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Market research. Economic and Financial Report.

WP 2 – Model development

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About the Project

The INSPIRE-US project tackles the urgent need for decarbonising the building sector, focusing on energy upgrades in Spain's private rented housing. Buildings in Europe account for nearly 40% of energy consumption and 36% of CO2 emissions, with 75% being energy inefficient. The Directive (EU) 2024/1275 aims to double the annual energy renovation rate by 2030, targeting 35 million renovated units and creating significant job opportunities. In Spain, the residential sector's energy efficiency is critically low, with a renovation rate of just 0.2%, far below the EU's required 2-3% per year. Approximately 9.4 million homes need urgent improvements. The Integrated National Energy and Climate Plan (PNIEC) aim to renovate 1.2 million homes by 2030, but progress has been slow. The rental housing sector is growing, with 24.9% of households renting in 2023, reflecting a shift from home ownership. A major barrier is the split incentive dilemma, where property owners bear the costs of energy efficiency investments, but tenants benefit from reduced energy costs. This misalignment often results in inaction. In addition, Spain faces a shortage of affordable rental housing, exacerbating the issue.

INSPIRE-US proposes a One-Stop Shop (OSS) to provide integrated services for energy upgrades, offering comprehensive support including information, diagnosis, financing, management of permits and grants, sourcing and contracting suppliers, technical supervision, and post-intervention evaluation. The OSS aims to address the split incentive dilemma and provide holistic support, especially for vulnerable and low-income households. The project will enhance energy efficiency while addressing social aspects such as accessibility, comfort, security, and neighbourhood identity. It will be implemented in two phases: initially through three pilots in Madrid and then expanding to ASVAL members across Spain. Specific objectives include developing an integrated solution for rental housing, encouraging energy rehabilitation projects, connecting relevant actors in the value chain, providing best practices to tenants, ensuring energy investment in vulnerable neighbourhoods, and creating strong public-private partnerships. INSPIRE-US aims to facilitate energy upgrades in Spain's private rented housing sector, addressing both technical and socio-economic barriers. By providing integrated services and support, the project seeks to enhance energy efficiency, reduce CO2 emissions, and improve the quality of life for residents, particularly in vulnerable neighbourhoods.

Partners

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1. Introduction

Rental is defined as the temporary use of an asset that is transferred by its owner to a third party in exchange for a price¹. This conception of rental is applied to multiple markets, one of them being housing. A rental property is a residential property in which its generated services are enjoyed and consumed by someone other than its owner and with which there is a transfer agreement in exchange for the periodic payment of the agreed price. There are, therefore, two conditions for the use of a dwelling to be classified as rental and, therefore, which would condition the delimitation of this type of market: that the use has been transferred to someone who is not its owner, and, secondly, that there is an economic consideration as payment for residential services.

A rental so defined may or may not be market. When the amount of the consideration is the result of the demand/supply interaction, then the rent responds to the market price, so that the allocation of resources (residential space) oversees the 'rental market'. However, there are numerous occasions in which the consideration is not market, but is fixed, either by the owners or by regulation², so that the amount paid does not represent the price that the market would be willing to assume to balance supply with demand. The extreme case is that of public rent, in which the amount is set by the Administration and responds to reasons in the field of social policy so that the units assigned by this formula make up a non-market segment. There are, therefore, segmented markets depending on the way in which the rental price is set and the homes reserved for it, if this restriction exists.

Finally, there are situations in which there is a transfer of use without a price. By definition, this formula would not enter into an 'ad hoc' analysis of renting, although the relevance of this figure in Spain may show how it could be a particular form of renting, or, from another perspective, a way by which the need for (permanent) use of housing is adjusted to a group of applicants without the ability to access.

¹ The dictionary of Spanish usage by María Moliner (Gredos, 1998) defines it as the action of renting or leaving a thing to be used and occupied, particularly a house, a farm or land, a exchange for a price that he pays periodically. 'Rent' refers to the price for which a thing is rented.

² The existence of rent regulations establishes a wide range of non-market 'rental prices'.

The rental market, composed of the aforementioned elements, should be able to be defined in two categories: the pure rental market, in which both transactions and prices respond as the forces of demand and supply, but also to what could be considered a 'public rental market', where prices are set by the Administration and in which housing is allocated for reasons other than the market. Housing transfers should not be considered rents either, as should housing provided to their employees by companies³, due to the way in which the price is set, although their characteristics allow us to intuit that they are adjustment formulas derived from the poor functioning of the market. Nor would the use of family dwellings by members other than the principal head (the case of students residing in dwellings owned by the family, but other than that of the main household) be considered within this category. The analysis of the rental market would be complete if the market segmentation between these residential use formulas were known, although the lack of transaction statistics makes it impossible to identify the relevance of each of them.

Finally, rental markets are partially regulated. In some countries, including Spain, most of the regulations are focused on controlling the use of homes on a permanent basis (main residence) to promote accessibility to housing,

with regulations that range from setting the rates of updating rents to limiting price levels. The rest of the use of housing has limited regulation (rentals of less than one year, student housing, other types of rentals) except for very short-term uses, whose segment is aligned with the regulations of the tourism sector. This strongly increases the segmentation of this market and identifying it spatially (all units are in the same markets, influencing each other) is complex, as well as evaluating or approximating the way in which the market allocates income levels.

Segmentation and applicable regulations have been able to generate interferences in the operation of the market that have distorted its ability to respond to changes in demand.

Promoting the development of imperfect and poorly sized rental markets in which conventional analysis is fruitless. The impacts of some of these interventions have been theoretically analysed. (Lopez, MA, 2004), although their empirical effect has not been evaluated in their different segments.

³ In which there may be a rental contract but not directly binding with the household that uses it.

In this deliverable, the rental market in Spain is addressed. It is a matter of describing in as much detail as possible, the use of a part of the housing stock by non-owner households. The aim was to begin by highlighting the differences between 'rental' and 'non-rental' due to the great relevance that other formulas of use have within the Spanish residential stock, highlighting the basic characteristics of the former, which are shown.

A second objective of this work is to bring to light the existing rental statistics and their disaggregated detail, listing their characteristics, relating their particularities according to what other experiences show, and providing arguments from economics that propose the development of the rental market under the logic that real estate theory marks and the information requirements that a rental market that can be analysed with respect to the information market should have periodicity.

The concept of rental that is addressed (and analysed) here is, therefore, strict. The characteristics of the market defined as 'permanent rental ' by the applicants themselves will be provided, and not the rest of the units with other housing uses, knowing that it is possible that the real proportion of demand that uses the residential stock as a home without resorting to ownership may be underestimated.

This document is organized as follows. In the first section, the rental market in Spain is introduced from an aggregate perspective, where the rental market in Spain is described using the only long-term source, such as censuses, complemented by the statistics of the Living Conditions Survey; this section also focuses on the tenure structure and the energy efficiency characteristics of buildings as far as the statistics allow us to observe. In the second section, the stock is reviewed in depth with a cross-checking of the censuses associated with the energy particularities of the buildings, to identify the state of the buildings/dwellings, dedicated to rent relative to those owned.

The third section reflects the current situation as a snapshot, which allows us to identify the economic trends and the determinants of renting in the future, in order to assess the need for renting; the financial mechanisms to improve buildings for rent, increasing their energy efficiency and the barriers that apparently exist, and, finally, the line of aid for energy renovation.

Finally, this report concludes with a summary of the contribution of this section to the INSPIRE-US project. The theoretical description of the rental market, its operation and the specific mechanisms that contribute to price setting has been taken to Annex I.

1.1 The rental market, determinants of rental demand, market typologies and evolution

Permanent rental markets, to the extent that they cover a fundamental need of households, are long-term markets. The population that rents intend to stay in the homes for a certain time in accordance with the evolution of their life cycle, which is delimited by a series of factors, which are then listed, which identify the different residential needs associated with the evolution of the home itself. This implies that demand has a persistent behaviour over long periods of time (which makes them predictable) and can be said to be stable in the long term, and supply must respond to this initial particularity.

In fact, this long-term demand is based on analyses of life cycle theory, which holds that the family unit is not static, but evolves through a series of phases marked by key demographic milestones (McAuley and Nutty, 1982). Each stage generates specific demands on (1) space needs, as the size and composition of the household determine whether a large or small dwelling is needed, with or without a garden or other amenities (e.g., it increases with the birth of children and decreases when the home enters the "empty nest" phase); (2) their financial and savings capacity, since income usually increases during active working life and decreases in retirement, affecting the ability to assume debts (mortgages) or rental costs; thirdly, (3) due to the need to move (for work or studies), that is, due to the degree of household mobility (which is usually high in the initial stages, favouring renting, and lower when the household settles and grows in size). The combination of the three explains the search for stability and accumulation of wealth drives the purchase in the middle stages.

Although modern life cycle models recognize more variations (divorce, cohabitation, prolonged singleness), the classic scheme that explains the stages of the Life Cycle would be, the first, an Initial phase (Singleness and Young Couples without Children), where their relationship with housing is marked by mobility, flexibility and low cost, so the preference is high for renting. The second phase is where the household grows (couples with small children), in which there is a need for more space, security and access to services (schools, health, commerce...), marked by a growing stabilization of income that drives the transition to ownership (purchase of the first home).

The third phase would be the stabilization of household size (couples with older children), where incomes are maximum, there is little mobility, and often the aim is to improve or consolidate home ownership.

Once the children have formed their own home, the fourth phase appears, which is known as the 'empty nest', in which the household reduces its size and can look for

options with less maintenance, valuing liquidity. Sometimes it involves selling and renting back or buying a smaller home.

The last phase, in which the household is reduced in size or its need for services decreases (widowhood and retirement), is characterized by lower income, focus on health and access to services other than conventional ones; In this phase, the home must be physically accessible and easy to maintain.

Households may deviate from the traditional trajectory expected by the life cycle model, as the determinants of rental market demand evolve. If developments are altered, there may be a gap between the normative stages of the household life cycle and the economic/social reality, which is reflected in the stability of housing tenure. The deviations in the trajectory of the life cycle of households with respect to housing that have been observed in recent years have been able to generate a break in the expected stabilization trajectory (such as the transition to ownership from the age of 35), causing generational disenchantment or a systemic failure in the residential market that prevents households from reaching the expected life milestones. forcing an unwanted stay in transitory stages (such as renting indefinitely).

These changes in trajectory would be determined by substantial shocks in residential demand factors that may come from (1) economic and social shocks with long-term effects, such as the shock derived from the financial crisis of 2008 and, even earlier, with the progressive deterioration of income distribution since the 1990s, which has led to an undermining of the stability of the phases of the life cycle due to an increase in the vulnerability of households, both economic (labour income loses purchasing power) and social (employment is massively generated in different locations). These changes increase the vulnerability of the stages of the life cycle due to the fragility of the household's situation, even if it is in a phase of "theoretical stability" (such as a homeowner with a mortgage), as happened in Spain during the period 2010-2014, in which a large part of households already settled lost their homes as a result of the crisis. This implies that access to lifecycle stages, which should provide a security shield (especially ownership), are now exposed to economic risk and can be quickly reversed, leading to foreclosures, non-payment of rent or reliance on social assistance.

Secondly, the disruption of economic developments and their effects (unemployment, rising interest rates, high residential prices), which has strong implications in the short and medium term to support the gap between stages of the life cycle, especially due to its effect on affordability, which limits the possibility of meeting the expectations of reaching the next step, and generating the generational disenchantment mentioned above.

Observing the factors of demand for housing is a fundamental element in carrying out an assessment of the rental market.

1.1.1 Factors indicative of housing demand

The demand for housing (and for other real estate assets) has components that act in the LONG and SHORT term, which allow us to identify the different effects on the evolution of the life cycle mentioned above. Among the first (or fundamentals) are those forces that act continuously over time and have permanent effects on the markets, shifting the demand curve with their changes. There are basically three:

- The demographic component. The population is the main demand for housing and is considered the potential demand in these markets, since it manifests in advance and foreseeably its need for the use of these goods. It is usually stable over long periods (baby-boom, migration flows, etc.). etc) and their characteristics determine potentiality, such as age, number of families, composition, among others. Population mobility is seen as the driver of rental demand, making it particularly sensitive to demographic and labour movements. Two types of rental demand are usually identified for demographic reasons:
 - Transition demand: The moving population (international migrants, internal migrants, newly emancipated) generates an initial demand for renting, either as a temporary step before purchase or as a permanent solution due to potentially existing restrictions in property markets.
 - Demand by household life cycle: Young people and newly educated people have a high propensity to rent due to their life stage (Quigley, 2002:⁴).
- The income and wealth of the economy and its distribution. Economic growth is considered to boost employment, wages and increase the purchasing power of the population being the fundamental conditioning factor that allows potential demand to become effective demand.

4.Quigley, J. M. (2002). Transactions costs and housing markets. UC Berkeley working papers, available on <https://escholarship.org/content/qt6pz8p6zt/qt6pz8p6zt.pdf>

Of the fundamentals, it is considered that the first, as potential demand, is the one that determines the size of the market and, therefore, the general needs for housing in number, in each market. The combination between the first and second groups (demand plus income) delimits the effective demand that would be the one that would have the possibility of accessing the market under some tenure formula and the decision between them would already be within the mechanisms described above.

There is a third condition that would be a determinant of the demand for property, such as the availability of financing. Given the high capital requirements of residential (real estate) assets, the availability of sufficient financing is a fundamental conditioning factor that allows demand to enter the market through ownership. Credit restrictions in the form of a limitation of financing flows have an immediate effect on the contraction of demand, since the availability of foreign capital is what makes it possible to access ownership through purchase, although it does not seem to have a direct influence on the formula of access to rent.

Short-term factors are those that act on the way the market reaches equilibrium. They usually have no permanent effects and are the source of fluctuations characteristic of this sector and can condition access over average time periods (3-5 years). These include some general indicators, such as interest rates, tax rates (components of the cost of use), the existence of market vacancies (such as a dormant offer waiting to be used) or legal and regulatory regimes and transaction costs (such as search and information costs, transaction registration (notary and registry fees, including intermediation costs). Regardless of the tenure formula finally chosen (ownership or rental), these costs are assessed in a high proportion of the rental or purchase price, which is an element that delays and slows down the decision to enter the market.

- The reasons that can make you demand a rental home are associated with different issues, among which the following stand out:
- Household mobility: Migration processes imply the mobility of households and the urgent need to
- meet residential demands. This means that mobility implies the need for rental housing, perhaps for
- temporary use, until the household is established in the destination labour market. In this sense,
- changes in employment formulas, remote work and new types of hiring, as well as the specialisation of jobs, may imply greater mobility of employment that has a direct relationship with rental demand.
- Absence of the determining conditions for the purchase. The rental market acts as a substitute market for ownership, so the absence of the precise conditions for the purchase of a home, such as prior savings, the availability of financing

(credit restriction) and/or the ability to pay, orient households to rent as a form of use of housing.

- Supply shortages can affect short-term allocation mechanisms and force households to take a different tenure formula than the desired one. This is especially relevant in the last two decades, when the supply of new units has been minimal in the European economy, generating a residential allocation that does not follow historical patterns. For example, the lack of new supply makes it difficult to replace the existing home with the new one in those households with a long stay in their homes) and therefore reduces the flow of units into the rental market.
- The accumulation of demand segments where rental access is the 'natural way' to enter the housing market. According to life cycle theory, this tenure formula is 'natural' in the first age strata (young people, immigrants and new households). In some cases, it is also often a form of tenure for older households (Ranney, 1981) or for moving households of any age (Hardman and Ioannides, 1995).
- On the other hand, rental demand is affected by changes in different macroeconomic areas, such as the evolution of the building cycle, housing policy, income (which determines affordability) and monetary policy, among others. As for the latter, the evolution of interest rates has effects on rental levels in the markets, according to existing research (see Stephens, 2025)⁵

⁵ Mark Stephens (2025) The role of housing in central banks' monetary policy decisions in Australia and the UK, *Housing Studies*, 40:9, 2085-2103, DOI: 0.1080/02673037.2024.2395361

1.1.2 The role of housing supply for residential rental

The determinants of housing supply also tend to present long-term patterns. The literature analyses them (the definition in (3) in the theoretical development of Annex I) based on the production function of building: the construction of new units that are added to the stock is a function of the existing stock, market prices, production factors (costs, availability of inputs, land) and other factors such as regulation or planning. Given that renting is a form of tenure, the determinants of the supply of rental housing will not differ too much from those that encourage construction, although the use of part of the units for this purpose will be directly related to the parameters of the rental market. These would be:

- Rental prices. An increase in rents will lead to more units being rented rather than owned, by increasing the profitability associated with managing homes. In this case, they would act as an incentive to increase the number of units for rent, which would eliminate the possible tension in prices.
- The available residential investment flows and the availability of factors of production, including land, in the market. Restrictions in any of these components would imply that supply cannot react to market impulses (Taltavull, 2006).
- The existence of technical construction regulations and those that affect the provision of rental housing. In the latter case, policies to encourage the construction of rental housing may have results that will depend on the strength and specialization of the market, so that the provision of rental housing within the location of property markets may reorient tenure, modifying the achievement of objectives.
- Existing restrictions on rent control can have a very relevant effect as they could incentivize/discourage the entry of new units on offer.
- The supply structure in the rental market depends on the weight of the institutional size of the owners. The form of allocation is determined by the size of the two large groups of owners, such as (1) institutional investors (large owners such as investment funds, REITs, companies specialising in build-to-rent) who manage housing portfolios to obtain a return, and (2) small private owners (individuals who rent one or a few second homes they own or homes they cannot sell).

1.1.3 Current typology of rental markets and the role of tenure

Rent covers a residential space use need for a person or household. The most important is that rental that satisfies the fundamental need for protection of the home (Maslow's pyramid), serving as housing for its development in the long term, since it lacks has a strong social impact in the medium and long term, and acts as a limitation on economic and social growth. For this reason, many regulations, including the Spanish one, make a legal distinction in the market between habitual and non-habitual residence, and protect, regulatorily, the former.

Nowadays, it is possible to define the types of rentals according to the reasons why a household or individual needs to rent a home, that is, home conditions that would make them demand rent, which would be the following:

- Financial and economic reasons, which would include those households that:
 - They do not have enough savings to cover the initial delivery in the purchase.
 - They have difficulty obtaining external financing, both due to their medium or low-income levels, and for other reasons associated with the mortgage market or the financial system.
 - They have job instability because they do not have long-term contracts that support their income stream in the purchase process (temporary contracts, precariousness or lack of seniority, among others).
- Reasons of mobility and flexibility in the use of housing. There are a growing number of these reasons that have been able to substantially increase the need for renting:
 - Labour market conditions may determine the need for labour mobility for short periods to other cities or localities.
 - Seasonal or remote jobs (teleworking) generate the need to rent for short periods in different locations.
 - Transition periods in the life cycle, such as mobility for study reasons, for those students who temporarily move to another city to study. These periods are long (average of 5 years) although they are considered non-fundamental.
 - Changes in the life cycle due to separations, divorces or residential coverage until the definitive home (while the definitive one is being built or sought).
- Lifestyle reasons and preferences. The tendency to rent can come from

(1) the preference to reduce the responsibility for the maintenance of the property (it is the landlord – owner – who assumes the costs and management of the major repairs and maintenance of the property).

(2) the preference for non-long-term indebtedness associated with property.

(3) Access to better locations, since renting allows you to live in prime areas (central, exclusive), close to services or workplaces, where the purchase price is prohibitive, there is not enough supply for sale, or the rent is affordable. The desire to rent in a specific area or neighbourhood could also be included here to check if it suits their needs before making the permanent purchase decision.

(4) The use of dwellings in different places for short periods, which would be categorized as seasonal rental or tourist use.

Of the four, the first two subgroups refer to the fundamental need for residence that would be covered by rent. Categorising the different typologies that exist in the regulations, with the needs.

Table 1.1 presents a list of types of residential rental that currently exist.

TABLE 1.1. RENTAL FORMULAS OR TYPES, PURPOSES AND NEW PATTERNS

TYPE OF CONTRACT	MAIN PURPOSE	NEED
PRIMARY RESIDENCE (LONG TERM)	The permanent need for housing. Tenant protection (LAU protection)	Those who cannot or do not wish to buy, and are seeking a stable, long-term home
SOCIAL HOUSING / VPO (OFFICIALLY PROTECTED HOUSING) (LONG-TERM)	The permanent need for housing. Reduced-price housing provided by the State or other entities for vulnerable or low-income groups.	Households at risk of exclusion or with severe economic constraints.
RENT-TO-OWN	The permanent need for housing. Flexible in terms of mobility. It allows occupants to live in the property while building up capital for a potential future purchase (LAU protection + Civil Code).	Those who need time to obtain mortgage financing or to stabilize their economic situation before committing to a purchase
LUXURY HOUSING RENTAL	The permanent need for housing. Dwellings with a large floor area or a very high initial rent (above certain legal thresholds) (Civil Code).	High-income tenants seeking contractual flexibility and luxury housing
TEMPORARY OR SEASONAL RENTAL	It meets a temporary and justified need for accommodation (e.g. temporary work, studies, etc.). LAU (use other than habitual residence; no protection).	People with work-related or academic mobility who require accommodation for a limited period.
- NEW MODELS OF SHARED RESIDENTIAL RENTAL		
ROOM RENTAL	Rental of a private room with shared common areas (kitchen, living room, bathroom). (no-LAU)	Students or young professionals seeking to reduce costs or who do not require a full dwelling
TOURIST OR HOLIDAY RENTAL	Short-term rental (days or weeks) for leisure and tourism purposes. Specific regulation of each Autonomous Community. (no-LAU)	Tourists who prefer a residential property over traditional hotel accommodation.

COLIVING (COLLABORATIVE HOUSING)	It is governed as a temporary rental or lodging agreement. Rental of a private room or individual studio space within a building that offers extensive shared areas and services (coworking spaces, gym, events). It prioritizes community, flexibility of stay, and networking. (non-LAU)	Digital nomads, young professionals, or individuals seeking a dynamic social environment without long-term commitments.
FLEX LIVING (FLEXIBLE RENTAL)	Short- or medium-term contracts (e.g. 1 to 11 months) for furnished homes with services included. It emphasizes convenience and quick move-in/move-out processes. (non-LAU)	Relocated executives, individuals in residential or professional transition who need everything arranged immediately.

The multiplicity of rental formulas is a reference point for the need to make the rental regulatory framework more flexible to adapt to the different residential needs derived from socio-economic evolution.

In this document, only reference is made to the permanent rental formulas, which cover the long-term need for residence of households, which are those considered in terms of their contribution to the stability of society and the good development of the city.

1.1.4 Long-term rental needs, the tenure formula and the regulatory instruments for rent control. International evidence.

In most developed countries, it is market criteria that are used for the allocation of rental housing (supply and demand), including affordable housing formulas where both supply and demand are limited to the availability of units and listings of households that meet the protection requirements. The resulting rental prices will depend on whether there is regulation, so that households that go to the free market will usually face a higher rent than those that access regulated markets. The price incentive on the supply of new homes would only act in the free market, while in the regulated market it must be accompanied by specific regulation that has this effect.

In developed countries, it is common to find both cases coexisting in the same areas: segments of the rental market in which one of the two components (supply and/or demand) or both, are set by public regulations, as well as market situations where the power of the owners allows them to direct prices. As for the former, there are very different formulas for social rents, depending on the countries and the type of housing provision. Social rent would take the form of the transfer of a dwelling that has been provided with public means (or regulations) and whose price of use is set by the

Administration and assigned for reasons of social policy to a household. This 'use price' does not represent a market value but a public price and is set for reasons other than those determined by the market. Based on this definition, social rents have very different casuistry in Europe, both in terms of pricing, provision and management, but in many cases they constitute a significant part of the total rental stock available in the country, as shown in Table 2: Rental markets in Europe seem to reflect the existence of three organisational models: the first, which includes the Nordic countries, the United Kingdom and the Netherlands, have a majority of public rentals, with the private market representing less than a third of the total. The second, with France and Austria, would have a rental market segmented 50% between public and private. The third model would be that of countries where most of their rental takes place in private allocation environments, such as Belgium, Greece, Germany, Italy, Luxembourg and Portugal.

This means that, in a large part of the markets, renting has developed under the protection of social policy, mainly after the Second World War, and has endured, possibly, entering competition with private renting. In others, however, this development has been maintained over time.

Table 2 – List of countries

TABLE 2. HOUSING STOCK TENURE IN EUROPE				
COUNTRY	Owner-occupied housing (%)	Total rental (%)	Market-rate rental (%)	Reduced-price or social rental housing (%)
AVERAGE UE (2023)	69.2%	30.8%	20.6%	10.2%
GERMANY	46.7%	53.3%	43.7%	9.6%
AUSTRIA	54.8%	45.2%	33.3%	11.9%
BELGIUM	67.4%	32.6%	22.4%	10.2%
BULGARY	87.7%	12.3%	9.2%	3.1%
CZECH REP.	78.4%	21.6%	17.5%	4.1%
CYPRUS	69.9%	30.1%	25.2%	4.9%
CROATIA	91.0%	9.0%	8.0%	1.0%
DENMARK	59.3%	40.7%	25.1%	15.6%
SLOVAKIA	93.3%	6.7%	4.5%	2.2%
SLOVENIA	68.6%	31.4%	22.9%	8.5%
SPAIN	75.1%	24.9%	20.8%	4.1%

ESTONIA	67.0%	33.0%	27.2%	5.8%
FINLAND	61.1%	38.9%	27.2%	11.7%
FRANCE	65.1%	34.9%	21.0%	13.9%
GREECE	75.9%	24.1%	20.6%	3.5%
HUNGARY	90.7%	9.3%	6.0%	3.3%
IRELAND	68.2%	31.8%	17.8%	14.0%
ITALY	73.7%	26.3%	22.0%	4.3%
LATVIA	76.8%	23.2%	18.0%	5.2%
LITHUANIA	90.9%	9.1%	8.0%	1.1%
LUXEMBOURG	69.4%	30.6%	24.5%	6.1%
MALTA	70.0%	30.0%	25.1%	4.9%
NETHERLANDS	67.8%	32.2%	8.8%	23.4%
POLAND	86.8%	13.2%	10.4%	2.8%
PORTUGAL	73.9%	26.1%	24.3%	1.8%
UNITED KINGDOM	63.5%	36.5%	19.0%	17.5%
ROMANIA	95.3%	4.7%	4.3%	0.4%
SWEDEN	63.8%	36.2%	23.3%	12.9%
SWITZERLAND	39.0%	61.0%	56.0%	5.0%

Table 2 shows four groups of countries. The first is made up of those countries with the highest ownership rates (more than 85%) concentrated in Eastern Europe (Romania, Slovakia, Croatia, Hungary, Lithuania, Poland, Bulgaria). The second group includes countries where renting is a form of tenure, with Germany, Switzerland and Austria being the only countries where total rent exceeds or is like ownership. In addition, market rent in Germany (43.7%) is the highest in the entire EU, almost double the average. The third group includes countries where there is a leadership in social renting, such as the Netherlands (23.4%), Denmark (15.6%), Ireland (14.0%) and France (13.9%), where different types of management allow the availability of housing for the provision of reduced-price or social renting. The last group is made up of countries where the provision of social rent is lower, although the rental market varies in size from 5% to 20% (Spain, Portugal, Greece, Romania, Bulgaria, Poland). In general

terms, the size of the average rental market oscillates around 0% of the main housing stock, with some countries where this proportion is less than 10% (mainly countries in Central and Eastern Europe, where the transition to a market economy led to the privatization of practically the entire stock leaving minimum rental rates). and a small group of countries have most households with rental tenure (Germany, Switzerland and Austria)

Most European countries, moreover, have long experience in the application of rent control regulations. This is a regulation that controls the increase in rental income by setting limits on some market conditions, either by setting maximum price limits to take as a reference, generating the appearance of maximum prices in this market, or by regulating the revision of these prices or, finally, by stipulating legal limits on the use of housing (such as the minimum duration of the contract or limitations on termination in periods lower than that set by the regulation), among others. Thus, the application of controls on a private rental market may have restrictive effects on its operation in a similar sense to that of public renting. The effects of rent controls are known in the literature and have been contrasted in other countries. See Fallis and Smith, 1984 or Vitaliano, 1986.

Although most European countries have legislation that limits annual rent increases (usually linked to the CPI), the strictest "rent control" usually also refers to limiting the initial price of contracts.

Table 3 includes regulations from some countries that are applied within the concept of rent control.

Table 3. Rent control mechanisms in Europe

Country	Main regulatory mechanism	Scope of price control	
GERMANY	Rent brake (Mietpreisbremse)	Localized (in stressed areas).	It limits the initial rent to 10% above the local average rent (Mietspiegel), while respecting existing contracts.
NETHERLANDS	Points-based system (WWS)	Middle- and low-income rental housing.	It assigns points to a dwelling based on quality, which are used to determine the maximum legal rent. It aims to prevent medium-quality homes from being rented at luxury prices.
SWEDEN	Annual collective bargaining	Universal (almost all contracts).	The rent is agreed annually between organized tenants and landlords, based on "use value" (rather than market value).

AUSTRIA (Viena)	Regulated rent and social housing	Predominance of legacy contracts and public housing.	he rent is set according to quality categories and protected rent levels. Social housing (<i>Gemeindewohnungen</i>) plays a dominant role in maintaining market stability.
SPAIN	Targeted regulation	Localized, applicable in “Stressed Areas” officially designated by the Autonomous Communities.	The 2023 Housing Law allows limits to be placed on initial rents and annual rent increases in areas officially declared as high-tension (high-demand) zones.
FRANCE	Localized rent control (Reference rent / <i>Loyer de référence</i>)	Localized application (major cities such as Paris, Lyon, etc.).	The initial rent and annual increases may not exceed an upper reference limit (<i>loyer de référence majoré</i>) set by the local government.
PORTUGAL	Inflation control and rent moratoriums	Universal (annual increase caps).	It sets a legal maximum cap on annual rent increases for all contracts, often decoupled from the actual inflation rate.
IRELAND	Rent Pressure Zones (RPZs)	Localized (in high-demand areas).	It limits rent increases to a maximum of 2% per year (or the CPI, if lower) within areas designated as high-pressure zones.
DENMARK	Historical regulation and cost-based rents	Most dwellings built before 1991.	It maintains regulations that limit general rent increases, allowing adjustments only to cover improvement and maintenance costs.
SWITZERLAN (Zúrich/Geneve)	Net return on capital	Universal (applies to all contracts).	The landlord may only increase the rent if they can justify higher housing-related costs or if they have made investments that improve the property’s capital return.

Fte. The authors, based in Germany (German Civil Code and Mietspiegel), Netherlands (Affordable Rent Act and Woningwaarderingsstelsel); Spain (Housing Law 2023); France (Loi ÉLAN- 2018); Sweden (Land Code, or Hyreslagen, cap 12 and Tenants' Association-Hyresgästföreningen); Switzerland (Swiss Code of Obligations), and European Parliament Report 2 025/2070(INI).

These countries are selected to classify the existing regulations applied, as they show the main models of rent regulation, although the reintroduction of rent control is a growing trend and may bring differential regulations. Table 3 shows the rent control mechanism and the scope of its application.

To summarize, it could be said that regulatory control tools could group countries into three models.

1 . Price Control Model "regulating the initial price", in Germany, France, Spain.

A market price index is used to set a ceiling only in areas where demand is greater than supply. The intervention is geographical and focuses on avoiding the bubble price in new rents.

2. Price Control Model "based on objective value". Netherlands, Sweden, Switzerland

The price that is set is the result of an objective evaluation of the property (quality, points, operating costs) or through a negotiation that decouples the value from the market price.

3. Price Control Model "seeks the stability of rent amounts"; Portugal, Ireland, Denmark (and, secondarily, Spain also applies limits to the annual increase in existing contracts). This method tries to limit the annual increases of existing contracts to protect tenants from inflation or speculation, leaving the initial price of the new contract freer (with certain exceptions).

In this regard, the European Commission's position tends to be cautious or critical of rent control, while the European Parliament and some social organisations advocate greater intervention to ensure affordability. On the one hand, the economic outlook (which guides most of the analyses generated in the European Commission's Directorate-General for Economic and Financial Affairs (DG ECFIN) indicate that the effects of rent control can lead to a relief from the increase in the amount of rent in the short term, but it has negative effects that would be classified into the following groups:

Long-Term Effects:

1.- Reduction of the market supply of the two large offering agents (new housing investors and owners), by discouraging mainly investment in new construction, but

also small owners who would stop renting their homes. This would occur in the regulated market, so there would be a segmentation within the residential market.

2.- Deterioration of the home by discouraging renovation. If the maximum rent set is low enough to offset the investment in improvement, landlords have no incentive to invest if they cannot pass on the cost to the rent.

3.- Increase in rents in the unregulated market, since part of the unsatisfied demand will be directed to it, increasing the pressure for housing and raising rents.

4.- Increase in price volatility in the residential market as a direct result of rent control measures.

5.- 'Financialisation' of housing: investment groups buy residential buildings and separate units (in the absence of financing) and exercise market power. The scheme of operation of the rental market is modified.

In Spain

In the case of Spain, the social rental market itself constitutes a typology per se. Housing policy has encouraged (with little success) both supply and demand to increase the stock for this tenure formula. Initially, social housing (with the old concept, i.e. those provided directly by the Public Administrations) and rented out at very low prices, would be the central body of this rental category. However, this stock has tended to be substantially reduced and its form of tenure to be reconverted towards ownership, because of the duration of the tenants' stay and the deterioration of the dwellings⁶.

The incentives for the construction of public rental housing that grew throughout the nineties, as well as the campaign to reuse housing in private hands to be managed quasi-publicly for rent with a fixed price or supervised by the Administration in all cases, could outline what would be understood by social renting. The rental use of public housing (VPO and following categories) where there is a fixed maximum module price, would be the equivalent for Spain of this figure. However, the existence of exemptions from the application of the public price, in the case, for example, of dwellings rented with furniture, introduces the uncertainty of whether there really is a public rental market. The lack of information and centralised management of homes that have had public aid.

⁶ The same reasons have led Building Societies in the Netherlands to sell their older social housing stock and reuse the proceeds in the construction of new buildings for the same purpose during the 1990s.

This provision makes it impossible to estimate the exact weight of this component within the total leased fleet, although it suggests that it may be greater than the 2% that Oxley and Smith assigned to it in their 1996 work.

The image that this combination of factors, with market segments that exhibit different patterns of behaviour and interference to equilibrium mechanisms, outlines a rental market that is complex in terms of its analysis, with reactions that are difficult to clear, not very transparent and difficult to identify.

2. Analysis of the rental market in Spain. Description determinants, distribution and rental prices

This section deals with a descriptive analysis of the supply and demand of rental units available in Spain. The sources used have been the Housing Censuses (2021, 2011, 2001 and 1991), statistics from the old Household Budget Survey and information from the Ministry of Housing, combined with statistics available for the Spanish economy in the INE and Eurostat (Eu-Silc), all with a disaggregated perspective at regional and provincial level.

When possible. Statistics on rental supply are very limited in the Spanish database. There is no record of contracts, and the size of the market can only be collected at certain times as a snapshot fixed in time through censuses and/or official annual statistics.

The order followed here responds to a market analysis structure, evaluating, in the first place, the existing supply in all the specific aspects that can be studied with the statistics, both in terms of the characteristics of the homes, their quality, location and distribution, including the information available on their energy efficiency.

Once the standard structure of the supply of rental units in the markets has been extracted, the demand characteristics and the adjustment parameters (rent-prices) in the markets are evaluated. To obtain a greater explanatory capacity of the data contained in the databases used, the information has been structured following the order, which has required combining different statistical sources with other databases that help to obtain relevant indicators for the explanation of the rental market. The use of microdata from the Living Conditions Survey, for example, has been necessary to arrive at this detail. In this way, the work contains a description of the relevant variables framed in an explanatory environment that argues about the situation of renting within the economic mechanisms of its operation.

This section begins by evaluating the market from the supply side, with a description of the characteristics of the stock and some empirical exercises that provide unobservable evidence related to the market. Subsequently, the claim is analysed,

proceeding in the same way. Finally, the existing information on rental prices is shown and the rent/ownership ratio and the cost of use are estimated for the period in which information is available, in Spain.

2.1 The supply of rental housing in Spain

The supply of rental housing in Spain has only been observed for several decades through the information provided by the Housing Censuses.

To correctly identify these markets, it is necessary to know their size, which determines the role that renting plays in adjusting the demand for housing. As we have seen in the first section, the rental market is the one that helps to adjust residential needs and how its price acts on the investment in property. This occurs when the size of the rental market can convey those influences efficiently. Size is therefore a fundamental issue for the understanding of mechanisms and how they operate.

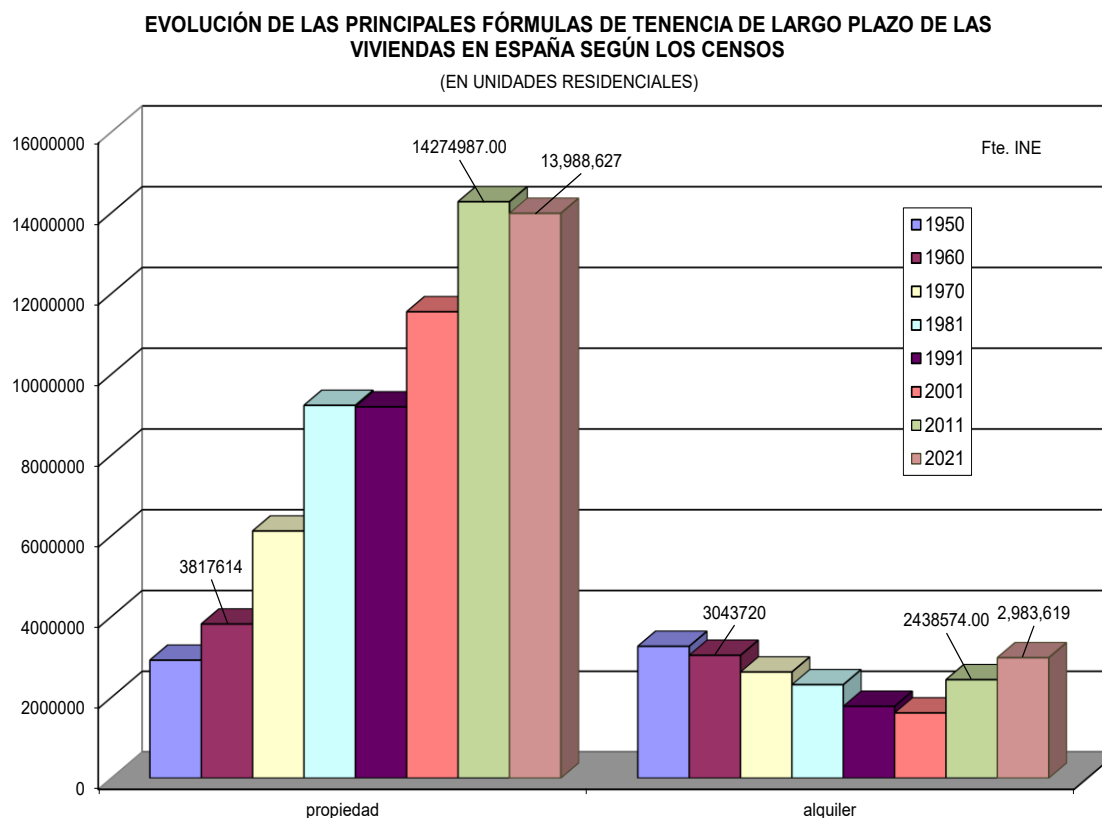
The first aspect provided by the Census is the knowledge about the total number of homes that are for rent at a given moment in time and at a given location, that is, the set of units differentiated by location, of this form of use. Most censuses also show its dynamics in the form of the flow of arrival of households to rental housing, indirectly reflecting the volume of transactions that this market carries out (and that remains when the information is collected) and, therefore, its real size and its evolution over time.

The following lines analyse these aspects of the Housing Census to give a clear idea of the size of these markets in Spain.

As can be seen in graph 1, the stock of main homes has grown substantially over the last 70 years from just over 6 million units to the almost 17 million recorded in the 2021 Census. Its evolution over this time has been very intense in two major periods, between 1960 and 1980 (the first major building cycle) and the last known cycle, from 1995 to 2008.

Most of these main homes are owned, up to 76% in the last census, and the rest rented, in a decreasing proportion throughout the period until 2011, a census that already registers an increase in rental use up to 16.1% in 2021. The loss of weight of rental throughout this period reached its minimum at the end of the twentieth century (the 2001 Census recorded 11.3% of rent) from almost half of the stock with this use in the fifties of the that century.

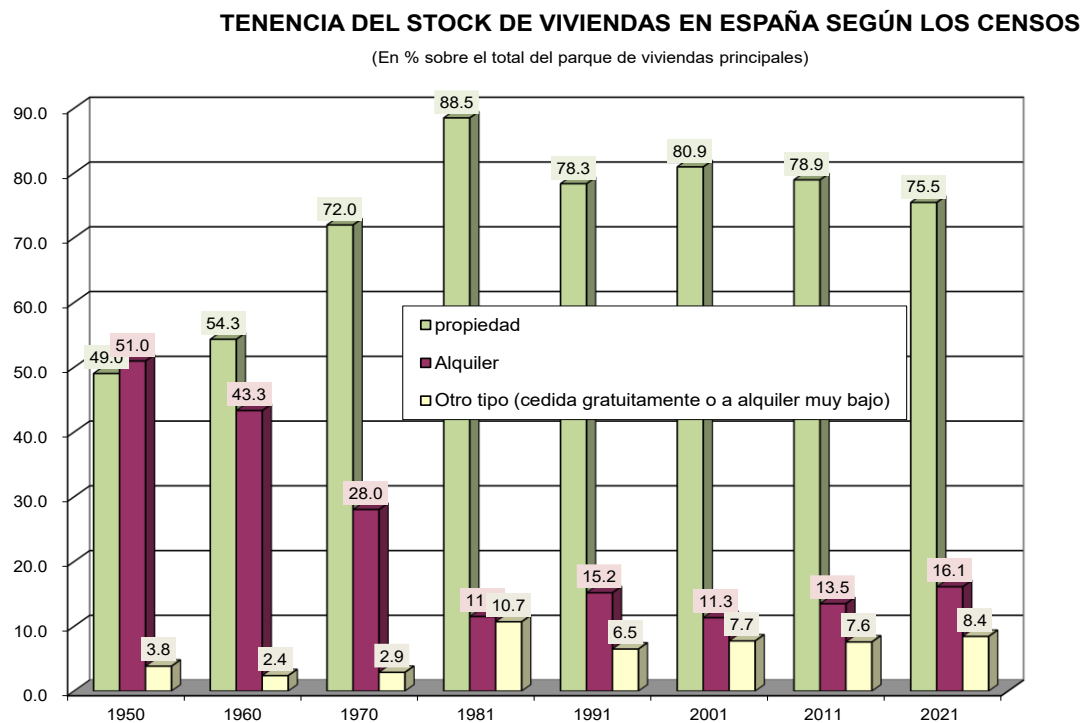
Graph 1 Housing Stock Tenue Over Time



The rapid increase in the number of main homes owned is a good example of how the construction experienced in those years was intended for the main use, that is, to cover the residential needs of the population.

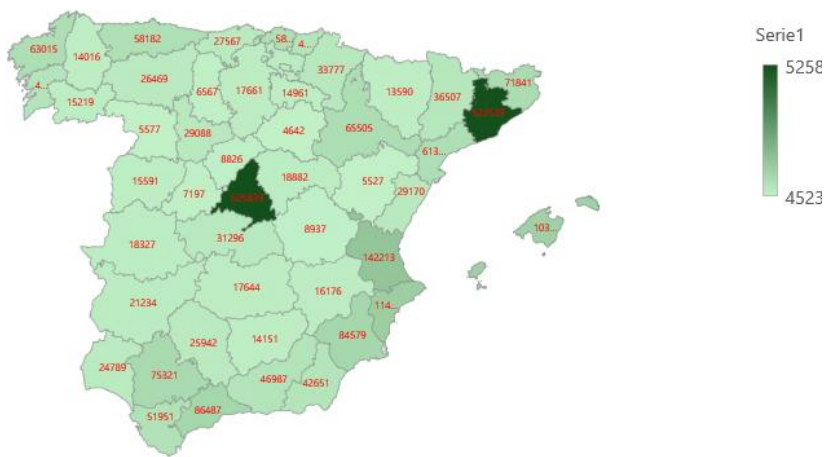
Graph 2 shows the temporal trend of the tenure formulas in proportion to the total number of main dwellings. The property rate in Spain consolidated its high level, above 75%, already in 1981 while the weight of renting fell to a level of 11% of all households (in 1981 and 2001). This small rent burden was supplemented by free housing tenure, which increased as the rent burden fell. Since 1981, there has been an average of between 6 and 8% of Spanish households residing in homes for free. The pattern of ownership was developed in Spain, therefore, from the seventies of the twentieth century, coinciding with the end of the first great cycle of construction.

Graph 2 Housing stock tenure in Spain according to census data.
(Percentages over the total stock of main dwellings)



A geographical distribution of the park is represented in Map 1.

Map 1. Total rental stock by provinces in Spain



The 'market share' of renting:

The weight of rent in the housing stock the ownership of main rental homes in Spain was 11.3% in 2021, having fallen from 54% in the 1950 Census to increase marginally again to 16.1% in 2021. The equivalent figure in units in 2021 is 2,983-649 residences in this form of tenure, up from approximately three million in 1950.

Graphs 1 and 2 above show how the process has taken place and mark the moment in which the change in the evolution of this tenure formula occurs, coinciding with the strong growth of the residential stock in Spain at the beginning of the long building cycle (decades of the sixties and seventies). The proportion of main homes for rent began to decrease as construction increased, so as not to abandon its negative trend over the next four decades until the change in trend from the financial crisis, reflected in the 2011 and 2021 censuses. Understanding this process is important, since the inverse evolution of tenures is associated with greater ease of access to property that emerged with residential construction in the sixties.

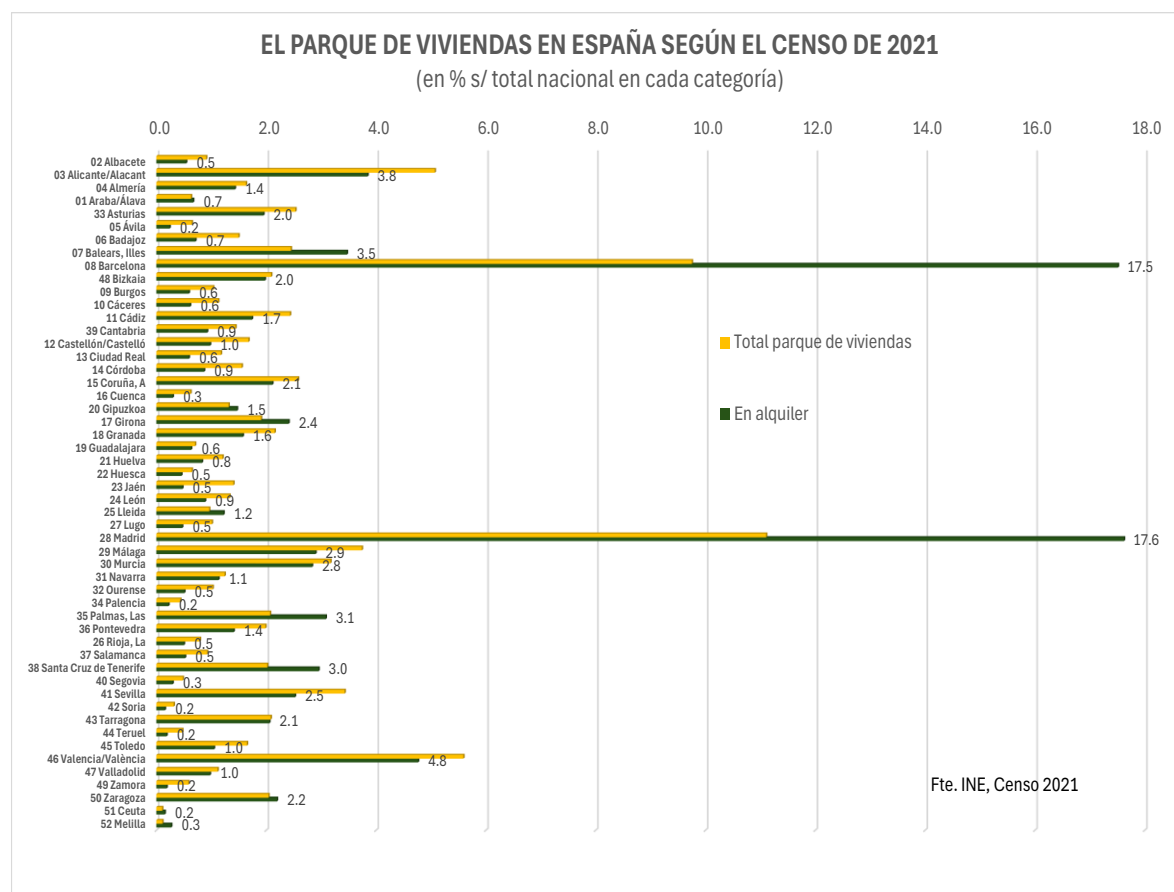
The relevance of the first great building cycle (1960-1977), the ways of encouraging building carried out from public policies and from the market impulse itself, and the means used to maximize the use of mortgage capital, scarce in those years, allowed the development of an agile system of transfer of credits from the developer to the buyer that facilitated and accelerated the construction process and the rapid supply of housing in a situation of manifest shortage. For the mechanism to work quickly, the system provided a first credit to the builder that was then transmitted to the final consumer of the house ⁷, freeing up the capital again to start new works. This mechanism only worked if the access of the final consumer was through the property, that is, through the assumption of the credit that came from the construction by the buyer, and freeing the developer from financial commitments and risks. The agility of the process and the existing need for housing made this system work dynamically, facilitating the adjustment between supply and demand in the market. This process explains such a rapid change in the form of tenure from 41.3% of rental homes over the total number of principals in 1960 to 24.6% only ten years later.

⁷ By making widespread use of the legal figure of surrogacy, which would become very popular from those years, under the protection of housing policy.

As can be seen in Graph 1, the number of rented dwellings in 1950 fell gently over time, without drastic jumps, which implies that it was the new homes that were directly owned, while the rental contracts were liquidated. The origin, therefore, of the greater differential trend towards ownership in Spain can be found rather in the mechanisms of housing provision associated with economic changes since the sixties, rather than a generational and sociological change in the population, although the continuation of the trend has been able to cause this effect. Several decades later (Taltavull, 2003).

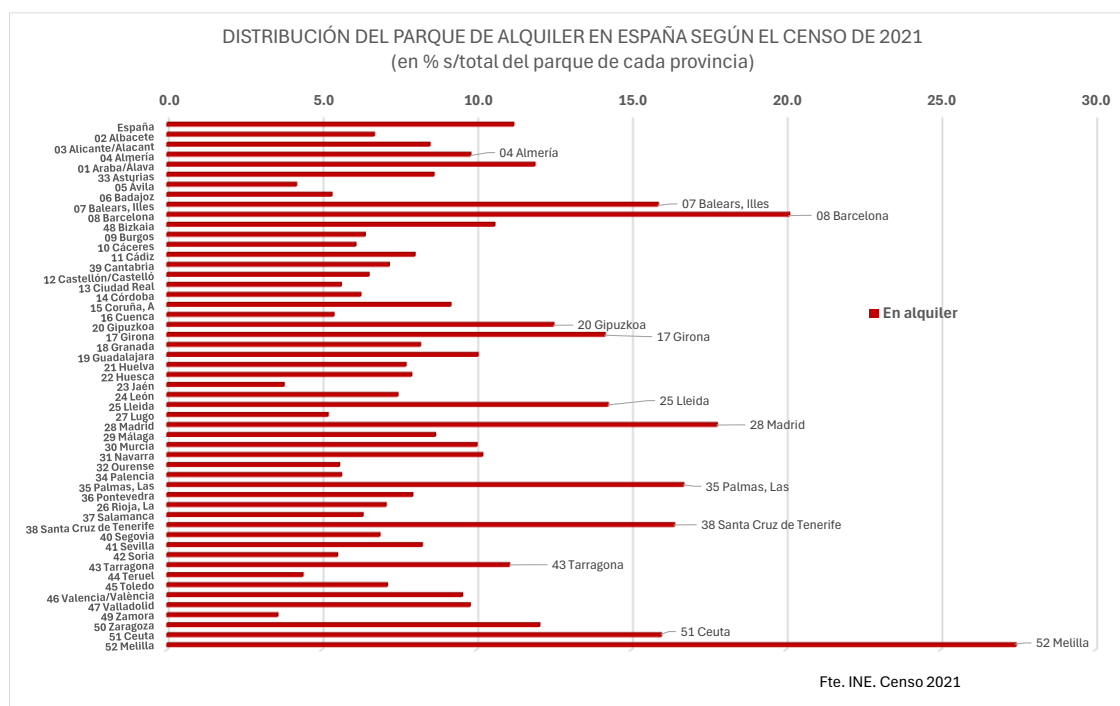
The distribution of rents by provinces shows the concentration in the largest markets (graph 3) in relation to the total rental units in Spain.

Graph 3. The housing stock in Spain according to the 2021 Census



In 2021, the stock allocated to the rental of main homes accounted for 16.1% of the total. This figure hides important geographical differences throughout the territory. There are two large residential rental markets in the provinces of Madrid and Barcelona, as corresponds to the largest capitals in Spain, followed by Valencia and Alicante (graph 3). Proportionally, the first two provinces concentrate most of the stock of main rental companies in Spain (approximately 35% of the total), which is a good example of how housing markets adjust their rental needs according to their demand.

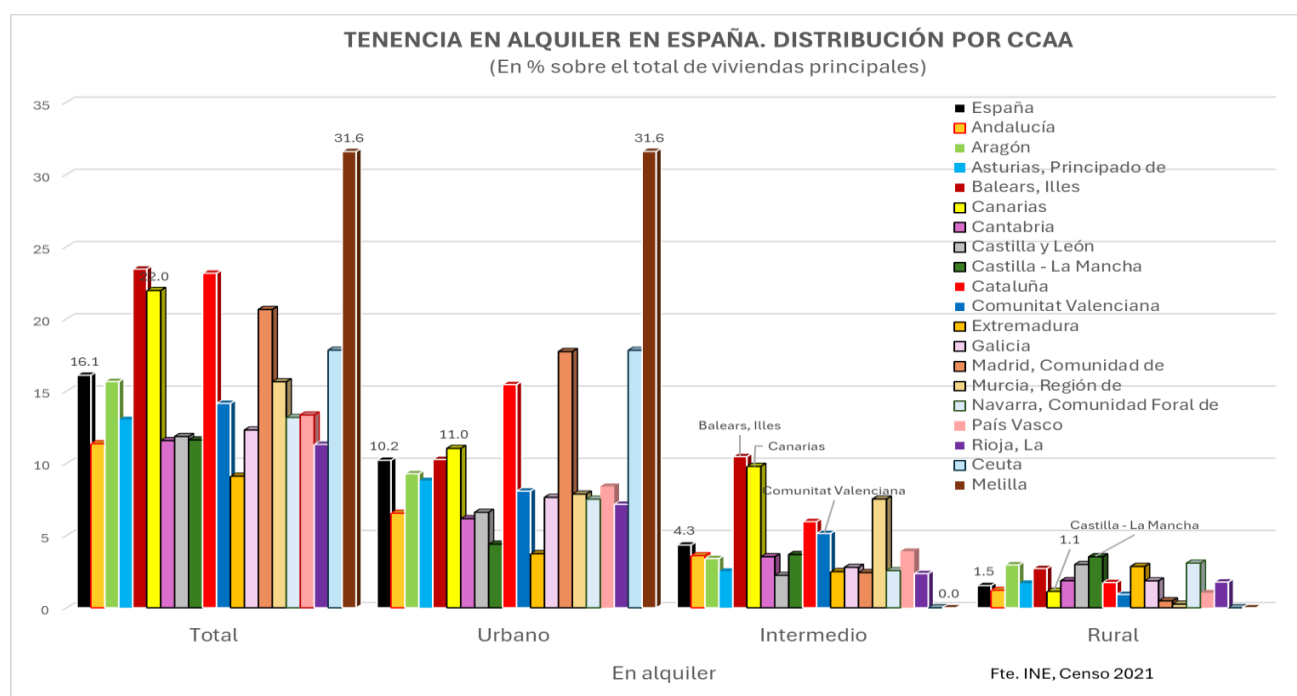
Graph 4. Distribution of the rental housing stock in Spain according to the 2021 Census
(as a percentage of the total housing stock in each province)



As for the relevance of this tenure within the provincial residential market itself, graph 4 reflects the weight of renting over the total stock of main dwellings. The provinces with the highest shares of the rental market would be Melilla, Ceuta, and Barcelona, the three with more than 20% of their stock of main homes used for this form of use, followed by the Balearic Islands, Madrid, and the Canary Islands, which allocate between 15% and 20% of the total number of homes used as their main homes. The provinces of Álava, Guipúzcoa, Girona, Lleida and Zaragoza (between 11.3 and 15% of the main provinces) are also above the national average, with the rest of the provinces

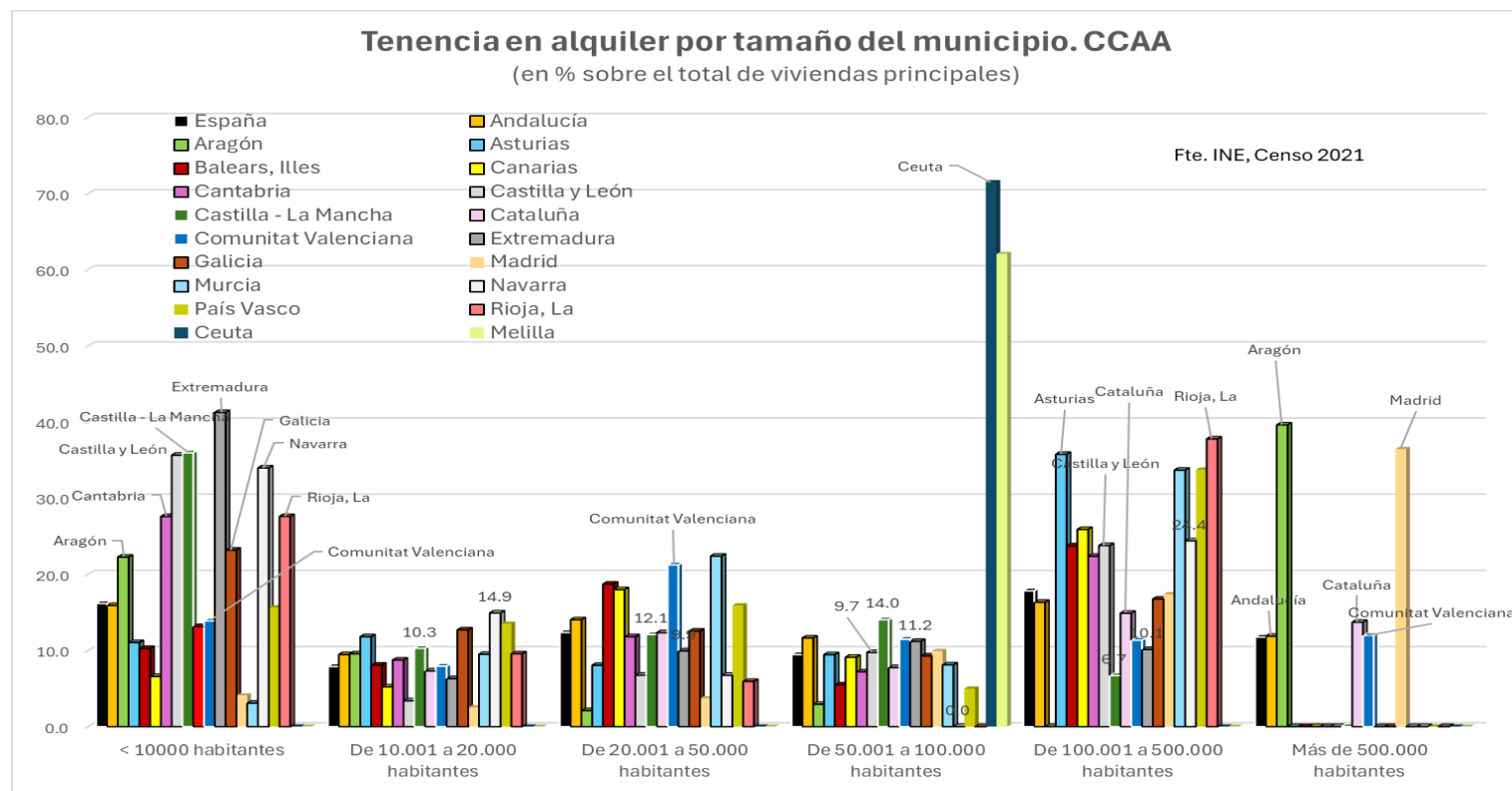
having ratios below 10% for renting. These statistics support the idea that renting meets the residential needs of the population with specific characteristics, and this is observed when the information is extracted by urban typology. The highest concentration of rental units is concentrated in urban areas and the presence of this holding in intermediate areas is less than 5% of the total number of main ones, except in the most touristic regions (Balearic Islands, Canary Islands, Catalonia, Valencian Community and Murcia) and minimal in rural areas except in Castilla La Mancha (graph 5). If the provinces are selected with the municipalities by size, it can be seen how the stock destined for rent is segmented between cities with more than 100 thousand inhabitants and those with less than 10 thousand (graph 5).

