

Challenge #6

**TO PROMOTE  
BALANCED, FAIR  
AND SUSTAINABLE  
TERRITORIAL  
DEVELOPMENT**





## EXECUTIVE SUMMARY

- Spain has seen a large increase in its urban population. In 1950, 50% of the Spanish population lived in cities; today that figure stands at 80%. This intense urbanisation has had very positive effects on Spain’s economic and social development: it has enhanced access to services and infrastructures, stimulated the transfer of knowledge and innovation, and has created more education and job opportunities.
- However, urbanisation has also led to a very uneven territorial population distribution. Demographic aging and a shortage of employment and services are threatening to empty many rural areas (nearly half of all Spanish municipalities are at “risk of depopulation”) and accelerating the population loss in some provincial capital cities.
- At the same time, urban concentration has led to significant challenges for cities: difficulties accessing housing have increased (45% of tenants earmark more than 40% of their income for rent), the environmental damage is greater due to heavier use of private vehicles, and phenomena such as social inequality and segregation have worsened in some cases.
- Urbanisation will continue over the coming decades. By 2050, 88% of the Spanish population is estimated to be living in cities with rural Spain losing nearly half of all its inhabitants. If measures are not taken, large cities and their metropolitan areas will become more extensive and disperse which will make them less socially and environmentally sustainable. Meanwhile, many rural towns and medium and small cities will become less economically sound and suffer a significant decline in their society and heritage.
- Fortunately, such scenario can be avoided. If the right policies are implemented and good use is made of megatrends such as digitalisation and the green transition, we can make the cities of the future healthier, more cohesive and more sustainable than they are now, as well as greatly improving the living conditions and opportunities in medium and small towns.
- For better health and urban sustainability, we must return to the compact, friendly city model; access to housing must be facilitated with a decisive commitment to affordable housing; encouraging building refurbishment; creating low-emissions areas; expanding green areas; and transforming the mobility model to favour public transport, carsharing, and active mobility (biking, walking).
- In order to promote balanced territorial development, we must reinforce the backbone role of medium-sized cities, enhance production diversification in smaller-sized towns, and guarantee access to services, all while improving transport connections and technology infrastructures, among other initiatives.

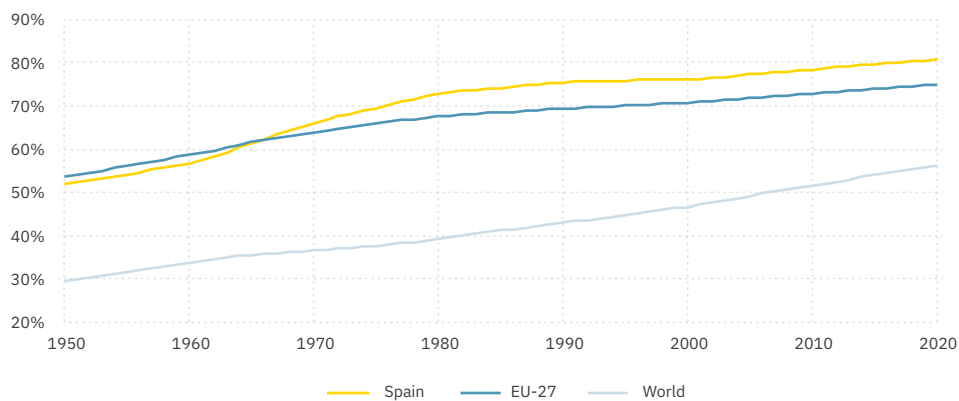


## THE PAST: ACHIEVEMENTS

Cities are the engines of the world. The gathering of services, human capital and ideas make them hotbeds of innovation and major epicenters for creating economic, social and cultural opportunities. This is why *urbanisation* (the process of concentrating people and economic activity within urban areas) has grown apace since the Industrial Revolution. Currently, 55% of the population is concentrated in cities where around 80% of the world's GDP is produced.<sup>1</sup>

Spain is by no means oblivious to this trend. Over the last century, **the population living in cities has more than doubled**, from accounting for 32% of the total in 1900<sup>2</sup> to 80% in 2020<sup>3</sup> [Fig.1].

Fig. 1. Urbanization rates



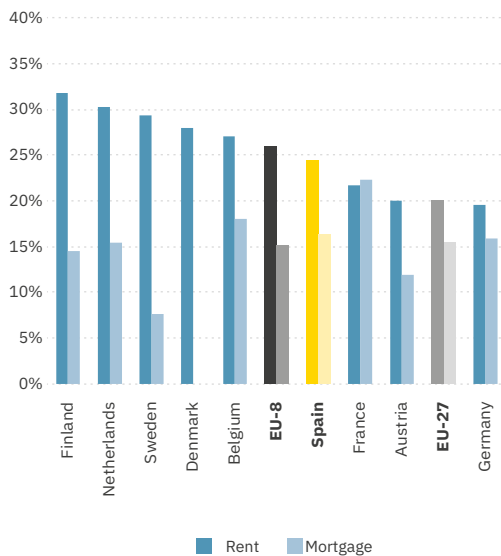
Source: By the authors based on data from the United Nations.<sup>4</sup>

**This urban growth has had very positive effects on Spain's economy and society:** it has facilitated the improvement of the services and infrastructures to which citizens have access, it has stimulated the transfer of information and knowledge, it has fostered the development of companies and new professional opportunities and it has contributed to an increase in productivity.<sup>5</sup>

**Spain has been able to combine this growth in cities with enhanced levels of security and wellbeing for most of its inhabitants.** Various data sources indicate that Spain's streets are some of the safest in the world<sup>6</sup> and that its urban areas are some of the most child<sup>7</sup> and elderly friendly.<sup>8</sup> Moreover, the levels of tolerance for foreigners<sup>9</sup> and trust among neighbours<sup>10</sup> are higher than in many surrounding countries.

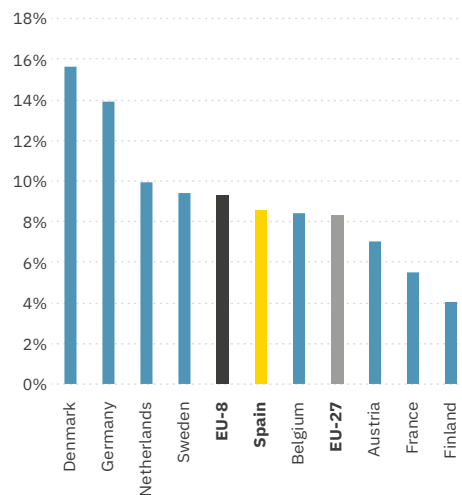
Despite the increasing difficulties, **accessing adequate housing in Spain is no more difficult than in most European countries** [Fig. 2]. The Spanish population reflects a higher ownership rate than the European average<sup>11</sup> with a similar housing cost overburden [Fig. 3]. The quality of the country's housing stock has significantly improved over the last few decades. Some 94% of Spain's homes are in good condition with practically all homes enjoying running water, a telephone line, and bathroom; 60% have heating. These proportions contrast with the 1970 figures when barely 8% of all homes had heating and only half had a bathroom or shower.<sup>12</sup> The data also show that the availability of m<sup>2</sup> per person has doubled from 1970 to 2011.<sup>13</sup>

**Fig. 2. Percentage of revenue households earmark to pay for housing, 2018 or most recent data available**



Source: Author's own based on data from the OECD.<sup>14</sup>

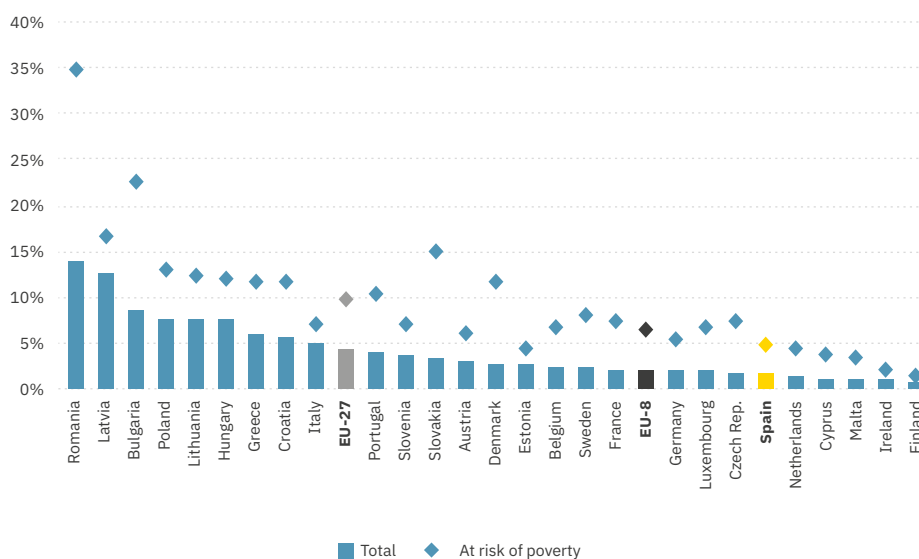
**Fig. 3. Housing cost overburden rate, 2019**



Source: By the authors based on data from EU-SILC.<sup>15</sup>

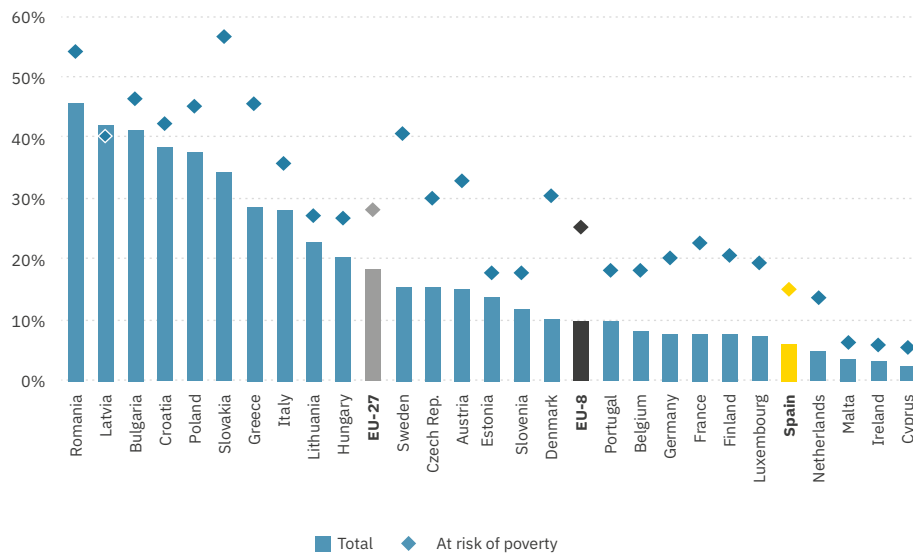
Because of these and other improvements, the percentage of people suffering from overcrowding (6% nowadays) and people suffering from serious hardship inside their home (2%) have gone down with both values below those recorded for the EU-27 and EU-8<sup>16</sup> [Figs. 4 and 5]. Other types of housing problems such as severely sub-standard housing (slums) have also gone drastically down in the last 40 years. In Madrid alone, there were some 30,000 shacks registered at the end of the seventies with more than 100,000 people living in them.<sup>17</sup> In 2018, only 132 sub-standard homes of this type were registered in the same city.<sup>18</sup>

**Fig. 4. Percentage of the population (total and at risk of poverty) suffering from severe housing deprivation, 2019**



Source: By the authors based on data from EU-SILC.<sup>19</sup>

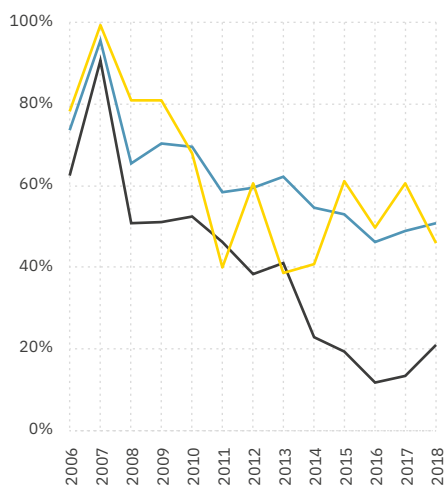
Fig. 5. Overcrowding rate by poverty status, 2019



Source: By the authors based on data from EU-SILC.<sup>20</sup>

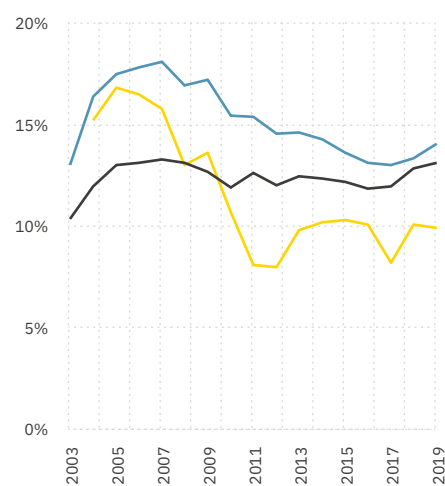
With regard to environmental sustainability, the country's cities have also seen significant progress. Most Spanish municipalities have implemented measures<sup>21</sup> aimed at reducing their environmental footprint and improving the usability of their streets. Thanks to this, the percentage of urban population exposed to high levels of air pollution has dropped substantially [Fig. 6], as has the percentage who believe they suffer from environmental problems<sup>22</sup> [Fig. 7].

