TECHNICAL REPORT

CREDEM

GREEN BUILDING FRAMEWORK

Bologna, 20/03/2026

1. INTRODUCTION

1.1. OBJECTIVES

This report aims to provide an overview of CREDEM's portfolio composed by green buildings and tax incentives related to building renovation, the current state of loans and relative buildings that are energy efficient. Energetic efficiency refers to the ability of a building to reduce its energy consumption and greenhouse gas emissions. The report will examine the benefits of energy efficiency for the environment, as well as the policies and incentives that support its spread. CRIF S.p.A. has identified the *Green Buildings* underlying a portfolio composed by mortgages, by assessing the eligible assets related to the acquisition or construction, and tax incentives related to renovation of existing buildings, in line with:

1. the Institution's Green, Social and Sustainability Bond Framework;
2. International Capital Market Association's (ICMA) GBPs, June 2025;
3. The UN SDGs and EU environmental objectives to address climate change;
4. The Climate Transition Finance Handbook, November 2025;
5. The Harmonised Framework for Impact Reporting, June 2024;
6. The Guidelines for Green, Social, Sustainability and Sustainability-Linked Bonds External Reviews, June 2022;

1.2. CONTENTS SUMMARY

REPORT CHAPTER	SUMMARY
1. INTRODUCTION	It overviews of the Italian real estate market, focusing on energy efficiency and the Energy Performance Certificate (*EPC*).
2. ELIGIBILITY CRITERIA	It describes the eligibility criteria identified for both the Italian residential and no-residential building stock.
3. CREDEM PORTFOLIO ANALYSIS	It provides an overview of CREDEM's Green Buildings portfolio
4. EMISSIONS METHODOLOGY	It provides an overview of CRIF's methodology to estimate avoided CO_2 emissions.
5. CREDEM PORTFOLIO EMISSIONS	It provides an analysis of the portfolio CO2 emissions and energy savings
6. CREDEM NET PROCEEDS	It provides an analysis of the portfolio net proceeds

1.3. THE EUROPEAN AND ITALIAN TRANSITION TO ENERGY-EFFICIENT BUILDING STOCK

The transition of the European and Italian building stock towards higher energy performance and zero-emission standards is one of the key pillars of the EU climate, energy and industrial agenda. Buildings account for around 40% of energy consumption in the European Union, about half of EU gas consumption and approximately 35–36% of energy-related greenhouse gas emissions. At the same time, around 85% of EU buildings were constructed before 2000, about 75% of the stock has poor energy performance and the annual renovation rate remains close to 1%, well below the level required to meet the Union's 2030 and 2050 objectives.

In this context, improving the energy performance of buildings through renovation, electrification, digitalisation and the integration of renewable energy sources is essential not only for decarbonisation, but also for reducing energy demand, strengthening energy security, lowering energy bills, improving indoor comfort and health, and supporting jobs and investment across construction and clean technology value chains. For a country such as Italy, where the building stock is old, fragmented and often energy-intensive, this transition is particularly relevant. Recent national evidence confirms that the energy performance of the certified Italian building stock is improving, yet Italy is still not fully on track to decarbonise buildings in line with the pace required by European targets.

The policy framework has significantly evolved in recent years. Approved in 2020, the European Green Deal established the objective of making the European Union climate-neutral by 2050 and triggered a broad legislative revision across transport, energy, industry, buildings and environmental protection. In the buildings sector, the Green Deal was subsequently reinforced by the Fit for 55 package and REPowerEU, which gave greater strategic importance to energy efficiency, renewable energy deployment, the reduction of fossil fuel dependence and the acceleration of building renovation. The Social Climate Fund also adds a social dimension to this framework by supporting vulnerable households and micro-enterprises in the energy transition, including through renovation-related measures

Within this regulatory architecture, the revised Energy Performance of Buildings Directive (Directive (EU) 2024/1275) is now the central legal instrument for the decarbonisation of the European building stock. The recast EPBD entered into force on 28 May 2024 and must be transposed into national law by 29 May 2026. Its objective is to accelerate the renovation of the worst-performing buildings, improve the quality and comparability of energy performance information, promote digital and smart solutions, and steer the entire EU building stock towards a fully decarbonised and zero-emission trajectory by 2050. The Directive is structured around four main policy dimensions: renovation, decarbonisation, modernisation and digitalisation, and financing with technical assistance.

A major innovation introduced by the recast EPBD is the replacement of the nearly zero-energy building standard with the zero-emission building standard for new construction. From 1 January 2028, all new buildings owned by public bodies must be zero-emission buildings, while from 1 January 2030 this requirement will apply to all new buildings. Under the revised framework, a zero-emission building must combine very high energy performance with zero on-site carbon emissions from fossil fuels, while the remaining energy demand should be covered by renewable energy generated on-site or nearby. The revised EPBD also strengthens the role of energy performance certificates, renovation passports, smart technologies, solar-readiness and broader building digitalisation, all of which are increasingly relevant for investors, lenders and property owners.

The recast Directive also introduces a stronger governance framework for renovation. Member States are required to prepare National Building Renovation Plans, replacing the former long-term renovation strategies. These plans are intended to define the roadmap for transforming national residential and non-residential building stocks, both public and private, into a highly energy-efficient and decarbonised stock by 2050. Draft plans were due by 31 December 2025 and final plans are due by 31 December 2026 following Commission assessment and national consultation. This new planning framework is expected to play a key role in aligning national building policies, investment needs and financing instruments with the EU's long-term climate objectives.

Another important element of the new framework concerns fossil-fuel heating systems. Under Article 17(15) of the recast EPBD, Member States must discontinue financial incentives for the installation of new stand-alone boilers powered by fossil fuels from 1 January 2025. The European Commission clarified that this applies to public support such as grants, preferential loans and tax incentives for new oil, coal or gas boilers, while certain hybrid systems may remain eligible only where the renewable component is significant. This provision strengthens the market shift towards heat pumps, renewable heating, hybrid low-carbon systems and electrification.

The revised EPBD is complemented by the recast Energy Efficiency Directive (Directive (EU) 2023/1791), which significantly raised the EU's level of ambition on energy savings. The EED establishes the "energy efficiency first" principle as a legally recognised guiding principle of EU energy policy and sets a binding EU-level target to reduce final energy consumption by 11.7% by 2030 compared with the 2020 reference scenario. It also reinforces the exemplary role of the public sector, including annual energy consumption reduction obligations and the requirement to renovate 3% of the total floor area of buildings owned by public bodies each year. Together, the EED and the EPBD provide a much more robust and integrated framework for the transformation of the building sector than the one in force under the previous legislative cycle.

In Italy, these developments are particularly significant in light of the characteristics of the national building stock and the growing importance of building energy data for the real estate and financial sectors. Italy submitted its

updated National Energy and Climate Plan in 2024, while ENEA and CTI have recently reported an improvement in the energy performance of certified buildings, with the share of buildings in the least efficient classes F and G falling below 50% for the first time. Nevertheless, independent assessments show that Italy still needs stronger progress in reducing final energy consumption in buildings and accelerating the uptake of renewable energy, especially in heating and cooling.

Overall, the European and Italian transition towards an energy-efficient and zero-emission building stock is no longer a medium-term aspiration, but an ongoing regulatory, financial and market transformation. For the real estate sector, and for financial institutions involved in green lending and sustainable finance, energy performance is increasingly becoming a strategic factor not only for environmental purposes, but also for asset quality, portfolio transparency, risk assessment and alignment with sustainable finance frameworks. In this perspective, EPCs, national building data systems and eligibility criteria for efficient buildings play an increasingly relevant role in connecting regulation, market practice and financing decisions.

1.4. ENERGY EFFICIENCY AND THE REAL ESTATE MARKET

Energy efficiency is a key factor for the sustainability and competitiveness of the real estate market in Europe. Energy efficiency measures can reduce greenhouse gas emissions, improve indoor comfort and air quality, and lower energy bills for households. Therefore, real estate represents a strategic arena where energy-efficient measures can impact achieving CO2 reduction targets.

According to Eurostat data, households accounted for 25,8% of final energy consumption in the EU in 2020. The main use of energy by households was for heating their homes (62.5% of final energy consumption in the residential sector), followed by water heating (15.1%), lighting and electrical appliances (14.5%), cooking (6.5%), other end-uses (0.8%) and space cooling (0.6%). As shown in Figure 1, the main use of energy by households in Italy in 2020 was for space heating: 66.3% of final energy consumption in the residential sector. Electricity used for lighting and most electrical appliances accounted for about 12%, while the share used for water heating was slightly higher at 10.7%. Major cooking appliances required 7.7% of the energy used by households, while space cooling and other end uses accounted for 3.3%.

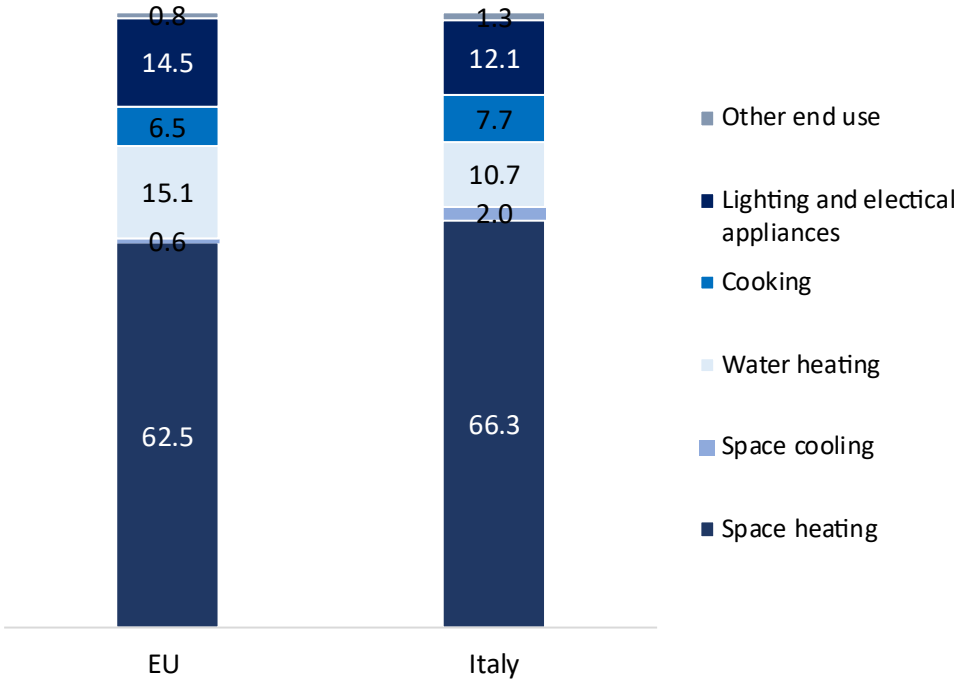


Figure 1: Share of the energy consumption of households broken down by end-use – Eurostat, 2023

1.5. ITALIAN TOOL FOR COLLECTING EPC

SIAPE stands for "Sistema Informativo sugli Attestati di Prestazione Energetica" which is the national tool for collecting Energy Performance Certificates (APE) of buildings and real estate units in Italy. It was established by Interministerial Decree 26/06/2015 and is managed by ENEA with the primary purpose of returning a certificate of energy performance of buildings and real estate units. The SIAPE (System of Information on Energy Performance Certificates) provides information on the Italian building stock, and it has been created and currently managed by ENEA. SIAPE collects and organizes data from certificates in collaboration with Regions and Autonomous Provinces; 16 connected entities share aggregated information with ENEA and become public. The energy cadasters gathering EPCs are managed under the regional jurisdiction. Accordingly, EPCs' data are not publicly accessible for all the Italian regions. To address the problems associated with the lack of building's energy efficiency data, the Ministerial Decree on 26/06/2015 introduced this database, SIAPE, where contributing regions are required to upload the gathered EPCs every year. As shown in figure 2, not all Italian regions today contribute to the SIAPE database. Indeed, the blue areas identify the energy cadasters providing EPCs' information, while the grey ones do not share information.

Figure 2 - Map of the Italian regions contributing to the SIAPE database, from SIAPE, ENEA

Figure 3 – SIAPE Logo

The SIAPE has collected 7,938,586 EPCs issued starting from 2015 from 19 regions when writing the present report. Overall, 87.5% of the records belong to residential buildings and 12.5% 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. As shown in figures below, Italy is divided into six climate zones:

climate zone A is the hottest, and zone F is the coldest. This subdivision is carried out at the municipality level, based on heating degree days.

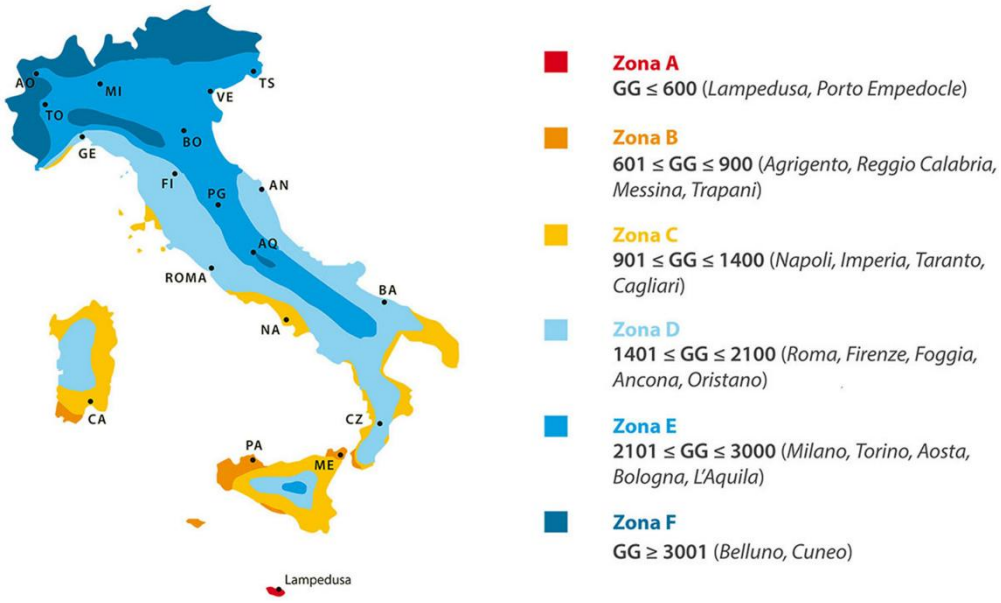


Figure 4 - Italian Climate Zones (zone climatiche) Subdivision

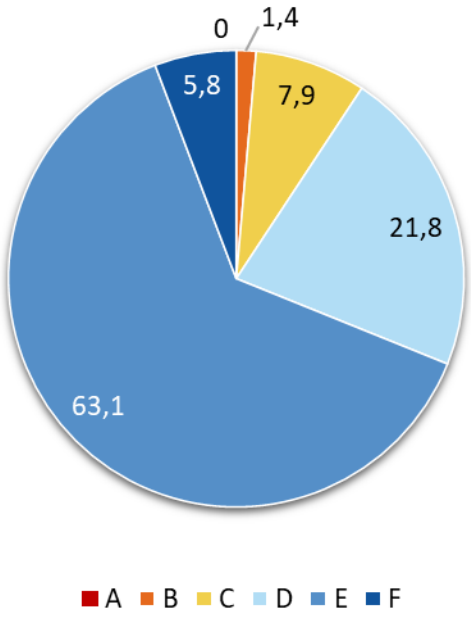


Figure 5 - Share of SIAPE EPCs per Climate Zones

1.6. MARKET REFERENCES FOR GREEN AND SUSTAINABLE BUILDINGS

1.6.1. EU TAXONOMY FOR SUSTAINABLE ACTIVITIES

The EU taxonomy for sustainable activities is a classification system that aims to help investors, companies and policymakers identify which economic activities can be considered environmentally sustainable. It is part of the EU's efforts to scale up sustainable investment and implement the European Green Deal. On 21 April 2021, the European Commission published the text of the EU Taxonomy Climate Delegated Act *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*. The attention poses to those actions needed to mitigate climate change effects. Indeed, Annex I focuses on the technical screening criteria (TSC) related to a substantial contribution to climate change mitigation and *do no significant harm* ('DNSH') different activities.

