TECHNICAL REPORT

CRÉDIT AGRICOLE ITALIA

GREEN COVERED BOND

Bologna, 02/03/2021

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1. INTRODUCTION

In its new Medium Plan Term 2019-2022, Crédit Agricole has affirmed its ambition of contribution to the necessary transition to low-carbon economies.

Crédit Agricole Green Bond Report 2020

1.1. OBJECTIVES

Crédit Agricole Italy engaged CRIF S.p.A. to assess a bank's residential mortgage portfolio's eligibility to be re-financed under a green covered bond issuance.

The present technical report reflects CRIF's independent opinion.

The assessment aims to provide a *technical* opinion about the energy efficiency of the portfolio, performed in line with the Green Bond Principles 2018[1] (*GBP 2018*), the Climate Bond Initiative[2] (CBI), EU TEG final report on the EU Taxonomy 2020, and the EU Green Bonds Standard[3] (*GBS 2020*).

The first chapter describes the Italian energy efficiency market's status, providing an overview of the national legal framework. The Italian residential stock's energy efficiency is analysed by implementing standard methodologies and proposed criteria in chapter 2.
The third chapter of the report provides an overview of the underlying buildings in the Crédit Agricole portfolio, focusing on identifying the eligible ones according to specific applied criteria.

[1] The Green Bond Principles are administered by the International Capital Market Association (ICMA) and available at GBP 2018
[2] See Climate Bond Initiative website page "Residential Building Criteria Overview"; reference is made to the methodology in its general terms, as the Climate Bond Initiative's *Location Specific Criteria for Residential Buildings* are not defined for Italy.
[3] The EU Green Bond Standard consists of the Technical Expert Group (TEG) proposal for an EU Green Bond Standard and available at GBS 2020

1.2. THE EUROPEAN AND ITALIAN TRANSITION TO CLEAN ENERGY

In the last decade, the European Union has taken a wide range of initiatives to accelerate the transition to a clean energy economy. Real-estate is the most consuming energy sector (around 40%), and it is responsible for approximately 36% of the actual European greenhouse emissions.[4]

Concerning the buildings' energy performance, the Energy Performance of Buildings Directive (EU EPBD 2010/31) introduced in 2010 the necessity of a minimum set of requirements' application regarding both new and existing buildings. The goal is to assess the building's primary and final energy consumption starting from those features making a real contribution in the property energy performance, i.e. heating and cooling systems, lighting, position, and the existence of renewable energy sources. According to this Directive, European Member States were responsible for setting the national minimum standards. Together with the EU Energy Efficiency Directive 2012/27 aim to de-carbonise the European building stock by 2050, stabilise the environment for investment decisions, and support consumers' awareness. As mentioned above, the Directives also considered the strategic role of public buildings in reducing emissions and promoting the Energy Transition. In particular, the above mentioned Energy Efficiency Directive states that the Member States must apply energy-efficient renovations to at least 3% of the total floor area of buildings owned and occupied by public authorities.

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

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

Looking at the more extended period, the election of the European Commission President Ursula von der Leyen in 2019 officially opened the new *European Green Deal*. It consists of a massive plan to comply with the United Nations' sustainable goals and the Paris Agreement (2015) while reducing the net greenhouse emissions to zero by 2050. With this regard, real-estate represents a critical sector as only 1% of buildings undergo retrofitting interventions every year, leading to an estimated 75% of the existing stock being inefficient, also considering that around 85-95%

[4] https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en

of the latter will be in use in 2050[5]. Indeed, the actual EU energy renovation rate is between 0.4% and 1.2%[6]. It is also expected to double in the next ten years according to the *Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives*, the Commission's strategy to boost renovation in all the Member States.

Italy has started drafting the NECP in 2018 and providing the European Commission with a final document in December 2019. The report results from the Ministry of Economic Development's integrated effort, Ministry of the Environment and Protection of Natural Resources and the Sea, Ministry of Infrastructure and Transport.

Italy is fully aware of the potential benefits inherent to the increased availability of renewables and energy efficiency, connected to the reduction in polluting and climate-changing emissions, improvements in energy security, and economic and employment opportunities for families and the production system. It intends to follow this path with conviction, with an approach that increasingly focuses on citizens, including in their capacity as prosumers, and businesses, small and medium-sized enterprises.[7]

From a political perspective, the Green New Deal's Italian application will promote new initiatives under Law 160 of the 27th of December 2019 to be part of the Budget Law for 2020. Additionally, Law 141 of the 12th of December 2019, converted with Decree-Law 111 of the 14th of October 2019,[8] aimed at fostering closer coordination of public policies and pursue the United Nations General Assembly's sustainable development objectives set out by Resolution A/70/L.1 (the 25th of September 2015).

Table 1 compares 2020 and 2030 objectives according to EU strategy and the Italian NECP.

[5] European Commission, Renovation Wave

[6] ENEA, Rapporto Annuale Efficienza Energetica , 2020, pag. 23, RAEE 2020

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

[8] Concerning the transformation of the Interministerial Committee for Economic Planning (CIPE) into the Interministerial Committee for Sustainable Development (CIPESS)

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

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

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

Considering the energy efficiency section, Italy has been adopting a mix of fiscal, economic, regulatory measures to reduce by 43.0% the primary energy consumptions before 2030, compared to the PRIMES[9] baseline scenario. On the other hand, the EU set an indicative reduction goal of -32.5%, around ten basis point lower than the Italian one. This result suggests the importance of effective measures trimming the existing average gap in Italy's energy efficiency and many other European countries.

[9] The PRIMES model, run by the E3MLab of National Technical University of Athens (NTUA), has been used to quantify the Baseline scenario for all the EU-27 Member-States up to the year 2030. PRIMES is a partial equilibrium model of the EU energy system providing projections for the medium and long term starting from 2010 and running up to 2030 with results for every fifth year. The PRIMES model was complemented by a series of specialised models and databases, including the POLES world energy model and the GEM-E3 macroeconomic model, Trends to 2030 – Update 2007, European Commission, Directorate-General for Energy and Transport, April 2008, Available At: https://ec.europa.eu/energy/sites/ener/files/documents/trends_to_2030_update_2007.pdf

1.3. ENERGY CONSUMPTION: A EUROPEAN AND ITALIAN VIEW

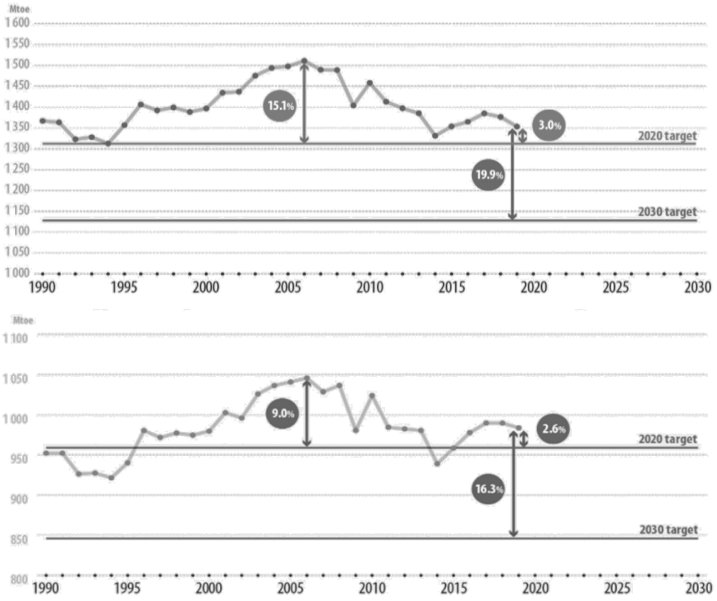
The primary energy consumption indicator is a useful instrument to compare the energy consumption among different European members. **Figure 1.A** shows the EU trend of primary energy consumption[10] in 1990-2019, while **Figure 1.B** focuses on the final energy consumption, highlighting the gap from the 2020 and 2030 reduction targets[11].

Primary energy consumption measures total domestic energy demand, while final energy consumption refers to what end users consume. The difference relates mainly to what the energy sector needs itself and to transformation and distribution losses.

Furthermore, **Figure 1** presents the EU 2020 and 2030 energy efficiency targets for consumption. Indeed,

- Primary energy consumption should amount to no more than 1,312 Mtoe and final energy consumption to no more than 959 Mtoe in 2020;
- Primary energy consumption should amount to no more than 1,128 Mtoe and final energy consumption to no more than 846 Mtoe in 2030.