Fig. 6. Urban population exposed to air pollutant concentration (pm. particles) above WHO air quality guidelines



Source: By the authors based on data from the European Environment Agency.<sup>23</sup>

Fig. 7. Percentage of the population claiming to suffer from pollution and other environmental risks



Source: By the authors based on data from EU-SILC.<sup>24</sup>

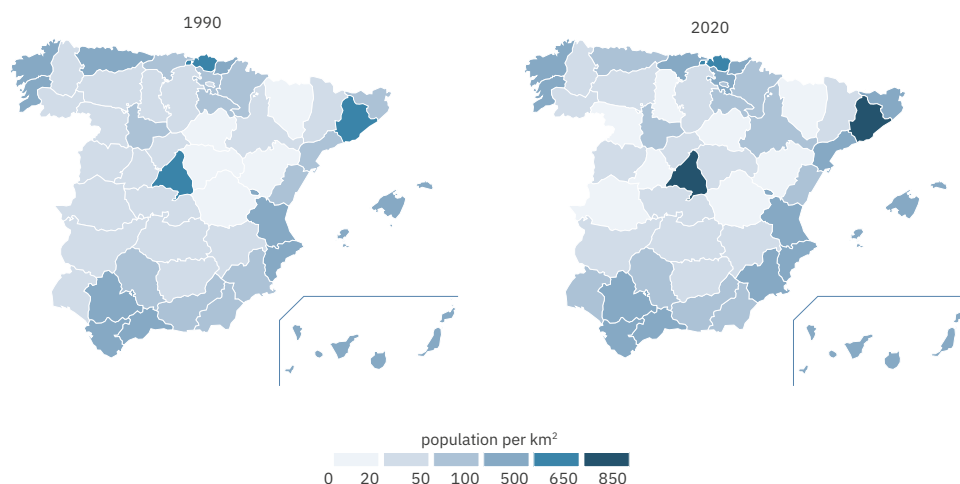
Besides being more sustainable, **the country's cities are now smarter** due to a more extensive and efficient use of sensors, open data and Artificial Intelligence when designing and managing urban areas. Spain has 83 cities with more than 50,000 inhabitants who are committed to using technology and innovation to improve issues such as saving energy, mobility, electronic administration, and services for citizens.<sup>25</sup>

In short, **the urbanisation Spain has experienced in the last few decades has been positive and successful**. However, this does not mean there have not been any negative effects. As we shall see, the growth of cities has also led to **an uneven territorial population distribution** which has also created significant **social, economic and environmental challenges in both rural and urban areas**.

## THE PRESENT: UNFINISHED BUSINESS

Spain has an average population density much like the EU-27.<sup>26</sup> Nonetheless, underlying it is **a very heterogeneous distribution over the territory** [Fig. 8], where the high population concentration in areas such as Madrid and Barcelona, the Mediterranean coast, the islands, some provinces of the Basque Country and Andalusia contrasts with the relative depopulation of other Peninsular inland areas.

Fig. 8. Municipality population density by province, Spain



Source: By the authors based on data from the INE (Spanish National Statistics Institute).<sup>27</sup>

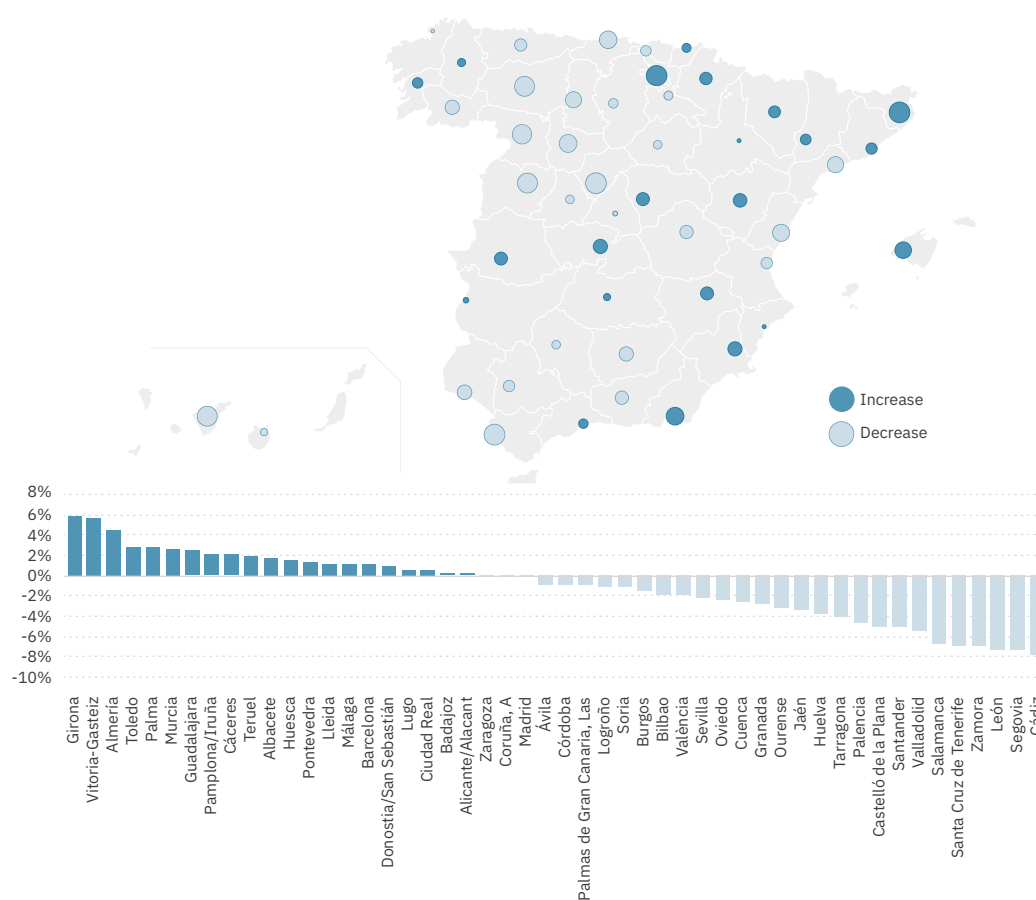
The story of how the country got here is long and complicated.<sup>28</sup> **Cities** (municipalities with more than 10,000 inhabitants) **have followed a rather unequal evolution** in space and over time. During the second half of the 20th century, the population increased in most cities in Spain first due to migrations from rural areas and later from the development of the autonomous region model which decentralized government and made it so that provincial capitals and other medium-sized cities<sup>29</sup> could house public institutions, universities, businesses and better job and leisure opportunities.<sup>30</sup> After the nineties, however, this generalized rising trend began to revert in several



areas of the country<sup>31</sup> due to the drop in the birth rate (negative population growth), a reduction in foreign immigrants, the inability to continue attracting people from nearby areas,<sup>32</sup> and growing attraction to large urban areas.<sup>33</sup> Such is the case that **half of the country's capital cities have lost inhabitants since 2010** [Fig. 9].

There are very different underlying causes for this trend which is determined by a multitude of factors such as economic invigoration, access to transport infrastructures and geographic location (i.e. proximity to the coast or pertaining to metropolitan areas of larger cities).<sup>34</sup> In any case, the conclusion is the same: **population decline does not only affect rural Spain; it is also occurring in many medium-sized cities throughout the country, including provincial capitals and county seats.**

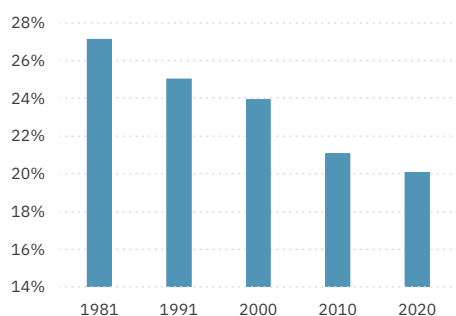
**Fig. 9. Population growth in provincial capitals between 2010 and 2019, Spain**



Source: By the authors based on data from the INE (Spanish National Statistics Institute).<sup>35</sup>

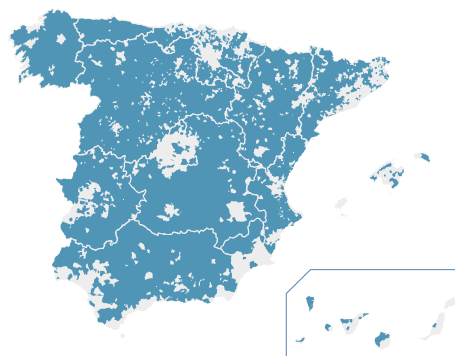
**With regard to rural municipalities (less than 10,000 inhabitants), most have lost population in the last few decades.**<sup>36</sup> The so-called rural exodus began in the sixties and has not stopped since. The arrival of foreign immigrants to Spain between 2001 and 2008 slowed the rural population decline a little in some areas.<sup>37</sup> However, the 2008 and 2011 economic crises reactivated the process<sup>38</sup> and consolidated the rural abandonment trend which neither the economic recovery nor the recovery of the influx of immigrants could reverse over the following years.<sup>39</sup> Thus, the percentage of the population living in rural towns has dropped from 27% in 1981 to 20% in 2020 [Fig. 10]. **Currently, nearly half of all Spanish rural municipalities are at “risk of a population decline”,<sup>40</sup> a phenomenon that affects practically all autonomous regions<sup>41</sup> [Fig. 11] and has major social, economic and environmental implications for the entire country.<sup>42</sup>**

**Fig. 10. Percentage of the Spanish population living in towns with less than 10,000 inhabitants.**



Source: By the authors based on data from the INE (Spanish National Statistics Institute).<sup>43</sup>

**Fig. 11. Municipalities with population decrease between 2010 and 2019, Spain**

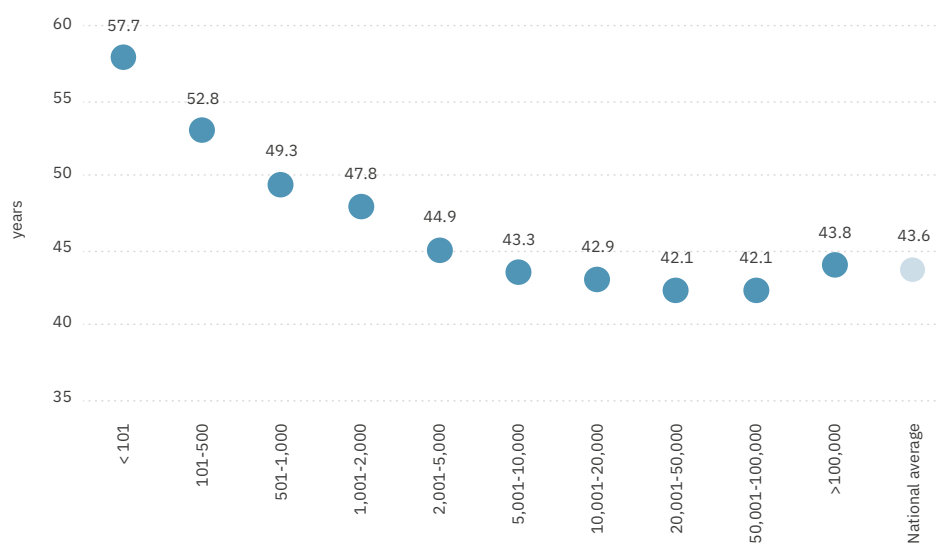


Source: MITECO (Spanish Department for the Ecological Transition and Demographic Challenge).<sup>44</sup>

**Population decline in rural Spain has intensified due to the progressive population aging.<sup>45</sup>**

The average age of Spanish society as a whole is 43.6 years, yet this average is closer to 50 in municipalities with less than 5,000 inhabitants [Fig. 12]. The proportion of people aged 15-19 in those areas compared to retirees dropped 41% between 2000 and 2018.<sup>46</sup> As the younger population leave their birth villages due to a lack of opportunities, the proportion of elderly people is rising.<sup>47</sup> As a result, **there are now 1,109 municipalities in Spain where no child aged 0-4 lives and there are 393 where most of their inhabitants are over 65.**<sup>48</sup> The low birth rate in these population centres,<sup>49</sup> partly explained by the large number of young women who have migrated from the countryside to the city, has made the demographic growth in these more unpopulated areas negative even when these migrations have stalled.<sup>50</sup>

**Fig. 12. Average age by town size (inhabitants) in Spain, 2020**

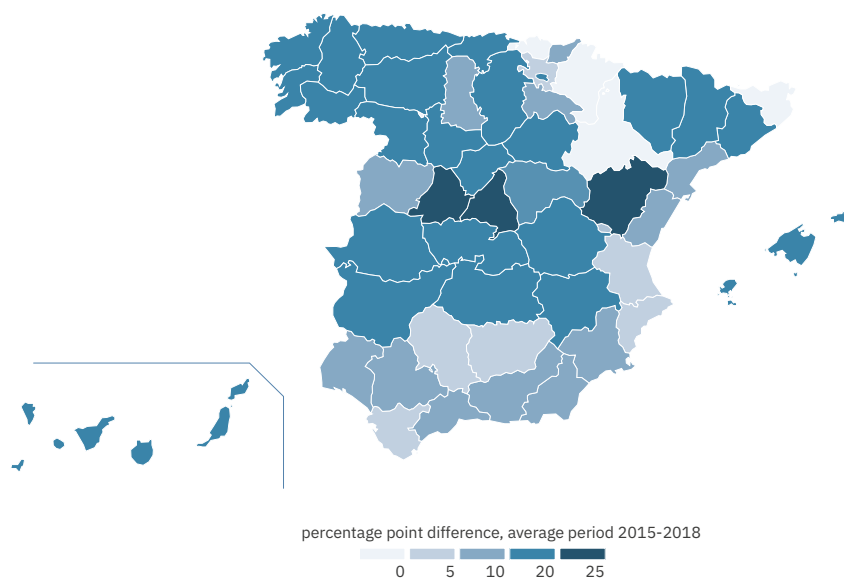


Source: By the authors based on data from the INE (Spanish National Statistics Institute).<sup>51</sup>