Graph 5. Rental tenure in Spain – distribution by Autonomous Community
(Percentage of total main dwellings)



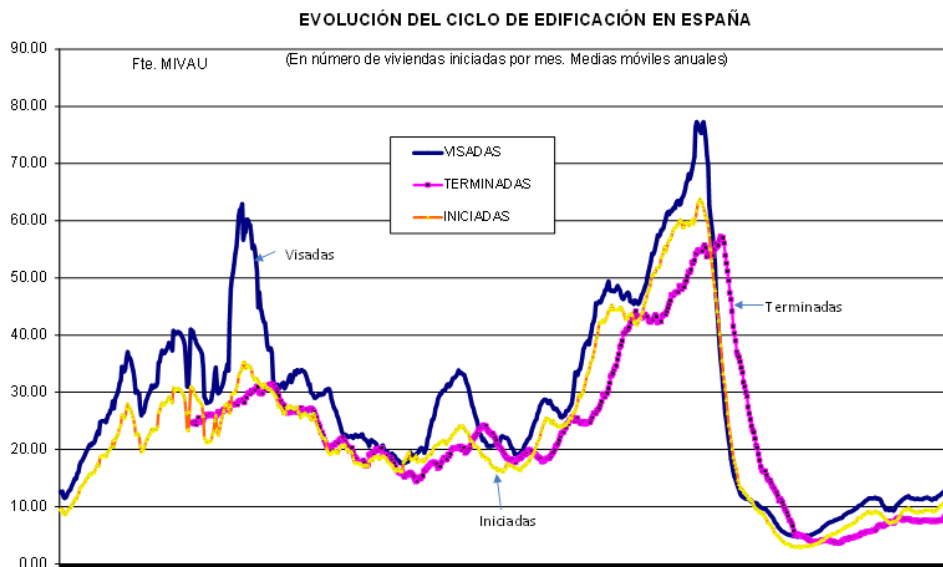
This distribution is inversely related to the size of the park, so that, in regions with less weight of the park, there are higher rental rates in towns with less than 10 thousand inhabitants, and in larger ones, the population is more concentrated in those with more than 100 thousand inhabitants (Graph 6).

Graph 6. Rental tenure by municipality size, by Autonomous Community
(Percentage of total main dwellings)



The following graph 7, for the illustration of the previous commentary, shows the evolution of housing production in a long phase, since 1960, which clearly represents the two building cycles mentioned above.

Graph 7. Evolution of the construction cycle in Spain



As can be seen, from the year of the analysis until 2024, the housing stock in Spain has increased sharply (graph 7), because of a building intensity that has reached the known historical maximums, configuring the second great Spanish building cycle after the one that occurred during the sixties of the twentieth century. This implies that the demand/supply forces that have been affecting the residential market may we'll have substantially modified the structure of use and the average characteristics of the park, especially in the regions where the building has been concentrated. The building activity since the years prior to 2000 and its strong acceleration between 2002 and 2007, mean that the first decade of the twenty-first century has seen relevant changes that would have broad similarities with that of the seventies, conditioning, and may have modified, the characteristics of the park in the issues analysed above.

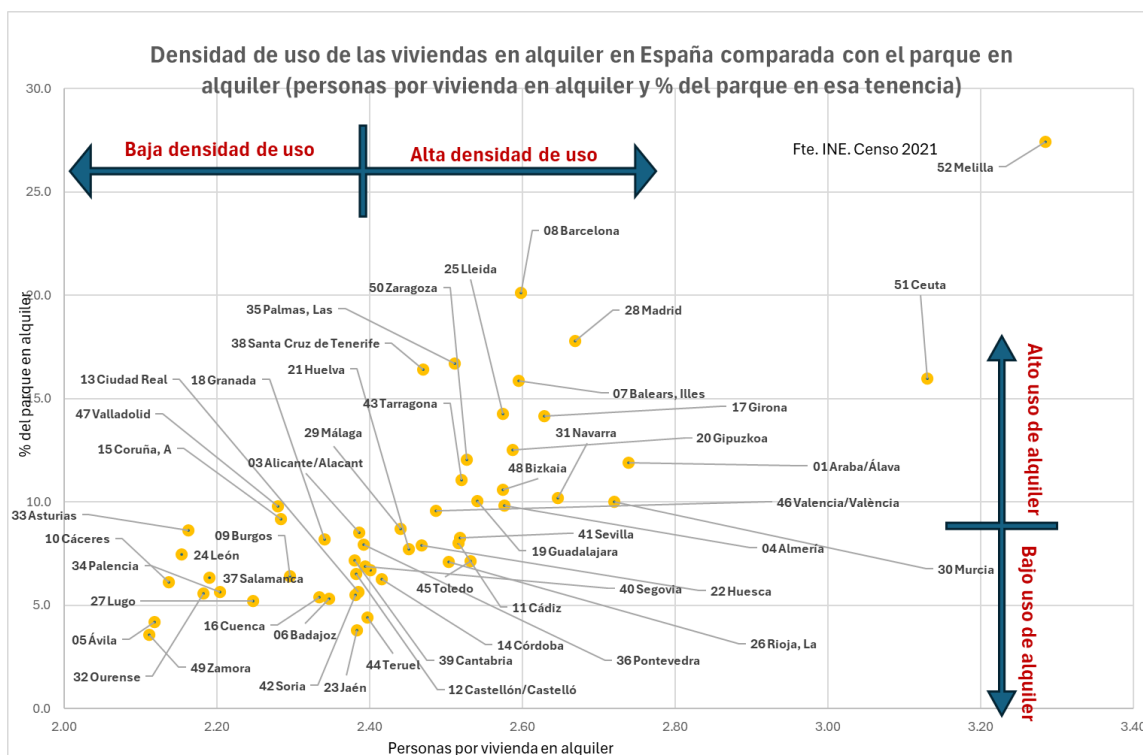
Subsequently, the financial crisis generated a sharp correction in activity, bringing the numbers of completed homes to their historic low, and, from 2015, recovering very gently, without reaching previous building levels, and maintaining production rates that remain at the minimum in 2024.

A measure of rental relevance

Considering the resident population, the positions of the provinces with respect to their rental market are very different throughout the Spanish geography. Except in the case of Ceuta and Melilla, and within a general range of stock use density that ranges between 2.2 and 3.4 people per household, the dedication of the housing stock to rental shows a pattern associated with the size of the households.

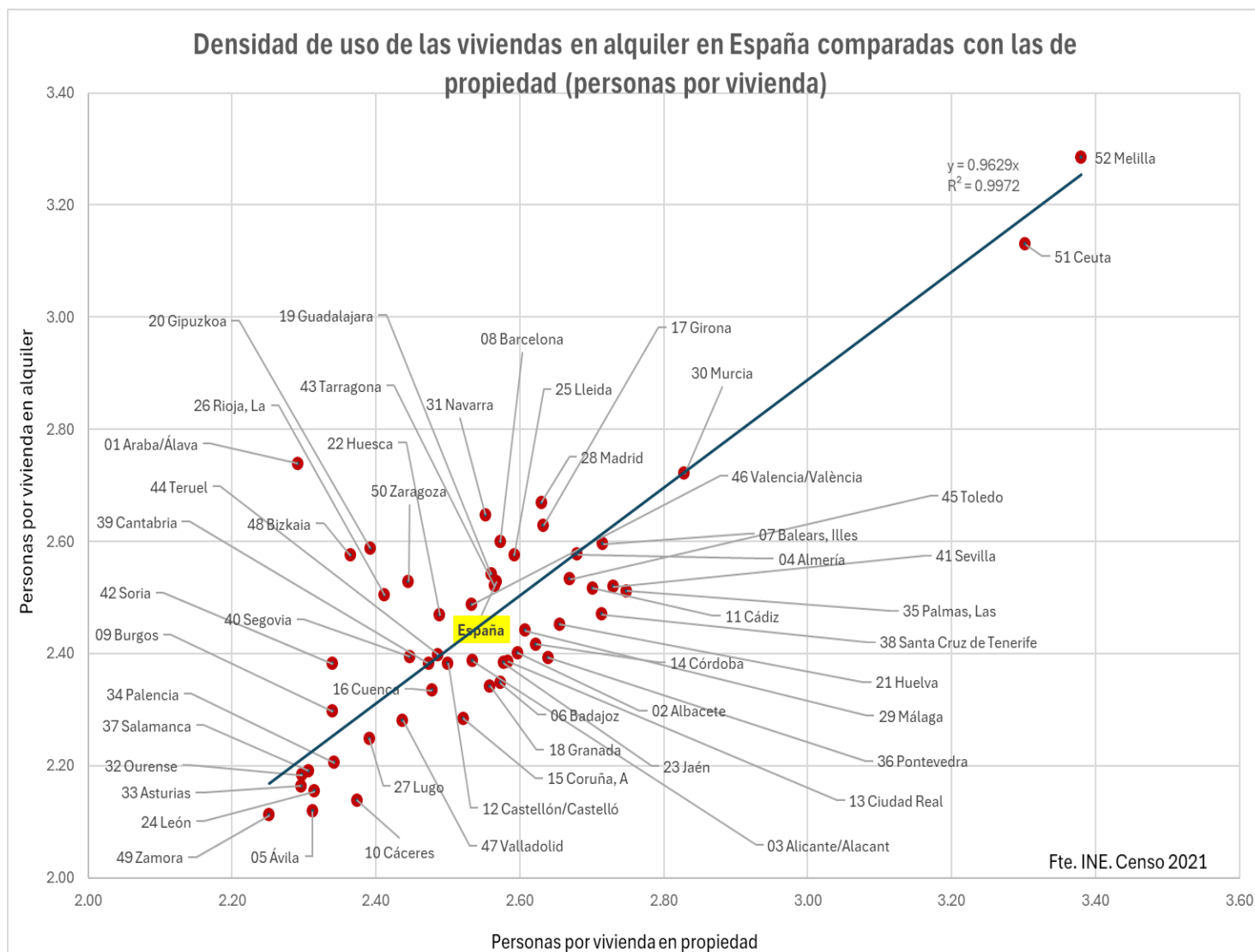
Graph 8 shows a point cloud that concentrates households with smaller households grouped into markets with less rental dedication and, therefore, a low density of housing use. On the other hand, the provinces where the size of the households is larger are associated with a greater dedication to renting their stock (the right part of the distribution of provinces). This shows a segmentation between rental markets that meet the needs of families with very few members, located in provinces where housing markets dedicate less than 10% of the stock to renting, and more densified rental markets usually associated with larger markets and where rental tenure is more relevant (between 10 and 20% of the stock of main homes).

Graph 8. Occupancy density of rental housing in Spain compared with the rental housing stock (people per rental dwelling and percentage of the housing stock under this tenure)



This greater density of use refers to a larger family size, which is general, as shown in Graph 9, with practically a unit correlation between the number of household members who use a home, whether owned or rented. This implies that the density of use does not seem to differentiate between markets, but between markets, showing a greater need for space in the most densified provinces.

Graph 9. Occupancy density of rental dwellings in Spain compared with owner-occupied dwellings (people per dwelling)

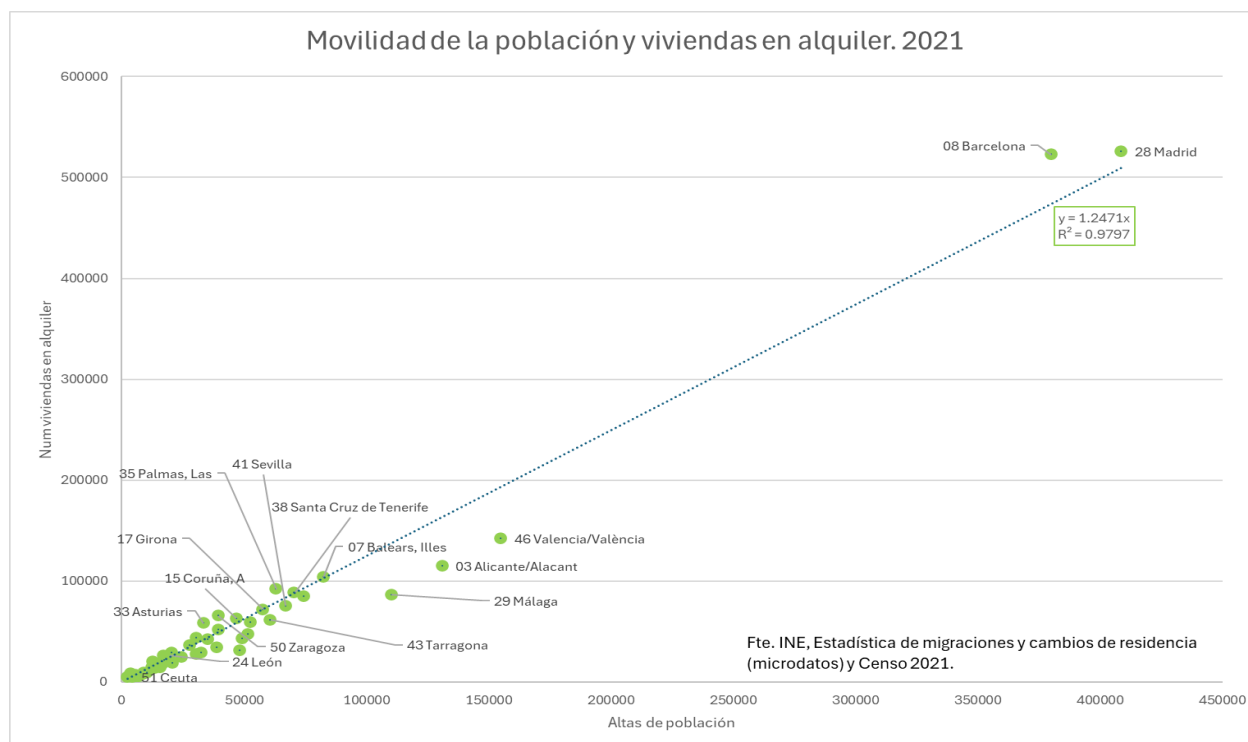


Rent covers the residential needs mainly of households that move their residences. Taking the statistics of residential variations for the same year as the last census (2021), graph 10 shows the correlation between residential registrations (interior and exterior) by province and rental housing. The registrations are taken instead of the balance by the intuition that not all the homes that are 'free' when the population migrates, enter the market.

The idea of the existence of greater rental use when mobility is greater underlies these statistics. To carry out an initial approximation to this relationship, two pieces of evidence are shown.

The first is the relationship between total residential registrations and the number of rental homes in each province (Graph 10), the second is the ratio of rental homes with respect to residential registrations. Graph 10 clearly shows the relationship between mobility and rented housing, in a structural vision that would indicate how the residential stock of the provinces adapts their number of homes to the needs of the population arriving from other regions or countries.

Graph 10. Population mobility and rental housing (2021)



However, the graph does not justify whether the allocation of rental housing is sufficient. If the relative value between residential registrations by provinces and the stock of rental housing existing in the last three successive censuses (2001, 2011 and 2021) is calculated, a classification more adjusted to how the rental market meets the needs of migration appears.

The group of provinces where their markets allocate a lower number of housing units to cope with migration (for rent) are those that show a higher ratio. Table 1.4 shows, in the form of a ranking, all the provinces ordered according to the year 2021⁸.

The table shows a heterogeneous order of provinces that has little to do with their dynamism or size but seems to reflect the intuition that there is a smaller rental market than would be necessary to accommodate the population that moves, in those that show ratios greater than unity. In total, fourteen of the 52 provinces measured have ratios above unity. The cases of Ceuta and Melilla are important.

Since they are the provinces where the dedication to renting is greater, and this fact is clearly reflected in their ratios, of 0.4 and 0.5, in the table.

⁸ We are aware that this is a relative and not precise measure, since the homes that are computed are already occupied for rent and possibly have been for years. The correct measurement would be considering the homes that are rented in that year, but this information is not available. However, this measurement is a rational approximation to the possible existence of tensions in the rental market derived from the external mobility of the population.

Table 1.4

Table 1.4.- Relative ranking of residential mobility and rent							
(ratio of annual residential move-ins to rental dwellings)							
Provinces	2001	2011	2021	Provinces	2001	2011	2021
45-Toledo	1,44	1,56	1.543	27-Lugo	0,77	0,79	0.888
29-Málaga	0,93	0,92	1.277	30-Murcia	1,25	1,21	0.880
44-Teruel	1,10	1,34	1.277	34-Palencia	0,80	0,69	0.871
05-Ávila	0,87	0,91	1.207	02-Albacete	0,93	1,00	0.856
16-Cuenca	1,37	1,35	1.160	36-Pontevedra	0,69	0,66	0.838
31-Navarra	1,24	1,26	1.159	06-Badajoz	0,59	0,49	0.832
04-Almería	1,49	1,50	1.155	09-Burgos	0,72	0,84	0.832
03-Alicante/Alacant	1,57	1,83	1.144	17-Girona	0,87	0,95	0.806
12-Castellón	1,19	1,29	1.124	38-SC de Tenerife	0,81	0,77	0.801
49-Zamora	1,00	0,97	1.122	07-Balears (Illes)	0,75	0,74	0.798
23-Jaén	0,78	0,65	1.116	28-Madrid	1,09	1,09	0.777
19-Guadalajara	2,08	2,40	1.113	25-Lleida	0,66	0,90	0.765
39-Cantabria	1,15	1,13	1.108	11-Cádiz	0,49	0,44	0.763
18-Granada	0,90	0,91	1.100	24-León	0,65	0,65	0.745
46-Valencia	1,22	1,34	1.090	15-Coruña (A)	0,68	0,64	0.744
32-Ourense	1,07	0,97	1.053	08-Barcelona	0,54	0,56	0.727
26-Rioja (La)	1,37	1,40	1.037	10-Cáceres	0,64	0,59	0.718
40-Segovia	0,81	0,87	1.028	47-Valladolid	0,74	0,91	0.707
21-Huelva	0,88	0,79	0.995	20-Guipúzcoa	0,77	0,82	0.699
43-Tarragona	1,24	1,13	0.993	35-Palmas (Las)	1,00	0,89	0.687
22-Huesca	0,84	1,04	0.984	14-Córdoba	0,63	0,63	0.660
42-Soria	1,08	1,10	0.980	01-Álava	1,06	1,16	0.638

13-Ciudad Real	0,92	1,01	0.965	50-Zaragoza	0,43	0,44	0.605
37-Salamanca	0,90	0,70	0.963	33-Asturias	0,49	0,46	0.577
48-Vizcaya	1,07	1,09	0.894	51-Ceuta	0,53	0,48	0.543
41-Sevilla	0,93	0,86	0.891	52-Melilla	0,35	0,32	0.472

The table also shows the situation in the previous censuses, so the evolution of some of the markets can be analysed. The values (and the classification) are very consistent among them, and it can be observed, through the table, the radical change in the last decade derived from the increase in mobility on the rental market that occurred in some of the provinces. For example, Malaga, Ávila, both with an increase in tension, Guadalajara or Vizcaya, with a lower tension in rent, among others.

The way in which the ratio has been calculated in the table above hides a relevant issue, which is the temporary permanence in the rental of families in Spain. Given that the census data show the stock, the use of the total number of homes for its calculation may be giving an unrealistic idea of the relevance of this tenure for the market. For example, if the ratios seen above show that there is apparently no problem of rental housing in Ceuta (0.54 residential registrations per rental property) but, nevertheless, a part of the stock is being rented for long periods, the figure obtained is not significant of the absence of tension in the housing market, and it would be necessary to have the actual number of homes on offer for rent to calculate a usable parameter. This information does not exist in Spanish statistics.

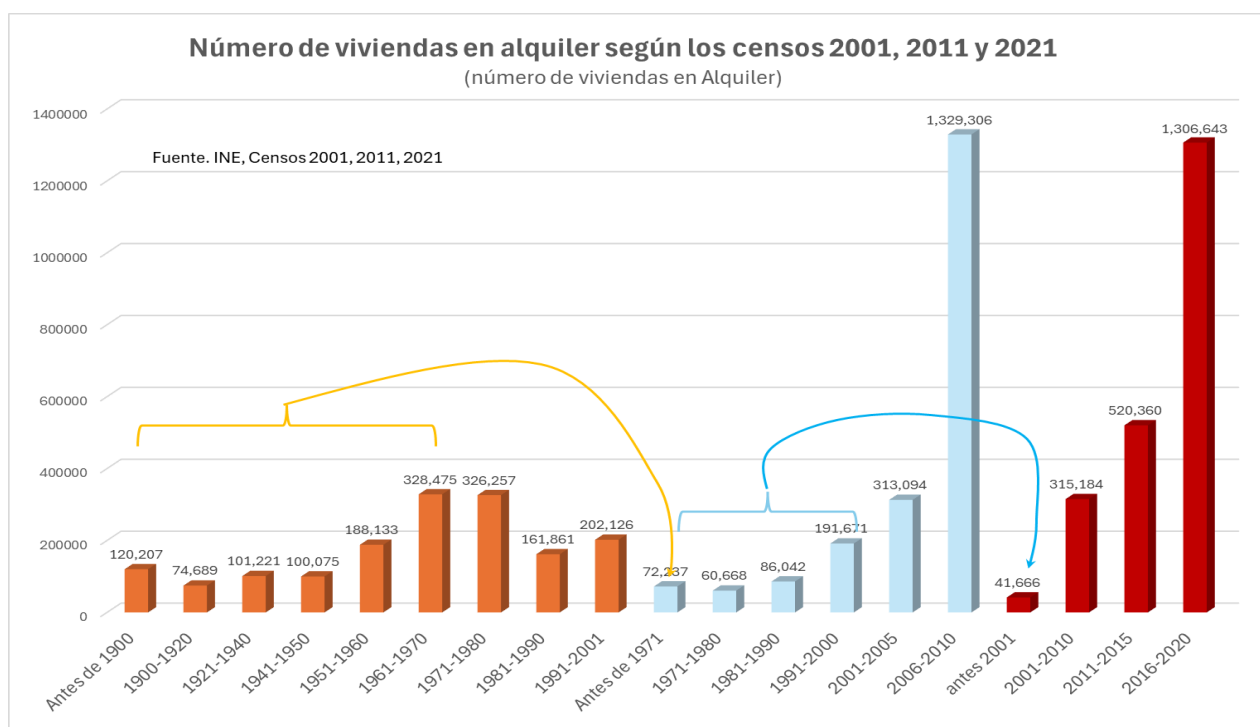
2.1.1 An estimate of market size from the Census

An approximation of the size of the rental market in each province is calculated using census information on the arrival of the household to the home. The size of a market is determined by the number of transactions that take place at a point in time. As there is no record of rental transactions in Spain, the size is derived towards the measurement of the number of rented homes that are recorded in the censuses when the information is collected, and which shows the number of homes for rent in the last year of the period and when they arrived at the home, so that this total is broken down into the previous years that households declare. This statistic should be interpreted as a snapshot of the end of the decade and would refer to the time of collection of census data, losing the homes that could have been rented during that period but have jumped to ownership over the ten years.

Perhaps for this reason, the number of rentals published in the last five years of the 2011 and 2021 Censuses are those with the highest accumulation of rental housing, as

can be seen in graph 11. If so, the last year shows the number of rental transactions made and reveals a large housing turnover, at least between decades, as shown by the initial count: The amount of rental units remaining in the 2011 Census for the period 'before 1971' is approximately 72.2 thousand units, which would be the ones that would remain for rent of all those registered in the previous census (2001) as contracted before 1970.

Graph 10. Number of rental dwellings according to the 2001, 2011 and 2021 Censuses
(number of rental dwellings)



The distribution of the first census clearly reflects the evolution of tenures in the first decades after autarky: an increase in rents as more homes were built in the great initial cycle (1960-1975) and the reduction in the weight of renting with the expansion of property since the seventies. The greater need for rentals since 2008 is also reflected in the latest bars (2021 Census, red) and, above all, highlights a very relevant rotation in the rental market, where the average duration of rentals would be almost 15 years.

Note that, given that households that declare to be renting do so by referring to their main homes, and that the Spanish rent regulation gives the right to remain with stable conditions for at least five years, it could be said that the number of homes for rent since 2016 (and in the previous census since 2006) would be showing an approximate

measure of the size of the rental market before the first expiration of the contract, that is, its real size.

The temporary structure of rents since the last five years is shown in Table 1.5, with detailed reference to the provinces.

Table 1.5.- SIZE OF THE RENTAL MARKET. Last five years

	Census 2001	Census 2011	Census 2021
Province	% of rental dwellings from 1996-2000 over total rented stock	% of rental dwellings from 2006-2010 over total rented stock	% of rental dwellings from 2016-2020 over total rented stock
Spain	6.7	71.3	43.8
01 Araba/Álava	6.6	86.2	55.6
02 Albacete	7.0	68.6	39.6
03 Alicante/Alacant	7.1	78.6	42.7
04 Almería	9.9	79.9	37.7
05 Ávila	9.9	78.5	41.8
06 Badajoz	16.2	59.3	41.5
07 Balears, Illes	6.3	74.5	43.0
08 Barcelona	3.4	67.0	43.6
09 Burgos	5.2	73.4	44.8
10 Cáceres	13.3	59.0	35.3
11 Cádiz	7.6	51.2	36.4
12 Castellón/Castelló	7.4	79.5	48.4
13 Ciudad Real	15.1	75.0	39.5
14 Córdoba	8.0	64.7	34.8
15 Coruña, A	5.7	62.0	42.3
16 Cuenca	9.0	82.3	42.3

17 Girona	7.8	75.7	45.0
18 Granada	7.3	71.0	40.6
19 Guadalajara	11.6	85.5	51.6
20 Gipuzkoa	5.6	72.0	53.9
21 Huelva	8.1	66.5	33.5
22 Huesca	6.2	78.0	45.4
23 Jaén	8.1	58.7	36.8
24 León	3.8	61.7	40.5
25 Lleida	6.7	77.0	43.9
26 Rioja, La	6.6	80.5	51.0
27 Lugo	5.5	64.7	38.5
28 Madrid	6.5	73.9	46.7
29 Málaga	8.8	75.9	39.8
30 Murcia	8.3	75.8	39.3
31 Navarra	9.1	81.5	48.9
32 Ourense	5.5	65.9	40.3
33 Asturias	6.3	64.0	45.5
34 Palencia	5.0	66.2	42.0
35 Palmas, Las	14.4	72.1	36.9
36 Pontevedra	5.9	63.7	41.1
37 Salamanca	7.8	68.7	44.7
38 Santa Cruz de Tenerife	12.3	66.8	36.7
39 Cantabria	4.4	71.6	47.8
40 Segovia	7.2	72.9	45.0
41 Sevilla	8.4	64.2	39.0
42 Soria	6.3	75.4	48.0

43 Tarragona	8.2	77.2	47.8
44 Teruel	7.4	82.9	44.8
45 Toledo	9.7	82.1	46.9
46 Valencia/València	4.4	71.9	45.9
47 Valladolid	7.7	73.7	45.6
48 Bizkaia	2.3	71.1	54.4
49 Zamora	4.7	61.2	41.2
50 Zaragoza	5.3	73.6	48.2
51 Ceuta	5.9	50.6	33.4
52 Melilla	9.6	65.0	37.9

In the table there is a notable jump between the rental volume of the last five years in the 2001 census with the other two subsequent ones. It is remarkable to see that, at the beginning of the decade 2010-20, the increase in rented housing during the last few years was a figure of more than 70% of the total rents registered in the census. For example, in the last five years observed in the 2011 census, Álava accounted for 86.2% of the total number of rental households registered in that year, and 55.6% in 2021.

Albacete, Guadalajara, Cuenca, La Rioja, Navarra, Teruel and Toledo show similar figures. This accumulation of rent must be related to at least two fundamental facts: (1) renewal of old leases according to the regulations published at the beginning of the nineties and which gave the following twenty years as a transitional period. (2) the effects of the financial crisis, in which many homeowners lost their homes and turned to the rental market.

In the last census, these figures are also relevant, although not as high, and indicate that in the last five years, a proportion of 43.8% of all renter households have reached the rental market. This pattern is repeated in almost all provinces, which indicates how rental rotation (and therefore, the reduced permanence of households in them) has become a characteristic pattern in the residential market in Spain. This is a relevant issue that cannot be studied without greater detail of the conditions of the contracts and the patterns of mobility.

These results show the existence of greater mobility than is usually accepted for the Spanish market, reflecting the fact that some rental markets have a greater relative relevance that stands out from the Spanish 'average'. What is remarkable about this information is that it observes the rapid reduction of the stock with old rentals during

the last decade, putting a high proportion of the rental segment on the market, which has been mobilized in recent years.

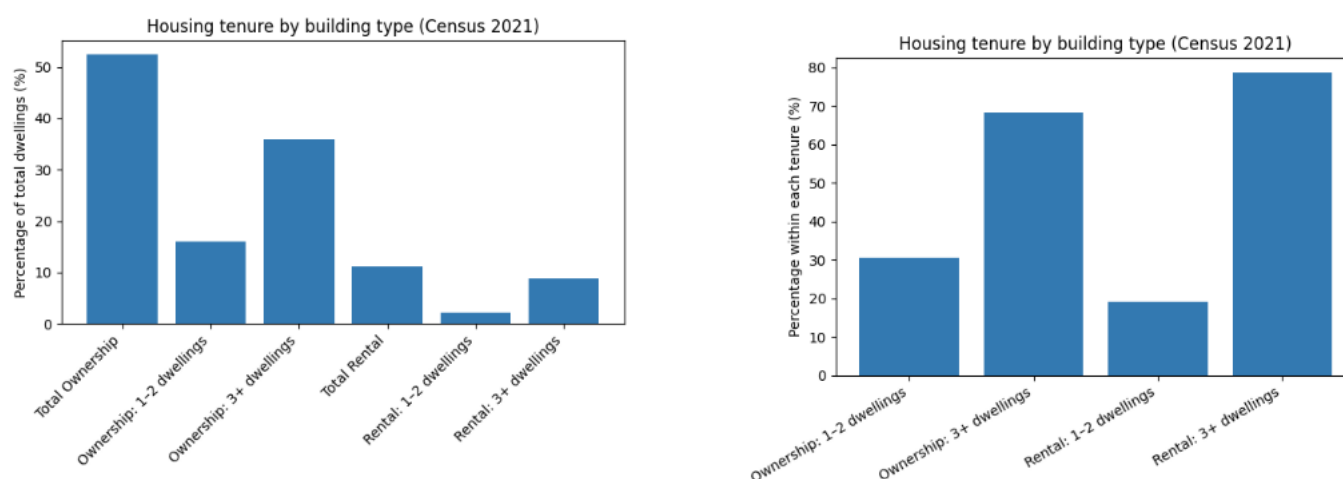
2.1.2 Characteristics of rental properties

In this section, the physical characteristics of rental housing are analysed, as well as quality and other characteristics so that different types of housing that are intended for rent can be identified. The general characteristics that are usually used in the classification of housing price models are evaluated, such as: surface area, number of rooms, type of building, services available in the home and characteristics of the building environment, as far as statistics allow. In some characteristics, the 2021 Census is not very specific, such as in the typology of buildings, so it is necessary to resort to the previous census for the description. To do this, the information has been summarised in the same categories to make it comparable.

Typology of buildings.

Figure 12 shows the distribution of dwellings according to the type of buildings. The 2021 Census is not very explicit in the classification of the latter and identifies block buildings as those with more than 3 residential units. With this distinction, the graph shows how homes are distributed by tenure (52.5% owned, 35.9% rented and the rest in other uses), with a similar distribution of rent by typologies and small significant differences between ownership and rental, at the national level (68.3% of owned homes and 78.6% of rented homes, they are in blocks of buildings), which indicates that rents tend to be marginally concentrated in buildings with higher unit density.

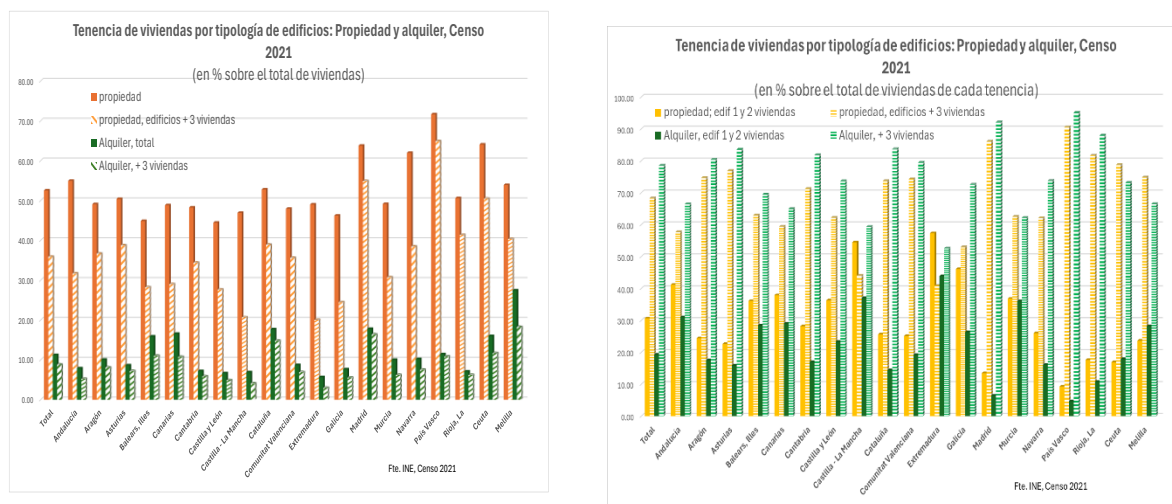
Graph 11. Housing tenure by building type. Ownership and rental, 2021 Census (% of total dwellings) and Housing tenure by building type. Ownership and rental. 2021 Census (% of total dwellings within each tenure)



These differences are systematic across nearly all Spanish regions (Graph 12), regardless of their tenure rates. The chart on the left shows the prevalence of renting in several autonomous communities—such as Ceuta, Melilla, Madrid, Catalonia, the

Balearic Islands, and the Canary Islands—which has already been noted. The chart on the right shows a distribution of rental housing that follows the pattern observed at the national level, with small differences in building size between owners and tenants. This reveals a rental and ownership market that is spatially integrated, where buildings can exhibit both forms of tenure indistinctly as a defining feature, implying that tenure is not a factor in market segmentation.

Graph 12 Housing tenure by building type: Ownership and rental, 2021 Census (% of total dwellings) and Housing tenure by building type: Ownership and rental, 2021 Census (% of total dwellings within each tenure)

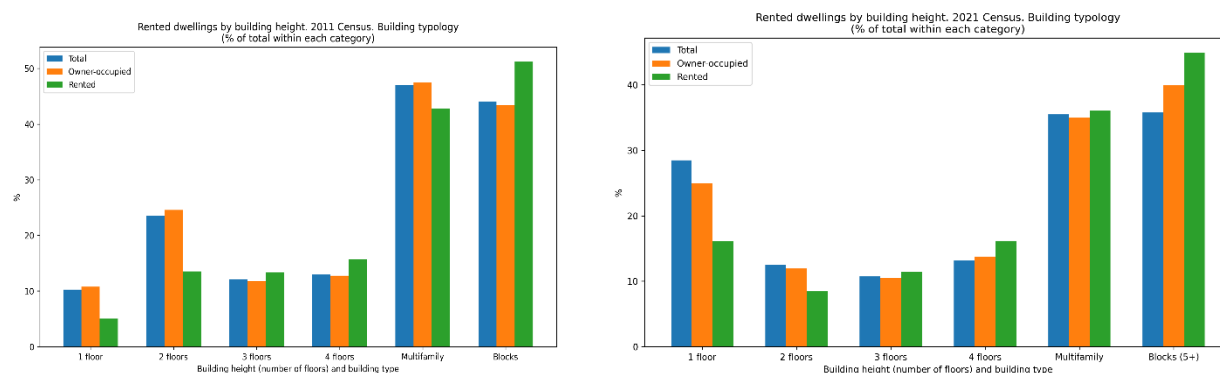


A little more information about the size of the buildings is given by the number of floors where the homes are located. Graph 13 shows this information referring to the main dwellings owned and rented according to the 2021 and 2011 censuses. The park for rent in Spain is located at an average height slightly higher than that of the park owned, 4.6 storeys instead of 4.3. There has been a change in the distribution by heights over the last decade: In 2011 (Figure 14, left), 51.3% of rental households were in **block**⁹ buildings, while 42.8% in multi-family homes (which add up floors 2 to 4) and 5.1% in single-family homes. A decade later, the census shows a shift in this distribution with a shift from rental housing to buildings with lower densities: 44.9% of owned households are in blocks of buildings (higher density), 36.1% in multi-family buildings and 16.1% in single-family buildings, showing a substantial increase in tenants' tenure in lower density. This change is general (it also occurs in the rest of the **holdings**¹⁰.

⁹ We recalculated the census data to adapt them to the international classification of buildings by typology, in three large groups: single-family (single-storey buildings, individual dwellings), multi-family (up to 4 storeys) and residential blocks (more than four storeys).

¹⁰ The 2021 Census is not a census as such, but an estimate based on questionnaires. This could explain this substantial change in distribution in a decade in which construction has been practically nil. If true, it could indicate changes in tastes or the massive orientation to renting homes, typical of the accessibility crisis we are experiencing.

Graph 13: Rented dwellings by building height (2011 and 2021) and Rented dwellings by building height. 2021 Census. Building typology (% of total within each category)

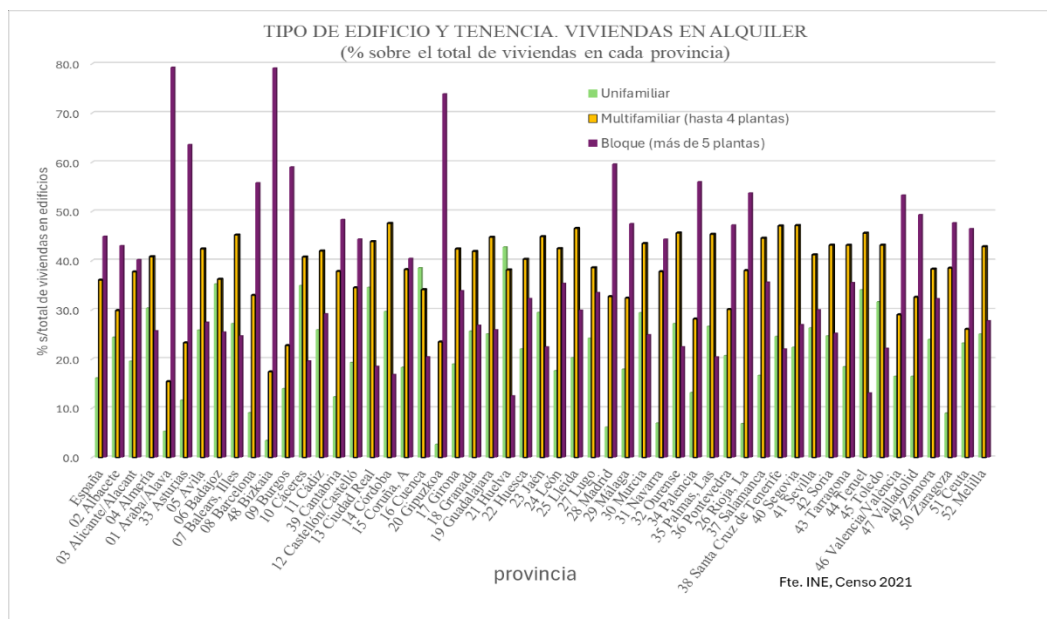


Therefore, rental tenure seems to be more present in buildings with a higher residential density, although the difference in distribution is not very relevant except in the case of single-family homes.

The spatial detail shows variations on the Spanish average. Figure 14 shows the three main types of buildings by province.

As can be seen, there are provinces where rental households are mostly concentrated in blocks of taller buildings, with Álava, Vizcaya and Barcelona concentrating more than 70% of the total tenants in them, above 60% in Asturias, and above 50% in Guipúzcoa, Madrid, Palencia, La Rioja and Valencia, according to the 2021 Census. Huelva is the province where the majority of tenants (40%) live in multi-family buildings (up to 4 floors) and those who are rented in one-storey homes are concentrated in the provinces of Almería, Badajoz, Cáceres, Ciudad Real, Cuenca, Huelva, Teruel and Toledo.

Graph 14. Building type and tenure, rented dwellings (% of total dwellings in each province)



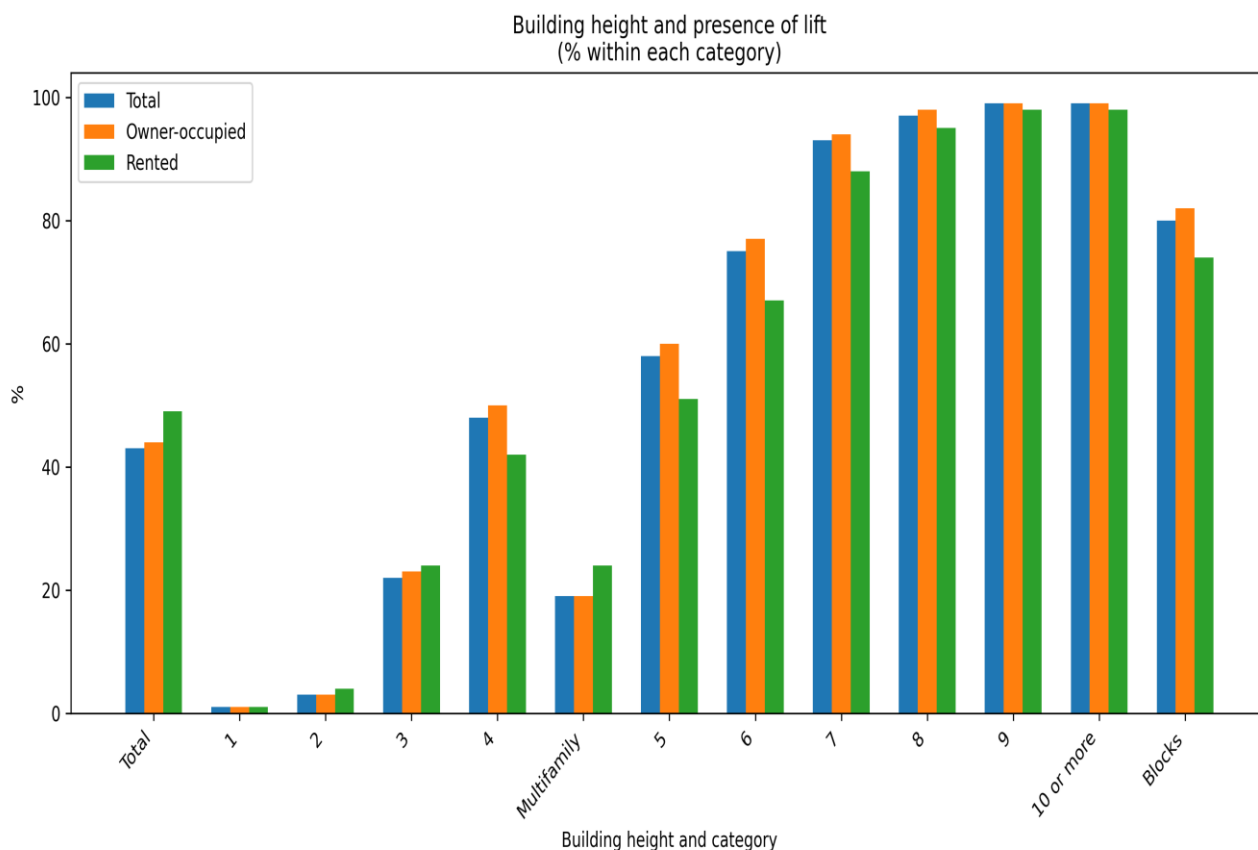
These data reflect the fact that most rental homes are in densified buildings, although with fundamental differences by market.

Height, existence of elevators

The concentration of renting in buildings with higher density means that certain facilities are very important to guarantee a minimum quality of life. The existence of lifts is a relevant element that affects this point. According to the 2011 census¹¹, the tallest buildings have an elevator. The available information shows that from the seventh floor; the buildings have an elevator almost 100%. It is those with 4 to 6 storeys that have a lower percentage of this service (Graph 16).

¹¹ The 2011 Census is used here, as the 2021 Census does not have this information in terms of the complete data that are published.

Graph 15. Building height and presence of lift (% within each category).



It could be said that the rental market is concentrated in the areas with the highest density of construction and is inserted in the same location and buildings as the units owned, apparently not existing rental segments exclusively in exclusive buildings in a generalized way (as is the case in other countries) that could appear ghettos for rent. This implies a very diffuse distribution of rental units in Spain within the housing markets, which does not allow us to know the model of concentration in space, the possible existence of clusters, or their influence on the markets where they are distributed. This information is important, given that a higher concentration of rental in housing markets could have a more offsetting effect on property prices than in cases of absence of rented units.

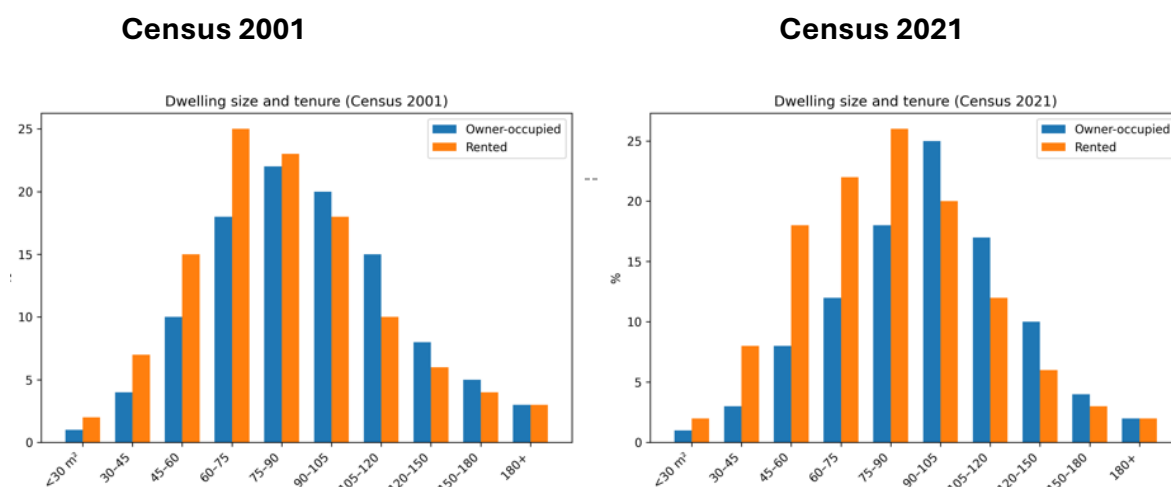
Surface area of dwellings by tenure.

In terms of size, rented homes show a systematically smaller surface area than owned homes. On a national average, owned homes are 89.6 m² while rented homes are 75

m² (graph 17) according to the 2021 Census. As can be seen in the distribution, the rented dwellings are located on the left side of the distribution, with the majority concentrated in the areas of between 46-60 m² and 61-75 m² and, to a lesser extent, in the group up to 90 m².

In the first two mentioned, together with homes of between 30-45 m², they are segments of the stock with a majority dedicated to the rental of the main residence.

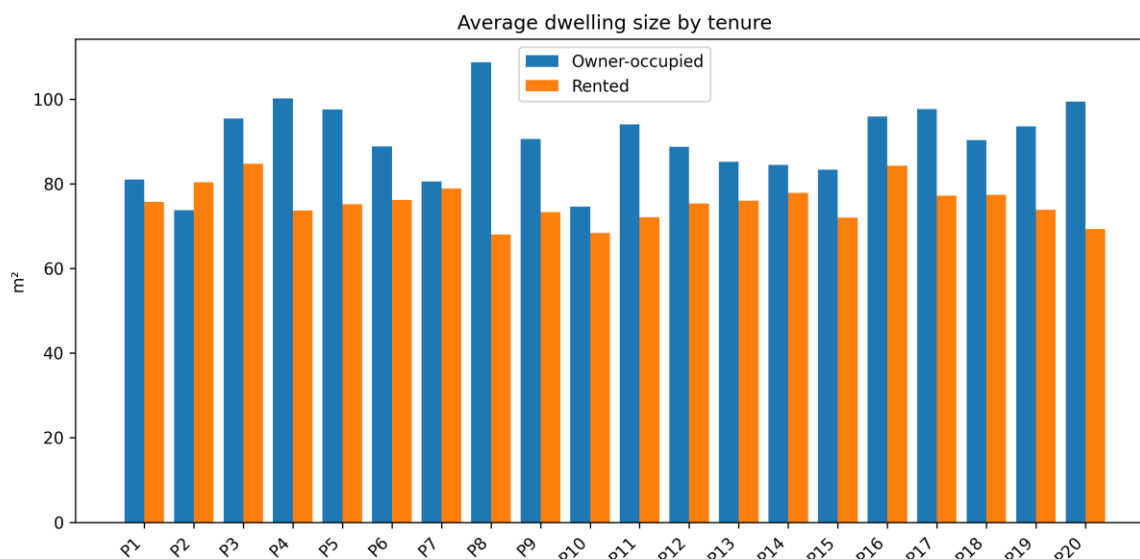
Graph 16. Dwelling size and tenure 2001 vs Dwelling size and tenure 2021



The graph shows the distribution according to two censuses that differ from each other 20 years¹² and in which two relevant changes are observed in the distribution of holdings in the park. Firstly, construction has tended to normalise the surface area by reducing the size of homes from a clear average of more than 90m², to 86 m² in 2021; In the distribution, it is clear how the park goes from 30% of the park with a surface area in the 75-90 m² section to a balanced weight in the park of the categories between 60 and 90 m². Homes, on average, have reduced in size in the two decades that differentiate this graph. Second, rental use has increased at both ends of the distribution, much more in the smaller housing segments and somewhat in the larger ones, reflecting growth in the higher-income rental market (we assume that the larger homes have higher rents) and are the main tenure for the smallest homes in the park. As for their distribution by provinces, Graph 17 shows how this difference in surface area is systematic in almost all markets, with some of them showing a greater disparity.

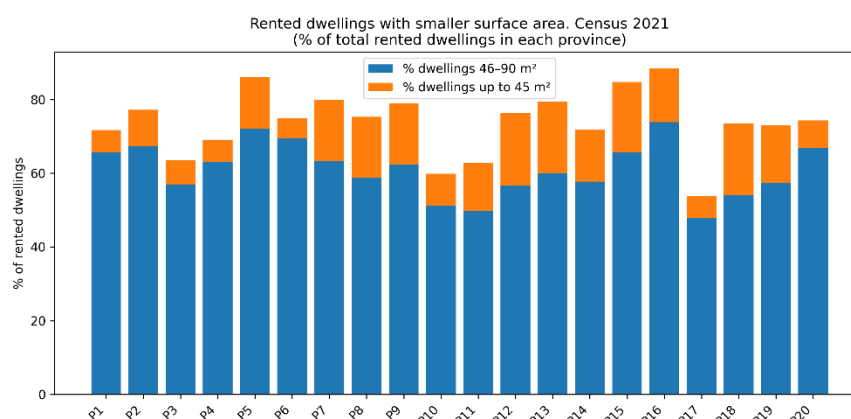
¹²The 2001 Census is used for comparison. The decision is based on the fact that the construction during the last decade (2011-2021) has been minimal and does not provide additional information to a static analysis such as the one carried out here, so we have gone back in time the stock information, since the first decade of the twentieth century experiences a sharp increase in construction, and it provides a profile that serves better for comparison.

Graph 17. Average dwelling size by tenure.



Of all of them, Asturias, Barcelona and Madrid are the ones with the smallest sizes of homes for rent, although also in ownership ownership. There are provinces in which there is a greater part of their smaller homes for rent. Initially, one would expect to find this phenomenon repeated in cities with a higher concentration of population where the price per square meter is higher. However, there does not seem to be a homogeneous model, since the census supports the idea that Madrid and Barcelona are the ones that rent the smallest homes more intensively, but so do Zaragoza, Ceuta, Melilla, the two Canary Islands provinces and the Balearic Islands, Malaga and Asturias. The intensity of renting is compatible with the idea of a lack of supply and strong competition for housing (Graph 18).

Graph 18. Dwellings rented with smaller surface area. Census 2021.

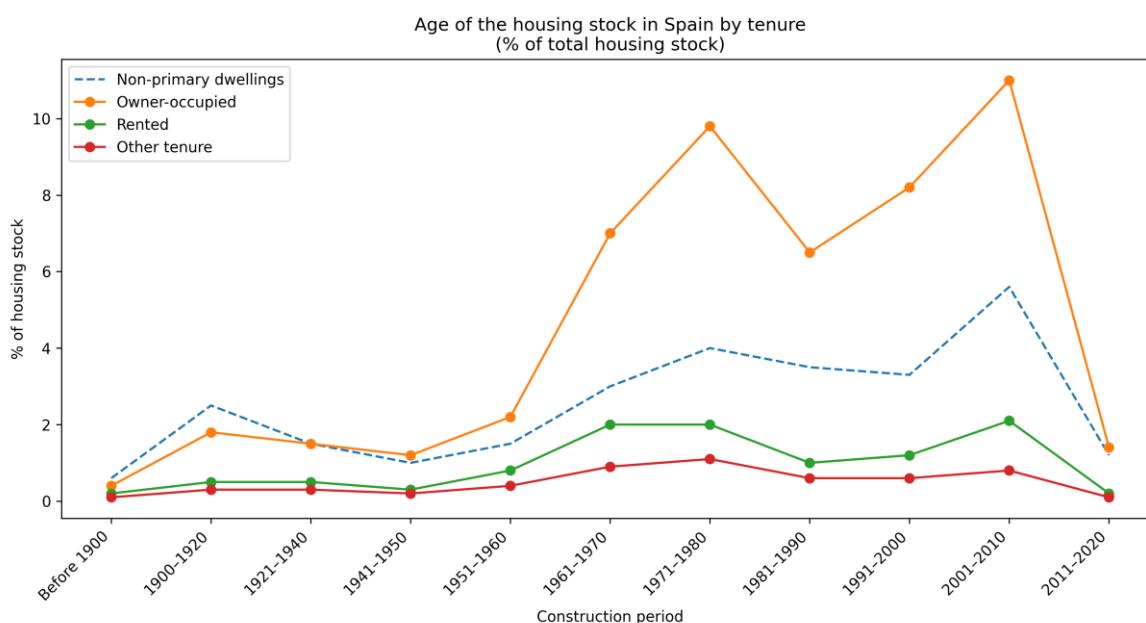


Condition and age of the building

The distribution by age and condition of the rental housing allows us to approximate the level of quality of the segment of the stock that is allocated to this tenure formula. These characteristics, together with the elements associated with the quality of residential services (lift, accessibility and services) set the rental values of housing in stress-free market conditions, so they are useful indicators to know the levels of satisfaction of the residential needs of rental households.

Starting the analysis by age, the average age of the building is shown in the profiles in graph 20, which clearly reflect the last two major building cycles in Spain, 1960-75 (housing persists) and 1995-2010, and a lower level of older housing (until 1950) within the stock of approximately 15.2% of the total. Ownership of the main use of housing is the majority (76.7% of the stock), followed by non-main housing, rental and other tenure formulas. As is clearly shown by the age structure of the dwellings, the three forms of tenure follow a similar profile and coincide with the building cycles, so that this temporal distribution rejects the idea that, in general, the oldest dwellings are destined for rent.

Graph 19. Age of the housing stock in Spain by tenure.



Rental use uses about 2% of the total stock in each decade of production and a much lower rate in periods where the weight of the stock is also smaller, such as about 0.5% in each decade of older housing, or 1-1.2% in the downturn phases of the building cycle (1980-87 and 1991-94).

The association of age with lack of quality is not rational since homes built in the past may have been rehabilitated. Table 1.6 represents the proportion of each of the quality categories considered over the total stock and the level of quality is high, with 91.4% of the total number of main dwellings in the best classification, 91.4% in the case of secondary dwellings and 83.1% in the case of empty dwellings. These proportions leave just under 9% of the total fleet in need of quality improvement and most of it is concentrated in the empty category (10.5% of poor quality but 4.4% in ruin or poor quality).

Table 1.6. Quality of the housing stock in Spain

Table 1.6.- Quality of the housing stock in Spain 2011 Census*				
	Total	Primary Dwellings	Secondary Dwellings	Empty Dwellings
Dilapidated	0.3	0.2	0.3	1.1
Poor	1.1	0.7	0.9	3.3
Deficient	5.6	4.6	5.6	10.5
Good	90.3	91.4	91.4	83.1
Not reported	2.7	3.1	1.8	2.0
*There are no data on housing stock quality in the 2021 Census				
Source. INE				

The quality of the park is very standard throughout the territory. In general, the proportion of poor-quality housing (dilapidated housing, poor housing and deficient housing) ranges between 5 and 10% of the stock stock, with notable differences depending on whether they are primary dwellings (the best quality), secondary or empty. Table 1.7 shows the situation by region.

Table 1.7. Proportion of the housing stock with the poorest quality levels.

Table 1.7. Proportion of the housing stock with the poorest quality levels (the sum of those that are in a dilapidated, poor, or deficient condition, as a proportion of the total housing stock).				
	Total	Primary Dwellings	Secondary Dwellings	Empty Dwellings
Spain	7.0	5.5	6.8	14.9
Andalucía	6.4	5.3	5.3	12.8
Aragón	6.5	4.2	8.0	16.7
Asturias, Principado de	7.7	5.4	9.0	19.4
Balears, Illes	7.8	7.2	5.5	14.6
Canarias	9.5	8.4	9.0	16.4
Cantabria	5.3	4.6	3.2	12.1
Castilla y León	7.7	4.9	8.0	18.0
Castilla - La Mancha	6.9	4.2	8.3	15.5
Cataluña	7.6	6.5	7.4	14.8
Comunitat Valenciana	7.4	6.5	6.0	12.9
Extremadura	6.9	4.0	7.7	17.2
Galicia	10.6	7.1	9.2	24.2
Madrid, Comunidad de	4.4	3.8	4.4	9.6
Murcia, Región de	7.8	7.0	5.1	13.8
Navarra, Comunidad Foral de	2.5	1.4	4.0	8.7
País Vasco	4.3	3.6	7.2	10.4
Rioja, La	8.3	5.9	8.7	16.6
Ceuta	23.6	23.5	21.7	25.1
Melilla	10.9	10.1	12.5	25.3

This table shows a better situation of the main dwellings except in Ceuta, Melilla and the Canary Islands, as well as the concentration of the worst quality in what the 2011 census called 'empty homes', a category that referred to units whose owners or use could not be contrasted when the census was carried out. It stakes the situation of the residential parks of the Canary Islands, Galicia, Ceuta and Melilla as the places with the worst quality conditions.

Age is not directly correlated with the quality of the homes. This is a characteristic of the Spanish housing stock, where building renovation processes have improved the quality of residential services across the board. The intersection between the age of the building and the quality of the park is confirmed by the lack of association between the age of the building and quality and ratifies the perception of a renovation with rehabilitation in the oldest units. Table 1.8 summarizes the information on this issue.