Figure 1.A and 1.B – Primary energy consumption (above) and final energy consumption (below) in the EU



Source: Eurostat

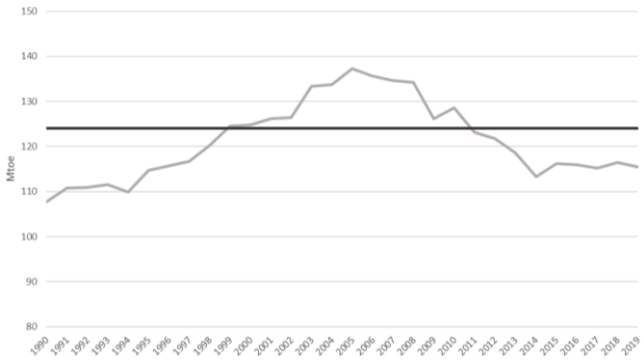
[10] Expressed in Millions of Tones Oil Equivalent (Mtoe)

[11] Eurostat, newsrelease, 04/02/2020, https://ec.europa.eu/eurostat/documents/2995521/10341545/8-04022020-BP-EN.pdf/39dcc365-bdaa-e6f6-046d-1b4d241392ad

As shown in **Figure 1.A**, in 2019, primary energy consumption was 3.0% above the target of 2020 and 19.9% far from the 2030 mark. Primary consumption increased from 1990 to 2006 when it attains the highest level in the period of observation. From 2006, the line declines up to 2014 when it reaches the lowest 1,332 Mtoe, a 1.5% gap from the 2020 target. Accordingly, **Figure 1.B** confirms a similar trend for the historical curve of final energy consumption. The curve fluctuates starting from 1990 but peaked in 2006: 1,046 Mtoe corresponding to a 9.0% distance from the 2020 target. Since then, an unstable decrease is detected, leading to the lowest point since 1997: 2.2% below the 2020 target.

Focusing on the Italian market, **Figure 2** provides an overview of the final energy consumption in 1990-2019. The Italian 2020 target at the level of 124 Mtoe is also highlighted.
Starting from 1990, following the EU trend, final energy consumptions fluctuates to the peak of 137.22 Mtoe in 2005. Afterwards, the trend slowly decreases below the 2020 target because of newly introduced energy efficiency measures where it remained almost stable in 2015-2019.

Figure 2 – Final energy consumption in Italy



Source: CRIF elaboration on Eurostat data

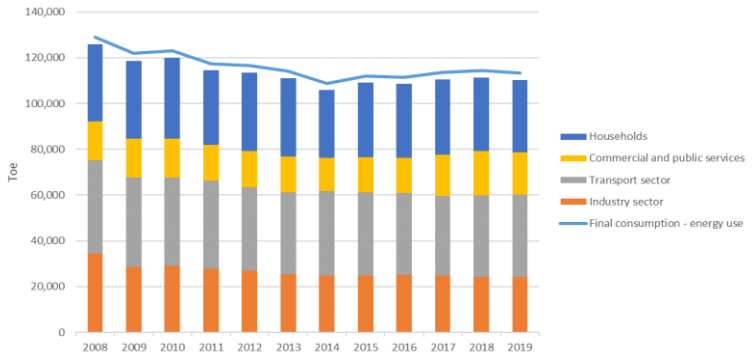
In this context, the COVID-19 crisis has a massive impact on people's lives, changing working habits and moving from one place to another as reaching the office. With this regard, home working can have a potential contribution to reducing final energy consumptions. A study in the United Kingdom[12] (2020) revealed how the combination of seasonal effects and the working place could save carbon emissions.
Overall, if the balance between home consumption and reducing transports and offices' emissions is positive, home working can contribute to the 2020's decline in final energy consumptions.

[12] Office vs Home Working: How we can save our carbon footprint, WSP, February 2020. Available at: https://www.wsp.com/en-GB/insights/office-vs-home-working-how-we-can-save-our-carbon-footprint

Nevertheless, this conclusion is not as simple as it seems. Different studies[13] in the UK underline the importance of many additional variables considered in this analysis, e.g. people habits on home energy consumption, air-con, and electricity sources in a specific area.

Furthermore, focusing on the sub-period 2008-2019, the analysis performed on the Italian final energy consumption by sector (**Figure 3**) highlights reducing the Industrial sector impact while a stable behaviour of both transport and households, underlying the importance of more in-depth energy-efficient actions. Passing from 2016 to 2017, commercial and public services increases by two basis point: This level has been almost constant in the following three years.

Figure 3 – Final energy consumption by sector, Italy



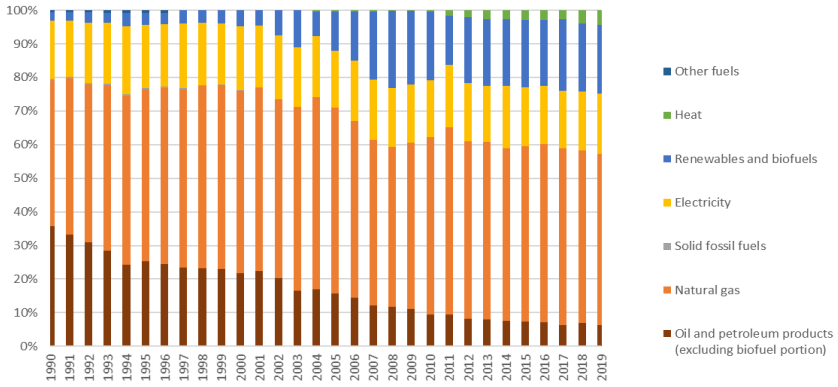
Source: CRIF elaboration on Eurostat data

In this context, the real estate market and households sector represent a strategic arena where energy-efficient measures can impact achieving CO_2 reduction target, improving the life quality of inhabitants and supporting the financial industry in the process of 'green' identification and labelling.

With this regard, **Figure 4** shows how oil and petroleum households' consumption dramatically decreased over time, passing from around 36% in 1990 to 6% in 2019. Conversely, in the last years, the heating systems rose, and renewables and biofuels sources show a considerable increase from 2005, leading to 21% of consumptions in 2019. Electricity and gas use remains relatively stable on average, 18% and 52% respectively.

[13] Why working from home might be less sustainable, BBC, February 2020. Available at: https://www.bbc.com/worklife/article/20200218-why-working-from-home-might-be-less-sustainable

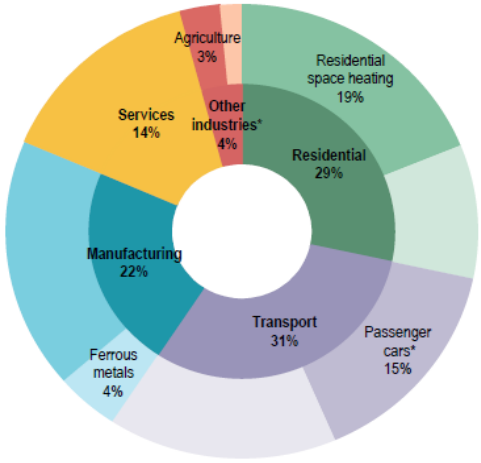
Figure 4 – Households final energy consumption by fuel



Source: CRIF elaboration on Eurostat data

According to the IEA report on Energy Efficiency Indicators (2020 ed.), **Figure 5** highlights how 29% of the Italian energy end-uses by sector is linked to the residential sector. At the same time, residential energy consumption the significant role played by heating systems (66%) combined with water heating (12%) and residential appliances (12%). Space cooling and lightning count for 1% each while cooking contribution is about 7% as in **Figure 6**. Indeed, appliances as refrigerators and washing equipment, weight for 6% and technological devices (e.g. TVs and PCs) for 2%[14].

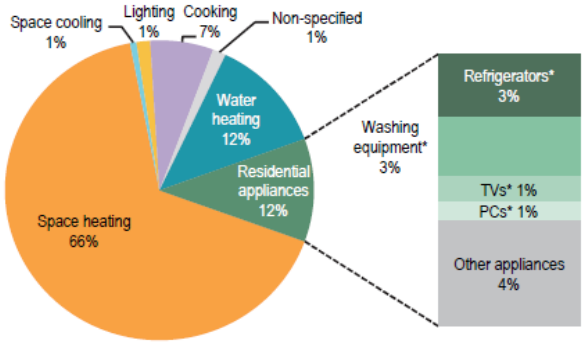
Figure 5 – Italian energy end-uses by sector in 2018



Source: IAE, 2020

[14] Refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology.

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



Source: IAE, 2020

1.4. ENERGY INTENSITY: AN OVERVIEW OF THE ITALIAN MARKET

Energy intensity is a powerful indicator of sustainable economic growth both at a national and global level. From a historical perspective, economic expansion tends to increase energy consumption amplifying the pressure on the environment due to higher energy production needed to satisfy a new market demand (decoupling effect).