The real estate sector is one of the sectors covered by the EU taxonomy, as it has a significant impact on climate change mitigation and adaptation, as well as on other environmental objectives such as water use, circular economy and pollution prevention. The EU taxonomy sets out specific criteria for real estate activities to qualify as sustainable, depending on their type and performance. One of the main types of real estate activities covered by the EU taxonomy is construction and real estate. Construction activities can contribute substantially to climate change mitigation if they meet certain thresholds for greenhouse gas emissions intensity or energy efficiency. For example, new buildings must have a primary energy demand that is at least 10% lower than the level required by national regulations for NZEBs. Construction activities can also contribute substantially to climate change adaptation if they increase the resilience of buildings to physical climate risks such as floods, heat waves or storms. Accordingly, Table 2 provides an overview of the TSC for the *construction of new buildings.*[1]

Another type of real estate activity covered by the EU taxonomy is renovation. Renovation activities can contribute substantially to climate change mitigation if they achieve a certain level of energy savings or emissions reduction compared to a baseline scenario. For example, renovation projects must achieve at least 30% energy savings in terms of less Primary Energy Demand. Renovation activities can also contribute substantially to climate change adaptation

[1] Description of the activity: development of building projects for residential and non-residential buildings by bringing together financial, technical and physical means to realise the building projects for later sale as well as the construction of complete residential or non-residential buildings, on own account for sale or on a fee or contract basis.

if they improve the resilience of buildings to physical climate risks. Table 3 relates to the *renovation of existing buildings.*[2]

A third type of real estate activity covered by the EU taxonomy is individual building ownership. Individual building ownership can contribute substantially to climate change mitigation if it meets certain criteria for energy performance or emissions intensity. Individual building ownership can also contribute substantially to climate change adaptation if it meets certain criteria for resilience to physical climate risks.

Table 1 - Substantial Contribution to Climate Change Mitigation: Construction of new buildings

Source: Delegated Act of the EU Taxonomy for sustainable activities

7.1 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.

Table 2 - Substantial Contribution to Climate Change Mitigation: Renovation of existing buildings

Source: Delegated Act of the EU Taxonomy for sustainable activities

7.2 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 %.

[2] Description of the activity: Construction and civil engineering works or preparation thereof.

Table 3 - Substantial Contribution to Climate Change Mitigation: Acquisition and ownership of buildings

Source: Delegated Act of the EU Taxonomy for sustainable activities

7.7 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 (see Table 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.

In addition to these types of real estate activities, the EU taxonomy introduces some new concepts that are relevant for the sector. One of these concepts is "do no significant harm" (DNSH), which means that an activity that contributes substantially to one environmental objective must not significantly harm any other environmental objective. For example, a construction project that reduces greenhouse gas emissions must not adversely affect water quality or biodiversity. Another concept introduced by the EU taxonomy is "minimum safeguards", which means that an activity must comply with certain social and governance standards in order to be considered sustainable. For example, an activity must respect human rights, labour rights and anti-corruption principles.

The EU taxonomy for sustainable activities and its implications for the real estate sector are complex and evolving topics. The classification system will require additional technical guidance and reporting standards from the European Commission and other bodies. It will also entail new disclosure obligations and opportunities for investors and companies involved in real estate 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 future. The EU Taxonomy aims to define a set of practices and thresholds to define business and activities aligned with the European climate change mitigation and adaptation objectives.

1.6.2. CLIMATE BONDS TAXONOMY

Similarly to the EU Taxonomy for sustainable activities, the Climate Bonds framework provides a reference methodology for identifying assets and projects aligned with the transition to a low-carbon and climate-resilient economy. In operational terms, this framework is implemented through the Climate Bonds Standard and the related sector-specific Criteria, including the Buildings Criteria, which support issuers, investors and other market participants in the identification of eligible green assets consistent with a net-zero pathway and the objectives of the Paris Agreement. The most recent update of the Buildings Criteria has also strengthened the alignment with the EU Taxonomy framework. With specific regard to buildings, the Climate Bonds Criteria define the conditions under which residential buildings, commercial buildings and upgrade projects may be considered aligned with a zero-carbon trajectory. In particular, the framework relies on a baseline emissions intensity target corresponding to the top 15% best-performing buildings in a given market, city or building typology, and applies an extrapolation methodology to define a decarbonisation pathway towards 2050. This approach provides a market-based benchmark for the identification of low-carbon building assets.3

For residential buildings, the Climate Bonds framework allows the use of screening indicators based either on very high energy and emissions performance or on significant reductions achieved through renovation. In this context, a residential asset may qualify where it is within the top 15% of emissions performance in the relevant local market, or where an upgrade or retrofit delivers a material reduction in emissions intensity. Where direct market emissions data are not available or are not sufficiently representative, the methodology allows the use of robust proxies, including building codes, recognised rating systems and energy labelling schemes such as Energy Performance Certificates (EPCs), provided that these are supported by adequate evidence and are representative of high building performance.

Accordingly, the Climate Bonds proxy methodology identifies two alternative approaches for the identification of the top 15% most energy-efficient buildings. The first approach is based on benchmarking against local market emissions performance. The second approach is based on the proportion of ratings or labels awarded under a recognised scheme. Both approaches are intended to provide a practical solution for the identification of low-carbon buildings in markets characterised by different levels of data availability and maturity.

Under the first approach, the analysis relies on robust and representative data on the operational emissions performance of buildings in the relevant market. The top 15% best-performing assets identified through this analysis represent the starting point of an emissions performance trajectory that declines towards zero carbon emissions by

[3] https://energy.ec.europa.eu/topics/energy-efficiency/energy-performance-buildings/nearly-zero-energy-and-zero-emission-buildings_en

2050. In line with the Climate Bonds methodology, the underlying data should originate from reliable sources, be representative of the relevant market and reflect operational performance.4

Under the second approach, which is particularly relevant in the absence of sufficiently granular local emissions data, the top 15% threshold may be identified through the use of a national or local rating, labelling or building code scheme. In this case, the analysis must demonstrate that the relevant rating or label corresponds to the top 15% of all ratings or labels awarded under the scheme and that the scheme predominantly reflects energy or emissions performance. This approach is especially relevant in jurisdictions where EPC schemes are available and can be used as a reliable proxy for building efficiency.

For new buildings, this market-based approach increasingly interacts with the European regulatory framework applicable to construction products. In particular, Regulation (EU) 2024/3110 on construction products, published in December 2024, entered into force on 7 January 2025 and became generally applicable from 8 January 2026. The revised Construction Products Regulation strengthens the sustainability and digitalisation framework of the sector by introducing, among other elements, the Digital Product Passport, enhanced environmental information requirements and a more harmonised treatment of environmental characteristics for construction products. In this respect, the CPR contributes to improving the quality, comparability and availability of environmental data across the construction value chain, thereby supporting the broader objectives of sustainable finance frameworks and green building assessment methodologies.

4 https://www.researchgate.net/publication/367467902_A_Policy_Roadmap_for_the_Energy_Renovation_of_the_Residential_and_Educational_Building_Stock_in_Italy/fulltext/63d3c82464fc860638f0f63e/A-Policy-Roadmap-for-the-Energy-Renovation-of-the-Residential-and-Educational-Building-Stock-in-Italy.pdf

1.7. EPC AND FINANCIAL DISCLOSURE

The Energy Performance Certificate (EPC) is a standardised technical instrument that provides relevant information on the energy performance of buildings and, in the context of mortgage lending, represents an important data point for the assessment of the quality and climate profile of the underlying real estate collateral.

From a prudential disclosure perspective, the regulatory framework has evolved since the first EBA consultation launched in 2021 on Pillar 3 disclosures on environmental, social and governance (ESG) risks. Following that consultation, the EBA published in January 2022 its final draft implementing technical standards on ESG risk disclosures, introducing comparable templates and key performance indicators aimed at improving transparency on how climate-related factors may affect institutions' balance sheets, how institutions mitigate such risks, and the extent to which their exposures finance taxonomy-aligned activities.[5] These disclosure requirements were first formalised through Commission Implementing Regulation (EU) 2022/2453 and have subsequently been incorporated into the broader Pillar 3 disclosure framework under Commission Implementing Regulation (EU) 2024/3172, which currently represents the main reference for public prudential disclosures by institutions under the CRR.[6]

In line with this framework, disclosure of ESG-related information is intended to strengthen market discipline by providing stakeholders with more consistent and comparable information on institutions' risk profile, climate-related vulnerabilities and sustainable finance strategy.2 In particular, the Pillar 3 ESG package includes both qualitative and quantitative information on transition risk, physical risk and mitigating actions, as well as metrics linked to taxonomy alignment.2

Within this context, EPC data are particularly relevant for real estate exposures. The EBA final draft ITS on Pillar 3 ESG disclosures explicitly refers to the need for information on the energy efficiency of real estate portfolios, including loans collateralised by commercial and residential immovable property and repossessed collateral. More broadly, the Pillar 3 disclosure framework requires institutions to provide information on the distribution and quality of real estate collateral in a way that supports the assessment of transition risk and the energy performance profile of the underlying assets.[7]

Accordingly, the collection and use of EPC data support a more granular and robust assessment of the energy efficiency of mortgaged properties and enhance the transparency of the institution's portfolio from both a risk and

[5] https://eba.europa.eu/publications-and-media/press-releases/eba-publishes-binding-standards-pillar-3-disclosures-esg
[6] https://eur-lex.europa.eu/eli/reg_impl/2022/2453/oj/eng
[7] https://eba.europa.eu/sites/default/files/document_library/Publications/Draft%20Technical%20Standards/2022/1026171/EBA%20draft%20ITS%20on%20Pillar%203%20disclosures%20on%20ESG%20risks.pdf

disclosure perspective. This is particularly relevant in the case of green or sustainable finance frameworks, where EPC information can support the identification of energy-efficient assets, the classification of eligible buildings and the monitoring of portfolio alignment with sustainability-related criteria.

Finally, EPC information is also relevant in the supervisory context. The ECB's climate risk stress-testing exercises have highlighted the importance of granular real estate data and, in particular, the breakdown of mortgage exposures by EPC rating, in order to assess banks' exposure to transition risk in mortgage portfolios and real estate-secured corporate exposures.[8]

The regulatory framework remains under development. In 2025, the EBA launched a further consultation on amendments to the Pillar 3 disclosure package in order to align the framework with CRR3 and introduce a more proportionate approach to ESG disclosures across different categories of institutions.

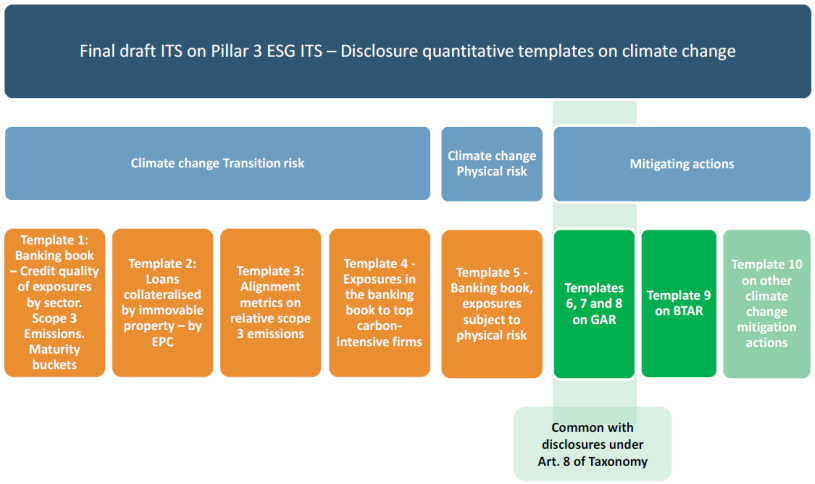


Figure 6 - Quantitative templates by EBA on Pillar 3, ESG disclosures
Source: Final draft technical standards on Pillar 3 disclosures of ESG risks, EBA, 2022

[8] https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.climate_stress_test_report.20220708~2e3cc0999f.en.pdf

1.8. 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.
4. Directive 2024/1275/EU.

Indeed, the revision of 2024 introduced the requirement that by 2030 all new buildings must be zero-emission. By 2050, this obligation will be extended to all buildings in the European building stock. The Directive will guide future national updates.

In particular, the directive's objectives are to reduce CO2 emissions and energy consumption, contribute to achieving the climate goals of the European Green Deal, modernize the European building stock, and create new jobs in the renewable energy and energy efficiency sectors.

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). The EPCs are a valuable guide for the real estate market concerning energy aspects. Indeed label and energy performance is a part of a more comprehensive assessment of the building under evaluation. The performance is measured for the structural components (walls, windows) and the energetic systems, divided by use (space heating or cooling, heating water).

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 7.

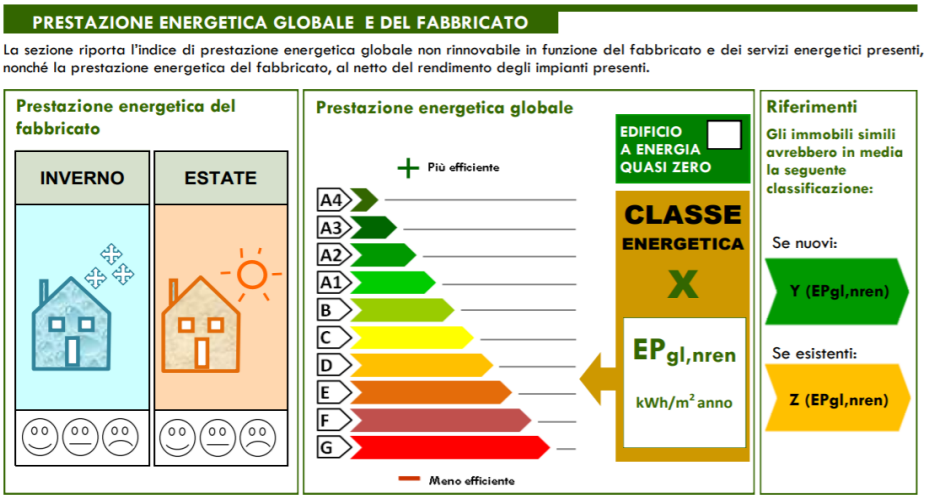


Figure 7 - Building's Energy Performance format

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.[9]

2. The $EP_{gl,nren}$ 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 square meter of heated floor per year. Overall, the $EP_{gl,nren}$ is defined as:

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

[9] See the Decree 26/06/2015, national criteria and technical norms (UNI/TS 11300), EU Directive 2010/31
[10] Expressed in kWh/m²

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 (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 8.

	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	$> 3{,}50\ EP_{gl,nren,rif,standard\ (2019/21)}$

Figure 8 - Italian EPC label thresholds
Source: Italian Decree 26/06/2015 (Requisiti Minimi)

1.8.1. NZEB BUILDINGS

The above-mentioned EPBD Directive 2024/1275/EU also introduces Nearly-Zero-Energy-Building (NZEB).:

"The maximum energy demand threshold for a zero-emission building is at least 10% lower than the threshold related to the total primary energy consumption established at the Member State level for nearly zero-energy buildings."

NZEB buildings are characterized by a nearly zero balance between energy consumption 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 in 2019 for the other types. Accordingly, the Lombardia region since 2016.

The current EPC format shown in figure 7 presents a dedicated box for the NZEB information (*EDIFICIO A ENERGIA QUASI ZERO*). As of today, according to the SIAPE, in Italy, 88,081 buildings are NZEB:

- 84,225 residential properties.
- 3,826 non-residential properties.

Figure 9 shows the distribution (%) of the EPC related to NZEB.

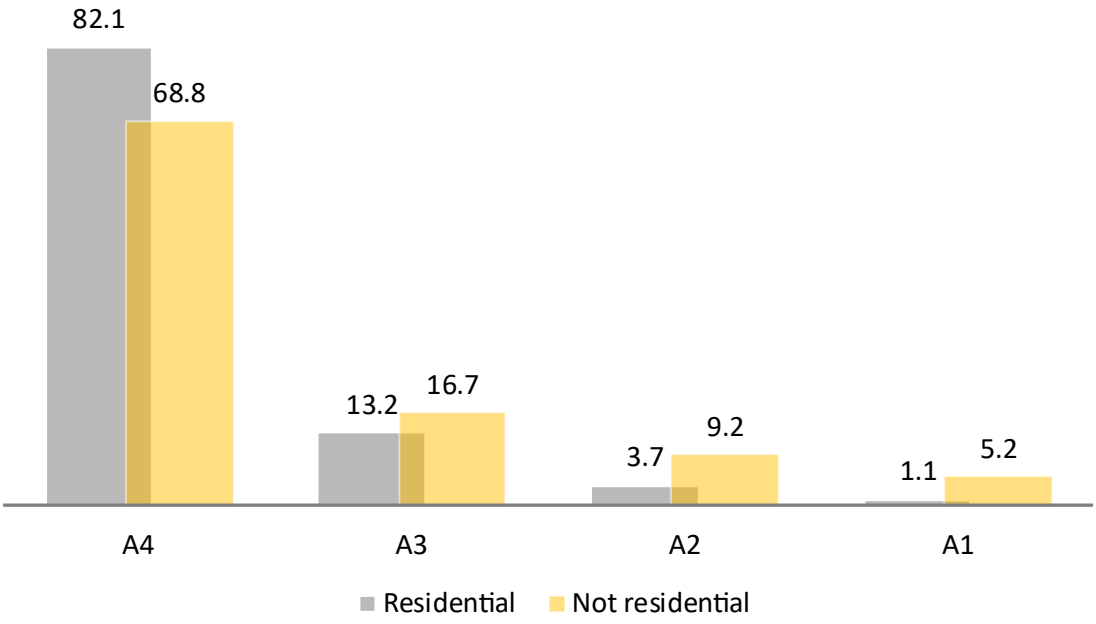


Figure 9 - Share of NZEB residential buildings per EPC class

Source: CRIF elaboration on SIAPE data

2. ELIGIBILITY CRITERIA

The applied methodology described in the next chapters relies on Climate Bonds Taxonomy, or EU taxonomy for new buildings, and it is fully aligned with the Eligibility Criteria for green buildings set in the Second Party Opinion Framework. Chapter 2.1 focuses on detailing the criteria for selecting eligible mortgages for energy-efficient buildings. Chapter 2.2 focuses on the methodology for selecting tax incentives related to energy efficiency renovation for existing buildings.