Table 1.8. Condition of residential buildings by age

Table 1.8. Condition of residential buildings by age (% of the total housing stock)					
Total Housing	Total	Hasta 1950	de 1950-1980	1981-2001	2001-2011
Total	100.0	11.0	42.8	26.8	16.3
Dilapidated	0.2	0.1	0.1	0.0	0.0
Poor	0.7	0.4	0.3	0.2	0.1
Deficient	4.6	1.7	2.4	14.4	16.2
Good	91.4	8.8	40.1	13.7	17.8
Rented dwellings					
Total	13.5	0.4	1.5	5.5	2.5
Dilapidated	0.0	2.1	6.1	3.6	0.0
Poor	0.2	0.0	0.0	2.8	0.0
Deficient	1.0	0.1	0.1	0.0	0.0
Good	11.8	0.4	0.5	0.0	2.5

In the total stock, the relevant proportion of homes in worse condition are in poor condition (4.6% of the total stock and 14.4% of the homes built between 1981-2001 and 16.2% of those built between 2001 and 2011). The quality structure of rented homes is different, as it concentrates 11.8% of the total as dilapidated and 2.8% as poor. The dilapidated houses would have been built throughout the period. This worse situation with respect to the situation of the stock shows renovation needs in the rental market which, without being general, does show a worse deterioration associated with this form of tenure.

Most of the units in the worst quality are concentrated among the group of older and rented homes. 13.5% of the total number of homes built before the 1970s are for rent and in some degree of poor condition, basically with deficient services. The greater weight of renting in this age group, and the renovation of the stock, mean that rented homes are also mostly in good condition, with a better degree of conservation than owned units. This structure of distribution by qualities breaks some preconceived ideas about the old rental stock, where problems of condition and maintenance, which are traditionally attributed to rented units, seem not to be as common as believed. Although it is true that there is a marginal number of homes in worse condition that would support this idea, this situation is not the majority, and it is possible that the rental ownership itself has generated a lower flow of investment for its maintenance over time.

The provinces that show the best quality of their housing are represented in the Table

Table 1.9. Rented dwellings in good condition. 2011 Census

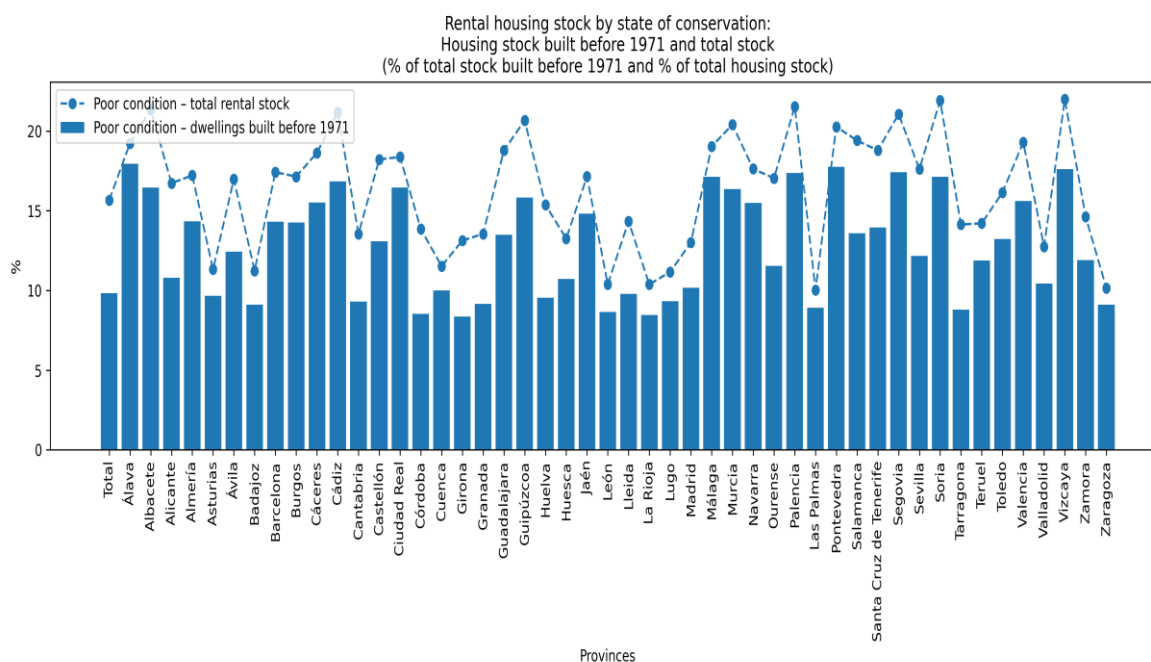
Table 1.9. Rented dwellings in good condition. 2011 Census. 2011 Census					
	Total in good conditions	Until 1950	Between 1950-1980	1981- 2001	2001-2011
Total	90.7	11.4	40.6	20.1	18.6
02 Albacete	94.8	4.9	41.7	30.2	18.0
03 Alicante/Alacant	89.5	4.5	40.0	17.8	27.2
04 Almería	91.4	3.8	25.4	24.2	38.0
01 Araba/Álava	98.7	7.4	39.2	13.3	38.8
33 Asturias	91.7	9.2	39.2	21.9	21.4
05 Ávila	97.5	7.2	42.8	23.2	24.3
06 Badajoz	99.2	10.4	28.4	33.8	26.6
07 Balears, Illes	88.9	13.6	39.3	19.5	16.4
08 Barcelona	87.5	19.9	45.3	11.7	10.5
48 Bizkaia	93.0	17.7	52.1	9.4	13.7
09 Burgos	87.1	9.6	43.0	15.5	18.9
10 Cáceres	91.4	7.9	31.9	38.0	13.5
11 Cádiz	79.2	9.2	28.6	25.9	15.6
39 Cantabria	89.0	14.4	34.5	19.5	20.6
12 Castellón	88.5	6.6	42.5	17.3	22.1
13 Ciudad Real	98.7	5.3	29.8	34.8	28.8
14 Córdoba	89.0	6.8	36.3	25.8	20.1
15 Coruña, A	89.2	7.4	38.6	18.0	25.3
16 Cuenca	91.4	12.7	33.6	23.0	22.1
20 Gipuzkoa	97.0	26.8	39.9	13.4	16.9
17 Girona	93.5	13.9	36.5	19.8	23.4
18 Granada	91.6	7.5	38.7	25.4	20.0
19 Guadalajara	97.8	6.9	32.8	25.2	32.9
21 Huelva	84.7	7.8	30.3	33.1	13.5
22 Huesca	93.7	12.2	39.5	22.4	19.6
23 Jaén	92.6	7.1	30.0	38.0	17.5
24 León	90.1	9.9	46.7	23.1	10.2
25 Lleida	91.1	13.2	34.2	18.1	25.5
27 Lugo	90.0	7.4	35.4	27.4	19.8
28 Madrid	93.6	12.5	43.8	19.9	17.4
29 Málaga	95.0	3.0	37.1	31.0	24.0
30 Murcia	90.2	5.7	37.8	23.2	23.6
31 Navarra	98.8	13.0	39.5	19.6	26.7
32 Ourense	94.8	8.0	42.6	13.5	30.7
34 Palencia	98.6	11.9	39.3	20.7	26.8

35 Palmas, Las	88.1	3.7	29.1	34.3	21.1
36 Pontevedra	92.7	7.0	41.4	23.3	21.0
26 Rioja, La	88.6	12.5	39.3	12.3	24.5
37 Salamanca	93.7	5.3	38.1	26.0	24.3
38 Santa Cruz de Tenerife	91.8	4.0	32.7	33.3	21.9
40 Segovia	90.4	6.9	44.9	19.1	19.5
41 Sevilla	89.2	8.0	40.1	23.7	17.4
42 Soria	94.3	9.8	37.5	21.1	25.9
43 Tarragona	79.1	11.6	30.2	20.0	17.3
44 Teruel	94.6	19.1	34.7	24.2	16.6
45 Toledo	99.1	4.3	35.4	21.8	37.6
46 Valencia/València	86.3	9.8	49.9	15.1	11.5
47 Valladolid	93.9	5.1	46.4	22.5	19.9
49 Zamora	94.8	11.5	33.0	16.6	33.8
50 Zaragoza	93.8	8.8	50.3	20.4	14.3
51 Ceuta	67.7	NA	NA	NA	NA
52 Melilla	76.9	NA	NA	NA	NA

The table shows what period the homes are in good condition. For the most part, the homes that entered the stock between 1950 and 1980 account for almost half of those that are in good condition, followed by those built in the last great cycle 2001-2011 and those of 1981-2001. The figure, therefore, is proportional to the size of the stock, which indicates that, in rental housing, the updating of its quality has also followed a similar pattern as in the main ones. The provinces with the greatest quality problems (which have less than 85% of their rental stock in good condition), would be mainly Cádiz. Ceuta and Melilla (although the latter two are not included when crossed by age of the stock in the 2011 Census), and below 90% of the stock would be the provinces with the greatest need for rehabilitation of their rental stock, after it. The high proportion of homes in good condition that were built before 1950 endorses a continuous rehabilitation process, although it does seem clear that the rental homes that are in the worst condition correspond to all the periods of construction of the stock except the last one.

To elaborate on this fact, a graph corresponding to the 2001 Census is shown below. It has segmented the information on older rental housing and can show how the renovation of a significant part of the old housing for this purpose has had to be carried out during the last cycle, since the poor quality figures in the rented units, then, were mainly concentrated in the pre-1971 housing (graph 20). especially in Cádiz, Ceuta, Melilla and Segovia.

Graph 20. Rental housing stock by state of conservation: housing stock built before 1971 and total stock



Accessibility and availability of garages.

To conclude the description of the rental stock in Spain with census information, this section addresses some characteristics associated with the housing provided by the 2011 census. Residential accessibility is regulated by habitability regulations, and the park is adapted as improvement works are carried out. It refers, therefore, to physical accessibility, one of the most relevant issues since it lacks must be solved with investment that adapts the structure. The information in Table 1.10 may be out of date at the end of 2011. However, the level of error incurred when using it cannot be very high given the low construction and rehabilitation activity that has taken place in the last decade. The table shows that 33.9% of the total stock of main homes have facilities that allow accessibility. Almost a similar proportion also has garage availability, and only a proportion of 19.5% has it in the group of homes not considered accessible.

Table 1.10. Accessibility of rented dwellings and availability of lifts

Table 1.10. Accessibility of rented dwellings and availability of lifts					
(% of total dwellings in each category)	Accessibility		total	Availability of garage	
	Yes	No		On accessible	on no accessible
Total primary dwellings	33.9	63.0	35.5	35.5	19.5
Rented	32.3	64.5	28.3	14.4	13.9

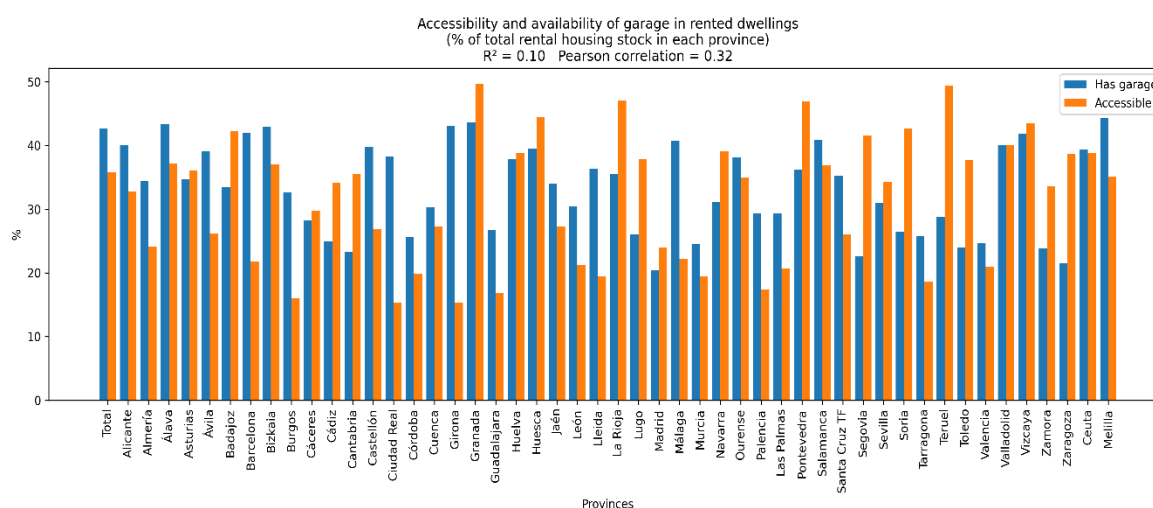
Owned (Total)	34.6	62.3	37.2	16.8	20.5
Owned through inheritance or donation.	24.7	73.1	24.2	6.9	17.3
Owned purchased, fully paid	33.0	65.1	32.7	13.3	19.5
Owned purchased partially paid (mortgage)	38.7	56.7	45.4	23.1	22.3
Provided free of charge or at a reduced price (by another household, paid by the employer, etc.)	28.6	68.6	28.4	10.9	17.5

Source. Censo 2011, INE

In the case of rented homes, the proportions are very close to the average for the stock, only slightly lower in terms of accessibility (1.5 percentage points below). The most important difference appears in the availability of garages, since only 28.3% of the total fleet is rented and has a garage. Of those homes rented with accessibility, 14.4% have a garage, 14.4% in accessible homes and 13.9% in non-accessible homes, consistent with the somewhat older rental stock and the fact that building regulations did not incorporate the obligation to build garages in previous decades. The rest of the table gives an idea consistent with building regulations; For example, the holding groups with the highest proportion of garages are own homes by recent purchase (because they continue to pay the mortgage), with 45.4%.

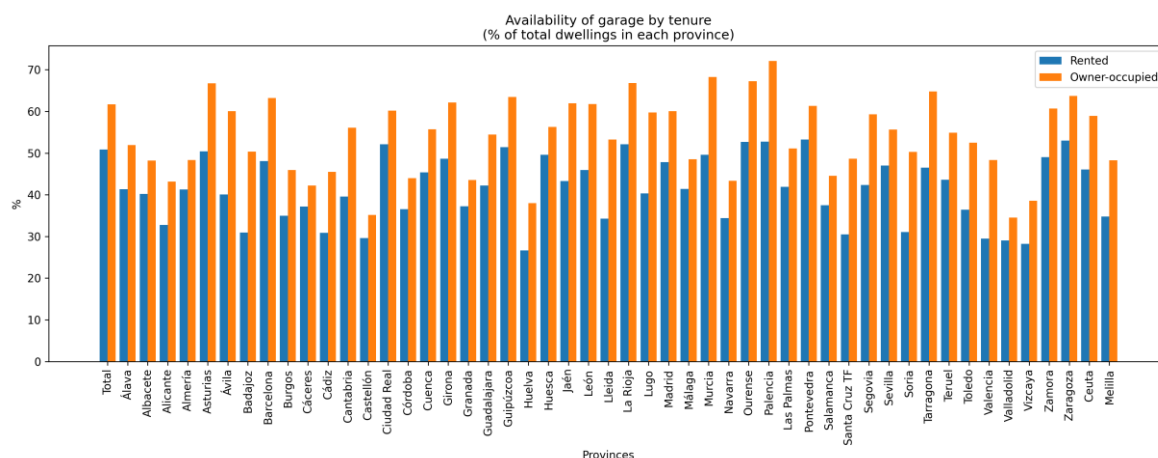
In terms of accessibility by province, graph 21 shows the levels for rental housing. The national average of accessible rented homes is 31% of the stock in that tenure. There are some provinces whose adaptation of this park is lower than that average, such as Melilla, Segovia, Ourense or the Balearic Islands.

Graph 21. Accessibility and availability of garage in rented dwellings.(% of tota



These access ratios contrast with those given in the previous Census (2001, graph 27), where the national average of housing adapted to access was 19% in rental housing, more than 10% less, and there were regions with a complete lack of residential adaptation. Between the two censuses, one of the largest building cycles in recent history took place in Spain. The results were not only evident in the new construction but also in the adaptation of the park, and the one used for rent has been improved because of this process. In fact, the provinces with the worst adaptation have experienced a significant leap in the renewal of the fleet and its adaptation to more sustainable designs, as can be seen by comparing the information from the 2001 census.

Graph 22. Availability of garage by tenure

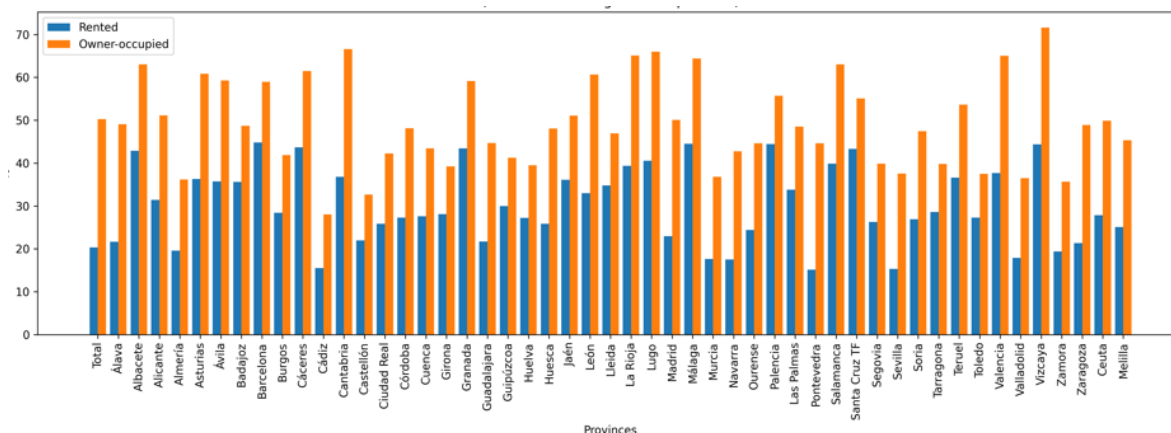


As for the number of elevators in the buildings, the evolution is similar to the one mentioned. Graph 23 shows an average of 29% of rented dwellings with garage availability in 2011 (14% in the 2001 Census, graph 24), with strong variations at the provincial level. The correlation between the metrics of garage existence and accessibility is low, 0.32%, which indicates that both characteristics of the dwellings are not related to each other ($R^2=0.10$) and are derived from different evolutions, regulations, trends, that have resulted in the existing structure. While accessibility levels have been able to follow building regulations when buildings have been updated, the increased availability of garages will be more in relation to the increase in the number of vehicles in towns and, of course, in new construction.

The distribution of homes with garages shows a higher endowment in provinces with medium-sized capitals, while in Madrid, Barcelona, Valencia or Bizkaia the proportion of rented homes that have a garage does not exceed 30% in the first case, and 20% in the rest of the larger ones. The size of the older cities and the fact that the strong expansion has developed in the metropolitan areas may be explanatory reasons for this

distribution structure. In any case, in the larger towns where the rental housing stock is more extensive, there seems to be a lack of garages to cover the population's need for mobility.

Graph 23. Availability of garage in primary dwellings by tenure type



Environment of rental housing in Spain.

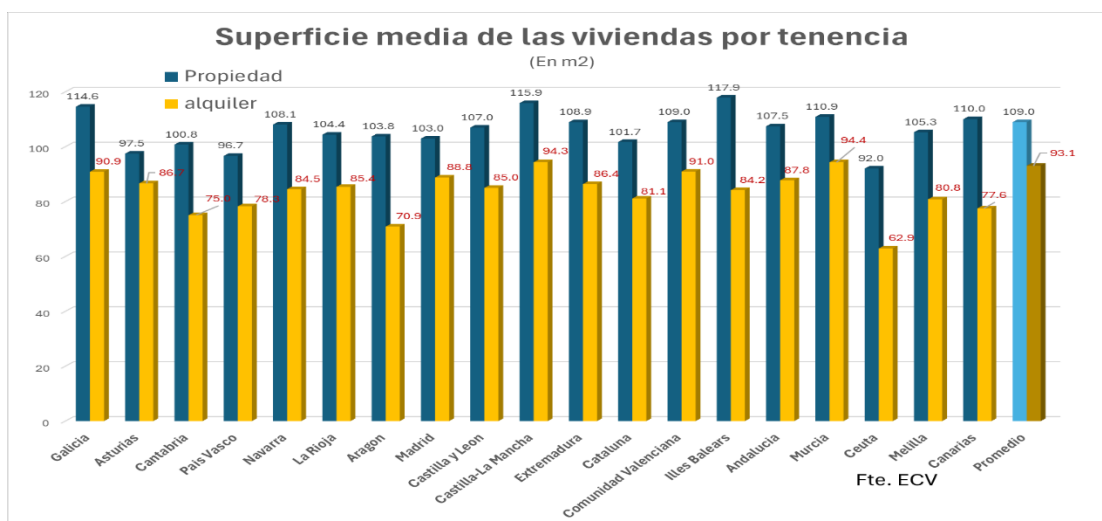
Finally, regarding the characteristics of the surroundings of the dwellings, the census allows us to know details regarding the problems related to the neighbourhood, with noise, pollution, poor cleanliness, poor communications, lack of green areas, crime or lack of cleaning service within the dwelling. All of them refer to the quality of life linked to the property and its residential environment. This information is not available in the 2011 and 2021 censuses, so it is provided using the Living Conditions Survey for Spain (years 2004-2024). It should be mentioned that this survey is not representative at the provincial level, so the geographical analysis can only be carried out at the level of the Autonomous Communities. This information was included in the 2001 Census, so this section provides the fundamental statistics of the Census to compare the evolution of conditions for rented housing. The LCA gives the possibility of evaluating a greater number of housing characteristics than the census, and the situation of rental tenure is described in the following graphs.

- Regarding size (surface area)
- In terms of housing quality, including type, location, neighbourhood quality and accessibility
- Regarding the characteristics of the energy installations in the building.

Size

Graph 24 shows the average area of the park owned and rented. The national average differs by about 16 m² between the two holdings, with the largest number of units owned and rented reaching 93.1 m². By region, the differences are notable, although in all cases, rental homes are lower than owned homes.

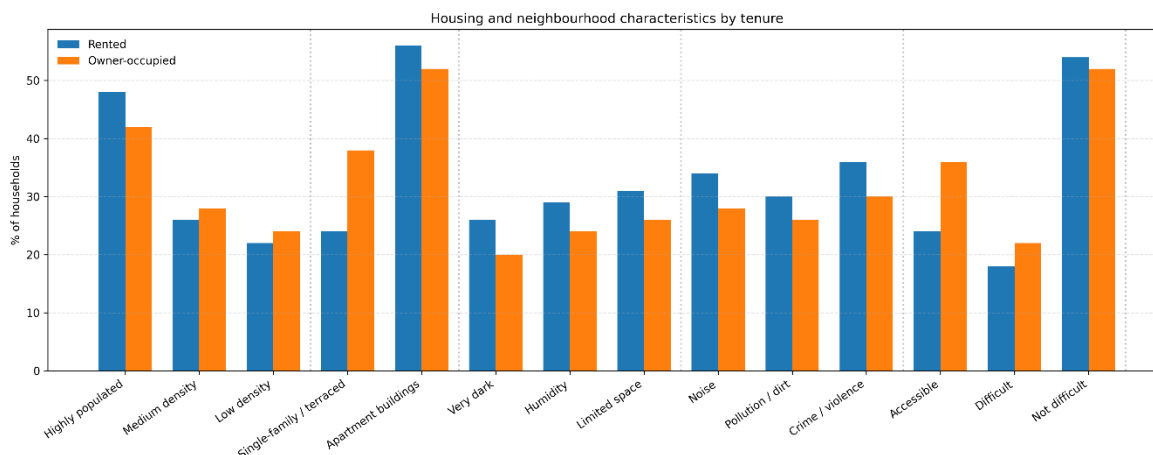
Graph 24. Average dwelling size by tenure (m²)



The greatest differences appear in Aragón, the Balearic Islands, the Canary Islands, Ceuta, Melilla, Navarra and Cantabria. In most regions, the average number of homes owned exceeds 100 m² except in Asturias, the Basque Country and Ceuta, and those for rent are 80m², except in Cantabria, the Basque Country, Aragón, Ceuta and the Canary Islands.

Quality of housing

Graph 25. General characteristics of rental housing in Spain.



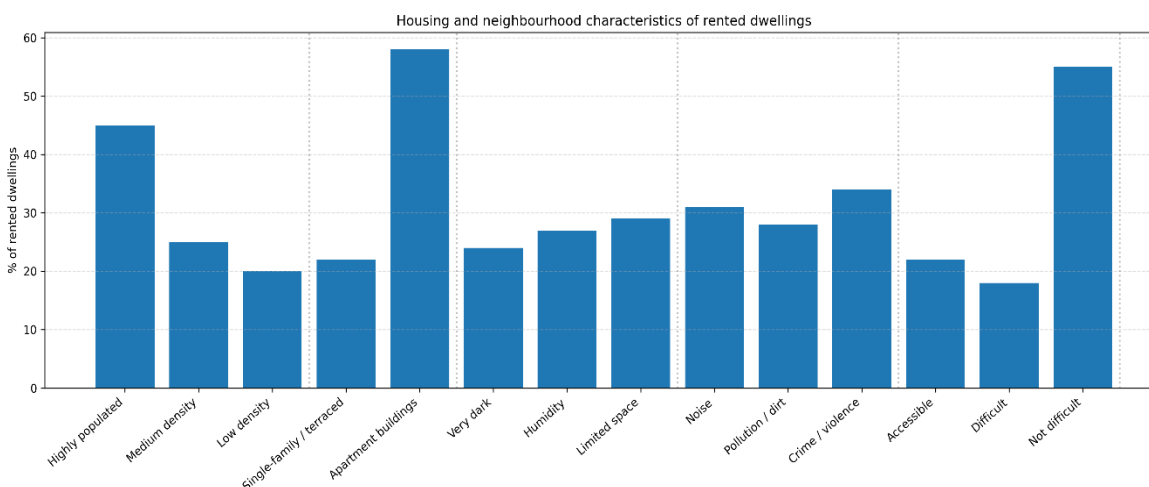
Graph 25 shows the general characteristics of rental housing in Spain, as well as the particularities of its environment. The value represents the proportion of dwellings for rent over the total number of households residing in a main dwelling. 7.7% of the total number of homes dedicated to rental in the Spanish stock are in an urban area of dense urbanization, the highest concentration, compared to 2.04 and 1.97% of those in urban areas with a smaller population. As for the type of housing, practically the majority is in buildings (10.89%), so the rental market is urban, corresponding to a dense concentration, and made up of apartments in buildings. The problems associated with rented homes are, fundamentally, the existence of damp (2.4%), little space (2.4%) and that they are dark (2%). A proportion of 2.8% of all households are rented and report noise in the neighbourhood, while 1.4% complain of pollution and 1.3% of crime and violence.

In general, the majority reflect that there is good accessibility of the home to services: 9.5% are rented and answer that it is not difficult to access even shops and 10.9% public transport.

The latter proportions indicate that the rental dwellings are, for the most part, well located in terms of an accessibility to services.

If these characteristics are considered in proportion to the total number of households in each tenure, the particularities of rental housing versus owned housing can be identified in the characteristics (Graph 26).

Graph 26. Total number of households in each tenure.



For example, rental housing, in proportion, is more concentrated in highly populated areas (60.8% vs. 52.2%), in residential buildings (40.7%) rather than in single-family homes.

Renter homes emphasize more that they are dark, with dampness, little space and noise in the neighbourhood, than owned homes, however, without significant differences in whether the environment has pollution or crime.

The levels of accessibility to shops and public transport are high in both holdings, although less than one percentage point in accessibility to shops and somewhat more accessible to public transport.

The energy installations in the building.

The LCA provides some questions that allow us to identify the quality of the energy installations of the homes where the households participating in the questionnaire live.

Table 1.11. Characteristics of the energy installations of dwellings by tenure.

Table 1.11. Characteristics of the energy installations of dwellings by tenure. Ownership and rental at market prices				
	property Rental (In % of total households)		property Rental (In % s/ total households in tenure)	
Ability to keep the house at the right temperature Warm enough	71.2	10.4	91.3	81.3
during the winter Cool enough during the summer	61.3	9.4	79.5	68.5
	56.2	8.3	72.9	60.1
Heating equipment of the house				
Central heating Other fixed heating system Non-fixed heating	36.6	4.2	47.4	31.4
system No heating	14.0	2.1	18.1	15.8
	7.8	2.8	10.1	20.8
	18.8	4.3	24.3	32.0
Type of heating system you mainly use				
Urban Central of the	0.7	0.1	0.9	0.7
building Individual	7.0	1.3	9.3	8.5
Central Fixed system	44.8	7.1	59.8	45.3
None of the above	11.9	3.5	15.9	22.2
	10.2	3.6	13.6	22.9
No answer	0.4	0.1	0.5	0.4
Main source of energy for home heating				
Electricity Gas	33.3	6.2	36.1	46.7
	9.1	0.6	43.1	44.1
Diesel Biomass	1.8	0.1	11.8	4.6
(pellets, etc.)	3.7	0.2	2.3	0.7
Wood Charcoal	0.2	0.0	4.7	1.4
	0.6	0.0	0.3	0.1
Renewable energies	0.3	0.0	0.8	0.2
Other sources of energy	0.5	0.3	0.4	0.3
Don't know	0.0	0.0	0.6	2.0
Etc. INE, ECV				

The two main tenants declare the ability to keep the house at an adequate temperature, 0.4% of the renter households and 71.2% of the owner households. The proportion corresponds to the distribution of tenure. If we look at the last two columns, 91.3% of owners and 81.3% of tenants seem to maintain adequate temperatures, which indicates that 8.7% and 18.7% respectively would not achieve it and are, potentially, households in energy poverty. The difference is more marked if you ask about the temperature in summer and winter. The ability to keep the dwelling warm in winter is greater than keeping it cool in summer and, if distinguished within each tenure, tenant households show a lower capacity than owners to have an adequate temperature with respect to the season of the year that needs to adjust the temperature. More than 10 percentage points separate tenants from owners, showing a worse adaptation to climate changes in rental housing compared to those of the property (68.5% of tenants compared to 79.5% of owners, say they have the ideal temperature in winter, being 60.1% compared to 72.9% respectively, with respect to summer).

The questionnaires mainly ask about the systems of installations for heating (and not cooling). Of the total number of households, most of those that have installations of this type are in fixed systems, central heating (36.6% of all households and with their own housing, and 4.2% of all households and with their home for rent) or another fixed system (14% and 2.1% respectively). Most of them are individual central heating systems (44.8% of households that are also owners and 7.1% that are tenants) or another fixed system (11.9% and 3.5% respectively), while only 7% and 1.3% respectively, have central heating of building¹³.

If analysed with reference to the response of owners and tenants in proportion to their tenure (last two columns), only 47.4% of owners and 31.4% of tenants have central heating, 18.1% and 15.8% respectively have another type of fixed heating system, 10.1% and 20.8% have a non-fixed system and the rest, it does not have. The most have individual central heating, but fewer renters have a fixed heating system than homeowners (76% of renters have a fixed system and 85% of landlords, indicating that rented homes are more likely to not have a central heating system than owned homes).

¹³ Note that the proportions calculated between the two questions, 'Heating equipment of the dwelling' and 'type of heating system used' do not match exact figures. This is a result of the fact that some of the questions that are quantified have been included in specific statistical modules to analysed heating and in some years. The differences are due to the comparison of data in particular years and the averages of all years in some of the questions, such as the first one in the table.

In terms of the source of energy used by these households, electricity and gas are mainly used by rental households (46.7% of all rental households use electricity and 44.1% use gas, compared to 36.1% and 43.1% of landlords, respectively). Diesel, biomass and firewood are more important marginal energy sources among owners than among tenants, clearly associated with the type of homes owned.

2.1.3 Energy rating of rental housing. Comparison with Homes owned

This section includes the results of the energy certificates downloaded from the Autonomous Communities of Valencia, Catalonia and Madrid. It should be mentioned that the databases, although they refer to the results contained in the Energy Certificates, have very different structures, which makes it impossible to analyse all of them together. For example, two of the databases consulted contain detailed information on heating and cooling consumption, but do not detail according to the use of the homes. Almost all of them distinguish by type of building, but only two identify the type of non-residential building while the rest group them together. Only the Catalonia database identifies the reason for the certificate, where the rental use appears, and in the rest, it is not distinguished, so the information provided only refers to the homes or blocks of flats but there is no distinction by tenure.

Thus, the general information reproduced below seems to be the common one in all of them. We leave a lot of valid information to be analysed, pending that we expand this document later.

Valencian Community

The information on the VC is very scarce but covers in detail the entire time (2013-2025) with sufficient detailed observations at the provincial level. Table 1.12 shows a summary of certified energy efficiency levels by building group, as an average of all available years.

The calculated energy efficiency averages show the reference letter resulting from the 12 years of available observations. Thus, hospitals, hotels and sports facilities show the best efficiency, with an average that is close to C. The two groups of properties on which this work focuses are blocks of residential buildings, and independently valued housing, within blocks (highlighted in bold in the table). Single-family homes are not analysed.

Table1.12. Energy efficiency in the Valencian Community. Average years 2013-2025

Table 1.12. Energy efficiency in the Valencian Community. Average years 2013-2025				
	CONSUMPTION Primary Energy (EP)	EMISSIONS CO2	KWH_VALOR Media	co2_VALOR Media
EDUCATIONAL CENTER	C	C	155.5	30.2
COMMERCIAL BUILDING	D	D	223.5	47.0
RESIDENTIAL BUILDING (COMPLETE BLOCK)	And	And	147.2	36.6
HOSPITAL	C-D	C	220.2	39.5
HOTEL	C-D	C	242.4	45.6
SPORTS FACILITIES	C-D	C-D	262.6	51.7
COMMERCIAL LOCATION	D-E	D	209.4	41.2
BUREAUX	D	D	198.7	40.8
OTHER	D	D	108572.5	18395.8
RESTAURANT	D-E	And	288.5	58.4
INDIVIDUAL HOUSING	E-F	And	169.3	64.9
SINGLE-FAMILY HOME/S	And	E	195.3	39.3
Fte. Prepared from IVACE data				

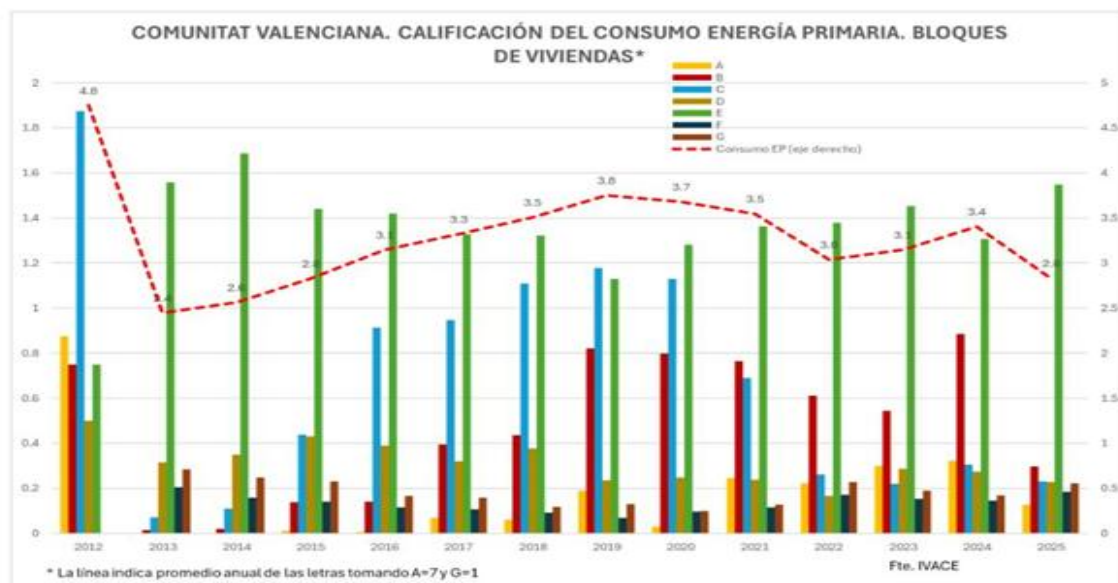
The residential group is the one with the averages with the lowest level of efficiency of the entire stock, with an average of E in primary energy consumption (EP) and CO2 equivalent emissions, in the complete blocks and in the homes evaluated individually. In EP consumption, the average efficiency is the lowest, with values between level E and F. The rest of the buildings have efficiency levels higher than D.

The rating levels by years show variability consistent with the fact that the composition of the information each year includes different properties. The average is now observed in its numerical form in the dotted line of graph 32, where its four panels represent the proportion of residential buildings and independent dwellings within the entire stock for which the certificate was issued, according to the grade obtained measured only in letters. Except for the first year (2012, available in the CV) in which the buildings in the best condition would possibly be evaluated, the average rating of the buildings oscillates around E, in a very stable trend that does not reflect a substantive change. The green columns in graph 32, panels 1 (EP) and 2 (CO2) show how most of the buildings in each reference year evaluated have an E rating. During the period 2018-2021, more energy-efficient buildings, with a B rating, were evaluated, which improved the average during this period. Buildings rated C (light blue column) are the third group

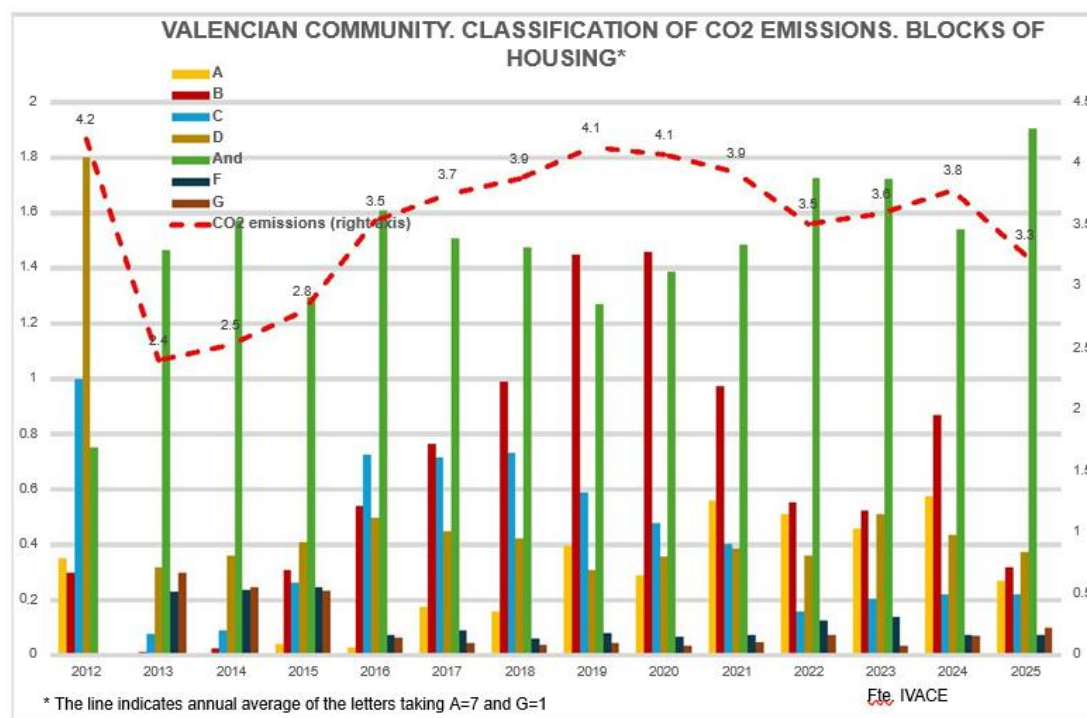
with efficiency until 2021 in which those with A and B gain weight, reflecting a process of improvement in the efficiency of both energy consumption and emission reduction (panels 1 and 2).

Buildings efficiency and energetics in the Community Valencian. 2013-2025.

Panel 1. Primary energy consumption rating, apartment blocks.

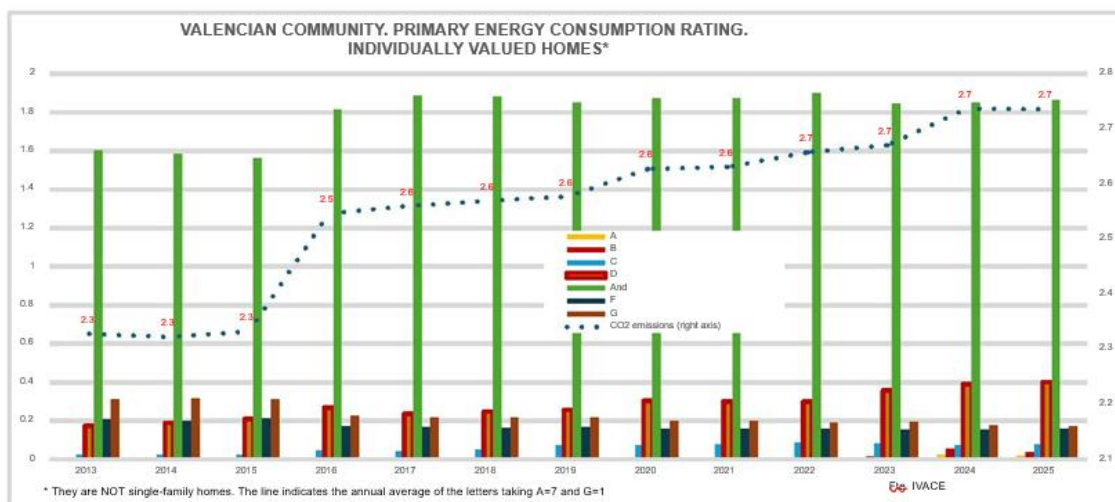


Panel 2. CO₂ emissions classification, apartments blocks.

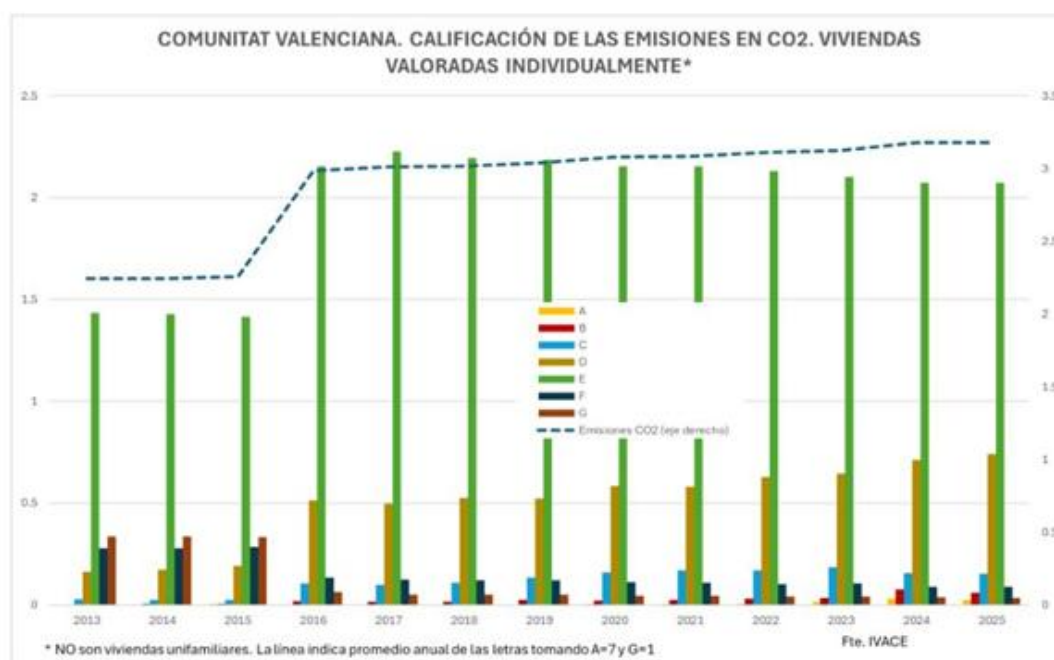


As for the rating of the homes evaluated individually, the average rating is massively E throughout the period. The smaller columns around this level are indicative of the change in energy efficiency that is carried out individually by households. Thus, during the first years, it is observed that the second most relevant group is G (worst efficiency), but this has been decreasing in favour of a strong increase in homes with level D (brown column).

Panel 1. Primary energy Consumption rating.



Panel 2. CO₂ emissions classification. Individually assessed dwellings.



The evolution of emissions supports this interpretation, as can be seen in panel 2, with an improvement in the rating as a CO₂ emitter since 2016, with a growing proportion of households that, although maintaining their energy consumption, fundamentally reduce emissions. Basically, the improvement occurs from G to D (three letters of improvement) indicating a generalized process of increasing energy efficiency in the homes that apply for certification. This supports the process seen above, although with timid overall results that do not allow us to foresee a generalized improvement in the rating.

Regarding the provincial information, Table 1.13 shows the general rating of the building stock on average for the entire period.

Most buildings are certified with a level E for primary energy consumption and emissions. The distribution of buildings by energy efficiency is similar, with small differences by provinces showing a marginally higher concentration of more energy-efficient buildings in Valencia (with B and C certificates) and in Alicante compared to Castellón. It should be noted that the levels of efficiency in emissions (lower CO₂ emitted) are better than those measured through primary energy consumption in the three provinces, which is reflected in a proportion of completely inefficient buildings (G) lower when emissions are measured than when energy is computed.

Thus, between 10 and 12% of the buildings in the CV are completely inefficient in terms of emissions, but between 18 and 23% are inefficient in terms of energy use.

Table 1.3 Energy efficiency in the built stock in the Valencian Community. Detail by province.

Table 1.13. Energy efficiency in the built stock in the Valencian Community. Provincial detail (Includes all types of buildings)			
	ALICANTE		
(% s/ total buildings with certificate)	PROVINCE	CASTELLÓN	VALENCE
CONSUMO_EP_LETRA	E-F	E-F	And
A	0.3	0.4	0.4
B	1.4	1.2	1.5
C	2.5	3.3	4.3
D	6.8	8.6	10.5
And	53.6	53.7	56.0
F	13.0	10.0	9.1
G	22.5	22.9	18.2
EMISIONES_CO2_LETRA	And	And	And
A	0.6	0.6	0.7

B	1.6	1.3	1.6
C	3.2	4.4	5.7
D	11.1	13.6	15.2
And	61.0	58.2	58.0
F	9.8	9.1	8.3
G	12.6	13.0	10.5
CONSUMO_EP (and KW/h) Average EMISIONES_CO2_promedio	192	10927	170
40 Fte. Prepared from IVACE data		1857	101

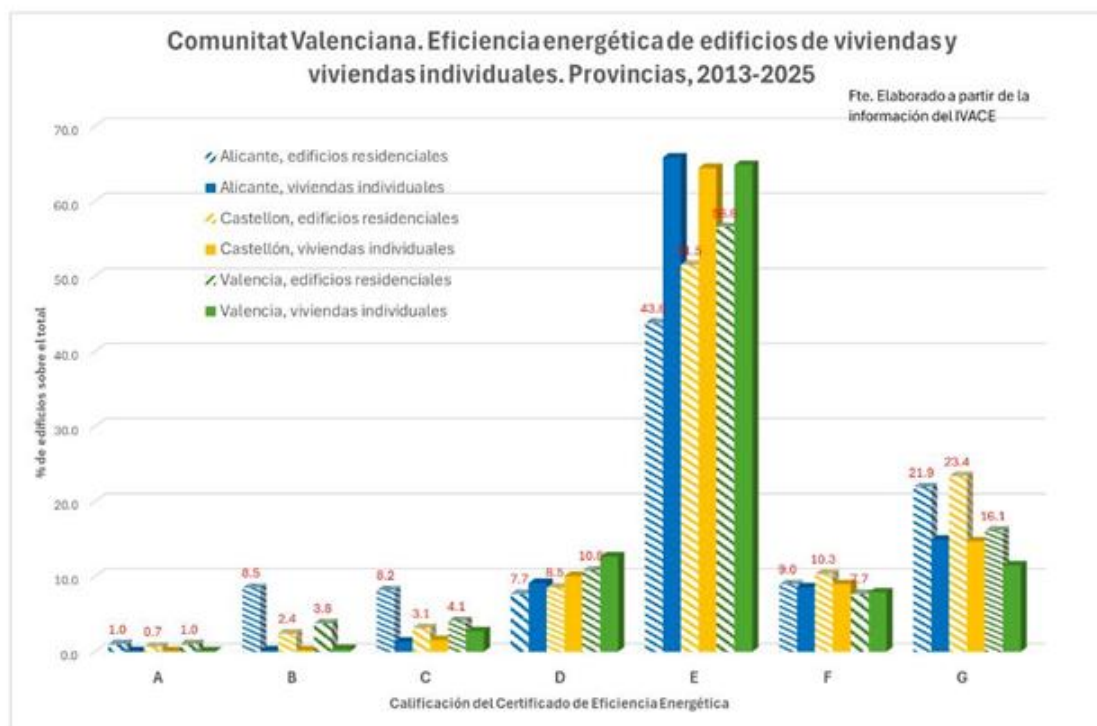
The typology of buildings shows very different levels of efficiency. This paper is interested in analysing residential buildings and dwellings that are individually certified and located in buildings. Graph 27 represents certification levels y the ratio of buildings/dwellings in each category.

The data supports previous comments. As can be seen, most residential buildings and dwellings have a rating of E, with differences by province.

Firstly, Alicante shows the highest number of buildings with better ratings than the rest of the provinces: 8.5% and 8.2% respectively of all residential buildings have an A or B rating in Alicante, the province where there is a greater number of buildings with high energy efficiency in the region.

This fact results in a lower number of buildings that have category E, and 21.9% of the total with G. In this last group, Castellón accumulates the highest proportion of its buildings with this rating, 23.4% of them.

Graph 27. Energy efficiency of residential buildings and individual dwellings. Provinces, 2013–2025



It could be said that the province of Valencia has a marginally better level of energy efficiency, concentrating most of its buildings in categories D and E, and despite not having as relevant a number as Alicante, among the most efficient categories.

Community of Madrid

The database for this region has detailed general information since 2016. As of this year, the database details the type of energy, equipment, uses and qualifications. It includes information on the rating of energy demand for heating and cooling, of those that use non-renewable energy (heating, cooling and sanitary water) and the corresponding emissions, the amount of demand EP or its emissions is not made explicit. Following the previous order of the description, Table 1.14 shows the typology of buildings and their level of qualification in letter of the heating and cooling demand, as well as that of heating emissions, there is no detail of the cooling level.

Table 1.4

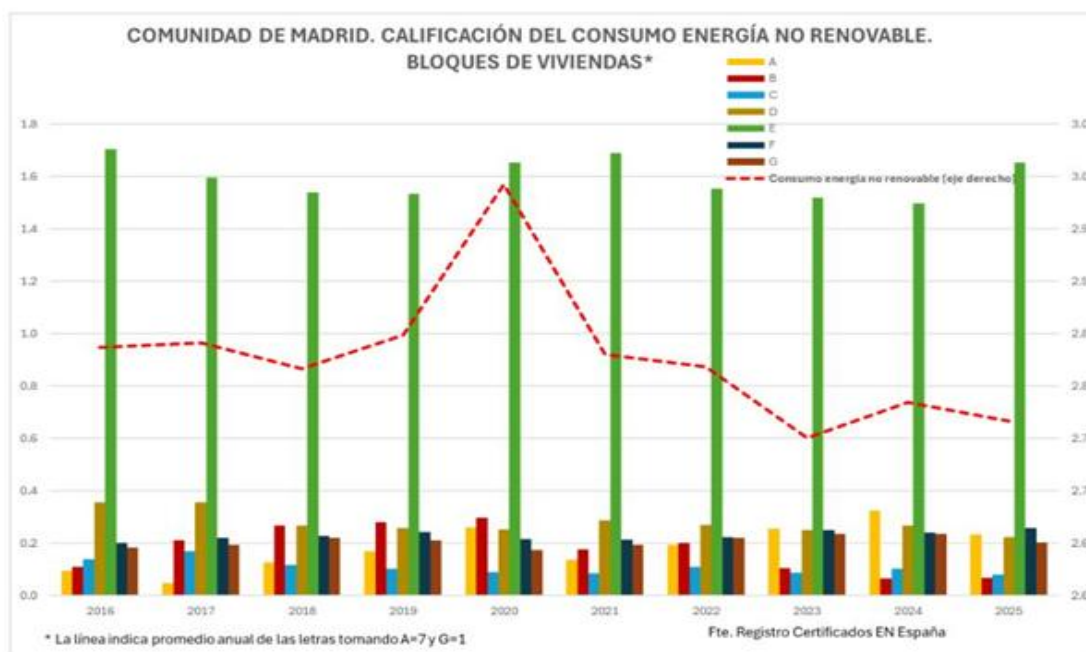
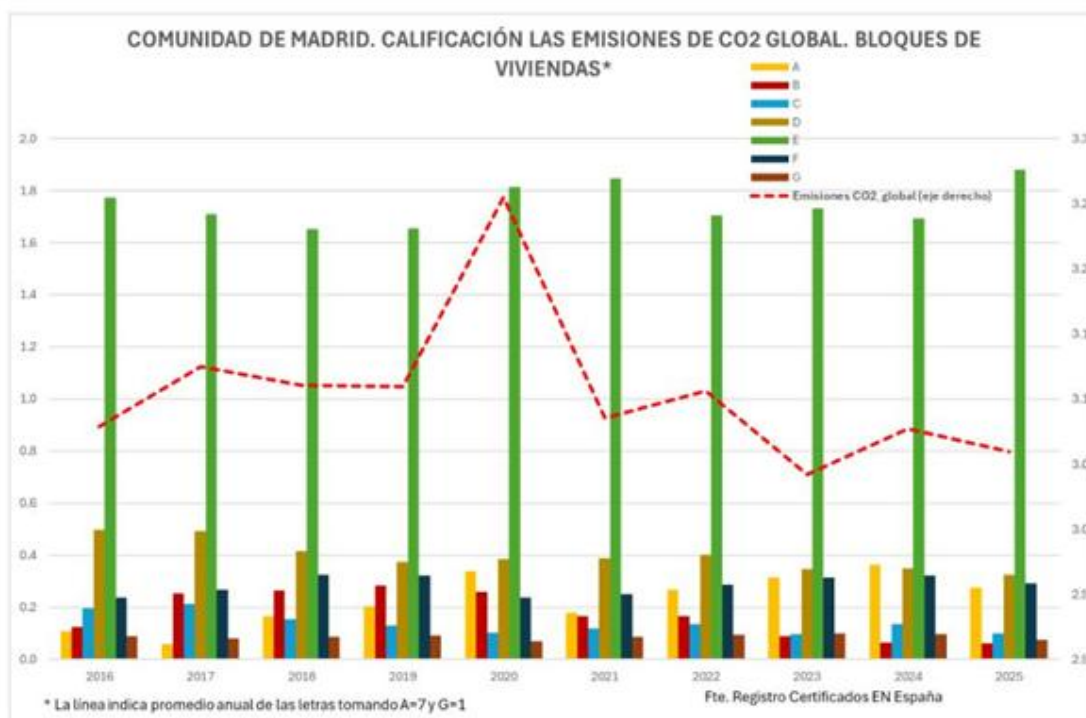
Table 1.14. Energy efficiency of buildings by use. Community of Madrid, 2016- 2025			
CONSUMO_Energía		EMISIONES_CO2.	% of Non-renewable.
Global Park Global Housing Block in Community E C-D			
E 10.9 Tertiary Use Building 1.2 Tertiary Use Premises D-E 6.7 Individual Housing Evaluated in Buildings E-F 62.5 Single-Family Dwelling D-E			
		C	
		D	
E D-E 18.7 Fte.		Prepared from the Register of Energy Performance Certificates of Spain.	
Available in			
https://datos.gob.es/es/catalogo/a13002908-registro-de-certificados-de-eficiencia-building-energy			

As can be seen, the average energy efficiency classification gives a better situation to tertiary use buildings (C-D or C), premises (D-E, D) and single-family homes (D-E), than to the residential blocks and the individually assessed dwellings located in them (E-F).

The information available for Madrid starts from 2016. The evolution of the ratings of blocks of residential buildings and individual dwellings (not single-family homes, which are excluded from this analysis) can be seen in Graph 28.

Graph 28

Panel 1. Non-renewable energy consumption classification, apartment blocks

Panel 2. Overall CO₂ emissions rating, apartment blocks

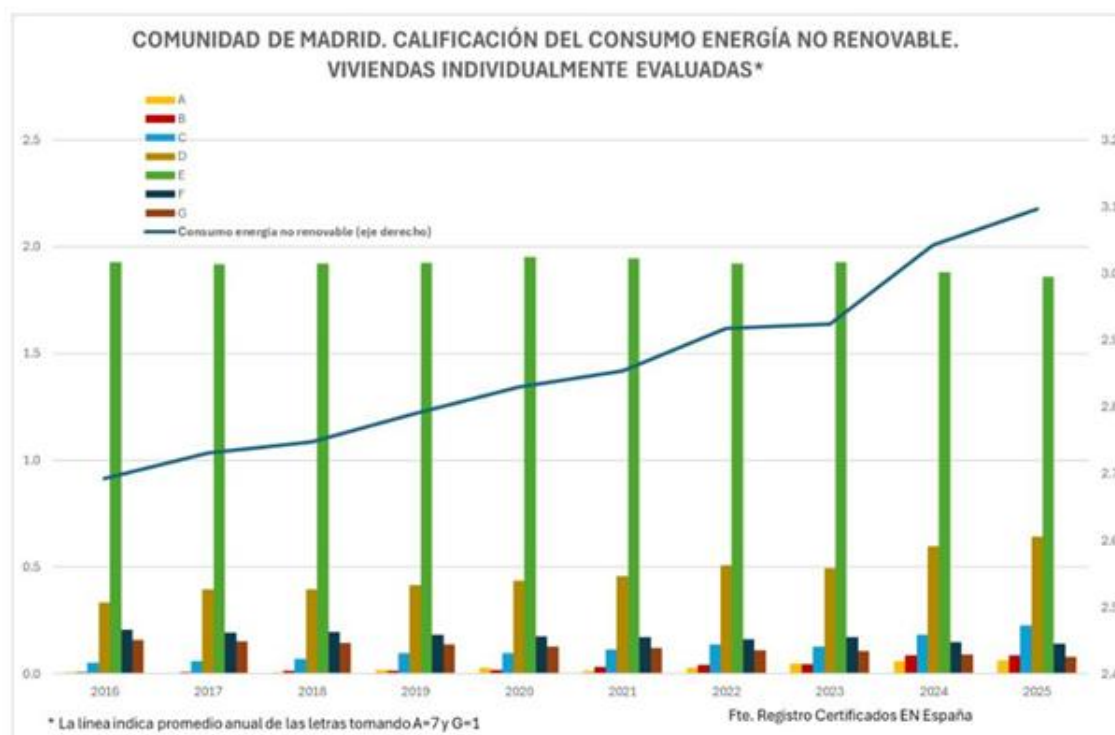
The data on certifications according to their evolution between 2016 and 2025 ratify the fact that residential buildings have an E category in both non-renewable energy consumption and CO2 emissions. This is the predominant category in the largest number of buildings, determines the average certificate and maintains a very stable evolution in the last ten years.

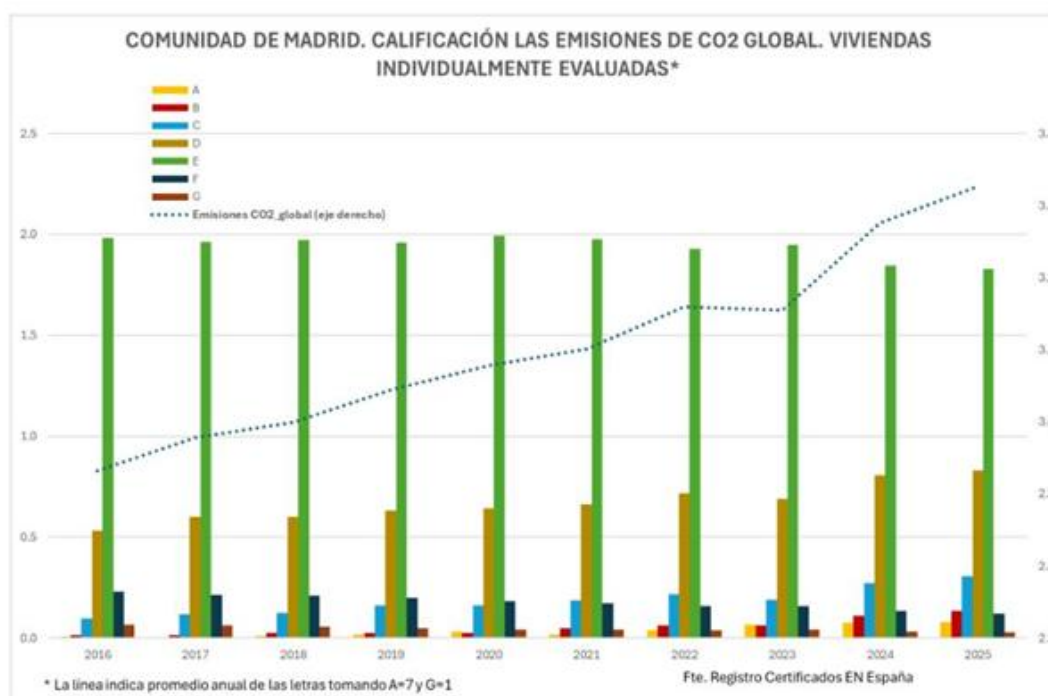
The certificates show a very timid growth in buildings with category A efficiency, although it seems that the process of change has slowed down and, of course, there does not seem to be a general improvement in the energy efficiency of the stock.