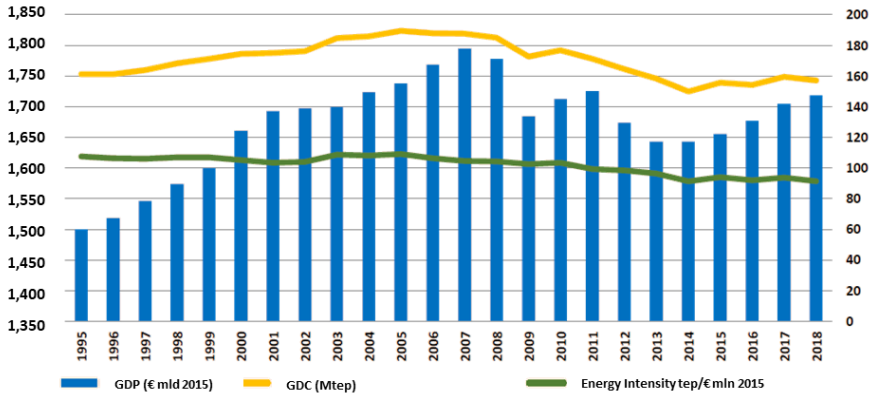
Indeed, the European Environment Agency defines *energy intensity* as *the ratio between gross inland energy consumption (GIEC) and gross domestic product (GDP), calculated for a calendar year. GIEC is calculated as the sum of the gross inland consumption of the five sources of energy: solid fuels, oil, gas, nuclear and renewable source […].*

Different elements can play a crucial role in defining intensity levels and trends, including the structure of the economy (share of large energy-consuming industries); geographic characteristics (e.g. longer distances implying higher demand for the transport sector); the overall climate and weather conditions (demand changes for heating or cooling); and the exchange rate (IEA, 2014).

According to the ENEA (2020), the Italian primary energy intensity indicator is equal to 91.36 tep/M€$_{2015}$ in 2018[15], 2.4% lower than in 2017. This is the combined result of a reduction (-1.58%) in the primary national energy demand and the increase (+0.8%) of the Italian GDP compared to 2015. Furthermore, Italy shows an indicator lower than the average EU energy intensity (comprising all the 28 members), equal to 104.9 tep/M€$_{2015}$.

Figure 7 provides an overview of the Italian GDP, energy intensity and Gross Domestic Consumption in 1995-2018. Overall, the energy intensity decreases by 15.02%, passing from 107.51 tep/M€$_{2015}$ in 1995 to 91.36 tep/M€$_{2015 \text{ in } 2018}$. The GDP growth is relatively higher than the gross domestic consumption during an economic expansion (1995-2007) while it shows a lower reduction in recession time (e.g. 2008-2014).

Figure 7 – Italian GDP, GDC and primary energy intensity in 1995-2018



Source: ENEA, 2020

[15] Analisi e Risultati delle policy di efficienza energetica del nostro paese, ENEA, 2020

1.5. CO_2 EMISSIONS: AN OVERVIEW OF THE ITALIAN MARKET

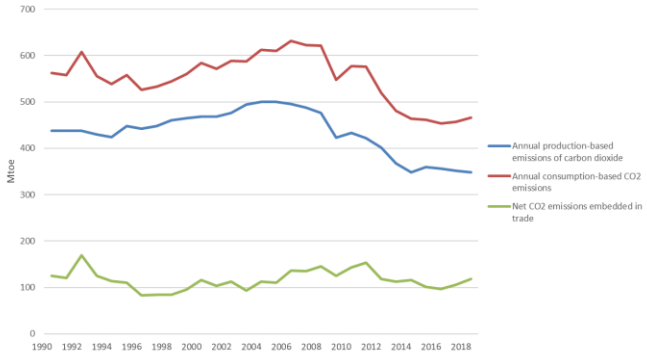
The buildings and buildings construction sectors combined are responsible for over one-third of global final energy consumption, and nearly 40% of total direct and indirect CO2 emissions. Energy demand from buildings and buildings construction continues to rise, driven by improved access to energy in developing countries, greater ownership and use of energy-consuming devices, and rapid growth in global buildings floor area.[16]

Climate change is a severe global systemic risk that threatens life and the economy (OECD, 2011). The rapid growth of greenhouse emissions represents a substantial risk for the environmental equilibrium: significant additional stress added to the global ecosystem can severely impact the short-medium period. Inadequate attention will also cost significant social risks, as some developing countries would suffer, under this scenario, access to essential elements of life as food production, water access, and health.

In recent years, global CO_2 emissions related to buildings have risen due to several factors mostly associated with an increasing energy demand for heating and cooling systems (e.g. air-conditioning), driven by climate change conditions (and extreme weather events). According to IEA (2020), energy-efficient measures do not offset increasing energy demand, especially for the real-estate sector. Indeed, the average annual floor area growth has remained at a significant rate of 2.5% since 2010, mainly boosted by the rapid increase of real-estate expansion in emerging economies.

Focusing on the Italian emissions only, **Figure 8** shows the distribution of the CO_2 emissions in terms of annual production-based and consumption-based emissions and net CO_2 emissions embedded in trade.

Figure 8 - CO_2 production, consumption and trade, Italy



Source: CRIF elaboration on Our World in Data

[16] IEA, 2020

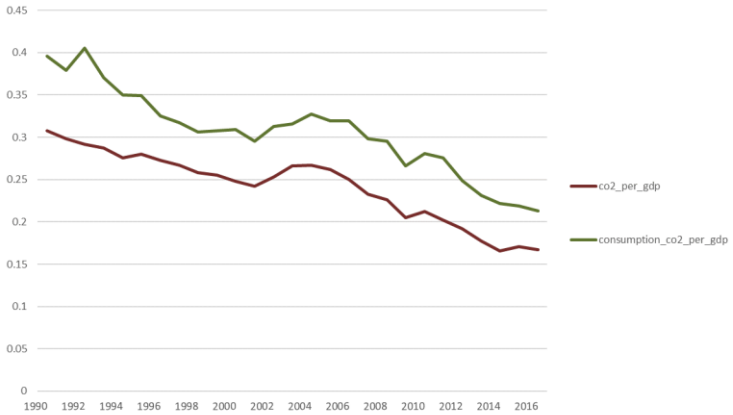
The CO_2 emission intensity represents the level of greenhouse gas emissions per unit of economic output. This indicator can be retrieved from two factors: energy intensity and fuel mix, as follows:

$$\frac{CO_2}{GDP} = \frac{Energy}{GDP} \; x \; \frac{CO_2}{Energy}$$

The first variable, *energy intensity*, consists of the ratio between energy consumed per unit of GDP. Accordingly, the higher the industrial production, the higher the percentage, all factors being equal. On the other hand, the *fuel mix* expresses the rate of carbon-dioxide emissions per energy consumed. A comparison between two countries having the same energy intensity level, but relying more heavily on coal, can significantly differ in energy intensity indicators.

In this context, the Italian energy intensity shows a downward sloping in the period 1990-2016 regarding both production-based CO_2 emissions and consumption-based CO_2 emissions per unit of gross domestic product[17] in Italy as in **Figure 9.**

Figure 9 – Production-based and consumption-based CO_2 emissions in Italy



Source: CRIF elaboration on Our World in Data

[17] GDP is adjusted for inflation and cross-country price differences (PPP-adjusted)

1.6. ITALIAN LEGISLATION ON ENERGY EFFICIENCY CERTIFICATION

1.6.1. NATIONAL POLICIES ON ENERGY EFFICIENCY

The history of the Union's policies on carbon emissions reduction and energy efficiency is founded on two pillars:

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

One of the first European steps to integrate national energy policies is represented by the *2020 Climate and Energy Package* drafted by the European Council in 2007. The targets have been transformed into national legislation of the Member States by 2009. The Italian target regarding the introduction of renewables sources was set at 17% compared to the final gross energy consumption to be achieved before 2020 with 10% regarding the transport sector only.

Another milestone in the Italian path across energy-efficiency is represented by the National Energy Strategy (SEN), approved in November 2017 jointly by a decree of the Minister of Economic Development and Environment. The SEN is one of the preliminary institutional steps towards the redaction of the INECP (2019). Not only this, in 2017, the Ministry of Economic Development and Ministry of Environment, Protection of Natural Resources and Sea published the *Towards a circular economy model in Italy – Framework and strategic positioning document* to define an institutional framework on the circular economy also addressing climate change risk, in line with the Paris Agreement. Moreover, in the same year, the Ministry of Environment and Protection of Natural Resources and the Sea, Ministry of Economic Development, Ministry of Infrastructure and Transport, economic operators and interested associations drafted the *Elements for a roadmap to sustainable mobility*. The documents outline mobility status at a national level, highlighting issues (e.g. heavy traffic, pollution, road safety) and weaknesses (electric mobility). All this, also considering environmental impacts and innovative technologies, can boost the implementation of entirely new infrastructure, an ecosystem can replace fuels' dependency in the medium-long period. Regarding sustainable mobility, in 2012, a *National Plan for Electric Vehicles Charging Infrastructure* (PNIRE) was published and updated in 2016. The program aims to define an agreement between local authorities and Regions to establish a vehicle charging network.