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

This chapter represents a fundamental premise in identifying the eligible buildings within the CREDEM's portfolio by providing:

- a detailed analysis of the Italian building stock to identify those properties belonging to the top 15% of the most energy-efficient buildings using the current Italian EPC labelling scheme as a proxy for criterion 1.1, 1.2 and 2
- thresholds for criterion 3 based on primary energy demand

As a result, the following milestones are considered:

1. EPCs distribution:

   1.1. Residential buildings.

   1.2. Non-residential buildings.

   Thresholds on Primary Energy Demand are used for buildings with a label straddling the top 15%;

2. Construction year as a proxy for the residential buildings without EPC.

3. New building: new properties are eligible only if these are highly efficient (NZEB-10% EU taxonomy criteria).

This section aims to identify the top 15% of the Italian residential and non-residential buildings stock, for criterion 1 and 2, by analysing EPC data gathered in the SIAPE platform by ENEA. The latter constitutes the most critical and complete data source for EPCs at a national level. Instead, CRIF and CTI[11] used statistical and expert approaches to

[11] The CTI is the Italian Standardization Body for energy efficiency and EPC: https://www.cti2000.it/index.php?controller=sezioni&action=lista&id=1

define the PED thresholds referred to in sections 7.1 and 7.7 of the Technical Screening Criteria. The thresholds that identify the green share of the Italian building stock that is the most energy-efficient differ according to:

- the year of construction of the property (pre- and post-2021 as per the Taxonomy),
- the climate zone, and
- intended use.

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

At first, a filter to identify residential buildings[12] only is applied, slightly reducing the SIAPE data pool to 6,947,953 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 on SIAPE website.

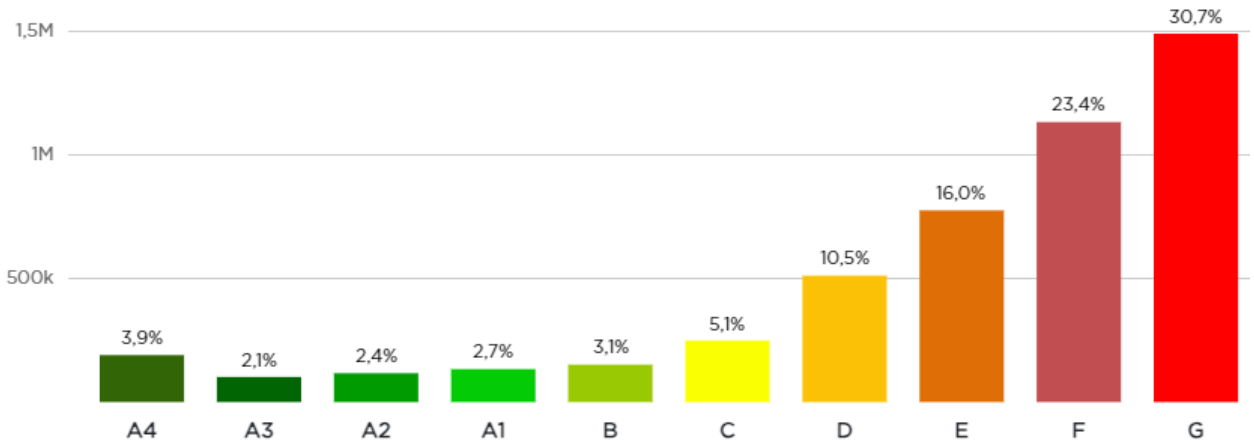


Figure 10 – Distribution (%) of EPCs for residential buildings
Source: SIAPE data

[12] 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

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 6.0%. With this regard, adding EPC A (containing A4, A3, A2, A1), B and C the 19.3% 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. As a result, the sum of EPC labels A (including A4, A3, A2, A1), B and C proves to be above the set threshold at 15%. The C label straddles the top 15% of the national distribution of EPC labels. In this case, the thresholds on Primary Energy Demand (PED) are used to assess the eligibility of the building for green financing. These thresholds have been defined by CRIF-CTI following the EU taxonomy, which sets technical criteria for sustainable activities. The PED thresholds reflect the energy demand of a building for heating, cooling, and domestic hot water, and are expressed in kWh/m^2 per year.

The thresholds, expressed in kWh/m^2 per year, defined by CRIF-CTI for the TOP15% residential properties are shown in the table below:

	Climate zone					
Year of construction <= 2020	**A**	**B**	**C**	**D**	**E**	**F**
Residential properties	65	65	70	75	100	105

Table 5 – Threshold for Substantial Contribution to Climate Change Mitigation: Acquisition and ownership of buildings[13]

[13] Source: Percentage distribution of primary energy (Ep) values in the Italian national building stock https://energyefficientmortgages.eu/wp-content/uploads/2022/12/Percentage-distribution-of-primary-energy-Ep-values-in-the-Italian-national-building-stock-1.pdf

2.1.2. 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 990,633 EPCs after 2015. 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 11 shows the distribution of EPCs.

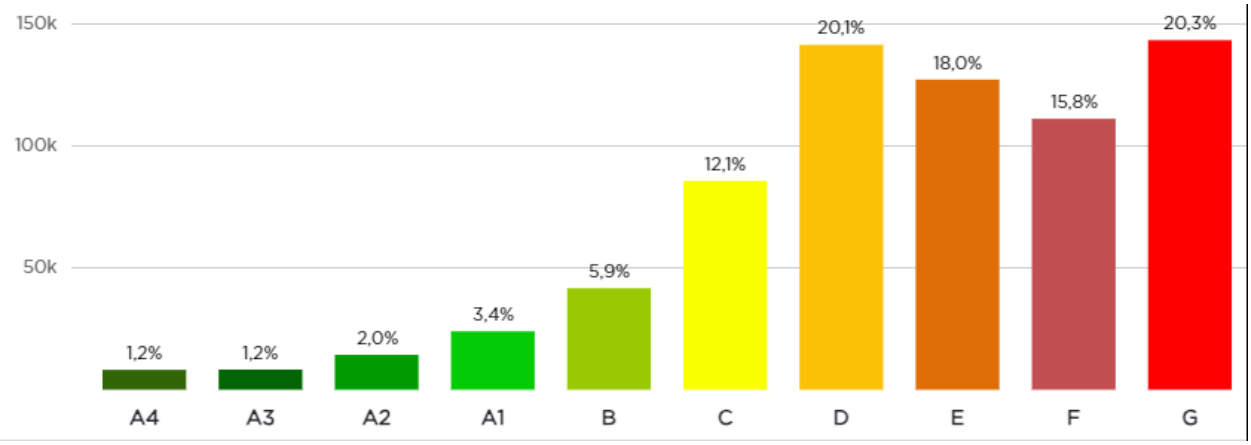


Figure 11 – Distribution (%) of EPCs for non-residential buildings
Source: SIAPE data

In contrast with the previous analysis, adding C labelled buildings would imply reaching a rate of 17.5% while only considering EPC classes A and B, the threshold of 15% is respected, examining 13.7% of the whole distribution. The thresholds defined the top 15% of buildings in terms of energy efficiency. The thresholds depend on the type of building, as different structures have different levels of energetic systems. For example, a hospital or a school may have a higher threshold than a residential or commercial building because they provide essential services and house more people. The report introduced the use of energy performance for different types of buildings in the portfolio. The eligible buildings are differentiated using the threshold determined from homogeneous groups of properties (e.g. hotels or shops). For each group, the TOP15% per label was defined, as summarized in the following table. The different thresholds were defined using the SIAPE and data available in 2023. These thresholds express the TOP15% in terms of energy performance as defined by the criterion already described. However, some buildings may have an EPC label that straddles the top 15% of the national distribution of EPC labels. In this case, the thresholds on Primary Energy Demand (PED) are used to assess the eligibility of the building for green financing. These thresholds

have been defined by CRIF-CTI following the EU taxonomy, which sets technical criteria for sustainable activities. The PED thresholds reflect the energy demand of a building for heating, cooling, ventilation, lighting and domestic hot water, and are expressed in kWh/m^2 per year.

Cluster	**Label**
Properties for tourist-hotel use	A4, A3, A2 *or* A1 and PED in TOP15%
Buildings for Workshop-Industrial-Agricultural use	A, B, C *or* D and PED in TOP15%
Commercial properties	A, B *or* C and PED in TOP15%
Other commercial properties	A, B *or* C and PED in TOP15%

Table 6 – TOP15% EPC label

Source: SIAPE data

The thresholds expressed in kWh/m^2 per year, defined by CRIF-CTI for the TOP15% non-residential properties are shown in the table below:

Year of construction <= 2020	**Climate zone**					
	A	**B**	**C**	**D**	**E**	**F**
Commercial properties	250	250	260	260	270	270
Properties used as offices	160	160	170	180	180	180
Properties for tourist-hotel use	270	270	280	280	290	290
Buildings for Workshop-Industrial-Agricultural use	170	170	170	180	180	180
Other commercial properties	250	250	270	275	280	300

Table 7 – Threshold for Substantial Contribution to Climate Change Mitigation: Acquisition and ownership of buildings[14]

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

[14] Percentage distribution of primary energy (Ep) values in the Italian national building stock https://energyefficientmortgages.eu/wp-content/uploads/2022/12/Percentage-distribution-of-primary-energy-Ep-values-in-the-Italian-national-building-stock-1.pdf

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. First, accessing the SIAPE database, the distribution of EPCs per building's construction year is derived from the certificates issued in 2015-2020 (6,947,953 EPCs). 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[15] 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.

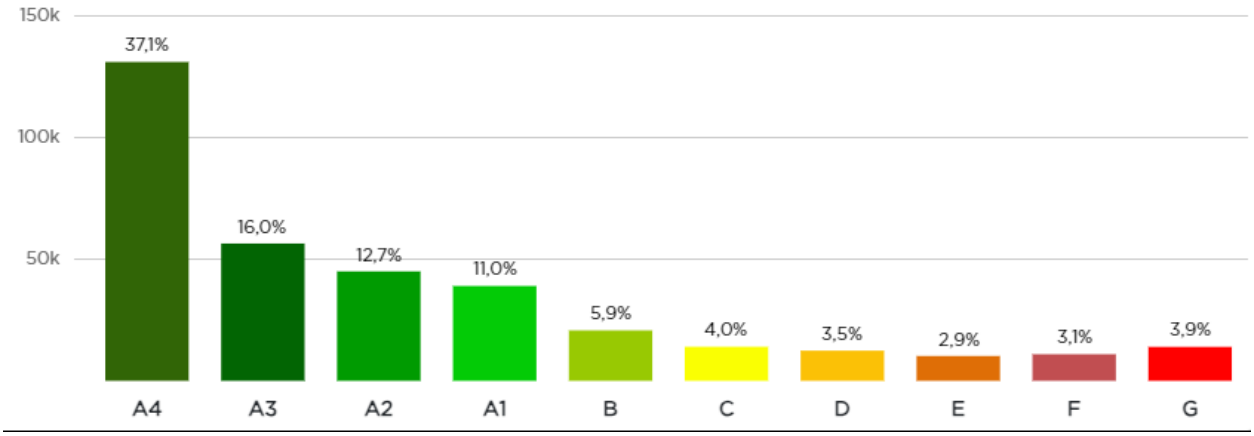


Figure 12 – Distribution (%) of EPC labels for buildings built in 2015-2020
Source: SIAPE data

Finally, filtering on new residential properties built after 2015 only, Figure 13 shows the distribution of EPCs in the SIAPE database. An additional filter on the year of EPC issuance is applied to analyze 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.

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

This result is also coherent with the rate of new constructions concerning the Italian stock in the last years. Overall, 98.4% of newly-built properties present an EPC equal or better to the C class.

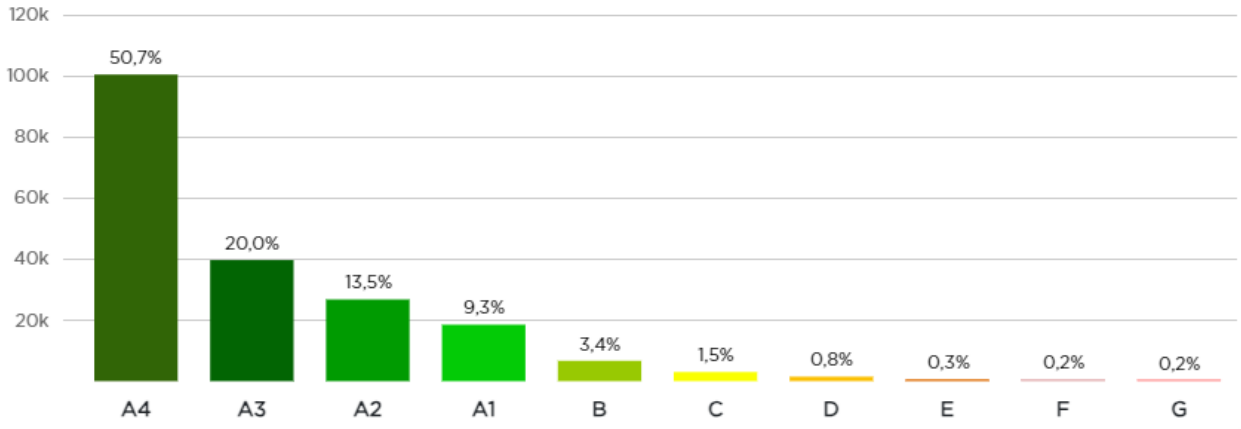


Figure 13 – Distribution (%) of EPC labels for new residential buildings after 2015
Source: SIAPE data

2.1.4. CRITERION 3: NEW BUILDING: NEW PROPERTIES ARE ELIGIBLE ONLY IF THESE ARE HIGHLY EFFICIENT (NZEB-10%).

The following methodology aims to identify the energy performance "threshold" below which a building can be considered energy-efficient under the section 7.1 of the TSC. In particular, CRIF analyzed the requirement of: *"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 EU taxonomy has criteria based on an index of energy demand deriving from the EPC. The primary energy demand (PED) is defined as *"The calculated amount of energy needed to meet the energy demand associated with the typical uses of a building expressed by a numeric indicator of total primary energy use in kWh/m^2 per year and based on the relevant national calculation methodology and as displayed on the Energy Performance Certificate (EPC)".*

An EPC database contains a significant data and information about each property for which an EPC has been released, and some of this information is needed to evaluate a property under the TSC. Starting with an EPC, it is necessary and sufficient to have the EPgl,nren (PED in the Italian EPC) value for each dwelling, EPgl,nren expressed the non-renewable primary energy used by the construction. EPCs have been analyzed by CRIF and CTI to define this criterion in terms of PED in the Italian context, following the insights of data. Aggregated data or simulations have

been used for clusters of properties with a number of certificates not statistically significant. As an example, to identify the "threshold" for buildings having a performance 10% better than so-called "nZEBs" (nearly Zero-Energy Buildings), aggregated data has been used due to the lack of information. In fact, nZEBs buildings are a very energy-efficient subset of the national building stock, but they are not uniformly present on the territory and for all building types. For the categories for which it was possible to collect sufficient data even after a data quality process, such as residential properties in colder climates, the maximum consumption of properties classified as NZEB was calculated, and then the 90th percentile was subsequently selected. In cases of the insignificant sample, expert thresholds were obtained also thanks to aggregated data.