As for individually qualified homes, there has been an improvement in energy efficiency as shown in graph 36 since 2016, going from level F to level E. As for energy consumption, this has been thanks to the improvement in the efficiency of homes that jump (since 2021) from an E-F level to a D, which has allowed the average rating to increase. This trend seems strong and persistent in the wake of the 2025 data.

Graph 29

Panel 1. Non-renewable energy consumption rating. Individually assessed dwellings



Panel 2. Overall CO₂ emissions rating. Individually assessed dwellings

The trend is also identified with emissions information. The average rating reflects the improvement in efficiency in emissions in greater proportion than in energy consumption, as is also common in the rest of the regions analysed.

Catalonia

This community publishes in detail the variables contained in the certificates. It is the only one that pays attention to the reasons why the energy certificate is requested, so that the characteristics of the buildings and homes that have been rented are known. The data available for this Autonomous Community cover the period 2015-2025, with a total of 1.3 million certificates (Table 1.15). In this section, descriptive results of the data are provided.

Table 1.15. Stock of buildings with energy rating in Catalonia.

Table 1.15. Stock of buildings with energy rating in Catalonia

	Multi-family housing block	Individual dwelling in a block of flats	Single-family home	Tertiary	TOTAL
<u>TOTAL (num)</u>	30093	891304	297331	117490	1336218
As % of total:					
2015 2016 2017	1.6	1.3	0.8	1.7	1.2
2018 2019 2020	9.8	11.5	8.1	13.2	10.9
2021 2022 2023	9.7	11.3	8.2	11.8	10.6
2024 2025	9.6	10.7	8.3	10.5	10.1
	8	9.7	8.3	9.5	9.3
	6.9	7.7	6.4	6.6	7.3
	7	9.4	7.6	8.1	8.8
	8.4	9.2	10.5	10.6	9.6
	13.3	9.2	14.7	9.3	10.5
	14.7	10.2	14.9	9.7	11.3
	11.1	9.8	12.3	8.9	10.3

Fte: Prepared from the Energy Performance Certificates of Catalonia

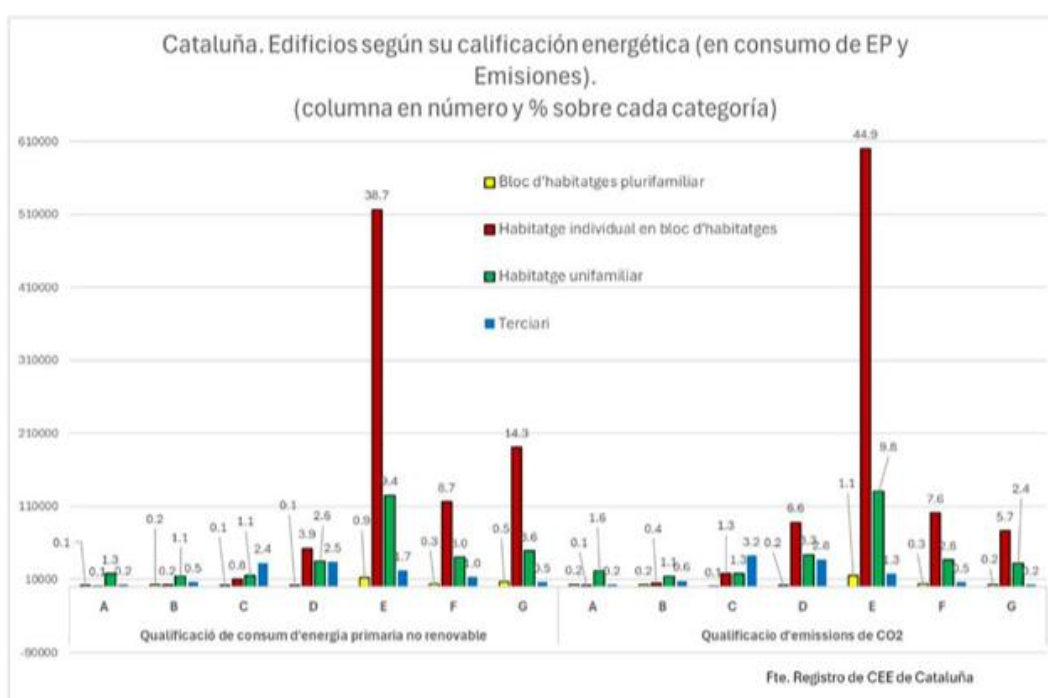
The representation of buildings in the full sample is stable, with an average of between 9 and 11% of each of the categories in the full database. The description of non-residential buildings appears in a separate variable, although it is not relevant to the purpose of this document, so it is not extracted. The two groups that are analysed, residential blocks and individual homes, account for 69% of the total database analysed.

Graph 30 contains the classification by energy efficiency, primary energy consumption (PE) and emissions (CO₂) of all the certificates in number in the database. As can be clearly seen, most of the fleet has an E classification, up to G, adding a relevant proportion of the buildings to the total. It is striking (because it is measured in number of certificates) the individual homes evaluated, which, in their category E, account for 38.7% of the total stock for the use of EP, and 44.9% in terms of their level of emissions.

The disparity between households according to consumption or emissions is a characteristic but given that efficiency that is consistent with climate change objectives is the emissions metric, these results imply a strong need for housing retrofitting.

The certificates that refer to the best level of energy efficiency (from A to D) account for 17.4% of buildings according to their PE demand, and 23.2% according to their emissions.

Graph 30. Buildings by energy performance rating (primary energy consumption and emissions). Columns in absolute numbers and % of each category



Since this database identifies by reason of the request for certificates, it allows the analysis of those homes that request it to be rented. In principle, the distribution of reasons for request can be seen in Table 1.16. This information is unique in the CEE databases available in Spain and shows how the market is being, through sales and rentals, driven by the regulation that requires its presentation, which shows the state of the park and its evolution.

The requirements for certificates in rental contracts show a high weight, they are 32% of the total, which, including the idea that the validity of certificates implies that only one is issued when the unit being rented did not have a previous certificate, is showing

the enormous relevance of this market in terms of its size and the rotation it imprints on the real estate stock¹⁴

Table 1.16. Reasons for applying for Energy Performance Certificates in Catalonia. 2015-2025

Table 1.16. Reasons for applying for Energy Performance Certificates in Catalonia. 2015-2025		
	No certificates	%
Voluntary certification	107895	8.1
Complement to the IEE building evaluation report or to the technical inspection of the ITE building	2830	0.2
Sale	696640	52.1
Existing public administration building Buildings or parts of buildings +500 m2 for administrative, health, commercial, educational, restoration use Buildings or parts of buildings where reforms or extensions are carried out	5062	0.4
	1544	0.1
	3484	0.3
Building Assessment Report (IEE)	1077	0.1
Rent	427581	32.0
New construction	10443	0.8
New construction - extension with independent legal entity	298	0.0
New construction or major renovation	10644	0.8
Renewal (in case of expiry of the old energy certificate)	5788	0.4
Application for grants	58195	4.4
Others (none of the above options)	4737	0.4
Total	1336218	100.0
<i>Fte. CEE Registration in Catalonia</i>		

Focusing the analysis on the certificates that refer to the dwellings, the relative figures are shown in Table 1.17. The rental market for individual homes that are rented and sold generates the largest number of certificates in the entire base, and those that do so under a rental contract would account for 36.6% of the total number of homes. We must not forget the rental market in the tertiary sector, relevant as evidenced by the fact that 45.7% of the total certificates of these properties are issued to be attached to the lease contract.

Table 1.17. Stock of buildings with energy certification in Catalonia. 2015-2025

Table 1.17. Stock of buildings with energy certification in Catalonia. 2015-2025					
(number of properties)	not rented	Total	% of rented	rented s/ total of CEE Bloc d'habitatges multi-family	25276 4817 30093 31.6
Individual housing in block	565189	326115	891304	36.6	
d'habitatges Single-family housing	254346	42985	297331	14.5	
Tertiary	63826	53664	117490	45.7	
Total	908637	427581	1336218	32.0	
Fte: Prepared from the Energy Efficiency Certificates of Catalonia					

¹⁴ Remember that the buildings that are evaluated each year do NOT have to be the same. The validity of 5-year certificates justifies that only one certificate is issued when the unit being rented did not have a previous certificate, i.e., if the rental units systematically enter the market several times within the validity period of the certificate, it is not required to issue a new one.

The rental market for housing units is very important in Catalonia in view of the number of certificates, and accounts for a third of the total certified stock in the residential market, and more than 45% in non-residential markets.

About energy efficiency, Table 1.18 shows the average in letter of the efficiency in consumption of non-renewable primary energy and CO2 emissions, for each group of buildings and buildings.

Table 1.18. Average energy efficiency of the building stock in Catalonia. 2015-2025

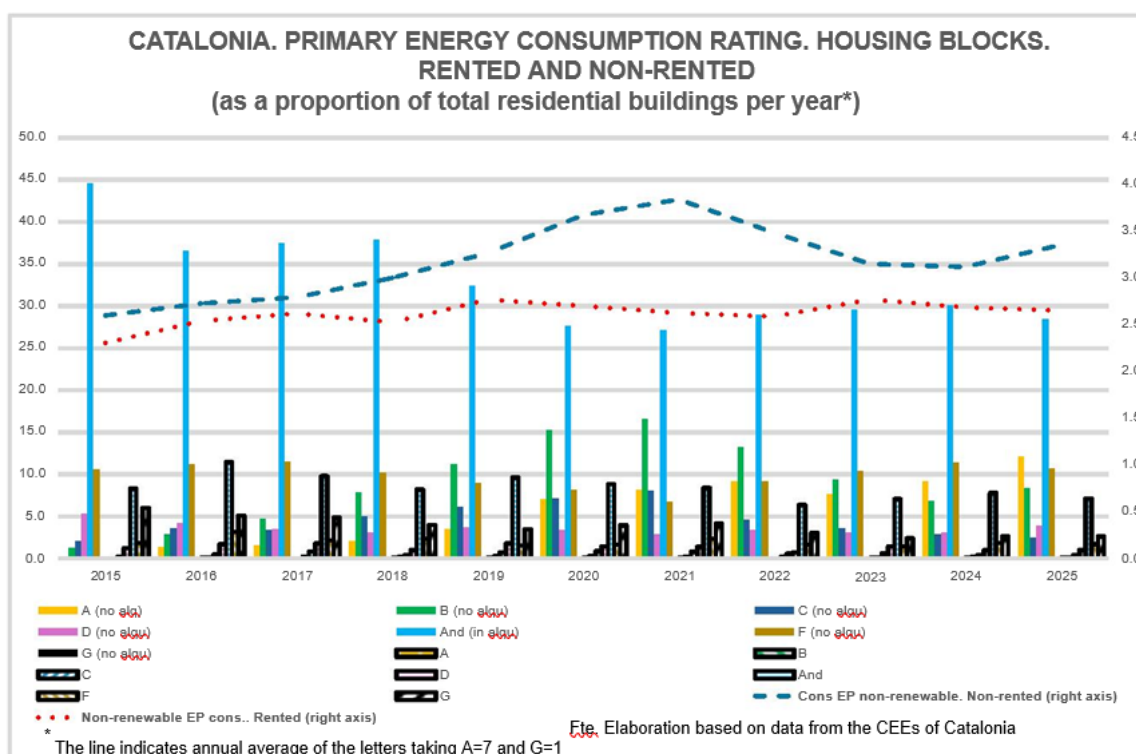
	Non-rented Consumption of EP KWh/m2	Emissions CO2	Yes rented Consumption of EP KWh/m2	Emissions CO2
Multi-family block of housing	E	E-D	F-E	E
Individual housing in block of housing	F	F-E	F	F-E
Single-family housing	E	E-D	F-E	F-E
Tertiary	D	D-C	E-D	D

The chart shows a difference in energy efficiency levels between rented and non-rented properties. On average, the stock meets the same pattern as in other regions, which is characterized by non-residential buildings showing better energy efficiency than residential buildings with at least one letter difference in the rating. All buildings show a better level of efficiency in the calculation of emissions than in primary energy consumption. This pattern, also observed in other areas, has to do with the growing need for energy in homes (remote work, increased use of electrical appliances associated with the way of life...), and the increase in energy demand that this result entails implies a strong need to reconvert PE into renewables.

In general, rental units show less energy efficiency compared to non-rented residential buildings, with an average efficiency in the case of non-rented buildings of E and an improvement trend towards D compared to rented buildings with a mean of F and an improvement trend towards E. However, in the certificates in the assessment of individual dwellings, the assigned letters show the same efficiency regardless of whether they are rented or not, indicating the general need for renovation of residential buildings regardless of their use (and of block dwellings for their improvement to more acceptable levels). As for single-family homes, the difference is clear: non-rented ones have an average efficiency of E with improvement towards D, while rented ones show a lower letter.

Graph 31 shows the detail of this classification and its evolution over time. The annual ratings in the two groups of rented and non-rented buildings have been included, and the individual dwellings are represented, with the same pattern, in Graph 32.

Graph 31. Primary energy consumption rating. Housing Blocks. Rented and non-rented.



Referring to the difference between buildings according to their form of use (rented or not), the average evolution of certification in Catalonia shows an important process of energy transformation that is not yet reflected in the average rating due to the relevance of buildings with category E (as initially shown). As can be seen in graph 31 (dotted blue line), buildings have followed a process of improvement in the rating for PE consumption, more intense in the stock of non-rented buildings than in rented buildings (red line), until 2021 from which the ratings worsen for non-rented buildings, probably due to the entry of less energy-resilient buildings into the market.

On the other hand, the efficiency estimate associated with rented buildings has remained constant, showing that the flow of energy renovation has not reached them. Each column represents the proportion of certified buildings within each year's total, and they are identified by the fact that rented buildings appear with colours in a pattern. If we look at those that are not rented, the certificates show an extraordinary process of energy renovation that has been going on since 2019, with a sharp increase in

For individual dwellings, Graph 32 presents the statistics in the same format as the previous graph.

CATALUÑA. CALIFICACIÓN DEL CONSUMO ENERGÍA PRIMARIA. VIVIENDAS INDIVIDUALES. ALQUILADAS Y NO ALQUILADAS
(en proporción con respecto al total de edificios residenciales por año*)

Año	A (no alq)	B (no alq)	C (no alq)	D (no alq)	E (no alq)	F (no alq)	A (alq)	B (alq)	C (alq)	D (alq)	E (alq)	F (alq)	Cons. EO no renovable. Alquilerados (eje derecho)	Cons. EP no renovable. No alquilerados (eje derecho)
2015	1.2	4.4	11.1	25.2	32.8	29.9	1.2	4.4	11.1	25.2	32.8	29.9	2.58	2.65
2016	1.2	4.4	11.1	27.4	32.9	27.7	1.2	4.4	11.1	27.4	32.9	27.7	2.55	2.52
2017	1.2	4.4	11.1	30.9	34	25.2	1.2	4.4	11.1	30.9	34	25.2	2.58	2.55
2018	1.2	4.4	11.1	33.5	33.6	21.3	1.2	4.4	11.1	33.5	33.6	21.3	2.58	2.58
2019	1.2	4.4	11.1	37.2	34	21.3	1.2	4.4	11.1	37.2	34	21.3	2.62	2.62
2020	1.2	4.4	11.1	37.1	33.3	21.4	1.2	4.4	11.1	37.1	33.3	21.4	2.55	2.55
2021	1.2	4.4	11.1	38.2	33.7	19.8	1.2	4.4	11.1	38.2	33.7	19.8	2.58	2.58
2022	1.2	4.4	11.1	41.9	34.4	17.1	1.2	4.4	11.1	41.9	34.4	17.1	2.58	2.62
2023	1.2	4.4	11.1	42.0	40	16.4	1.2	4.4	11.1	42.0	40	16.4	2.58	2.65
2024	1.2	4.4	11.1	42.8	33.2	17.0	1.2	4.4	11.1	42.8	33.2	17.0	2.68	2.68
2025	1.2	4.4	11.1	43.5	32.8	17.1	1.2	4.4	11.1	43.5	32.8	17.1	2.68	2.65

* La línea indica promedio anual de las letras tomando A=7 y G=1

Fte. Elaboración a partir de los datos de los CEE de Cataluña

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However, trends are showing how a process of rating improvement is experienced in both forms of use. The annual data clearly reflect a reduction in the number of homes with the lowest rating and rented throughout the period: in 2015, this group accounted for 12.8% of the total number of certified homes, and in 2025 it is 5.3%, a similar drop in the group of homes F and E, which reduce their weight from 29.9% in 2015 to 17.1% in 2025. Interestingly, these changes do not correspond to an improvement in the rating in the first groups. In terms of rental, the best categories (A to D) are almost non-existent and the number of those with level D has been progressively reduced. This shift suggests that improved homes may have exited the market, although it is an extreme that needs to be identified in depth. As for non-rented housing, the improvement in the worst levels of efficiency has been very limited, and the positive change in the rating seems to come mainly from the increase in efficiency in the first letters, since the number of buildings between A and D has increased progressively since Covid. So does the weight of non-rented E-rated housing, which supports the idea of transfer between uses.

In any case, a clear conclusion is that the energy efficiency levels of homes taken individually is worse than the rating of the buildings where they are located, indicating that it is necessary to generalize intervention actions and improve consumption and emissions.

2.1.4 Microdata analysis: Explanatory factors of the supply of rental housing and market segments. The typology of rental homes on offer in Spain

Using microdata from the 2001 Census¹⁵, three exercises have been carried out that aim to delimit the fundamental characteristics of the stock of main rental dwellings with empirical support that supports the intuition previously obtained.

¹⁵Aggregated data extracted 5% of the total information. <http://www.ine.es>. This census has been used for its richness in detail. We are aware that many of the particularities that are identified may have changed after 20 years. We believe that the changes that would have occurred would have been concentrated in the decade 2001-2011, with a very intense building process, but not in the following decade 2011-2021, since the construction has been minimal in these years, which would have caused the park today to be very similar to that of 2011. The 2011 census also does not have the necessary detail to carry out an analysis such as the one shown here without cross-referencing with additional databases. This work is being carried out, and an additional report will be generated with the results.

Firstly, the 'typical' model of rental housing has been extracted from the Spanish market. Secondly, the possibility of differentiated rental markets from the supply side has been explored, applying an estimate of the significant clusters within the model. Thirdly, the characteristics that would jointly define rental housing have been estimated, applying a factor analysis.

The first exercise describes the average type of rental housing in Spain (Table 1.19). It is a main house, which was rented between 1992 and 1993, with low levels of pollution, good cleanliness in the streets, good communications, low level of crime and sufficient common services, although not with complete isolation from outside noise and with a certain level of external noise, not excessive. They are in neighbourhoods with green areas available, although in small numbers (4/6).

The homes are located on the third floor, on average, with between 4 and 5 bedrooms and 81 m² of useful space. They have heating, but not cooling, and have an average of two vehicles, the house is in buildings of between 4 and 5 floors with other homes, and with an average age of 6 years, although with a good condition of the building (3.81 / 4 = good).

The landlord of the rented property is a natural person, and the building it does not have accessibility characteristics, it has public water supply and evacuation services, with electronic intercom systems, without the availability of garages despite having spaces in the building. It does not have gas or centralized hot water service and has telephone lines.

Table 1.19. Typical rental housing reflected in the 2001 census.

Table 1.19. Typical rental housing reflected in the 2001 census*

	Mean	Std. Deviation N	
Housing, accommodation or collective	1,00	0,00	92088,00
Housing Class	1,00	0,00	92088,00
Year arrival at the house	1992,19	11,81	92088,00
Outside noises	4,19	2,40	92088,00
Contamination	4,98	2,01	92088,00
Little cleanliness in the streets	4,48	2,30	92088,00
Poor communications	5,40	1,63	92088,00
Few green areas	4,07	2,43	92088,00
Crime in the area	4,76	2,16	92088,00
Lack of services	5,91	0,65	92088,00
Refrigeration	5,50	1,50	92088,00
Heating	2,77	0,88	92088,00
Heating Oil	1,83	0,98	72852,00
Height (in number of floors) on which the house is located	3,14	2,12	91549,00
Number of rooms	4,52	1,54	92088,00
Usable area	81,33	34,04	92088,00
Disp. Motor vehicles (not motorcycles)	2,31	1,37	92088,00
Number of floors above ground	4,96	2,87	92088,00
Number of floors below ground	0,07	0,30	92088,00
Building Type	2,36	0,85	92088,00
Year of construction	5,96	2,20	91492,00
Exact year	1995,71	3,20	11882,00
Building Condition	3,81	0,51	91492,00
Owner Class	1,60	0,52	91492,00

Building accessibility	3,20	1,11	92088,00
Running water	1,03	0,19	92088,00
Wastewater disposal	1,06	0,27	91579,00
Goal	1,95	1,32	91579,00
Garage	1,84	0,37	91637,00
Number of parking spaces	23,42	49,99	14531,00
Gas	1,49	0,50	92088,00
Telephone Lineage	1,06	0,25	91644,00
Central hot water	1,69	0,47	91509,00

* Most answers are coded with a 1 for YES and a 6 for NO

In the second exercise, two homogeneous groups of rental housing are basically identified (Table 1.20)16. The first is a typical house that was rented in 1992, on the third floor, in an environment with little pollution, good communications, sufficient public services, no crime and with a certain degree of noise and a smaller number of green areas.

The house has an area of 100 m2, with five bedrooms, in a multi-family building, with five floors on average and six years old. The building is in good condition, with a lack of accessibility and basic services provided, with the availability of a parking space in a building with a small number of homes.

The second cluster of rental homes differs basically from the first group in terms of surface area: they are 4-bedroom homes and 63 m2, with worse assessments of pollution, noise, cleanliness, and green areas, and with a greater availability of garages.

Table 1.20

Table 1.20.- Estimated Cluster Centroids		
	Cluster	
	1	2
Year arrival at the house	1992,40	1991,99

1

⁶The two clusters have been selected after having estimated the existence of up to 7, as the best identification figure of differentiated groups.

Tenure regime	Exterior
noise	Pollution
Poor cleanliness in the streets	Poor
Poor communications	Few
green areas	Crime in the
area	Lack of services
Cooling	Heating
Heating	Heating oil
Height (in number of floors)	
on which the house is	
located	No. of rooms
Usable area	Disp. Motor
vehicles (not motorcycles)	Number of floors above
ground	Number of floors below ground
Type of building	Year of construction
Exact year	Condition of the building
Class of owner	Building
accessibility	Running water
Waste water disposal	Porter's lodge
Garage	Number of parking spaces
Gas	Telephone lines
Central hot water	4.00 4.20 5.01 4.59 5.40
	4.18 4.91 5.94 5.44 2.62 1.88 3.14
	5.08 100.93 2.15 4.97 0.09 2.35
	6.29 1995.62 3.87 1.58 3.04 1.03
	1,06 1,99 1,68 19,74 1,50 1,06
	1,64 4,00 4,19 4,96 4,38 5,40 3,97
	4,62 5,89 5,55 2,91 1,78 3,14 3,99
	62,90 2,46 4,95 0,06 2,37 5,65
	1995,84 3,76 1,62 3,35 1,03 1,06
	1,92 2,00 404,35 1,48 1,06 1,74

The main difference, therefore, is in the type of housing by surface area and not so much by quality, although the introduction of a location indicator that would identify the characteristics considering spatial references 17 would be pending. On the other hand, the clustering analysis (Table 1.21) carried out cannot identify the rental segment of the worst quality that appeared in the descriptive analysis, possibly due to its small size and greater dispersion.

Table 1.21 Explanatory factors of rental housing in the Spanish housing stock. Supply-side perspective

Table 1.21 – Explanatory factors of rental housing in the Spanish housing stock. Supply-side perspective					
Factor 1- Type of building	*				
Number of above-ground floors	0,88				
Floor level of the dwelling (number of storeys)	0,79	KMO and Bartlett's Test			
Type of building	0,75	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,75	
Type of owner	0,59	Bartlett's Test of Sphericity	Approx. Chi-Square	14724,87	
Number of parking spaces	0,51		df	378,00	
Factor 2- Problems related to the surrounding area (neighbourhood)			Sig.	0,00	
Pollution	0,66				
Poor street cleanliness	0,64	Determinant of a matrix	0,012		
External noise	0,63				
Crime in the area	0,58	Total variance explained			
Few green areas	0,47	Components – Factors	Initial Eigenvalues		
Poor transport connections	0,30		Total	% of variance explained	% Acc
Factor 3- Surface area		1	3,85	13,75	13,75
Nº of rooms	0,87	2	1,99	7,11	20,86
Usable floor area	0,86	3	1,68	5,99	26,85
Factor 4- Year of arrival		4	1,59	5,69	32,55

Exact year	0,83	5	1,31	4,67	37,22
Year of move-in to the dwelling	0,77	6	1,22	4,37	41,59
Factor 5- Heating		7	1,13	4,04	45,63
Heating fuel	0,77	8	1,09	3,89	49,52
Gas	0,59	9	1,08	3,85	53,36
Factor 6- services		10	1,03	3,69	57,05
Telephone line	0,64				
Heating	0,61				
Central hot water	0,35				
Factor 7 - Water system					
Running water	0,82				
Wastewater disposal	0,78				
Factor 8 - Condition of the building					
Condition of the building	0,71				
Poor transport connections	0,52				
Lack of services	0,33				
Factor 9- Accessibility					
Availability of motor vehicles (excluding motorcycles)	0,70				
Factor 10 - parking					
Number of parking spaces	0,35				
Doorman service	0,31				
* Coefficients of the rotated component matrix					
Extraction method: principal components; rotation: Varimax with Kaiser normalization					

Finally, the third exercise identifies the components that determine the type of rental housing that is contracted and, therefore, the characteristics that would show the decision to rent from the perspective of supply, have been calculated from a factor

analysis in which 10 factors have been obtained that would explain 57% of the variance observed in the rental segment (Table 19, right)¹⁸.

Factors that are clearly identifiable in the following groups (variance and components:

- Factor 1– Type of building.
- Factor 2 – Housing and neighbourhood related issues.
- Factor 3– Surface area
- Factor 4– Year of arrival
- Factor 5 - Heating
- Factor 6– Services
- Factor 7– Water Channelling and Collection System
- Factor 8– Building Condition
- Factor 9– Accessibility
- Factor 10– Parking Stock

The order classifies the factors from highest to lowest explainability of the variance, as well as the relevance of the characteristics in the rental decision making from the supply of the homes.

This exercise shows the characteristics of the homes that are decisive in understanding the structure of the rental market in 2021. It also shows the type of information that needs to be known for an ongoing analysis of rental markets.

The presence of fact 4 in this supply scheme is striking, which could be interpreted as a reaction of the size of the rental market to an increase in the mobility of the population, that is, an increase in households that migrate would be correlated with the size of the market in the form of an increase in the supply of rental units.

¹⁸ The estimation method used is the principal component method and the matrix has been rotated with the Varimax method with Kaiser normalization.

3. Approach to demand of rent: Demographic economic and financial.

In this section, an analysis is carried out that follows the guidelines of the previous section, that is, the information on the Spanish rental market is described, considering the characteristics of demand.

The 2001 population and housing census has been used again for its wealth of information, extracting that relating to the resident population by formulas of use and tenure of the main dwellings. The aim is to identify the type of household that demands and/or has its first residence for rent at the beginning of the twenty-first century, and to compare it with the information provided by other sources, such as the old information from the Household Budget Survey¹⁹.

The order followed here will address issues of age, occupancy density (household size), structure, characteristics of the main person, age, nationality, economic activity, availability of second homes, level of education, and mobility.

3.1 Size of household living in rental housing

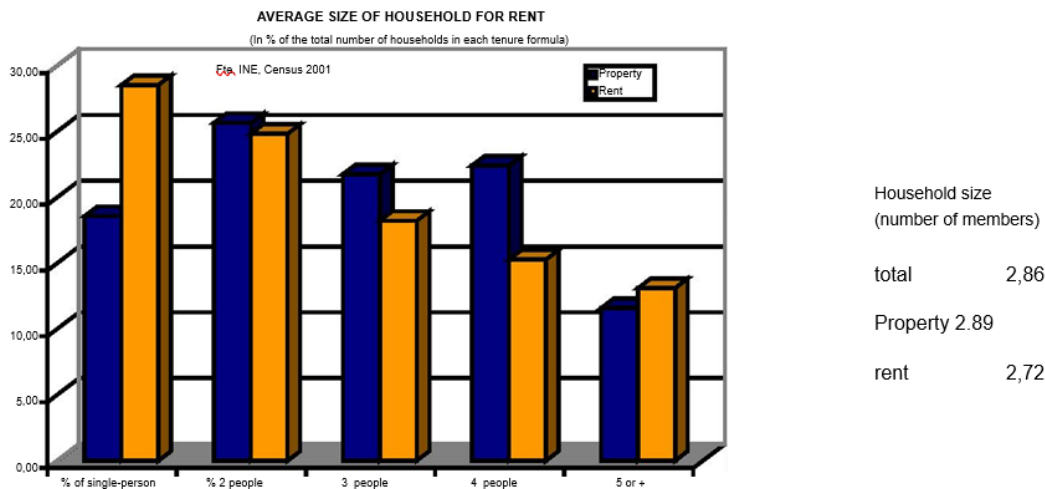
Households with an average size marginally smaller than those of owned homes lived in rented accommodation in 2001 in Spain. Considering the number of people who form it, the size is very stable between the different forms of tenure with an average of 2.72 individuals per family unit rented (2.89 owned). The distribution of rental households in terms of the number of individuals is not proportional, as can be seen in Graph 37, with a significant weight of those with smaller sizes and showing a greater concentration in the rental of households at the extremes of the size range, reflecting distinctions that need to be mentioned. Thus, the relevance of renting in single-person families is remarkable, since 30% of the total number of homes with this tenure is occupied by this type of household. After this group, the units with the largest number of members stand out as occupants of rental rather than ownership, occupying almost 14% of the total units rented.

¹⁹ Given that these particularities of households are structural in nature, we believe that they are still valid today. However, this validity will be contrasted later with an in-depth analysis of the demand.

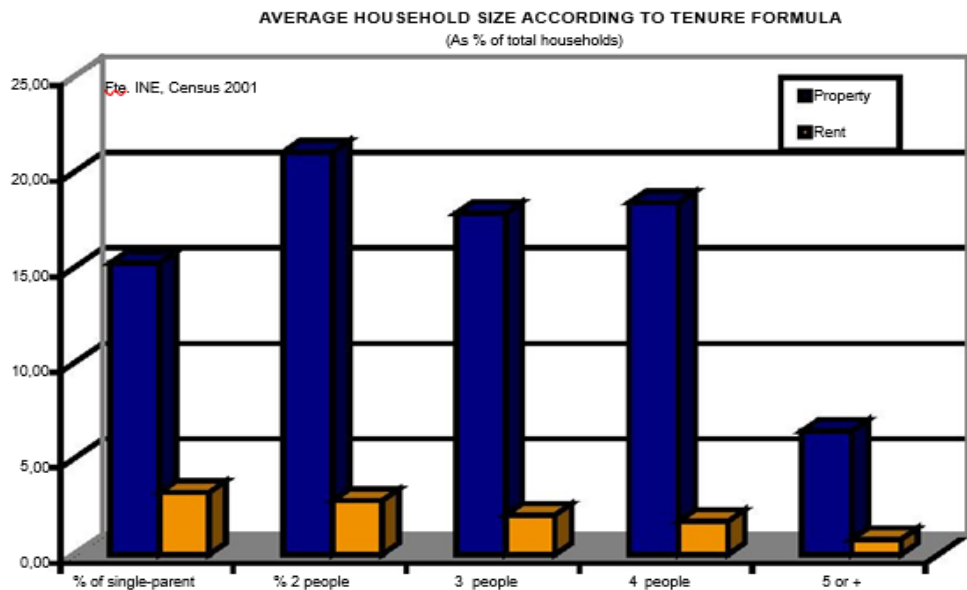
In terms of the total number of households (Figure 40), these proportions highlight the significance of one- and two-person households living in rented accommodation, representing slightly more than 6% of all Spanish households, and underscore the inverse relationship between family size and renting as a primary driver of demand.

This relationship is reflected in the ratio of use density lower than property density shown in the table associated with Graph 33.

Graph 33 Average Size of Household for rent.

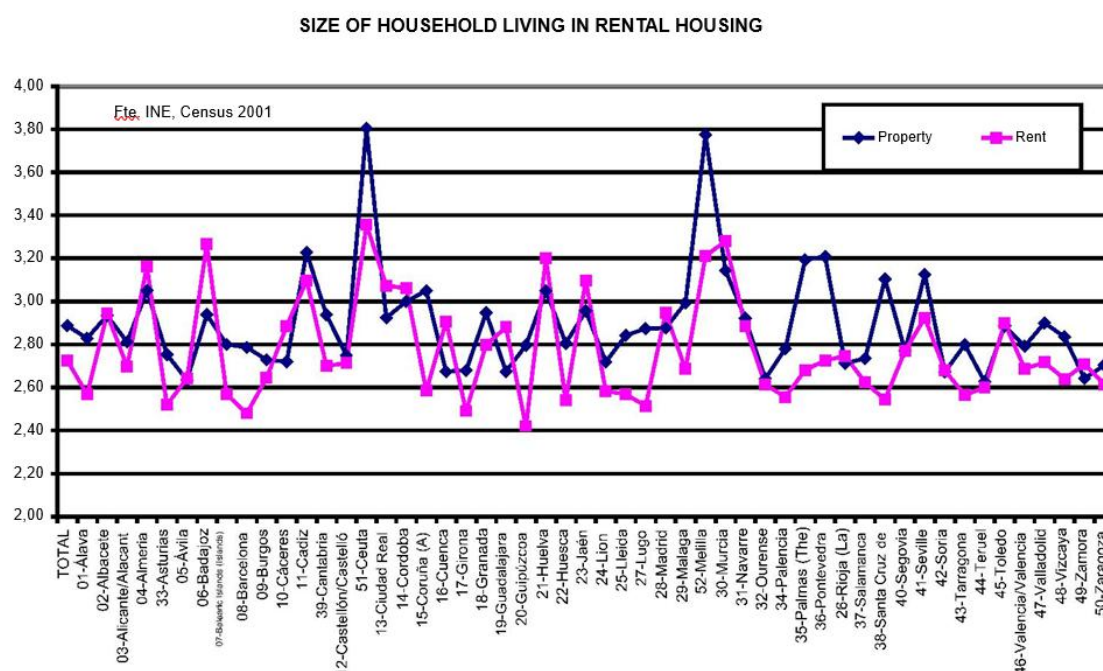


Graph 34 Average Household size according to tenure formula



The fact that the size of the household that inhabits a rental home is slightly smaller than that which owns it seems to be a common pattern in most Spanish regions (Graph 42), although in some these differences are greater: Ceuta, Melilla, Las Palmas, Pontevedra, Santa Cruz and Seville have substantially smaller sizes of households for rent than those for ownership. while in Almeria, Badajoz, Huelva, Jaén and Murcia, rental households have a greater number of members than owned.

Graph 35. Size of household living in rental housing.



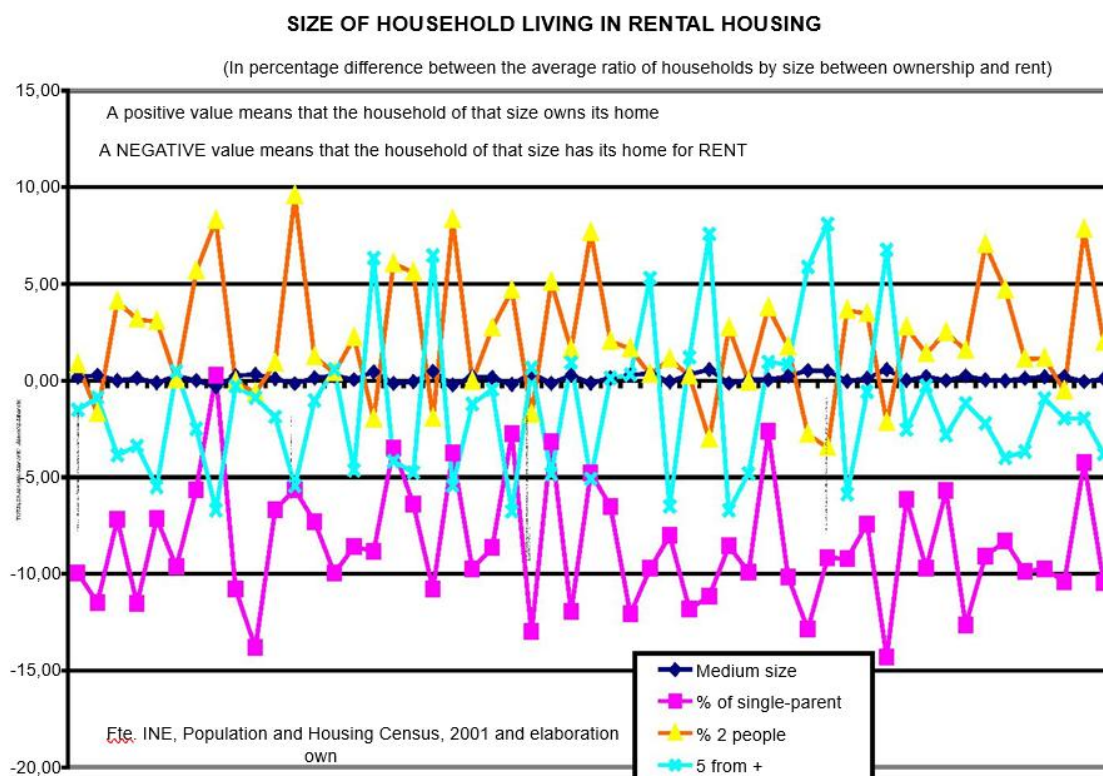
If the propensity to rent or own households is calculated by size²⁰, the idea that there are two groups with a greater propensity to rent is corroborated. Graph 40 shows the differences in the distribution structures of dwellings by form of use, between households by size. The pink line corresponds to homes occupied by single person

²⁰ This propensity is calculated in the same way as in Figure 10, calculating the difference between the proportion of households owned and rented for each size of household.

households, and each point represents the difference between the proportion of these households that live in ownership and those that live in rent, in both cases, the proportion is calculated on the total of each form of use. A negative value means that the proportion of those who live in rented accommodation and are single-parent households is greater than the proportion of those who live in property, this being a way of highlighting the relevance of this size of household within the distribution of rent, in the entire Spanish geography, except for the Balearic Islands.

The first group is made up of single-person households, which, except in Badajoz, show a high tendency towards rented ownership. The latter are the largest households (more than five members) in which this characteristic is more distributed throughout the Spanish provinces, with a greater propensity to rent in all except Cantabria, Ceuta, Coruña, Lugo, Melilla, Ourense, Palencia, Las Palmas, Pontevedra and Santa Cruz. The rest of the households by size show a high propensity to own property, following the model that the group of households with two people exhibit in Graph 36, with a greater propensity to own their main homes, in almost the entire geography.

Graph 36. Size of Household living in Rental Housing.

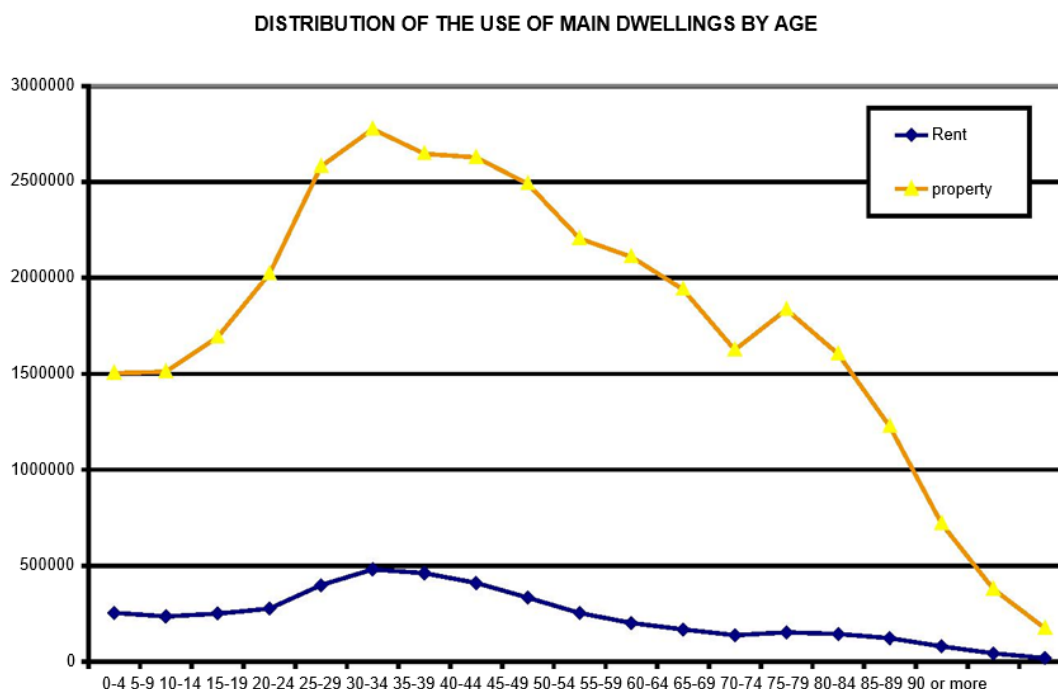


This fact reflects a segmentation in the group of rental users in Spain in practically all regions, between single-parent households that use, on average, 28.5% of the total rental stock, and larger households, with almost 14% on average and a great variability depending on the regions.

3.2 Age of the population living in the rented dwellings

The age distribution of residents in rented housing can be seen in Graph 37. The distribution of the total population follows the general lines of distribution by age cohort in the two tenure formulas, so the accumulation of young people in housing should not be surprising. The profile that appears for rent follows a similar pattern, where most homes of this type concentrate a high proportion of young people between 20 and 34 years old, while the representative queues of older people tend to shrink rapidly.

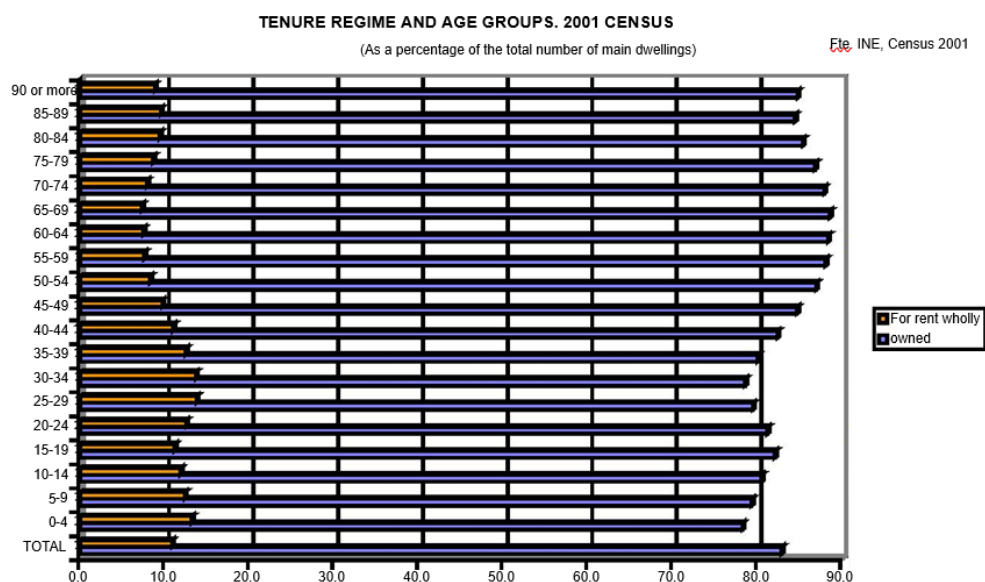
Graph 37. Distribution of the use of main dwellings by Age.



Thus, the relative position of each age group shows a concentration of rent between the youngest households with children and the oldest (from 75 years of age), which is remarkable within this tenure formula (Graph 37).

Both groups with a significant presence in rental must respond to different reasons. The accumulation of the population aged 25-34 years associated with that of children between 0 and 10 years of age clearly refers to young households as rent-seeking (between 11 and 11 and 14% of the total population within each of these age cohorts live in rented accommodation, Graph 38).

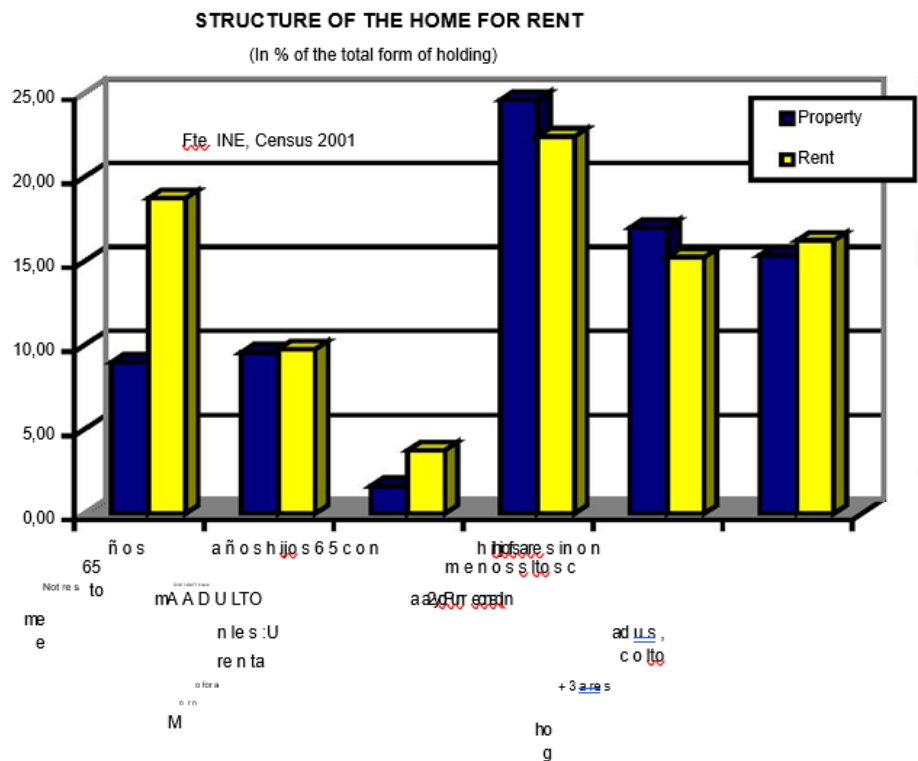
Graph 38 Tenure Regime and Age groups. 2001 census.



The proportion of older households in rental is showing the residue of old rentals that remain in the housing stock, and which had been calculated as 6.23% of the total rents, existing from years prior to 1960 (see graph 8b in the first part of this work).

The structure of the home that lives in rent is very distributed among all the existing household models (Graph 39), although there are two groups that stand out within the total: single-person households, especially those with members under 65 years of age, and couples with two adults. Renting is especially relevant in households under 65 years of age, although it also stands out in those made up of an elderly person with children and three adults. Basically, couples without children (who are also the largest group of households in the property) and single-person households under 65 years of age demand for rent, followed by the group of people over 65 years of age and the rest of the types of households (Graph 39).

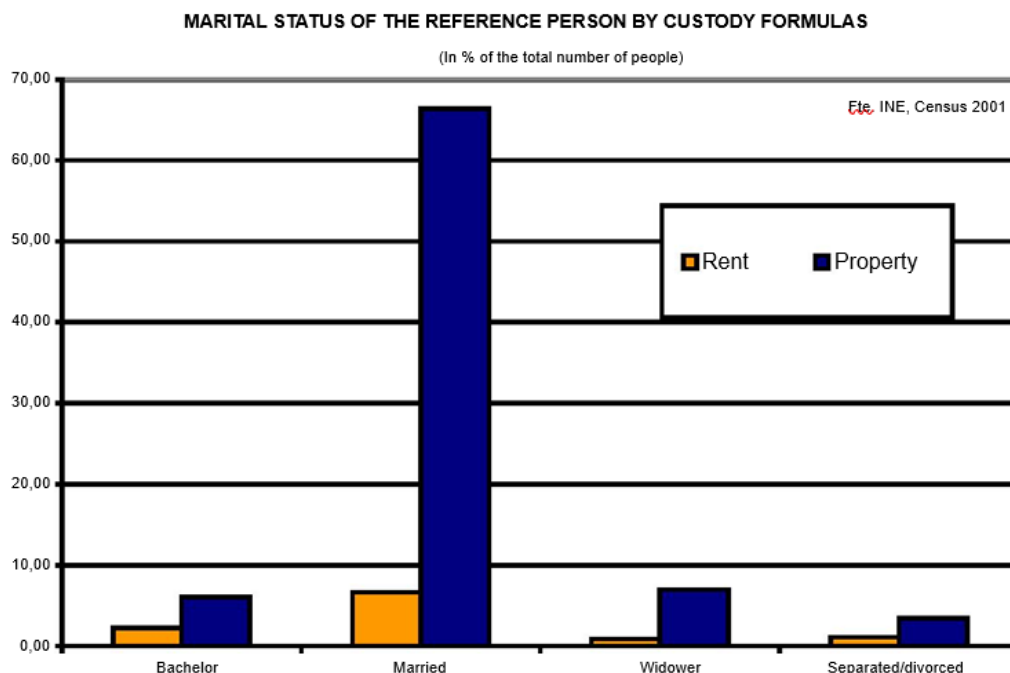
Graph 39. Structure of the home for rent.



The greater rental demand of these population groups is basically the result of changes in the formulas for the formation of households (active alone, father / mother with children, etc.), so that this distribution structure shows a growing need for this form of use to cover the needs of these groups, and would justify the appearance of a process of renewal of the rental stock that may have taken place during the first years of the twenty-first century and that is not fully observed with the available statistics.

Marital status is another characteristic that can be observed with the 2001 Census and provides information about the person in question and his or her form of custody. Considering the total resident population, Graph 40 represents the percentage distribution of households with a single, married, widowed or separated/divorced reference person.

Graph 40. Marital Status of the reference person by custody formulas.

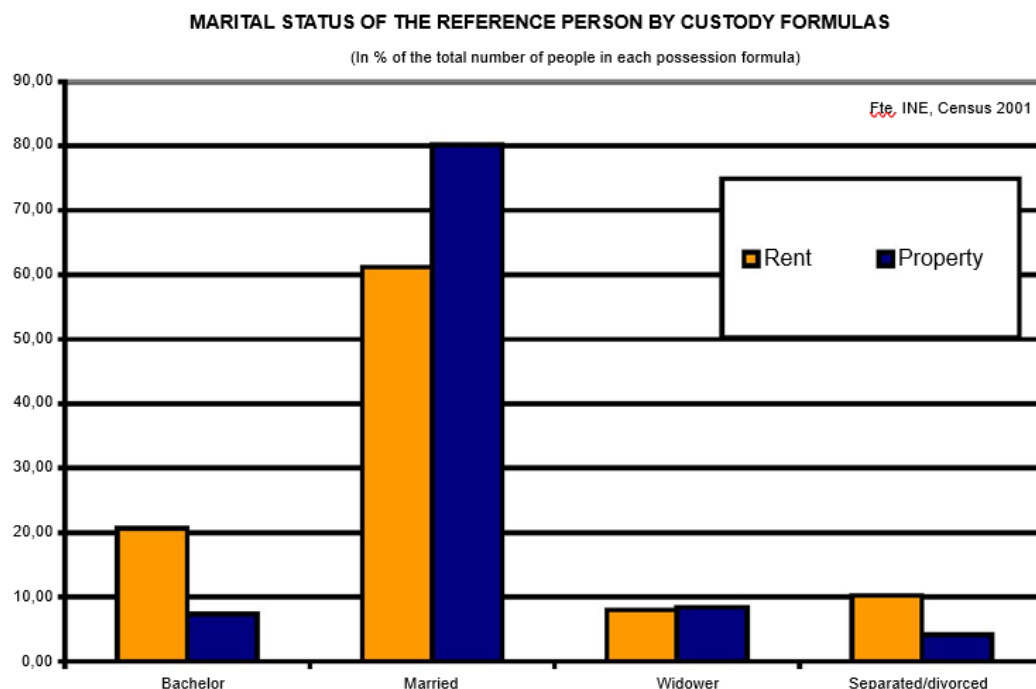


In this case, most of the households rented (and owned) have a married reference person. In relative terms (Graph 48), 20% of the total population living in rented accommodation has a single person, 10% a separated or divorced person, and just over 60% a married person.

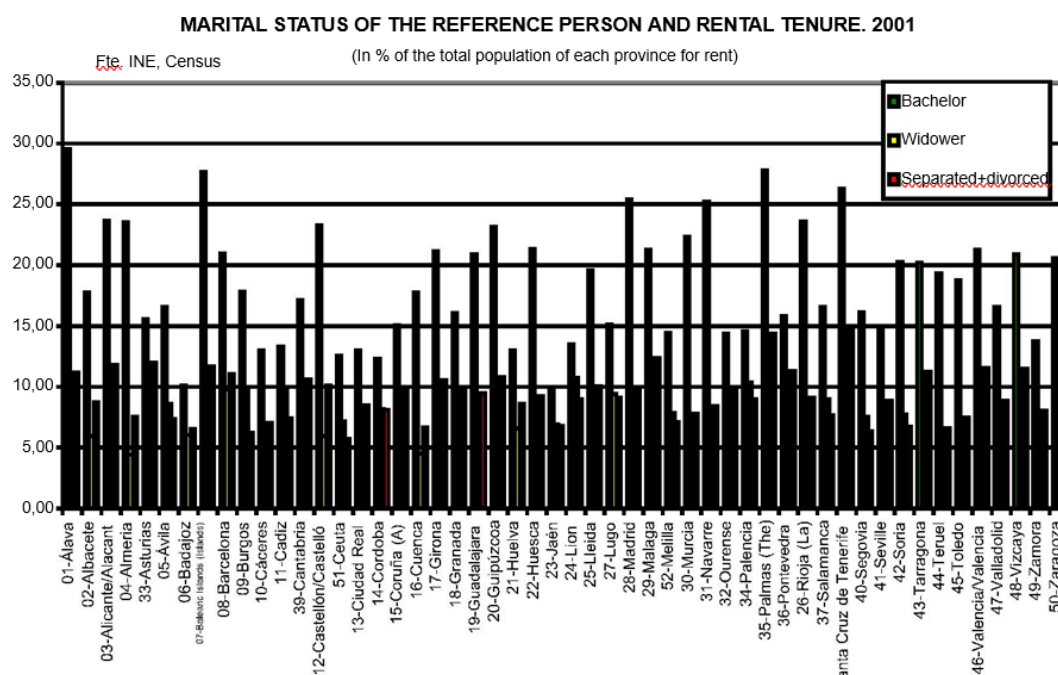
Although the distribution prevails over the most common household formula in Spain, the relative weights of the two extremes of the distribution by marital status, single and separated/divorced, highlight the importance of renting for these households. In this case, the differences by province in Spain are very relevant.

Graph 41 represents the proportion of total rented persons in households with a single, widowed or separated/divorced reference person.

Graph 41. Marital status of the reference person by custody formulas.



Graph 42. Marital status of the reference person and rental tenure 2001.



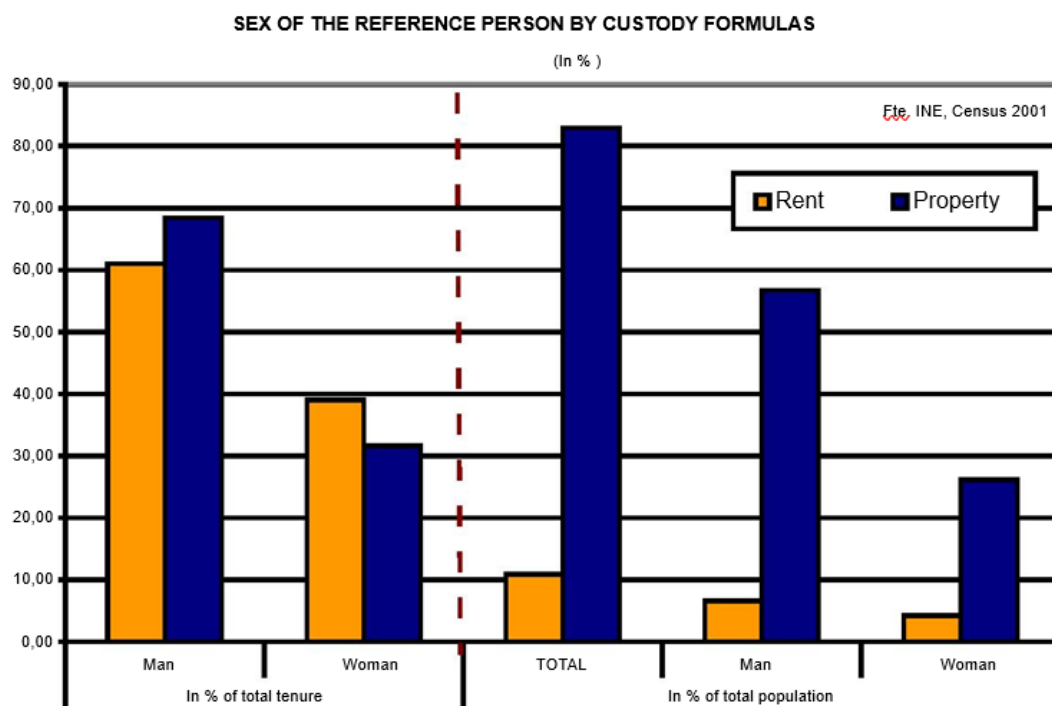
The graph is understood as the % of the population living in a rented household with a head of household that has the marital status that is classified

There are provinces where households with a single represent between 25 and 30% of the total number of people living in rented accommodation (Álava, Balearic Islands, Madrid, Navarra, Las Palmas and Santa Cruz de Tenerife), and between 20 and 25% (Alicante, Almeria, Barcelona, Cantabria, Castellón, Girona, Guadalajara, Gipuzkoa, Huesca, Malaga, Murcia, La Rioja, Valencia, Vizcaya and Zaragoza).

The group of households with a separated/divorced head of household and living in rented accommodation that represent the highest proportion are found in Las Palmas and Santa Cruz, with almost 15% of the total population renting.

Regarding the gender of the reference person by tenure formula (Graph 50), men are the ones who appear in the highest proportion as a reference person - 'heads of households', with just over 60% of households renting, while women are the reference person of almost 40% of them. These proportions are equivalent to 6.6% and 4.3%, respectively, of the total number of households. In relative terms, women have a greater weight in renting as heads of household than in owning property.

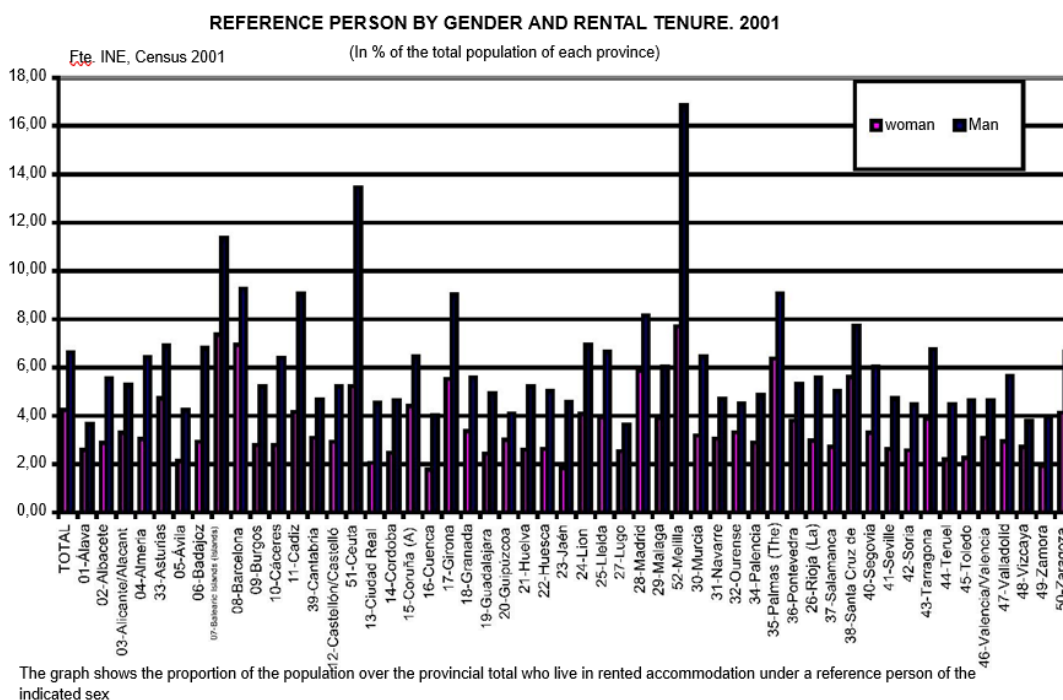
Graph 43. Sex of the reference person by custody formulas.



