SIAPE and Banco BPM portfolio

Considering the SIAPE database (left) coverage, the orange coloured regions, i.e. Aosta Valley and Molise, have not uploaded yet EPCs in the pool at the time of the present report. However, they are currently managing the upload phase.

3.2. APPLICATION OF ELIGIBILITY CRITERIA

Table 6 presents the eligible buildings in more detail.

Table 6 – Description of eligible buildings under Criterion 1 and Criterion 2 per building's type

Criterion	Type of building[22]	Number of residential buildings	Current mortgage amount (€)
Criterion 1 ***EPC***	A/1	1 *0,02%*	31,134.32 *0,01%*
	A/2	2,746 *62,67%*	356,487,840.17 *63,91%*
	A/3	987 *22,52%*	110,928,369.49 *19,89%*
	A/4	42 *0,96%*	3,819,718.08 *0,68%*
	A/5	2 *0,05%*	143,964.06 *0,03%*
	A/7	603 *13,76%*	85,823,668.71 *15,39%*
	A/8	1 *0,02%*	522,978.70 *0,09%*
Total Criterion 1		**4,382** ***61.87%***	**557,757,673.53** ***61.02%***
Criterion 2 ***Construction year***	A/1	-	-
	A/2	1,960 *72.57%*	261,827,740.77 *73.49%*
	A/3	372 *13.77%%*	41,230,896.85 *11.57%*
	A/4	22 *0.81%*	2,081,166.18 *0.58%*
	A/5	1 *0.04%*	28,184.72 *0.01%*
	A/7	345 *12.76%*	50,876,218.97 *14.28%*
	A/8	1 *0.04%*	221,508.90 *0.06%*
Total Criterion 2[23]		**2,701** ***38.13%***	**356,265,716.39** ***38.98%***
Total eligible buildings		**7,083**	**914,023,389.92**

Source: CRIF elaboration on Banco BPM portfolio

[22] A/1 - Abitazioni di tipo signorile; A/2 - Abitazioni di tipo civile; A/3 - Abitazioni di tipo economico; A/4 - Abitazioni di tipo popolare; A/5 - Abitazioni di tipo ultrapopolare; A/7 - Abitazioni in villini; A/8 - Abitazioni in ville

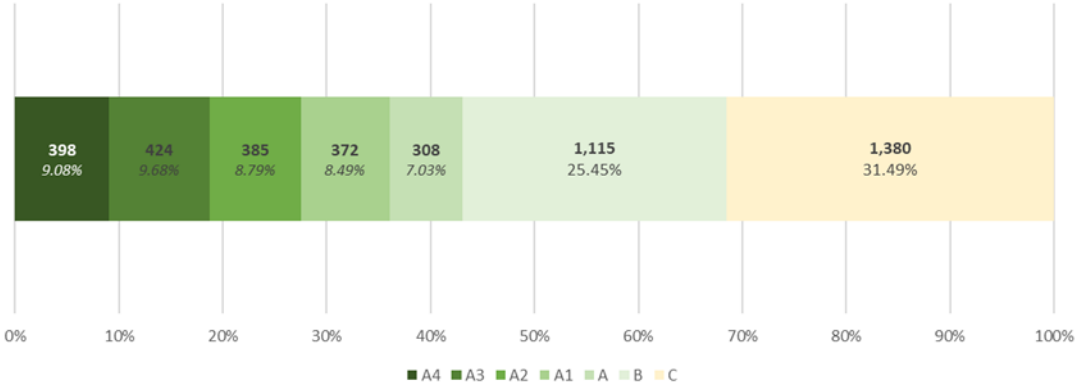
[23] Prudential haircut at 2.5% applied to the value of eligible portfolio under Criterion 2 only

3.2.1. ELIGIBILITY UNDER CRITERION 1 – TOP 15% OF AWARDED EPCs AT A NATIONAL LEVEL

CRIF analysed the Portfolio under **Criterion 1**, considering the distribution of existing EPCs attached to the buildings to identify those falling in the top 15%, according to the national stock's distribution and the certificates' validity until 1 May 2021[24].