The thresholds defined by CRIF-CTI for newly built residential properties are shown in the table below:

Year of construction > 2020	**Climate zone**					
	A	**B**	**C**	**D**	**E**	**F**
Residential properties	45	45	50	55	70	70
Commercial properties	150	150	160	160	180	180
Properties used as offices	105	105	110	115	120	120
Properties for tourist-hotel use	180	180	190	190	200	210
Buildings for Workshop-Industrial-Agricultural use	110	110	115	115	120	125
Other commercial properties	150	150	160	165	170	175

Table 8 – Threshold for Substantial Contribution to Climate Change Mitigation: Construction of new buildings[16]

If the year of construction is not available, this criterion is applied to the properties as it is the most stringent of the 4 criteria.

[16] Percentage distribution of primary energy (Ep) values in the Italian national building stock https://energyefficientmortgages.eu/wp-content/uploads/2022/12/Percentage-distribution-of-primary-energy-Ep-values-in-the-Italian-national-building-stock-1.pdf

2.2. RENOVATIONS OF EXISTING BUILDINGS AND RELATED TAX INCENTIVES

As stated in the bank's green bond framework, in the eligible green buildings' category falls the acquisition of tax incentives, put in place by Italian and other UE mechanism, dedicated to the improvement of energy efficiency for buildings. The relevant tax incentive in Italy are denominated: "Ecobonus" and "Superbonus".

2.2.1. ECOBONUS

Ecobonus is the tax incentive for interventions that increase the level of energy efficiency of buildings, introduced by the 2007 financial law (article 1, paragraphs 344 to 349, of law 296/2006), and is currently governed by the article 14 of Legislative Decree 63/2013.

The benefit consists of a deduction from the IRPEF[17] or IRES[18], to be divided into 10 annual installments of the same amount, the amount of which varies depending on whether the intervention concerns a single real estate unit or a condominium buildings and the year in which it is carried out. At the state of the current Italian budget law, the relief can be requested for expenses incurred by 31 December 2025. However, after 30 March 2024, the option to transfer the tax credit to a third party or to receive an upfront discount on the invoice for Ecobonus-eligible works is no longer available.

Following 30 March 2024, certain aspects of the tax benefits were confirmed: the ten-year installment plan for specific bonuses remains in effect, and the utilization of building bonus tax credits is still permitted even if the beneficiary has existing debts with tax collection agencies.

Conversely, new measures were introduced, including stricter anti-fraud regulations concerning the assignment of ACE (Aid for Economic Growth) credits, more stringent rules for managing "dormant" CILAS (Simplified Building Permit Communication) filings, and a gradual reduction (decalage) of the 50% rate applicable to the building renovation bonus.

For most interventions the tax deduction is equal to 65%, for others it is 50%. They fall into the following categories:

- the purchase and installation of windows including frames;
- the purchase and installation of solar shading;

[17] Personal income tax (IRPEF) is tax payable by natural persons in receipt of various type of incomes
https://www.agenziaentrate.gov.it/portale/web/english/personal-income-tax-what-it-is

[18] IRES is the corporate income tax
https://www.agenziaentrate.gov.it/portale/web/english/corporate-income-tax-ires

- the purchase and installation of winter air conditioning systems equipped with heat generators powered by combustible biomass;
- the replacement of winter air conditioning systems with systems equipped with condensing boilers with efficiency at least equal to class A or with systems equipped with heat generators powered by combustible biomass (however, the greater deduction of 65% is due if the boilers, in addition to be at least in class A, they are also equipped with advanced thermoregulation systems).;

For interventions carried out on the common parts of condominium buildings or which affect all the real estate units that make up the single condominium, different rules and measures are envisaged. When certain energy performance indices are achieved, higher deductions can be made (70% or 75%).

For interventions on the common parts of condominium buildings located in seismic zones 1, 2 and 3, aimed jointly at reducing seismic risk and energy requalification, an even higher deduction is envisaged, equal to 80%, if the interventions determine the passage to a lower risk class, i.e. 85%, if the interventions determine the passage to two lower risk classes.

If the legislation in force still allows it (article 121, Legislative Decree 34/2020; Legislative Decree 11/2023), those entitled to the benefit can opt, as an alternative to directly using the deduction:

- for a contribution in the form of a discount on the fee due, up to a maximum amount equal to the fee itself, advanced by the supplier who carried out the interventions (so-called "invoice discount") and recovered by the latter in the form of a tax credit
- for the transfer of a tax credit to other subjects corresponding to the deduction due.

Three further credit transfers are possible, but only if carried out in favor of:

- registered banks and financial intermediaries
- companies belonging to a registered banking group
- insurance companies authorized to operate in Italy.

2.2.2. SUPERBONUS

The Superbonus is the tax benefit regulated by article 119 of legislative decree no. 34/2020 ("relaunch decree"), which consists of a 110% tax deduction of expenses incurred starting from 1 July 2020 for the implementation of specific interventions aimed at energy efficiency and static consolidation or reducing the seismic risk of buildings. The subsidized interventions also include the installation of photovoltaic systems and infrastructure for charging electric vehicles in buildings.

The benefit comes alongside the deductions, already in force for many years, due for energy requalification interventions of buildings (ecobonus) and for those for the recovery of the building heritage, including anti-seismic ones (sismabonus), currently regulated, respectively, by the articles 14 and 16 of the legislative decree n. 63/2013.

The 2022 Budget Law extended the relief, providing for different deadlines depending on the subjects who support the eligible expenses. In particular, the Superbonus is due to until 31 December 2025, in the following measures:

- 110% for expenses incurred until 31 December 2023
- 70% for expenses incurred in 2024
- 65% for expenses incurred in 2025

for condominiums and natural persons, outside the exercise of business, artistic and professional activities, for interventions on buildings consisting of two to four distinctly registered real estate units, even if owned by a single owner or co-owned by several natural persons.

This includes interventions carried out by natural persons on individual real estate units within the same condominium or the same building, as well as those carried out on buildings subject to demolition and reconstruction. The deduction must be divided into five equal annual installments.

Same expiry date also for interventions carried out by non-profit organizations voluntary organizations and social promotion associations registered in the appropriate registers.

a. until 31 December 2022 (with 110% deduction), for interventions carried out by natural persons on single-family buildings, provided that at 30 September 2022 works for at least 30% of the overall intervention have been carried out
b. until 31 December 2023 (with 110% deduction), for interventions carried out by the IACP (and entities with the same social purposes) on properties, owned or managed on behalf of the municipalities, used for public residential buildings, provided that at 30 June 2023, work has been carried out for at least 60% of the overall

intervention. Same deadline also for undivided ownership housing cooperatives for interventions on properties assigned for use to their members.

As an alternative to the tax deduction, it is possible to benefit from the Superbonus through one of the methods provided for in Article 121 of Legislative Decree no. 34/2020. Pratically, it is possible to opt for an advance contribution in the form of a discount applied by the suppliers of the goods or services for the assignment of the credit corresponding to the tax deduction due.

The Superbonus is due in case of the following “main” or “driving” or “key” interventions:

- thermal insulation interventions on the casings
- replacement of winter air conditioning systems in common areas replacement of winter air
- conditioning systems on single-family buildings or on the real estate units of functionally independent multi-family buildings
- anti-seismic interventions.

In addition to the key interventions listed above, the Superbonus also includes expenses for interventions carried out together with at least one of the “driving” interventions. These are:

- energy efficiency interventions
- installation of photovoltaic solar systems and storage systems infrastructure for charging electric vehicles
- interventions to eliminate architectural barriers (16-bis, letter e of the TUIR).

The deduction is recognized in the amount described above and must be divided among those entitled, for expenses incurred starting from 1 January 2022 within the capacity limits of the annual tax deriving from the tax return.

As an alternative to directly using the deduction, it is possible to opt for an advance contribution in the form of a discount applied by the suppliers of the goods or services (discount on the invoice) or for the assignment of the credit corresponding to the deduction due.

The transfer can be arranged in favor of:

- of the suppliers of the goods and services necessary for the implementation of the interventions
- of other subjects (natural persons, including those carrying out self-employed or business activities, companies and organizations)
- of credit institutions and financial intermediaries.

As part of the CREDEM ECOBONUS project, the bank offered its customers the possibility of transferring tax credits linked to Superbonus, Ecobonus.

The bank was thus able to collect, for each practice relating to one or more building interventions and in the cases for which they were required by law, the pre- and post-renovation energy performance certificates of the buildings.

For the purposes of the portfolio analysis, for each practice, only the tax incentives related to energy efficiency interventions identified by the following tax codes were taken into consideration:

TAX CODE	DESCRIPTION
6921	SUPERBONUS ART. 119 DL N. 34/2020 - USE IN COMPENSATION OF CREDIT FOR TRANSFER OR DISCOUNT - ART. 121 DL No. 34/2020
6922	ECOBONUS ART. 14 DL N. 63/2013 AND PHOTOVOLTAIC SYSTEMS ART. 16-BIS, PARAGRAPH 1, LETT. H), OF THE TUIR - USE IN COMPENSATION OF CREDIT FOR TRANSFER OR DISCOUNT ART. 121 DL No. 34/2020
6924	CHARGING COLUMNS ART. 16-TER DL N. 63/2013 - USE IN COMPENSATION OF CREDIT FOR TRANSFER OR DISCOUNT - ART. 121 DL No. 34/2020
7701	CREDIT TRANSFER - SUPERBONUS ART. 119 AND 121 DL N. 34/2020 - ART. 121 DL No. 34/2020
7702	CREDIT TRANSFER - ECOBONUS ART. 14 DL N. 63/2013 AND PHOTOVOLTAIC SYSTEMS ART. 16-BIS, PARAGRAPH 1, LETT. H), OF THE TUIR - ART. 121 DL No. 34/2020
7704	CREDIT TRANSFER - TOP UP COLUMNS ART. 16-TER DL N. 63/2013 - ART. 121 DL No. 34/2020
7708	CREDIT TRANSFER - SUPERBONUS ART. 119 DL N. 34/2020 ART. 121 DL N. 34/2020 OPTIONS FROM 01/11/2022
7709	CREDIT TRANSFER - SUPERBONUS ART. 119 DL N. 34/2020 ART. 121 DL N. 34/2020 OPTIONS FROM 04/01/2023
7711	DISCOUNT - SUPERBONUS ART. 119 DL N. 34/2020 - ART. 121 DL No. 34/2020
7712	DISCOUNT - ECOBONUS ART. 14 DL N. 63/2013 AND PHOTOVOLTAIC SYSTEMS ART. 16-BIS, PARAGRAPH 1, LETT. H), OF THE TUIR - ART. 121 DL No. 34/2020
7718	DISCOUNT - SUPERBONUS ART. 119 DL N. 34/2020 ART. 121 DL N. 34/2020 - OPTIONS FROM 01/11/2022
7719	DISCOUNT - SUPERBONUS ART. 119 DL N. 34/2020 ART. 121 DL N. 34/2020 - OPTIONS FROM 04/01/2023

The tax codes relating to the SUPERBONUS (6921, 7701, 7708, 7709, 7711, 7718, 7719) can however refer to both energy efficiency intervention and seismic risk reduction.

In this case, three situations can occur, based on the type of underlying interventions:

1. If the building interventions that benefit from the SUPERBONUS rate underlying the individual practice are exclusively energy efficiency interventions, the amount transferred relating to SUPERBONUS tax codes is considered in full.

2. If the construction interventions benefiting from the SUPERBONUS rate underlying the individual practice are exclusively seismic risk reduction interventions, the amount transferred relating to SUPERBONUS tax codes is not considered.

3. If among the construction interventions benefiting from the SUPERBONUS rate underlying the individual practice there is at least one seismic risk reduction intervention, the amount transferred relating to SUPERBONUS tax codes is considered only for the part relating to the energy efficiency interventions.

3. CREDEM PORTFOLIO ANALYSIS

3.1. MORTGAGES FOR CONSTRUCTION AND/OR ACQUISITION OF RESIDENTIAL AND NON-RESIDENTIAL BUILDINGS

The portfolio includes 9,268 mortgages up to 30.09.2025, and the current financing amount accounts for 1,657 billion euros. One of the main findings is that green mortgages have increased significantly after the second half of the last decade, with 98% of the total origination (9,061) occurring after 2015. Although 94% of mortgages are secured by residential properties, these properties only account for 71% of the total value of the eligible portfolio.

Type of Loan	# Eligible Mortgages	% Eligible Mortgages	Current financing amount € mln	% Current financing amount
Residential	8,677	94%	1,169	71%
Non-Residential	591	6%	488	29%
Grand Total	**9,268**	**100%**	**1,657**	**100%**

Table 9a – Eligible mortgages per Type of Loan[19]

Year of Origination	# Eligible Mortgages	% Eligible Mortgages	Current financing amount € mln	% Current financing amount
<=2010	97	1%	12	1%
2010-2015	110	1%	28	2%
2015-2020	3,915	42%	613	37%
>2020	5,146	56%	1,004	61%
Grand Total	**9,268**	**100%**	**1,657**	**100%**

Table 9b – Eligible mortgages per Year of Origination[20]

This report provides an overview of the portfolio's composition and performance. The portfolio consists mainly of residential buildings, which account for 94% of the eligible assets. Industrial buildings represent only 2% of the portfolio, while non-residential buildings make up the remaining 4%. Furthermore, most of the buildings are located in climate zone E, which is typical of the Po Valley. About 63% of the buildings are situated in this zone, while the rest are distributed among the other zones.

[19] Source: CRIF elaboration on CREDEM portfolio
[20] Source: CRIF elaboration on CREDEM portfolio

Eligible Buildings	# Buildings	%Buildings
Residential	8,799	94%
Non-Residential	378	4%
Industrial	222	2%
Grand Total	**9,399**	**100%**

Climate zones	# Buildings	% Buildings
A	7	0%
B	509	5%
C	1,646	18%
D	1,168	12%
E	5,927	63%
F	142	2%
Grand Total	**9,399**	**100%**

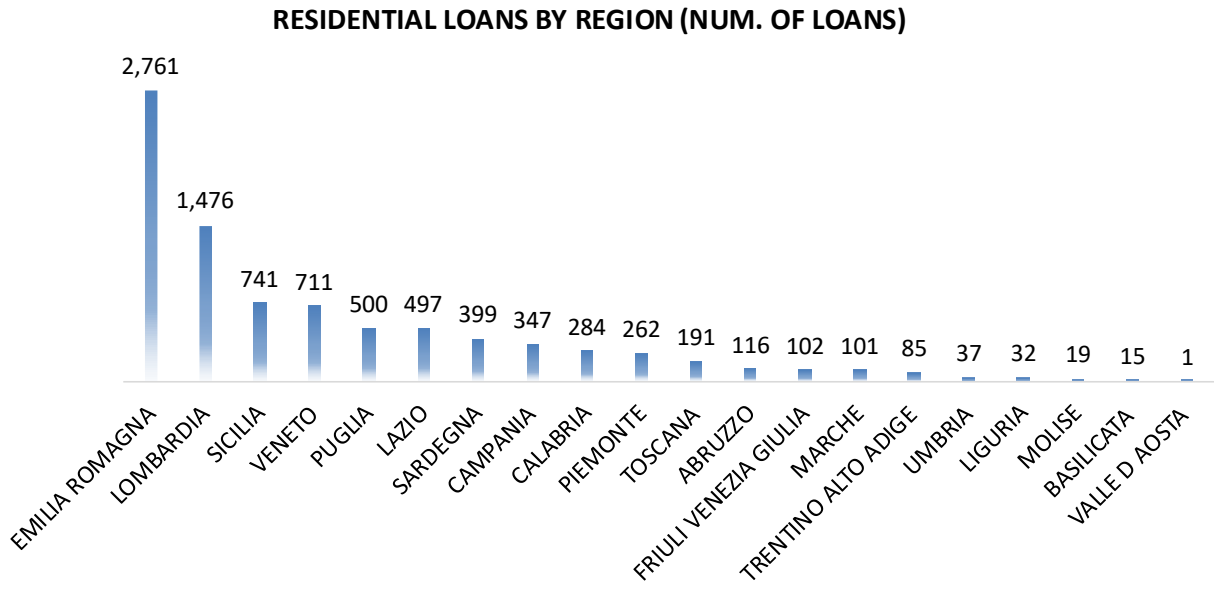
Table 10 – Eligible buildings per type and climate zones

Source: CRIF elaboration on CREDEM portfolio

The picture illustrates how many buildings in different regions meet the eligibility. Each green point on the map represents a building that is eligible, and most of them are located in the northern regions of the countries, such as Milano urban area and cities along the via emilia in Emilia-Romagna region where the bank has it headquarter and a strong territorial presence.

Figure 14 – Distribution (%) of EPC labels for new residential buildings in 2016-2024
Source: CRIF elaboration on CREDEM portfolio

Below is a breakdown of properties by type and region. Around 50 percent of residential properties are located in Lombardia and Emilia-Romagna, and these mortgages are worth 619 million euros.