This average relevance has, as has been seen in the rest of the statistics, different provincial models, so that the importance of women leading a household with rental tenure is greater than the average in some provinces, such as Álava, Barcelona, Madrid, Las Palmas, Santa Cruz de Tenerife or Vizcaya (graph 44).

In general, the weight of both sexes in rental tenure is more gender-balanced than in ownership.

Graph 44. Reference person by gender and rental tenure 2001.



3.3 Economic activity

The economic activity associated with households living in rented accommodation is measured in this paper by means of the census information provided for the main people of the households, measuring whether they and the members of the household are active, as well as their employment status.

The pattern of activity of the inhabitants of rental housing can be seen in Graph 52. If the total number of main dwellings is measured as a reference (which are, remember, 11.4% of the total number of main dwellings), the majority have active and unemployed members, and the pattern is similar in renting and owning. In cases where there are

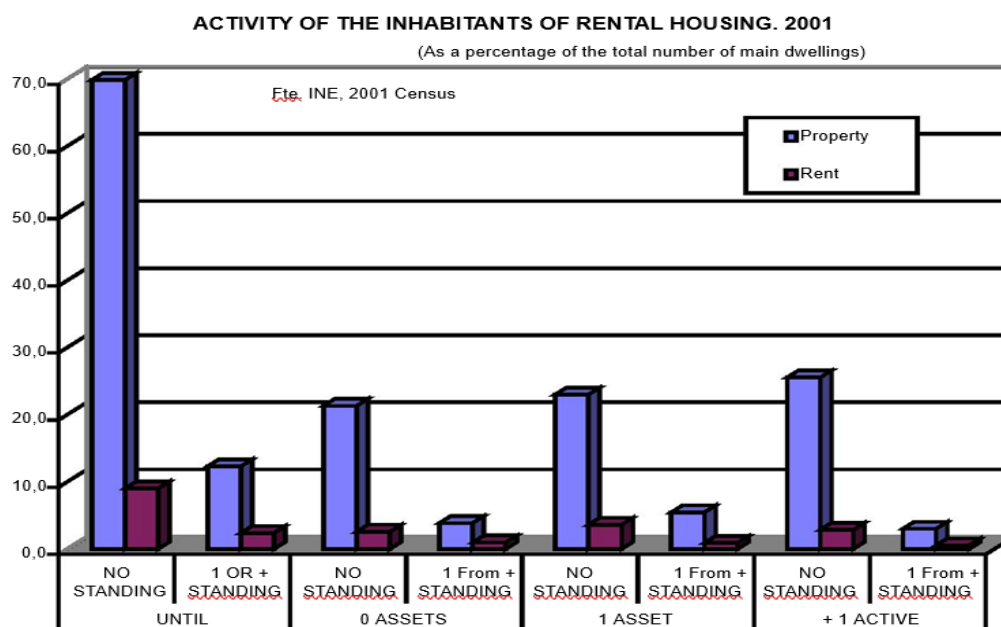
unemployed people, the situation seems more problematic for households owned than rented.

According to the 2001 census, 9% are renting and have no unemployed in the household and 2.4% do. This implies that 21% of all rented homes had at least one unemployed person in the household in 2001. There are 2.6% of the total number of main dwellings that are rental dwellings inhabited by no active + no unemployed, i.e. this is the proportion of rental with inactive or retired population. In 1% of the total rental housing there were unemployed members without being active, according to the 2001 Census.

This structure shows a stock of rental housing with a high activity rate, which would dispel the idea that renting is the resource of households with greater employment problems and lower income from work.

However, these data refer to the year in which they were collected (2001) and are difficult to extrapolate to the rest of the period because of cyclical variability in employment. Additional information on employment stability would be necessary to carry out a more in-depth analysis.

Graph 45. Activity of the inhabitants of rental housing 2001.

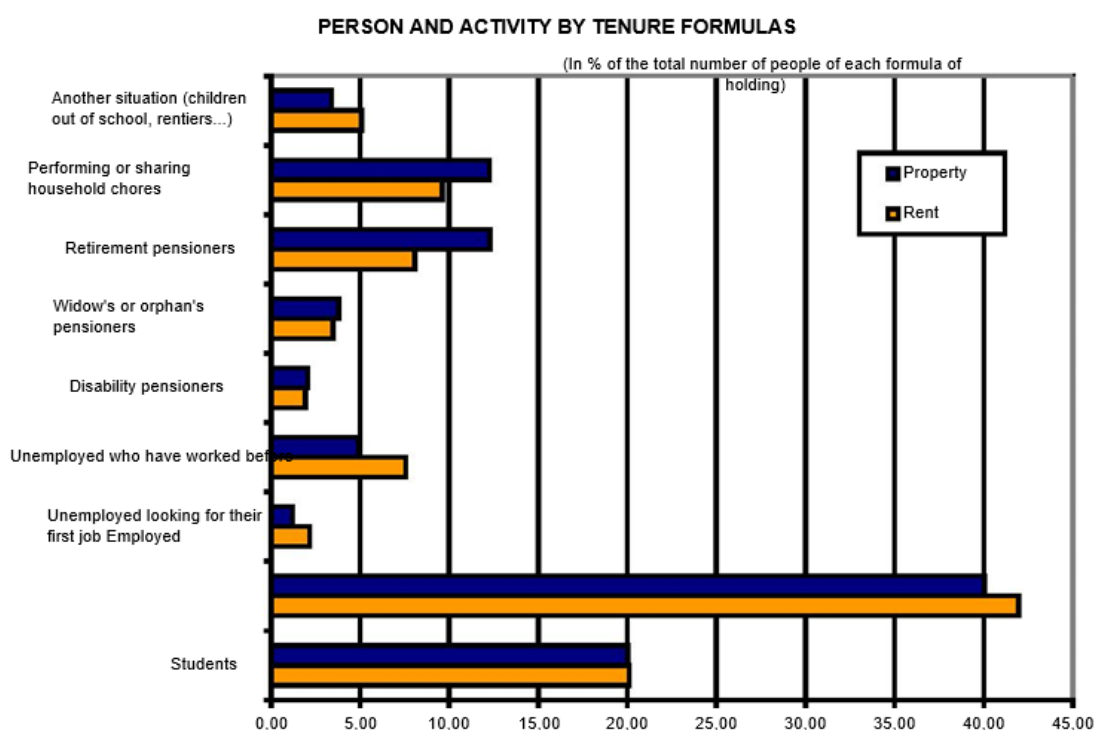


The idea of the higher degree of occupancy of households that have their dwelling for rent can be shown in Graph 46, where the relationship with the activity of the main people in households appears. It contrasts how the proportion of employed people over the total within the rent is somewhat higher than in property (within each category)

of tenure), pensioners and those who perform household chores are also lower in proportion.

Comparing this information with that obtained in 2006 by the rental survey, the distribution of the sample observed is like that obtained from the Census, as can be seen in graph 46, with a predominance of employed and retired people as the main rental demanders.

Graph 46. Person and Activity by tenure formulas.

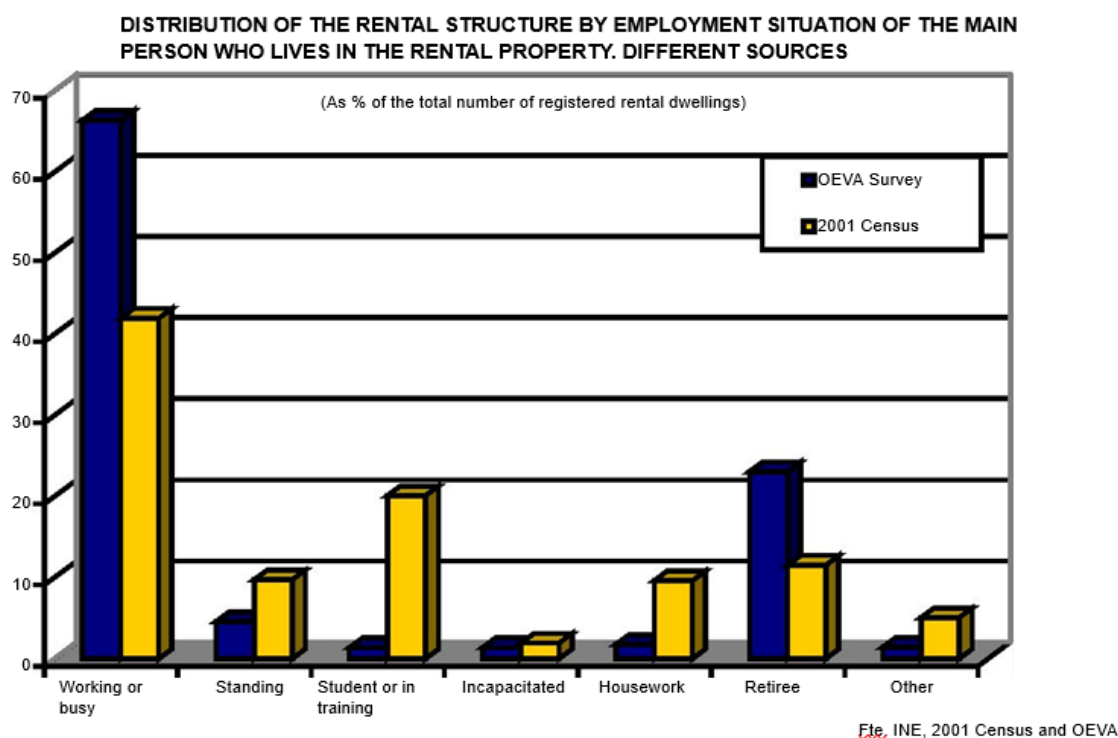


Taking into account the nature of the stock that the calculation of rents in the census has, and that it includes all individuals residing in the household when the information on the activity carried out is crossed, it could be considered that the excessive weight of students in training and those who perform household chores refers to activities of non-main family members. Thus, employed or retired people (in both sources) would constitute most of the rental demand.

While the former are natural sources of demand, the result of the latter is surprising. This figure is not equivalent in weight to the older component that previously appeared as a source of rental demand. Analysed with census data, apparently this group forms the old rental segments, but with a survey that reflects the flow, this group appears as a source of consolidated demand. The causes that explain the new rental contracts

made to retirees are not clearly guessed and a more detailed analysis of this group would be necessary.

Graph 47. Distribution of the rental structure by employment situation of the main person who lives in the rental property.

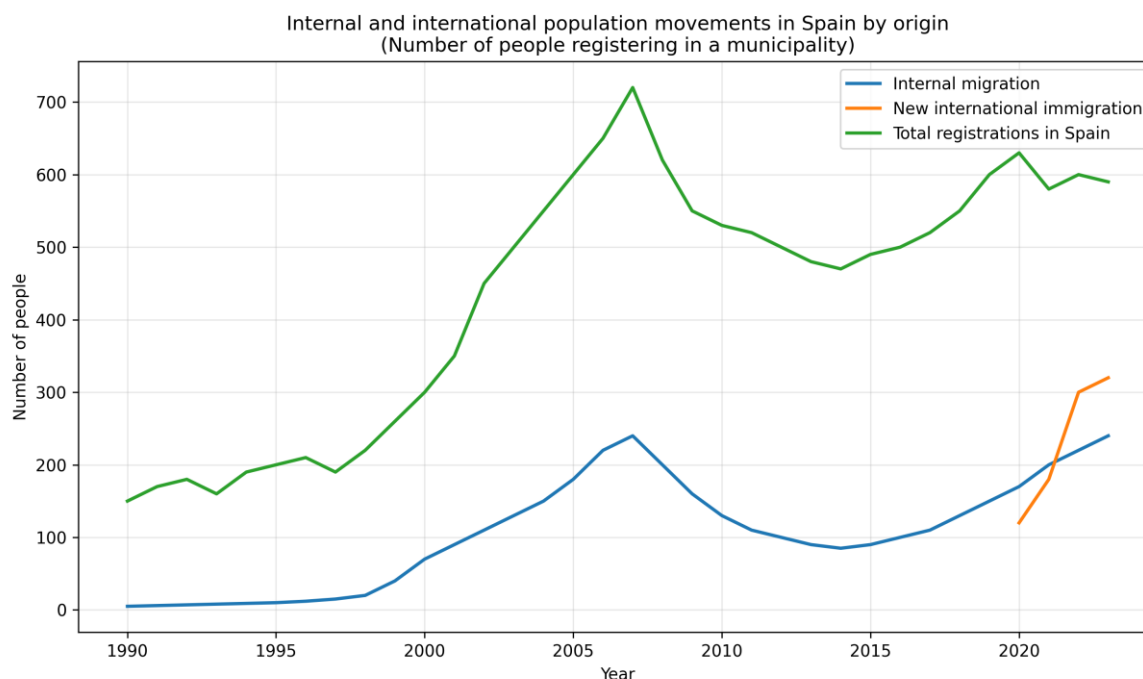


3.4 Nationality and Residential Variations

The census shows that 20.4% of residents in rented homes are foreigners. This figure is even more significant, if possible, because the year of collection of census information does not yet register the strong influx of migration that has occurred throughout this specific period.

This implies that the census data reflect a situation that could be considered one of equilibrium, in an economy that was beginning to receive the effects of immigration. To ratify this statement, a temporal view of the process of entry of non-residents into Spain is provided here (graph 48), which gives an idea of how the census data did not incorporate the most notable effects of the migratory process. This means that the description of the distribution by nationality reflects a status quo that we believe may continue to be in force in view of the strong migratory process that has continued after that decade of expansion (reflected in the 2001 census data) and the two decades that followed, as shown in graph 48.

Graph 48. Internal and international population movements in Spain by origin.



This change in demographic behaviour has been able to put pressure on rental markets, raising their price on a situation already at the peak of growth (at the beginning of the 2000s, but also today, from 2019 to 2025), or activate them, to increase their volume of transactions.

A survey carried out by the Ministry of Housing (OEVA) during the first decade of the twenty-first century showed a greater number of rental transactions with foreigners, as did the 2001 Census (Figure 49), which would be reasonable in view of this evolution and would reflect a rental market that adjusts to the circumstances of demand.

Graph 49. Nationality and Tenure.

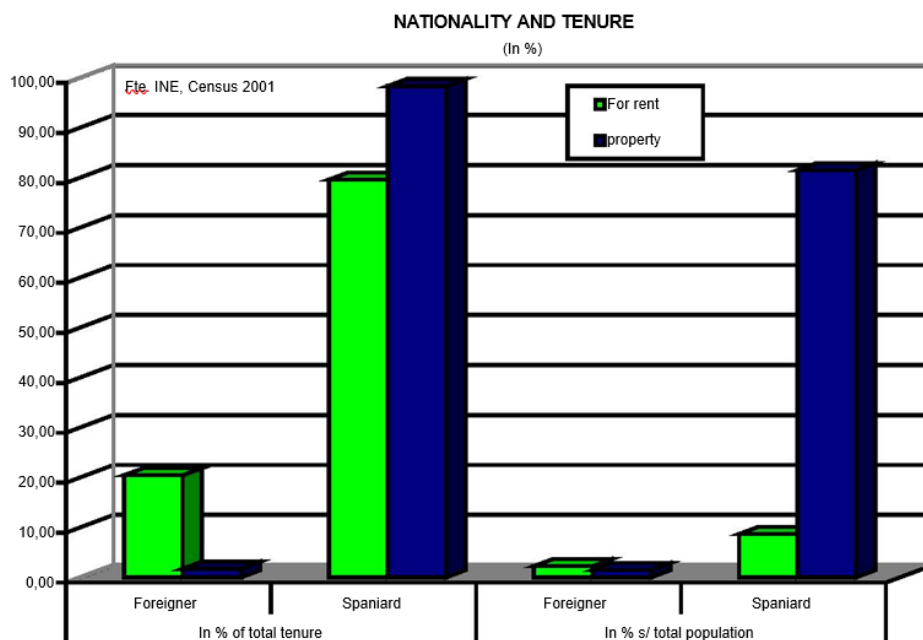


Table 20. Rental tenure and nationality.

Table 20.- RENTAL TENURE AND NATIONALITY	
(As % of the total rental population)	
Spanish	79,60
Europe without Spaniards	4.81
Africa	4,87
America	9,80
Asia	0,92
Oceania	0,01
Stateless	0,01
Fte. INE, Census 2001	

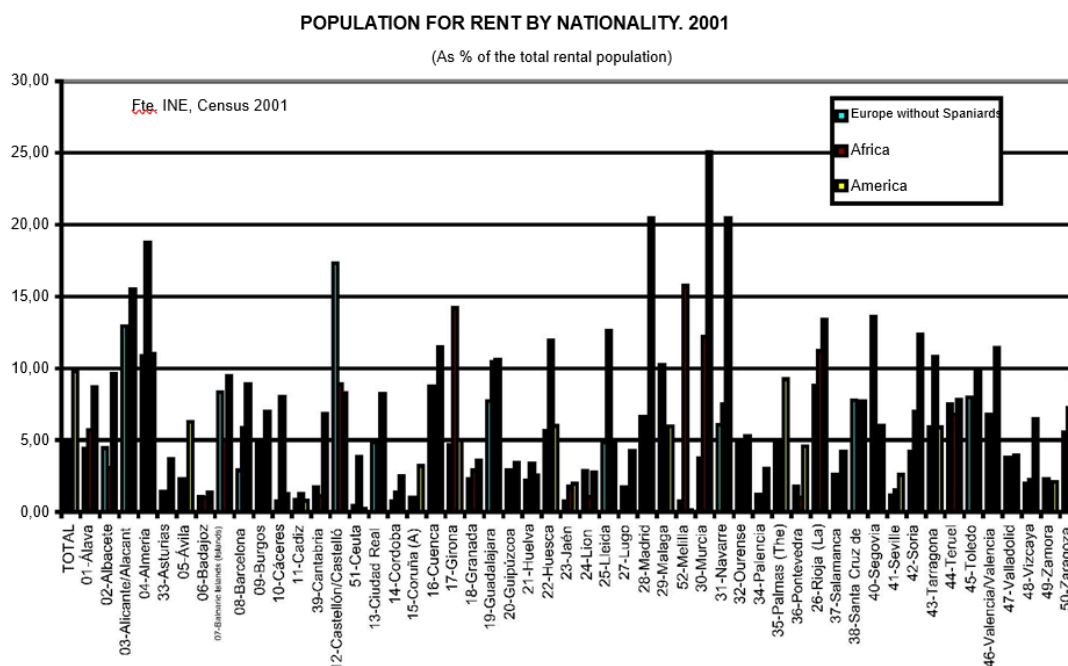
As can be seen, the 2001 Census already showed the relevance of renting to foreigners.

Graph 49 summarises the information and shows the greater relative weight of rent among this group, even in a period when the total foreign population did not exceed 3.8% of the total Spanish population. Of the total rental population, 20.4% were foreigners, with proportions widely distributed by nationality, with almost 10% of the rented dwellings inhabited by the population coming from America, 4.8% from Europe and 4.87% from Africa (Table 20).

In terms of relevance by region, this foreign population has not been evenly distributed throughout Spain, but has tended to be concentrated in different provinces, which may have put more stress on rents in some of them. Figure 57 shows this distribution for the three most important groups of foreigners for rent.

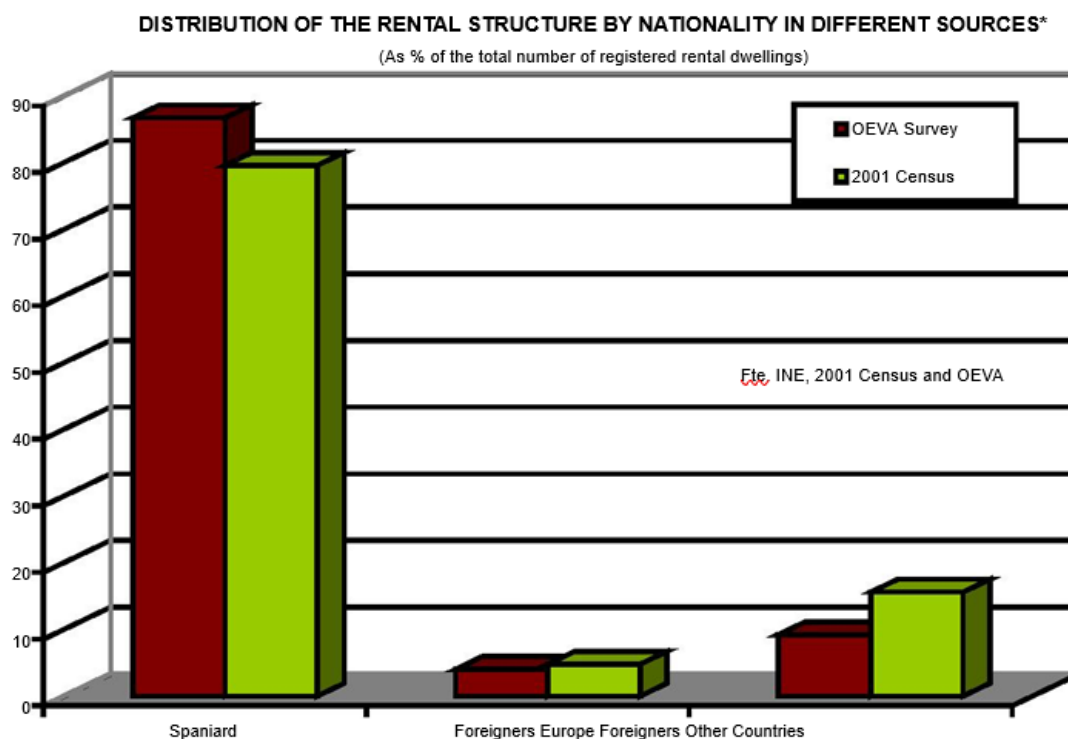
It shows how there are provinces where the population of Africans is greater (in their weight over total rent, such as Almeria, Castellón, Guadalajara, Huesca, Lleida, Murcia, La Rioja or Tarragona), while Europeans are more relevant in Alicante, Castellón, Malaga or Segovia, and the Americans in Madrid, Murcia, Navarra, Alicante and La Rioja. among others

Graph 50. Population for rent by nationality 2001.



The distribution in 2001 was in relation to that identified in the Ministry of Housing's rental survey mentioned for 2006. In that year, new contracts registered a higher proportion of Spanish rentals compared to foreign ones compared to census data (graph 51). However, this bias could be due to the evolution of national demand itself after years of strong price growth.

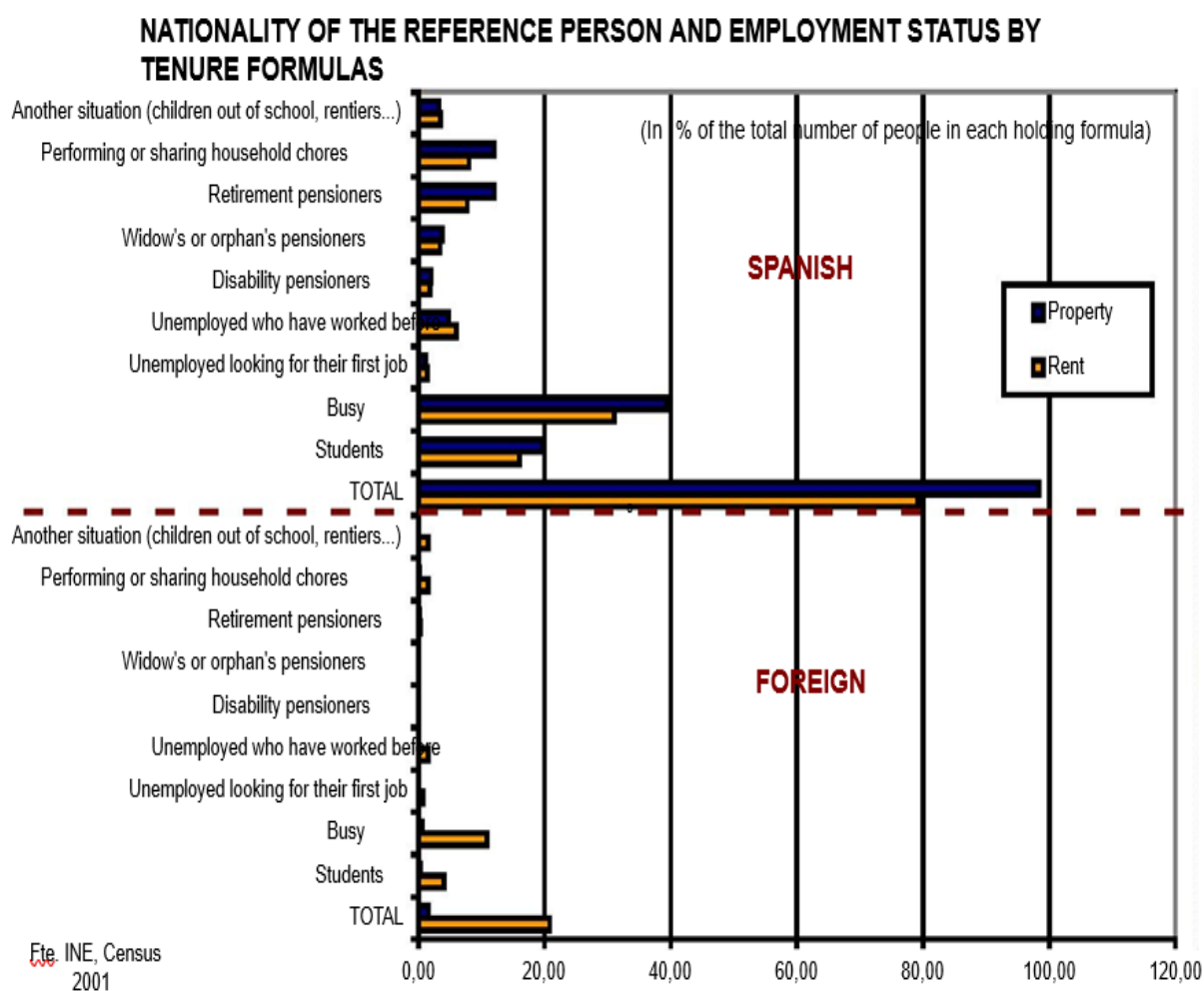
Graph 51. Distribution of the Rental structure by nationality in different sources.



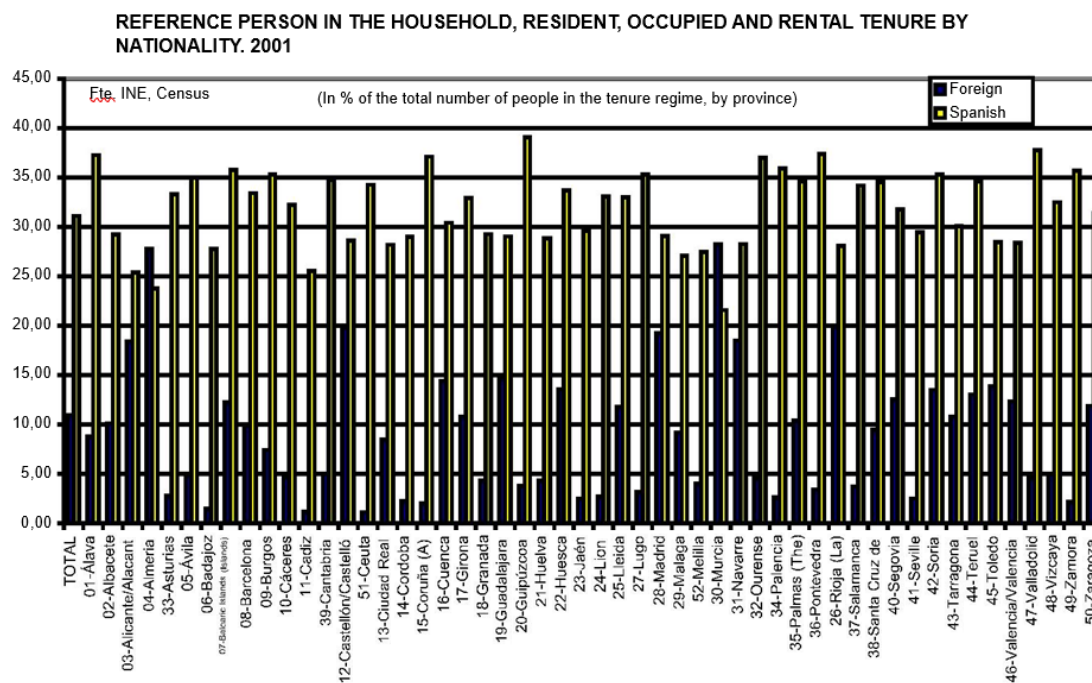
If the information on nationality is cross-referenced with the occupation of the resident at the time, the majority of non-Spanish tenants are associated with employed people who enter the labour market, as recorded in the 2001 Census (graph 52), where most of the reference persons in the household of 20.4% of tenants were employed, the rest being representative population of families (students and people who do household chores or other conditions). In that year, the census recorded a small and insignificant number of foreign owners, a situation that will have changed with the massive entry into ownership of labour immigrants from 2021 onwards.

If only the number of employed household reference persons is considered, foreign rental demand appeared to be of great relevance in some Spanish provinces. This demand is stronger than the national demand in places such as Almería, Castellón, Madrid, Murcia, Navarra and La Rioja (graph 53), where the proportion of foreign employees among tenants forms the highest demand in this market. These regions are particularly sensitive in their rental markets due to this dependence.

Graph 52. Nationality of the Reference person and employment status by Tenure formulas.



Graph 53. Reference person in the Household, Resident, Occupied and Rental Tenure by Nationality. 2001.



Given the lack of information that prevents replicating these results for 2021, and the similarity of the dynamics in the last 15 years, we are inclined to think that the structure of the rental market has continued to adapt to the demographic changes and, therefore, has experienced continuous pressure since the beginning of the twenty-first century. clearly documented in the first decade. The migratory and population dynamics after the financial crisis and the lack of supply have been able to maintain this pressure so that the description made could continue to be valid.

The rental market, therefore, seems to have shown itself to be an element that has met the demand for mobility of the national and foreign population, and may have been fundamental in periods and regions where migration flows have increased rapidly, but, after two decades, it may have exhausted its capacity to react.

3.5 Availability of second homes

It is usually assumed that a household with its main home for rent may be in circumstances that prevent it from owning a different home, so it may be paradoxical that these households have second homes.

However, data from the 2001 Census show that this is a common situation for a proportion of renter households, and they follow similar patterns as households owning their primary residences.

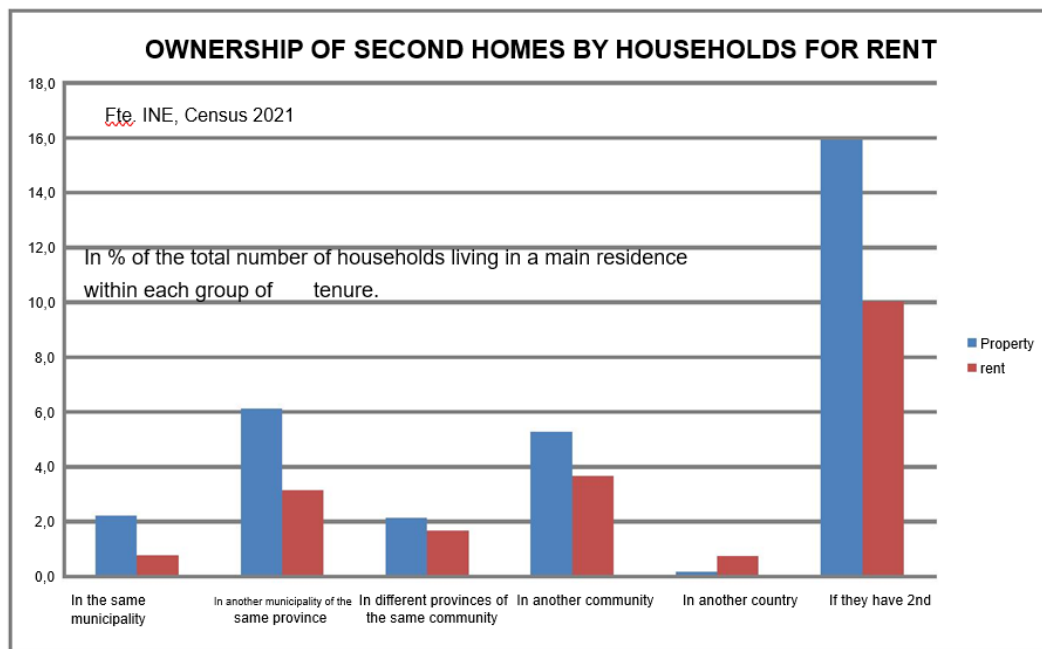
Unfortunately, the 2011 and 2021 censuses have not included this information, so the only existing one is that referring to the previous census, which is the one summarized in this section.

Rental households have second homes, although the form of ownership of these is unknown. Approximately 10% of households living in rented accommodation have temporary housing, basically in another community (3.7%), in a municipality in the same province (3.2%), in a different province of the same community (1.7%), in the same municipality (0.8%) or abroad (0.7%) (Graph 62). This means that 1.2% of households are rented and have a second home at the same time.

Their tenure pattern is like the existing distribution among owner-households, so it is possible that the existence of second homes associated with these households responds to similar reasons or similar sociological patterns. A group of them can be those linked to the places of origin of migration, that is, households that move within the territory can keep their original homes as second homes and use them temporarily. This use has redistributive connotations with economic effects of great relevance.

Holiday reasons are the second of the arguments being considered, i.e. rented households would have second homes to spend their holidays. In any case, both arguments suggest the idea that a concept of housing use is being established in Spanish households that is different from the traditional place-based concept for the main home.

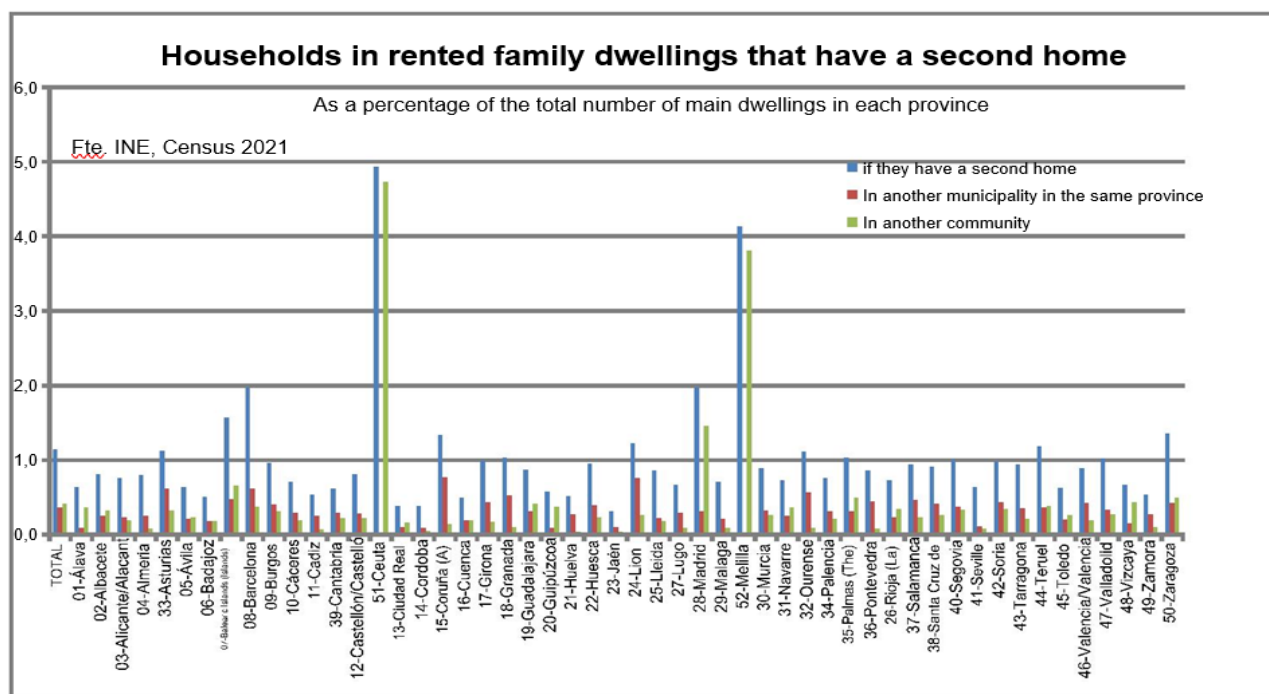
Graph 54. Ownership of second homes by households for Rent.



If you look at Graph 55, this seems to be the conclusion. There are communities such as Ceuta and Melilla where 5% of the total number of main homes are for rent and have associated second homes in another community. These figures are lower in other provinces such as 4% in Melilla, 2% in Madrid and Barcelona, 1.8% in the Balearic Islands, ...), up to an average of 1.2% of the total number of main homes (which are rented) in Spain, which is equivalent to 161,646 homes. The figure corresponding to the main homes owned is 13.1% (9.3% in the case of Ceuta, 7.7% in Melilla and 19.3 and 12.7% in Madrid and Barcelona, respectively).

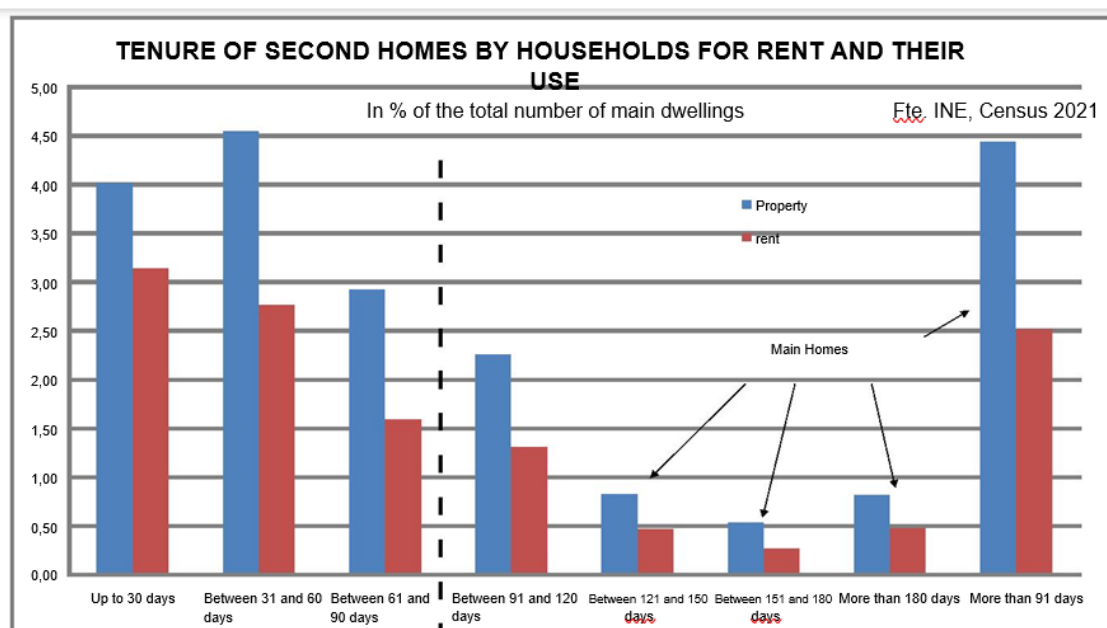
The pattern of use of secondary dwellings by rental households seems similar to that of those who own their first residences and clarifies the idea that secondary dwellings fulfil an additional role to that usually conceived, which goes beyond being a temporary place of residence. Graph 63 shows the average stays in the secondary dwelling of the two forms of tenure analysed, owned or rented.

Graph 55. Households in rented family dwellings that have a second home.



Their model in terms of temporary use is very similar between owners and tenants, with most stays between 30 and 60 days, which indicates a similarity in the perception and use of second homes. There is a not low proportion (with 4.5% of households owning, and plus 2.5% of renters, last two columns of Figure 56) of primary dwellings with associated secondary dwellings in which households spend more than 91 days per year residing in them. This means that these households divide long periods of stay of the year between two homes, which introduces the doubt of which of them is the main one, and generalizes the concept of 'residential mobility' within the living habit of households, such as using two main homes in the living model.

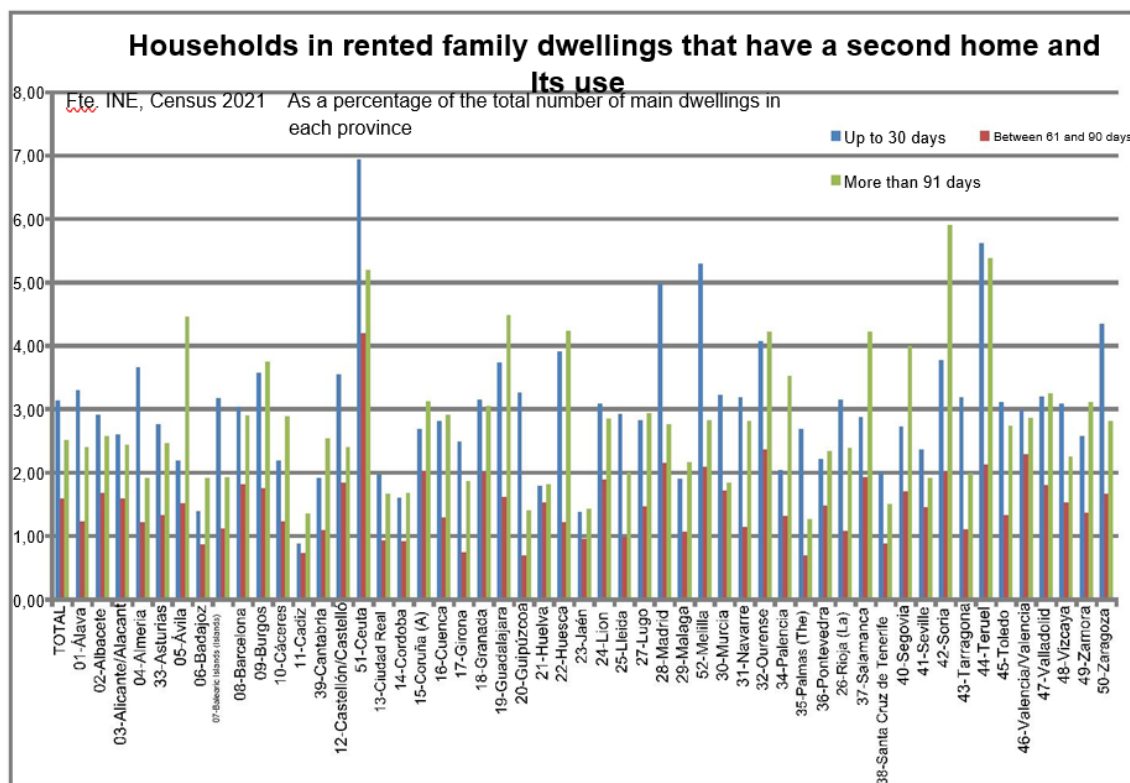
Graph 56. Tenure of second homes by Households for rent and their use.



Residential mobility is one of the growing characteristics in Spanish society that is evident when these details are analysed, and they show a way of life associated with developed countries, shared with similar habits of other European citizens (Germans, British, Dutch, etc.).

This type of mobility is especially intense in provinces such as Ávila, Ceuta, Guadalajara, Huesca, Orense, Salamanca, Segovia, Soria and Teruel, among others (graph 57). In these homes, a greater proportion of households have second homes and spend more than 91 days a year in them. The generalization of this form of use in almost all Spanish provinces gives an idea of the extent of this habit, which covers both owners and tenants, and allows us to understand the second home as a formula for life at home.

Graph 57. Households in rented family dwellings that have a second home and its use.

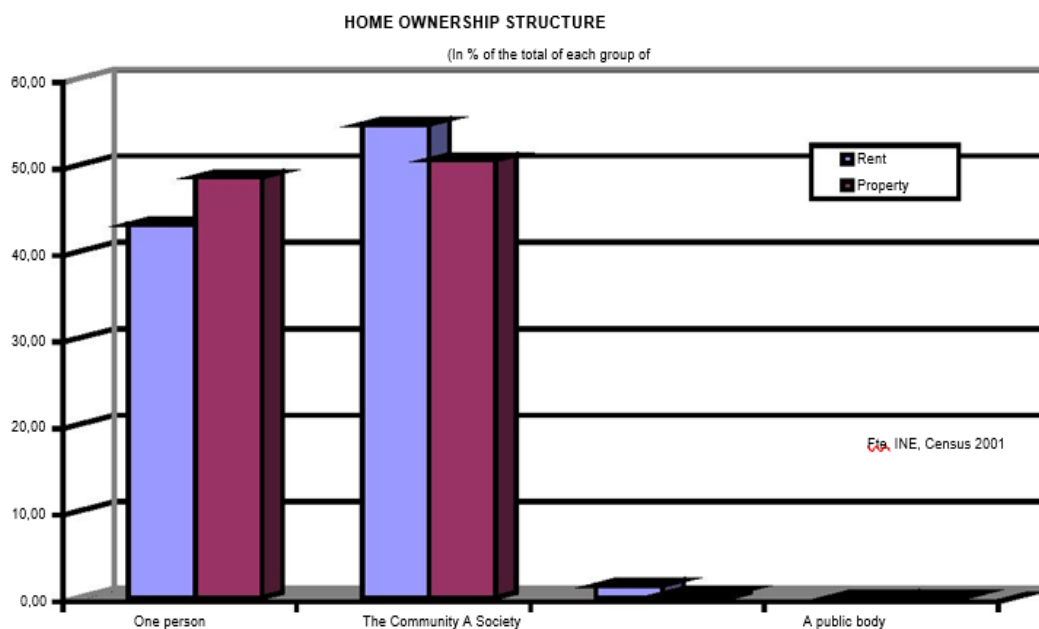


3.6 Typology of owners of rental dwellings

One of the arguments used to justify the tightness of rental markets in Spain is that the ownership structure of rented dwellings is highly fragmented and lacks the necessary framework for individual owners to view this activity as a productive endeavour from a market perspective. The 2001 census (again, subsequent censuses provide no information on this aspect) offers data on the owners of this type of housing. This perception is accurate when the census information is examined. Graph 58 shows the most significant distribution structure, in aggregate terms, of the owners of rented dwellings.

The data indicate that more than 50% are owned by “the community,” and 42% by individuals. The relevance of “the community” as an owner arises from the registration of ownership of common elements in buildings—most of which have been constituted under horizontal property regimes—which means that cross-referencing the housing and building censuses yields the result that the community is recorded as the owner of dwellings in multifamily buildings. Under this interpretation, and adding those units owned by individuals, the census shows that around 98% of dwellings (both owner-occupied and rented) are owned by natural persons.

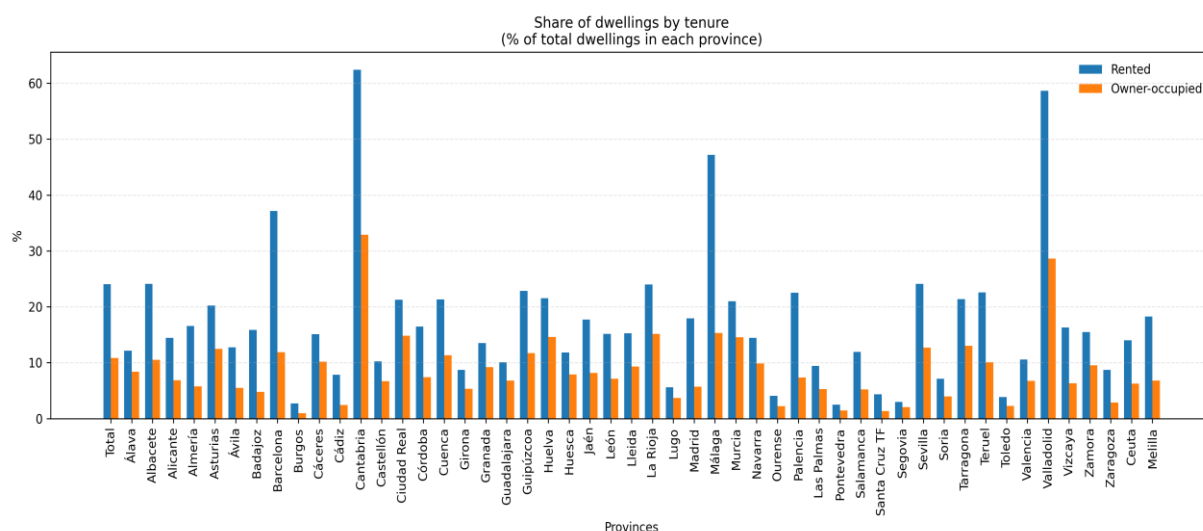
Graph 58. Home ownership structure.



The proportion of 'companies' that own homes is more relevant in the case of rental tenure, so that 1.43% of the total rented is in the hands of companies that manage this stock. This proportion varies depending on the province. Graph 59 shows how there are regions where the presence of these companies influences a larger size of the rental stock in terms of its management, such as in Burgos (almost 8% of the total rental is managed by companies), Ceuta, Melilla, Palencia and Valladolid. In Barcelona this weight is around 2% and in Madrid 1.8%.

These data are particularly significant in that they represent a small degree of market organisation. The fragmentation of ownership can have the effect of disrupting the rental market. In fact, in Spain there are no homeowners' associations that are organised or carry out joint coordination projects with respect to the park and most of the rental is usually managed by specialised agents. This model is particular to the Spanish market, where the presence of these agents is already traditional, so it could, in a simple way, be organized and policy measures associated with rental could be channelled through its network of professionals. This aspect must be one of the most varied over the last twenty years, so that the 2021 market is likely to incorporate a growing number of managers/owners and real estate investment companies, especially in major cities. However, there are no reliable public statistics that allow us to analyse this point.

Graph 59. Share of dwellings by tenure

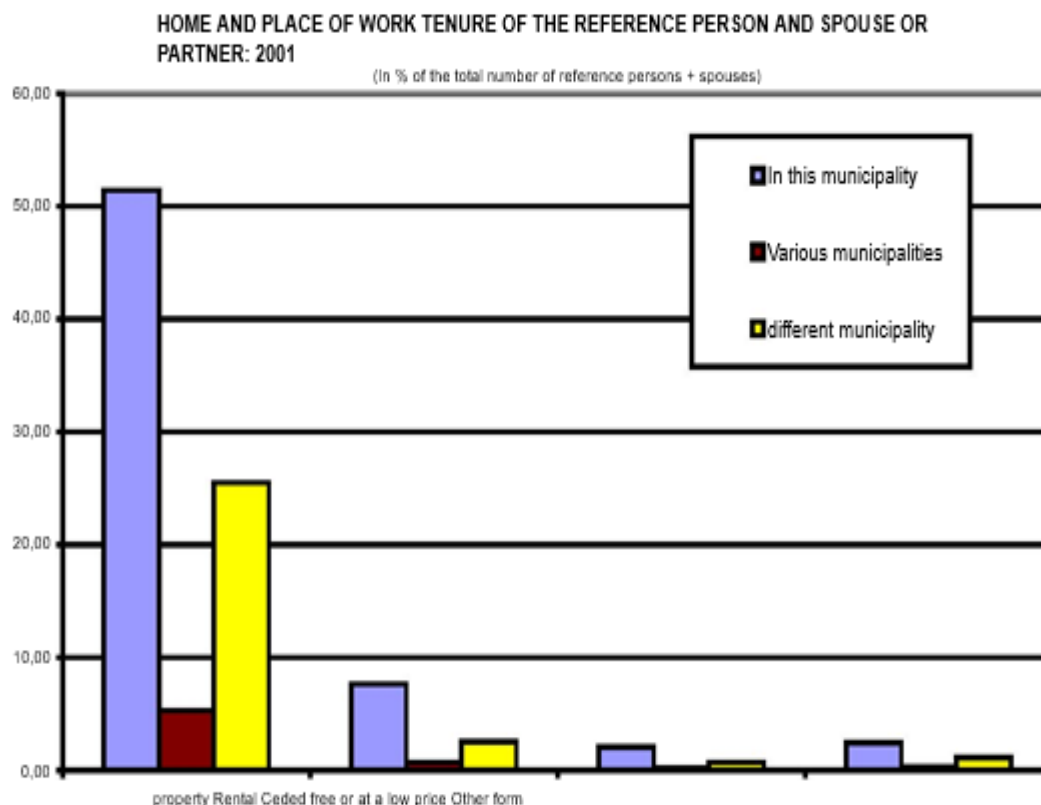


3.7 Labour mobility

The academic literature supports the existence of relationships between greater labour mobility and rental tenure, such that living in rented housing, to a greater extent if it is rent-free, is associated with greater employment mobility between labour markets distant in space, while living in a home owned (or rented publicly) is associated with lower mobility. In the initial chapters of this report, this aspect was already addressed, and the strong correlation between rental housing and population mobility was identified using residential registrations. The census allows us to know some characteristics related to the mobility of the workforce associated with the rental market, such as the place of work, the previous place of residence, the daily mobility to work (number of trips) and the time of travel.

In general terms, it can be said that there are no substantial differences in terms of mobility related to the form of tenure in the census data. Analysed in levels, given the relevance of ownership, the mobility exhibited by rental households seems marginal, as can be seen in Graph 60, so inferring the existence of differential models is complex and any more technical analysis that differentiates the reasons for mobility by tenure will be biased to the total values.

Graph 60. Home and place of work tenure of the reference person and spouse or partner. 2001



If the proportion referred to the total number of households by tenure is addressed (only the mobility of the main person and the spouse or partner is evaluated here), those renting and with the housing transferred at a low price, have a higher proportion of people working in the same municipality.

Mobility to other or several municipalities is greater in the case of ownership (Graph 61), which would be contrary to the belief (based on empirical evidence from other markets) in which it is found that rental households are more mobile than owned.

Graph 61. Tenure and place of work of the reference person and his or her spouse or partner.



However, there are studies (Meen, 2002) in which a contrary relationship is shown, in which households that enjoy public rental housing (in the United Kingdom) are less likely to move from their work in the city where they live so as not to lose the benefits linked to the residence. The Spanish census does not provide enough data to compare the types of renting or this behaviour, so this information would be an important element in identifying the effects of renting on households.

To obtain some information on this aspect, census data on households residing in rent and place of residence 10 years ago have been cross-referenced with the place of work. What can be said about mobility is the following:

- Long-term mobility, calculating residence in the last ten years, basically seems to respond to the need to be close to the workplace, since most of the households that have changed municipalities in the last decade work there (Table 2.1). Of the proportion of the total number of households that have moved housing, 19.02% have done so to another municipality during the last decade. Their work pattern endorses the previous statement, since 63.45% work in the same municipality, while 29.8% do so in a different municipality.

Table 2.1. Mobility Tenure and workplace: 2001, 2011(15), 2021(65)

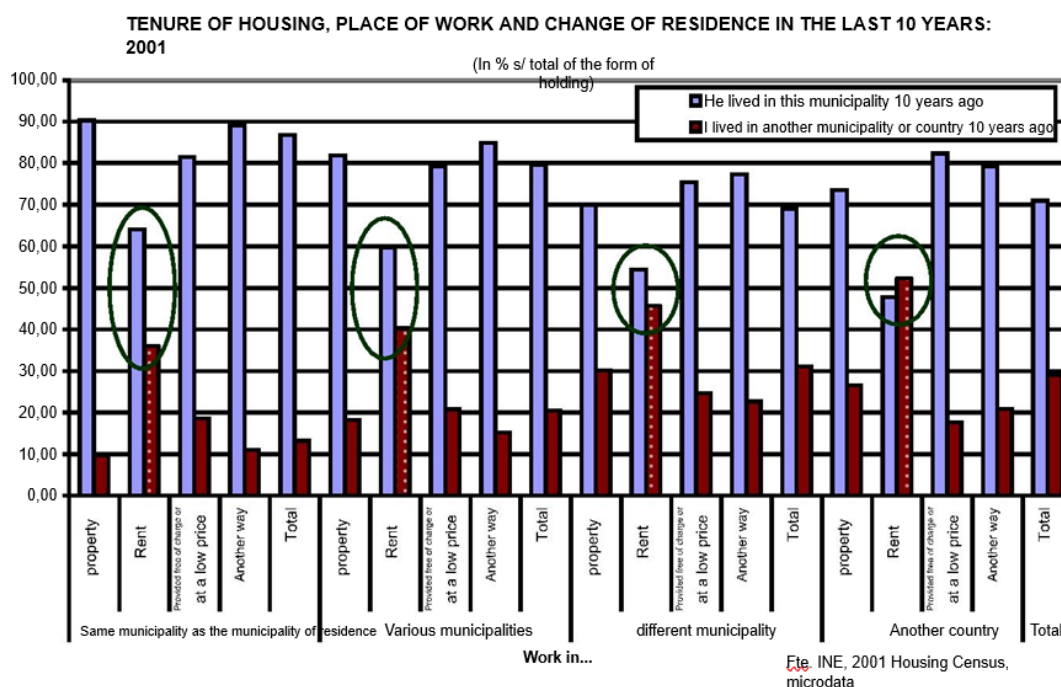
TABLE 2.1. MOBILITY, TENURE AND WORKPLACE: 2001, 2011(15),2021(65)				
In % s/ total of reference persons and spouses Residence 10 years ago				Total
	Country Tenure regime	In this municipality	In other municipality/country	
Same municipality as the municipality of reference	Property	46,38	4,98	51,36
	Rent	4,88	2,75	7,63
	Provided for free or at low price	1,66	0,38	2,04
	Another way	2,15	0,27	2,42
	Total	55,08	8,37	63,45
Various municipalities	Property	4,33	0,96	5,30
	Rent	0,41	0,28	0,68
	Provided for free or at low price	0,15	0,04	0,19
	Another way	0,26	0,05	0,30
	Total	5,15	1,32	6,47
Different municipality	Property	17,78	7,67	25,45
	Rent	1,37	1,15	2,52
	Provided for free or at low price	0,54	0,18	0,71
	Another way	0,88	0,26	1,13

	Total	20,57	9,25	29,82
Other country	Property	0,14	0,05	0,20
	Rent	0,02	0,02	0,03
	Provided for free or at low price	0,01	0,00	0,01
	Another way	0,01	0,00	0,02
Total	Total	0,18	0,07	0,25
total		80,98	19,02	100,00

- The proportion of them who live in rented accommodation after the residential change is like the global pattern (10.87%), and most of them work in the same municipality (7.63%), while 2.52% work in a different one. It can be inferred, therefore, that there is a relationship between the change of rental housing and the need to be in a place closer to the labour market, which would be an explanatory element of mobility.

If the data are analysed in relative terms for each tenure group, there is a greater relevance of rental use to explain mobility. Graph 62 shows that mobility when the household resided in another municipality or country is higher in the case of rental tenure, and when the head of the household works in a different municipality, in several municipalities or in another country. On the other hand, the rental tenure of those who have not changed their place of residence has a lower relative weight on the total of this form of tenure, which would support the hypothesis about the existence of a causal relationship in the decision to rent, in the case of household movements between cities. with higher mobility patterns for reasons of work and would be reflecting the demand for residence due to mobility.