Furthermore, the *National Action Plan on Green Public Procurement - PAN GPP* (2007) focuses on integrating environmental criteria for Public Administration in all the purchase processes and product development by

implementing new technologies able to reduce the impacts on the environment at a minimum level. Besides, the *National strategic framework for the development of the alternative fuels market in the transport sector and the creation of associated infrastructure* (2016) aims at promoting the introduction of alternative fuels, particularly regarding electricity (charging stations and infrastructure), gas (LNG refuelling) and hydrogen (transport sector).

As a result of the coming EU Green New Deal, in 2019, the NADEF2019[18], updating the Economic and Finance Document 2019, provides ad-hoc measures and incentives to achieve environmental objectives and lift the circular economy's implementation. Coherently, two investment funds have been established to support the urban renovation, energy conversion and use of renewables.

To boost investment by local authorities, with effect from 2020 a fund assigned to municipalities for initiatives involving energy efficiency, sustainable local development and the security of infrastructure and public buildings will be in place.[19]

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

One of the main consequences of the recent COVID-19 crisis is the need for a massive recover Plan able to support the real economy. With this regard, the EU Recovery Plan was announced in December 2020. It will represent the highest EU long-term budget ever granted, equal to around €1.8 trillion to support the post-COVID-19 recovery, making the EU greener, digitalised and resilient. Considering the combined 2021-2017 Multiannual Financial Framework and NextGenerationEU, €373.9 billion will be destined for Natural Resources and the environment.

According to the draft of the Italian COVID-19 recovery plan:

- €74.3 billion will be invested in green revolution and ecologic transition;
- €27.7 billion will support sustainable mobility and infrastructure;

The total amount of budget that will be granted to Italy is €196 billion.

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

[19] INECP, 2019

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

Moving forward in the context of the post-COVID-19 crisis, the economic recovery plan with particular attention to the EU *Renovation Wave* will foster new investments in energy-efficient buildings, creating at the same time new workplaces, especially in the context of SMEs. According to JRC[20] analysis, one fiscal measure for Italy's residential sector was available in 2019: the *Ecobonus* 2017 tax deduction scheme. To accelerate the national renovation rate, the Italian INECP is intended to support fiscal incentives' level off for energy efficiency and retrofitting interventions: not only the *Ecobonus* mechanism has been integrated with *Sismabonus* also a new measure, the *Superbonus 110*, introduced in May 2020[21]. This exceptional measure was intended to last one year only, but the Government has confirmed the extension of its validity until the 31st of December 2022.

Apart from this act's technical specifics, a massive campaign for buildings renovation based on public economic support has been launched. Indeed, under strict conditions, the *Superbonus 110* allows the deduction of 110% of the incurred expenses for energy efficiency and seismic risk reduction interventions on a building and the installation of new 'green' energy sources as for the photovoltaic and charging electric vehicles systems. Additionally, the tax deduction can be replaced in the form of an invoice discount: the tax credit is now transferable to other subjects as the supplier of the interventions and financial institutions (e.g. banks, insurance companies).

[20] Accelerating energy renovation investments in buildings, Financial and fiscal instruments across the EU, JRC SCIENCE FOR POLICY REPORT, 2019

[21] Art.119, Decreto Rilancio

1.7. ITALIAN EPC LABELLING SCHEME

The *Clean Energy for All Europeans Package* (2019) represents a fundamental step toward securing a sustainable energy transition addressing the climate change challenges. Under the updated Energy Performance Building Directive (EU 2018/844), *almost 50 % of Union's final energy consumption is used for heating and cooling, 80% used in buildings*. The European Union aims to stimulate and *renovate its building stock by giving priority to energy efficiency, making use of the 'energy efficiency first' principle as well as considering the deployment of renewables*.

Starting from the 31st of December 2020, the increase of energy consumption will also be tackled by introducing new requirements about newly-built constructions: Nearly Zero Energy Buildings (NZEB).

The EU suggests that the member states should define a strategy to renovate the national building stock. The transformation of existing buildings into Nearly Zero-Energy Buildings is expected to end by 2050.

NZEB, together with Energy Performance Certificates, represent the current labelling system for buildings' energy efficiency.

Looking at the Italian real estate market, in 2016, over 19 million buildings owned by individuals consists of principal residences together with more than 13 million ancillary buildings (e.g. garage) over 57 million dwellings[22].

The first Italian National Energetic Plan was introduced in 1991, while the energy label (ACE - Attestato Certificazione Energetica) in 2005 because of the EU Directive 2002/91 on the EPBD (ENEA, 2020). Nowadays, the building's energy performance certificate consists of the APE – Attestato Prestazione Energetica (2015). According to the existing law, the EPC is mandatory in rent, acquisition, construction of a new building and energy renovation.

The EPC can be assigned after a building's technical valuation by a real-estate expert that has to be registered in the trade association, proving to have expertise in building's energy assessment according to former education or attendance of specific courses. Moreover, intending to preserve an unbiased approach in the evaluation procedure, the assessors must declare the absence of any conflict of interest concerning the owner or the property under assessment. The emission of an EPC also relies on the use of specific software.

In this context, based on the existing methodology, the energy performance is defined through a ranking from A4 (more efficient) to G (less efficient) and expressed in KWh/m^2 per year. Besides, the current system imposes to compute the index of global energy performance based on a *reference building*. The latter has the same features of

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

the assessed building in terms of geometry, location, exposition, and use but having the exact parameters of the energy-efficient property as defined in the Decree 26/06/2015 (*Requisiti Minimi*) and based on the national criteria and technical norms (UNI/TS 11300), compliant with EU Directive 2010/31. As a prerequisite, the analysis is stand-alone from its inhabitants' habits but considering the building's everyday use.

Furthermore, The Decree specifies:

1. Application of energy performance calculation methods and the definition of the rules and minimum requirements for buildings;

2. Reference procedures and framework for compiling the project technical report for the application of rules and minimum energy performance requirements for buildings;

3. Adaptation measures to the national buildings' energy certification guidelines.

Notably, the legislator defines a set of new minimum standards and a methodology for assessing dwellings' energy performance using a predefined scale. Outlines for project technical reports are provided:

- New residential buildings being constructed under the new law are expected to get an EPC class equal to A4, A3, A2, A1;

- The transition to NZEB includes progressive strengthening of the building regulations.

Considering regional energy efficiency measures, some Italian regions in 2017 have already published dedicated acts to boost the low-impact-building market. For instance, the Emilia-Romagna region anticipates the national deadlines for implementing NZEB requirements by two years. Accordingly, the Lombardia region set the deadline on the 31st of December 2015. Since 2004, the Piemonte region has launched incentive schemes for NZEBs, and in 2011, a call for NZEB in the private sector has been published to grant aid for the construction of nearly zero-energy buildings.[23] Finally, the Autonomous Province of Bolzano promotes NZEB buildings (No. 362 of the 4th of March 2013, as amended): new buildings must meet the *ClimateHouse* A rating starting from the 1st of January 2017.
Regions are responsible for the quality assessment of EPCs performing energy-efficiency tests on energy systems.

[23] Italian Energy Efficiency Action Plan, June 2017, The Italian Energy Efficiency Action Plan (EEAP) 2017, prepared on the basis of an ENEA proposal under Article 17(1) of Legislative Decree No 102/2014, contains a brief summary of the energy efficiency targets set by Italy for 2020

To summarise, the Energy Performance Certificate (EPC) is the building's passport. It includes a complete set of information regarding not only the physical features, the geo identification and existing energy equipment but also CO_2 emissions produced and exported energy, overall energy performance of the building in total primary energy and non-renewable primary energy.

The dwelling's energy class is assigned computing a non-renewable global energy performance index ($EP_{gl,nren}$). Under specific criteria, the assigned rating returns a numeric value indicating both the building's energy demand and consumption of non-renewable energy sources.

Class	Threshold
A4	≤ 0,4 $EP_{gl,nren}$
A3	≤ 0,6 $EP_{gl,nren}$
A2	≤ 0,8 $EP_{gl,nren}$
A1	≤ 1,0 $EP_{gl,nren}$
B	≤ 1,2 $EP_{gl,nren}$
C	≤ 1,5 $EP_{gl,nren}$
D	≤ 2,0 $EP_{gl,nren}$
E	≤ 2,6 $EP_{gl,nren}$
F	≤ 3,5 $EP_{gl,nren}$
G	> 3,5 $EP_{gl,nren}$

The $EP_{gl,nren}$[24] provides information about the kilo-wattage of energy required by the building under standard conditions per every square meter of floor-space heated over a year. Additionally, the $EP_{gl,nren}$ is calculated under the hypothesis of a building being equipped with a minimum set of prerequisites[25]. The $EP_{gl,nren}$ is defined as:

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

In particular, the above formula considers:

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

In Italy, the energy cadasters gathering Energy Performance Certificates are managed under the regional jurisdiction. Accordingly, The EPCs are not publicly accessible for all the Italian regions. Lombardia and Province of Trento –

[24] Expressed in kWh/m²

[25] The Italian law applies to public buildings from the 1st of January 2019 and from the 1st of January 2021 for all the other type of buildings

Trentino Alto Adige give access to open data on energy efficiency while Piemonte, Friuli – Venezia Giulia, Sicilia and Emilia-Romagna allow querying their databases using the specific information of the building as input.