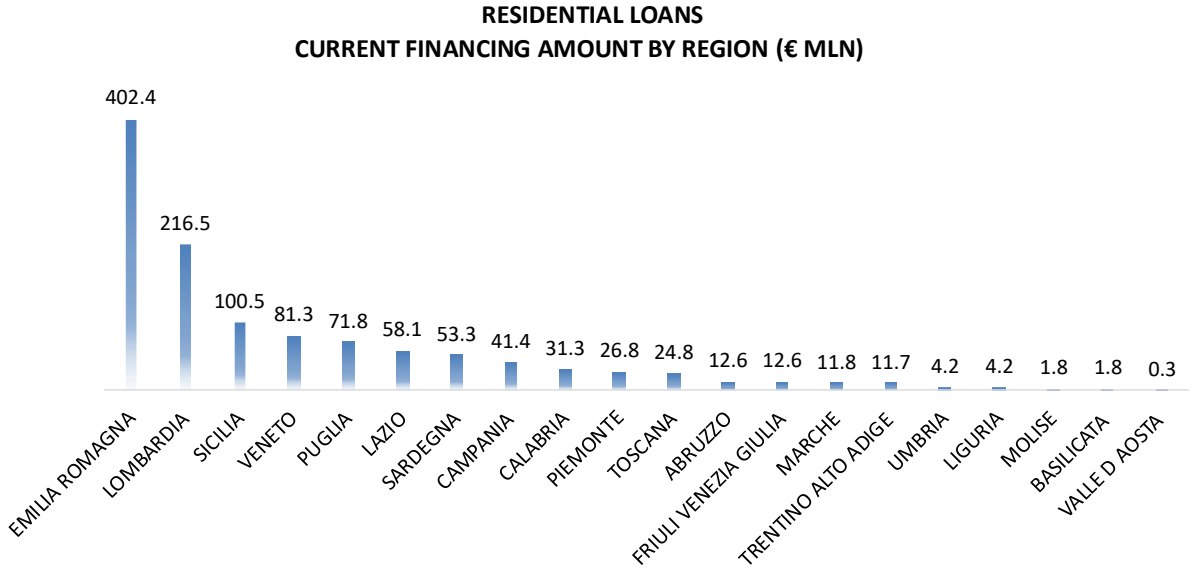
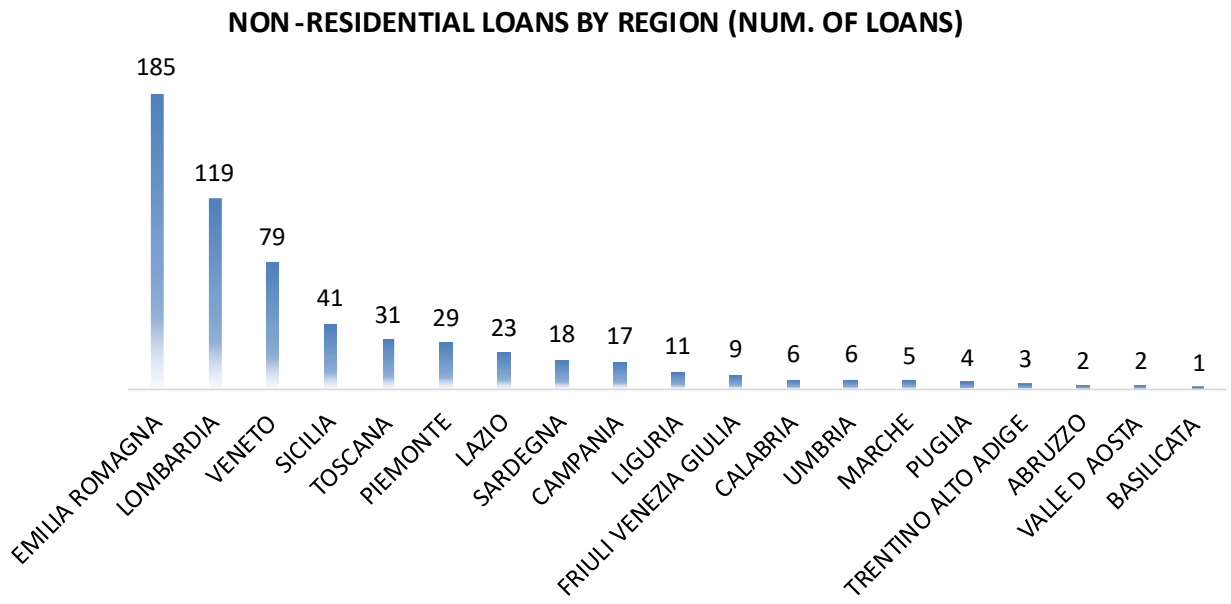


Figure 15 – Distribution by regions
Source: CRIF elaboration on CREDEM portfolio

Non-residential ones, on the other hand, are also concentrated in Emilia Romagna and Lombardia for half of it, amounting to 304 million euros.



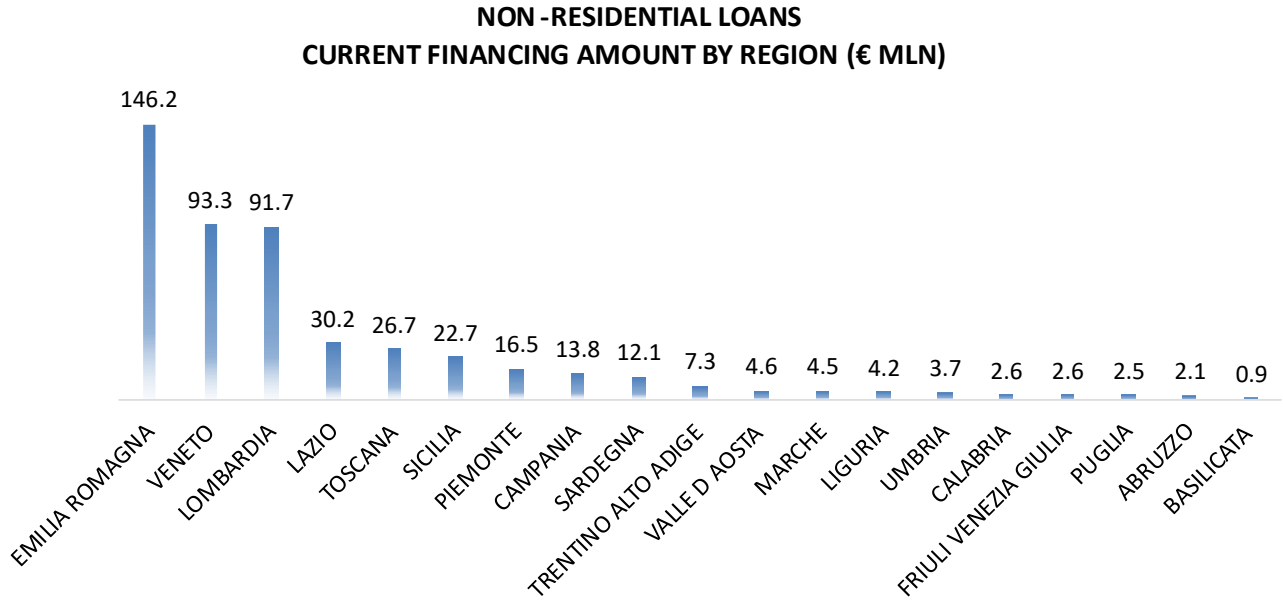


Figure 16 – Distribution by regions
Source: CRIF elaboration on CREDEM portfolio

The regional distribution of real estate properties is analyzed based on the macro-areas defined by ISTAT, the Italian National Statistical Institute. The regions are grouped into four macro-areas: North-West, North-East, Center and South. The North-West includes Valle d'Aosta, Lombardia, Piemonte, and Liguria; the North-East comprises Veneto, Trentino Alto Adige, Friuli Venezia Giulia, and Emilia Romagna; the Center consists of Toscana, Lazio, Marche and Umbria; and the South covers Abruzzo, Molise, Campania, Basilicata, Puglia, Calabria, Sicilia and Sardegna. The graphs below illustrate the percentage of buildings and current financing amount by macro-area for residential and non-residential properties. It can be observed that the North-East has the highest share of both types of properties, accounting for 42% of the residential properties and 47% for non-residential.

For residential properties, the second macro-area is the South with 28% of properties and 24% of amount while North-West and Center are the least important and together count for 30% of mortgages and 31% of financing amount.

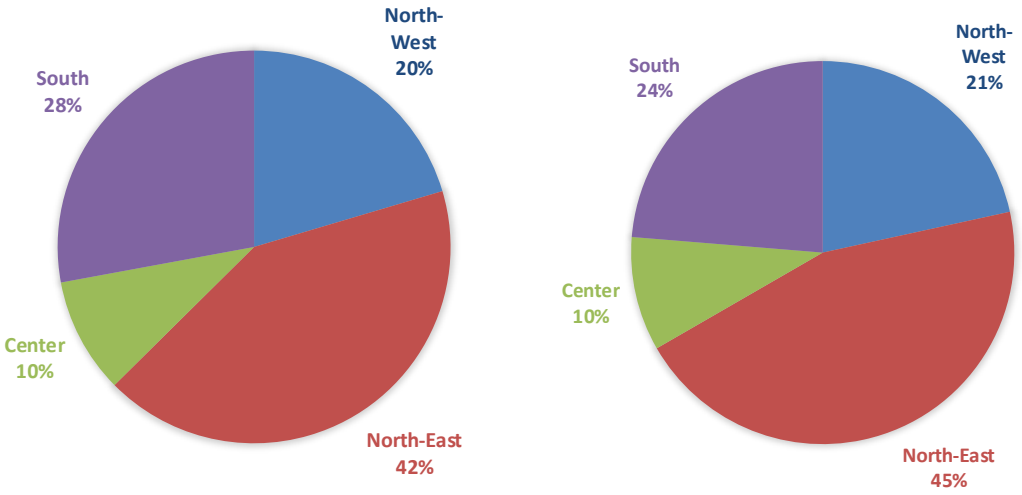


Figure 17a – Distribution of eligible residential properties according to the area breakdown (left) and Distribution of the current financing amount for residential properties (right)
Source: CRIF elaboration on CREDEM portfolio

As already mentioned, looking at non-residential properties distribution shows that North-East is the most important macro-area accounting for 47% of the portfolio. Half of building portfolios are in other Italian macro-areas.

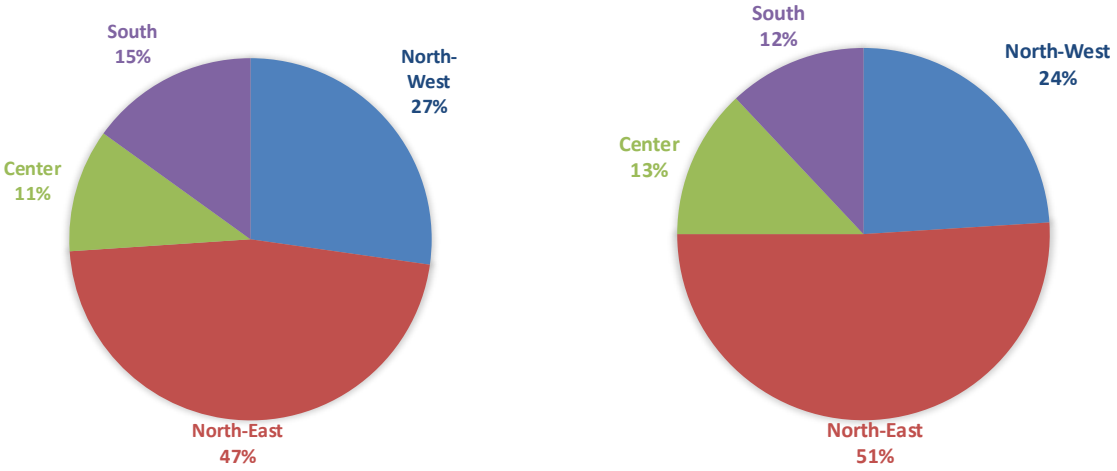


Figure 17b – Distribution of eligible non-residential properties according to the area breakdown (left) and Distribution of the current financing amount for non-residential properties (right)
Source: CRIF elaboration on CREDEM portfolio

3.1.1. APPLICATION OF ELIGIBILITY CRITERIA

This section presents the results of applying the eligibility criteria from Chapter 2 to the Portfolios. The following table summarizes the criteria already defined in the previous paragraphs. The eligible financing amount is determined by the type of building and the energy performance certificate (EPC) and the Year of construction. If the construction's year is missing, but PED is available the building is evaluated using the most stringent criterion, NZEB−10%, but will be classified under criterion 1.1 or 1.2 if it is residential or non-residential respectively.

Eligibility Criterion	Type of building	Criterion	KPI
1.1	**Residential**	TOP15%	EPC Label and PED
1.2	**Non-Residential**	TOP15%	EPC Label and PED
2	**Residential**	TOP15%	Year of Construction (without EPC, built 2016-20)
3	**All**	NZEB-10%	PED

Table 11 – Eligible mortgages per criterion

Source: CRIF elaboration on CREDEM portfolio

The following table shows the distribution between eligibility criteria of the sample in terms of number of mortgages and current financing amount.

Eligibility Criterion	# Mortgage	% Mortgage	Current financing amount in € mln	% Current financing amount
1.1 - Residential - TOP15%	4,425	48%	605	36%
1.2 – Non-Residential - TOP15%	392	4%	203	12%
2 - Residential - 2016-2020	2,759	30%	301	18%
3 - NZEB-10%	1,692	18%	548	33%
Grand Total	**9,268**	**100%**	**1,657**	**100%**

Table 12 – Eligible mortgages per criterion

Source: CRIF elaboration on CREDEM portfolio

The portfolio consists of four categories: residential buildings built before 2020 with an EPC rating, residential buildings without EPC rating and built between 2016 and 2020, business buildings, and new constructions. The total value of the portfolio is 1.65 billion euros.

The largest category is residential buildings with EPC ratings, which account for 36% of the portfolio value and 48% of the number of mortgages. These are buildings that have an energy performance certificate (EPC) rating between A and C. The second largest category is residential buildings without EPC ratings, which account for 18% of the portfolio value and 30% of the number of mortgages. These are buildings that do not have an EPC rating and have

been built between 2016 and 2020. Non-residential buildings, which account for 12% of the portfolio value and 4% of the number of mortgages. These are buildings that are used for commercial purposes and have a variety of EPC ratings. New construction accounts for 33% of the portfolio value and 18% of the number of mortgages. These are buildings that are built after 2021 and satisfy the criterion 3 (NZEB -10%).

As already mentioned, the portfolio consists of various types of properties with different levels of energy efficiency. The most efficient properties are those with an EPC label A, which represents 51% of the portfolio (including NZEB -10%). These are mainly residential properties, and many of them are new constructions that comply with the highest standards of energy performance. The second most efficient category is EPC label B, which accounts for 14% of the portfolio. The 30% of the portfolio does not have an EPC label yet. This means that their energy performance is unknown, but they have been built under new construction law, and as SIAPE shows, there are high probabilities that they are highly efficient.

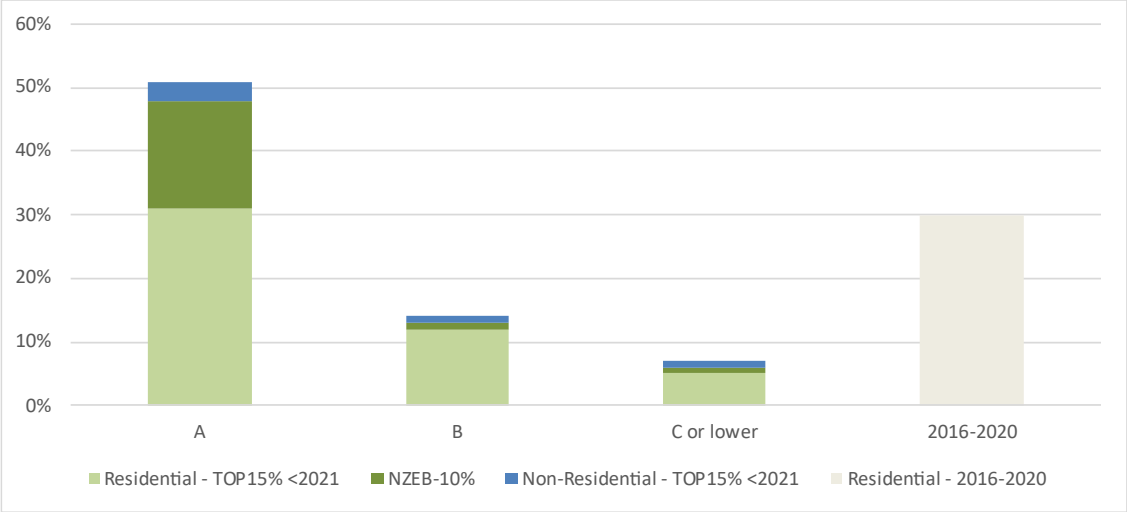


Figure 18 – Distribution of eligible properties according to EPC label
Source: CRIF elaboration on CREDEM portfolio

The following table shows the distribution of a portfolio of mortgages by eligibility criteria and year of origination. The amount is expressed as a number of loans and current financing amount.