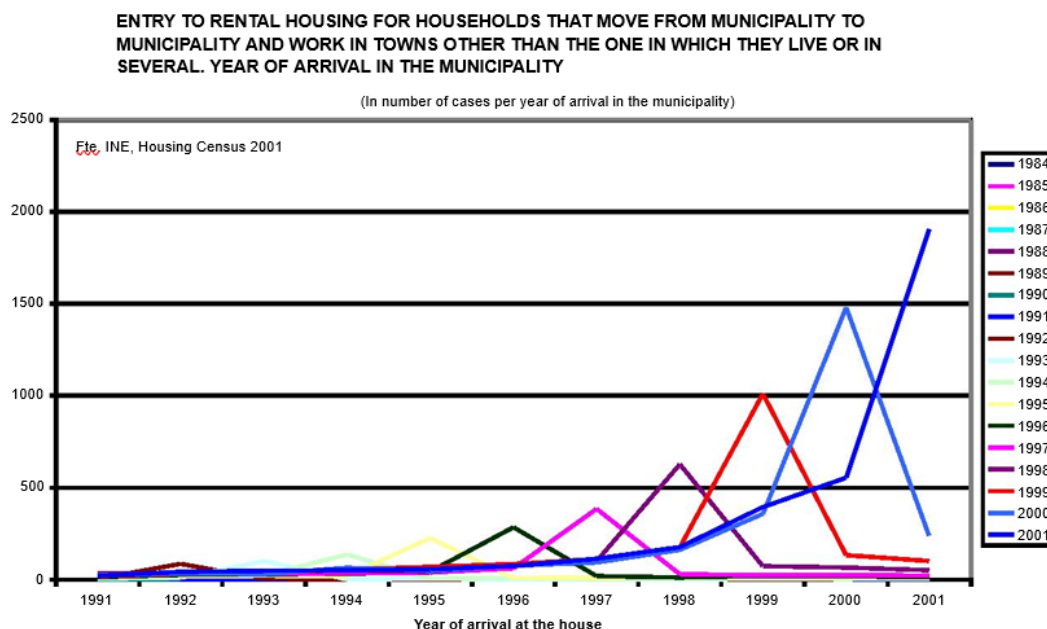
Graph 62. Tenure of Housing, place of work and change of residence in the last 10 years: 2001



However, the weight of ownership may also indicate that households that move in access to the property shortly after settling their residence, or that they have moved to a residence that they previously owned. The idea of the use of second homes as a bridge for work mobility is suggestive and seems to be shown in descriptive statistics, but it is not fully addressed in this work.

The mobility pattern of households that ONLY use rental housing is shown in graph 63, and shows two issues of great interest, such as, (1) that most households have access to rental accommodation in this type of household immediately after their change of municipality, so that a very small percentage subsequently accesses rental in subsequent or previous years (forecast and need for temporary residence), and (2) that access for this reason has been increasing since 1997 in Spain, showing a more intense use of renting in this period and, possibly, a greater need for rental stock associated with the mobility of household work, not only that which forces the household to move to work in a municipality, but also to the one that relocates the household that maintains its mobility throughout the territory.

Graph 63. Entry to Rental Housing for Households that move from municipality and work in Towns or others.



This implies that the use made of the rental stock is strongly related to the evolution of labour markets, the location of activities and the mobility of households in Spain. These reasons are usually recognized as determining factors of the demand for housing in general, and not only for rentals in particular, by the literature.

3.8 Analysis with microdata: The typology of demand in the rental market in Spain

As was done for the determination of the standard type of rental housing, using microdata from the 2001 Census, the profile of the housing seeker has been estimated with this existing tenure formula within the Spanish market. The three exercises have been replicated for the delimitation of the fundamental characteristics of the applicants for main rental homes, so that, firstly, the 'type' model of tenant in the Spanish market has been extracted. Secondly, the possible segmentation of rental markets by the claimants has been explored by extracting the significant clusters existing within the available census data panel. Thirdly, the characteristics that would jointly define the typical household seeking rent have been estimated, applying a factor analysis.

3.8.1 The typical tenant in the residential market in Spain

The household living on a standard rental basis in the Spanish housing market in 2021 is represented in Table 2.2. He had as a reference person a man, 35 years old on average (28 the most repeated), of Spanish nationality, married, who arrived in the municipality in 1983 and lives there.

The employment situation is active, and he is busy in the same municipality of residence, making an average daily trip to work by bus (his own car is the one that is most repeated) between 10 and 20 minutes away from his home. The average level of studies achieved is Higher Baccalaureate or COU, sometimes taking specific studies, such as competitive examinations, master's or postgraduate studies.

They work as a permanent employee, in management activities (as employees of travel agencies, as professionals in occupations exclusive to the public administration or foremen of non-agricultural establishments), 40 hours per week. It arrived at the current rental house in 1998, which, in general, has a good level of qualities related to the environment, little noise and pollution, clean streets and sufficient green areas, etc., it is located on the third floor (the first is the one that is repeated the most) and the house has 5 rooms in total and between 80 and 81 m² of surface. The house is in a building with an average of 5 floors, multi-family, built between 1961 and 1970 (1991 is the one that is most repeated), in good condition, under a horizontal property regime and without complete accessibility.

The home does not generally have a second home and, in cases where it does, it is in a municipality other than the one in which it is located and is enjoyed about 60 days a year. The household is made up of a basic family nucleus, with one child in the case of the youngest households, and with the partner in the case of the oldest, on average 3 people (4 is the one that is repeated the most).

The minimum age of the youngest generation present in the family is 14 years old and that of the oldest is 46, with the couple with children being the most common type of household. They have two employed at home and 0.24 unemployed.

Table 2.2. Typical Household Renter as reflected in the 2001 Census.

Table 2.2. Typical Household Renter as Reflected in the 2001 Census					
	Half Num Observations	Median	Standard Fashion deviation		
Year of birth 92088 1964.86		1967,00	1973,00	11,39	
Age 92088 35.98		34,00	28,00	11,39	
Sex 92088 2.99		1,00	1,00	2,45	
Country code of nationality 92088 149.96		108,00	108,00	85,69	
Spanish or foreign 92088 0.74		1,00	1,00	0,44	
Marital status 92088 1.76		2,00	1,00	0,96	
Year of arrival in the municipality 92088 1981.59		1983,00	2021,00	17,05	
Residence 10 years ago 92088 1.38		1,00	1,00	0,49	
Situation last week (first answer)	92088	1,92	2,00	2,00	0,27
Place of work or study	92088	3,13	3,00	3,00	0,64
Number of daily trips	83960	2,38	2,00	2,00	0,54
Means of travel	81687	3,17	3,00	1,00	2,15
Travel time	81687	2,59	2,00	2,00	1,40
Level of education	92088	4,92	4,00	4,00	2,13

Type of studies carried out	26715	6,01	6,00	3,00	3,42
Ongoing studies	7580	11,20	12,00	15,00	4,01
Occupancy Code	92088	591,00	533,00	533,00	261,17
Professional situation	92088	3,25	3,00	3,00	0,79
Activity Code	92088	554,15	551,00	452,00	245,17
Socioeconomic status	92088	12,65	13,00	16,00	3,51
Usual working time	92088	39,29	40,00	40,00	10,34
Year arrival at the house	92088	1992,19	1998,00	2021,00	11,81
Outside noises	92088	4,19	6,00	6,00	2,40
Contamination	92088	4,98	6,00	6,00	2,01
Little cleanliness in the streets	92088	4,48	6,00	6,00	2,30
Poor communications	92088	5,40	6,00	6,00	1,63
Few green areas	92088	4,07	6,00	6,00	2,43
Crime in the area	92088	4,76	6,00	6,00	2,16
Lack of services	92088	5,91	6,00	6,00	0,65
Refrigeration	92088	5,50	6,00	6,00	1,50
Heating	92088	2,77	3,00	3,00	0,88

Table 22. Typical Household Renter as Reflected in the 2001 Census.

Table 22 (cont). Typical Household Renter as Reflected in the 2001 Census					
	Mean Num of observations	Median	Standard Fashion deviation		
Height (in number of floors) on which the house is located	91549	3,14	3,00	1,00	2,12
Number of rooms	92088	4,52	5,00	5,00	1,54
Usable area	92088	81,33	80,00	90,00	34,04
Number of floors above ground	92088	4,96	5,00	5,00	2,87
Building Type	92088	2,36	2,00	3,00	0,85
Year of construction	91492	5,96	6,00	7,00	2,20



Building Condition	91492	3,81	4,00	4,00	0,51
Owner Class	91492	1,60	2,00	2,00	0,52
Building Accessibility	92088	3,20	4,00	4,00	1,11
Second home availability	92088	5,44	6,00	6,00	1,58
Location of a second home	10315	2,02	2,00	2,00	0,41
Number of days per year of use of the 2nd dwelling	10315	71,59	60,00	30,00	60,07
Disp. Motor vehicles (not motorcycles)	92088	2,31	2,00	1,00	1,37
Household Family Number	92088	1,09	1,00	1,00	4,26
Condition within the core	92088	0,85	1,00	1,00	0,68
Type of child	18718	0,95	0,00	0,00	1,23
Form of cohabitation in people 65 years of age or older	1542	2,86	3,00	0,00	2,68
Form of cohabitation in people aged 16 to 64	91142	4,55	4,00	9,00	2,86
Living with partner and children	92088	2,77	2,00	1,00	2,17
Number of nucleus within the home	91860	0,73	1,00	1,00	0,53
Household size (or number of residents in collectives)	91860	20,86	3,00	4,00	328,13
Number of families in the household	92088	1,14	1,00	1,00	3,24
Number of cores in the home	91492	0,87	1,00	1,00	0,58
Number of generations in the household	91492	1,31	2,00	2,00	1,03
Minimum age of the newest generation	57624	14,19	13,00	0,00	11,08
Maximum age of the oldest generation	57624	48,38	46,00	44,00	13,82
Home Structure (New Definition)	91492	38,74	41,00	55,00	13,68
Household structure (1991 definition)	92088	9,97	13,00	14,00	4,52
Type of home	92088	7,41	5,00	5,00	6,37
Number of household employees	92088	2,29	2,00	2,00	1,60
Number of unemployed in the household	92088	0,24	0,00	0,00	0,59

Fte. INE, Census 2001, microdata

The fundamental difference between the description made here of this resident-tenant household-type and the average of households in main dwellings focuses on two characteristics: the first consists of the average age of the head of the household, who is younger, and the second is the surface area of the dwelling, which is smaller. In the rest of the characteristics, the similarity with those of property is high.

3.8.2 The rental segments

The extraction of clusters²¹ has shown five different segments of rental applicants included in the 2001 census in Spain, whose characteristics are shown in Table 23. The five would correspond to households whose reference person is of different ages: young people of 26 years of age on average (cluster 1), between 52 and 58 years of age (clusters 2 and 3), and between 37 and 45 (clusters 4 and 5). Clusters 1, 2 and 3 are associated with foreign residents, from outside Europe (clusters 1 and 3) and Europeans (2), while the last two refer to Spanish households seeking it. All of them except cluster 3 have a male as the main person, i.e. cluster 3 refers to households with a reference to women, with an average age of 52 years, and from Latin America.

Cluster 1 represents households with a young male as a reference person, also from Latin America. He is not related to the household with which he shares a home and is single. He has a medium-level training in engineering, lives and works in the municipality, making a long daily trip (1.5 hours) to work as a passenger, by car or van. The occupation code shows a job as an agricultural labourer, employed, temporary and temporary (professional sit=4), in agriculture and for a few hours greater than the average (60). She arrived in the city in 2021, and her home nucleus is a one-person home. The house that you live in for rent has attractions: no noise, pollution or negative characteristics in the environment, although few green areas, in a multi-family building in good condition, with an average area of 80 m² and 6 bedrooms. The reference to single-person households of foreign residents who move for work reasons is clear in this rental segment, not being recent immigrants.

²¹ Due to the characteristics of the information, repetitive variables that made it difficult to extract the clusters have been eliminated.

Cluster 2.3 refers to a single-parent household with a 52-year-old single female reference person from Latin America. It is the main person of the family unit which has another member (on average). His level of training is lower than in the previous case, he lived outside the city in the last decade from where he moved to his current home, and travels by bus to the workplace.

Table 2.3. Rental demand clusters.

Table 2.3- Rental demand clusters					
	Cluster numbers... 1 2 3			4	5
Age	26,00	58,00	52,00	37,00	45,00
Sex	1,00	1,00	6,00	1,00	1,00
Country code of nationality	345,00	125,00	348,00	108,00	108,00
Marital status	1,00	2,00	1,00	1,00	1,00
Relac. Relationship with a person of reduced reference	70,00	10,00	10,00	10,00	10,00
Level of education	8,00	9,00	7,00	7,00	9,00
Type of studies carried out	6,00	12,00	2,00	4,00	11,00
Residency 10 years ago	1,00	2,00	2,00	1,00	1,00
Knowledge of one's own language	1,00	1,00	2,00	6,00	5,00
Reduced Workplace 3 Categories	1,00	1,00	1,00	1,00	1,00
Number of daily trips	2,00	3,00	2,00	3,00	3,00
Means of travel	2,00	2,00	3,00	1,00	1,00
Travel time	6,00	3,00	2,00	1,00	2,00
Occupancy Code	941,00	102,00	911,00	931,00	112,00
Professional situation	4,00	3,00	4,00	4,00	3,00
Activity Code	11,00	990,00	950,00	744,00	158,00
Socioeconomic status	5,00	10,00	14,00	14,00	10,00
Usual working time	60,00	45,00	12,00	40,00	40,00
Year arrival at the house	2021	1999	1999	1996	1969
Outside noises	6,00	1,00	1,00	1,00	6,00
Contamination	6,00	6,00	6,00	6,00	6,00
Little cleanliness in the streets	6,00	6,00	1,00	6,00	6,00
Poor communications	6,00	6,00	6,00	6,00	6,00

Few green areas	1,00	6,00	1,00	6,00	6,00
Crime in the area	6,00	6,00	6,00	1,00	6,00
Lack of services	6,00	6,00	6,00	6,00	6,00
Height (in number of floors) on which the house is located	2,00	1,00	1,00	5,00	7,00
Number of rooms	6,00	6,00	5,00	3,00	14,00
Usable area	80,00	110,00	700,00	50,00	400,00
Second home availability	6,00	6,00	6,00	6,00	6,00
Number of floors above ground	5,00	2,00	1,00	5,00	7,00
Building Type	3,00	1,00	1,00	2,00	2,00
Building Condition	4,00	4,00	4,00	4,00	4,00
Household Family Number	0,00	1,00	1,00	1,00	1,00
Condition within the core	0,00	1,00	1,00	0,00	1,00

Fte. INE, Census 2001, microdata and own elaboration

His activity is linked to household services (both codes of occupation and activity), as a temporary employee, with few declared hours of work (12), having arrived in 1999. The house he lives in has some problems related to the neighbourhood (noise, cleanliness and few green areas) although the multi-family building is in good condition. This profile defines a woman who has recently immigrated, who works in household cleaning services.

The third rental segment (cluster 2) refers to a household with a male main person, a foreigner from Europe (the median key is from the United Kingdom), 58 years old, married, with a high level of education and specialisation in services, who has moved his residence in the last decade to the current home. They work in the municipality where they live and travel by vehicle as a passenger, with a level of occupation, activity and socioeconomic condition that refers to the managers of Public Administrations or intra-territorial bodies, or senior civil servants, with an indefinite contract and 45 working hours per week. It arrived at the end of the nineties, and the house has high quality conditions (although with exterior noise), with a housing area of 110 m2 on average and in single-family houses of two floors. This profile corresponds to the demand for higher quality rental housing for a social segment with a greater capacity to pay, made up of European immigrants with a high level of education.

The last segments (clusters 4 and 5) refer to Spanish tenants. In both cases they are single men belonging to two different socioeconomic ranges. The first (cluster 4) refers to a 37-year-old person, with training at the level of higher vocational training in arts and humanities, resident in the municipality, where he has worked, for at least the last decade. He travels more than twice a day in his own car. Their work is in the service sector, possibly to companies (the advertising code is the one that provides the extraction exercise) and with a not very specialized category of work, being a temporary employee. The house has good conditions of the environment except in terms of noise and crime, and lives in a detached house with 70 m² on one floor. It does not seem that this household includes additional members, that is, it would be a single-person household.

The second segment (cluster 5) refers to a household with a male main person, 45 years old, also single, with a high level of education, a degree in health or social services, resident of the municipality for the last decade and working in it, with more than two trips to work and traveling in their own car. Their training is at the level of directors and production managers, or senior officials, with a permanent contract, working 40 hours a week. The exercise gives one year of arrival at the old house (1969), so this model possibly reflects the existence of old rents paid to the children. The quality conditions of the environment are very high, with the building being multi-family, in good condition and the house on high floors, with a very relevant surface.

In none of the cases do the main people have a second home, and it is striking that the cluster extraction has not identified the segment of tenants who are conventional households with children.

3.8.3 Demand factors identifying rental in Spain

To identify the existence of common properties that determine the characteristics of the tenants, a factor analysis has been carried out to reduce the number of characteristic variables of the set of rental dwellings and group them into those factors identified by the rental applicants.

The exercise has defined 16 factors that would group together the 46 characteristics of demand that the microdata from the 2001 Census allow us to use. Table 24 contains the main results of the exercise, including the explained variance of the components from which the 16 factors obtained in the exercise are extracted, the results of the Bartlett²² test that allow the identification and definition of the factors, and the factors obtained with their interpretation. The 16 factors extracted explain 74.78% of the total variance of the sample.

The determination of the nature of the factors can be seen in Table 2.4. All the factors have been identified very clearly in terms of the explanatory capacity of their composition, and determine the elements that are common in households living in

rented accommodation in Spain, which implies that a household will tend to be a tenant when its characteristics in terms of the 16 factors obtained are similar to those of the rental reference.

Table 2.4. Characteristic factors of Tenants in Spain.

Table 2.4.- CHARACTERISTIC FACTORS OF TENANTS IN SPAIN			
FACTORS AND THEIR DEFINITION		Corr (1)	Var (2)
Factor 1- Type of home			7,9
Living with partner and children Form of cohabitation: people from 16 to 64 years old		0,83	
Age Relac. Relationship with reference person		0,40	
		-0,86	
Factor 2- Type of building of the house			7,4
Number of floors above ground		0,90	
Class of owner Height (in number of floors) of the dwelling		0,80	
Number of parking spaces		0,78	
Type of building		0,64	
		0,60	
Factor 3- Training characteristic of the main person			5,7
Significance statistics KMO and Bartlett's Test Kaiser-Meyer-Olkin, Sample adequacy. Bartlett's Sphericity Test Approx. Chi2 df 0,52 3433,678 1035 Itself. 3.4E-254 Total Variance Explained (after rotation) % variance Total acc component			

22 The Bartlett test provides a value that is within acceptable limits, and although it does not reach the levels obtained in the characterization of the offer, it allows the interpretation of the exercise.

23 In this regard, the definition of the 'typical' tenant, which represents the common average to which each of the factors refers, is useful.

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These factors could be classified into four distinct groups, as shown in Table 2.5. The first would be defined by those related to the type of household, the second by those related to employment and short-and long-term mobility; the third with the quality of the housing and the fourth with the quality of the neighbourhood where the housing is located. The first is the one with the greatest capacity to explain the total variance of the sample, 30.42% computing the accumulated variances of each factor, the second is the quality of housing, followed by the type of employment and mobility, and with the quality of the neighbourhood in last place.

Table 2.5. Groups of identifying factors of Households for rent in Spain. Variance explained.

TABLE 2.5.- GROUPS OF IDENTIFYING FACTORS OF HOUSEHOLDS FOR RENT IN SPAIN. Variance explained							
Home	Employment and mobility		Quality of housing		Quality of the neighbourhood		
Factor 1- Type of household	7,88	Factor 9 - Mobility to work	4,03	Factor 2- Type of building of the house	7,38	Factor 8 - quality of neighborhood 1 (environmental)	4,14
Factor 3- Characteristic of formation of the		Factor 14 - Availability of					
Principal Person	5,69	Factor 15 - Activity of the person	3,37	Factor 7 - State of the building	5,05	Factor 10 - quality of neighborhood 2 (maintenance)	4,00
Factor 5- Principal Reason for household formation	5,27	Factor 4- Time of arrival in the municipality	3,19	Factor 1- Building of the house	3,98	Factor 12 - Quality of the neighborhood 3 (lack of urbanization)	3,68
Factor 6- Reason for household formation	5,27		5,55	Factor 11- Surface area of the house	3,19		
Factor 13.- Son of the household	3,48						
Factor 16.- Nationality	2,74						
TOTAL S 30.42 16.14 16.41 11.82							

The description suggests some important issues. Firstly, that there are groups of characteristics that would make households tend to rent. The first would be the existence of certain characteristics of the household, such as being a single-parent household, single-person household, families of more than 5 members or households whose main person is foreigners.

Secondly, the reasons of permanent mobility and daily employment would segment the group of households most prone to renting, such as those who have recently arrived from outside the municipality (residential relocation), as well as the professional activity that requires the existence of daily movements to work (and the requirement of vehicles, which implied longer travel times). Third, housing quality, in terms of its characteristics, is the third group of factors segmenting demand towards renting, with the size, condition and type of building, which would imply that these characteristics

could determine both the supply of housing and its price, which would be made accessible to households seeking to be renters. At this point, the market equilibrium mechanism would act, which would match the qualities and prices to the household's ability to pay.

Fourthly, neighbourhood quality factors count as a common determinant in rental housing, although their ability to explain variance supports the description made above with respect to these characteristics. This interpretation would support the idea that it is the supply segment located in the areas with the lowest investments that are most occupied for rent, while highlighting the relevance of the characteristics of the environment to guarantee a quality of life and demand for housing in the neighbourhood.

These issues are useful in terms of the definition of housing policy measures insofar as they clarify the average profile of the tenant and the conditions that would enhance renting. The factors obtained highlight several issues that need to be insisted on:

- There are type homes that are more likely to be rented,
- There is a home-type tenant model, which is not the conventional family.
- Relevance of the quality of the housing in terms of surface area, condition of the building and type of housing.
- And that the neighbourhood is of great importance when deciding on rent.

4. Financial resources for the rental market: Finance Sustainable and energy rehabilitation

4.1 Conceptual and regulatory framework of the European Union

European Union funds and national budgets alone will not be enough to cover the necessary investments required to decarbonise Europe's building stock. According to recent estimates, achieving the energy and climate targets for 2030, especially the reduction of emissions from heating and cooling buildings, will require mobilising around € 297 billion per year, implying an investment gap of close to € 149 billion per year until 2030 (Keliauskaitė, McWilliams, Sgaravatti and Tagliapietra, 2024). This volume is equivalent to approximately 1% of the European Union's GDP and reflects the need to triple the current rate of decarbonisation of the sector to meet climate targets.

The magnitude of the challenge is explained by the fact that 75% of existing buildings in the European Union are energy inefficient, while the rate of renovation barely reaches 1% per year (Keliauskaitė et al., 2024). To achieve the targets set out in the Energy Performance of Buildings Directive (EPBD, EU/2024/1275), emissions associated with the use of fossil fuels in buildings should be reduced by 55% compared to 2022 levels. This requires drastically accelerating rehabilitation rates and the replacement of polluting thermal systems.

Added to this economic challenge are persistent structural barriers that hinder the mobilisation of private investment: high initial costs, uncertainty about long-term returns, lack of access to credit for lower-middle-income households and the existence of incentives divided between landlords and tenants. As a result, the rate of "deep renovations" (which are those that reduce energy consumption by at least 60%) only reaches 0.2% of homes in the EU. In this context, it is very important to create a set of rules and a financial system that can attract private investment and direct it towards improving energy efficiency in Europe's buildings. This framework is part of the European Strategy for Financing the Transition to a Sustainable Economy, which sets out the architecture of sustainable finance in the European Union. This system is the basis of the European Green Finance Ecosystem, led by the EU Taxonomy, which is fundamental for classifying, measuring and reporting economic activities that are environmentally sustainable.

4.2 European SUSTAINABLE FINANCE (GREEN) Ecosystem

Sustainable finance represents a set of financial instruments designed to channel resources towards environmentally sustainable projects, facilitating the transition to a low-carbon economy. This financial paradigm has undergone a significant evolution

from its conception to become a fundamental pillar of European climate policy (Maria et al., 2023).

4.2.1 The European Union taxonomy

The European Union Taxonomy (Regulation (EU) 2020/852) is a classification system to determine which economic activities can be considered environmentally sustainable. This legal instrument, which entered into force on 12 July 2020, emerges as a direct response to the Action Plan on Financing Sustainable Growth adopted by the European Commission in March 2018, which identified the imperative need to establish a unified classification system that would allow private capital flows to be redirected towards sustainable investments (European Commission, 2018).

It is the basis of the European Sustainable Finance Framework, acting as a key infrastructure that provides the common language needed for both financial and non-financial actors to identify, assess and report economic activities that are environmentally sustainable (GBCE GBCE, etc.).

First, taxonomy operates as a classification system that translates abstract environmental objectives into quantitative and verifiable technical criteria. This translation makes it possible for concepts such as "environmental sustainability" or "climate transition" to become measurable performance standards. This reduces the confusion in its meaning and the freedom of interpretation that previously existed in sustainable finance (Schütze & Stede, 2021).

Second, the Taxonomy works as a mechanism for the prevention of greenwashing by establishing technical standards and rigorous minimum criteria that activities must meet to be labelled as sustainable. Empirical research indicates that the Taxonomy can help address the main types of greenwashing: use of vague or imprecise language, lack of clarity, lack of evidence for environmental claims, unreliable green promises, and misleading narratives (Paccès, 2021; Buchinskaya, 2024).

Third, as stated by Sautner et al. (2025) and Bassen et al. (2025), the Taxonomy acts as a catalyst for the transformation of financial markets by creating economic incentives for sustainable activities. By providing clarity on which activities qualify as sustainable, the Taxonomy reduces information and transaction costs for investors, facilitates comparability between green financial products, and potentially lowers the cost of capital for companies aligned with its criteria.

Six environmental objectives are established that constitute the thematic pillars on which the entire architecture of the Taxonomy is structured (European Commission, 2020a):

1. Climate change mitigation: This objective is aimed at stabilizing greenhouse gas concentrations in the atmosphere, avoiding dangerous anthropogenic interference with the climate system. Activities that contribute substantially to this goal includes renewable energy generation, energy efficiency improvements, sustainable mobility, and carbon capture, use, and storage.
2. Climate change adaptation: Includes activities that substantially reduce the risk of adverse effects of current and future climate on people, nature or assets, without increasing the risk of adverse effects.
3. Sustainable use and protection of water and marine resources: Covers the protection of the environment against the adverse effects of urban wastewater discharges and certain industrial sectors, the protection of human health against the harmful effects of pollution of water intended for human consumption, and the achievement of good surface and groundwater status.
4. Transition to a circular economy: Includes increasing resource efficiency, increasing product durability, repairability, upgradability, and recyclability, reducing the hazardous substance content of materials and products, and prolonging product use through reuse, design for longevity, and repairability.
5. Pollution prevention and control: This refers to the prevention or, when this is not possible, the reduction of polluting emissions into the atmosphere, water or soil, other than greenhouse gases.
6. Protection and restoration of biodiversity and ecosystems: This includes the conservation of nature, the protection, conservation or restoration of biodiversity, ecosystems and their functions.

For an economic activity to be considered environmentally sustainable, it must cumulatively meet four conditions (European Commission, 2020a):

- a) Substantial Contribution: The activity must contribute substantially to at least one of the six environmental objectives in accordance with the technical selection criteria established in the delegated acts. This contribution should be measurable and verifiable through specific quantitative indicators.
- b) Do No Significant Harm (DNSH): The activity must not cause significant harm to any of the other environmental objectives. Article 17 of the Taxonomy Regulation defines what constitutes "significant harm" for each objective.
- c) Minimum Safeguards: The activity must be carried out in compliance with the minimum safeguards set out in Article 18, which require alignment with the OECD Guidelines for Multinational Enterprises and the United Nations Guiding Principles on Business and Human Rights.

- d) Compliance with Technical Selection Criteria: The activity must comply with the Technical Selection Criteria (TSC) established by the Commission through delegated acts. These criteria are specific to sector and activity, based on scientific evidence and subjects a periodic review.

The effectiveness of the Taxonomy as a sustainable finance infrastructure depends on its integration with other regulatory instruments that make up the European sustainable finance ecosystem. This integration is mainly articulated through the three complementary regulatory frameworks (SFDR, CSRD, EuGBS) that are detailed below.

4.2.2 Sustainable Finance Disclosure Regulation (SFDR)

Regulation (EU) 2019/2088 on sustainability disclosures in the financial services sector (SFDR) lays down transparency obligations for financial market participants and financial advisers (European Parliament and Council, 2019). This regulation classifies financial products into three types: Article 6 includes products that do not have a specific sustainability objective; Article 8 refers to products that support environmental or social characteristics; and Article 9 is for products that have a sustainable investment objective (European Commission, 2022).

The EU Taxonomy is connected to the SFDR by Articles 5, 6 and 7 of Regulation (EU) 2020/852. These articles establish the reporting obligations for financial products that promote environmental characteristics (art. 8 SFDR) or that seek to make sustainable investments (art. 9 SFDR). Such products should specify how and to what extent their underlying investments align with the sustainable activities defined in the Taxonomy, while products not included in Articles 8 and 9 SFDR should expressly state that their investments do not consider those criteria (European Parliament and Council, 2020).

In addition, financial institutions, especially credit institutions, are subject to additional sustainability reporting requirements beyond the SFDR. In the prudential area, they must publish specific indicators related to environmental, social and governance risks. These include the Green Asset Ratio (GAR), introduced by the European Banking Authority (EBA) as part of the disclosure obligations set out in Regulation (EU) No 575/2013 and developed in the Implementing Technical Standards (ITS) on ESG risks (EBA, 2022). The GAR measures the proportion of Taxonomy-aligned exposures to total bank balance sheet assets, complementing (but not formally integrating) the SFDR's transparency obligations.

4.2.3 Corporate Sustainability Reporting Directive (CSRD)

Directive (EU) 2022/2464 on corporate sustainability reporting (CSRD) amends Directive 2013/34/EU, significantly expanding the scope and depth of sustainability reporting requirements (European Union, 2022a). The CSRD extends reporting obligations from approximately 11,000 companies under the previous Non-Financial Reporting Directive (NFRD) to nearly 50,000 companies in the European Union (European Parliament, 2022; European Parliament, n.d.).

The integration between the Taxonomy and the CSRD takes place at multiple levels. First, companies subject to the CSRD must mandatorily report their Taxonomy indicators (eligibility and alignment) in accordance with Article 8 of the Taxonomy Regulation and its delegated act, which specifies the content, presentation and methodology of disclosures (European Union, 2021a; European Commission, 2021b). Second, the European Sustainability Reporting Standards (ESRS) created under the CSRD clearly include metrics and mentions of the Taxonomy as part of the environmental reporting requirements (European Union, 2023a).

4.2.4 European Green Bond Standard (EuGBS)

Regulation (EU) 2023/2631 on European Green Bonds establishes a high-quality voluntary standard for green bonds that requires full alignment with the Taxonomy (European Parliament and Council, 2023). Bond issuers under the EuGBS standard must allocate at least 85% of the funds raised to projects aligned with the Taxonomy, with a "flexibility pocket" of 15% for sectors not yet covered by the technical criteria (European Parliament and Council, 2023; Anthesis Group, 2024).

The EuGBS "seal" or designation represents adherence to a regulated and integrated ecosystem of accountability, linking four key components:

- The Issuer: who makes a legally binding promise about the use of the funds.
- The Asset: Projects (such as loans and mortgages) that must meet the criteria of the Taxonomy.
- The Verifier: an external entity that audits the issuer's promise and its fulfilment (ESMA, 2024).
- The Supervisor: the European Securities and Markets Authority (ESMA), which audits and supervises the verifier (European Union, 2023b).

In pre-existing voluntary standards, such as ICMA's Green Bond Principles (GBP), external review (Second-Party Opinion or SPO) is a recommendation. Although most of the market uses it for credibility, its format, rigor, and provider are not regulated (ICMA, 2022). EuGBS elevates this practice from a market recommendation to a legal requirement for the use of the "EuGB" designation. A bond cannot call itself "EuGB" without having gone through this formal audit process (European Parliament and Council, 2023).

Once the concept of sustainable finance has been defined, its most direct use in the construction sector is carried out through Directive (EU) 2018/844 (EPBD), which adapts the principles of the Taxonomy to the specific case of energy renovation 3. Taxonomy and articulation of energy rehabilitation under the Directive (EU) 024/1275.

EPBD) Directive (EU) 2024/1275 is one of the central instruments of the European

framework for the decarbonisation of the building stock. It aims to reach a zero-emission stock of buildings by 2050, in line with the European Green Deal and the Renovation Wave, which aims to double energy refurbishment rates by 2030 and renovate some 35 million buildings (European Commission, 2020b; European Parliament and Council of the European Union, 2024a).

The Directive underlines that the deep renovation of the built stock is essential to meet climate objectives.

Currently, around 75% of European buildings are inefficient and generate around 36% of energy-related greenhouse gas emissions (European Parliament and Council of the European Union, 2024a). Improving the energy performance of the building stock is thus considered an environmental, economic and social priority.

The European Taxonomy of Sustainable Finance reinforces this approach by recognising the renovation of existing buildings (Activity 7.2) as a sustainable activity. To do this, the intervention must meet the "major renewal" criteria defined in the EPBD or reduce primary energy demand by at least 30% compared to the previous situation (European Union, 2021b). In turn, the recast EPBD considers a deep renovation to be one that transforms the building into an nZEB (nearly Zero-Energy Building) before 2030 or into a ZEB (Zero-Emission Building) from that date (European Commission, 2025a, 2025b).

However, the average rate of energy renewal in the EU remains low, at around 1% per year, when it would need to be doubled to meet the 2030 milestones (European Commission, 2020b). According to the Commission, the investment needed to achieve energy efficiency targets amounts to around € 275 billion per year, with a funding gap of € 165 billion each year (European Commission, 2021a). Recent studies estimate even greater needs, close to € 297 billion per year, and place the gap at around 1% of EU GDP (Bruegel, 2025).

The articulation between the EPBD and the European Taxonomy seeks to channel part of this investment towards energy rehabilitation, facilitating the mobilisation of private capital and alignment with sustainability criteria. This convergence strengthens the coherence between the Union's climate and financial policies and makes the renovation of buildings a priority axis of the transition to climate neutrality.

4.3 The Taxonomy as a Criterion for Access to Finance for Building Renovation

Article 17 and its interpretative guide in Annex 2 of the Directive (European Commission, 2025c) form the basis of the system of financial support for energy

rehabilitation. This framework recognises that the investment needed exceeds the public budgetary capacity, so the success of the transition depends on mobilising private capital, aligning it with European climate objectives through green financing instruments and EU Taxonomy sustainability criteria.

The EPBD promotes a multi-level financial architecture. First, Member States should coordinate their policies with the main mechanisms of the European Union: the Recovery and Resilience Facility (RRF), the Social Climate Fund, the Cohesion Fund, InvestEU and revenues from European emissions trading (ETS). These funds are conceived as catalysts to generate additional private investment under blended finance schemes, in which public subsidies reduce the perceived risk of the financial sector (European Commission, 2025c).

The Recovery and Resilience Facility, created by the EU to deal with the emergency arising from COVID-19, includes the renovation of buildings among its priorities. To be eligible for these funds, each Member State must draw up a National Recovery and Resilience Plan detailing the implementation of the investments and their contribution to the low-carbon transition (European Commission, 2021a).

- The Social Climate Fund is a resource that Member States can draw on to support vulnerable households during the energy transition. It will be launched in 2026 and is directly related to the energy burdens of the buildings sector (by ETS2), its nature is primarily social and mitigation, ensuring that vulnerable households can afford energy or, alternatively, make the necessary investments to reduce their energy demand, without renovation being the only possible use of funds (European Parliament and Council of the European Union, 2023b).
- The Cohesion Fund, which supports the most depressed economies in the Union and uses instruments such as loans, guarantees and capital to support (among others) deep renovation projects in public infrastructure, housing and enterprises.
- The InvestEU programme addresses the EU's long-term financing needs by combining public and private investments. It focuses on financing key priorities such as the green and digital transitions, innovation and social investments, including building renovation.
- Revenues from European emissions trading (ETS). ETS2 will start in 2027 and will apply a price to emissions generated by the direct combustion of fossil fuels in buildings and road transport. Part of the proceeds are expected to be reinvested in renovations and to finance the SFC (Social Climate Fund).

Other complementary European sources include the European Fund for Strategic Investments (EFSI), the Horizon Europe programme (Cluster 5), the ELENA technical assistance instrument, which covers up to 90% of eligible costs of energy efficiency projects, and the LIFE Clean Energy Transition sub-programme, which focuses on innovation, training and the fight against energy poverty (European Commission, 2025c).

Article 17 also mentions that member states should promote the development and effective use of enabling financing tools and lists the financing instruments through which member states can support such investment mobilization. In addition, (European Commission. (2025a).

- (Green) Loans for Energy Efficiency and (Green) Mortgages for Building Renovation, linked to improving the energy efficiency of homes and based on the criteria of the Taxonomy of Sustainable Activities.
- Energy performance contracts (EPCs), which guarantee verifiable savings and allow the investment to be repaid with the savings obtained.
- Pay-as-you-save or "on-bill/on-tax" schemes, which integrate the financing of improvements in energy or tax bills.
- Guarantee funds and revolving funds, designed to provide credit to households and energy communities.
- Mortgage Portfolio Standards, these standards are defined as "mechanisms that incentivise mortgage lenders to establish a path to increase the average energy performance of the building portfolio" (European Commission, 2025c).

The EU Taxonomy acts as a cross-cutting framework: renovation projects must meet its sustainability criteria to be classified as green investments. Annex I to Directive (EU) 2024/1275 (European Commission, 2025d) establishes that the common methodology for the calculation of energy efficiency constitutes the technical basis for the application of that taxonomy, connecting the assessment of energy performance with the financial sustainability criteria of Regulation (EU) 2020/852.

4.4 Complementary instruments and financial traceability

The EPBD's financing system is supported by a documentary and technical infrastructure that ensures the traceability of investments. Renovation passports (European Commission, 2025a) are the strategic tool: each building should have a customized roadmap that sequences improvements over time, details costs, benefits, and potential sources of funding, and integrates with Energy Performance Certificates (EPCs) (European Commission, 2025c).

Both documents are registered in interoperable national databases (European Commission, 2025d) that allow the aggregation of information and the evaluation of the impact of investments in terms of energy savings, emission reductions and socio-economic profitability. These bases constitute the reference source of information for European, national and local funding programmes.

The Directive requires that any public aid or financing – grant, subsidised loan or tax deduction – be linked to the verifiable energy performance of the action, integrating the cost-effectiveness principle and the revised cost-optimality criterion in Delegated Regulation C (2025) 4133 (European Commission, 2025b). This framework incorporates the assessment of global warming potential (GWP) and environmental external costs sanitary, combining energy efficiency with climate efficiency.

The regulatory and financial framework described above lays the foundations for the development of support instruments aimed at channelling capital towards the energy rehabilitation of buildings. The main mechanisms included under Article 17(7) of the EPBD (European Commission, 2025c) are analysed below, together with other complementary models that help to expand financing options and mobilise private investment.

5. Financial Instruments

5.1 Soft Loans and Green Mortgages

5.1.1 Technical Characteristics.

Low-interest loans for energy efficiency are defined as long-term debt instruments (typically 0-20 years) offered by financial institutions with reduced interest rates compared to conventional credit products, often with grace periods or extended repayment periods (European Commission, 2023a; CINEA, 2024).

Green mortgage loans are a subset of low-interest loans specifically designed to finance the purchase of homes or the realization of energy improvements in residential properties with class A energy certification or equivalent according to EU Taxonomy criteria (WorldGBC Europe, 2018; Deason et al., 2022).

5.1.2 Economic Justification and Risk Mechanisms

The reduced interest rate for green products is based on empirically documented credit risk reduction.

Multiple studies show that households occupying energy-efficient buildings have lower default rates due to reduced operating costs (energy and maintenance), which

translates into greater debt service capacity (WorldGBC Europe, 2018; Deason et al., 2022). Risk reduction also reflects the lower risk of obsolescence and depreciation of energy-efficient properties in contexts of increasingly restrictive climate policy (Akhtyrskaya & Fuerst, 2024).

The European Banking Federation (EBF) has documented a credit risk differential of approximately 15-25 basis points between green mortgages (on class A buildings) and conventional mortgages, justifying reduced interest margins of up to 50 basis points in some cases (WorldGBC Europe, 2018).

5.1.3 The role of financial institutions

The Taxonomy becomes the mandatory reference metric for the financing of rehabilitation through a regulatory mechanism on the balance sheet and reporting of information of financial institutions:

1. Asset Side (EPBD): The EPBD directly links the management of mortgage portfolios to the Taxonomy. Article 17(7) of the EPBD calls for the promotion of "Mortgage Portfolio Standards" that should be based on the criteria of the Taxonomy (Article 3 of Regulation (EU) 2020/852) to increase the average energy performance of building portfolios. This forces banks to use the Taxonomy as a risk management and regulatory compliance tool.
2. Liability Side (EuGBS). The European Green Bond Standard (EuGBS) requires the alignment of 100% of funds with the Taxonomy for the issuance of this type of bond.
3. Mandatory Reporting (GAR): Delegated Regulation (EU) 2021/2178 establishes specific disclosure obligations for financial institutions, introducing the concept of Green Asset Ratio (GAR) as a key performance indicator (European Commission, 2021b; Golka et al., 2024)

The GAR is defined as the proportion of assets of a credit institution that finance or are invested in economic activities aligned with the Taxonomy with respect to the total assets covered (European Commission, 2021b; Golka et al., 2024).

The Green Asset Ratio (GAR), a mandatory key performance indicator for banks, requires loans to individuals to be included in the numerator only if they demonstrate alignment with the TSCs of the Taxonomy. For retail exposures (loans to households), alignment is measured by the technical characteristics of the underlying asset (the building), not by the counterparty's report.

5.1.4 Operational limitations and moratorium of the RAG (EBA 2025)

For a rehabilitation loan to be counted as "green" in the numerator of the RAM or to support a EuGBS bond, the financed activity (Activity 7.2: Renovation of existing buildings) must demonstrate:

- A reduction in primary energy demand (PED) of at least 30%.
- Or, alternatively, that the rehabilitation is considered a "major renovation", as defined by the EPBD.
- In addition, it must comply with DNSH criteria, which includes verifying compliance with thresholds in aspects such as the management of construction materials and contaminants.

Banks began publishing their Green Asset Ratios (GAR) in the 2024 reports, corresponding to the 2023 fiscal year. However, in the face of widespread criticism of the methodology and practical difficulties in collecting the necessary information from millions of retail customers (especially that which demonstrates compliance with the Taxonomy's demanding technical criteria, including "No Significant Harm" (DNSH)), the European Banking Authority (EBA) intervened in August 2025. On that date, it issued a "no-action letter", in which it recommended that national competent authorities not prioritise the application of certain ESG disclosure templates of Pillar 3, specifically those relating to ESG (Templates 6-10).

This suspension is expected to remain in place until the end of 2026, while some specific indicators of the GAR, such as those relating to fees and the trading book, have been postponed until 1 January 2028.

5.1.5 Market fragmentation and institutional response (EBA 2022– 2023)

The fragmentation of the market, the risk of greenwashing and the difficulties in verifying the real sustainability of loans and mortgages that were presented as "green" led the European Commission to request a detailed analysis of this situation. In November 2022, the Commission issued a Call for Advice (CfA) addressed to the European Banking Authority (EBA), in order to assess the degree of maturity of the market, identify practical obstacles to implementing the EU Taxonomy, in particular those related to the No Significant Harm (DNSH) criteria and the calculation of the Green Asset Ratio (GAR), and assess the desirability of establishing a common regulatory framework.

The EBA's analysis confirmed that the green loan market remained small and heterogeneous, with large differences between countries and banks. It was particularly challenging to classify energy rehabilitation loans as sustainable, due to the difficulty of demonstrating compliance with the technical criteria of the Taxonomy. According to

the EBA (2023a), this low presence of rehabilitation loans is not only due to a lack of demand or interest on the part of the institutions, but above all to the technical and verification barriers that hinder their eligibility.

The EBA's diagnosis and its green label proposal are, together, the most concrete institutional response to the problems detected in the classification and harmonisation of the market.

The EBA formally recommended to the Commission the creation of a voluntary European label for green loans, aimed at unifying definitions, improving comparability, reducing the risk of greenwashing and stimulating financing for the rehabilitation of the existing building stock (European Commission, 2022; EBA, 2023a). In addition, the Authority proposed to integrate the concept of "green mortgage" and its sustainability characteristics into the future revision of the Mortgage Credit Directive (DCF), currently pending approval.

Various reports published between 2024 and 2025 (Finance Watch, 2024; Mertens & van der Zwan, 2025) insist on the need for such a legislative review to create a unified market for green loans, boost energy rehabilitation and strengthen consumer protection, warning of the risk of confusion and harm if new ESG financial products are not regulated in a consistent manner.

5.1.6 Voluntary market standards: Energy Efficient Mortgage Label (EEML)

In the absence of a fully operational regulatory standard, the industry has developed voluntary initiatives such as the Energy Efficient Mortgage Label (EEML), which act as self-regulatory mechanisms and signalling of green assets in capital markets.

Despite that lack of "official" standardization, the Energy Efficient Mortgage Label (EEML) is a voluntary industry initiative launched by the European Mortgage Federation (EMF-ECBC). It was initially funded by EU programmes (such as Horizon 2020) and is administered by the European Covered Bond Board (ECBC).

The core purpose of the EEML is B2B (Bank-to-Investor). It is a tool for creating a standardized and transparent asset for the capital markets. It allows banks to:

- Group these labelled mortgages.
- Issue Green Bonds or Green Covered Bonds backed by this set of assets

The label makes it easier for the bank to finance itself more cheaply or diversified in the capital markets thanks to the growing demand for "green" assets from institutional investors. The EEML is the market infrastructure that enables this securitisation.

Bonds structured using only the EEML criteria do not, by definition, comply with the requirements of the EuGBS. The reason is that the EEML operates with criteria that, although aligned in intention, are not technically equivalent or substitutes for the strict TSCs of the Taxonomy.

The gap is evident in the financing of the renovation (Activity 7.2):

- EEML is satisfied with a 30% improvement in energy efficiency.
- The Taxonomy requires a 30% improvement PLUS meeting other component-specific criteria or qualifying as a "Major Renewal."

Because the EuGBS requires 100% taxonomic alignment, an EEML mortgage portfolio that is only 30% compliant is not eligible to support a EuGBS. This creates an operational and strategic gap.

5.1.7 Dual-Track Strategy Financial institutions

Must operate in a "dual-track" market:

Route 1 (Regulated): EuGBS: Uses verified with EPC data. "Pure" wallets 100% aligned with the Taxonomy Uses verified with EPC data.

Track 2 (Market): ICMA/EEML Bonds: Uses broader portfolios, where the EEML serves as a credible market signal for investors under the flexible ICMA (GBP) principles, which do not require mandatory alignment with the Taxonomy.

5.1.8 Implementation Cases:

Program KfW y Energy Efficient Mortgages Action Plan KfW-Effizienzhaus Program (Germany): The German development bank KfW (Kreditanstalt für Wiederaufbau) offers preferential financing for building renovations under criteria aligned with the Taxonomy. The "KfW 261 Wohngebäude-Kredit" program provides loans of up to €150,000 per housing unit with the following characteristics (KfW, 2025):

- Interest rates of currently between 2.0%-4.5%, depending on term and market value.
- Non-repayable grants that cover 15% to 45% of the principal amount depending on the type of energy efficiency achieved post-renovation.
- For buildings that reach Effizienzhaus 40 standard (roughly equivalent to primary energy demand <44 kWh/m²/year): maximum subsidy of € 48,000 per unit.
- Payback periods up to 25-30 years with grace period options of 1-2 years.

Energy Efficient Mortgages Action Plan (EeMAP): An EU-funded initiative under Horizon 020, developed a conceptual framework and operational standards for energy efficiency mortgages in Europe (WorldGBC Europe, 2018; EEMI, 2023). In June 2018, 37 major European banks launched the pilot scheme, with combined lending power more than € 3trillion (approximately 20% of EU GDP) (WorldGBC Europe, 2018).

- The EeMAP framework defines four essential components (WorldGBC Europe, 2018):
- Building Energy Passport: Standardized record of the property's energy efficiency history.
- Green value: Integration of energy performance into residential property valuations.
- Eligibility criteria: Technical definition of which buildings qualify for preferential conditions (Class A according to Energy Performance Certificates, or equivalent according to EU Taxonomy).
- Risk mechanisms: Differentiation of credit risk based on energy consumption

5.2 Energy Performance Contracts (EPC)

5.2.1 Definition and Structure

Energy Performance Contracts (EPCs) are contractual agreements between a building or facility owner (customer) and an Energy Service Company (ESCO) in which ESCO agrees to design, implement and, in many cases, finance energy efficiency improvements, and to ensure a pre-agreed level of energy (or cost) savings or service level energy (European Parliament and Council of the EU, 2023b; JRC, 2021). ESCOs finance the initial costs of an energy performance improvement project based on energy cost savings during operation. An ESCO can replace the traditional utility provider or contract the client only for the implementation of a set of jointly agreed measures (Eurostat & EIB, 2018).

5.2.2 Process and Guarantees

In this type of contract, the following steps are usually taken:

Energy audit of the building/facility to define a baseline of consumption (European Parliament and Council of the EU, 2023b).

Design and execution of efficiency measures– e.g. insulation improvement, renovation of HVAC systems, efficient lighting, automation, etc. (JRC, 2021).

Implementation by the ESCO, which in many cases assumes the technical risk of the project (JRC, 2021; Wacinkiewicz & Słotwiński, 2023).

Measurement and verification (M&V – Measurement & Verification) of performance and savings achieved: ESCO is responsible if the agreement is not complied with (EVO, 2022; UNEP- Copenhagen/Global ESCO Network, 2022).

During the contract period, the customer pays ESCO in relation to the savings achieved or the services provided; at the end of the contract, the savings flows are already for the customer (Eurostat & EIB, 2018).

5.2.3 Contract Models

The two common types of performance-based contract structures used by ESCOs are "Guaranteed Savings" and "Shared Savings":

"Shared Savings: Under this model, ESCO finances the project through its own funds or through a loan from a third party. ESCO assumes the risk of project performance. Cost savings are divided between ESCO and the customer at a predetermined percentage (JRC, 2023; Bertoldi et al., 2021).

Guaranteed Savings: ESCO guarantees a minimum level of energy savings that will cover the loan payments. If the savings are smaller, the ESCO pays the difference (JRC, 2023; Zhang et al., 2024).

5.2.4 Key Aspects

Transfer of technical risk to the supplier (ESCO) in a way that minimizes the customer's risk (JRC, 2021; Wacinkiewicz & Stotwiński, 2023).

Creative financing: the project is financed based on expected savings, allowing investments without the client necessarily having to contribute capital until the savings begin to materialise (Eurostat & EIB, 2018).

Measurement/Verification (M&V): This is an essential element, and the IPMVP (International Performance Measurement and Verification Protocol) protocol is frequently used as an international standard to verify savings (EVO, 2022).

Compliance with regulations and policies: EPCs are recognised, regulated and promoted by European legislation as a key instrument for improving the energy efficiency of the building stock (European Parliament and Council of the EU, 2023b; European Commission, 2025e).

5.2.5 European Examples

Energiesprong (Netherlands): Started in the Netherlands, the model refurbishes homes to "zero energy" standard, with a 30-year performance guarantee. The Energiesprong program was created by the government of the Netherlands in 2010 to retrofit existing buildings to higher energy efficiency standards, becoming zero-energy buildings. When the program was launched, it initiated agreements with social housing companies and contractors to convert 111,000 houses in the Netherlands into near-zero-energy buildings (European Commission, 2018; Energiesprong, 2017). The renovation work consists of covering the facades with an extra insulating layer, replacing window frames, installing solar panels, heat pumps, as well as efficient central heating and air conditioning systems (European Commission, 2018).

Renowatt (Belgium): Regional programme for public buildings that achieves savings of 30– 50% and payback periods of less than 10 years (EIB, 2018; Climate-ADAPT, 2024).

These contracts are supported by the IPMVP protocol (EVO, 2022) for verification and are eligible within the EU Taxonomy by complying with improvements of more than 30% of initial consumption (European Commission, 2025d).

5.3 On-Tax Financing / PACE (Property Assessed Clean Energy)

The On-Tax Financing model, also known as Property Assessed Clean Energy (PACE), represents an innovation in the financing of energy rehabilitation, by linking the obligation to pay for improvements to the property itself and not to the owner. According to the European Investment Bank (EIB, 2022) and the EuroPACE Consortium (2021) this scheme allows energy efficiency investments to be repaid through a surcharge on municipal property taxes, such as the “Impuesto sobre Bienes Inmuebles (IBI)” in Spain. Its main advantage lies in the fact that the cost of the improvements is associated with the asset and not with the person, facilitating long repayment terms (10-30 years) and eliminating the need for initial outlay.

5.4 Examples

Pilot in Olot, Spain. The first European pilot of the PACE model was developed between 2019 and 2021 in the city of Olot (Girona), within the framework of the EuroPACE project, co-financed by the European Union through Horizon 2020 (CORDIS, 2021). In this case, the City Council of Olot and GNE Finance created a legal figure equivalent to the “non-tax public patrimonial benefit”, which allowed the reimbursement fees to be collected directly through the property tax.

The HolaDomus platform acted as a one-stop shop for the comprehensive management of the process: technical advice, processing of Next Generation EU grants, supervision of contractors and final validation of results. In two years, the project mobilised more than € 1.87 million in energy rehabilitation, with monthly payments between € 40 and € 500 per home, demonstrating the viability of the model in European urban contexts (EuroPACE Consortium, 2021). Currently, the scheme is being replicated in other municipalities in Girona and is currently being studied in Barcelona.

5.5 On-Bill Financing (OBF)

The On-Bill Financing (OBF) model allows users to reimburse the cost of energy efficiency investments directly through their utility bill (electricity, gas or water). According to the RenOnBill Consortium (2022) and the European Commission (CORDIS, 2024) this system reduces financial and administrative barriers by integrating the payment of the investment into an existing flow, guaranteeing a return based on the savings generated. There are two main modalities: the On-Bill Loan, where the loan is associated with the customer, and the Tariffed On-Bill Financing

(TOBF), where the payment commitment is linked to the supply point, being transferred to the new user in the event of a change of ownership.

Its benefits include eliminating the initial outlay, simplifying payment management, and improving accessibility for vulnerable households. The Regulatory Assistance Project (RAP, 2022) highlights that this model facilitates the participation of tenants and SMEs by decoupling financing from property ownership.

5.5.1 European Example (FBO): RenOnBill Project

Pilots of the RenOnBill project in Italy, Germany, Spain and Lithuania validated on-bill schemes with utilities and financial institutions, and published replicability analyses and enabling conditions (CORDIS, 2024; RenOnBill Consortium, 2022). These pilots demonstrate technical and financial feasibility for deep residential rehabilitation at scale.

5.6 Pay-As-You-Save (PAYS).

The Pay-As-You-Save (PAYS) scheme is based on the principle that the repayment fee should never exceed the energy savings generated. According to the RAP (2022), this "golden rule" ensures that the consumer maintains a positive cash flow from the start, making energy efficiency an investment accessible to all income segments. Unlike conventional loans, the payment obligation is associated with the property or meter, not the user, and is automatically transferred to the new occupant.

The European Union (2024), through Directive EPBD 2024/1275, recognises this mechanism as a key instrument to ensure affordability and consumer protection, especially in contexts of energy poverty.

5.7 Heat-as-a-Service (HaaS)

The Heat-as-a-Service (HaaS) model transforms access to heating into a comprehensive energy service. According to the International Energy Agency (IEA, 2022), the supplier assumes the investment, installation, operation and maintenance of thermal systems (such as heat pumps, biomass or geothermal), while the user pays only for the thermal energy consumed. This model eliminates the need for upfront investment and transfers technical risks to the supplier.

Precisely because the provider assumes all financial and operational risk, the commercial viability of HaaS depends on advanced technology integration. To ensure the efficiency and profitability of the service, digitalization is essential (IEA DHC, 2023).

The use of sensors, the Internet of Things (IoT) and data analytics allows the provider to optimise both district heating networks and demand in buildings in real time, ensuring energy efficiency and facilitating electrification (Danfoss, n.d.). European examples such as Veolia (2023) in France or PAUL Tech AG (n.d.) in Germany show how this

combination of service model and technology makes it possible to move towards decarbonised and affordable heating.

5.7.1 European Examples of Heat-as-a-Service

Veolia (France). District networks and energy contracting with integration of renewables and waste heat. Paris-Saclay case (5GDHC): since 2023 Veolia operates the 5th generation network of the urban campus with deep geothermal and heat recovery from the CNRS supercomputer (Boesten et al., 2019; Veolia, 2023). Lille-Roubaix case (Covalys-Idex): energy recovery from waste with annual production of ~650 GWh and service to ~70,000 households (Veolia, 2017).

PAUL (Germany). Residential heat-as-a-service with heat pumps, PV, buffer and AI control. Building case 1962, 54 dwellings (NRW): from spring 2024, energy class A, -97% CO and -77% primary energy, with HaaS and O&M contracts included (PAUL Tech AG, n.d.).

5.8 Energy leasing

Energy leasing is a financial instrument that allows the use and enjoyment of efficiency equipment (such as solar panels, heat pumps or HVAC systems) in exchange for a periodic fee. According to the European PPP Expertise Centre (EPEC, 2012) and Economidou et al. (2019), this model allows access to clean technologies without initial investment.

Its main accounting advantage lies in the operating leasing (renting) modality, where the contract can be considered an operating expense (OPEX) instead of a debt (CAPEX), without affecting the user's borrowing capacity. This characteristic makes it particularly attractive for public sector entities subject to debt restrictions (EPEC, 2012).

There are two main modalities: operational leasing, where the provider retains ownership and offers maintenance, and financial leasing, which includes a final purchase option (Economidou et al., 2019). In both cases, the fees are usually offset by the energy savings achieved. Companies such as Repsol (n.d.) apply this system in the photovoltaic sector through "solar leasing" models, facilitating the adoption of renewable energies through flexible and tax-advantageous contracts.

5.9 Energy Savings Certificate (EAC) System

The Energy Savings Certificate (EAC) System constitutes the national transposition of a mandate of the European Union, established in the successive Energy Efficiency Directives (EED). In particular, it responds to the obligation imposed on Member States to achieve an annual energy savings quota (European Parliament and Council of the European Union, 2023), which can be met through the creation of energy efficiency obligation schemes (Article 9) or the implementation of alternative measures (Article 10).

At the national level, this market mechanism is regulated through Royal Decree 36/2023, of 24 January, which establishes the framework of the system (Ministry for the Ecological Transition and the Demographic Challenge [MITECO], 2023a). Its purpose is to quantify, verify and monetize final energy savings, configuring the CAE as a negotiable electronic document, in which each unit represents 1 kWh of final energy savings (MITECO, n.d.).

The system serves as a tool for compliance with European energy efficiency obligations, offering an economic alternative to direct contributions to the National Energy Efficiency Fund (FNEE), which acts as the maximum cost of compliance (MITECO, 2023a). The regulation is complemented by implementing regulations, such as Order TED/815/2023, which defines operational procedures (MITECO, 2023b), and Order TED/845/2023, which approves the official catalogue of standardised energy efficiency measures (MITECO, 2023c).

5.9.1 Market structure and participating agents

The demand for CAEs comes from the Obligated Entities (SO) – electricity and natural gas marketing companies, as well as wholesale operators of petroleum products and liquefied petroleum gases (LPG) – who must prove a minimum energy saving quota annually (MITECO, n.d.). These agents can choose between making an economic deposit to the FNEE or acquiring and liquidating CAEs in the market, the latter option being potentially more efficient from an economic point of view (MITECO, 2023a).

For its part, the offer originates from the so-called Owner of Savings, any natural or legal person who has executed an energy efficiency measure (MITECO, n.d.). These owners do not intervene directly in the secondary market but assign their savings rights through a "CAE Agreement", a private contract regulated by Order TED/815/2023 (art. 11), which allows the transfer of the right to save in exchange for economic consideration (MITECO, 2023b).

Delegated Entities (SDs) – accredited entities that act as savings aggregators – channel these agreements and actively participate in the certificate market. The regulations expressly prohibit SD from fulfilling their commitments through contributions to the FNEE, which requires compliance exclusively through the acquisition and liquidation of CAEs (MITECO, 2023a).

5.9.2 Validation, verification and registration

To guarantee the integrity and traceability of the system, each energy efficiency action must be validated by an Energy Savings Verifier, an independent entity accredited by the National Accreditation Entity (ENAC) under the RDE-33 Rev. 3 scheme (National Accreditation Entity, 2025).