## The causes

The divergence between the demographic behaviour of urban and rural areas is due to a number of economic, social and cultural factors. One of the main ones is no doubt **the greater attraction cities offer regarding access to services,<sup>52</sup> infrastructures, and employment,<sup>53</sup> education and leisure opportunities.** The increasing concentration of employment in Spanish urban municipalities is a clear reflection of this [Fig. 13]. Moreover, there is evidence that wages (as well as expenditure) tend to be higher the bigger the city is due to the learning and productivity benefits usually involved.<sup>54</sup> Thus, the average household income in Spanish urban areas, adjusted for the population's buying power, totaled 20,608 euros in 2019 versus 15,638 euros in rural areas.<sup>55</sup> In contrast, the lack of diversification of rural economies (very much still dominated by the primary sector) tends to mean less dynamic job markets and limited job and professional development opportunities, especially for women.<sup>56</sup>

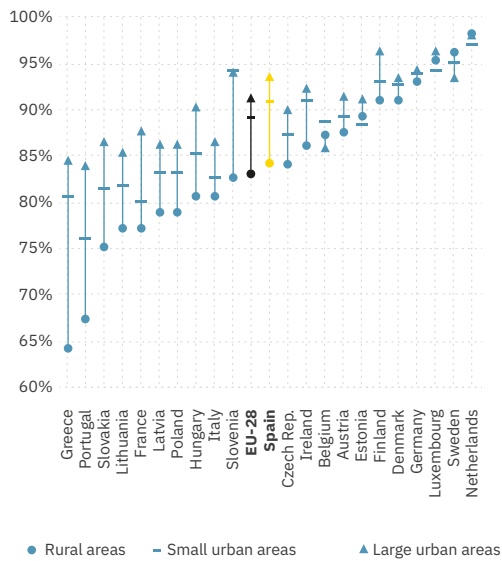
**Fig. 13. Difference in Social Security affiliation between urban and rural municipalities by provinces, Spain**



Source: By the authors based on data from the Digital Atlas of Urban Areas of Spain.<sup>57</sup>

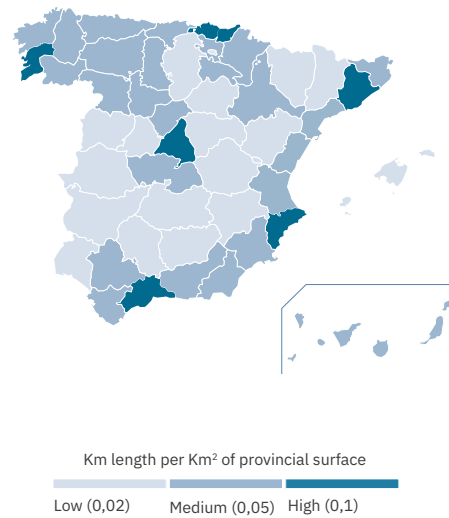
As far as **access to services and infrastructures**, and despite the great progress seen over the last few decades, the difference between the rural world and urban world is still notable. This is due to the fact that it is more profitable for public administrations and companies to offer services in densely populated areas where they are able to cover more needs for similar overhead costs. Thus, the services and infrastructures in rural areas are much less developed. This reality can be seen, for example, **in the area of broadband access where the urban-rural divide in Spain is still significant** and much greater than is observed in the most advanced European countries [Fig. 14]. Similarly, there is more motorway and highway density in places with a more heavily concentrated population [Fig. 15], which facilitates interactions with other areas, increases the market size for the purchase and sale of products and services and reduces production costs.<sup>58</sup>

**Fig. 14. Urban-rural divide in broadband access, 2019**



Source: Author's own based on data from the OECD.<sup>59</sup>

**Fig. 15. Motorway and highway density by Spanish provinces, 2018**

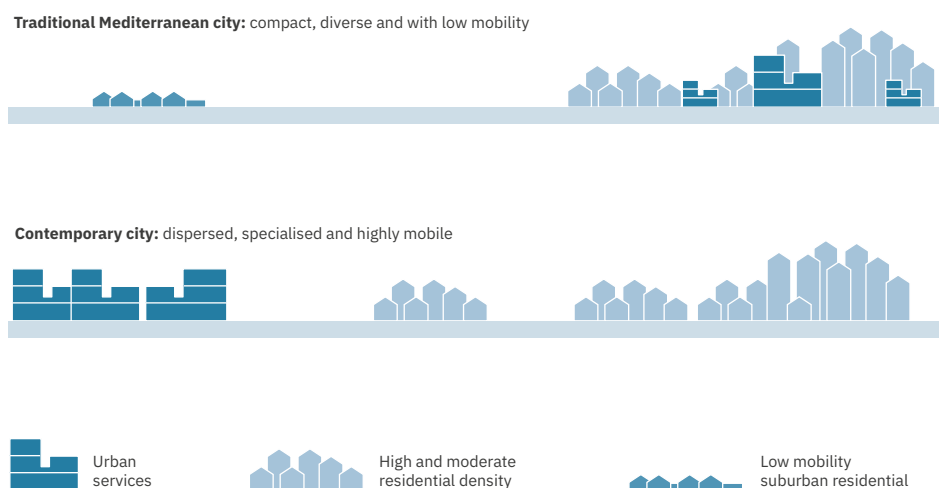


Source: By the authors based on data from INE (Spanish National Statistics Institute) and MITMA (Spanish Department of Transport, Mobility and Urban Agenda).<sup>60</sup>

### A different urbanisation model

The population of the various towns is not the only thing that has changed over the last few decades. An urban model that is different from in the past has also been gradually forming. **Up until the eighties, most Spanish cities reflected what is known as the “Mediterranean city” model**, which is characterized by compact cities with diverse uses (residential, commercial and services) which tend to be near to one another. This model, the roots of which date back to antiquity, offers several advantages: more efficient use of infrastructures and resources, it encourages social integration, is good for attracting tourism,<sup>61</sup> and enables the development of active mobility habits<sup>62</sup> which are key to better health and wellbeing.<sup>63</sup> As of the nineties, however, **suburbanisation processes** (the growth of residential areas outside the cities, mostly occupied by the middle classes)<sup>64</sup> **began transforming this urban model towards a more disperse and less dense one** [Fig. 16], which is associated with higher land consumption, an increase in environmental pressure, longer travel times and a significant increase in the costs of service provision.<sup>65</sup>

Fig. 16. City Models: Compact Versus Disperse



Source: Adaptation based on Sanabria Artunduaga, Tadeo Humberto, and John Fredy Ramírez Ríos, 2017.<sup>66</sup>

This rise in suburbanisation was **very much linked to the expansion of the construction sector** up until the 2008 crisis.<sup>67</sup> In those years, most new homes were built in medium-sized cities and their metropolitan areas,<sup>68</sup> forming low-density urban developments.<sup>69</sup> Part of this expansion was **the result of the economic internationalisation of metropolises, the location of business centres in the suburbs<sup>70</sup> as well as the formation of new households** with the latter due to the entry of the immigrant population and the increase in the number of people leaving the nest during those years of a positive economic and employment situation.<sup>71</sup>

Many households found that these metropolitan areas better suited their **housing preferences**,<sup>72</sup> both in terms of the housing characteristics (size or availability of communal areas and parking) and prices. Nonetheless, it is also true that there was a major imbalance in Spain between the demographic and housing market growth<sup>73</sup> given that a significant portion of this expansive urban development did not meet any real housing need but rather involved the acquisition of second homes<sup>74</sup> and fulfilled builders', town halls' and owners' own economic interests. Proof of this can be found in the fact that **25% of the homes in Spain in 2019 were not habitually occupied** either because they were empty or used as second homes.<sup>75</sup>

Other factors that may have aggravated the unequal population distribution throughout the territory and rise of suburbanisation in the last few decades included **the fiscal differences between the various autonomous regions,<sup>76</sup> the complex legal and regulatory framework, and the lack of any coordinated territorial policy.**<sup>77</sup> The first of these aspects has influenced the location of production resources and company headquarters. On the other hand, legislative plurality has limited the creation of synergies in the distribution of infrastructures and resources, thereby affecting the population distribution throughout the territory.<sup>78</sup> As well as this, several autonomous regions still do not have territorial planning guidelines that serve as a strategic guide within their regions<sup>79</sup> and, in terms of town planning, despite the fact that nearly 70% of municipalities have a General Plan,<sup>80</sup> the time required for its modification does not allow them to respond to a rapidly changing reality. Finally, in addition to all of the above is the fact that urban development processes often extend beyond municipal borders without really any effective coordination between metropolitan and provincial policies.<sup>81</sup>

## The implications of the territorial imbalance in Spain

The territorial dynamics described have had and have a deep impact on the economy, society and the environment. In fact, **they are closely linked to many of the structural challenges facing Spain** which are discussed in this *Strategy* [see chapters 1, 3, 4 and 8]. More directly, they have led to or worsened four significant challenges that must be resolved over the coming decades: 1) difficulties accessing housing, 2) the deterioration in the environment and urban health, 3) inequality and social segregation, and 4) the loss of dynamism in the rural world.

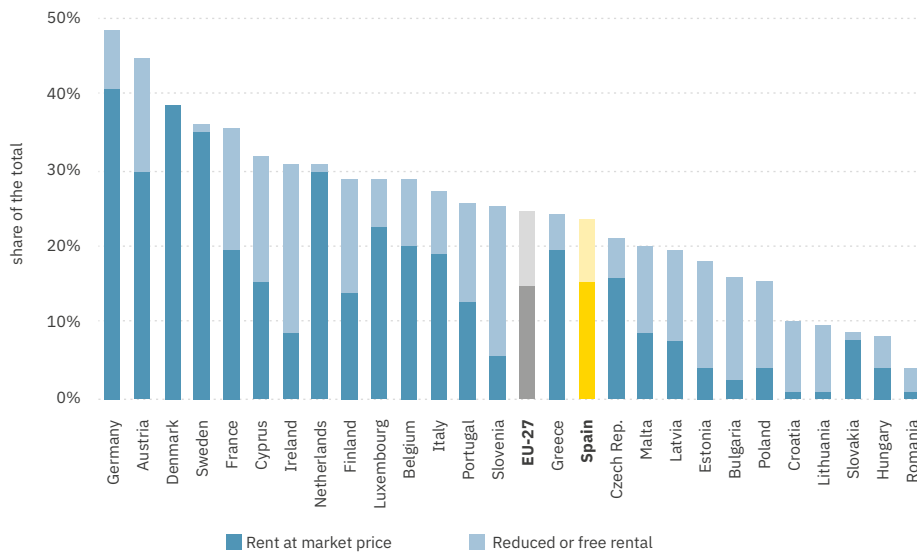
### I. Difficulties in accessing decent and adequate housing

Spain has one of the highest home ownership rates in Europe (76%) and one of the highest percentages of population living in their own property without any type of mortgage (47%).<sup>82</sup> Notwithstanding, this does not mean the population's residential needs are wholly satisfied. In fact, **the numbers indicate that accessing a decent and adequate home in Spain is becoming ever more complicated**. With regard to owning homes, the rising difficulty of securing a mortgage stands out. Over the last two decades, the sharp drop in interest rates has stabilized the proportion of income households earmark each month for paying a mortgage (at around 30%), and far from the 60% observed prior to the 2008 crisis.<sup>83</sup> It has also meant that a lower and lower proportion of people must over extend themselves<sup>84</sup> to try and make their pending mortgage payments (currently less than 4%).<sup>85</sup>

Yet even though monthly instalments have gone down, **the initial effort it takes to buy a home** (ratio between the value of the home not covered by a mortgage and household income) **has considerably increased**.<sup>86</sup> The harsher requirements for bank loans<sup>87</sup> following the financial crisis along with the high seasonality of the job market and low wages have made access to buying quite difficult.<sup>88</sup> This is especially true in large cities like Madrid, Barcelona and Bilbao,<sup>89</sup> as well as among the segments of the population with the lowest capacity to save such<sup>90</sup> as young people and lower income households.<sup>91</sup>

At the same time, **the proportion of the population living in rented housing has increased considerably** even though it continues to be quite lower than most countries surrounding Spain [Fig. 17].