	Criterion	Loan origination	Number of loans	Current financing amount (mln €)
1. EPC	1.1 Residential (TOP15% <2021)	<=2015	133	11.2
		2016	108	9.7
		2017	172	17.9
		2018	216	25.5
		2019	485	58.2
		2020	710	90.9
		2021	584	75.9
		2022	275	40.3
		2023	196	28.0
		2024	710	109.8
		2025	836	137.3
	TOTAL CRITERION 1.1		**4,425**	**604.7**
	1.2 Non-Residential (TOP15% <2021)	<=2015	51	24.3
		2016	47	26.7
		2017	72	40.8
		2018	56	31.8
		2019	40	25.2
		2020	22	11.2
		2021	13	7.7
		2022	13	2.5
		2023	7	2.3
		2024	34	17.5
		2025	37	13.2
	TOTAL CRITERION 1.2		**392**	**203.2**
2. CONSTRUCTION YEAR *(2016-2020)*	Residential	<=2015	9	1.3
		2016	274	22.6
		2017	309	25.5
		2018	281	30.1
		2019	503	51.5
		2020	569	66.1

		2021	405	49.3
		2022	145	19.1
		2023	197	26.2
		2024	60	8.2
		2025	7	1.0
	TOTAL CRITERION 2		**2,759**	**300.9**
3. NZEB-10%	<=2015		14	4.0
	2016		2	0.8
	2017		2	2.8
	2018		6	14.6
	2019		19	41.1
	2020		22	20.1
	2021		165	59.8
	2022		196	65.2
	2023		148	75.7
	2024		493	136.1
	2025		625	128.3
	TOTAL CRITERION 3		**1,692**	**548.4**
	TOTAL		**9,268**	**1,657.2**

Table 13 – Eligible mortgages per criterion and year of origination

Source: CRIF elaboration on CREDEM portfolio

The table has the following entries:

- 4,425 mortgages (48%) count for 36% of the total amount, and they are related to residential buildings with EPC and built before 2020.
- 12% of the amount is related to non-residential buildings with EPC and built before 2020 (203 million euros).
- 18% of the amount is related to buildings without EPC and built between 2016 and 2020 (300 million euros and 2,759 mortgages).
- 33% of the portfolio (548 million euros) is related to buildings with high efficiency.

The table suggests that most of the portfolio is composed of residential mortgages. It also indicates that a significant portion of the mortgages were originated in the last ten years. Only a small fraction of the portfolio is related to newer buildings with EPC.

The figure 19 shows the distribution of energy performance certificates (EPC) for the different criteria of buildings. The figure also shows the percentage of mortgages and the percentage of current financing amount for each EPC label. According to the figure 19, the buildings under criterion 3 have the highest proportion of EPC label A, with about 81% of buildings and 84% of the current financing amount. The same trend is observed for criterion 1.1, where EPC label A accounts for about 64% of buildings and more than 66% of the current financing amount. These results indicate that the buildings under criteria 1.1 and 3 are more energy efficient than the average. On the other hand, the buildings under criterion 1.2 have a lower share of EPC label A, with only about 55% of buildings and 62% of the current financing amount. Moreover, the buildings under criterion 1.2 have a higher share of EPC label C or lower, with about 25% of buildings and 18% of the current financing amount.

Figure 19 – Distribution of eligible properties according to EPC label and criterion
Source: CRIF elaboration on CREDEM portfolio

The figure 20 shows the distribution of buildings by year of construction and eligibility criteria. Criterion 3 is the most restrictive and only applies to buildings built after 2021. In CREDEM's portfolio, all buildings eligible under criterion 3 have been built after 2021. Criterion 2 is less restrictive and applies to buildings built between 2016 and 2020, with a slight decrease over time. In particular, 23% were built in 2017, 19% in 2018 and 17% in 2019. Criterion 1.1 and 1.2 are applied to buildings built before 2021. The figure suggests that non-residential buildings are newer than other types of buildings on average.

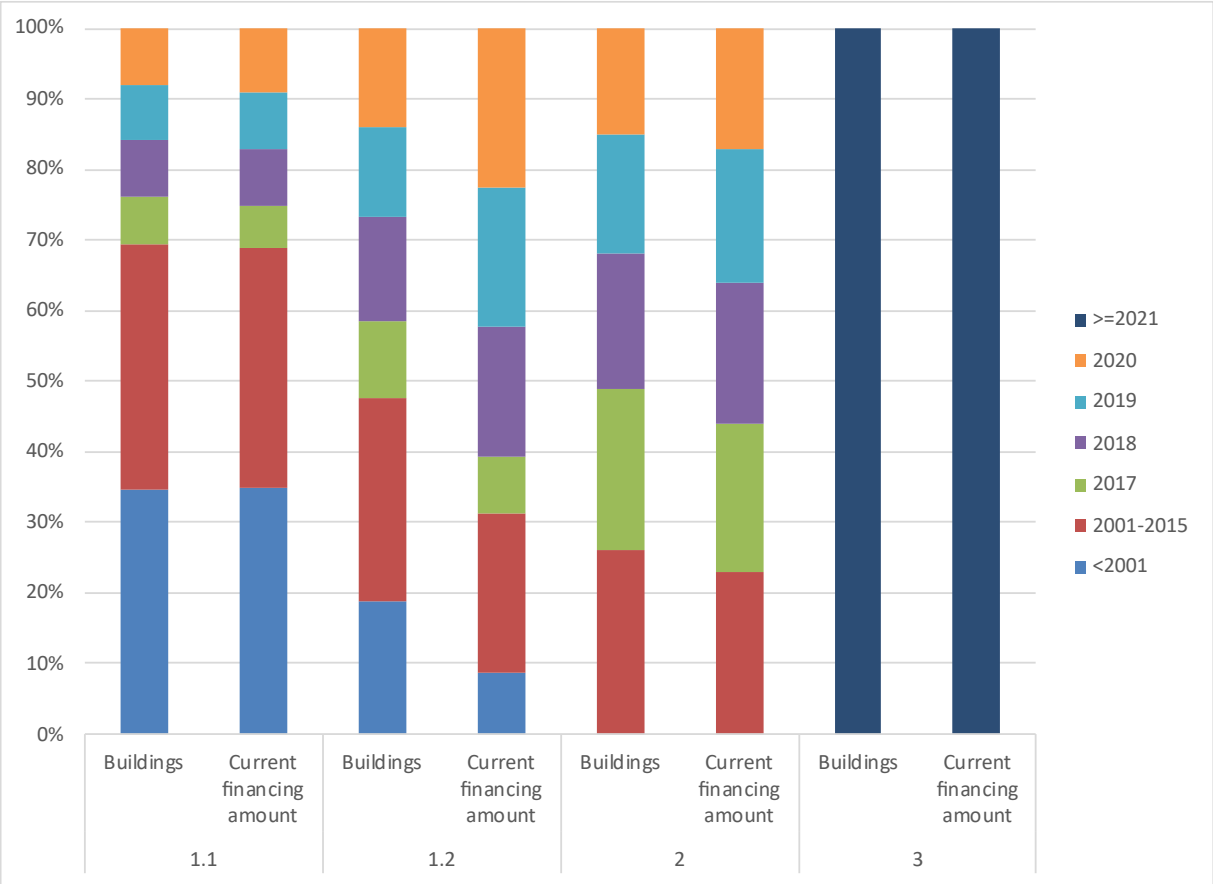


Figure 20 – Distribution of eligible properties according to year of construction and criterion
Source: CRIF elaboration on CREDEM portfolio

3.2. TAX INCENTIVES RELATED TO BUILDING RENOVATION

The perimeter has been maintained consistently with previous reports, and no new practices have emerged during the reporting period. **Tax incentives related to efficiency renovation are 11,704 and correspond to 122 mln €.** Analyzing the EPC, 97% of the renovations have leaded to a reduction of primary energy demand (PED) of at least 30%, thus these renovations comply with EU Taxonomy TSC 7.2 for Renovation of existing buildings (par 1.6.1). This section provides an overview of the characteristics of the portfolio's tax incentives. The next table provide the distribution of the incentives based on the tax code list presented in paragraph 2.2.

TAX CODE	# Tax incentives	% Tax incentives	Current financing amount € mln	% Current financing amount
7701	4,140	35%	16	13%
7711	2,650	23%	16	13%
6921	1,882	16%	12	10%
7708	1,198	10%	16	14%
7709	1,139	10%	22	18%
7719	349	3%	30	25%
7718	302	3%	9	8%
7702	33	0%	0	0%
6922	11	0%	0	0%
Grand Total	**11,704**	**100%**	**122**	**100%**

Table – Tax incentives per tax code

Source: CRIF elaboration on CREDEM portfolio

The next table provide the distribution of the incentives based on their maturity year:

Maturity year	# Tax incentives	% Tax incentives	Current financing amount € mln	% Current financing amount
2026	10,215	87.3%	65	53.3%
2027	1,421	12.1%	56	46.0%
2028	26	0.2%	<0,1	0.2%
2030	4	<0.1%	<0,1	<0.1%
2031	14	0.1%	<0,1	0.2%
2032	21	0.2%	<0,1	0.3%
2033	3	<0.1%	<0,1	<0.1%
Grand Total	**11,704**	**100%**	**122**	**100%**

Tax incentives per maturity date

Source: CRIF elaboration on CREDEM portfolio

The next table provide the distribution of the incentives based on the region where the building renovation took place:

Region	# Tax incentives	% Tax incentives	Current financing amount € mln	% Current financing amount
Emilia Romagna	4,190	36%	48	39%
Sicilia	885	8%	8	7%
Lombardia	870	7%	11	9%
Puglia	856	7%	7	6%
Veneto	781	7%	6	5%
Sardegna	726	6%	5	4%
Piemonte	694	6%	7	6%
Campania	694	6%	9	7%
Toscana	637	5%	4	3%
Lazio	496	4%	5	4%
Calabria	343	3%	5	4%
Marche	140	1%	1	1%
Basilicata	83	1%	1	1%
Friuli Venezia Giulia	77	1%	1	1%
Liguria	69	1%	1	1%
Abruzzo	55	0.5%	1	1%
Umbria	40	0.3%	<0.1	0.3%
Molise	37	0.3%	<0.1	0.3%
Trentino-Alto Adige	26	0.2%	<0.1	0.2%
Valle d'Aosta	5	<0.1%	<0.1	<0.1%
Grand Total	**11,704**	**100%**	**122**	**100%**

Tax incentives per region's building renovation

Source: CRIF elaboration on CREDEM portfolio

The next table provide the distribution of the incentives based on the underlying tax recipient:

Tax recipient	# Tax incentives	% Tax incentives	Current financing amount € mln	% Current financing amount
Private	6,260	53%	39	32%
Company	3,605	31%	62	51%
Condominium	1,839	16%	20	17%
Grand Total	**11,704**	**100%**	**122**	**100%**

Tax incentives per tax recipient

Source: CRIF elaboration on CREDEM portfolio

The next table provide the distribution of the incentives and buildings based on the region where the building renovation took place:

Region	# Tax incentives	% Tax incentives	# Eligible buildings	% Eligible buildings
Emilia Romagna	4,190	36%	915	38%
Sicilia	885	8%	143	6%
Lombardia	870	7%	193	8%
Puglia	856	7%	166	7%
Veneto	781	7%	159	7%
Sardegna	726	6%	158	7%
Piemonte	694	6%	119	5%
Campania	694	6%	103	4%
Toscana	637	5%	119	5%
Lazio	496	4%	93	4%
Calabria	343	3%	86	4%
Marche	140	1%	28	1%
Basilicata	83	1%	16	1%
Friuli Venezia Giulia	77	1%	20	1%
Liguria	69	1%	18	1%
Abruzzo	55	1%	15	1%
Umbria	40	0.3%	14	1%
Molise	37	0.3%	9	0.4%
Trentino-Alto Adige	26	0.2%	10	0.4%
Valle d'Aosta	5	0.0%	1	0.0%
Grand Total	**11,704**	**100%**	**2,385**	**100%**

Tax incentives and buildings per region's building renovation

Source: CRIF elaboration on CREDEM portfolio

4. EMISSIONS METHODOLOGY

This section provides an overview of CRIF's methodology to estimate avoided CO2 emissions of CREDEM's green buildings portfolio (following 'Portfolio') and for the renovations of existing buildings related to tax incentives:

4.1. GREEN BUILDINGS PORTFOLIO EMISSION METHODOLOGY

The assessment relies on four pillars:

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

4.1.1. CALCULATION OF BUILDINGS' GREENHOUSE GAS EMISSIONS

The calculation of GHG emissions of CREDEM's Green Buildings consists of three approaches:

1. CO2 emissions are available through a valid Energy Performance Certificate (following 'EPC'). Estimated CO2 emissions are the result of an automatic computation by professional software in line with national existing legislation on energy efficiency and the characteristics of the assets as provided by the real estate valuer. This approach is implemented for the largest share of the Portfolio.
2. CO2 emissions are valued through the attribution of a benchmark value based on EPC's data when the PED is missing. This approach is executed for a small portion of the Portfolio for which the EPC label and Primary Energy Demand are available but not CO2 emissions due to lack of data provided by regional energy cadasters.
3. CO2 emissions are the result of an automatic estimation performed by CRIF implementing the physical characteristics of the property.

4.1.2. IDENTIFICATION OF A NATIONAL BENCHMARK

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

In 2025, the reference value for emissions of residential properties in Italy was 37.3 kg per square meter per year. However, as shown on the left in figure 21, it varies according to the climatic zone. The energy consumption average for residential properties at national level is 185.3 kwh per square meter per year. This parameter depends on the climatic zone, it is higher for zone "F" (240) and from then progressively lower.

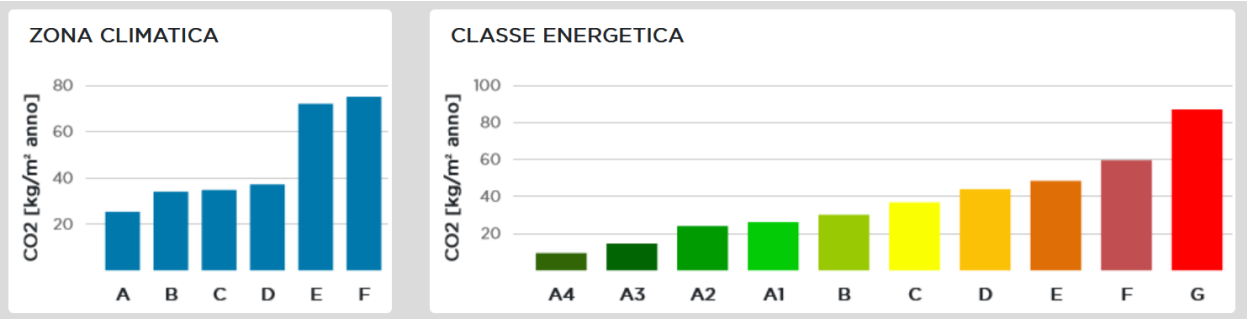


Figure 21 – Residential Buildings - Average of emissions for climate zone (zona climatica) and EPC label (classe energetica) from SIAPE portal

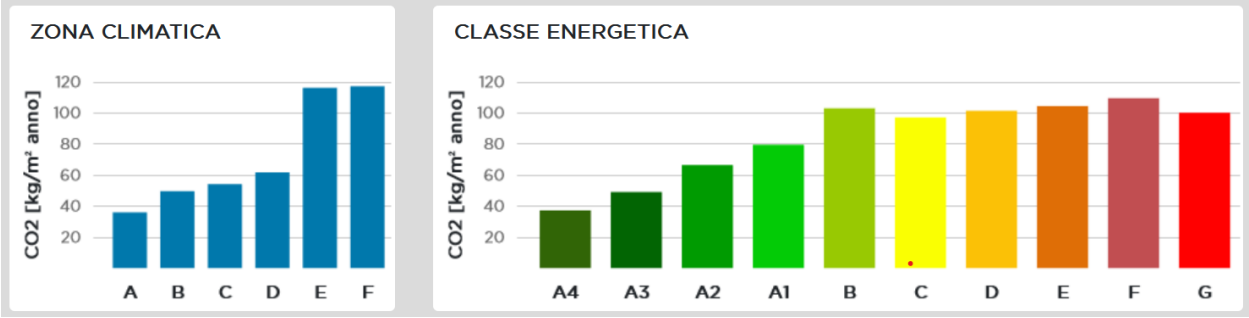


Figure 22 – Non-residential Buildings - Average of emissions for climate zone (zona climatica) and EPC label (classe energetica) from SIAPE portal

4.1.3. ATTRIBUTION OF EMISSIONS

To estimate CO2 emissions, as mentioned in paragraph 4.1.1, when Primary Energy Demand is available from EPC the following Italian market standard conversion factors are implemented[21]:

1. The CO2 emission conversion factor for natural gas is 0.1998 kg/m^3
2. The CO2 emission conversion factor for electricity consumption is 0.4332 tCO2/MWh

[21] Source: Circolare Ministero dello sviluppo economico 18.12.2014 Nomina del responsabile per la conservazione e l'uso razionale dell'energia di cui all'art. 19 della legge 9 gennaio 1991 n. 10 e all'articolo 7 comma 1, lettera e) del decreto ministeriale 28 dicembre 2012. Metodologia di valutazione dei consumi energetici e comunicazione degli stessi. Tabella 1. Contenuto energetico dei vari combustibili valevoli ai fini del calcolo del consumo energetico.