The quantification of savings can be carried out through two ways (MITECO, 2023b, 2023c):

- Standardised actions, which apply predefined formulas from the official catalogue of measures (MITECO, 2023c).
- Unique actions, which require a specific measurement and verification methodology approved by MITECO

Once the savings have been verified, the Regional Manager pre-registers the certificate in the regional register, and then the National Coordinator makes the definitive registration in the National Register of CAEs (MITECO, 2023d).

In short, the CAE System turns energy efficiency into a regulated financial asset, structuring a two-tier market:

- A primary market, where savings owners cede their rights through agreements (MITECO, 2023b).
- A secondary market, restricted to Obligated Entities and Delegates, where the certificates issued are negotiated and settled (MITECO, n.d.).

This scheme contributes to mobilising private investment and accelerating compliance with the efficiency and decarbonisation objectives set out in the Integrated National Energy and Climate Plan 2023-2030 (MITECO, 2024), in line with the European regulatory framework for energy efficiency (European Parliament and Council of the European Union, 2023).

5.10 The ETS2 Market

ETS2 is the new European carbon market that extends the emissions trading system to the buildings and road transport sectors, traditionally part of the so-called diffuse sectors. Its creation was agreed in 2023, as part of the Fit for 55 legislative packages. Unlike the original EU ETS (focused on power generation and heavy industry), ETS2 will operate upstream: distributors of building and transport fuels will have to purchase and surrender emission allowances for the CO generated by their products, rather than directly taxing end-users (European Commission, 2023b; European Parliament and Council, 2023). This new cap-and-trade regime sets a decreasing emissions ceiling from 2027, designed to achieve a 42– 43% reduction in emissions from these sectors by 2030 compared to 2005 (European Commission, 2023b; European Parliament and Council, 2023). All ETS2 emission allowances will be allocated through auctions (without free distribution), reinforcing its nature as an economic instrument: a carbon cost is internalised in fossil fuels for buildings and transport, to progressively make the most emitting options more expensive and incentivise investment in clean alternatives (European Environment Agency, 2025).

According to the European Commission, the carbon price set by ETS2 will act as a market signal that will boost investments in energy retrofitting of buildings and low-emission mobility (European Commission, 2023b).

From an economic-regulatory perspective, ETS2 complements the energy efficiency and decarbonisation standards of the building stock (e.g. the Energy Efficiency Directive or the EPBD) through a direct financial incentive: insulation improvements, modernisation of HVAC systems or switching to renewable energy in buildings will be more cost-effective decisions to the extent that they avoid rising costs due to the CO emissions (European Environment Agency, 2025).

A few ex-ante analyses suggest that, in the absence of ambitious complementary policies, the carbon price in the ETS2 could rise significantly to meet the reduction targets. For example, modelling with a general equilibrium and energy systems approach projects that the price per tonne of CO in 2030 could be between ~€ 70 and more than € 250 depending on the intensity of the energy efficiency measures adopted, even reaching.

At levels in the order of € 200– 300 /t in scenarios of lower prior mitigation (Rickels et al., 2023; Günther et al., 2024). These estimates, although uncertain, show the potential economic impact of ETS2: on the one hand, they highlight the strong signal that agents would receive to undertake in-depth rehabilitations (avoiding paying increasingly expensive fees); on the other, they highlight the need to combine the carbon market with additional standards and incentives to contain the aggregate costs of the transition. In fact, the regulatory design of the ETS2 incorporates stability and equity mechanisms aimed at ensuring progressive implementation: during the first years of operation (2027– 2030) additional auctions of rights and market stability reserves will be activated to avoid excessive volatility, including the automatic release of rights if the price exceeds € 45 (in 2020 euros) on a sustained basis (European Parliament and Council, 2023). A possible delay in the entry into force of the system (until 2028) is also foreseen if wholesale energy prices at the end of 2026 are exceptionally high, in order not to aggravate adverse socio-economic situations (European Parliament and Council, 2023).

A central pillar of the ETS2 architecture is the mobilization of resources for the rehabilitation and protection of the vulnerable. Legislation obliges Member States to allocate the proceeds from ETS2 auctions entirely to climate and social actions linked to the energy transition of buildings and transport (European Commission, 2023b; European Parliament and Council, 2023). In particular, the Social Climate Fund (SCF) has been created with a maximum allocation of € 65 billion from ETS2 auctions (together with 25% national co-financing), aimed at financing measures to mitigate the impact of carbon on vulnerable households and micro-enterprises (European Environment Agency, 2025; Ministry for the Ecological Transition and the Demographic Challenge [MITECO], 2025). Eligible actions include investments in energy rehabilitation of homes, emission-free heating and cooling systems (heat pumps, solar thermal, etc.), and direct aid programmes that reduce the energy bills of the most exposed consumers (MITECO, 2025). This approach involves feeding back into the carbon market itself in financing for the renovation of the building stock: the environmental cost imposed on fossil fuels is partly recycled as subsidies and support

to accelerate the transition to low-carbon buildings, thus reinforcing the virtuous investment-emission reduction circle. According to the European Environment Agency, from 2027 ETS2 will add an explicit price to the carbon emitted by buildings, which will incentivise the shift towards renewable energies and efficiency improvements in the residential and tertiary sector, while a fraction of its revenues will be redistributed via the Social Fund to co-finance these same improvements to the neediest groups (European Environment Agency, 2025).

In the context of Spain, ETS2 is seen as an important catalyst to achieve the decarbonisation goals of the national building stock, as well as a complementary source of financing for rehabilitation. Spain has supported the implementation of this market and is already preparing its Social Climate Plan (Plan Social para el Clima, PSpC), which will articulate the use of SCF resources in the country. According to MITECO (2025), Spain will receive approximately 10.5% of the European SCF funds between 2026 and 2032, which, added to national co-financing, means around 9,000 million euros to invest in improving the energy efficiency of buildings, the implementation of clean heating and cooling and sustainable mobility accessible to vulnerable populations. These figures, equivalent to a substantial part of the public investment in renovation planned for this decade, reflect the financial dimension of ETS2 as a lever for change: not only does it make carbon-intensive technologies more expensive, but it also provides resources for member countries to scale up building renovation programs aimed at reducing emissions and combating energy poverty (MITECO 2025). In short, the ETS2 market is configured as a dual instrument – regulatory and economic – that reinforces the viability of investments in energy rehabilitation. By placing an increasing price on the carbon associated with buildings, it creates a direct incentive to invest in building renovation and achieve climate goals; simultaneously, by channelling its revenues into national funds and plans, it financially underpins the rehabilitation policies necessary for a just transition, particularly in countries such as Spain with a significant challenge of improving the efficiency of their buildings. This marriage between price signal and budgetary support makes ETS2 a key element – even before financial instruments such as green bonds – to align capital flows with the decarbonisation of the built environment between now and 2050, accelerating the rate of deep rehabilitation and ensuring that the reduction of emissions in the building sector is achieved in a cost-effective and socially balanced way (European Environment Agency, 2025; European Commission, 2023b).

5.11 Institutional and market financing (macro/equity)

In parallel to the retail instruments described, the financing of energy retrofitting is also supported by institutional-scale mechanisms, capable of mobilising capital through financial markets. The EPBD Directive and Regulation (EU) 2023/2631, which establishes the European Green Bond Standard (EuGBS), promote this convergence between retail credit and market finance.

The European green bond market has experienced exponential growth over the past decade. According to the European Investment Bank's European Green Bond Report 2025 (EIB, 2025), global green bond issuance exceeded € 1.7 trillion in 2024, with an annual increase of 20%. Within this volume, the building sector represents about 14% of the projects financed, with energy rehabilitation and efficiency in public and residential buildings being the main destinations of capital.

5.11.1 Green bonds and their role in financing rehabilitation

Green bonds are debt instruments whose proceeds are used exclusively to finance or refinance projects with verifiable environmental benefits. In the field of energy rehabilitation these bonds allow the aggregation of projects to improve the energy performance of both public and private buildings. Issuances are usually structured around national or regional programmes, in which public banks, such as the European Investment Bank (EIB), the Official Credit Institute (ICO) or the German KfW, play a catalytic role. These bodies not only issue green bonds to directly finance rehabilitation programmes but also act as guarantors or co-investors in issuances by subnational and private entities. According to the EIB (2025), about 35% of the institution's green bond issuances in 2024 went to energy efficiency and building renovation projects.

5.11.2 Main actors and types of broadcasts

Green bond issuances fall into three broad categories:

1. Sovereign and Supranational Issuers. This category includes international organisations and state entities, whose role is crucial in financing the energy transition:
 - Scope: The regulation sets out a uniform set of requirements for bonds issued by sovereign issuers wishing to use the designation 'EuGB' (European Parliament and Council, 2023, para. 7).
 - Supranational Institutions: The European Investment Bank (EIB) is a "leading global issuer of green bonds" and is committed to gradually aligning its programme with the European green bond standard (European Parliament and Council, 2023, para. 20).
 - Use of Funds: Sovereign issuers can allocate the proceeds of EuGBs to finance public expenditures such as grants or current transfers that meet the requirements of the Taxonomy (European Parliament and Council, 2023, paras. 51, 55).
2. Subnational Issuers (Regional and Municipal). Subnational entities are recognized as key issuers within the sovereign category and are essential for local impact:

- Definition: The category of sovereign issuers eligible to issue uVEBs includes a regional or municipal entity (European Parliament and Council, 2023, para. 51).
 - Use of Funds: These issuers may allocate the proceeds of their bonds to finance public assets or expenditures (such as grants) to the extent that such activities comply with the requirements of the Taxonomy (European Parliament and Council, 2023, para. 51,55).
3. Corporate Issuers and Real Estate Entities. This category covers private sector companies seeking financing for their sustainable and transition activities:
- Scope: Financial and non-financial companies can emit environmentally bonuses sustainable emissions (European Parliament and Council, 2023, para. 7).
 - Real Estate: The real estate sector, construction, and administrative and support activities are economic activities evaluated in the Taxonomy. Taxonomy-aligned Capital Expenditure (CapEx) in relevant sectors was € 41 billion in 2023 (EU Platform on Sustainable Finance, 2025)
 - Use of Corporate Funds: The revenues of EuGBs should be allocated to fixed assets (tangible or intangible), capital expenditures (CapEx) and operating or financial assets related to economic activities that meet the requirements of the Taxonomy (European Parliament and Council, 2023, para. 9– 10). The report by the Green Building Council Spain (GBCE, 2025) points out that green bonds in the Spanish real estate sector mobilised more than 4,200 million euros between 2020 and 2024, mainly focused on the rehabilitation of offices and residential buildings to achieve energy efficiency levels A or B. These instruments have attracted institutional investors interested in sustainable assets and have reduced the average cost of financing for issuing companies by around 30 basis points.

5.11.3 Examples

- a) **Green bond issuance by MERLIN Properties** (Spain, 2024): In 2024, MERLIN Properties issued a € 650 million green bond maturing in 2032, aimed at financing the energy renovation of its portfolio of office buildings and logistics centres. The company's green framework was reviewed by Sustainalytics and declared aligned with the EU Taxonomy and the EuGBS. The funds went towards the improvement of HVAC systems, installation of photovoltaic panels,

replacement of LED luminaires and BREEAM or LEED certification on all assets. According to the company's annual report, the financed projects led to a reduction in operational emissions by 47% and energy consumption by 35% compared to the 2019 baseline (MERLIN Properties, 2025).

- b) **EIB-UCI Green Bonds for rehabilitation** (Prado VIII) A concrete example of financing renovation is the joint operation of the European Investment Bank (EIB) and the Real Estate Credit Union (UCI). In 2021, the EIB supported UCI's first green bond securitisation (RMBS), called Prado VIII, aimed at financing the energy rehabilitation of residential buildings in Spain and Portugal (EIB, 2021).

6. Public aid for the energy renovation of buildings, Regional differences

GENERAL FRAMEWORK: RECOVERY PLAN, TRANSFORMATIONY RESILIENCE. COMPONENT 2 (Presidency of the Government, 2023).

The main impetus for energy rehabilitation at the state level is integrated into Component 2 of the Housing Rehabilitation and Urban Regeneration Plan, managed by the Ministry of Housing and Urban Agenda in coordination with the Autonomous Communities. This component is mainly regulated by Royal Decree (Royal Decree 853/2021, 2021).

6.1 Objectives

Component 2 has, in line with the Renovation Wave, the European Pillar of Social Rights and the United Nations Sustainable Development Goals, a double objective: on the one hand, to activate a rehabilitation sector in Spain that allows decarbonisation and improves the quality and comfort of the building stock; on the other, to promote the construction of a stock of social rental housing that is currently insufficient and that is urgently needed to respond to the needs of decent and affordable housing of the most vulnerable population in order to make society more resilient and guarantee a fairer and more inclusive recovery.

In the field of rehabilitation, the objective is to produce a substantial increase in the rate of renovation of the built stock with models that, due to their technical and financial feasibility, can be sustained in the medium and long term. In this way, it would be possible to advance the fulfilment of the objectives of the National Integrated Energy and Climate Plan (PNIEC), within the framework of the Long-Term Strategy for Energy Rehabilitation in the Building Sector in Spain (ERESEE). Likewise, the renovation of the housing stock and buildings is committed to comprehensive approaches, so that the improvement of energy efficiency and the integration of renewable energy sources

is accompanied by an improvement in habitability, accessibility, conservation, improvement of the safety of use and the digitalisation of buildings.

6.2 Investment

The total estimated investment in millions of euros, including other sources of financing other than the recovery and resilience mechanism is 15,367 million euros. The investment of the component under the recovery and resilience mechanism is 10,820 million euros. The accrual of the planned investment, in millions of euros, is shown in the following figure.

As can be seen, the planned investment for the last two years is 1,800 million euros, which are included in the C02I07 programme, as can be seen in the following table

C02.I01	Rehabilitation programme for economic and social recovery in residential areas: €3.42 billion.							
Phasing	2020	2021	2022	2023	2024	2025	2026	Total
Cost of the mechanism	0	1151	1389	880	0	0	0	3420
C02.I03	Energy Rehabilitation Programme for Buildings (PREE): €300 million.							
Cost of the mechanism	300	0	0	0	0	0	0	300
C02.I07	List of ICO loans to support social housing: €4 billion.							
Cost of the mechanism				1100	1100	1100	700	4000

6.3 Programmes

The following diagram shows the programmes of component 2 of the Recovery, Transformation and Resilience Plan that are related to energy efficiency rehabilitation.

A) C02. I01 REHABILITATION PROGRAMME FOR THE ECONOMIC AND SOCIAL RECOVERY OF RESIDENTIAL ENVIRONMENTS (€ 3420 M). The investment is articulated in three lines of action:

Line of action 1: Programme of rehabilitation actions at neighbourhood level (€ 976 million, €856 million for the renovation of the energy efficiency of existing buildings, € 120 million for the regeneration of the physical environment).

This Programme is aimed, through subsidies and the application of other support instruments, at promoting large-scale rehabilitation, regeneration and urban renewal operations, in neighbourhoods or areas delimited according to their income level, favouring the development of actions to improve the energy efficiency of the building that are part of a comprehensive rehabilitation approach. that it attends to

conservation, safety and sustainability and, among other aspects, that addresses actions of:

- a) Rehabilitation of the building envelope (facades and roofs).
- b) Use of renewable energies in thermal heating, cooling, ventilation and domestic hot water installations.
- c) Implementation of technologies for the generation of electricity from renewable sources in the building.
- d) Improvement of the energy efficiency of common areas in the refurbished buildings.
- e) Deployment of infrastructures associated with electric mobility.
- f) Digitisation actions.
- g) Improvement of the conditions of habitability and accessibility of the building.
- h) Conservation and removal of asbestos.

Cost estimate (Presidency of the Government, 2023, p.88):

- Rehabilitation of residential buildings in neighbourhoods € 800,000,000
- Number of dwellings subject to renovation 40,000•
- Average funding rate 80%
- Complementary urban regeneration actions € 120,000,000
- Number of dwellings subject to reference refurbishment actions 40,000
- Average funding rate: 80%

In building renovation actions, it will be ensured that an average percentage reduction in non-renewable primary energy consumption of more than 30% will be achieved, accredited through the energy efficiency certificate. To this end, a reduction in the consumption of non-renewable primary energy, referred to the energy certification, of at least 30%, or the improvement of the building's energy rating to obtain an energy class "A" or "B", on the same rating scale, will be established as a requirement to access the subsidy.

Line of action 2: Comprehensive building rehabilitation programme (1994 M€). It will be developed through the subsidy of energy efficiency renovation actions that promote the comprehensive rehabilitation of buildings of predominantly residential use, including the improvement of energy efficiency and the implementation of renewable energies that improve sustainability, as well as the promotion of

conservation, improvement of safety of use and digitalization in homes. prioritising action on complete buildings of collective residential typology. Among others, the following actions will be supported:

- a) Rehabilitation of the building envelope (facades and roofs).
- b) Use of renewable energies in thermal heating, cooling, ventilation and domestic hot water
- c) installations.
- d) Implementation of technologies for the generation of electricity from renewable sources in
- e) the building.
- f) Improvement of the energy efficiency of common areas in the refurbished buildings.
- g) Deployment of infrastructures associated with electric mobility.
- h) Digitisation actions.
- i) Improvement of the conditions of habitability and accessibility of the building.
- j) Conservation: removal of asbestos

Cost estimation (Presidency of the Government, 2023, p.89)

- Rehabilitation of residential buildings: 1.496.250.000 €
- Number of dwellings subject to renovation actions 1154,320
- Average funding rate: 70%

Renovation of construction elements in homes: 220.000.000 €

- Number of dwellings subject to renovation of construction elements: 74,422
- Average percentage of funding: 40%

Promotion of the "Book of the existing building" and digitalisation € 277,750,000

- Number of buildings with building book: 68,379
- Number of buildings with a refurbishment project: 13953
- Average reference cost Book of the existing building: 1587.34 euros
- Average reference cost of the renovation project: 15634.94 euros

- Average funding rate: 85%

In building renovation actions, it will be ensured that an average percentage reduction in non-renewable primary energy consumption of more than 30% will be achieved, accredited through the energy efficiency certificate. To this end, a reduction in the consumption of non-renewable primary energy, referred to the energy certification, of at least 30%, or the improvement of the building's energy rating to obtain an energy class "A" or "B", on the same rating scale, will be established as a requirement to access the subsidy.

The savings generated, depending on the depth of the rehabilitation and the level of income of the residents of the building, will determine the level of aid, which in turn will depend on the type of action. In general terms, three schemes are identified: those large-scale actions where energy savings are sufficient to finance the action in a reasonable period, in which the subsidy would cover the part of the investment that fails to finance energy savings (between 35% and 50% of the total investment); medium actions where a longer period of recovery of the investment reduces its attractiveness, the subsidy would be increased to shorten the recovery time (between 50% and 70% of the total investment); and, finally, in actions involving energy poverty or low-income families, the subsidy would increase to finance between 70% and 100% of the intervention.

Through this program, it will be possible to finance, independently of the development of the rehabilitation action, the preparation of the "Book of the existing building". Likewise, the development of technical rehabilitation projects that facilitate decision-making and can serve as a basis for the granting of aid, contributing to the digitalisation of the sector, may also be financed independently of the development of the rehabilitation action when circumstances so advise.

Line of action 3: Creation of a favourable environment for activity (€ 450 million).

Improving taxation

Considering that the rehabilitation of residential buildings must be carried out mostly by individuals, who make improvements to their own homes, a significant deduction will be established in Personal Income Tax of the amounts invested in the rehabilitation works to improve energy efficiency at the home level and at the building level.

The personal income tax deduction is structured in two components:

- Deduction for works that contribute to the improvement of the energy efficiency of the MAIN RESIDENCE, applicable to individuals who carry out certain works in their main residence or in a home owned by them, leased as their main residence, which contribute to the improvement of energy efficiency by reducing the heating and cooling demand of the home by 7% (comparable to a replacement of windows with a high-performance one), or a 30% reduction in

the consumption of non-renewable primary energy, creditable in both cases through the energy efficiency certificate.

- Deduction for renovation works that contribute to the improvement of energy efficiency in BUILDINGS of predominantly residential use, applicable to amounts paid by natural persons who own a home, conditional on a reduction in the consumption of non-renewable primary energy, referred to the energy certification, of at least 30%, or the improvement of the building's energy rating to obtain an "A" or "B" energy class, on the same rating scale.

Improving the financing framework:

- To encourage the application of public-private collaboration formulas that serve to facilitate the financing of investments, incorporating, where appropriate, increases in urban use.
- Promote "turnkey" models that allow both public and private funding for rehabilitation actions to be managed.
- Progress will be made in the implementation of a line of ICO guarantees to guarantee credits for the energy rehabilitation of buildings.
- Regulatory modifications will be made to the Horizontal Property Law, to strengthen legal certainty in the granting of loans to communities of owners.
- The development of green financing will be stimulated in collaboration with banks, thus contributing to the promotion and verification of actions.

B) C02. I03 ENERGY REHABILITATION OF BUILDINGS PROGRAM (PREE): Among the novelties of the PREE with respect to its predecessors, the following stand out:

- Investments linked to fossil fuels are not eligible (in thermal installations, only renewable installations are eligible).
- Increase in the intensity of aid for Energy Communities, promoting social participation in decision-making in efficiency.
- Possibility of anticipating the aid (conditional on effective subsequent implementation) before the investment is carried out, facilitating liquidity and the rapid activation of investments.
- On the contrary, previous programmes included the possibility of supplementing non-repayable aid with loans. The new PREE program dispenses with the loan part, as it has been proven that there are accessible financial products that facilitate this financing.

- Territorialised management, in line with the Spanish competence framework, which also facilitates a more agile management of the files once they have been submitted.

C) C02. I07 ICO LOAN LINE FOR THE IMULSO OF SOCIAL HOUSING: The actions subject to financing will be aimed at increasing the stock of housing for social rent or at an affordable price, as well as improving the existing stock of social housing:

Through the refurbishment of existing buildings in which an improvement in energy efficiency is accredited, establishing a reduction of at least 30% in the building's non-renewable primary energy consumption (complying with the requirements of intervention field 025 bis "Renovation of the energy efficiency of existing buildings, demonstration projects and support measures in accordance with energy efficiency criteria").

The loan may cover the purchase of land or real estate by public or private operators who are going to promote the construction or rehabilitation, in addition to all the expenses necessary for the development of the actions, as well as the management and administration costs of the loan line, which will be associated with the 77 fields of intervention indicated above depending on the actions subject to financing.

The investment will be applied to:

- 1) FINANCING OF BUILDING REHABILITATION ACTIONS,** which are going to be used for social or affordable renting, both in publicly owned and privately owned properties. Financing for the development of these operations must be granted before the 30 June 2026, and the actions may be carried out within four years of the formalisation of the loan (with the possibility of extension based on objective reasons of another two years). This line may specifically include the financing of rehabilitation actions of the public housing stock owned by the Autonomous Communities and Local Entities, or their dependent entities.
- 2) DEDUCTIONS FOR ENERGY REHABILITATION WORKS INCOME TAX CAMPAIGN 2024:** Citizens can benefit from two tax deductions in housing for rental income and for energy renovation works the deductions applicable to the energy rehabilitation of homes can reach up to 60% of the total cost of the works if they prove an improvement in energy efficiency.

Tax incentives for the energy rehabilitation of homes:

Citizens can benefit from different deductions in Personal Income Tax (IRPF) for works to improve energy efficiency in homes that are applied to the amounts invested in renovation works, if they contribute to achieving certain improvements in the energy efficiency of the main residence and in residential buildings. accredited through an

energy efficiency certificate. The deductions apply in the case of works completed before December 31, 2024, and are as follows:

- Deduction of 20% for actions that reduce the demand for heating and cooling in a primary residence or any other property by 7%, if it was leased or with expectations of renting it as a home, and with the obligation to sign said contract before 31 December 2025. Up to € 5,000 per year. (Application up to 31/12/2024).
- Deduction of 40% for actions that reduce the consumption of non-renewable primary energy by 30%, or improve the energy rating by reaching the letters "A" or "B" in a primary residence or any other property, provided that it was leased or with expectations of renting it as a home, and with the obligation to sign said contract before December 31, 2025. Up to € 7,500 per year. (Application 31/12/2024)
- Deduction of 60% for actions that reduce the consumption of non-renewable primary energy by 30% or improve the rating by reaching the letters "A" or "B" in residential buildings. Its application period ends on December 31, 2025. Up to 15,000 euros, and up to 5,000 euros each year. (Application until 31/12/2025)

3) INCENTIVES FOR SELF-CONSUMPTION IN THE IBI 67% of Spanish municipalities have tax ordinances that apply discounts on the annual quota of the Property Tax (IBI) for self-consumption installations. 32% impose restrictive requirements.

4) BONUSES IN THE ICIO: The Tax on Constructions, Installations and Works (ICIO) is subsidized by 65% of the municipalities in Spain:

- a. 91% of the ordinances contemplate affordable conditions.
- b. 6% are restrictive.
- c. 3% are very restrictive.

This makes the ICIO one of the most accessible taxes to promote renewable self-consumption.

5) TAX ADVANTAGES IN THE IAE: Only 26% of municipalities offer discounts for self-consumption. Of these, 77% have affordable requirements. 19% establish restrictive conditions. 4% are very restrictive. Although they are still in the minority, more municipalities are beginning to include the IAE in their strategies to support self-consumption.

6) ICO GREEN RECOVERY AND RESILIENCE MECHANISM (MRR) LINE (Instituto de Crédito Oficial, (2024) This line is one of the financing instruments deployed

by ICO in the second phase of the Recovery, Transformation and Resilience Plan to channel financing from the Next Generation EU Funds.

The Line will provide loans for the implementation of viable and sustainable investment projects by the private sector, with a special focus on the self-employed and SMEs. It aims to contribute to boosting the transition to a climate-neutral economy in the areas of energy efficiency, renewable energy production, sustainable transport and industrial decarbonisation.

Who can apply for this funding: Households, understood as individuals who do not apply for financing for the exercise of an economic activity.

Eligible concepts: By way of example, solar panel installations, machinery renovations, renovations of buildings or facilities that improve energy efficiency, acquisition of electric vehicles and installation of charging points, etc., will be financed.

Maximum amount: Up to 100% of the costs of the investment project (excluding VAT or similar tax).

Operation modality: The financing will be formalized under the modality of loan or leasing.

Repayment period and grace period:

1 year without grace period or with a one-year grace period on principal.

2 to 6 years without a grace period for principal or with a one-year grace period for principal.

7 to 9 years without a grace period for principal or with a 1 or 2 year grace period for principal.

10 to 20 years with a 1, 2 or 3-year grace period

Loan interest rate and Maximum APR

The Annual Percentage Rate (APR) applicable to the transaction will be made up of the cost of the initial fee applied by the Financial Institution plus the interest rate. The APR may not exceed the following limits:

For forward transactions equal to 1 year: fixed or variable rate plus up to a margin of 2.30%.

For forward operations of 2, 3 or 4 years: fixed or variable rate plus up to a margin of 4.00%.

For transactions with a term equal to or greater than 5 years: fixed or variable rate plus up to a margin of 4.30%.

Validity: Transactions may be requested at the Financial Institution until 1 June 2026 and formalised until 31 August 2026.

7) ICO HOUSING AND URBAN AND RURAL REGENERATION PROGRAM (Instituto de Crédito Oficial, (2025))

The objective of the Program is to increase the stock of housing for social or affordable rent; improving the energy efficiency, decarbonisation and sustainability of homes; conservation and improvement of accessibility in and to housing; and the regeneration and renovation of urban and rural spaces.

Eligible items: Acquisition and promotion of newly built homes to be used for rental or transfer in use; rehabilitation of buildings not currently intended for housing to be used for rent or transfer in use; improving energy efficiency, decarbonisation and sustainability of homes; conservation and improvement of accessibility in and to housing; and urban and rural regeneration and renewal.

Minimum amount: € 750,000.

Modality: loan.

Interest rate: The ICO will operate under market conditions, in accordance with the provisions of Circular BE 4/2017.

Depreciation and grace period: Operations will preferably be formalised in the medium and long term.

Validity: until December 31, 2025.

8) ICO MIVAU REHABILITATION OF RESIDENTIAL BUILDINGS (Instituto de Crédito Oficial, (2022)).

Intended for owners or communities of owners who undertake renovation works on residential buildings located in national territory and who have received aid from the Autonomous Communities or the Cities of Ceuta and Melilla in which the building is located.

Maximum amount up to 30,000 euros

It finances rehabilitation works or actions to improve residential buildings in which an energy improvement is achieved.

Guaranteed loan modality: Repayment period from 1 to 15 years with the possibility of up to 2 years grace period depending on the term

Validity, application until 30/11/2025

9) STATE IN THE AUTONOMOUS COMMUNITIES

Next, the information available in the Spanish autonomous communities is analysed; to obtain information on the programs they have available for actions in the field of energy rehabilitation

ANDALUSIA

Incentives for the efficient use of energy in Andalusia (INEA). The Andalusia ERDF Programme 2021-2027 is the main planning instrument for the actions that the Regional Government of Andalusia is going to finance with the support of the European Regional Development Fund, and whose objectives and priorities include those aimed at contributing to a clean energy transition and strengthening sustainable growth.

Through this programme, the Andalusian Energy Agency will make available to citizens, the self-employed, SMEs and large companies, local public entities and the third sector, as well as energy communities, the Incentives for the efficient use of energy in Andalusia (INEA).

With a budget of 160.2 million euros, financed by the Andalusia ERDF Programme 2021-2027, it includes four programmes depending on their recipients and actions to be financed: Residential sector and public buildings and facilities, Business sector and agri-food chain, Smart networks and systems and Vulnerable households.

Programme I. Residential sector and public buildings and facilities, with a budget of 92.9 million euros in aid.

- Type 1.1.- Energy efficiency in homes and residential buildings.
- Type 1.2.- Energy efficiency in buildings, facilities and public infrastructures.
- Type 1.3.-Renewable energies in homes and private residential buildings
- Type 1.4.-Renewable energies in public facilities and infrastructures and non-residential buildings

Program 4. Vulnerable households, with a budget of 10 million euros in aid

- Type 4.1- Energy rehabilitation of homes.
- Type 4.2.- Photovoltaic self-consumption with and without storage Annex II (Order 24/2025, 2025, p. 68) lists the actions and incentives.

ARAGON

Aid for residential rehabilitation for the improvement of energy efficiency (RTRP) – Additional aid for the rehabilitation of homes due to situations of economic vulnerability. Deadline until 31/12/2025

ASTURIAS

AYUD0421T02 - Aid for renovation at building level from the Recovery, Transformation and Resilience Plan (RRF). Out of time from 22/11/2024 to 02/07/2025

CANARY ISLANDS

Subsidies for the improvement of energy efficiency and the use of renewable energies in companies and residential buildings, co-financed with ERDF within the scope of the Canary Islands Operational Programme. Deadline for submission Out of time.

CANTABRIA

European PRTR Funds - Grants for actions in the field of Residential Rehabilitation: Programme 1, 2, 3, 4 and 5 (Call closed)

CASTILLA LA MANCHA

Rehabilitation and improvement of energy efficiency in homes and CLM residential buildings - FEDER. From 14/08/2025 to 30/10/2025

CASTILLA LEON

Subsidies from the aid programme for renovation actions at building level (Year 2022). Out of time, from 8 July 2022 to 30 December 2023 Subsidies from the aid programme for actions to improve energy efficiency in homes (Year 2022). Out of time, from 8 July 2022 to 30 December 2023.

CATALONIA

ICAEN: Programme of aid for the energy rehabilitation of buildings– PREE. Out of time, application period ended ANNOUNCEMENT on the call for the award, under a non-competitive public competition regime, of subsidies under Regulation (EU) 2021/241 of the European Parliament and of the Council, of 12 February 2021, of the Recovery, Transformation and Resilience Plan, funded by the European Union - NextGenerationEU, for the actions of the renovation at the level of single-family and multi-family residential buildings, the Programme of actions to improve energy efficiency in housing and the Programme for the preparation of the existing building book for the rehabilitation and drafting of renovation projects (ref. BDNS 632786). After the deadline, until June 30, 2023.

CALL FOR THE GRANTING OF GRANTS IN THE FIELD OF RESIDENTIAL RENOVATION UNDER REGULATION (EU) 2021/241 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL 2 FEBRUARY 2021 OF THE RECOVERY, TRANSFORMATION AND RESILIENCE PLAN, FUNDED BY THE EUROPEAN UNION-NEXTGENERATION EU FOR THE MUNICIPALITIES THAT MAKE UP THE METROPOLITAN AREA OF BARCELONA UNDER A NON-COMPETITIVE COMPETITION REGIME. The deadline for submitting applications

for all programmes begins the day after publication in the Official Gazette of the Province of Barcelona and ends on 30 June 2026, inclusive. However, this period may be extended by resolution of the General Director of the Consortium.

- a) Aid programme for rehabilitation actions at BARRIO level.
- b) Aid programme for renovation actions at BUILDING level.
- c) Program Help them Performances of Millionaire of Efficiency Energy in HOUSEHOLDS:

c.5. Amount of the aid: The amounts of the aid are those set out in article 44 of the regulatory bases (Royal Decree 853/2021, 2021, p.122170).

Article 44. Amount of aid.

- 1. The minimum cost of the action must be equal to or greater than 1,000 euros per dwelling.
- 2. The amount of the subsidy will be 40% of the cost of the action, with a limit of € 3,000.

Eligible costs are not those corresponding to licenses, fees, taxes or taxes. However, VAT or the equivalent indirect tax may be considered eligible if they cannot be subject to recovery or total compensation or partial

The cost of these actions corresponds to intervention field 025bis "Renovation of the energy efficiency of existing buildings, demonstration projects and support measures in accordance with energy efficiency criteria" of Annex VI to Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021.

COMMUNITY OF MADRID

Recovery, Transformation and Resilience Plan - Programmes 3, 4 and 5. Deadline for applications for Programs 3, 4 and 5 A fifth increase of the credit has been made for an amount of 19,230,100.00 euros for the Programme of aid for rehabilitation actions at building level (programme 3), which brings the total budget to 237,499,303.25 euros for this programme.

These funds will be used to meet applications already submitted, so a new application period is not opened Aid for the rehabilitation of residential buildings of the Recovery, Transformation and Resilience Plan Royal Decree 853/2021, of 5 October - Programme 3 Deadline closed, from 01/06/2022 to 30/06/2023 Subsidies Plan Rehabilita Madrid 2025. Out of time 04/06/2025 to 31/07/2025.

COMMUNITY OF VALENCIA

Aid for renovation actions at building level, within the framework of the Recovery,

Transformation and Resilience Plan (Next Generation EU Aid). Call 2024-2026. Open period from 23-01-2025 to 27-02-2026.

The following figure shows a diagram showing the main magnitudes of this aid programme.

Eligible actions

Eligible actions are those for the improvement or rehabilitation of buildings for predominantly residential use for housing with the maximum eligible investment limits established in the following base, provided that a reduction of at least 30% is obtained in the indicator of non-renewable primary energy consumption, which must be accredited by the corresponding energy efficiency certificate.

In addition, in buildings located in climate zones C, D and E, according to the climate classification established by the Technical Building Code (Ministry of Housing and Urban Agenda, 2019) or by the Recognised Document CTE-DR/056/22 (Ministry of Housing and Urban Agenda, 2022), a reduction in the overall annual energy demand for heating and cooling of the single-family home or building must be obtained. as applicable, of at least:

- Climate zones D and E: 35%
- Climate zone C: 25%

Eligible expenditure

In addition to the cost of the works, the management inherent to the development of the action and the associated expenses, the fees of the professionals involved, the cost of drafting the projects, technical reports and necessary certificates, the expenses derived from the administrative processing, and other similar general expenses, may be part of the eligible expenditure of the action. if all of them are duly justified. Eligible expenditure is not considered to be expenditure corresponding to licences, fees, taxes or levies, or financial expenses and interest receivables and other financial expenses, except for interest subsidies or guarantee fee subsidies included in the aid regions and the exceptions provided for in the rest of the financial instruments.

However, VAT may be considered eligible if it can be recovered or it can't be compensated in whole or in part.

Amount of aid

- a) Objective aid

Depending on the savings in non-renewable primary energy consumption achieved through the action, the percentage of the aid to be granted will be:-

- Between 30% and 45%: the maximum percentage of the subsidy will be 40%

- Between 45% and 60%: the maximum percentage of the subsidy will be 65%
 - More than 60%: the maximum percentage of the subsidy will be 80% The maximum amount of housing aid is as follows:
 - Between 30% and 45%: € 6,300 per home and € 56/m2 for commercial premises
 - Between 45% and 60%: € 11,600 per home and € 104/m2 for commercial premises
 - More than 60%: € 18,800 per home and € 168/m2 for commercial premises
- b) Complementary aid: Personnel due to vulnerability (Requested independently step and in person). (These grants have their own procedure). When situations of economic vulnerability are identified in any of the cohabitation units that own or use the dwellings included in the building subject to rehabilitation, or tenants, and provided that they are in charge of the execution of the works and the ultimate beneficiary is registered in the dwelling, in accordance with base 17 of this resolution, Exclusively for the cohabitation unit of the affected dwelling, you may obtain personal aid in addition to the previous one, up to a maximum of 100%, not exceeding the amounts indicated in the following table, distinguishing between dwellings in multi-family and single-family buildings:
- Between 30% and 45%: € 15,750 or € 20,250
 - Between 45% and 60%: € 17,846 or € 22,308
 - More than 60%: € 23,500 or € 26,750

Aid for actions to improve energy efficiency in homes, within the framework of the Recovery,

Transformation and Resilience Plan (Next Generation EU Aid). Call 2024-2026. Deadline from 23-01-2025 to 27-02-2026

The following figure shows a diagram showing the main magnitudes of this aid programme.

Eligible actions

In the event that Aid for the Improvement of Energy Efficiency in Housing is requested, eligible actions are those that are carried out in homes and in which at least one of the following criteria is achieved:

- Either a reduction in overall annual energy demand for heating or cooling of at least 7%.
- A reduction in the consumption of non-renewable primary energy of at least 30%.

If Aid is requested for the Modification or replacement of construction elements of the Thermal Envelope, actions that meet each one of the following criteria will be considered eligible:

- a) The action must consist of a modification or replacement of the construction elements of the thermal envelope.
- b) The purpose of the action must be to adapt its characteristics to the limit values of thermal transmittance and air permeability where applicable, established in tables 3.1.1.a-HE1 and 3.1.3.a-HE1, of the Basic Document DB HE on Energy Saving of the Technical Building Code (Ministry of Housing and Urban Agenda, 2019).

Negative values in savings and reductions included in the section "Building subject to the actions for which the aid is requested" of the aid application form may not be accepted.

Eligible Expenditure

In addition to the cost of the works, the management inherent to the development of the action and the associated expenses, the fees of the professionals involved, the cost of drafting the projects, technical reports and necessary certificates, the expenses derived from the administrative processing, and other similar general expenses, may be part of the eligible cost of the action. if all of them are duly justified. Eligible costs are not those corresponding to licences, fees, taxes or levies or financial expenses and interest owed and other financial expenses, except for interest subsidies or guarantee fee bonuses included in the aid regions and the exceptions provided for in the rest of the financial instruments. However, VAT may be considered eligible if it cannot be fully or partially recovered or compensated.

Amount of aid

The Grants for the Improvement of the Energy Efficiency of Housing and the Grants for the Modification or Replacement of Construction Elements of the Thermal Envelope, corresponding to Program 4, will be calculated respecting the following:

- a) It will be 40% of the cost of the action.
- b) It will have a limit of € 3,000.
- c) In order to apply for these grants, the cost of the action must be equal to or greater than 1,000 euros per home.

The amount of the total aid will be, in any case, limited by the maximum amount resulting from the application of the State aid regulations, which would be applicable to the type of action and the type of beneficiary.

EXTREMADURA

Aid for residential rehabilitation and social housing (Plan_RR_345). Out of time from 1/01/2022 to 07/03/2024.

Subsidies from the following programmes within the Residential Rehabilitation and Social Housing (Plan_RR_345) subsidy programme: 1. Programme to help refurbishment actions at building level. 2.

Programme to help actions to improve energy efficiency in homes. 3. Programme of assistance for the preparation of the book of the existing building for the rehabilitation and drafting of rehabilitation projects.

Programme for the Promotion of the Energy Rehabilitation of Existing Housing (PEEVE). Out of time 02/05/2019 to 09/08/2019.

Improvement of the energy efficiency of existing housing to reduce the number of vulnerable households and consumers, terms framed within the concept of energy poverty Energy Rehabilitation Program of Existing Buildings (PREE). Out of time from 12/06/2021 to 31/07/2021.

Grants for energy rehabilitation actions in existing buildings located in the Autonomous Community of Extremadura within the framework of the call for the Energy Rehabilitation Program of Existing Buildings of Extremadura (PREE).

Improvement of energy efficiency and sustainability in homes. Out of time from 26/01/2019 to 27/09/2019.

Improvement of energy efficiency and sustainability, with special attention to the building envelope in: Single-family homes, detached or grouped in a row, whether urban or rural.

Residential buildings of collective residential typology, intervening both in their common elements and in the interior of each dwelling.

GALICIA

Programme of aid for actions to improve energy efficiency in homes within the framework of the Recovery, Transformation and Resilience Plan-Financed by the European Union-NextGenerationEU, for the year 2025, on a multi-annual basis. Out of time from 08/05/2025 to 08/07/2025 Aid programme for energy rehabilitation actions in existing buildings in municipalities with a demographic challenge (PREE 5000). Out of time from 03/01/2022 to 30/09/2022.

Aid programme for renovation actions at building level, within the framework of the Recovery, Transformation and Resilience Plan, financed by the European Union - NextGenerationEU, for the year 2024, on a multi-annual basis. Out of time from 12/07/2024 to 12/08/2024 Actions for the rehabilitation of homes and residential buildings. Out of time from 02/01/2021 to 31/07/2021.

LA RIOJA

LA RIOJA PREE 5000. Out of time from 18/03/2022 to 31/07/2024

NAVARRA

PREE Programme, energy rehabilitation of existing buildings. Running from 05/11/2020 to 1/07/2021

PREE 5000 programme, improvement of energy efficiency in residential buildings in municipalities with a demographic challenge. In execution, from 19/11/2021 to 31/12/2023.

MRR 2023 housing programme, actions to improve energy efficiency in homes. In BASQUE COUNTRY execution, until the aid is exhausted

MRR 2023 building programme, accredited improvement of energy rehabilitation or rehabilitation of buildings for residential use. In execution, until the aid is exhausted
MRR neighbourhoods programme, envelope improvement in residential buildings located in a residential environment of programmed rehabilitation (ERRP). In resolution.

BASQUE COUNTRY

Next Funds

The aid programmes for residential rehabilitation and social housing of the Recovery, Transformation and Resilience Plan (PRTR) - Next Generation EU Funds are regulated by Royal Decree 853/2021, of 5 October.

Grants for energy renovation

The body in charge of managing the aid is the Basque Government's Department of Housing and Urban Agenda, which through Visesa (Vivienda y Suelo de Euskadi, S.A. belonging to the government), manages the following programmes:

- Programme 3 - Energy improvement actions at building level
- Programme 4 - Energy improvement actions for private homes located in buildings

- Programme 5 - Grants for the book of the existing building and rehabilitation projects

The Basque Country has already met the objectives of the Next Generation EU Funds for the energy rehabilitation of buildings and homes, and now, the process to admit new applications for programmes 3, 4 and 5 is paralysed. In the event of receiving new funds that allow more files to be received, information will be provided on the reactivation of the application period.

However, aid can continue to be requested, including energy efficiency aid, within the framework of the lines contemplated in the order of 21 July 2021 (Order 21/2021, 2021)-

- Line 1: Financial measures for private works.
- Line 2: Financial measures for community work.
- Line 3: Financial measures for community work of comprehensive and efficient rehabilitation

Line 1: financial measures for private works. When the renovation works or interventions are carried out in single-family homes or in private elements of buildings under the horizontal property regime or private real estate complex, both in the homes and in the premises that are intended for housing. The actions may be:

Type 2. Works to improve energy efficiency.

Line 2: financial measures for community works. When the rehabilitation works or interventions are carried out in common elements of the construction, facilities or common services of two-family or semi-detached dwellings and buildings of collective residential typology with main use as housing, under the horizontal property regime, private real estate complex or sole proprietorship. They may be:

Type 2. Works to improve energy efficiency.

Line 3: Financial measures for community work for comprehensive and efficient rehabilitation. When the rehabilitation works have a global scope typical of an intervention project that jointly and simultaneously covers energy efficiency, accessibility and safety in the event of fire of at least one complete building of collective residential typology with main residential use. Likewise, the intervention projects may include actions to improve the exterior habitability of the dwellings.

PREE 5000 Basque Country Programme. Rehabilitation of homes and buildings in municipalities with less than 5000 inhabitants. From 13/01/2022 to 31/07/2023.

REGION DE MURCIA

Aid for actions to improve energy efficiency in homes in the Region of Murcia (PRTR - Financed by NextG-EU - C2. I1). (code 3783) (SIA 2891856). Deadline for submission

closed, from June 2022 to 31/07/2023 for actions in buildings, from 2022 to 31/07/2024 for homes.

CEUTA AND MELILLA

Application for aid for ENERGY REHABILITATION actions in existing buildings in the Autonomous City of Melilla (PREE) (IND). Out of time, from 10/04/2021 to 31/07/2021.

10) ENERGY SIMULATIONS

In the Spanish building sector, when considering energy efficiency as a fundamental parameter for building efficient and low-emission buildings, three periods can be fundamentally distinguished.

A first period that covers until the approval of the Basic Building Standard Thermal Conditions of 1979 (Ministry of Public Works and Urban Planning, 1979), which came into force on January 22, 1980. In this period, building in Spain was not regulated by any regulations that had thermal or energy criteria. The fundamental priority was structural durability and habitability, without considering thermal insulation and its importance in reducing energy consumption and increasing the well-being of the inhabitants of the buildings.

In this decade, the world experienced two major oil crises to which Spain was no stranger.

The first crisis occurred between 1973-1974 caused by the embargo of the Organization of the Petroleum Exporting Countries (OPEC) after the Yom Kippur War that caused the price of a barrel to quadruple. Spain, highly dependent on imported oil, is subject to a strong economic impact, facing problems of rationing, inflation and recession. The second crisis 1979-1980 was due to the Islamic revolution in Iran and its war against Iraq. This new conflict causes a new increase in oil prices, which intensifies the concern of states about energy consumption and foreign dependence. In the European context, energy saving and efficiency policies are beginning to emerge.

In this scenario, the Basic Building Standard is approved in Spain. Thermal Conditions (NBE CT-79), whose purpose was to establish the thermal conditions required of buildings, as well as the data that condition their determination. This regulation was a turning point, since, from its entry into force, limit values of thermal transmittance for the building envelope were implemented, beginning to consider energy efficiency in the design of buildings.

A second period that extends from the approval of this regulation to its repeal by the Technical Building Code (CTE) (Ministry of Housing and Urban Agenda, 2019) on March 29, 2006. During this second period, the NEB CT-79 was applied in the design of the buildings. However, although it represented a significant advance compared to the

previous period, its mainly prescriptive approach did not globally consider the energy performance of the building or aspects related to ventilation or watertightness. During the 80s and 90s, technological development, together with the first European directives on energy, had an influence on national regulations, leading to the repeal of NBE CT-79 and the approval of the new regulatory framework of reference in the building sector, the CTE.

The third period, after the approval of the CTE, is characterised by the comprehensive vision of the building's energy performance that incorporates the Basic Energy Saving Document (DB-HE). This document incorporates new requirements such as the limitation of energy demand, the efficiency of the facilities, the use of renewable energies or energy certification.

From its entry into force to the present, the DB-HE has undergone various modifications to align with the European directives on energy efficiency in buildings (Directive (EU) 2024/1275, 2024), promoting the concept of Nearly Zero Energy Buildings (nZEB)

Considering the above scenario, and with the aim of analysing the potential for improvement in the energy performance of an existing building, With typical construction characteristics of the first period indicated, three energy simulations (option 1 to 3) of a model building will be carried out to analyse how its energy efficiency is improved and the cost that the actions to be carried out would entail.

The building in question is a multi-family building with a height of 10 floors and a floor area of about 25m x 18 m, located in Madrid (Spain), which would house four dwellings of 90 m² of useful area per floor and a nucleus with a staircase and elevator. The total estimated built area is 4700 m².

- Option 1: The building is considered with the facades and roof without insulation and with a single glass in the carpentry.
- Option 2. The building envelope is improved, affecting the façade, and the carpentry.

Insulation is introduced in the façade, and a change of carpentry is considered with the incorporation of double glazing with an intermediate chamber. The approximate cost per m² is shown in the table below.

Description	Cost
SATE-type façade applied to existing enclosure	72 €/m ²
PVC window installation with double glazing with chamber	310 €/m ²

- Option 3. Option 2 is added to the improvement of the roof, introducing thermal insulation on the roof to complete the improvement of the envelope. The approximate cost per m² is shown in the table below.

Description	Cost
SATE-type façade applied to existing enclosure	72 €/m ²
PVC window installation with double glazing with chamber	310 €/m ²
Installation of an insulation layer on the roof	53 €/m ²

The results of the simulation of the three options are shown in the following table:

EUI Option	Operating coal	Incorporated Carbon	Total coal
1	228,82289.923,89	139.479,03	438.402,92
2	146,62 207.370,64	408.306,20	615.676,83
3	129,64188.436,64	439.416,73	627.853,37

Energy use intensity (EUI) is an indicator that measures a building's annual consumption per unit area. As can be seen, as the measures to improve the building envelope increase, the EUI is considerably reduced, almost 100 kWh/m² when carrying out an overall intervention on the building envelope. Also relevant is the reduction of operational carbon, which falls by almost 100,000 kgCO₂e. As expected, the same is not true of incorporated carbon, as new building materials (greater insulation, glass) are added, it increases.

As indicated in the note to the table, the analysis of coal affects stage A1-A3 and operating energy B6 of the life cycle of the building, leaving out of the analysis the rest of the stages.

A final issue considered has been to analyse the solar energy production potential of the model building. It is not a fourth option, since it is a question of incorporating

photovoltaic solar panels on the roof of the building that could be carried out with any of the three options considered above.

The results obtained show that the building's electricity production potential is 76,839 kWh/year. For this simulation, 270 m² of photovoltaic panels with an efficiency of 20% occupying 60% of the building's roof surface have been considered. If the improvement in the EUI generated by option 3 over option 1 is considered, the electrical energy produced by photovoltaic panels goes from covering a little more than 7% to almost 13%.

Option	Estimated energy consumption(kWh/year)	Photovoltaic production	(kWh/year)
1	1.075.454	76.839	7,14
2	689.114	76.839	11,15
3	609.308	76.839	12,61

The cost of incorporating the photovoltaic panels with the characteristics indicated above, estimating a cost of € 2 per watt installed, would be € 153678.

7. Conclusions

In this deliverable we have sought to describe the rental market in Spain in as much detail as possible, resorting to all the (scarce) sources of statistical information that could shed light on some shadows related to beliefs about the Spanish rental market. The thinning that this market has experienced over the last decades has not prevented it from maintaining the constants of economic functioning by being fully integrated into the housing markets and, as far as can be said, supplying the demand for room services.

The efficiency with which it does so has not been measured here, both because of the lack of information because of the impossibility of evaluating the effects derived from aspects from regulation and the situation.

There are two important issues that have framed the analysis. Firstly, that most of it refers to the beginning of the twenty-first century, given that the basis that has been most exploited has been the 2021 Census. This means that the situation of the rental markets has not been described in 2008 but in that year, which possibly implies important differences in the situation of the rental market. Secondly, the changes that the Spanish housing market has undergone throughout the twenty-first century have been considered structural. The construction and demand for housing have exceeded previous historical highs and the process has led to a change in the relevance of housing markets and as far as can be assessed, in their functioning. The extraordinary growth in fundamental demand factors, such as immigration (new demand in the market), the change in the pattern of household formation, increased labour mobility,

sustained income growth and the large expansion of credit, have created a prolonged period of strong demand that has converged in almost all housing markets, unlike what happened in the previous expansion. The particularity in this period has been that supply has reacted very quickly, unlike what has happened in other countries, reducing the strong tensions in residential markets that could have existed in the absence of this flexibility, although not preventing them from appearing in the end in the form of access limitations. Throughout this process, the rental market has not been able to be on the sidelines. The scarce existing data seem to suggest that it has acted by resolving residential demand with different perspectives, but it may have collapsed after the strong influx of immigration and the increase in mobility. The studies on access to property for foreign labour immigrants can show how the market has once again resolved the tensions in the demand for housing through ownership, until the financial crisis paralysed the mechanisms of allocation in this way.

In the analysis, the expository structure has attempted to describe the characteristics of demand and supply, bringing the arguments closer to the factors that real estate theory shows to be the keys to the functioning of the market. To this end, the well-known databases on rental have been used, of which the richest is the 2021 Census, in addition to the survey of residential variations and the specific sources of building activity, prices, economic variables and existing rental data. An important part of the deliverable contains many deductive sections. The lack of data prevents the accurate testing of hypotheses, and, in these cases, the only tools left to the analyst are the use of techniques adjusted to the data, their knowledge of the market and economic intuition. The census data have been extracted by cross-referencing with three and four dimensions, based on national microdata, and carrying out exercises for the segmentation and grouping of variables (cluster and factors) that could provide additional information on the characteristics of these markets, both from the perspective of rental supply and demand. Different databases have been combined in the analysis to observe the effects on the market. Variables have also been estimated that have allowed the comparison of (available) rental prices with those of property. In this case, the absence of the market price indicator prevents us from recognising the evolution of renting in recent years, although the perception, after the census analysis, that the rental market does not constitute a residential ghetto and is integrated into the rest of the markets in terms of its particularities of supply, allows us to infer the general features of its evolution in these years.

The knowledge in the evolution of the fundamental demand factors suggests that the changes that have occurred in the Spanish housing market have been able to empty the rental market to its lowest level, during the first years of the twenty-first century. This situation had to put pressure on prices to the maximum, reducing the ability to access the rental and preventing the entry of natural rental customers and generating, with different levels of severity in the Spanish geography, three effects. The first is the price effect, whereby rents increase because of demand tension and supply shortages, to levels like those of property prices, or rather, to the cost of acquiring a home with

external financing. The direct result of this situation is the expulsion from the market of the rental demand that comes to this market due to their lower ability to pay.

The second consists of the reorientation of the 'natural' demand for rent towards property. Under conditions of almost equal cost of both tenure formulas, the attractiveness of investment acts by tilting the decision towards ownership. This market solution has been possible because of the coincidence in time of positive factors for access (already mentioned). From an eclectic perspective, the long period of easy access has solved possible residential problems that would have been very serious if households had not been able to access it as a property, in a market like Spain's, with a tight supply, although apparently in balance (as the census data seem to show) and which has had to face migrations of almost four million foreigners in just seven years.

The third effect has been that of densification in the use of rental housing, a serious problem in some more populated municipalities and non-existent in others. The process of tension described has resulted in the appearance of actions in which the dwellings were over-rented, with higher returns per square metre, but generating residential places of low or very low quality. This phenomenon has not been confirmed in this deliverable, although there are numerous publications that describe it.

The question of why the rental market in Spain is narrow is addressed in the principle of deliverable. It is suggested that the formulas followed by which housing problems were (successfully) solved during the sixties and seventies, established the habit of access to property in Spanish society two decades before similar trends spread to other developed countries. The lack of specialised agents in management, the lack of incentives-price to rent, the role of the public rental market (which has not been able to be verified) and factors related to Spanish economic growth, would justify a progressive process of entry into ownership and the languishing of the rental market, whose units changed their form of use systematically. The relevance of renting within the social perception as a generalized demand only appeared in periods of loss of accessibility for purchase and also only in the last twenty years (1991-1993, 2007-2008), which would indicate that the rental market has been able to adjust its mechanisms by adapting to the situation of predominance of property reducing their size in accordance with the usual needs of the municipalities. It also shows that its size has made it lose the ability to resolve sudden changes in society that imply greater (and rapid) housing needs, as in the case of immigration, which implies that its role as a 'cushion' of supply in the market has been reduced in recent years.

An important question appears as a conclusion here, and that is the evaluation of what the equilibrium size of the rental market in each housing market is. Its evaluation is not simple, but the census approach has shown how each province shows different needs in this regard. The concentration of most of the rental in the larger and small municipalities (before 2002) and the existence of large rental markets in certain provinces compared to others with a very short dedication, seems to suggest this. One

of the contrasting exercises that the deliverable provides is found in this section, where we have tried to evaluate the impact of the increase in migration on rental markets by size (p. 38). The perception of the need for rental markets to react to these changes modifies the map of rental markets by size, making new regions appear with possible tensions (such as Alicante, Guadalajara, Toledo, etc.). The deliverable provides an approximation of the size of the rental markets in 2021, reflecting that of the total number of rented homes, approximately 15.5% would be the volume of recent transactions, which means 1.8% of the total number of main homes in 2021 and 6% over the last five years, figures that show the size of the market. Thus analysed, these figures are far from some information referring to the size of other rental markets in Europe²⁴. Another relevant issue shown by the census is the strong renewal of rents in Spain (52.8% of the total), which seems to correspond to the rental trend reflected in the old base of the Household Budget Survey.

The perception of the integration of rental markets in Spain within the residential market comes from the small differences in their characteristics. The deliverable makes an exhaustive comparison between the physical similarities in both markets, aggregated and by provinces, finding hardly differences between the two. If some are highlighted, which are later confirmed in the factor analysis that is carried out, rented homes are mainly found in buildings with higher density; in a good state of maintenance although they have a greater propensity to experience lower qualities; with services similar to the rest of the park, although more concentrated in buildings without elevators; A higher proportion of older dwellings prior to 1971 are rented and their average surface area is somewhat smaller than the average owned dwellings, with most of these units being distributed within the categories of less than 90 m².

The residential environment of the rental homes does not differ substantially from the rest either, which means that these units are distributed throughout the stock without constituting concentrations. The segmentation of the sample reflects that 5% of rental homes would be in places with worse conditions, with more noise, crime and unfriendly urban environments, which would be related to worse maintenance of the home.

The comparison of census particularities with the most up-to-date sources, such as the construction of public housing or the rental survey, reflect similar distributions despite the different nature of the sources. The delimitation of the 'standard dwelling' for rent has been carried out using methods of extraction of common factors, obtaining 10 that reflect the specific characteristics between the rented dwellings, in which

²⁴ This issue has not been dealt with in the report, since European statistics speak indistinctly of rental stock, only public rentals, or public and private rentals, or transactions, so they are not homogeneous for comparative purposes.

questions related to the type of building (greater density), environment of the dwelling (pollution and cleanliness), surface area (smaller), year of arrival (age of the rental), available services (heating, etc.). water, telephone), state of the building, accessibility to it (communications and access) and existence of garages (minor), distinguish the rented dwellings

The lower precision that can be given to these analyses from the point of view of supply endorses the need for the elaboration of detailed statistics in terms of physical, environmental and location characteristics, which allow analysis based on spatial methods.

The analysis of demand shows similar particularities in terms of the difficulty of finding a clear segmentation of individuals seeking rent compared to the rest. In some characteristics the typology of tenants seem clearer, as in the case of the size and type of household, highlighting the (marginal) importance of single-person and single-parent households and families with more than 5 components and concentrated in two age segments: up to 39 years old and among the oldest, both important in stock but also in rental transactions, as shown by the 2006 survey. By marital status, households with a main person, which are single and separated (and women) are shown as a specific group in relevance, although, again, marginal in the total rent.

The socioeconomic profile shows a greater propensity to occupy than in property, of tenant households, with an intermediate education at the level prior to university. The presence of households with a foreign main person is already relevant in the data from the 2021 census, where the group of these tenants already reached 20% of the total rent. The profile of the residential variations of foreigners showed a strong growth from the year, so it is suggested in the deliverable that this is one of the aspects that have possibly changed the rental market the most in the last seven years. The rental markets for foreigners are also segmented by origins in the Spanish geography, so the multiple influences would have further differentiated these markets.

An additional issue that appears in the analysis is the availability of second homes by tenant households. Again, the pattern of ownership does not differ too much from that of owned households, suggesting the idea that secondary dwellings serve an additional role that goes beyond being a temporary place of residence. The stay of more than 90 days in the secondary dwellings of a significant part of the households in rent implies that these long periods of stay of the year between two dwellings, which introduces the doubt of which of them is the main one, generalizing the concept of 'residential mobility' within the habit of living of households.