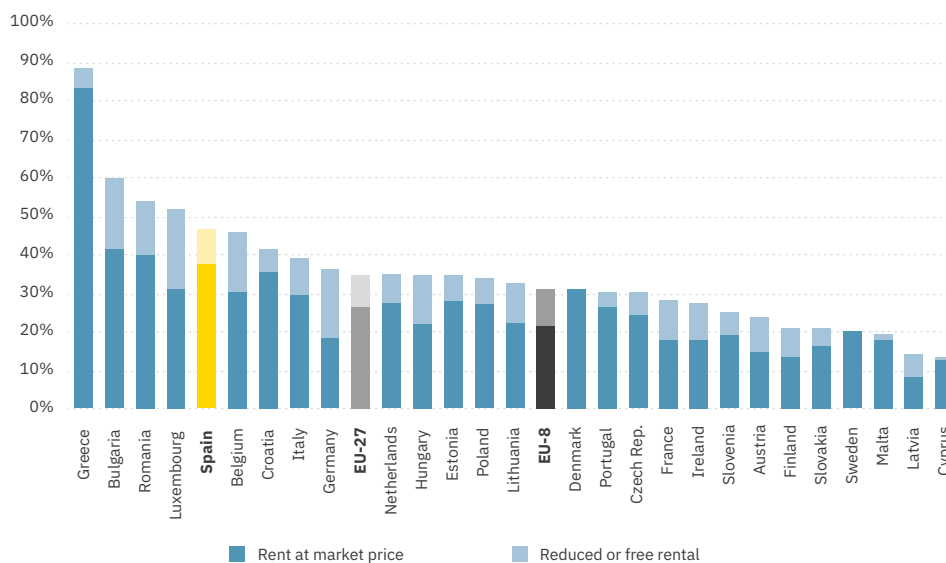
Fig. 17. Share of population living in rented housing with a reduced price rent, 2019



Source: By the authors based on data from EU-SILC.<sup>92</sup>

The increase in demand, along with an insufficient number of homes available for rent,<sup>93</sup> has led to **a sustained rise in rental prices over the last few years** particularly in Madrid, Barcelona, Malaga, Valencia, and some areas of the Balearic Islands and Canary Islands.<sup>94</sup> This increase, added to the **low number of subsidized homes**<sup>95</sup> in Spain (only 2.5% of the total number of primary residences are estimated to be reserved for subsidized rent when such percentage exceeds 20% in countries like Austria, Denmark and Holland)<sup>96</sup> has led to a **significant increase in the proportion of people who are financially overburdened when it comes to to paying their rent** in this country, which now reflects **one of the highest rates in Europe for such figure** [Fig. 18].

Fig. 18. Housing cost overburden rate among tenants (% out of the total number of tenants, 2019).



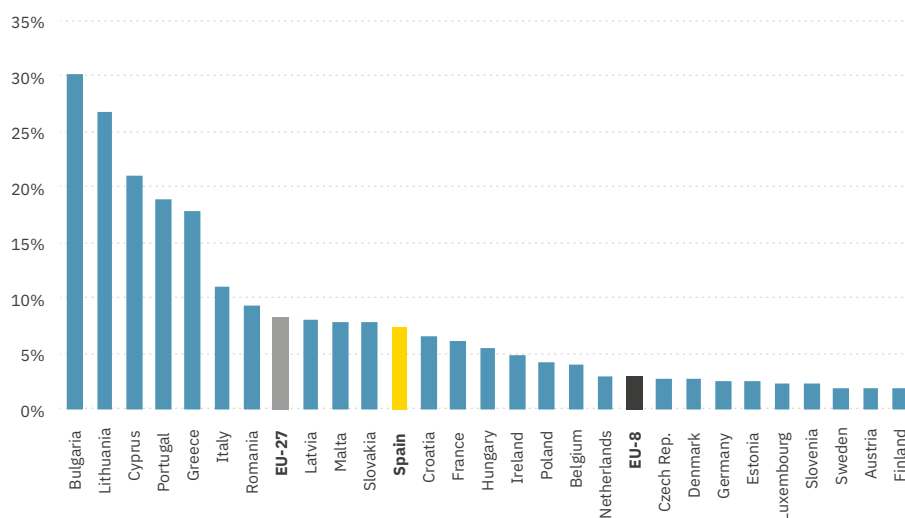
Source: By the authors based on data from EU-SILC.<sup>97</sup>

The increased difficulty accessing a home, along with the precarious employment situation, has had **very profound effects** on this country: it has contributed to the increase in inequality [see chapter 8]; it has altered social dynamics, and has further prolonged the length of time young adults remain living with their parents.<sup>98</sup> At present, 64% of all Spaniards between the ages of 18 and 34 live with their parents. This proportion is much higher than in the EU as a whole (50%)<sup>99</sup> and the figure for Spain just two decades ago (51%).<sup>100</sup> This delay in the age of leaving home has also contributed to a higher average age of first-time mothers, a drop in the birth rate, and worsened living prospects for millions of young people<sup>101</sup> along with everything this implies for the country's overall economy and society.

**As far as housing quality is concerned, the situation in Spain is rather favourable in comparison with most European countries.** However, there are significant unresolved challenges that affect the most vulnerable groups in particular. For the population below the poverty threshold,<sup>102</sup> housing quality has substantially worsened: 11.3% are living in situations of overcrowding and 4.9% are experiencing severe housing deprivation.<sup>103</sup> All of this has a real impact on the physical and mental health of this segment of the population.<sup>104</sup>

Another unresolved issue is that of **reducing the energy poverty**<sup>105</sup> still affecting many households in Spain, especially those headed by women and people over the age of 65.<sup>106</sup> Nearly 17% of all households in this country face energy bills which are in absolute disproportion to their income,<sup>107</sup> and 8% cannot keep their homes at an adequate temperature; this percentage is similar for the EU-27, but much higher than for the EU-8 [Fig. 19].

**Fig. 19. Proportion of the population unable to keep their home adequately warm, 2019**



Source: By the authors based on data from EU-SILC.<sup>108</sup>



One additional aspect that must be improved is **accessibility to buildings, which is key to the social inclusion of the population with mobility problems**. In 66% of Spanish residential buildings, people in a wheelchair can not get to the door of a home from the street without help.<sup>109</sup> This situation will be more problematic in the future because of the ageing population.<sup>110</sup>

## II. Environmental deterioration, quality of public areas and improvement in urban health

Spain has made great progress in urban sustainability over the last two decades. In spite of this, the country's cities still face major challenges concerning their ability to reduce urban health problems, fight climate change and environmental deterioration as well as adapt to the most negative effects.

The recent trend towards a more disperse and lower density city model has made some of these issues worse, particularly as concerns mobility. City compartmentalization into different areas with various purposes (work area, residential area, leisure area) has caused **an increase in urban and metropolitan travel**. Travel on foot, by bike or by public transport is more common in city centres while the use of private vehicles is predominant in the surrounding metropolitan areas.<sup>111</sup> Such use in Spain is generally very polluting as the average cars are much older than in neighbouring European countries.<sup>112</sup> This has brought several negative consequences. Nowadays, **around 60% of the public areas in major Spanish cities are for private vehicles (circulation and parking)**,<sup>113</sup> meaning a significant decrease in the public space available for pedestrians and residents. Moreover, travel by car is responsible for many of the air and noise pollution and congestion problems suffered in the cities, all of which generate harmful effects for the environment and people's health.

Although air quality has improved in recent years, in part due to greater awareness of the impact of pollution<sup>114</sup> and the implementation of measures such as low-emissions zones,<sup>115</sup> the most congested cities continue to surpass the regulated limits for air pollutants,<sup>116</sup> which causes thousands of deaths and diseases each year [see chapter 4]. Moreover, Spain still has relatively high noise pollution levels. In 2017, more than three million Spaniards were exposed to high noise levels according to the European Environment Agency.<sup>117</sup>

Finally, **the trend towards a more dispersed city model has also led to an increase in the environmental footprint of urban areas and their disconnection from rural areas**, thus increasing the cost of providing public services and making the development of sustainable, short-distance supply chains more difficult.<sup>118</sup>

### III. Poverty, Inequality and Social Segregation

Spain has one of the highest poverty rates in Europe [see chapter 8]. This rate is higher in rural areas;<sup>119</sup> however, it is in the cities where the lack of resources may have a greater impact on the population's quality of life. Nowadays, **23% of all people living in urban areas are at risk of poverty or social exclusion**, which exceeds the EU-27 average (20%).<sup>120</sup> The number of vulnerable neighbourhoods in Spanish cities (918 in 2011) has increased since the start of the 21st century along with the number of people living in them.<sup>121</sup> In many places, the situation is truly concerning. In fact, a recent UN report highlighted the extreme poverty found in some Spanish neighbourhoods as one of the unresolved issues that our country must tackle.<sup>122</sup>

At the same time, poverty is just a part of a much bigger problem: **income inequality**. This is one of the great paradoxes of modern cities: **although the urban areas offer better opportunities and higher income levels, they also reflect higher inequality than the rural world**.<sup>123</sup> Such inequality is associated with social/spatial segregation issues which create a differentiated population distribution in urban areas based on income level, origin, gender and age. The factors behind this segregation are quite diverse and numerous<sup>124</sup> yet the housing market is perhaps the main one.<sup>125</sup> Real estate development, the interest in centric areas among certain population segments (the recent gentrification<sup>126</sup> and touristification<sup>127</sup> phenomena) as well as the increased presence of office space in residential buildings have worsened this segregation in big cities leading to a certain displacement of the people with fewer resources to the peripheral areas and resulting in changes to the social makeup and local trade in affected areas.<sup>128</sup> **There are numerous significant negative impacts of urban segregation for the entire country**. The increased segregation tends to create a less cohesive society, limits long-term economic growth,<sup>129</sup> increases tensions and conflict,<sup>130</sup> and also reduces wellbeing and education and job opportunities in certain neighbourhoods.<sup>131</sup>

### IV. Loss of dynamism in the rural world

Although the aforementioned challenges have had a greater impact on cities, the rural world has also been deeply affected by the imbalances in the country's territorial development. Firstly, the ageing and declining population has been accompanied by **a sharp drop in economic dynamism**.<sup>132</sup> Thousands of companies and jobs have been lost in small towns,<sup>133</sup> and this has conditioned residents' income levels and wages.<sup>134</sup> This trend is added to a deterioration in access to basic services such as education, medical care, public transport and banking<sup>135</sup> making it more difficult for those who wish to remain in rural areas.<sup>136</sup>

The emptying of rural Spain has **also accelerated the environmental deterioration of several places around the country and aggravated the climate emergency**. Difficulty in obtaining land has limited the inclusion of younger generations in farming.<sup>137</sup> The abandonment of many farming and forestry practices has increased vulnerability to fires, soil erosion and the loss of biodiversity,<sup>138</sup> while putting at risk the development of some primary activities which are essential to the entire country<sup>139</sup> [see chapter 4].

Likewise, this rural depopulation is endangering the conservation of a significant portion of the country's material heritage (churches, traditional architecture, roads, bridges) and immaterial heritage (dialects, oral traditions, dances, festivals, artisan techniques, culinary traditions)<sup>140</sup> with consequences for people's wellbeing and the country's cultural identity.

# THE FUTURE: CHALLENGES AND OPPORTUNITIES FOR THE COMING DECADES

## The short-term: life in cities and rural areas during Coronavirus

The pandemic has revealed just how vulnerable our country's towns and cities are to public health and environmental emergencies, which will almost certainly increase in frequency and severity over the next few decades as a result of climate change and the deterioration of our natural environment [see chapter 4]. The social and economic impact of the coronavirus has been particularly severe in the most vulnerable and impoverished towns and neighbourhoods, largely due to the employment situation of their residents (greater precariousness and less access to teleworking) as well as their poorer health,<sup>141</sup> but also because they do not have adequate housing, live in overcrowded conditions or are more dependent on the use of public areas.<sup>142</sup> During the lockdown, many homes were proven to have too little space and reflected a lack of adaptability for new activities such as teleworking and education in addition to deficiencies in ventilation, acoustic and thermal insulation, and not to mention a lack of sufficient natural light and balconies. Urban areas particularly suffered the impact of the pandemic as more recurrent and sustained restrictions were adopted. Even though the population in rural towns got through the public health crisis better, its effects were also significant considering the difficulties accessing certain public or commercial services within a nearby radius.

Whatever the circumstances, the pandemic also brought **many opportunities for change** which in the not too distant future may be useful to modify life in cities and dynamise rural areas. On the one hand, the drop in traffic over the months of greatest restrictions on mobility led to a **significant decrease in air and noise pollution**,<sup>143</sup> thus making clear the positive effects of less car use on our cities if the right measures are implemented. The crisis also led to the **reassessment of public areas** and made clear the need to recover areas currently used by motor vehicles. Moreover, the coronavirus led **people to placing much higher value on having natural areas nearby, away from any urban congestion**. It is still too early to know if this will lead to a certain exodus to the rural world or smaller cities by some segments of the population; however, the greater use of remote work could boost this trend.

Meanwhile, the crisis has also helped **speed up some changes that had been gradually observed in recent years as far as consumption channels and habits**. The rise in e-commerce and the development of food delivery logistics platforms are proof of this. Thus, in a context of the complete collapse of global production chains, it is hardly odd that the ties between cities and rural areas have become more highly valued, especially those concerning food supply.

Finally, the pandemic highlighted **the resilience and capacity for transformation in our social system**. During the lockdown, neighbourhood support networks became more important as they offered essential assistance to the most vulnerable. Social relations among neighbours were strengthened and helped people deal with the pandemic, especially when contact with family and friends was partially interrupted.