Accordingly, the Italian Decree issued on 26th of June 2015 introduced a new national database to gather EPCs from regions to provide an overview of the National building stock and allow a more detailed analysis at the regional level. ENEA[26] manages the SIAPE system.

As depicted in **Figure 10**, not all the Italian regions nowadays are contributing to the database[27]. Indeed, the blue areas identify the energy cadasters providing EPCs' information while the grey ones are not. In yellow, the regions updating their data.

Figure 10 – Map of the Italian regions contributing to the SIAPE database

Source: SIAPE, ENEA

When writing the present report, the SIAPE system gathered 1.938.348 certificates for issuances in 2015-2020.

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

[27] As of 31/12/2019

2. ELIGIBILITY CRITERIA

2.1. MARKET REFERENCES

The applied methodology to select eligible energy-efficient buildings part of the Crédit Agricole portfolio relies on both the TEG final report on the EU Taxonomy (2020) and the Climate Bonds Initiative (CBI) Taxonomy (2019). Indeed, they represent market references in the process of establishing buildings proxies for the identification of eligible buildings for the green covered bonds issuance.

In March 2020, the Final Report on the EU Taxonomy of the Technical Expert Group on Sustainable Finance was published. The TEG report's main contributions regard specific recommendations on the overarching design of the EU Taxonomy, applied methodology, and the identification of green performance thresholds (*Technical Screening Criteria*) to identify Taxonomy-aligned assets and economic activities.
Indeed, considering the Technical Screening Criteria for *Construction and Real Estate activities,* four economic activities are identified to assess those eligible investments in real estate and construction fields. The buildings' energy performances and their potential impact in terms of carbon emissions are analysed. In particular:

1. Construction of new buildings;
2. Building renovation;
3. Individual measures and professional services;
4. Acquisition and ownership.

This section's main goal consists of identifying those buildings, newly built or acquired, providing *a substantial contribution to climate change mitigation objectives*. In light of the challenges behind the definition of appropriate mitigation criteria, the TEG proposal agrees on *adopting a best-in-class approach to ensure that the acquisition and ownership criteria support both significant market uptake and sufficient environmental benefits*.
Accordingly, the Technical Annex to the TEG Final Report suggests addressing the best-in-class *by benchmarking the top 15% of the existing national stock*. This rate is intended to decline while approaching the 2050 decarbonisation targets. The Primary Energy Demand (PED) is the reference metric defined as *the annual primary energy demand associated with regulated energy use during the operational phase of the building life-cycle calculated ex-ante according to the national methodologies and expressed as* $\mathrm{kWh/m^2}$ *per year*.

In acquisition and ownership cases, TEG clarifies that *the calculated performance of the building must be within the top 15% of the local existing stock in terms of operational Primary Energy Demand, expressed as kWh/m2 year. Alignment with this criterion can be demonstrated by providing adequate evidence comparing the performance of the relevant asset to the performance of the local stock built before the 31st of December 2020. Such evidence should be based on a representative sample of the building stock in the respective area where the building is located, distinguishing at the very least between residential and non-residential buildings. The area can be defined as a city, a region or a country. Certification schemes such as EPCs may be used as evidence of eligibility when adequate data is available to demonstrate that a specific level (e.g. EPC A) clearly falls within the top 15% of the respective local stock.*[28]

For the acquisition of buildings built after the 31st of December 2020, the *construction of new buildings* applies. In this case, *to be eligible, the net primary energy demand of the new construction must be at least 20% lower than the primary energy demand resulting from the relevant NZEB requirements*.

Besides, *The Climate Bonds Taxonomy identifies the assets and projects needed to deliver a low carbon economy and gives GHG emissions screening criteria consistent with the 2-degree global warming target set by the COP 21 Paris Agreement […] and has benefited from the input of hundreds of technical experts from around the world. It can be used by any entity looking to identify which assets and activities, and associated financial instruments, are compatible with a 2-degree trajectory. First released in 2013, the Climate Bonds Taxonomy is regularly updated based on the latest climate science, emergence of new technologies and the Climate Bonds Standard Sector Criteria*[29].

The CBI Taxonomy (2019) identifies three assets according to the *Buildings* section[30]:

- Commercial Buildings (e.g. offices, hotels, retail buildings, public buildings, educational buildings, healthcare buildings);
- Residential Buildings (Private dwellings and Multifamily residential buildings);

[28] TEG Final report on EU Taxonomy: Technical Annex, pag. 388. Available at: https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes_en.pdf

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

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

- Other building types (e.g. Data centres, Stations, and related buildings for eligible transport, Industrial buildings).

The CBI Taxonomy identifies a *Screening Indicator* for the first two asset types, i.e. Commercial and Residential buildings, as the *emissions footprint in the top 15% of emissions performance in the local market or a substantial reduction in* gCO_2/m_2 *because of upgrade or retrofit*. Additionally, according to CBI, all three buildings types are compliant with a 2-degree decarbonisation trajectory to satisfy the Screening Indicator criteria.

With this regard, considering residential buildings*, existing instruments such as local building codes, energy rating schemes (e.g. US Energy Star) and energy labelling schemes (e.g. Energy Performance Certificates in the EU) are leveraged as emission performance proxies (using the proxy methodology)*[31].

The CBI Methodology for establishing building proxies[32] (2016) provides two methods for the identification of the top 15% most energy-efficient buildings:

A. *Benchmarking against local market emissions performance*;

B. The proportion of total ratings/label awarded.

Option A relies on the existence of data and statistics on the emission performance of buildings. Identifying the local top 15% bucket represents the starting point for drafting an *emission performance trajectory* that declines towards zero emissions in 2050. Conversely, Option B proposes a solution in case of emission performance's data lack trough a consistent reference dataset of EPCs.

There must be evidence to demonstrate that the rating or label is in the top 15% of all ratings or labels awarded under the scheme (that predominantly rates buildings on energy efficiency/emissions).

[31] https://www.climatebonds.net/standard/buildings

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

2.2. ENERGY EFFICIENCY AND RESIDENTIAL MARKET: CRIF'S APPROACH

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

The top 15% benchmark will be implemented during the Crédit Agricole portfolio assessment described in **Chapter 3**.

CRIF performed the following analysis:

- Italian residential building stock according to the EPC distribution;
- Italian residential building stock according to the construction year.

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

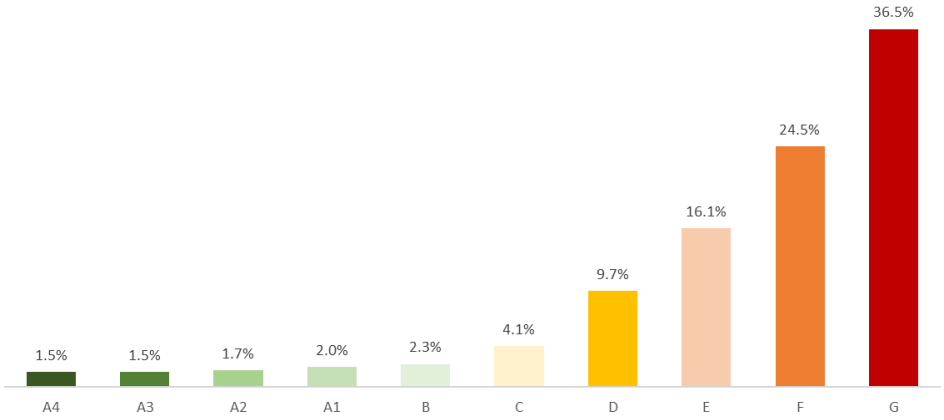
This section aims to identify the top 15% of the Italian buildings stock by analysing EPC data gathered in the SIAPE portal by ENEA.

When writing the present report, the SIAPE has collected 1,938,348 EPCs issued in 2015-2020 from 12 regions. Two additional regions are updating data, Valle d'Aosta and Molise. Following Section 8.1.2 of Annex 1 to the Ministerial Decree 26/06/2015, every region has to upload the gathered EPCs by the end of March on a yearly base.
Overall, 85.4% of the records belong to residential buildings and 14.6% to non-residential ones. This result is consistent with the evidence of the last Italian census in 2011, when residential buildings represented 89% of the stock against the 11% of non-residential buildings.

At first, a filter for selecting residential buildings[33] is applied, slightly reducing the SIAPE data pool to 1,654,445 EPCs. Nevertheless, The SIAPE dataset is robust in terms of dimension and provides a good representation of the buildings' distribution according to the Italian regions.
Figure 11 shows the distribution of EPCs, while **Figure 12** identifies the top 15% of properties.