4.1.4. ATTRIBUTION OF EMISSIONS

The first step consists of the identification of a proper attribution factor: Loan-to-value (LTV)
Thus, the attribution is equal to the ratio of the outstanding amount at the time of GHG accounting (t) to the property value at loan origination[22] (t_0):

$$Attribution\ factor_t = \frac{Outstanding\ amount_t}{Property\ Value_{t_0}}$$

The attribution factor is constantly updated by changing the numerator following the mortgage repayment plan. The denominator remains constant over time, and it represents the whole value of properties (e.g. the sum of dwelling and garage values). A cap of 1 is applied to the attribution factor.[23]

4.1.5. FINANCED EMISSIONS

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

$$Financed\ emissions = \sum_i^t Attribution\ factor_{i,t} \times Estimated\ emissions_{i,t}$$

Where i = property in CREDEM's portfolio at time t.

Estimated emissions' calculation relies on **Section 1.1**. In the applied methodology, no distinction is made between private or corporate mortgages. Concerning energy and emissions data, higher limits have been applied to limit errors in data. The limits for emissions are 58 kg per square meter per year, which is the average emissions of buildings in the worst energy class. Instead, the upper limit for energy consumption is 300 kWh, the average of buildings with poor efficiency.

4.1.6. AVOIDED EMISSION

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

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

[23] The bank emission saving cannot be greater than the real one.

$$Avoided\ emission\ =\ [\ (\sum_i^t Attribution\ factor_{i,t}\ \times Benchmark\ emissions_{i,t}\ )\ -\ Financed\ emission_i\ ]\ \times Building\ surface_i$$

The formula expresses the total amount of savings in kg of CO_2 for the guarantees under investigation, considering the attribution factor and a market benchmark.

4.1.7. CALCULATION OF THE POSITIVE CARBON IMPACT

The Positive Carbon Impact (PCI) is calculated as the ratio between tonnes of CO2 emissions avoided and the total outstanding amount expressed in millions of euros, the PCI therefore measures the positive impact in tonnes per million euros:

$$PCI\ =\sum_i^n Avoided\ emissions_i\ /\ \sum_i^n Outstanding\ amount_i$$

4.1.8. ENERGY SAVING

Energy saving is determined as the difference between the benchmark and the non-renewable energy performance index ($EPgl_{nren}$) of the building multiplied by the building surface and the attribution factor described in chapter 4.1.4:

$$Energy\ savings\ =\sum_i^n [(EPgl_{nren})_{benchmark}\ -\ (EPgl_{nren})_i]\ \times Building\ surface_i\ \times Attribution\ factor_i$$

Where the $EPgl_{nren}$ is expressed in kWh/m^2 per year and the heated surface in m^2, the formula therefore expresses the annual saving of kWh.

4.2. EMISSION METHODOLOGY FOR RENOVATIONS OF EXISTING BUILDINGS RELATED TO TAX INCETIVES

The assessment relies on four steps:

- Collection of buildings' Greenhouse gas emissions before and after renovation;
- Calculation of avoided emissions from renovation
- Attribution of the avoided emission to the tax incentives
- Calculation of the Positive Carbon Impact

4.2.1. COLLECTION OF BUILDINGS' GREENHOUSE GAS EMISSIONS BEFORE AND AFTER RENOVATION

The CO2 emissions were obtained through digitalization of the pre- and post-renovation Energy Performance Certificates (Ape) obtained from the documentary platforms managed by the bank.

4.2.2. CALCULATION OF AVOIDED EMISSION FROM RENOVATION

The avoided emissions are calculated as the difference between the pre- and post-renovation CO2 emissions multiplied by the heated surface area of the property indicated on the EPC:

$$Building's\ renovation\ avoided\ emission = [\sum_{i}^{t} (CO_2\ emission)_{\ i,pre} - (CO_2\ emission)_{\ i,post}\ ] \times heated\ surface$$

Where CO_2 emissions are expressed in kg/m^2 per year and the heated surface in m^2. The formula therefore expresses the annual saving of kg of CO_2.

If the EPC pre or post is missing the CO_2 value is compared with the same benchmark value used for green buildings

$$Building's\ renovation\ avoided\ emission = [\sum_{i}^{t} Benchmark\ emissions - (CO_2\ emission)_{\ i,pre/post}] \times heated\ surface$$

4.2.3. ATTRIBUTION OF THE AVOIDED EMISSIONS TO THE TAX INCENTIVES

The avoided emissions are then allocated in proportion to the value of the single tranche of the related tax incentive linked to the building renovation's practice, the attribution factor is therefore calculated as follows.

$$Attribution\ factor_i = \frac{Tax\ incetive's\ tranche\ value_i}{\sum Tax\ incentive's\ tranche\ value_i}$$

Avoided emission of the single tax incentive's tranche are thus calculated:

$$Tax\ incentive's\ tranche\ avoided\ emissions_i = Attribution\ factor_i\ x\ Building's\ renovation\ avoided\ emissions_i$$

4.2.4. CALCULATION OF THE POSITIVE CARBON IMPACT

The Positive Carbon Impact (PCI) is calculated as the ratio between tonnes of CO2 emissions avoided and the total amount of tax incentives expressed in millions of euros, the PCI therefore measures the positive impact in tonnes per million euros:

$$PCI = \sum_i^n Tax\ incentive's\ tranche\ avoided\ emissions_i \ / \ \sum_i^n Tax\ incetive's\ tranche\ value_i$$

4.2.5. ENERGY SAVING OF THE TAX INCENTIVES

The reduction in primary energy demand is determined as the difference between the pre- and post-renovation non-renewable energy performance index ($EPgl_{nren}$) multiplied by the heated surface area of the property indicated on the certificate and the attribution factor described in chapter 4.2.3:

$$Building's\ renovation\ energy\ savings = [\sum_i^t (EPgl_{nren})_{\ i,pre} - (EPgl_{nren})_{\ i,post}\ ] \times heated\ surface_i \times attribution\ factor_i$$

Where the $EPgl_{nren}$ is expressed in kWh/m^2 per year and the heated surface in m^2, the formula therefore expresses the annual saving of kWh.

If the EPC pre or post is missing the $EPgl_{nren}$ value is compared with the same benchmark value used for green buildings:

$$Building's\ renovation\ energy\ savings = [\sum_i^t (EPgl_{nren})_{benchmark} - (EPgl_{nren})_{\ i,pre/post}\ ] \times heated\ surface_i \times attribution\ factor_i$$

5. CREDEM PORTFOLIO EMISSIONS

5.1. MORTGAGES FOR CONSTRUCTION AND/OR ACQUISITION OF RESIDENTIAL AND NON-RESIDENTIAL BUILDINGS EMISSIONS

Portfolio emissions are estimated as presented in the previous Chapter. In this section, the analysis focuses on the positive environmental impact of the loans' underlying assets.

Eligibility Criterion	# Mortgage	Current financing amount in € mln	Avoided emissions in tons	PCI	Energy savings in mWh	Square meters
1.1 - Residential - TOP15%	4,425	605	7,464	12	37,225	623,402
1.2 – Non-Residential - TOP15%	392	203	2,619	13	25,873	383,076
2 - Residential - 2016-2020	2,759	301	1,861	6	12,681	403,401
3 - NZEB-10%	1,692	548	7,097	13	46,819	403,439
Grand Total	**9,268**	**1,657**	**19,041**	**11**	**122,598**	**1,813,318**

Table 14 – Eligible mortgages per criterion
Source: CRIF elaboration on CREDEM portfolio

As shown in Table, on average, 1 million financed by CREDEM avoided 12 tons of equivalent carbon dioxide per year.

5.1.1. RESIDENTIAL

Residential properties with EPC ratings in the Portfolios have a positive impact of 7,464 tons of CO_2 per year compared to the national benchmark. It corresponds to 12 tons of equivalent carbon dioxide every financed million euro. Residential properties without EPC ratings in the Portfolios have a positive impact of 1861 tons of CO_2 per year compared to the national benchmark. It corresponds to 6 tons of equivalent carbon dioxide every financed million euro.

The following figure shows the average of carbon emissions by EPC class. As expected, eligible buildings have lower emission attributes than the national benchmark. The eligible buildings are more efficient than buildings with the same label.

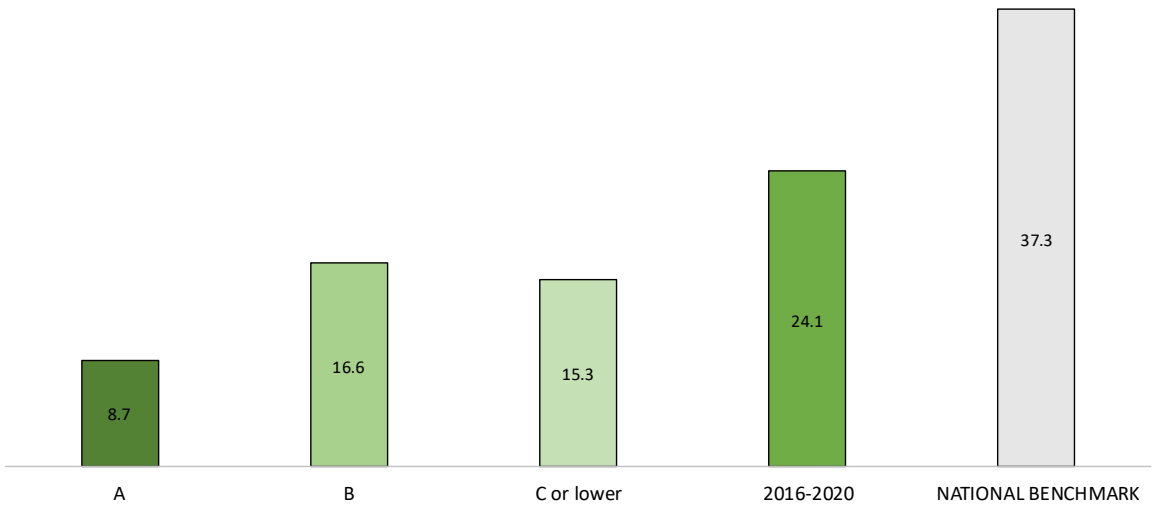
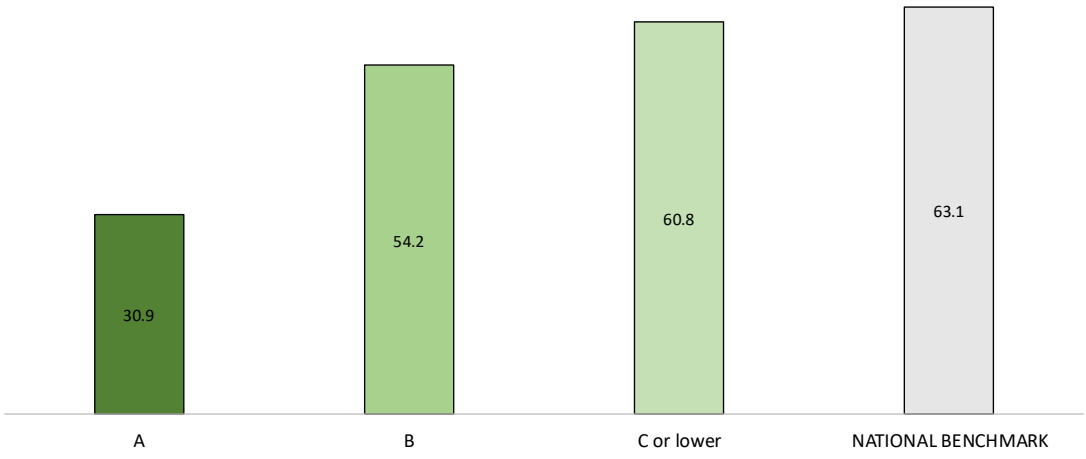


Figure 23 – Average of emissions in Kg CO_2 m^2 per year of eligible assets by EPC class and benchmark

5.1.2. NON-RESIDENTIAL

Also non-residential properties have a positive impact compared to the national benchmark. Non-residential properties with EPC ratings in the Portfolios have a positive impact of 2,619 tons of CO2 per year compared to the national benchmark. It corresponds to 13 tons of equivalent carbon dioxide every financed million euro.



5.1.3. NZEB-10%

NZEB-10% buildings have a positive impact of 7,097 tons of CO2 per year compared to the national benchmark. It corresponds to 13 tons of equivalent carbon dioxide every financed million euro. These buildings can be both residential or non-residential. The following figures shows the average of carbon emissions by EPC class for residential buildings while figure 26 shows the average of carbon emissions by EPC class for non-residential buildings.

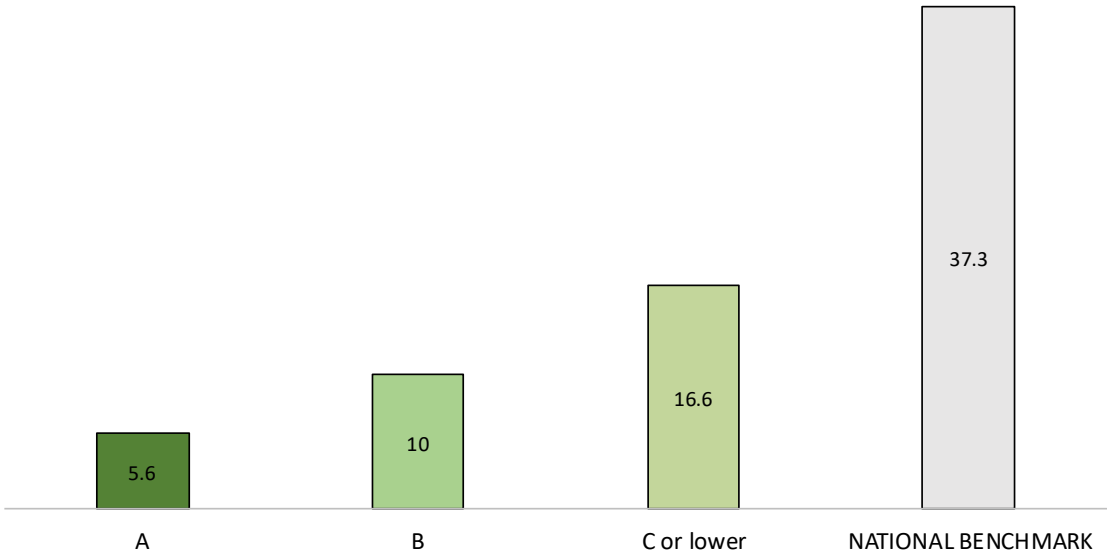


Figure 25 – Average of emissions in Kg CO_2 m^2 per year of eligible assets by EPC class and benchmark (Residential)

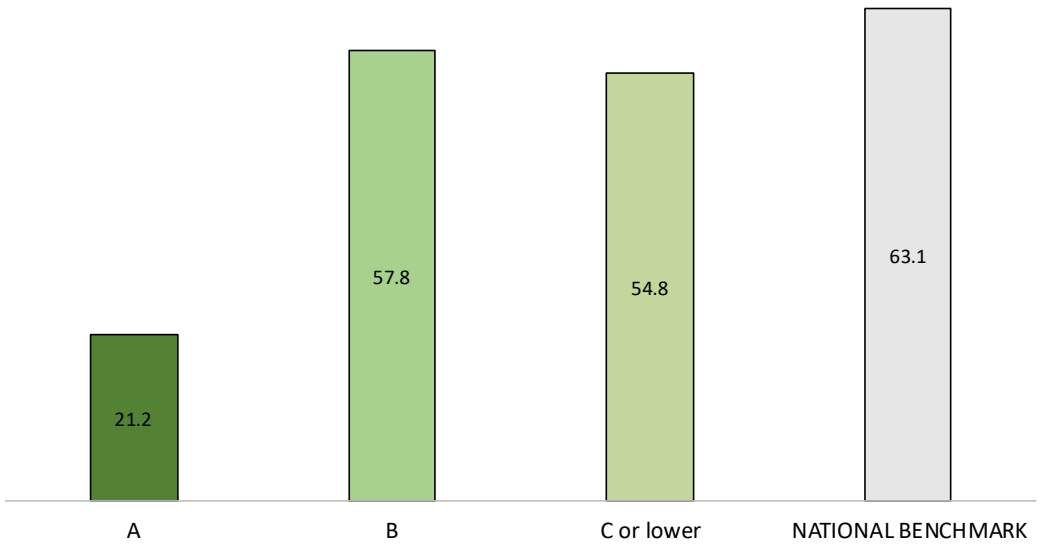


Figure 26 – Average of emissions in Kg CO_2 m^2 per year of eligible assets by EPC class and benchmark (Non-Residential)

5.2. ACQUISITION OF TAX INCENTIVES RELATED TO THE RENOVATION OF EXISTING BUILDINGS

Emissions are estimated as presented (see par. 4.2). The analysis focuses on the positive environmental impact for tax incentives described in the section 3.2.