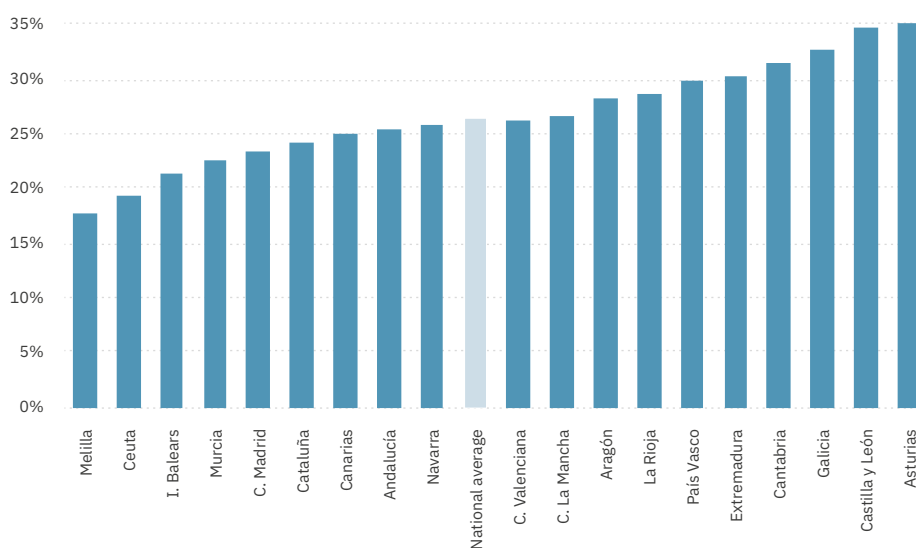
In summary, **the coronavirus crisis helped us re-think our city model and its relationship with the rural world, thus creating a context that is conducive to major changes on both fronts**.

## The medium and long-term: changing trends

In the medium and long-term, our territorial model will go through profound transformations as a result of its interaction with a series of megatrends which will become apparent over the coming decades.

One of the most important will be **demographic aging and its impact on population growth**. Over the next 30 years, Spain's population will increase at around 5% to exceed 49 million people by 2050.<sup>144</sup> Notwithstanding, this growth will be mainly due to international immigration as more deaths will occur every year than births. This will have effects on the country's demographic structure with a clear **increase in the proportion of elderly** [Fig. 20]<sup>145</sup> and those born abroad [see chapter 5].

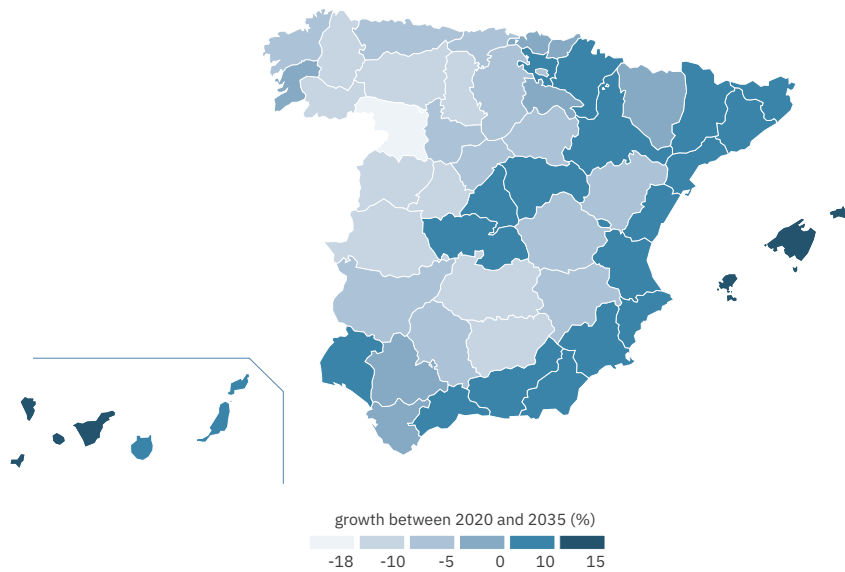
**Fig. 20. Projected population aged 65 and older out of the total population of Spain, 2035**



Source: By the authors based on data from the INE (Spanish National Statistics Institute).<sup>146</sup>

Such a change in the demographic dynamics **will affect the various regions and municipalities in Spanish territory very differently**. From now until 2035,<sup>147</sup> nine autonomous regions and one autonomous city will lose population: Asturias, Castilla y León, Extremadura, Galicia, Cantabria, Ceuta, Castilla-La Mancha, the Basque Country, Aragón and La Rioja, in order of magnitude.<sup>148</sup> The population will increase in all the other regions. The biggest relative increases will occur on the islands (Balearic Islands and Canary Islands) and in the Region of Madrid [Fig. 21]. However, in absolute terms, the increases will be particularly concentrated in the Region of Madrid (where 614,049 more people will be living than now) and in Catalonia (with an increase of 414,060 people)<sup>149</sup> due to the arrival of people from abroad as well as from other autonomous regions.<sup>150</sup>

**Fig. 21. Relative population growth  
by Spanish province, 2020-2035**

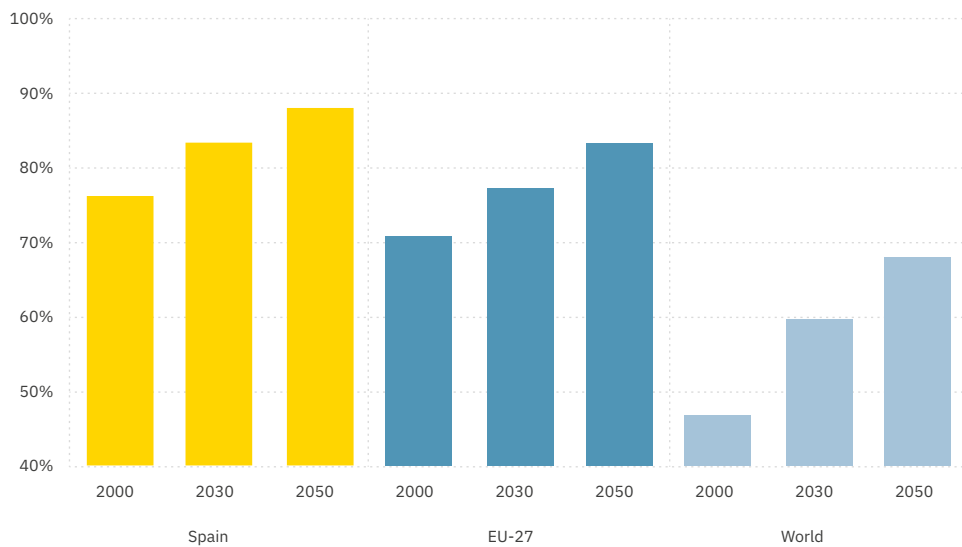


Source: By the authors based on data from the INE (Spanish National Statistics Institute).<sup>151</sup>

**The same asymmetry will affect the urban – rural balance.** At the dawn of the digital revolution (end of the nineties), it was expected that the spread of the Internet and new technologies would have a corrective effect on the population distribution since it would help distribute the economic opportunities throughout the territory more evenly. However, the opposite occurred: the digital economy concentrated its activities even more in cities and metropolitan areas with an expansion of the services sector and greater accumulation of companies in urban belts.

Everything seems to suggest that **this trend will be maintained or even accentuate in the future.** Although the progress being made with teleworking, telemedicine, e-commerce and other innovations will make it possible to reduce the divide with the rural world in the coming decades,<sup>152</sup> cities will continue to comparatively offer citizens more opportunities for education, employment and services. As a result, **the proportion of the resident population in urban centres will continue to rise and may even move from the current 80% of the total to 88% in 2050.**<sup>153</sup> This same trend will also be seen in Europe and the rest of the world [Fig. 22].

Fig. 22. Projected urbanization rate



Source: By the authors based on data from the United Nations.<sup>154</sup>

Moreover, it is quite possible that the **population concentration in large Spanish cities** such as Madrid,<sup>155</sup> Barcelona, Valencia and Zaragoza will become even more pronounced and there will be **a progressive expansion of the metropolitan areas surrounding them**,<sup>156</sup> as they will move from currently being home to 30% of the population to 32% in 2035.<sup>157</sup>

As for **medium cities, their future will largely depend on their participation in regional and national urban networks, their proximity to expanding metropolitan areas, their capacity to take advantage of all their economic potential, and the evolution of nearby rural population centres**. If a medium city has the role of providing services to rural areas and these areas lose population or even disappear, the city will likely end up falling into decline unless it finds activities to self-sustain or joins metropolitan areas. This same logic applies in the opposite sense and, therefore, **the development of medium cities will be essential in preventing an even greater exodus from our country's villages and achieving instead a more balanced distribution of the urban population**.<sup>158</sup>

With regard to **the rural population**, everything seems to suggest **it will continue declining from the current 9 million to 5 million in 2050**.<sup>159</sup> The process will not be the same throughout the territory at any rate. As a general rule, **the largest rural municipalities**, with between 5,000 and 10,000 inhabitants, are expected to **continue growing**,<sup>160</sup> while **the smallest population centres** (especially those with less than 500 inhabitants) **may experience severe population loss**. Given the absence of new births and the reduced capacity to attract population, towns with a more elderly population may die out naturally.

The destination of the country's villages will depend on many factors: their current size, their demographic pyramid, their proximity to nearby cities, their capacity for economic dynamism, and guaranteeing access to quality services as well as the commitment and ties of their people. Well-connected rural towns that are able to take advantage of opportunities provided by the green transition and digitalisation to boost their attractiveness as places to settle, and which are brought to life through economic, educational, or cultural projects may retain and even draw in more residents. On the contrary, poorly connected peripheral rural towns with barely diversified economies will continue to lose inhabitants.<sup>161</sup>

**There will be positive as well as negative effects from this contrast.** On the one hand, the population concentration in larger towns may help re-organize public expenditure (i.e. that which is associated with health, education and waste management) and achieve greater economic dynamism in the country as a whole. On the other hand, the population decline in some medium cities and rural towns may increase the saturation of large cities, worsen the deterioration and abandonment of the country's natural ecosystems,<sup>162</sup> provoke an immense cultural and heritage loss, and accelerate the economic decline in those areas, thus leading to the close of many businesses, the loss of agricultural, forestry and tourism activities and the depreciation of thousands of properties. **Finding a balance between these potential losses and gains, and designing a strategy to halt the loss of dynamism in the smallest towns based on such balance will be one of the greatest challenges Spain must resolve between now and 2050.**

**The change in demographic structure will also modify our society's priorities.** In the cities, it will force the refurbishment of thousands of buildings and public areas, the adaptation of services such as healthcare and mobility and the expansion of care networks to ensure a balanced distribution throughout the urban territory. In the rural world, where aging will be more pronounced, the implementation of these changes will be particularly relevant and, in some cases, quite complex. In any case, it is important to keep in mind that the new technologies, if developed under accessibility criteria, will facilitate the work quite a bit. In addition to being a challenge, these transformations will create a significant opportunity for economic and social development [see chapter 5].<sup>163</sup>

Another *megatrend* which will alter the country's territorial model is **the green transition**. Over the next three decades, Spain must become a carbon neutral economy, resilient to climate change and sustainable in the use of its natural resources [see chapter 4]. As we will see, the country will have to undertake deep transformations in its territorial model which will affect the cities and towns, as well as the relationship between the two in order to reach this goal. Cities in general are more vulnerable to climate change,<sup>164</sup> as well as being responsible for most energy, water and food consumption not to mention nearly 70% of the greenhouse gases emitted in Spain.<sup>165</sup> Rural municipalities, on the other hand, will be key to produce clean energy, absorb emissions and ensure the sustainability of the country's ecosystems.

Likewise, the Spanish territorial model will be affected by **the digital revolution and progress in innovation which may help substantially improve the quality of life in the urban and rural world if well-managed**. The massification of technologies such as Artificial Intelligence, advanced robotics, autonomous vehicles, the Internet of Things (IoT) and 5G will have an impact on the way in which our cities operate and may give rise to new jobs, new businesses, new forms of consumption and service provision as well as new possibilities for management and government which may enhance citizen participation and facilitate accountability.<sup>166</sup> The increase in teleworking may reduce congestion in central hubs, expand the economic opportunities in many neighbourhoods and make living in new areas and towns attractive. To this end, the creation of innovation districts (knowledge districts of renewed urban development that are attractive for entrepreneurial initiatives and foreign investment)<sup>167</sup> may be one means of growth for smaller cities with a lower cost of living.<sup>168</sup>

The use of digital technologies will also help design **smarter cities**<sup>169</sup> which are capable of identifying pockets of poverty and social vulnerability, adjusting traffic and public transport based on need at any given time, and better managing the supply of water and energy as well as waste management, among many other key issues for urban sustainability.<sup>170</sup>

Furthermore, **the technology revolution will help enhance life in rural areas and smaller cities** by facilitating access to more and better jobs, information and service opportunities. In 2050, the digitalization of the public sector will bring services closer to all of the population; telemedicine will make it possible to serve thousands of patients each day in rural areas; e-commerce will take products to even the most isolated corners; and online education will allow those living in small towns to take the very same courses as those living in cities.<sup>171</sup> Plus, teleworking will give people more flexibility when choosing a place of residence meaning the demographic loss expected for some villages may be mitigated. Getting goods and services closer to those who do not have them today combined with the benefits of living in small towns may make them increasingly attractive places to live.

### The Spanish urban model and future challenges

The megatrends will also change (and will be modified by) the evolution of the Spanish urban model over the coming decades. Although it is impossible to anticipate anything with absolute certainty, everything seems to suggest that **the dynamic towards greater suburbanisation will hold steady and increase from now until 2050**, making cities become ever more extensive and dispersed and borders increasingly diffuse, as has already occurred in metropolises like London and Paris.<sup>172</sup> This increase in dispersion may bring an increase in motorized mobility<sup>173</sup> and travel times and, in the absence of measures, a bigger environmental impact.