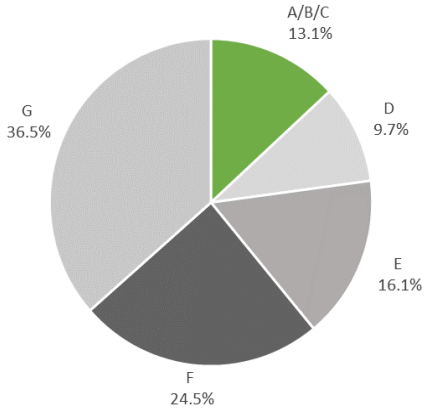
[33] DPR 412/93. *Destinazione d'uso in: E1(1) - abitazioni adibite a residenza con carattere continuativo, E(1) bis – collegi, luoghi di ricovero, case di pena, caserme, conventi and E1(2) - abitazioni adibite a residenza con occupazione saltuaria*

Figure 11 – Distribution (%) of EPCs for residential buildings



Source: CRIF elaboration on SIAPE data

Figure 12 – Identification of the top 15% among EPCs classes

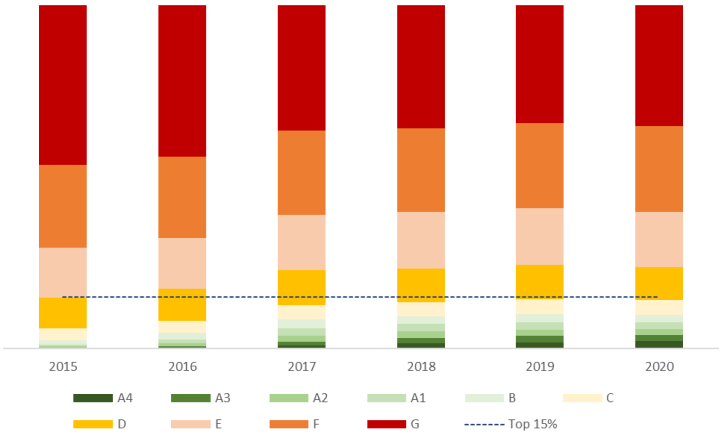


Source: CRIF elaboration on SIAPE data

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

Furthermore, **Figure 13** provides the distribution of EPCs per year of certificate issuance.

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



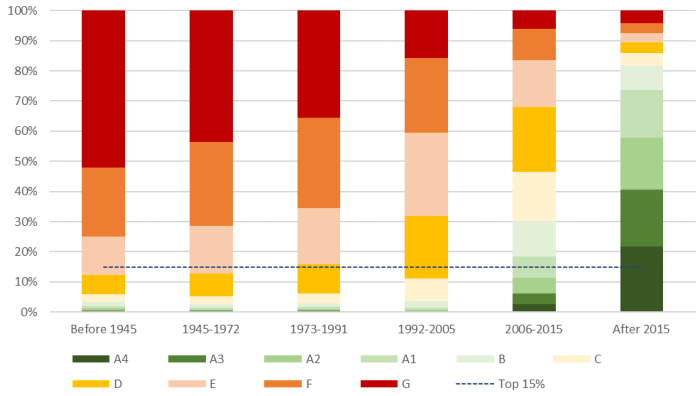
Source: CRIF elaboration on SIAPE data

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

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

The second criterion uses 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. Accessing the SIAPE database, the distribution of EPCs per building's construction year is derived for those certificates issued in 2015-2020 (1,654,445 EPCs), as in **Figure 14**.

Figure 14 – Distribution (%) of EPCs per year of construction

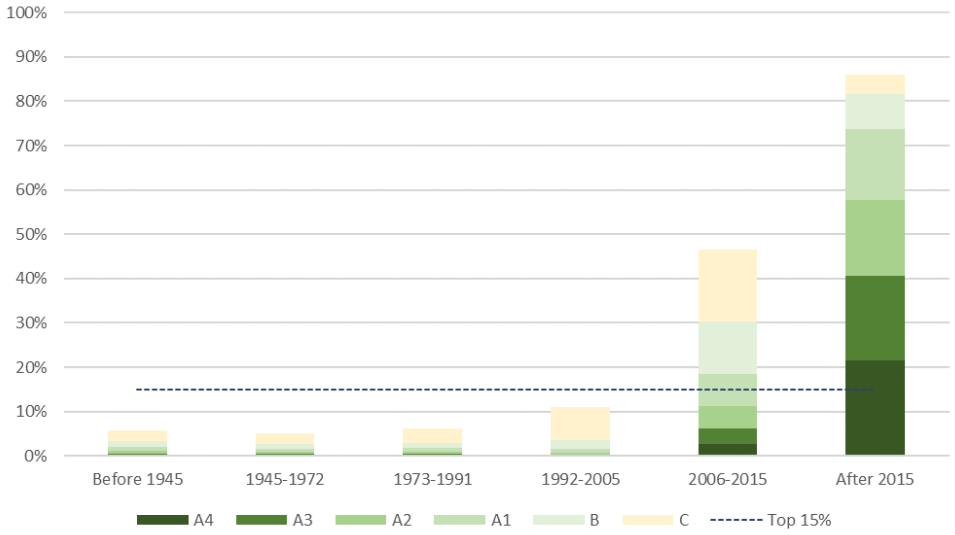


Source: CRIF elaboration on SIAPE data

Overall, the Italian stock has experienced a massive change in energy efficiency according to the construction year. For those buildings built before 1991, G and F classes weight about 60-70%, while in 1992-2005, the intermediate energy classes (i.e. C, D) significantly increase their contribution. This is the first signal of a real moderate change in the real-estate sector towards energy efficiency. Concerning EPC label G, the Italian Law 10/1991[34] 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 15** focuses on the variation of A, B and C EPC classes over time.

Figure 15 – Distribution (%) of EPC classes A (A4, A3, A2, A1), B and C per construction year



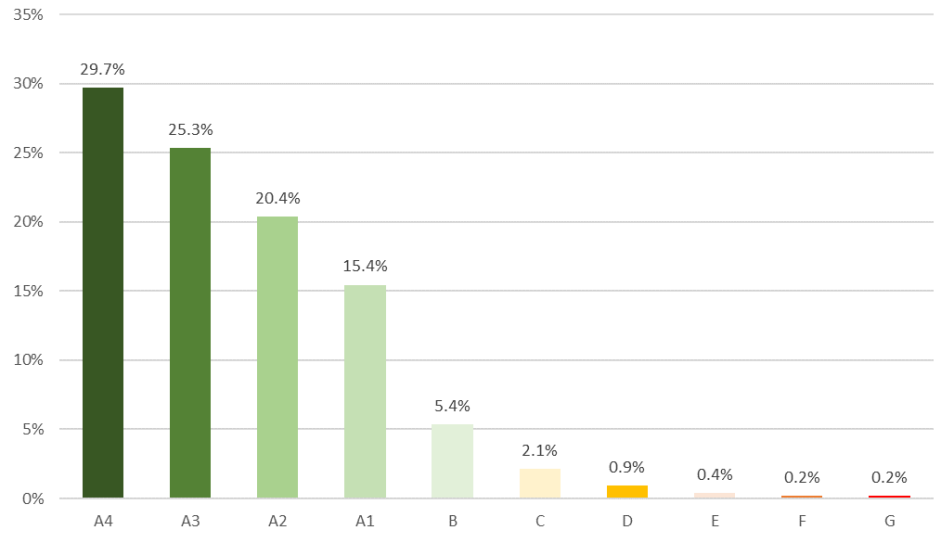
Source: CRIF elaboration on SIAPE data

Finally, filtering on new residential properties built after 2015 only, **Figure 16** shows the distribution of EPCs in the SIAPE database. An additional filter on the year of EPC issuance is applied to analyse the period 2016-2020. Accordingly, after using the filters mentioned above, the analysed perimeter is slightly lower than 5% of the entire pool of residential EPCs, uploaded in the SIAPE system. This result is in line with the rate of new constructions

[34] https://www.efficienzaenergetica.enea.it/component/jdownloads/send/27-leggi/66-legge-9-gennaio-1991-n-10.html

concerning the Italian stock in the last years. As a result, 98.3% of newly-built properties present an EPC equal or better to the C class.