With this regard, as shown in **Section 2.2.1**, the top 15% of the national stock is proxied by buildings in the EPC class ranging from A4 to C. Accordingly, **Figure 18** summarises the EPCs' distribution of the eligible Portfolio.

Figure 18 – Distribution of EPCs for eligible buildings



Source: CRIF elaboration on Banco BPM portfolio

As the Portfolio contains buildings assessed both before and after introducing the Ministerial Decree 26/06/2015 on the national guidelines for energy efficiency and the new standardised labelling methodology, EPCs 'A', 'A+' are gathered under the label 'A', separately from A4, A3, A2, A1 labels, introduced after 2015. On the other hand, EPCs 'B' and 'B+' are pooled under the label 'B' while EPCs 'C' and 'C+' are labelled 'C'.

Among the eligible buildings, over 30% are attached to a C label and around 25% to EPC B. The analysis of A-labels helps in drawing essential conclusions. For example, EPC A ('A' and 'A+'), referring to the old criteria of EPC's issuance, weighs 7% of the eligible Portfolio, confirming that before 2015 only a tiny proportion of financed buildings were energy-efficient. Conversely, EPCS A4, A3, A2, A1, introduced after 2015, range between 8.5 and 9%: the bank has granted mortgages for more energy-efficient buildings over the last years. Additionally, **Table 7** highlights the

[24] According to the Italian law, the EPC's validity is 10 years

distribution of eligible EPCs under **Criterion 1** per type of building (Italian cadastral category[25]) underlying the mortgage.

Table 7 - Distribution (%) of eligible EPCs under Criterion 1 per type of dwelling

Type of dwelling	A4	A3	A2	A1	A	B	C	TOTAL
A/1	-	-	-	-	-	-	0.02%	0.02%
A/2	6.91%	6.25%	5.96%	4.85%	4.64%	15.43%	18.61%	62.67%
A/3	0.78%	2.32%	1.63%	2.52%	1.18%	5.26%	8.84%	22.52%
A/4	0.05%	0.02%	0.06%	0.01%	0.05%	0.11%	0.66%	0.96%
A/5	-	-	-	-	-	-	0.05%	0.05%
A/7	1.39%	1.12%	1.12%	1.05%	1.06%	4.58%	3.44%	13.76%
A/8	-	-	0.02%	-	-	-	-	0.02%
TOTAL	**9.13%**	**9.71%**	**8.79%**	**8.43%**	**6.93%**	**25.39%**	**31.63%**	**100.00%**

Source: CRIF elaboration on Banco BPM portfolio

Finally, **Table 8** shows the average current balance of eligible mortgages under **Criterion 1** per EPC label.

Table 8 – Average eligible mortgages' current balance under Criterion 1 per EPC label

	A4	A3	A2	A1	A	B	C	AVERAGE PORTFOLIO (€)
AVERAGE (€)	155,913.77	161,163.71	162,154.51	149,390.06	144,553.35	111,851.49	101,644.63	**127,283.81**

Source: CRIF elaboration on Banco BPM portfolio

Table 7 suggests how the average current balance of mortgages with high energy-efficient underlying buildings, i.e. A4, A3, A2, A1, is slightly higher than A, B and C labels.

[25] Italian cadastral categories are available at: https://www.amministrazionicomunali.it/docs/pdf/categorie_catastali.pdf