This dispersion trend will coincide with **and increase in the densification of consolidated areas which still allow for such** either due to the existence of available space, an increase in buildability or the refurbishment of areas in poor condition. There are many benefits of a potential urban regeneration: it may help invigorate the local economy, decrease social segregation and make progress towards the environmental sustainability of cities and their adaptation to climate change. However, an increase in densification may also lead to additional challenges for housing prices, availability and access to urban facilities (i.e. education, healthcare, culture and sports) or the healthiness of public areas. Greater densification also does not ensure the creation of communities or prevent problems like undesired loneliness.

It is reasonable to think that **the processes of touristification and gentrification observed in recent decades will continue**. Once the current crisis ends and tourism goes back to pre-pandemic levels, many of the country's neighbourhoods are likely to become renovated and occupied by holiday rental flats and hotels or even homes for young people with greater buying power than the previous residents who may be forced to move to peripheral or less attractive neighbourhoods. This process may modify the social structure of the country's major cities, thus increasing segregation and altering the cultural and neighbourhood dynamics<sup>174</sup> as has already occurred in several places around Barcelona and Madrid.<sup>175</sup>

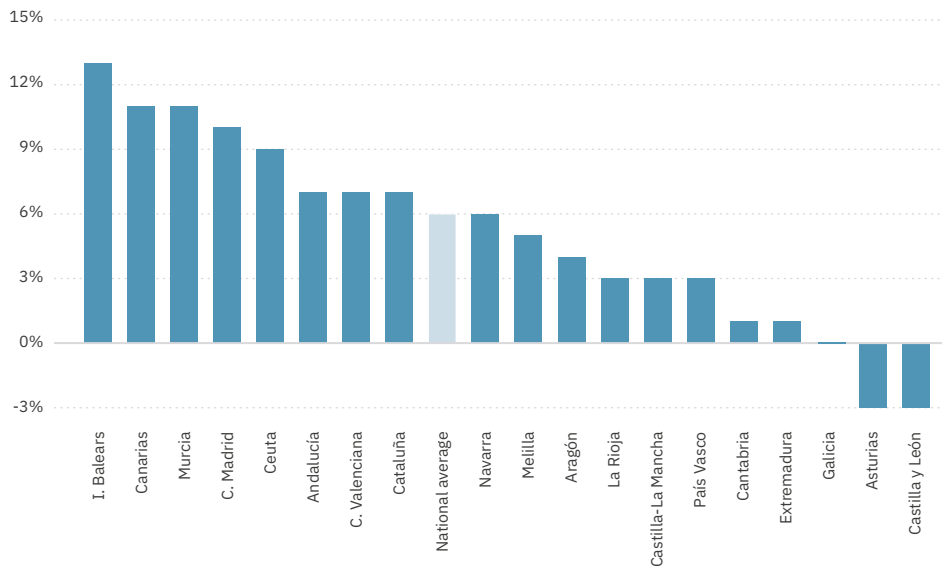
This and the other undesirable processes described may, of course, be avoided. As will be seen, if we are able to take advantage of the opportunities afforded by the social, technological and environmental changes and implement the right policies, **the Spain of the future may end up having more habitable cities, livelier villages and more just and balanced territorial development**.



## I. Guaranteeing access to housing

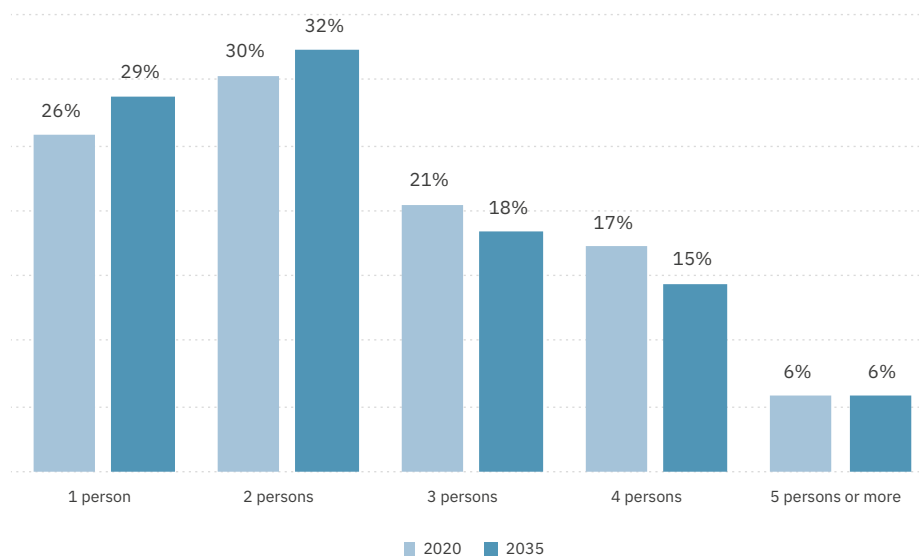
From now until 2035, **the number of households in Spain will increase by 1.1 million** at a slightly higher pace than has been observed over the last few years (73,600 new households a year)<sup>176</sup> and with trends differentiated by region [Fig. 23]. This increase in household formation will be due to demographic growth as well as a change in type, moving away from the traditional nuclear family with children model. Thus, the expectation is that **the average size of Spanish households will fall**,<sup>177</sup> the number of households with just one or two people will increase (accounting for 61% of the total in 2035)<sup>178</sup> [Fig. 24], and there will be more households with elderly members.

Fig. 23. Household projection in Spain, 2020-2035



Source: By the authors based on data from the INE (Spanish National Statistics Institute).<sup>179</sup>

Fig. 24. Projected distribution of household by size in Spain, 2020-2035



Source: By the authors based on data from the INE (Spanish National Statistics Institute).<sup>180</sup>

These changes, along with the trends already described, **may intensify the difficulties accessing housing in some areas of the country**. The situation will particularly affect young people residing in large cities and, above all, those with worse job conditions. Without decisive measures aimed at improving employment rates and job conditions [see chapters 1 and 7], the increase in prices will prevent many households from owning a home as they will not have the capacity to make a down payment or stable revenue to pay a mortgage. Therefore, rentals are expected to continue growing as the primary alternative<sup>181</sup> even though the increase in prices in some areas will also make such access more and more erosive on tenants' incomes, thus turning shared rentals into real options for some sectors of the population.

In this context, other **alternative occupation formulas** may become more relevant than the traditional purchase or rental ones such as temporary ownership<sup>182</sup> or shared ownership.<sup>183</sup> The collaborative economy may also erupt onto the housing market in Spain: some shared housing methods (like cohousing) may become interesting options for young people as well as the elderly, leading to new forms of intergenerational co-existence. In any case, many people will not be able to access decent and adequate housing without support from the State, meaning it is believed that **the potential demand for subsidized housing in Spain will nearly double over the next decade** from the 1.5 million homes some studies calculate as necessary currently to 2.6 million by 2030.<sup>184</sup> One of the key aspects will no doubt be that their implementation takes in to account people's real housing needs and prevents the development of a new social-spatial process of segregation.

**Reducing the difficulties accessing quality housing is crucial to improving birth rates, favouring household consumption and savings capacity, and thus preventing an increase in inequality**, both regarding revenue as well as wealth, which is very much in Spain is very much dependent on owning a home [see chapter 8]. If we do not move in this direction, our large cities may lean towards a model of "rich owners and poor tenants",<sup>185</sup> thereby polarizing households with one or more owned homes (either because they have purchased them or received them in inheritance) and those living in rented or shared homes. While some of these households may have savings and resources to finance potential expenses (health, education, entertainment), a growing sector of the population will have to earmark a large part of their wages or pension to paying rent each month which may exacerbate the inequality seen among the elderly.

## II. Improving environmental sustainability and urban health

**By 2050, Spanish cities must be carbon neutral, free of pollution, more sparing and circular in the use of resources and have greater resilience to the impacts of climate change**, especially in regard to people's health [see chapter 4]. In order to get there, major changes will be necessary on several fronts. Three are highlighted below:

**Firstly, Spanish cities must develop a more sustainable urban model** that will reduce the times and distances for travel between home, work and leisure places as this will minimize their environmental footprint and help improve people's wellbeing.<sup>186</sup> Along these same lines, the space

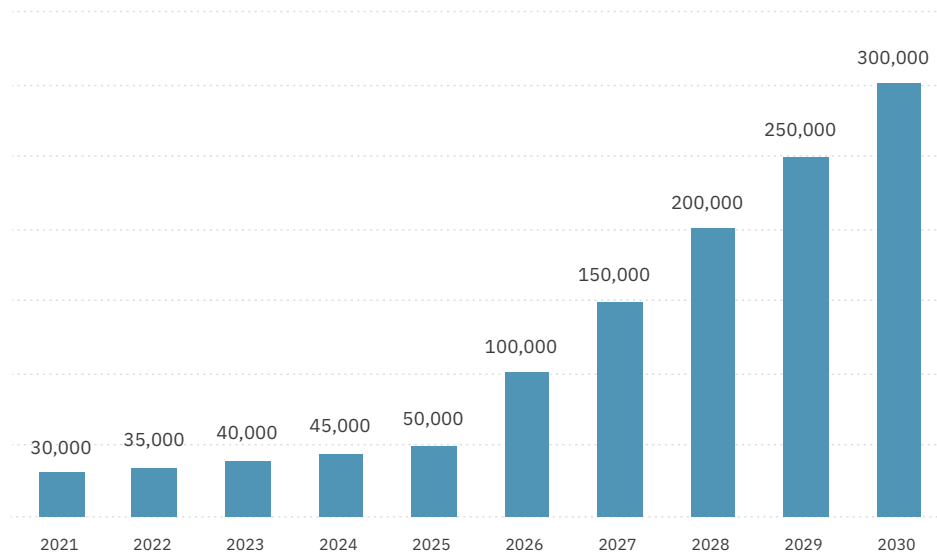
occupied by vehicles (circulation and parking) must be freed up and pedestrian areas expanded as such measures will benefit health and commercial activity in local neighbourhoods.<sup>187</sup> Initiatives designed to reduce traffic to a minimum and encourage pedestrian life with super-blocks, for example, will become more and more common in Spain.<sup>188</sup>

**Secondly, our cities will have to transform their mobility models.**<sup>189</sup> The progressive widespread popularity of electric vehicles and autonomous vehicles<sup>190</sup> will contribute to this transformation although it will not be enough to reach the goals established for Europe as a whole. Thus, reducing the use of private vehicles in favour of public transport, shared mobility services<sup>191</sup> (such as carsharing and carpooling), and active mobility models (biking, electric scooters and walking)<sup>192</sup> with a special emphasis on metropolitan mobility will be essential. At the same time, the integration of all these mobility services must be enhanced with shared memberships, digital apps, and the use of technologies like Artificial Intelligence and the Internet of Things to optimize the design and management of transport networks based on users' changing needs.<sup>193</sup>

The expansion of e-commerce and home delivery will pose an additional challenge as it is already threatening to turn the logistics sector into one of the main sources of pollution and congestion in the cities of the future.<sup>194</sup> In order to prevent this, **the last-mile delivery model** (the last step before a product arrives at a customer's door) **must be completely re-devised**. Companies will have to replace their current fleets of vans and lorries with lighter, carbon-neutral vehicles, possibly even including delivery drones. They will also have to find new delivery methods such as local neighbourhood pick-up points (mobile package boxes in urban centres) and use digital technologies to make the distribution chain more efficient while reducing goods traffic.

**Thirdly, our cities will have to reduce the environmental impact of their buildings and public areas.** This involves a **mass renovation** of the housing stock which is generally rather old<sup>195</sup> and reflects a significant margin for improvement in terms of energy efficiency.<sup>196</sup> Nowadays, some 26,000 homes are being renovated a year in Spain; this accounts for 0.1% of the total stock.<sup>197</sup> In European countries like France and Norway, on the other hand, the percentage of renovated homes each year is 2%.<sup>198</sup> If we wish to adapt our homes to the new environmental paradigm, we must drastically increase the renovation rates.<sup>199</sup> The Spanish National Integrated Energy and Climate Plan (PNIEC)<sup>200</sup> already indicates some 1.2 million homes must be refurbished from now until 2030, with a particular emphasis on enhanced energy efficiency with wall and roofing insulation and more modern building enclosures [Fig. 25]. These housing modifications must be done considering the characteristics and needs of modern households which will possibly favour smaller homes without architectural barriers, and that are adapted to people with reduced mobility all while considering the physical, mental and social health of those inhabiting them.<sup>201</sup> Additionally, electricity is expected to become more widespread in household climate control systems with a greater use of heat pumps powered by renewable energies as opposed to traditional gas boilers, not to mention the rollout of renewable and smart public lighting as well as an increase in self-consumption fixtures in line with the surge observed over the last few years.<sup>202</sup> Solar panels will supply homes with the electricity needed for lighting, cooking and heating and they may be used to charge electric vehicles as well as to store renewable energy at times of high production and low demand.<sup>203</sup>

**Fig. 25. Projected energy-refurbished homes in Spain as per the PNIEC (2021-2030)**



Source: By the authors based on data from MITECO (Spanish Department for the Ecological Transition and Demographic Challenge).<sup>204</sup>

Moreover, **Spanish cities will need to become greener**, with the expansion and re-designing of parks and gardens<sup>205</sup> so they have hardier species that demand less water; the creation of noise-free areas; promoting the construction of planted facades and terraces;<sup>206</sup> encouraging urban and peri-urban vegetable patches<sup>207</sup> and the development of technologies like hydroponics and aeroponics;<sup>208</sup> as well as improving the reuse of grey water and capture of rainwater for irrigation. In doing so, cities will expand their role as carbon drains and greatly reduce their consumption of resources, further enhancing their self-sufficiency in food supply, fostering biodiversity and increasing their resilience to climate change.<sup>209</sup>

Finally, better physical connectivity between cities, regardless of their size, and the rest of the territory with the incorporation of a new paradigm of infrastructure modernisation and environmental sustainability, the promotion of the railway and the development of intermodal transport nodes must be ensured.