Figure 16 – Distribution (%) of EPC labels for new residential buildings in 2016-2020



Source: CRIF elaboration on SIAPE data

3. CRÉDIT AGRICOLE PORTFOLIO ANALYSIS

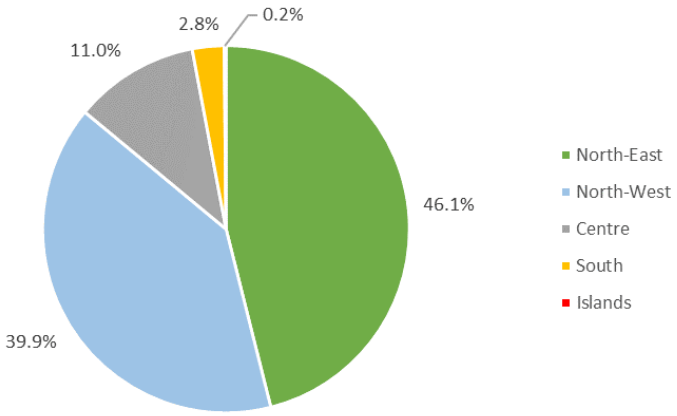
Under the criteria presented in **Chapter 2**, the 9,255 eligible mortgages in the Crédit Agricole portfolio (following 'Portfolio') correspond to € 1,175,517,938 bln total current balance. The average amount of the eligible current Portfolio's exposure[35] is €127,014 compared to €137,643 at the mortgage's origination date.

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

3.1. OVERVIEW OF CRÉDIT AGRICOLE'S ELIGIBLE BUILDINGS

Firstly, **Figure 17** provides the buildings' geo-distribution implementing the ISTAT regional breakdown[36].

Figure 17 – Distribution of properties according to the regional breakdown



Source: CRIF elaboration on Crédit Agricole portfolio

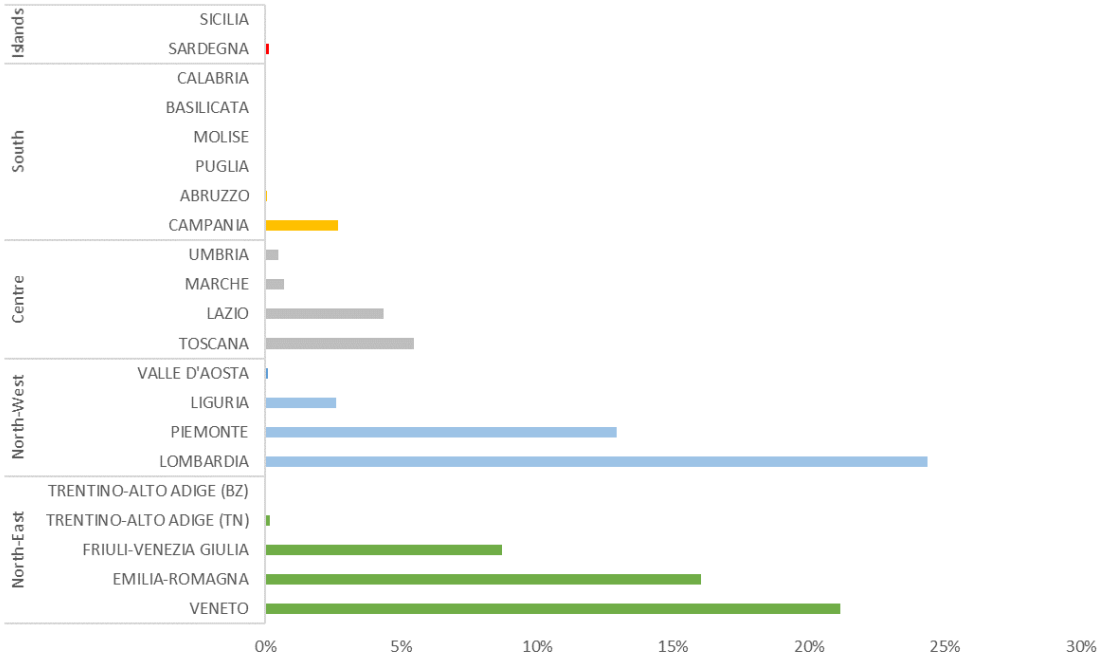
[35] At the date of the report production

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

Indeed, around 46% of the Portfolio is located in the North-East area, followed by North-West, with about 40% of the total. The central regions weight approximately 11% while South and Islands together about 3%. Overall, the Northern regions have a massive representation, counting for 86%.

Accordingly, a breakdown of the previous buckets identifies the most represented regions in the Portfolio, as in **Figure 18**.

Figure 18 – Distribution (%) of properties by ISTAT breakdown and regions

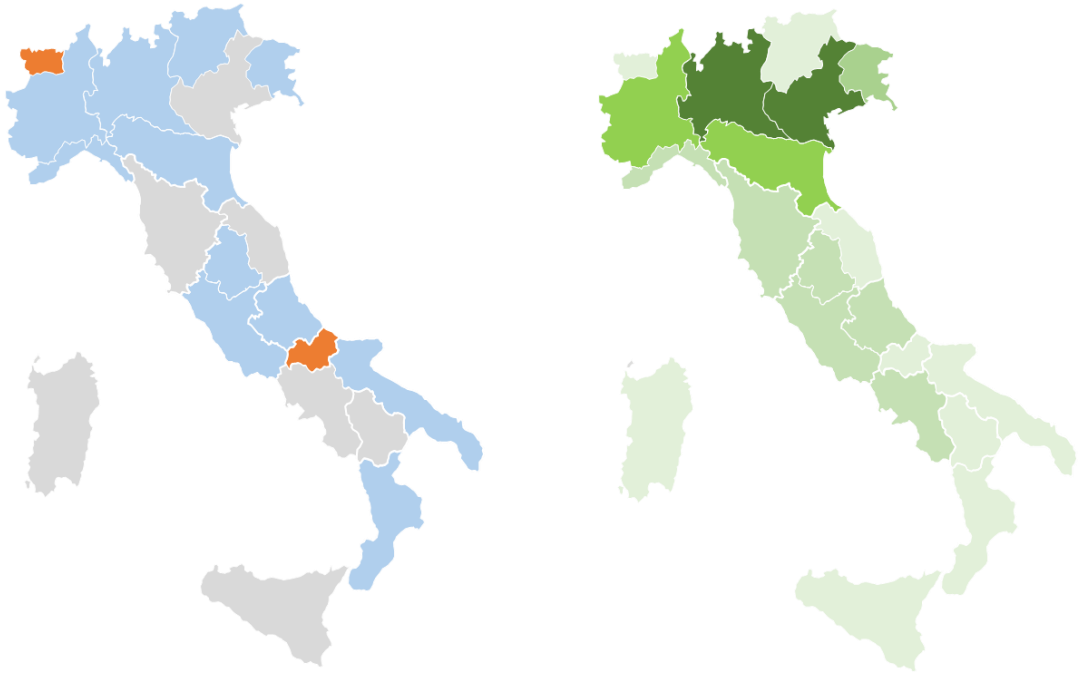


Source: CRIF elaboration on Crédit Agricole portfolio

The Lombardia is the most represented region, with around 24% of the buildings, closely followed by Veneto, approximately 21% and Emilia-Romagna, 16%. Looking at the central area, Toscana weights more than 5% of the whole Portfolio, while Campania is the most represented in the Southern region with 2.7%. Finally, only 0.1% of the Portfolio belongs to buildings in Sardegna.

Comparing the eligible buildings' distribution with the SIAPE database's coverage, **Figure 19** highlights how the Northern area is the most represented in the Portfolio (right), following the EPCs distribution in the SIAPE distribution (left). Apart from the Veneto region, the North-West and North-East areas are about 75% of the uploaded EPCs attached to residential buildings.

Figure 19 – Comparison between the SIAPE (left) and Portfolio (right) distribution at the regional level



Source: CRIF elaboration on SIAPE and Crédit Agricole portfolio

Moreover, the distribution of the Portfolio is analysed through a coloured scaled approach. Following Figure 18, despite the mortgages are granted in all the Italian regions by Crédit Agricole, the Northern area shows the highest representation. Simultaneously, the orange areas represent those regions (i.e. Valle d'Aosta and Molise) for which the SIAPE system is updating data.

3.2. APPLICATION OF ELIGIBILITY CRITERIA

Table 2 presents the eligible buildings in more detail.