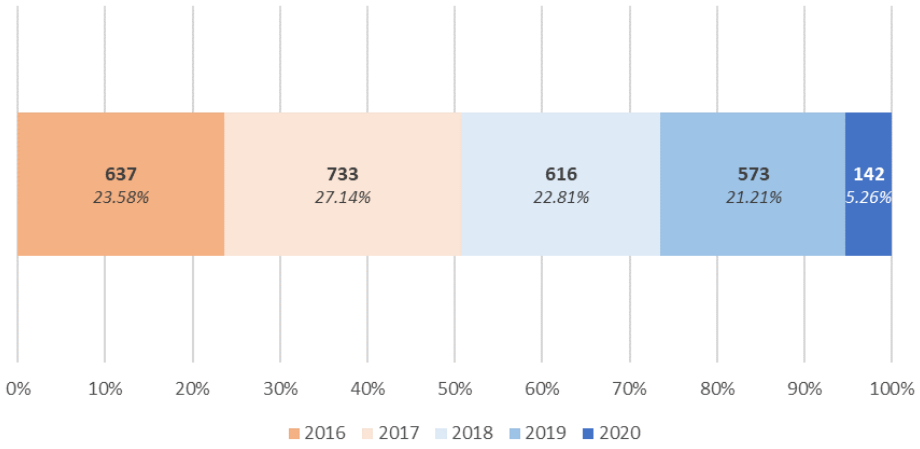
3.2.2. ELIGIBILITY UNDER CRITERION 2 – CONSTRUCTION YEAR

CRIF analysed the Portfolio under **Criterion 2**, considering both the existing law about EPCs and the Italian residential stock distribution according to the construction year (since 2016).

As stated in the present report, the existing law prescribes the EPC's attachment to construct new buildings. Besides, following **Figure 15**, in 2016-2020, 98.3% of the EPCs issued for new residential buildings and uploaded in the SIAPE database ranges from C to A4. Consequently, the eligible portfolio's conservative treatment under Criterion 2 is implemented to consider the remaining 1.7%. The application of a prudent 2.5% haircut renders the portfolio's value 100% eligible.

With this regard, CRIF identified the eligible new residential buildings in the Portfolio in 2016-2020. **Figure 19** shows the distribution.

Figure 19 – Distribution of eligible new residential buildings in the Portfolio in 2016-2020



Source: CRIF elaboration on Banco BPM eligible portfolio

The highest rate is related to new residential buildings built in 2017 with 27%, followed by 2016 at 24%. Two thousand twenty only weighs 5.2%.

Furthermore, **Table 9** provides an overview of the eligible dwelling's distribution under **Criterion 2** per year of construction and cadastral category.

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

Type of dwelling	2016	2017	2018	2019	2020	TOTAL
A/1	-	-	-	-	-	**-**
A/2	15.77%	18.51%	18.18%	15.99%	4.11%	**72.57%**
A/3	3.52%	4.33%	2.26%	3.00%	0.67%	**13.77%**
A/4	0.22%	0.33%	0.04%	0.22%	-	**0.81%**
A/5	-	0.04%	-	-	-	**0.04%**
A/7	4.07%	3.92%	2.30%	2.00%	0.48%	**12.77%**
A/8	-	-	0.04%	-	-	**0.04%**
TOTAL	**23.58%**	**27.14%**	**22.81%**	**21.21%**	**5.26%**	**100.00%**

Source: CRIF elaboration on Banco BPM portfolio

Overall, the highest contribution in the eligible portfolio consists of A/2 buildings been built in 2017, i.e. 18.51%, followed by the same buildings' type constructed in 2018 with 18.18%. A/7 buildings been built in 2017 also have a considerable contribution, 4.07%, considering that the A/7 category weighs 12.77% of the overall portfolio. Conversely, categories A/4 and A/8 built in 2018 and buildings A/5 constructed in 2017 accounts for 0.04% each.

To conclude, **Table 10** reports the average current balance of eligible buildings under **Criterion 2** per type of dwelling and construction year.

Table 10 – Average current balance of eligible mortgages under Criterion 2 per construction year[26]

	2016	2017	2018	2019	2020	AVERAGE PORTFOLIO (€)
AVERAGE (€)	116,836.72	126,123.94	135,466.38	146,371.61	155,448.31	**131,901.41**

Source: CRIF elaboration on Banco BPM portfolio

[26] The table shows the average current balance of the eligible portfolio under Criterion 2, computed after the application of a prudential haircut of 2.5%

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