**All of these transformations will pose significant challenges for public administrations, companies and citizens both from the resource mobilization point of view and the management of the interests of different social groups. Yet, if well-managed, they may also provide opportunities for huge economic and social development.** They will create thousands of jobs in crucial sectors in Spain, lead to energy bill savings and greater comfort in homes and workplaces, and improve people's health while enabling new forms of leisure and living in society.

### III. Reducing poverty, inequality and social segregation

**If decisive measures are not taken, economic inequality will continue to grow in Spain over the coming decades [see chapter 8].** This may lead to an increase in social/spatial segregation in cities, especially in the biggest ones, as they may become more and more atomised where people of different ages, income levels and origins barely interact. As already mentioned, the

increase in the price of housing in some areas both for buying and renting may also add to the polarization of the spatial distribution of the population. Households with high buying power may mostly concentrate in the centre of cities or most socially highly-valued areas while lower-income households will do so in the more impoverished and worse-equipped urban areas. The result will be a less cohesive society with all of the social, economic and political consequences of such a situation.

In order to prevent this prognosis, cities that identify these risks must implement **decisive anti-segregation actions** over the next few years which guarantee equal access to public services in all neighbourhoods, prevent housing discrimination,<sup>210</sup> mitigate the effects of gentrification and touristification (as the loss of identity and local commerce in metropolises) and foster inter-generational co-existence and the creation of a sense of community so as to reduce problems of isolation and loneliness. The goal must be for Spanish cities of the future to be places where people of different ages, origins and socioeconomic conditions live and interact cohesively.

#### IV. Dynamising rural Spain

In the next few decades, the heterogeneity of rural Spain is likely to intensify. The most isolated and smallest towns which are disconnected from the new infrastructure and transport networks as well as from urban centres for geographic or other reasons will probably continue to lose population. In some very extreme cases, they may end up completely depopulated.

At the same time, however, **many rural towns will begin enjoying new-found prosperity** thanks to greater economic diversification, the spread of new technologies and improved connections with other municipalities providing access to quality services.<sup>211</sup> The ecological transition may also bring new opportunities to rural Spain as well as what is known as the “silver economy”, which is associated with the needs and new interests of the elderly. Technological advances such as 5G, satellite Internet, robotics, autonomous vehicles and other social innovations will bring business, employment, and service (healthcare, education and transport) opportunities to places that have never before had them. For example, digital healthcare services will make it possible for those in rural areas to have lab analyses, receive care from specialists hundreds of kilometres away and complete administrative procedures with their mobile and electronic devices.<sup>212</sup>

Likewise, the popularisation of emerging social changes and dynamics such as the revaluation of the environment and the increase in teleworking [see chapter 7], e-commerce and new forms of entertainment (i.e. watching series and content online instead of going to the cinema) may turn some disadvantages of living in a village around, with many people choosing to remain or even move to a rural area to enjoy the benefits of living in these areas:<sup>213</sup> a lower cost of living, better housing access and greater contact with nature, just to name a few. Moreover, the rural world may also be conducive for the development of innovative educational projects, new means of active aging and new cultural and sports activities.

To summarise, **it is highly probable that less people will be living in rural Spain in 2050 than today. However, if a more integrated and balanced territorial model is developed, those who are able to take advantage of the opportunities created by trends like digitalisation, the green transition and demographic change will live better than ever.**

**How can this be achieved?** Various measures will be suggested on the following pages.

## WHAT CAN BE DONE TO ACHIEVE BALANCED TERRITORIAL DEVELOPMENT AND MORE LIVABLE AND SUSTAINABLE CITIES

Over the next few decades, Spain must achieve a more balanced population distribution throughout its territory to facilitate the development of a more prosperous, socially just, and environmentally sustainable economy. In order to do so, **access to services and job opportunities in rural areas must be improved on the one hand and, on the other, the livability, sustainability and resilience of cities must be improved by opting for a compact urban model of proximity, thus enhancing territorial cohesion and implementing ambitious initiatives aimed at improving urban health and social inclusion.**

To achieve these changes it will be vital over the next few years to reach a consensus, through social dialogue, on a **dashboard of measurable indicators and a list of specific goals** to monitor and update progress made in these areas as well as guide the ambition of these reforms. Here are some suggestions, following the principles outlined in the Introduction to this *Strategy*.

**Goal 32.** Progressively reduce the proportion of population suffering from housing cost overburden from now until 2050, especially those living in rented accommodation as they are the ones with the greatest overburden.

**Goal 33.** Increase the annual percentage of renovated homes using an integrated approach which includes enhancing their energy efficiency so that by 2050, 2% of the total stock is being rehabilitated (now, 0.1%) to be in line with the *European strategy for rehabilitation (Renovation Wave)* and the *Long-Term Strategy for energy renovations in the building sector in Spain*.<sup>214</sup>

**Goal 34.** Reduce the maximum percentage of municipal waste deposited in landfill to 10% in 2030 (versus the current 53.4%),<sup>215</sup> thus complying with the shared EU objective.<sup>216</sup> For 2050, this goal must be even greater so that no municipal waste is deposited at landfill.

**Goal 35.** Reduce the number of people exposed to air pollution levels (PM<sub>2.5</sub>) above the levels recommended by the WHO by as much as possible.

**Goal 36.** Eradicate energy poverty by 2050, in line with the European Committee of the Regions proposal.<sup>217</sup> Measures aimed at enhancing home energy efficiency should be added to increasing income and reducing income inequality [see chapters 1 and 8].

## Scoreboard and Goals

Indicators	Place	Average 2015-2019 or latest data available*	Targets		
			2030	2040	2050
32 Percentage of population suffering housing cost overburden <sup>218</sup>	Spain	9.5%	8.0%	6.5%	4.5% <sup>219</sup>
	EU-27	9.2%	–	–	–
	EU-8	9.4%	–	–	–
33 Proportion of dwellings rehabilitated per year (% of total stock) <sup>220</sup>	Spain	0.1%	1.5%	1.8%	2.0%
	EU-27	n.d.	–	–	–
	EU-8	n.d.	–	–	–
34 Municipal waste sent to landfill (% of total generated) <sup>221</sup>	Spain	55%	10% <sup>222</sup>	5%	0%
	EU-27	25%	–	–	–
	EU-8	4%	–	–	–
35 Population exposed to air pollution levels (PM <sub>2.5</sub> particles) above WHO recommendations (% of total) <sup>223</sup>	Spain	51%	25%	15%	2% <sup>224</sup>
	EU-27	73%*	–	–	–
	EU-8	63%*	–	–	–
36 Energy poverty (% of population unable to keep their dwelling at an adequate temperature) <sup>225</sup>	Spain	7.5%*	6.0% <sup>226</sup>	3.0%	0.0% <sup>227</sup>
	EU-27	8.2%*	–	–	–
	EU-8	3.0%*	–	–	–

In order to reach these goals, Spain must undertake extensive reforms on at least five fronts as set out in the Spanish Urban Agenda:<sup>228</sup>

### Front 1: Foster more balanced territorial development so those who so desire can remain in medium and small cities as well as in rural areas.

- Improve and increase economic and employment opportunities in smaller towns, taking advantage of local resources and promoting rural development. This means:
  - Encouraging productive diversification by enhancing people’s skills, boosting innovation and the knowledge economy [see chapter 1], and taking best advantage of the opportunities offered by trends such as the green transition and the digital transformation. To do so, entrepreneurship must be encouraged and SMEs must be supported with advising plans and feasibility analyses in accordance with the territorial potential, paying special attention to fostering youth and female employment. One starting point to be explored would be business incubators.<sup>229</sup>
  - Effectively updating and implementing the National Law on Sustainable Rural Development,<sup>230</sup> considering the territorial heterogeneity when diagnosing priorities for action, evaluating the potential benefits of public/private collaboration, empowering local action groups, and focusing on protecting heritage and natural resources. the experience of the LEADER fund may be a good reference to this end.<sup>231</sup>

- Reducing the digital divide between rural and urban areas, guaranteeing 100% of the population has 100 Mbps coverage by 2025, in line with the target established in the 2025 Digital Agenda.<sup>232</sup> In order to do so, digital infrastructures must be expanded and improved in rural centres by following the Spanish National Strategy for the Demographic Challenge,<sup>233</sup> and developing digital education programs.
  - Implementing a “Rural Guarantee Mechanism” which ensures the needs of rural communities are taken into account as concerns the design and application of sector and economic laws and policies.<sup>234</sup>
- Balance the presence of public bodies belonging to the state in each territory without creating duplicities. The digitalization of public administration may help achieve this [see chapter 1].
  - Design a strategy for metropolitan industrial clusters aimed at preventing dispersion of efforts, reducing dependence on external areas, promoting the exportation of high added-value products and creating stable employment. Some examples include the aerospace cluster in Toulouse, the chemical corporations cluster in the Rhine basin (Bayer, BASF) as well as the robotics cluster in Pittsburgh, among others.
  - Develop a network of strategically located innovation districts which attract talent and drive research and entrepreneurship by strengthening human capital as a key to improving people’s wellbeing. Models such as the one in Boston (Boston Waterfront Innovation District),<sup>235</sup> which is replicated in the metropolitan area (Kendall Square<sup>236</sup> in Cambridge), could be implemented.
  - Increase access to both public and private services in small towns, which requires:
    - Developing more integrated territorial planning, not necessarily focusing on municipal administrative limitations, based on people’s needs and aimed at the optimal use of available resources.
    - Adjusting public infrastructure and services options in rural areas based on criteria of demand, basic needs coverage, and efficiency, with a particular focus on territories at risk of depopulation. The fundamental principle will be to ensure quality services are provided and deciding upon the most appropriate approach or strategy in accordance with the situation in each municipality. New technologies and social innovation will facilitate both the provision of services as well as the analysis and prediction of priorities for each population.
    - Facilitating the integration of rural areas in metropolitan systems and offering incentives for the creation of municipal groups with shared interests by improving the network of public transport connections and other shared mobility options so that they may benefit from those already existing without resorting to the use of private vehicles.



## Front 2: Effectively guarantee access to decent and adequate housing while reducing the economic effort and improving its suitability

- With regard to the reduction of the economic effort, we recommend:
  - Increasing the availability of public and subsidized housing with the acquisition of homes in already consolidated buildings and communities, housing renovations or the construction of new homes.<sup>237</sup> Their locations should prevent any new social/spatial segregation processes.
  - Encouraging the rental of empty homes while offering property owners sufficient guarantees and controlling the quality of the housing offered. To do so, the creation or improvement, as applicable, of public rental listings<sup>238</sup> and public/private collaboration frameworks that contribute to better management (partnerships or models similar to housing associations) are proposed.<sup>239</sup>
  - Creating a taxation system aimed at fostering both an increase in the range of rental homes on offer at affordable prices as well as effective access to housing for those in the lowest income brackets, particularly emphasizing territorial areas subject to greater tension. With regard to the second point, it is important to consider the ratio between rental prices and household income levels, as well as the regional and municipal heterogeneity of the Spanish housing market.
  - Establishing mechanisms to protect the stock of public housing and reserve land for housing subject to rent control, ensuring the maintenance and availability thereof as well as preventing their transfer to the private market.
  - Offering incentives for alternatives to absolute ownership and rental such as temporary ownership and shared ownership, adjusting such methods to the Spanish reality.
  - Guaranteeing households receive the correct information with regard to financing when buying or renting a home, thus facilitating residential mobility as household needs change. This implies ensuring their protection starting with the pre-contract phase, the professionalism of real estate agents and the creation of public advisory and supervisory systems that promote transparency (the Danish example).<sup>240</sup>
- To adjust the existing housing stock to the needs of today's households, the following is proposed:
  - To implement aid programs aimed at achieving universal housing access as well as alternative housing solutions such as exchange programs for housing managed by public agencies or partnerships where people with mobility problems may rent their home and become a tenant of another home that is better adapted to their housing needs.
  - To implement a National Strategy for integrated urban regeneration which particularly focuses on underprivileged and vulnerable neighbourhoods or those with a presence of shanty towns, as well as homes which are not in vulnerable areas yet are below the acceptable housing standard.