The paper delves a little deeper into the mobility aspects of work, given the relationship between rental tenure and a greater propensity to change jobs and locations. The studies that contrast these aspects have been evaluated on societies other than the Spanish one, so it is doubtful that the general pattern is the same as in Spain. The

contrasts carried out on the census data show an absence of markedly different models of mobility between rental and ownership although, again, a greater tendency to work within the municipality in the former and a greater municipal mobility in the long term that shows changes of residence in households living in rented accommodation. The pattern of mobility of rental households shows (1) that the majority of renting in this type of household occurs immediately after their change of municipality, so that a very small percentage subsequently accesses rental in subsequent or previous years (forecast and need for temporary residence), and (2) that access for this reason has been increasing since 1997 in Spain, showing the greater need for rental stock associated with the mobility of household work, not only that which forces the household to move to work in a municipality, but also that which relocates the household that maintains its mobility throughout the territory. This result is in accordance with the theoretical principles of market demand.

The cross-estimation of rental households working inside and outside the municipality, and which have moved in recent years, shows an unobserved phenomenon of increased daily mobility associated with residential relocation and rental that reflects the possible tension in residential markets related to the expansion of labour markets. In this case, the greatest relevance that renting seems to have is to accommodate households that move for work reasons, basically those who go to the municipalities where the activity is located, and it is clearly reflected in the role that renting has played in recent years, also showing the growing tension of demand in this market possibly related to the processes of job creation which should have increased a lot in the years after 2021.

The typical tenant described in the census has common factors related to the type of household (segmented between young households with children and the elderly), who live in high-rise housing, whose main person has a similar average education (technical, high school level), who recently arrived in the municipality of another municipality or abroad, with a family in the household and a generation, Living in an old building (built in the seventies, in good condition), with a smaller than average surface area, located in neighbourhoods that have problems of pollution, noise and few green areas of different consideration, greater in the former, but less relevant in the case of lack of services and poor communications. They are mobile for work reasons with medium or long travel times, in their own vehicles.

The analysis of rental prices has been carried out by taking some observations from the rental component of the Consumer Price Index, from the Household Budget Survey with the design prior to 1997 and some isolated data obtained from the rental survey of the Ministry of Housing. The lack of this basic factor in the study of any market prevents the observation of the processes of tension and adjustment that are carried out, obliging, once again, the analysis to be more deductive than precise.

Even so, the evolution of rental prices (CPI) has been reasoned in terms of the principles that guide the usual equilibrium in the housing market (taking into account that rental tenure is a substitute for ownership), computing the effects that two indicators of tension in the market may have had on the evolution of prices: accessibility to purchase, which has been calculated using basic income as a reference, and financial availability. An impulse response exercise shows the relationship between the evolution of the rental component in the CPI and the existence of demand tensions in the market, reflecting a time lag of 7 quarters on average between changes in the conditions of access to property, and variations in rental prices. Both exercises would suggest the substitutability of both markets and, therefore, the functioning of the rental market according to economic principles.

From the analysis of rents in monetary terms and their (short) evolution, the relationship with property prices is deduced and the loss of profitability that is common in this market, and which results in a disincentive to investment in renting, is confirmed. In this last section, different exercises have been carried out to compare the behaviour of prices.

There are some relevant issues to highlight. The first, which was already advanced in the census analysis, would be that there are different rental segments that introduce biases when it comes to identifying the market with the average price values and number of units. In fact, until the end of the nineties there were two rental markets, the old rental market that was very static and with rents that were difficult to update, and the new rental market, with price levels closer to market prices. The average of both rentals was not significant in the Spanish market and, therefore, introduced biases in the recognition of the operating mechanisms.

Prices were distributed inversely to the size of the population, and their evolution does not seem to respond to market principles. The estimation of the costs of use and the rent/property price ratio that has been carried out shows that the real rental market is made up of the largest number of contracts signed in the last two decades and closer to the cost patterns consistent with a more efficient operation. The great weight of old rentals and those subject to more restrictive regulations showed non-economic behaviour within the aggregate rental market, which is identified (and separated) only when there is statistical availability of prices by contract periods for the last years of the nineties. The similarity in the values of the cost of use and the ratio mentioned in those years refer to a market that reacts in accordance with the fundamental principles, but the loss of that information eliminates the possibility of further analysis of it.

The deliverable, in short, tries to show the gaps that should be covered in order to reach conclusive definitions of the rental market in Spain, the reasons for its evolution, the existing needs (if and where), the characteristics of the applicants, among others, which would provide sufficient information to encourage the recovery of its size to levels consistent with the residential needs in each market. It is not possible to implement policy measures consistent with rationality without knowing how this market works and how it adjusts, as interventions could create development biases that would make it more difficult for this market to grow.

Housing markets and the need for greater employment mobility require the Spanish economy to develop housing markets adjusted in size to each form of use, and to reach a balance consistent with their level of development.

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9. ANNEXES

9.1 Theoretical introduction to the analysis of the rental market Housing

The housing rental market is an essential component of the contemporary urban system, serving simultaneously as a consumer good, investment asset and socio-spatial adjustment mechanism. His analysis has evolved from classical microeconomic approaches, focusing on supply, demand, and hedonic prices, to modern perspectives that incorporate financialization, concentration of ownership, and distributional effects. This section synthesizes both academic traditions, showing the continuity and transformation of the fundamental ideas that explain the functioning of the rental market.

9.1.1 Basic concepts

The most classical real estate theory analyses the housing market as the mechanism for the exchange of residential services, so that, by definition, the principles of operation of the housing market refer to the conditions of adjustment of the supply and demand of services generated by housing under the rental formula. This approach is considered the analytical foundation that allows us to understand the evolution of the market and was developed between the 1960s and 90s of the twentieth century, focusing on the microeconomic foundations of house values, the mechanisms of adjustment of supply and demand, and the role of public policies to others.

This is the way to focus on the meaning of the rental price: it is the payment of residential services, known as payment for 'housing services'²⁵

Renting is the fundamental form of use in the initial theoretical analyses of the residential stock. The general theory is not initially concerned with the form of ownership, considering that all households rent their dwelling, either to themselves or

From this perspective, the entire housing stock is rented, and the resulting price will be a function of the flows of demand that need to cover their residential need. Although this may give the idea that the rental market is unique, it is not, as MacLennan emphasizes, "The housing market is not really a simple neoclassical market but is the set of overlapping submarkets differentiated by tenure, location, size and quality. There are markets in which the capital good (housing) is exchanged, while in others it is the consumer good (housing services). The impediments that reduce the ability to adjust towards a neoclassical equilibrium in this market can be summarized in five categories: search costs, legal and administrative costs, adjustment costs, financial costs and costs derived from uncertainty. Each of them can be expressed in terms that are identifiable, but they are difficult to measure" (McLennan, 1982: 59-75).

The complexity derived from the existence of different demands that can be oriented towards the same supply, in addition to the aforementioned connotations, has not been reflected in complex theoretical approaches but, rather, the analysis has tended to be simplified by showing, firstly, the conditions that affect the equilibrium in the market for rental (or housing services) demand. secondly, to discriminate between the decision to buy or rent in each submarket, basically defining the conditions that must be met to encourage ownership.

The concept of managed rental is along these lines, considering rental to be that market formed by the stock of homes that is not owned by the household that inhabits it or has another transfer formula. This is a supply perspective (stock used for rent) and this is where the characteristics that have initially been mentioned are circumscribed. Renting from demand would show households that resort to renting because of the discriminatory decision process (buy-rent), i.e., they would be the final consumers. In the previous decision would be those households that buy for self-consumption (which the general theory would consider self-tenants) and those that buy by investment, to, in turn, rent the home to the final demanders of residential services.

²⁵ In this sense, the definition of housing services by De Leeuw and Ekanem is very graphic: "... By this concept is meant a weighted average of space, level of maintenance, surface, proximity to work, and other things of value provided by the housing stock." DE LEEUW, Frank and EKANEM, Nkanta F. (1971), "The Supply of Rental Housing", in The American Economic Review, December, p. 807

9.1.2 The evolution of the rental market's body of knowledge

The fundamental references that established the basic theory in housing rental market studies come mainly from two areas: welfare economics /public policy (which addresses affordability and state intervention) and urban/real estate economics (which establishes price mechanisms). The link between the rental market and the urban structure was established by William Alonso (1964) through his land rent model, which recovers and models the Rent Gradient theory and generalizes it in what is now known as the Alonso-Muth-Mills Model. This model explains how physical accessibility (distances) determines households' willingness to pay and, consequently, the spatial distribution of income. Subsequently, Neil Smith (1979) introduced the concept of gentrification, showing how investment and the revaluation of urban land cause the displacement of original residents and changes in markets, in what has become known as the Rent-Gap theory.

Associated with the first group, and as a theory that develops Alonso's principles at the microeconomic level, three analytical environments are established to understand equilibrium in the rental market: the tenure choice model (one of the seminal works is that of Quigley, 1979); the role of supply inelasticity as a fundamental explanatory element of market adjustment (De Leew and Ekanem, 1971), and the final adjustment of prices by characteristics (Rosen, 1974), so that the current theoretical basis combines the three approaches. Thus, the efficient adjustment or allocation mechanism consists of the analysis of how the market allocates resources (based on income) and preferences:

From demand, tenants, with different preferences, self-select from among the available homes. Those who value a feature highly (e.g., proximity to the centre) will pay a higher price to obtain it, adjusting their choice on other attributes.

From the supply side, builders and lessors adjust their investment and maintenance decisions based on these implicit prices. They will invest in the attribute whose production costs less than the implicit price that tenants are willing to pay.

This results in a segmentation of residential markets by 'homogeneous' characteristics that exhibit disparate adjustment patterns, typically have supply constraints and may experience systematic changes in demand from households jumping from one segment to another.

Thus, the evolution of the theories associated with preferences (and the role of characteristics) that affect marginal prices, the choice of tenure, the principles of rigid supply and influence between submarkets, as well as the models of spatial equilibrium, would be the fundamental basis on which to classify the theoretical explanatory principles of the rental market.

The modern literature takes these fundamental principles and focuses on delving into the problems associated with the malfunctioning of the market mechanism that has undesired effects on the population's ability to access housing and, therefore, on inequality and urban stability itself (Gyourko et al, 2013²⁶, Kneebone and Garr, 2010: ²⁷, Covington, 2015: ²⁸, Banabak and Kadi, 2024: ²⁹). They appear basically from the first decade of the twenty-first century onwards, they concentrate on analysing the process of converting the market into income in a financial market, and its social implications. A fundamental change consists of the acceptance that housing is not only a traditional consumer good or investment that meets fundamental needs, but also a global financial asset.

This theoretical and empirical shift has given rise to new concerns about affordability, inequality, and urban stability, such as (1) the coined 'financialization' of the market and the proliferation of 'institutional ownership'. Financialization describes the process by which financial logic dominates the housing market and the game of supply and demand shifts from depending on historical sources to depending on the supply and demand of financing (Fields, 2015, Fields & Uffer, 2016:³⁰, Powell, 2017:³¹). This concept spread after the 2008 crisis, in which large investment funds, REITs and REITs acquired massive housing portfolios in numerous developed countries, transforming the market into a corporate management system, augmented by technological innovations (Fields, 2022: ³²). This process has introduced new dynamics of profitability and risk that prioritize the maximization of the value of capital over the social function of housing (Fields, 2020:³³).

²⁶ Gyourko, J., Mayer, C., & Sinai, T. (2013). Superstar cities. *American Economic Journal: Economic Policy*, 5(4), 167-199.

²⁷ Kneebone, E., & Garr, E. (2010). *The suburbanization of poverty*. Washington, DC: Brookings Institute.

²⁸ Covington, K. L. (2015). Poverty suburbanization: Theoretical insights and empirical analyses. *Social Inclusion*, 3(2), 71-90.

²⁹ Banabak, S., Kadi, J., & Schneider, A. E. (2024). Gentrification and the suburbanization of poverty: evidence from a highly regulated housing system. *Urban Geography*, 45(9), 1596-1618.

³⁰ Fields, D., & Uffer, S. (2016). The financialization of rental housing: A comparative analysis of New York City and Berlin. *Urban studies*, 53(7), 1486-1502.

³¹ Powell, R (2017) A Review of "The financialization of housing: a political economy approach", By Manuel B. Aalbers, *International Journal of Housing Policy*, 17:4,603-605, DOI: 10.1080/19491247.2017.13774646

³² Fields, D. (2022). Automated landlord: Digital technologies and post-crisis financial accumulation. *Environment and Planning A: Economy and Space*, 54(1), 160-181.

³³ Fields, D. (2020). Raquel Rolnik 2019: *Urban Warfare: Housing under the Empire of Finance*. London: Verso Books. *International Journal of Urban and Regional Research*, 4(5), 938-939. Disponible en <https://escholarship.org/content/qt08f1s5rx/qt08f1s5rx.pdf>

The massive entry of institutional groups into rental management has generated changes in the behaviour of residential space providers that are analysed under two areas: the first is the principle of double profitability, and the second is the adjustment in the market in an environment of ownership concentration and aggressiveness in management. Recent literature has identified the 'double profitability principle' (Fields, 2020; Hackworth, 2019), according to which institutional investors seek two simultaneous sources of profit: the operating yield of rental and the capital gain derived from the revaluation of the active. This model generates more aggressive behaviours in pricing and tenant management, incentivizing forced rotation practices and evictions to capture higher future rents (market power principles). Increased ownership concentration has resulted in significant market power in the hands of a few institutional actors.

Funds control large portions of the rental stock in urban areas, with doubts about whether this allows them to set rents above competitive equilibrium (Aghion et al, 2013:³⁴) or benefit tenants by increasing supply (Coven, 2025:³⁵). This phenomenon has been called 'business gentrification', as it combines financial and territorial repositioning strategies. The answer to this process is to emphasise the need for 'second generation' policies that combine soft rent regulation, expansion of the public rental stock and subsidies to vulnerable households. Gyourko (2009)³⁶ and Glaeser et al. (2005, 2008)³⁷ point out that, if supply is inelastic, demand subsidies tend to be passed on to higher prices, so supply-side policies are more effective in improving affordability.

³⁴ Aghion, P., Van Reenen, J., & Zingales, L. (2013). Innovation and institutional ownership. *American economic review*, 103(1), 277-304. Palvarini, P., Pavolini, E. (2010). Housing Deprivation and Vulnerability in Western Europe. In: Ranci, C. (eds) *Social Vulnerability in Europe*. Palgrave Macmillan, London. https://doi.org/10.1057/9780230245778_6

³⁵ Coven, J. (2025). The impact of institutional investors on homeownership and neighborhood access. Available at SSRN 4554831.

³⁶ Gyourko, J. (2009). Housing supply. *Annu. Rev. Econ.*, 1(1), 295-318.

³⁷ Glaeser, E. L., Gyourko, J., & Saks, R. E. (2006). Urban growth and housing supply. *Journal of economic geography*, 6(1), 71-89. Glaeser, E. L., Gyourko, J., & Saiz, A. (2008). Housing supply and housing bubbles. *Journal of urban Economics*, 64(2), 198-217.

The rest of the rental uses are not analysed in this document, however, the economic effects that the extension of short-term rentals and the development of the residential rental market in general through technological platforms are having, are protagonists of the expansion of the use of residential rentals in most developed countries. with effects on increased mobility and possible stress on the rental markets. Gentrification processes, resulting from the acceleration in investment in housing renovation to increase supply, have long-term effects on the market. The principles that lead this process are also included in the next section.

The new literature therefore focuses on defining and measuring financialization and its effects by incorporating the components of the double profitability model into tenure decision principles and assessing the macroeconomic implications (for cities and social stability) of ownership concentration and the role of global finance capital.

9.2 Classical theoretical foundations explaining the general mechanism of rent fixing

In economics, the real estate market in general is understood as one that intermediates the services derived from construction goods. Not all construction goods are part of the real estate market after they are produced. The essential distinction, regardless of its supply (public or private), lies in the ability of the final product to be transmitted through the market, that is, the existence of a private demand for it and an organizational structure that intermediates it.

What demand, ultimately, requires from real estate is what they produce once built, that is, their associated services, and their greater availability in an economy contributes to an improvement in the productivity and general efficiency of its productive sectors, to a better quality of life, environment and, ultimately, to economic development in the broad sense. The differential characteristic of the real estate market is that it is a market that intermediates services and produces investment goods.

The housing rental market is one of the most traditional real estate markets, both because of its traditional size (it is the housing market in a broad concept), and because it is the laboratory that has led to knowledge of the functioning of housing markets.

The rules that govern equilibrium in the rental market are determined, firstly, by the characteristics of the goods produced, secondly, by the existence of an endogenous market mechanism, thirdly, by the exogenous conditioning factors of demand, which do not have to depend on the housing market itself where the rental property is located,

and, finally, by the interrelation with other economic sectors that integrate in this market the forces that act on those determinants. The functioning of rental markets is conditioned by the specific characteristics of the goods that are intermediated. A home is a stationary asset, which generates the existence of local markets where the supply tends to be rigid, since the rental supply may not grow (or decrease) without apparent substitutes. Likewise, they determine the location and accessibility of the markets where they are located to the reference centres, and with them, to their values. It is an indestructible asset, which means that housing tends to be the object of investment in addition to being used for rent; due to its different physical and location particularities; it is heterogeneous, which makes its markets uncompetitive; it is normally subject to general and local regulations which condition the mechanisms of consumption of the services derived from rented housing, such as rental regulations, price controls, regulations on public housing, among others, which also segment the final markets.

Its nature as a necessary good for the development of society determines that its form of provision and its adjustment in the market are conditioned by different characteristics that affect the value of the goods, while justifying the presence of public policy in their provision and management. Their provision is not exempt from scarcity (as in other real estate) derived from restrictions in land markets (and competition for other uses); the risk associated with the provision and the fact that they are configured as imperfect markets. The risk associated with their supply process is accentuated by the non-existence of substitute markets beyond that of homes owned, which theoretically justifies the requirement of higher rates of return when making the decision to provide these goods.

As a result, the characteristics of rental markets could be summarized as follows:

- a) They are markets where competition is located (by its fixation)
- b) Supply is fixed in the short term, determining that the equilibrium depends on changes in demand.
- c) The goods have high values, which determines the need for financial capital for their provision, so that there is competition for capital for construction with the property submarket.
- d) They have a long economic life, which is attractive to investment, regardless of the form of ownership.
- e) Stratified demand and heterogeneous goods create the existence of submarkets or market niches
- f) Transactions are confidential, generating diffuse markets and information costs (imperfect information).

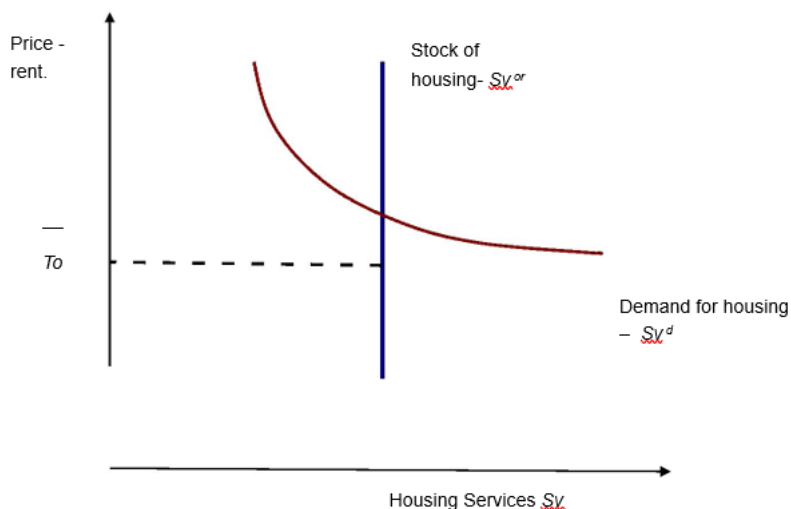
A market with these characteristics is difficult to achieve efficiency in adjustment. Although there are different degrees, it is generally accepted that these markets do not adjust supply and demand in the short term and have a very specific endogenous mechanism of equilibrium in the short term.

9.3 The market mechanism

Considering these characteristics, in a broad sense, the rental market would have a fixed supply in the short term that would be determined by the set of services produced by the existing housing stock in a country (Scheme 1)³⁸. Note that in this form of reasoning lies one of the keys to understanding the current increase in rental prices: the supply is rigid in the short term, therefore, it is not flexible to change of prices in such a way that it is balanced in the maximum possible price associated with the purchasing power of the demand. Prices could be nuanced (grow less or decrease) if the fixed stock curve were to move to the right, which would only happen if demand were fixed and supply increases. The limitation of supply prevents this correction.

Diagram 1. The housing services market

Diagram 1. The housing services market



³⁸ This section follows Poterba, 1991 and 1996, and López García, 2021

The scheme indicates that the total set of the residential stock (S_v) generates a maximum number of residential services at each moment of time which, for simplicity's sake, are considered constants³⁹, of S_v . The demand for housing services (S_{vd}) interacts by fixing the equilibrium price of the set of services (A).

The fixed supply would have a dynamic behaviour depending on the activity of the construction of new units or the rehabilitation or improvement of existing ones, since both activities would have the effect of increasing the services associated with the set of residential units. Thus, the flow of services will vary over time depending on the process of production of new units and reinvestment in existing ones, so that:

$$S_v^o = \phi(V, FP) \quad (1)$$

Where V = the number of existing dwellings, which includes residential investment in the period; FP includes a set of other productive factors of the process; and ϕ is the function that links them, with a positive relationship between residential investment and the housing stock at a given point in time (marginal productivity of residential capital =). It can be observed that if supply increases in the following period, under constant demand conditions (and therefore the total supply curve shifts to the right), the price per unit of residential service () could be lower.

For its part, the demand for residential services, S_{vd} , depends on their price (A), the income of households demanding residential services (Y), and a set of sociodemographic and location variables (O) that affect decision-making regarding the residential services to be consumed. In fact, these components would segment rental markets, so that they could be divided into as many markets as are defined by income conditions and by the relevant socioeconomic and location variables.

³⁹ Although it is in reality a flow of services that never ceases to be produced unless the dwelling disappears, and which, moreover, is not constant over time, but its quantity depends on the quality conditions of the residential asset.

⁴⁰ It is traditionally considered that this income should be understood under the concept of "life-cycle income" or permanent income. This is the approach adopted by the authors in their theoretical frameworks, based on the argument that the consumption of housing services is determined by the total income expected over the life cycle, rather than by current income alone. Although this concept is widely accepted, it has not been empirically tested. Nevertheless, it is reasonable to assume that one of the most significant consumption decisions made by households is aligned with their expectations regarding quality of life and, therefore, is associated with income concepts segmented into levels that relate not only to current income but also to other factors reflecting expectations of future earnings.

The rental price that would 'empty' the housing services market would be the one that would equate both functions and would have, as determining factors, those included in the following expression:

$$A = [V, Y, (O, FP)] \quad (3)$$

From a general point of view, rental prices will depend, from an aggregate point of view, basically on the stock of housing and income levels. Given that this expression reflects the marginal value of housing services generated by the stock as a whole for each of the submarkets determined by the rest of the variables, it could be said that the rents thus calculated will vary directly with household income levels and inversely with the available stock, i.e., they will increase more in those markets with higher incomes (*caeteris paribus* the rest of the determinants of (3)) and less where the available stock is greater. These two variables are, in principle, fundamental to understanding the evolution of this market.

This definition of rental refers to all residential services⁴¹ and does not restrict the analysis to a rental market as defined in the introduction, i.e. it measures the price per residential service that would be paid for each unit of ownership (on average) both to the market and to 'oneself' in the case of owners living in their homes. Residences. This theoretical definition does not resolve the question of identifying the explicit functioning of a rental market isolated from the one owned. In fact, it is necessary to approach the principles of the housing market as an asset market in order to identify the reasons that make households decide their form of tenure.

9.4 The endogenous adjustment mechanism and rental prices

The fixed supply in the short term and the connotations of demand mean that residential markets, and the rental markets within them, have particular connotations. They are markets where competition is localized, which defines them as local markets; their high values and the long life of the homes means that investment demands compete for those of use, causing different demands on the same goods to coincide; the characteristics of the applicants and the heterogeneity of the dwellings define different market segments with differentiated economic characteristics; there is no complete information and they are not very transparent markets.

⁴¹ Nor does it differentiate between the levels of quality associated with rental services, that is to say, their heterogeneity, an issue which is not addressed in this section but which will be dealt with later.

The result of all this generates a type of market in which adjustments between supply and demand in the short term are difficult, showing a particular adjustment formula that has been known as the endogenous equilibrium mechanism (Diagram 2) that can be explained as follows⁴².

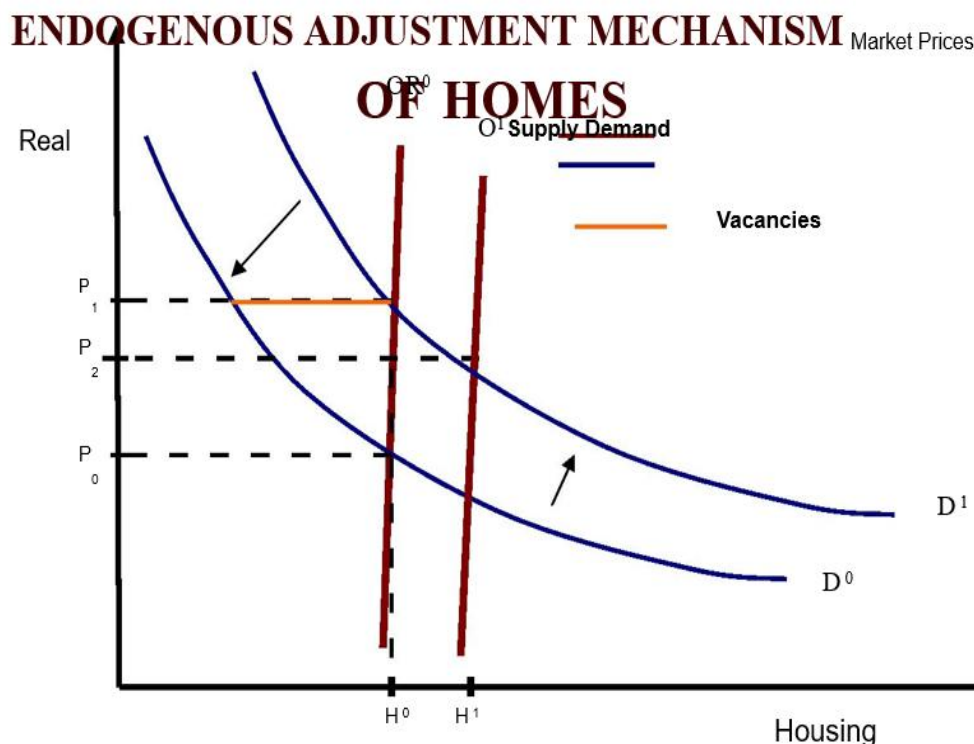
As a result of the lags in the production process, its location and its heterogeneity, among others, in the short term the total supply of housing is inelastic, which means that any change in the conditions of demand has an immediate effect on prices. This usually occurs when demand grows (from D_0 to D_1), so prices will increase more the stiffer the supply curve. Prices act as an incentive for supply, and each increase stimulates builders to produce new residential units (or to convert them from ownership), so that this curve is transferred in the following period, maintaining rigidity in the short term, although its degree depends on changes in the producing sector that allow greater flexibility in supply.

The reverse is not the case. In periods of recession, demand falls (moves to the left, from D_1 to D_0 on the chart) which should adjust prices downwards in the market. However, since these goods have an investment character in addition to being a good for use (demand for their services to be consumed), owners will not be willing to lose part of their wealth by selling at a lower price than that reached in the previous period in the market, or to revise the expected present value of the rents obtained from the rental, so there is no substantial fall in prices in nominal terms and vacancies appear, or units on the market that are unsold (or unfinished). Stabilized prices in the period of crisis⁴³ (decreasing in real terms) and the existence of a pool of unsold units (vacancies) is a characteristic of this market. This stock exchange serves as an endogenous equilibrium mechanism for the market so that its volume adjusts, together with prices, the levels of construction. When the recovery occurs, demand will first absorb existing vacancies, emptying the market before incentivising the promotion of new construction, which generates a disparate and often mismatched behaviour between the pace of activity in this submarket and that of the economy as a whole.

⁴² As has been said, it is generally considered that there is no instantaneous equilibrium and the short-term of this market is more than a year due to the delays in construction and investment decision-making

⁴³ This characteristic of prices has been known as 'sticky prices', and this property is widely recognized by the literature as a formula for equilibrium in the short term.

Diagram 2.-Endogenous adjustment mechanism of homes



The existence of a fixed supply in the short term determines that the fundamental impulse that makes the real estate market react is that which comes from demand. Location implies that the changes that occur in the markets are a consequence of variations in the conditions of 'their demand', so these components are what determine the equilibrium of the residential markets, both in ownership and in rent.

The vacancy mechanism is especially relevant in rental markets. Vacancies are defined as those housing units that are not used and are ready to be sold or rented. The number of vacant units is an indicator of the performance of the real estate market, and that its variation allows investors and builders to take positions in the housing market through the provision of new works. The importance of this factor in models was defined by Maisel, 1963, in what is known as the 'Inventory Theory'. Inventories are defined as the sum of the units started, occupied homes, those that are vacant and the increase in housing derived from renovations or conversions of existing ones. From this amount must be subtracted the demolitions and losses derived from the unification of residences. By vacancies (or inventory of vacancies) in the direction

Spacious, Maisel Understand those units finished that are not inhabited plus the units that are being built; This factor is used as a thermometer of the equilibrium of the residential market, so that builders start the exact number of homes to keep the level of inventory constant.

It could be said that the excess supply (S) over demand ((.)) would be the vacancies in the short term. = VL ⁴⁴

$$VL = S - (R, Y, P, H)$$

R being the rental price, Y the household income, P the housing prices and H the total existing housing stock.

The recognition of the role of vacancies as a housing fund that balances the market is followed in a large part of the works. Smith, Rosen, and Fallis state: ." Although the housing response of families tends to happen slowly, adjustments from the demand side tend to inevitably come through instantaneous changes in house prices, and in vacancies, from their long-term equilibrium level"⁴⁵.

There are many works that contrast the significance of this factor from the works of Maisel, such as Rosen and Smith, 1983, De Leeuw and Ekanem, 1971, and more recent ones, such as Hendershott and Smith, 1988, Gabriel and Nothaf, 1988, among others. Fewer studies that use it in adjustment do not find a positive relationship, such as Eubank and Sirmans, 1979.

9.5 The role of features in price formation

Preferences and location determine both market segmentation and their differential adjustment mechanism. Sherwin Rosen's (1974) main contribution to the

⁴⁴ Maisel, 1963

⁴⁵ SMITH, Lawrence B., ROSEN, Kenneth T. y FALLIS, George (1988), "Recent Developments in Economic Models of Housing Markets", in *Journal of Economic Literature*, vol. XXVI, Marzo, pages. 50

understanding of the rental market, through his Hedonic Price model, focuses on the valuation mechanism that establishes the equilibrium price, since Rosen's Hedonic Model assumes that housing is not a homogeneous good, but a set of characteristics (attributes). The rental price is not simply set by the unit but is the implicit sum of the prices of each feature that the home offers.

These 'shadow' prices (because they cannot be observed individually) are the ones that reveal the preferences of the two parts of the market and set the micro price finally obtained. Shadow prices are the marginal values of each attribute that, when added together, make up the final market price of each part.

For example, if a dwelling with an extra attribute (e.g., a balcony) rents for more than an identical dwelling without that attribute, the difference in rent is the implied price of that balcony. The identification of shadow prices is usually done through a hedonic model (or hedonic function) that has the following functional form

$$P_{aiqu} = \Pi(\text{atributos}) = \alpha_1 + \beta_1 \text{atrib}_1 + \beta_2 \text{atrib}_2 + \dots + \beta_n \text{atrib}_n + \text{error}_t$$

The Rosen fit is a quality and composition fit: The rental market adjusts when the marginal prices of attributes equal the marginal costs of producing them, leading to an efficient allocation of housing characteristics among consumers with different preferences. The differences in income between neighbourhoods are, to a large extent, the result of the market having "disaggregated" the total price of housing into the prices of its attributes.

9.6 Determination of the form of holding: selection conditions

In an asset market, the purchase decision is made based on the relative return of the asset, i.e., how much the profits outweigh the costs of owning the asset and the relative cost with respect to alternative assets.

From the consumer's point of view, the decision whether to obtain rental housing services or not depends on the opportunity cost associated with the form of tenure, i.e. the differential between the benefits derived from consuming housing in one or the other formula and its associated costs.

The 'cost of a home' is a concept that refers to the cost of consuming its services, so, indirectly, it is showing what anyone should pay to have the residential services they demand, and, therefore, it is assimilated to the cost of 'rent'.

In addition, owning a home as an asset has an 'additional cost' to having it rented, which refers to the cost of use as property, which is a basic concept of the decision process.

The definition of this cost of using housing as an asset was enunciated by Dougherty and Van Order, 1982 and widely known thanks to the work of Engelhardt and Poterba (1991) and Poterba (1984), being generally recognized as the factor that justifies the short-term changes in the demand for investment in housing.

Dougherty and Van Order's 1982 approach is simple: In an economy, families maximize their standard utility function in the form:

$$U(c^0, c^1 \dots c^N; h^0, h^1, \dots, h^N)$$

where C is the different non-durable consumer goods and h is consumption in homes.

Subject to the three current budgetary constraints of families, which are given by:

A)

$$c_t + s_t + qx_t = (1 - \tau) y +$$

$(1 - \tau) b_t$, Where c is the real consumption of non-durable goods, x is the real gross purchases of housing, s is the real financial saving, $q = p_h / p$ (real house price), $y = Y/P$ (rent real) and $b = B/P$ (real value of bonds), τ is the tax rate, and i is the nominal interest rate at which bonds are paid.

B) $h_{t+1} - h_t = x_t - d h_t$

Where h is owner-occupied and d is the depreciation rate

C) $b_{t+1} - b_t = s_t - i b_t$

Where b is the total amount of bonds purchased by households at the interest rate i, and π is the expected inflation rate (the rate at which real bonds depreciate).

Differentiating the utility function subjected to the proposed constraints, it can be seen that the first condition for optimizing this function implies that utility is maximized in housing consumption when:

$$[(1 - \tau) i - \pi + d] q = U_h / U_c \quad (4)$$

The right side of equation (4) is the marginal rate of substitution between dwellings and other goods, and the left part is the ratio $[(1 - \tau) i - \pi + d] p_h / p$, which is a measure of

housing costs that indicate the cost per monetary unit of value that a household would have to give up to make the decision to purchase an additional unit of housing services.

$$[(1 - \tau) i - \tau + d] p_h = C \quad (5)$$

Some additional factors are introduced to this expression by Engelhardt and Poterba, 1991, who are also responsible for the generalization of the concept of cost of use (Cus)⁴⁶:

$$cUS = [(i + \tau)(1 - \tau) + \tau + m - e^v] \quad (6)$$

Where i is the nominal interest rate, τ is the property tax rate, τ is the rate marginal tax of families, τ is a risk premium, τ is the depreciation rate physical, m is the required cost of maintenance and repairs of the house, and e^v is the expected rate of real appreciation of the house price.

To the extent that this cost refers to each residential service unit, it could be said to be a proportion of home prices. This concept introduces the possibility that, under certain conditions, the costs of use could be negative. Poterba, 1984, defines the income associated with owning a home as:

$$R = \frac{[(1 - \tau) i - \tau + \tau + m - e^v] p_h}{(1 - \tau) p_h} \quad (7)$$

⁴⁶ Engelhardt and Poterba, 1991:539-546

And in a non-perfect capital market, where there is a differentiation between the interest rate of alternative investment assets, and in the case where the average rate of mortgage loans differs from that obtained by real assets, the function is:

$$R = \{(1 - \tau) [(L i_A - (1 - L) i_B)(1 - \tau) + \tau - (P^*/P)] + [(1 - \tau) + \tau](1 - \tau) P_H\} \quad (8)$$

Where τ is the deduction of the housing expense that the buyer can make in his income tax. i is the market interest rate. i_A is the interest rate on mortgage loans. i_B is the interest rate on alternative investment assets. L is the Credit-to-home value ratio that is applied in the granting of mortgages. τ is the type marginal income tax of individuals. δ is the rate of depreciation of the Housing. π is the inflation rate of the economy.

(P^*/P) is a factor that approximates the H

H Capital gains from owning a home. π is the proportion of the value of the home that generates the basis on which taxes are applied. τ is the tax on the value of the property. τ is the return on real estate. τ is the tax applied to the purchase of homes and P_H is the house price index.

Therefore, the idea of cost of use is what generalizes this definition as a discriminating element between purchase and rent: If the use of a home 'costs' the owner more than the tenant the amount determined by these components, then the marginal net cost of use will be the discriminator that allows a household to decide to cover its residential needs through purchase or rent.

It could be said, and it is generally accepted, that the cost of use is a proportion of the real price of the house:

$$Cous_v = P_H \quad (9)$$

So would be an estimator of the relationship (8):

$$= \{(1 - \tau) [(L i_A - (1 - L) i_B)(1 - \tau) + \tau - (P^*/P)] + [(1 - \tau) + \tau](1 - \tau) P_H\} \quad (10)$$

Showing a path of behaviour associated with the conditioning factors of ownership that can indicate the evolution of the costs of use associated with each real price of the house. Costs of use will be higher when interest differentials are higher in financial transactions, home depreciation, and tax components, while cost of use is lower if capital gains are higher⁴⁷

The existence of a return associated with owning a home determines that there will be an implicit rent' that will be set to maximize the benefit of being an owner, which is the element that will make a household decide to own and rent the home to itself, that is, there will be a:

$$A = P_H \quad (11)$$

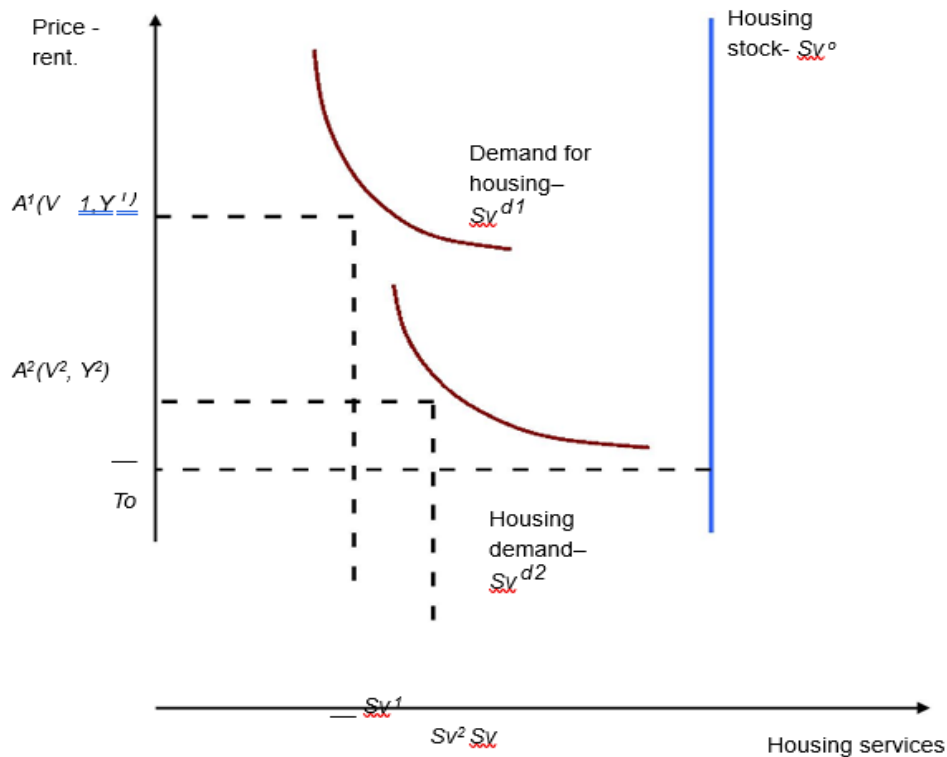
This implies that the owner observes that the value of the unit of residential asset that he owns will be the result of updating the future value of the price (rent) of the flow of services that the house will generate, so an expression of its present value will be a good approximation of the current value of the asset⁴⁸. In equilibrium, 'A' and P_H must be such that it is fulfilled (11), thus giving an expression of the relationship between the levels of rents that are linked to the asset market (Diagram 3): there would be different equilibrium levels at which rents would reflect the prices of the housing asset being interrelated by a common factor.

At each level of income and given stock, the implicit rental amount will determine the entry decision of households, as well as the substitution effects between rental markets in cases of non-purchase decision-making.

⁴⁷ Miguel Ángel López adds that the higher the marginal income tax rate, the lower the cost of using the home, López García, 2021:34

⁴⁸ This assumption is the basis of one of the most widespread techniques for housing valuation, whereby the value of a property is the Net Present Value (NPV) of the future rental income stream. This concept is also included in the valuation techniques recognised in Spain by OMeco/805/2003 and is called 'value in rent'.

Diagram 3. The housing services market



9.7 The rental market and the dynamics of the city.

The rental market is not an isolated entity; It is intrinsically linked and is a key driver of the dynamics, evolution and structure of cities. The principles of the New Urban Economy establish that rental income is fundamental to structuring the city in space. William Alonso's (1964) seminal model, generalized as the Alonso-Muth-Mills model, recovers the Ricardian principle of the value of land rent as a gradient from the point of highest price to the city limit, that is, the value of the land and, therefore, the rental income, is explained by the distance to the center and, generally, through accessibility and the cost of travel: As the distance to the center increases, the rent they are willing to pay decreases, creating a downward sloping Bid Rent Curve.

The rental market allows the mobility of the population, which is an essential element for urban dynamics. Cities with large rental stocks allow for a faster adjustment of the population to economic opportunities.

From the classical point of view, renting is the city's fundamental resource to facilitate the mobility of the population, while mobility (or lack thereof) is a primary driver of rental demand, forcing the city to have a minimum residential stock to shelter the households that move. This is one of the reasons why each city has a stable stock of vacancies over time, which is what contributes to reducing the frictions associated with the change of residence, acting as a buffer for the labour market.

This is because it is considered that renting a home involves much lower costs of entering and exiting the market than buying a home (mortgage, taxes, commissions), which reduces the cost of labour mobility (Hanushek and Quigley, 1979:⁴⁹). In addition, renting is the preferred option for households with high job uncertainty or who hope to move soon (e.g., students, young professionals, or workers on temporary contracts), it does not imply a commitment to long-term housing and therefore facilitates the mobility of workers to cities with better housing opportunities.

This contributes to the economic efficiency of the city and the country, as human capital can be reallocated faster (Glaeser and Gyourko, 2018:⁵⁰).

However, the rental market itself can become disrupted, acting as a limit on immigration and promoting emigration. Normally, this mismatch occurs when rental prices have grown above the payment capacity of the households that move, and/or there is no supply, which is when an affordability crisis appears. In markets with inelastic supply (where it is difficult to build), the high demand for mobility generates an explosive increase in rents. High rental prices force the low-income population into forced immobility (they cannot move to employment centres, or must live in the peripheries) or, conversely, force them to move out of their neighbourhood. The phenomena of sub-urbanization of poverty have been contrasted in different developed countries (Covington, 2015), as well as the contrast that the phenomenon of expulsion occurs in those cities with greater success, and an increase in property rents (Mayer et al, 2006:⁵¹).

⁴⁹ Hanushek, E. A., & Quigley, J. M. (1979). The dynamics of the housing market: A stock adjustment model of housing consumption. *Journal of Urban Economics*, 6(1), 90-111.

⁵⁰ Glaeser, E., & Gyourko, J. (2018). The economic implications of housing supply. *Journal of economic perspectives*, 32(1), 3-30.

⁵¹ Mayer, C. J., Gyourko, J., & Sinai, T. M. (2006). Superstar cities. Available at SSRN 921741.

9.8 Current approaches to the rental market

The literature has shifted towards empirical analysis of affordability, financialization, supply policies, and distributional effects of rental markets in crisis.

9.8.1 Financialization and Increasing Institutional Ownership

Financialization is the process by which the logic, techniques, and actors of finance are introduced into the housing sector as investment companies take positions by adding residential properties to their portfolios for the purpose of rental exploitation. This objective, which is traditional in the institutions specialized, it is amplified after the financial crisis and makes rental decision-making adopt the principles

of efficiency and profitability that have traditionally been applied to other investment assets. The house is then analysed as a financial asset in the investment process. This implies that the asset is decoupled from the utility: Housing is valued primarily for its ability to generate cash flows and capital gains, decoupled from the value of its residential use or its social affordability.

In this process, new investment vehicles proliferate, expressly designed to mobilise capital and finance the real estate sector, such as REITs (Real Estate Investment Trusts, known in Spain as SOCIMIs), venture capital funds and Build-to-Rent (BRT) platforms, which have been key in the process that is explained. These actors are looking for economies of scale and professionalized and standardized management.

The strong growth of this new investment structure occurred after the financial crisis, which reduced financing for real estate activities to a minimum, so that the situation of massive purchases of repossessed or social rental housing portfolios at discount prices was favoured.

The proliferation of institutional investors is explained by (1) the strong attractiveness derived from obtaining double returns and (2) the possibility of generating market power in the residential sector that would reduce the risk of profits.

9.8.2 The double profitability model

The double profitability model shows that the benefits of investing in housing come from the existence of two sources of economic benefit associated with rental properties: (1) income return, which is the recurring income generated by the property when renting it out, and (2) return on revaluation (capital gain). which would be the increase in the value of the property over time, which is made when it is sold. This double source of profit makes the residential rental business very attractive, which is

why it has attracted international capital to a greater extent than in the past (after the financial crisis), generating an increase in the presence of institutional investors in the rental markets. The total return on investment would be the sum of two returns: the return itself associated with the rental ($\text{alqu}/P_{\text{de compra}}$), and the one associated with the increase in the value of the property at the time of sale (value/P of purchase).

$$R_{\text{total}} = R_{\text{operativa}} + R_{\text{capital}} = \frac{\sum \text{alquileres}}{P_{\text{de compra}}} + \frac{(P_{\text{venta}} - P_{\text{de compra}})}{P_{\text{de compra}}}$$

Where R , the return, $P_{\text{de compra}}$ the price paid for the asset, P_{venta} the price received when selling the asset, the difference between the two would be the gain on revaluation. The first sum would be the operating profitability or net profit obtained from rental income, and the second refers to capital gains. The institutional investor will tend to maximize both components.

This doubling of returns allows for decision-making with a wider range than that of a conventional investment. For example, in markets where capital appreciation is high, expected capital gains can offset the existence of relatively low rents when making the investment decision. If the revaluation is low, the rental income must be higher to justify the investment.

In the case of markets where rent control policies are applied, these result in lower rental returns and therefore investments are mainly oriented towards markets with high capital gains, so this dual profitability model explains why some urban areas show a very active rental market even with regulated rents. Since investors anticipate significant future capital gains.

Property value increases through asset renovations, so the incentive to renovate influences future capital gains.

The incentives of double profitability tend to concentrate institutional investors in the most profitable markets, which generates a tendency to the concentration of properties and the emergence of market power and competition problems

Oligopolistic power allows rents to be fixed at increasing levels throughout the stock acquired (Weiss, 2023:⁵²). In addition, professionalised institutional management creates an asymmetry in the bargaining power with private tenants that favours landlords in the contracting phases and litigation processes, promoting the displacement of tenants to other areas and their replacement by new households with greater capacity to pay.

Institutionalized management and maximization of both returns results in a process of aggressiveness in asset management: since the value of the property is proportional to its ability to generate future income, an acceleration of present income increases the book value of the asset and its capital gains in the event of a future sale (Fields, 2018:⁵³). The financial logic in institutional investment, when valuing the maximization of the two returns, moves away from the logic of small owners who value the stability of the tenant that provides a constant return, generating a segmentation between both markets from the supply side.

The results of a concentration of ownership that leads to an acceleration of rents have strong social effects, such as (1) being one of the culprits of affordability problems that is concentrated in the poorest segments and exacerbates inequality. (2) It generates residential instability since institutional models (especially those with defined investment horizons) prioritize tenant rotation to apply rent increases and maximize capital gains, which has strong negative effects on health, education, and community cohesion; and (3) dissociation between public and private interests, since institutional interest (maximization of the IRR or Internal Rate of Return) clashes directly with the public interest (guarantee of the right to housing), requiring new forms of urban regulation and governance.

9.8.3 Gentrification and rent-gap theory

The literature underlines that increased investment and demand in urban centres often leads to a gentrification phenomenon, where rising rents displace low-income populations to peripheral areas. The public policy challenge is to balance the need for private investment to increase supply with the protection of affordability.

⁵² Weiss, B. (2023). Corporate consolidation of rental housing & the case for national rent stabilization. Wash. UL Rev., 101, 553.

⁵³ Fields, D. (2018). Constructing a new asset class: Property-led financial accumulation after the crisis. Economic Geography, 94(2), 118-140.

Gentrification, as a process of reinvesting capital in deteriorated central areas, has been the subject of two major theoretical approaches: the demand side (cultural preferences, return to the center of the creative class) and the production side.

The Income Gap Theory (Neil Smith, 1987:⁵⁴) holds that the determining factor of gentrification is not the mere arrival of people, but the opportunity for economic benefit that arises from a disparity of rents in the land market. For Smith, gentrification is an inevitable geographical process driven by the circulation of capital that seeks to maximize its return.

The rent-gap is conceptualized as a gap between the rent of the property in its current use and its potential rent, that is, the difference between two capitalized rents on the same real estate.

$$\text{Rent gap} = R_p - R_c$$

Where R_p is a potential income and R_c is the present capitalized income. The latter can be low because the capital invested in the maintenance and improvement of the building has decreased (disinvestment), allowing physical and social deterioration, remaining at low levels as incomes that are a reference for lower-income households. However, R_p would be the value of the rent that the land would produce if it were redeveloped, modernized, or rebuilt under its Best and Best Use" (HBU), and is tied to the ability to appeal to the upper-middle class and premium market prices.

Gentrification is triggered only when the gap between the two rents is wide enough to justify the cost of redevelopment or rehabilitation, generating a potential profit that must exceed the necessary investment costs.

⁵⁴ Smith, N. (1987). Gentrification and the Rent Gap. *Annals of the Association of American Geographers*, 77(3), 462–465. <https://doi.org/10.1111/j.1467-8306.1987.tb00171.x> Smith, N. (2005). *The new urban frontier: Gentrification and the revanchist city*. routledge.

As the potential value of land remains high (due to central location, access to key infrastructure, and the overall demand for urban living) while the current value is reduced, the gap becomes an investment magnet that is typically activated following distinct phases, with the first being led by individual investors buying properties at low prices, they invest in rehabilitation and increase the rent to its original level; Subsequently, institutional investors (public or private) continue the transformation process.

9.9 Reasons for public intervention in the provision

To conclude this theoretical introduction to the rental market, and in order to establish the positions of analysis, some elements justifying public intervention in the housing market from the economic perspective are included here, both promoting ownership and renting. Intervention in this market has been much discussed in Spain in recent years with the argument that public resources are allocated to private activities that generate non-socializable benefits. The observation of housing as an asset exclusively would be at the basis of this type of argument.

This section includes the usual arguments in the literature on residential markets that are nothing more than the transposition of the general market principles that justify the intervention of the State in the economy⁵⁵.

The general characteristics of the dwelling property are that of heterogeneity, it belongs to a market with little information, are goods that are subject to different demands at the same time, and they have an investment appeal due to their long duration. Although they have not been discussed in⁵⁶, their existence defines markets that adjust to imperfect competition and in which, often, supply has the capacity to affect prices and efficiency in the allocation of resources.

⁵⁵ And that can be consulted in any introductory manual to economics, such as that of Krugman and Wells, 2006, or Mankiw, 1998

⁵⁶ See Taltavull, 2000

A specific feature of real estate, and residential property in particular, is interdependence⁵⁷, which implies that decisions to provide one real estate asset have direct and indirect effects on the production and consumption of others. This (generally accepted) definition of externality implies that there are areas of (housing) markets where provision will not be made efficiently due to these cross-effects.

In addition, and without exhausting the list, it must be considered that housing is not only a market good but also one of the three goods that cover the basic needs of the population, along with food and clothing. This nature as a basic good has led most States to recognize housing as a good of social interest, accepting that its consumption in sufficient quantities guarantees the well-being of the population and a minimum quality of life for the society of a developed country.

With these components and remembering that in a mixed economy the State must intervene at least to achieve three objectives (to solve market failures, guarantee the redistribution of income, and contribute to a stable growth of the economy by nuanced economic cycles), the need for intervention in the housing market is fully supported. The intensity, typology and objectives of the intervention are within the group of other issues that must be addressed in a very precise way.

Following Oxley and Smith, 1996, a state should try to provide the maximum possible competition to its markets, including housing, so that resources are 'Pareto-efficient' located. However, in practice this is not the case, and governments often regulate the conditions of provision and distribution of housing to avoid the effects of market failures on society. This is so for three reasons. Firstly, because the supply process generates external costs and benefits in production and consumption of housing that must be regulated and compensated⁵⁸, both with direct regulations and with technical and planning measures. A typical case of negative externality associated with home ownership is lack of maintenance and reinvestment. If there is no reinvestment to maintain the quality of the existing buildings, it usually generates a loss of the overall quality of the neighbourhood and a fall in the value and attractiveness of that part of the municipality. In the case of rental housing, tenants will not be interested in updating the home from its deterioration because of depreciation due to use since the benefit it would generate would be insufficient, although if all the homes were improved, the common benefit would be considerable. The owner would only be willing to improve if

⁵⁷ See Dasso et al, 1995

⁵⁸ Externalities such as, for example, the effects on the views or light of a neighbourhood if nearby towers are built, generating additional costs for the pre-existing inhabitants, or due to the low quality of construction that generates deterioration in the neighbourhood where it is located and the consequent danger to the neighbours

his profit, measured through the amount of rents he receives updated, was higher than the cost of renovation. In this case, a collective decision to intervene is required, which the market cannot take as a whole. The renovation of housing and neighbourhoods is in the public interest to, among other reasons, guarantee the quality of housing and the health of the inhabitants, which is directly related to their state⁵⁹. They are also linked to educational levels and to the existing levels of crime.

Second, governments may consider housing as a good of social interest, both in terms of the quantity and quality of the services consumed. This implies that it is chosen to apply to the consumer some degree of reduction in their 'sovereignty' to decide whether to consume housing and how much they consume, being able to replace the process of market allocation at levels that are directly proportional to the degree of intervention. Within this approach, we would find the arguments that justify residential allocation in cases where the market fails to provide it, such as the absence of housing production for certain lower-income social groups or specific ethnic groups.

Thirdly, and directly related to the ultimate assessment, the reason that justifies the intervention in housing is that it is used as a tool for redistribution. The high correlation between income levels and housing conditions means that intervention in this market is seen as an element with high redistributive power. The difficulty of low-income families in accessing housing of sufficient quality has been one of the arguments that have prompted governments to regulate the minimum conditions of buildings⁶⁰, as well as to control (with varying degrees of success) the possibility of using housing that does not reach the minimum health standards.

Fourthly, governments intervene to meet the detected 'need' for housing linked to demand. While the demand for housing can be measurable with economic factors, the need follows a different concept, since it would be the amount of housing required to ensure that households consume sufficient housing services of a minimum standard.

⁵⁹ The relationship between housing and health was one of the first reasons for intervention in the setting of minimum housing conditions during the nineteenth century in the United Kingdom

⁶⁰ This has been the case of housing construction in Spain since the 1960s, with strong quality requirements in design that were generalized to the entire stock from the first expansive cycles

This concept is independent of the ability to pay, and its principles are not conveniently operated by the market. Most of the intervention in this regard has been difficult to precise, since governments have assessed the existing 'need' (although usually in aggregate and not individual terms) and interventions have been made on supply, trying to ensure sufficient construction to compensate for estimated needs. In Spain, this has also been the model that has been followed by the municipal authorities.

A fifth argument for intervening in the housing market addresses the effects that other macroeconomic policies have on the functioning of the market, such as those of unemployment, or inflation, among others. For example, reductions in public spending associated with a contractionary policy can increase the costs of using housing and interfere in the market, making it difficult for demand to access. Rent control policies are aimed at avoiding price increases that may be the result of tensions of this type (Muellbauer, 1990).

The endogenous functioning of the market itself has important implications that make the State intervene with public policies: The rapid reaction of the prices and the slower reaction of supply generate periods of tension in the short and medium term that disrupt access to the market. The types of intervention are classified into two categories of measures, those that incentivise the most rapid increase in supply, with provision or transformation in uses, or, secondly, through price control policies, often with dubious effects on efficiency in allocation.

The generally recognized idea is that regulation should precisely set out its housing policy objectives to solve market problems, seeking to minimize the effects of intervention on allocation mechanisms rather than replace them.

Public Policy Solutions

Solutions being discussed to improve the rental market situation include:

- **Construction of Public Housing:** Significantly increase the stock of social rental housing managed by the Administration.
- **Rent Regulation (Rent Control):** Its effect is much debated. While it stabilizes prices in the short term, many studies warn that it can reduce investment in maintenance and discourage the creation of new supply in the long term

Rent control has been the subject of intense debate since the mid-twentieth century. Authors such as Stigler (1946) and Olsen (1969) argued that this policy generates a shortage of supply, deterioration of the housing stock and misallocation of resources, by setting prices below the market equilibrium. Arnott

(1995) reviewed this literature and concluded that strict controls are counterproductive, although softer forms of regulation could mitigate the negative effects in the short term.

Rent control, as an intervention in the market mechanism itself, has the effect of potentially distorting the supply curve, resulting in a decrease in the quantity and quality of available housing. The effects can be:

Desired: Affordability and Residential Stability

- The establishment of price ceilings manages to reduce rental prices by concentrating the benefit on a specific population, which improves the affordability of households occupying regulated housing. In economic theory, this benefit translates into a direct transfer of wealth from the landlord to the existing tenant.
- The benefit of permanence or stability for the tenant is the most robust effect of these measures, as they are usually accompanied by the introduction of direct protection regulations in the contract. Thus, tenants are not forced to leave their neighbourhoods due to rent increases that their income cannot cover, while saving on free-up rent increases resources to spend on other goods and services (consumption). By reducing forced turnover, the stability of communities and neighbourhood ties is promoted.

Unwanted: Reduced supply and investment

- Price regulation distorts the supply curve, resulting in a decrease in the quantity and quality of available housing.
- If the reduction is substantial, and is set below the market equilibrium price, the economic incentive to invest in the sector is reduced, so new construction is reduced (when the internal rate of return of developers is reduced below that of other financial assets).
- Market restructuring, since in the face of control regulations, there is a withdrawal of existing units (in the medium term) or units in the rental market are sold or converted to other uses (such as short-term rentals)
- Finally, the lack of reinvestment in the property generates a deterioration in the quality of the home. Over time, the quality of the regulated housing stock decreases compared to the unregulated stock, negatively affecting the habitability of the area (Negative Externalities).

The most subtle effect is the inefficient allocation of resources and the transfer of pressure to the unregulated market. As for the former, regulation reduces mobility

between units of the regulated market and the non-regulated market, due to the higher cost of the latter. On the other hand, existing demand accumulates in the unregulated market, generating pressure on its prices.

In summary, to assess the role of the housing market according to the principles of operation, it would be necessary to know in detail the type of market to be analysed, differentiating between the rental market that would require protection (for social purposes) and the private market. Intuition says that private markets tend to serve a different type of demand than public markets and it is necessary to delimit the boundary between them to know in detail how they work and how prices react. The role played by renting as a potentially balancing element of the housing market, and as a dynamized of general economic activity (to the extent that it settles the population in space, allows mobility, guarantees the quality of life in society, increases the value of the living environment, among others), is important enough to justify the existence of powerful databases that allow its analysis.

It is necessary to know the market share of public and private rentals (and the equilibrium size of the rental market compared to the property market), to assess the level and evolution of its basic constants (prices and vacancies), to know what are the characteristics of its demand (for households, income level, need for mobility, particularities of family formation, etc.). among others), to identify the needs that the rental must cover and the market niches where intervention may be essential.

The availability and characteristics of housing determine the level of development of society to the extent that it provides a quality of life that allows individuals to project their well-being to their social and productive activity.