Table 2 – Description of eligible buildings under Criterion 1 and Criterion 2

Criterion	Type of dwelling	Number of residential buildings	Current mortgage amount (€)
Criterion 1 ***EPC***	Apartment	4,852 *52.43%*	596,088,660.86 *50.71%*
	Detached house	1,313 14.19%	188,380,733.04 *16.03%*
	Holiday House	1 *0.01%*	155,754.42 *0.01%*
	Residential Housing Complex	2 *0.02%*	339,685.13 *0.03%*
Total Criterion 1		**6,168** ***66.65%***	**784,964,833.45** ***66.78%***
Criterion 2 ***Construction year***	Apartment	1,825 *19.72%*	222,146,199.48 *19.38%*
	Detached house	1,254 *13.55%*	157,535,838.75 *13.75%*
	Holiday House	1 *0.01%*	74,211.99 *0.01%*
	Residential Housing Complex	7 *0.08%*	1,033,027.67 *0.09%*
Total Criterion 2[37]		**3,087** ***33.35%***	**380,789,277.89** ***33.22%***
Total eligible buildings		**9,255** ***100.00%***	**1,165,754,111.34** ***100.00%***

Source: CRIF elaboration on Crédit Agricole portfolio

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

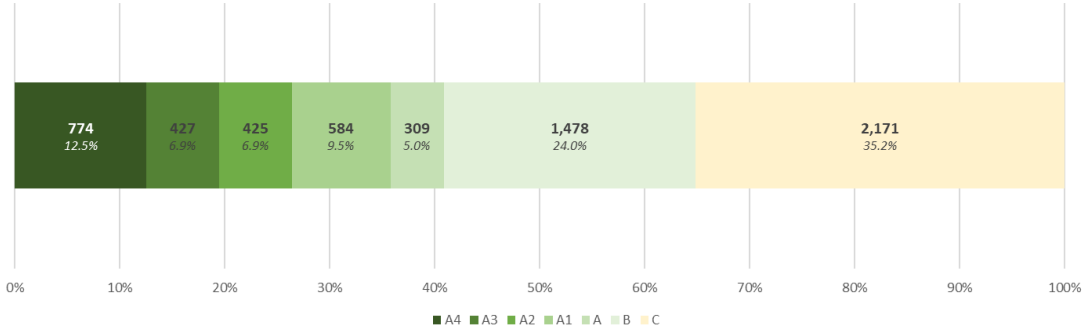
CRIF analysed the Portfolio under **Criterion 1**, considering both the distribution of existing EPCs attached to the buildings to identify those falling in the top 15%, according to the national stock's distribution and the certificates' validity on 31st of December 2020[38].

With this regards, as shown in **Section 2.2.1**, the top 15% of the national stock is proxied by buildings in EPC class ranging from A4 to C. Accordingly, **Figure 20** summaries the EPCs' distribution of the eligible Portfolio.

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

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

Figure 20 – Distribution of EPCs for eligible buildings



Source: CRIF elaboration on Crédit Agricole portfolio

As the Portfolio contains buildings assessed both before and after introducing the Ministerial Decree 26/06/2015 on the national guidelines for energy efficiency and the new standardised labelling methodology, EPCs 'A' are considered separately from A4, A3, A2, A1 labels introduced after 2015.

Among the eligible buildings, over 35% are attached to a C label and 24% to EPC B. The analysis of A-labels helps in drawing essential conclusions. EPC A, referring to the old criteria of EPC's issuance, only weight 5% of the eligible Portfolio, confirming that before 2015 only a small proportion of financed buildings were energy-efficient. Conversely, A4 EPCs, introduced after 2015, weight from more than 12%: the bank has granted mortgages for more energy-efficient buildings over the last years. Additionally, **Table 3** highlights the distribution of eligible EPCs under **Criterion 1** per type of dwelling underlying the mortgage.

Table 3 - Distribution (%) of eligible EPCs under Criterion 1 per type of dwelling

Type of dwelling	A4	A3	A2	A1	A	B	C	TOTAL
Apartment	8.71%	4.90%	4.96%	7.15%	4.52%	19.16%	29.26%	**78.66%**
Detached house	3.83%	2.01%	1.91%	2.32%	0.49%	4.80%	5.93%	**21.29%**
Holiday House			0.02%					**0.02%**
Residential Housing Complex	0.02%	0.02%						**0.03%**
TOTAL	**12.55%**	**6.92%**	**6.89%**	**9.47%**	**5.01%**	**23.96%**	**35.20%**	**100.00%**

Source: CRIF elaboration on Crédit Agricole portfolio

Finally, **Table 4** shows the average current balance of eligible mortgages under **Criterion 1** per type of dwelling and EPC label.

Table 4 – Average eligible mortgages' current balance under Criterion 1 per EPC label

Type of dwelling	A4	A3	A2	A1	A	B	C	TOTAL AVERAGE
Apartment	€143,175.31	€143,593.47	€142,739.95	€139,460.54	€129,709.51	€118,452.81	€107,732.74	**€122,854.22**
Detached house	€158,170.66	€156,264.35	€146,010.12	€146,102.78	€145,806.41	€141,591.29	€129,149.10	**€143,473.52**
Holiday House			€155,754.42					**€155,754.42**
Residential Housing Complex	€220,699.59	€118,985.54						**€169,842.57**
TOTAL AVERAGE	**€147,847.69**	**€147,215.44**	**€143,678.53**	**€141,086.98**	**€131,272.32**	**€123,086.77**	**€111,343.23**	**€127,264.08**

Source: CRIF elaboration on Crédit Agricole portfolio

Table 4 suggests how the average current balance of mortgages with high energy-efficient underlying buildings, i.e. A4, A3, A2, A1, is slightly higher than A, B and C labels. Simultaneously, considering the type of dwelling, the average current balance of detached houses proves to be more than apartments but lower than holiday houses (A2 label only).

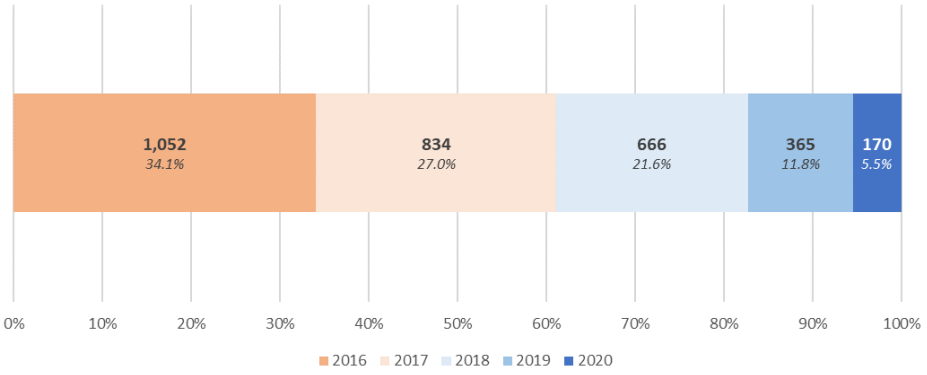
3.2.2. ELIGIBILITY UNDER CRITERION 2 – CONSTRUCTION YEAR

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

As stated in the present report, the existing law prescribes the EPC's attachment to construct new buildings. Besides, following **Figure 16**, in 2016-2020, 98.3% of the EPCs issued for new residential buildings and uploaded in the SIAPE database ranges from C to A4. Consequently, the eligible portfolio's conservative treatment under Criterion 2 is implemented to consider the remaining 1.7%. The application of a prudent 2.5% haircut renders the portfolio's value 100% eligible.

With this regard, CRIF identified the eligible new residential buildings in the Portfolio in 2016-2020. **Figure 21** shows the distribution.

Figure 21 – Distribution of eligible new residential buildings in the Portfolio in 2016-2020



Source: CRIF elaboration on Crédit Agricole portfolio

The highest rate is related to new residential buildings built in 2016 with 34%, followed by 2017 at 27%. Two thousand twenty only weights 5.5%: the COVID-19 crisis and the Italian lockdown between March and May had a vast impact on the real-estate constructions, especially for new buildings, also heavily affecting the mortgage's market.

Furthermore, **Table 5** provides an overview of the eligible dwelling's distribution under **Criterion 2** per year of construction.

Table 5 – Distribution (%) of eligible buildings under Criterion 2 per construction year

Type of dwelling	2016	2017	2018	2019	2020	TOTAL
Apartment	20.08%	16.78%	12.31%	6.71%	3.24%	**59.12%**
Detached house	13.96%	10.14%	9.20%	5.05%	2.27%	**40.62%**
Holiday House		0.03%				**0.03%**
Residential Housing Complex	0,03%	0.06%	0.06%	0.06%		**0.23%**
TOTAL	**34.08%**	**27.02%**	**21.57%**	**11.82%**	**5.51%**	**100.00%**

Source: CRIF elaboration on Crédit Agricole portfolio

To conclude, **Table 6** reports the average current balance of eligible buildings under **Criterion 2** per type of dwelling and construction year.

Table 6 – Average current balance of eligible mortgages under Criterion 2 per construction year[39]

Type of dwelling	2016	2017	2018	2019	2020	TOTAL AVERAGE
Apartment	€113,816.02	€126,220.99	€125,541.92	€128,617.78	€118,679.86	**€121,723.94**
Detached house	€115,936.35	€129,003.41	€134,681.17	€133,406.41	€116,119.35	**€125,626.67**
Holiday House		€74,211.99				**€74,211.99**
Residential Housing Complex	€106,111.26	€216,825.77	€103,815.27	€142,817.18		**€147,575.38**
TOTAL AVERAGE	**€114,677.38**	**€127,420.15**	**€129,373.89**	**€130,742.23**	**€117,625.53**	**€123,352.54**

Source: CRIF elaboration on Crédit Agricole portfolio

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

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

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