Allocation (€ m.)	Avoided emissions (t CO_2 eq. per year)	Carbon impact (t CO_2 eq. per € m. / year)	Energy saving (mWh)	Square meters
122	**27,772**	**229**	**99,574**	**543,555**

6. CREDEM NET PROCEEDS

This section describes the net proceeds of the Green Bond that have been selected from the Portfolio. Both mortgages to finance the construction and/or acquisition of buildings and tax incentives related to the renovation of existing buildings were selected preferring those with the shortest maturity date. The net proceeds amount to 1.000 million € and are composed as follows:

Type of securities	# Eligible securities	% Eligible securities	Current financing amount € mln	% Current financing amount
Mortgages	4,501	28%	878	88%
Tax incentives	11,704	72%	122	12%
Grand Total	**16,205**	**100%**	**1,000**	**100%**

6.1. MORTGAGES FOR CONSTRUCTION AND/OR ACQUISITION OF RESIDENTIAL AND NON-RESIDENTIAL BUILDINGS

This section provides an overview of the characteristics of the green mortgages selected for the Green Bond.

Type of Loan	# Eligible Mortgages	% Eligible Mortgages	Current financing amount € mln	% Current financing amount
Residential	3,932	87%	395	45%
Non-Residential	569	13%	483	55%
Grand Total	**4,501**	**100%**	**878**	**100%**

Table 15 – Eligible mortgages per type of loan
Source: CRIF elaboration on CREDEM portfolio

Eligibility Criterion	# Mortgage	% Mortgage	Current financing amount in € mln	% Current financing amount
1.1 - Residential - TOP15%	1,897	42%	197	22%
1.2 - Business - TOP15%	373	8%	200	23%
2 - Residential - 2016-2020	1,753	39%	156	18%
3 - NZEB-10%	478	11%	326	37%
Grand Total	**4,501**	**100%**	**878**	**100%**

Table 16 – Eligible mortgages per criterion
Source: CRIF elaboration on CREDEM portfolio

Firstly, the next figure and Table 17 provide the distribution of the regions and areas where the eligible residential buildings are located.

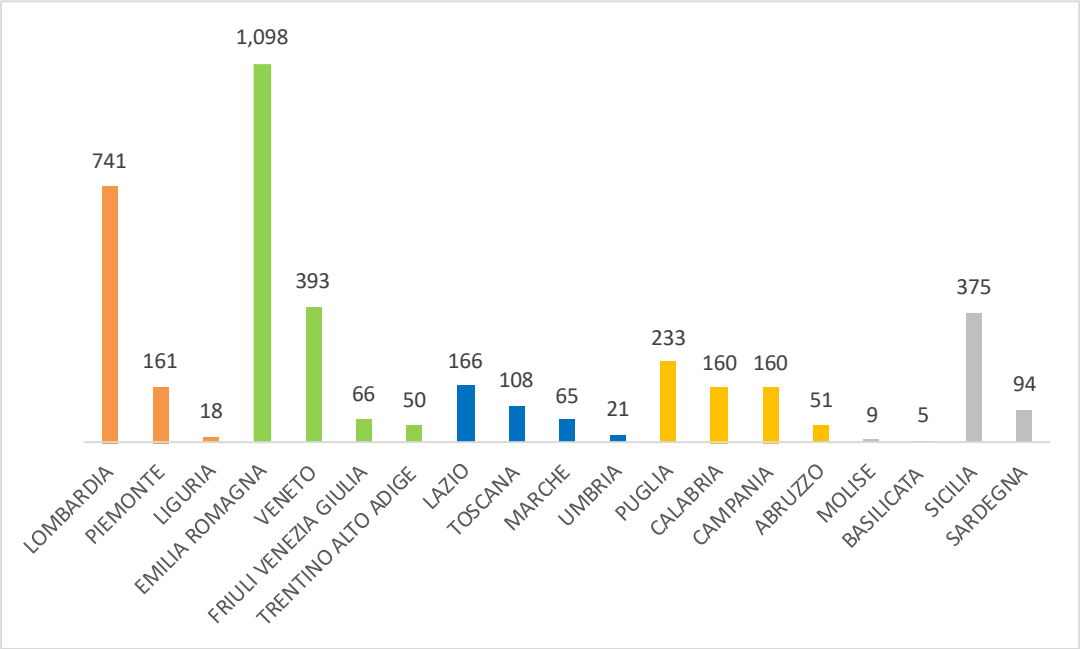


Figure 27 – Distribution of eligible buildings according to the region
Source: CRIF elaboration on CREDEM portfolio

Area		Current financing amount (mln €)	Current financing amount (%)
North West		116	24%
North East		246	51%
Center		65	13%
South		22	4%
Islands		35	7%
Grand Total		**440**	**483**

Table 17 – Overview of eligible properties per ISTAT area
Source: CRIF elaboration on CREDEM portfolio

Figure 28 and Table 18 provide the distribution for non-residential properties and relative loans.

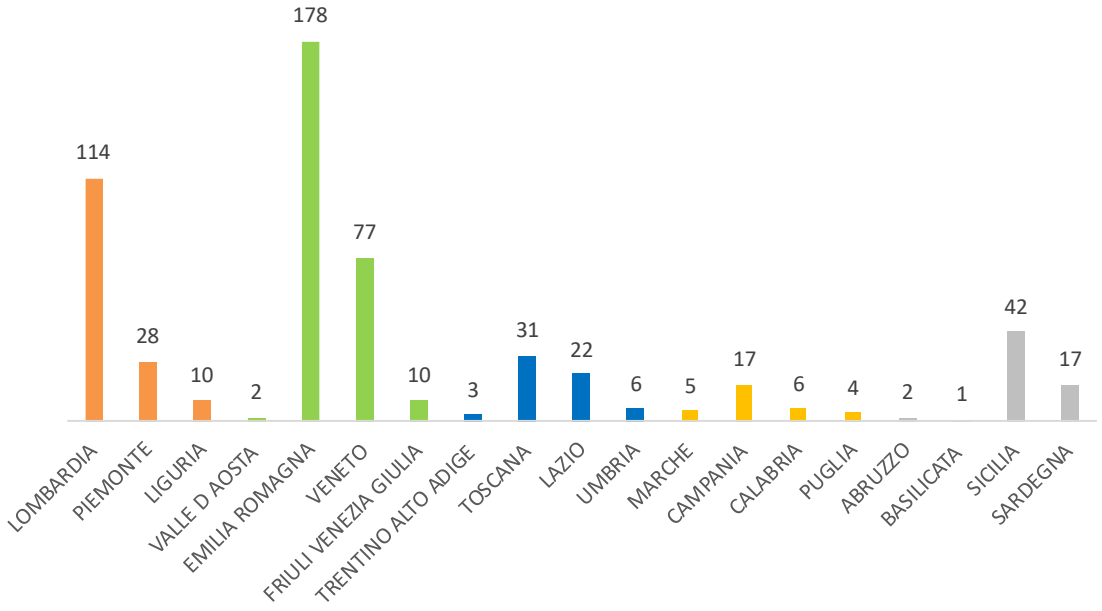


Figure 28 – Distribution of eligible buildings according to the region
Source: CRIF elaboration on CREDEM portfolio

Area	Current financing amount (mln €)	Current financing amount (%)
North West	97	25%
North East	174	44%
Center	37	9%
South	49	12%
Islands	38	10%
Grand Total	**395**	**100%**

Table 18 – Overview of eligible properties per ISTAT area
Source: CRIF elaboration on CREDEM portfolio

	Criterion	Loan origination	Number of loans	Current financing amount (€)
1. EPC	1.1 Residential (TOP15% <2021)	<=2015	108	8
		2016	85	7
		2017	104	8
		2018	123	13
		2019	324	33
		2020	465	51
		2021	354	39
		2022	70	7
		2023	41	4
		2024	101	10
		2025	122	17
	TOTAL CRITERION 1.1		**1,897**	**197**
	1.2 Non-Residential (TOP15% <2021)	<=2015	51	24
		2016	47	27
		2017	72	41
		2018	56	32
		2019	40	25
		2020	22	11
		2021	13	8
		2022	13	3
		2023	7	2
		2024	32	17
		2025	20	10
	TOTAL CRITERION 1.2		**373**	**200**
2. CONSTRUCTION YEAR *(2016-2020)*	Residential	<=2015	8	1
		2016	216	16
		2017	229	15
		2018	180	16
		2019	361	30
		2020	393	38
		2021	279	29

		2022	39	5
		2023	34	3
		2024	14	1
		2025	8	1
	TOTAL CRITERION 2		**1,753**	**154**
3. NZEB-10%	<=2015		14	4
	2016		2	1
	2017		2	3
	2018		6	15
	2019		19	41
	2020		21	20
	2021		106	50
	2022		44	40
	2023		49	59
	2024		112	66
	2025		103	28
	TOTAL CRITERION 3		**478**	**327**
	TOTAL		**4,501**	**878**

Table 19 – Overview of eligible properties per Criterion and financing origination year
Source: CRIF elaboration on CREDEM portfolio

6.1.1. POSITIVE IMPACT

Emissions are estimated as presented (see par. 4.1). In this section, the analysis focuses on the positive environmental impact for buildings described in the previous section.

Eligibility Criterion	# Mortgage	Current financing amount in € mln	Avoided emissions in tons	PCI	Energy saving in mWh	Square meters
1.1 - Residential - TOP15%	1,897	197	2,669	14	13,109	297,137
1.2 - Business - TOP15%	373	200	2,583	13	25,685	380,974
2 - Residential - 2016-2020	1,753	156	989	6	6,794	267,737
3 - NZEB-10%	478	326	4,209	13	31,863	252,919

Grand Total	**4,501**	**878**	**10,450**	**12**	**77,452**	**1,198,767**

Table 20 – Overview of eligible financing per Criterion Source: CRIF elaboration on CREDEM portfolio

Allocation (€ m.)	**Avoided emissions (t CO_2 eq. per year)**	**Carbon impact (t CO_2 eq. per € m. / year)**	**Energy saving (mWh)**
878	**10,450**	**12**	**77,452**

Table 21 – Overview of positive emission impact

Source: CRIF elaboration on CREDEM portfolio

6.1.2. RESIDENTIAL

Criterion	**Allocation (€ m.)**	**Avoided emissions (t CO_2 eq. per year)**	**Carbon impact (t CO_2 eq. per € m. / year)**	**Energy saving (mWh)**	**Square meters**
1.1 - Residential - TOP15%	197	2,669	14	13,109	297,137
2 - Residential - 2016-2020	156	989	6	6,794	267,737
NZEB-10%	43	594	14	3,157	44,512
Total	**395**	**4,252**	**11**	**23,060**	**609,386**

Table 22 – Overview of positive emission impact - residential

Source: CRIF elaboration on CREDEM portfolio

6.1.3. NON-RESIDENTIAL

Criterion	**Allocation (€ m.)**	**Avoided emissions (t CO_2 eq. per year)**	**Carbon impact (t CO_2 eq. per € m. / year)**	**Energy saving (mWh)**	**Square meters**
1.2 - Business - TOP15%	200	2,583	13	25,685	380,974
NZEB-10%	283	3,615	13	28,706	208,407
Total	**483**	**6,198**	**13**	**54,392**	**589,381**

Table 23 – Overview of positive emission impact – non-residential

Source: CRIF elaboration on CREDEM portfolio

6.1.4. NZEB-10%

Criterion	Allocation (€ m.)	Avoided emissions (t CO_2 eq. per year)	Carbon impact (t CO_2 eq. per € m. / year)	Energy saving (mWh)	Square meters
NZEB-10%	326	4,209	13	31,863	252,919

Table 24 - Overview of positive emission impact – new building

Source: CRIF elaboration on CREDEM portfolio

6.2. ACQUISITION OF TAX INCENTIVES RELATED TO THE RENOVATION OF EXISTING BUILDINGS

This section provides an overview of the characteristics of the tax incentives selected for the Green Bond. The next table provide the distribution of the incentives based on the tax code list presented in paragraph 2.2.

TAX CODE	# Tax incentives	% Tax incentives	Current financing amount € mln	% Current financing amount
7701	4,140	35%	16	13%
7711	2,650	23%	16	13%
6921	1,882	16%	12	10%
7708	1,198	10%	16	14%
7709	1,139	10%	22	18%
7719	349	3%	30	25%
7718	302	3%	9	8%
7702	33	0.3%	0	0.3%
6922	11	0.1%	0	0.2%
Grand Total	**11,704**	**100%**	**122**	**100%**

Table 25 – Tax incentives per tax code

Source: CRIF elaboration on CREDEM portfolio

The next table provide the distribution of the incentives based on their maturity year:

Maturity year	# Tax incentives	% Tax incentives	Current financing amount € mln	% Current financing amount
2026	10,215	87%	65	53%
2027	1,421	12%	56	46%
2028	26	0.2%	<0,1	0.2%
2030	4	<0,1%	<0,1	<0,1%

2031	14	0.1%	<0,1	0.2%
2032	21	0.2%	<0,1	0.3%
2033	3	<0,1%	<0,1	<0,1%
Grand Total	**11,704**	**100%**	**122**	**100%**

Table 26 – Tax incentives per maturity date

Source: CRIF elaboration on CREDEM portfolio

The next table provide the distribution of the incentives based on the region where the building renovation took place:

Region	**# Tax incentives**	**% Tax incentives**	**Current financing amount € mln**	**% Current financing amount**
Emilia Romagna	4,190	36%	48	39%
Sicilia	885	8%	8	7%
Lombardia	870	7%	11	9%
Puglia	856	7%	7	6%
Veneto	781	7%	6	5%
Sardegna	726	6%	5	4%
Piemonte	694	6%	7	6%
Campania	694	6%	9	7%
Toscana	637	5%	4	3%
Lazio	496	4%	5	4%
Calabria	343	3%	5	4%
Marche	140	1%	1	1%
Basilicata	83	1%	1	1%
Friuli Venezia Giulia	77	1%	1	1%
Liguria	69	1%	1	1%
Abruzzo	55	0.5%	1	1%
Umbria	40	0.3%	<0,1	0.3%
Molise	37	0.3%	<0,1	0.3%
Trentino-Alto Adige	26	0.2%	<0,1	0.2%
Valle d'Aosta	5	0.0%	<0,1	<0.1%
Grand Total	**11,704**	**100%**	**122**	**100%**

Table 27 – Tax incentives per region's building renovation

Source: CRIF elaboration on CREDEM portfolio

The next table provide the distribution of the incentives based on the underlying tax recipient:

Tax recipient	# Tax incentives	% Tax incentives	Current financing amount € mln	% Current financing amount
Private	6,260	53%	39	32%
Company	3,605	31%	62	51%
Condominium	1,839	16%	20	17%
Grand Total	**11,704**	**100%**	**122**	**100%**

Table 28 – Tax incentives per tax recipient

Source: CRIF elaboration on CREDEM portfolio

6.2.1. POSITIVE IMPACT

Emissions are estimated as presented (see par. 4.2). The analysis focuses on the positive environmental impact for tax incentives described in the previous section.

Allocation (€ m.)	Avoided emissions (t CO_2 eq. per year)	Carbon impact (t CO_2 eq. per € m. / year)	Energy saving (mWh)	Square meters
122	27,772	229	99,574	543,555

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