### Front 3: Reduce the ecological footprint and improve the sustainability and environmental health of the country's cities

- Highlight the value of the compact, local urban model (“Mediterranean city”) in the country’s urban planning in an effort to improve people’s health, foster inclusion and social interaction and increase cities’ resilience to climate change.
- Promote the urban green transition by reducing the consumption of resources (water, energy, food) and improving their management. To do so, the following is suggested:
  - Develop strategies to improve adaptation to climate change in cities by integrating climate criteria in urban planning, developing municipal regulations and institutions that support and reinforce them, applying technologies that enable local risk assessment and a decisive commitment to nature-based solutions.
  - Integrate specific health and quality of life criteria in urban planning in line with the One Health concept [see chapter 4].
  - Reduce the generation and improving the management of municipal waste. In the first instance, with measures that encourage less use of packaging and packing, limit food waste and foster community composting. In the second instance, with rubbish compacters in bins powered by renewable energies, smart fleet management systems and bin fill prediction.<sup>241</sup> Successful examples in this field can be found in Seoul and Singapore.<sup>242</sup>
  - Promote sustainable water management systems that facilitate the collection of rainwater, the re-use of used water and the reduction of flood risks with permeable paving, planted trenches, plant covers and green roofs on buildings.<sup>243</sup>
  - Encourage local food sourcing with the creation of urban and peri-urban vegetable patches and by setting up more local markets.
  - Implement measures aimed at energy efficiency and the use of renewable energies for all public infrastructures and buildings.<sup>244</sup>
  - Raise the volume of energy generated with photovoltaic panels on roofs so that a high proportion of the total solar energy produced in the country will be coming from this method by 2050.<sup>245</sup> Moreover, legal frameworks and the necessary incentives must be established to facilitate the generation of energy in the power supply system, thereby enabling areas without generation capability to benefit from the energy captured from adjacent buildings.

- Promote the energy efficiency of residential buildings by renovating them to reduce energy consumption among the existing housing stock to around 35% from now until 2050.<sup>246</sup> Actions to improve building energy efficiency should include: the installation of heat pumps for climate control and domestic hot water systems, the development of renewable energies and improvements to thermal building envelopes (facade and roof insulation, the replacement of wooden and metal frames, green roofs, etc.). The construction sector also needs to spread the application of solutions that comply with energy efficiency requirements as well as establish greater control for proper compliance. This energy renovation will also act as a lever for approaching the issue of energy poverty, eliminating architectural barriers and improving healthy housing, especially among people with disabilities and among the elderly.<sup>247</sup>
- Promote sustainable and inclusive urban and metropolitan mobility <sup>248</sup> [see chapter 4].
- Use the Spanish Mobility Law to develop Sustainable Urban Mobility Plans guided by health, specific age-gender perspective, climate change mitigation and adaptation as well as education and awareness as the transversal backbones in order to drive changes in mobility behaviours.
- Implement low and ultra-low emissions areas (such as the Low Emissions Area in Barcelona or Central Madrid), urban tolls (Stockholm, London, Milan) and super blocks (Barcelona), for the purpose of lowering air and noise pollution to the levels recommended by the WHO<sup>249</sup> in addition to road accident rates. Further proposed is the establishment of maximum congestion and noise levels in Sustainable Urban Mobility Plans.
- Streamline delivery logistics throughout urban areas by establishing a regulatory framework and incentives that promote the use of low-emissions vehicles, implementing local drop-off and pick-up spots to reduce e-commerce logistics (returns and damaged items), creating ordinances on minimal storage areas and preventing delivery activities during peak traffic hours.
- Encourage the use of public transport, improving route efficiency and frequencies with Artificial Intelligence techniques. On a metropolitan scale, the connectivity between residential areas and the main public transport stops needs to be reinforced (such as in Vitoria Gasteiz) by increasing the frequency of radial connections and dissuading the use of private cars with public car parks at transport stations.
- Promote active mobility by expanding bike lane systems and guaranteeing quality pedestrian routes using not only the pavement but also stoplight cycles and all types of intersections pursuant to universal accessibility criteria.

#### Front 4: Work towards greater social cohesion by reducing vulnerability and social/spatial segregation while fostering the sense of community belonging

- Turning public areas into meeting places for co-existence and social integration that value daily living and contribute to the provision of care services. To do so, the following will be necessary:
  - Creating cultural and leisure areas which are adequately equipped in areas where they still do not exist or have not been sufficiently implemented all while following quality, accessibility and inclusiveness criteria and performing adequate maintenance.
  - Recovering areas used for vehicle parking and limiting the privatization of public spaces.
  - Improving the design of public areas and urban furniture, ensuring universal accessibility and facilitating diverse, intergenerational use.
  - Incorporating care needs into urban designs by expanding proposals like the MICOS Project in Madrid.<sup>250</sup> Also proposed is the implementation of safe itinerary designs in the collective local space with less traffic around schools, parks, primary care centres, elderly centres, hospitals and any other location where this need is detected.
- Adding mechanisms and protocols for flexible action and networked social services so they may be more proactive in collaboration with key stakeholders in the early detection of social vulnerabilities. This includes social workers in the public arena and those working directly with groups at risk of exclusion.
- Developing a national integration and welcoming strategy for immigrants aimed at better understanding and meeting the needs and aspirations of recently-arrived communities, reducing stereotypes and prejudice, eliminating any form of discrimination in housing access and fostering social relations with the locals. This strategy shall take into account the needs associated with changing the future immigration profile.
- Approaching the problem of loneliness by developing early detection systems, emphasizing the value of community care among neighbours, implementing community co-existence plans and reinforcing social service interventions. To this end, encouraging volunteering and community action will be particularly relevant.

## Front 5: Improving territorial dynamics governance, monitoring and evaluation tools.

- Expand and optimize available databases and statistics, increasing their frequency and including new indicators while desegregating them according to census tracts. This measure should be completed with a stronger role played by Observatories already in existence so they move beyond the descriptive dimension they mostly fulfil currently, and begin to actively contribute to analysis efforts (generating open data which are available to any user) and decision making by the competent bodies. Also suggested is the creation of new Observatories in fields where the new territorial and urban realities require them<sup>251</sup> as well as improved coordination between research and decision-making bodies.
  
- Implement a shared, continuous assessment and monitoring system for policies and plans to establish proper diagnostics, make quick modifications when the outcomes are not as expected and respond to unforeseen external changes.
  
- Implement effective multi-level, networked anticipatory governance systems in order to take best advantage of territorial synergies, streamline available resources and create new shares responses to the economic, social and environmental challenges of the future. To do so, the following is suggested:
  - Foster multi-level governance and strengthening methods of intra- and inter-territorial collaboration by defining shared strategies among autonomous regions, implementing new metropolitan management systems and offering incentives for supra-municipal forms of collaboration when they are deemed efficient.
  
  - Develop a nationwide urban policy which promotes sustainable, inclusive and resilient long-term urban development and incorporates potential health risks and benefits as the criteria for decision making [see chapter 4].<sup>252</sup> It will be coordinated with relevant sectoral policies (such as housing, mobility or climate change) and implemented based on the collaborative framework established in the measure above. The purpose is to handle present challenges as well as prevent and act in view of possible future risks.
  
  - Boost the role of city networks such as the Global Covenant of Mayors,<sup>253</sup> Eurocities<sup>254</sup> and the Spanish Network of Cities for Climate.<sup>255</sup>
  
  - Increase cities' influence on decision making and the design of national, EU and international public policy.<sup>256</sup> This means empowering local governments as well as citizens by implementing the channels that foster more fluid communication with government administrations, overcoming the current difficulties of bureaucracy and taking advantage of all the potential of digitalization. All of this will favour the early detection of any problems, an increased sense of belonging and greater support for the measures adopted<sup>257</sup>.

## CHALLENGE 6: PROMOTING BALANCED, FAIR AND SUSTAINABLE TERRITORIAL DEVELOPMENT

<sup>1</sup> World Bank. “Urban development”. World Bank. <https://www.bancomundial.org/es/topic/urbandevelopment/overview>.

<sup>2</sup> INE. *Censo de 1900*. <https://www.ine.es/dynt3/inebase/es/index.htm?padre=580&dh=1>.

<sup>3</sup> United Nations. *World Urbanization Prospects 2018. Percentage of population in urban and rural areas*. <https://population.un.org/wup/Country-Profiles/>.

<sup>4</sup> Due to data availability and international comparability, the urbanisation rate since 1950 is represented. The EU-27 average is a simple average of the individual countries. In this regard, see: *Ibid*.

<sup>5</sup> On this question, see, among others: Archondo, Ignacio, *et al. Tendencias en la urbanización: Riesgos y oportunidades*. BBVA Research, 2018. <https://www.bbva.com/wp-content/uploads/2018/11/Observatorio-Futuro-de-las-Ciudades.pdf>; European Commission and UN-Habitat. *The State of European Cities 2016. Cities leading the way to a better future*. Luxembourg: Publications Office of the European Union, 2016. [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP\(2019\)4&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP(2019)4&docLanguage=En); and Goerlich Gisbert, Francisco, and Ernest Reig Martínez (dirs.). *Las Áreas urbanas funcionales en España: Economía y Calidad de Vida*. Bilbao: Fundación BBVA, 2020. [https://www.fbbva.es/wp-content/uploads/2020/06/DE2020\\_areas-urbanas-funcionales\\_ivie\\_web.pdf](https://www.fbbva.es/wp-content/uploads/2020/06/DE2020_areas-urbanas-funcionales_ivie_web.pdf); Gutiérrez, Eduardo, Enrique Moral-Benito, and Roberto Ramos. “Tendencias recientes de la población en las áreas rurales y urbanas de España.” *Documentos Ocasionales Banco de España*, n.º 2027, 2020. <https://www.bde.es/f/webbde/SES/Secciones/Publicaciones/PublicacionesSerias/DocumentosOcasionales/20/Fich/do2027.pdf>; and OECD. *The Metropolitan Century. Understanding urbanization and its consequences. Policy Highlights*. Paris: OECD Publishing, 2015. <http://www.oecd.org/regional/regional-policy/The-Metropolitan-Century-Policy-Highlights%20.pdf>.

<sup>6</sup> Spain is the third safest country in Europe and one of the safest in the world. In our country, more than 80% of people say they feel safe walking alone at night, above the OECD average of 68%. This safety is not only subjective, different safety records also place Spain among the safest countries in the European Union. In this regard, refer to: Eurostat. *Recorded offences by offence category - police data [crim\_off\_cat]*. <https://ec.europa.eu/eurostat/data/database>; and OCDE. *How’s life? 2015. Measuring well-being*. Paris: OECD Publishing, 2015. [https://dx.doi.org/10.1787/how\\_life-2015-en](https://dx.doi.org/10.1787/how_life-2015-en) \t “\_blank” \o “How’s Life? 2015.

<sup>7</sup> 274 Spanish municipalities have been recognised as child-friendly cities by Unicef. Spain is a world leader in this field. For further details, see: Unicef. *Ciudades Amigas de la Infancia 2018-2022*. <https://ciudadesamigas.org/ciudades-infancia-2018/ciudades-amigas-2018/>.

<sup>8</sup> Spain is the country with the most municipalities in the world that have joined the network of age-friendly cities and communities. In 2020, 191 municipalities, in which 32.4% of the over-60 population reside, hold this title. In this regard, see: WHO “About the Global Network for Age-friendly Cities and Communities.” WHO, <https://extranet.who.int/>

[agefriendlyworld/who-network/](https://agefriendlyworld/who-network/).

<sup>9</sup> Even at the peak of migratory flows and at the lowest point of employment, Spain has shown a more open attitude towards immigration than the average of the European countries, as well as a greater appreciation of its contribution in all spheres, and fluid intercultural relations. In this regard, see: Spanish Economic and Social Council. *La inmigración en España: efectos y oportunidades*. Madrid, 2019. <http://www.ces.es/informes>; and González Enríquez, Carmen. *Luces y sombras en la integración de los migrantes en España*. Madrid: Real Instituto Elcano, 2016. [http://www.realinstitutoelcano.org/wps/portal/rielcano\\_es/contenido?WCM\\_GLOBAL\\_CONTEXT=/elcano/elcano\\_es/zonas\\_es/demografia+y+poblacion/ari38-2016-gonzalez-enriquez-luces-sombras-integracion-migrantes-espana](http://www.realinstitutoelcano.org/wps/portal/rielcano_es/contenido?WCM_GLOBAL_CONTEXT=/elcano/elcano_es/zonas_es/demografia+y+poblacion/ari38-2016-gonzalez-enriquez-luces-sombras-integracion-migrantes-espana).

<sup>10</sup> 72% of those who live in Spanish cities trust the rest of the inhabitants of their urban area, a high percentage and much higher than the average for southern European countries. In this regard, refer to: European Commission, Directorate-General for Regional and Urban Policy. *Report on the Quality Of Life In European Cities, 2020*. Luxembourg: Publications Office of the European Union, 2020. [https://ec.europa.eu/regional\\_policy/en/information/maps/quality\\_of\\_life](https://ec.europa.eu/regional_policy/en/information/maps/quality_of_life).

<sup>11</sup> Eurostat. *European Union Statistics on Income and Living Conditions. Distribution of population by tenure status, type of household and income group- EU-SILC survey [ILC\_LVHO02]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>12</sup> For further details, see: INE. *Censo de Población y Viviendas 1991*. <https://www.ine.es/censo91/es/inicio.jsp>; INE. *Censo de Población y Viviendas 2011*. [https://www.ine.es/censos2011\\_datos/cen11\\_datos\\_resultados.htm#](https://www.ine.es/censos2011_datos/cen11_datos_resultados.htm#); and Department of Public Works, Transport and Environment. *Informe Nacional de España Hábitat II*. Madrid, 1997. <http://habitat.aq.upm.es/in/>.

<sup>13</sup> This improvement is due to a decrease in household size (fewer children, fewer intergenerational households and an increase in single-person households) and an increase in the floor area of dwellings built. Thus, in 1970, the usable floor area per person was 18.3 m<sup>2</sup>, rising to 37.37 m<sup>2</sup> in 2011 (latest available census). For further details, see: INE. *Censo de Población y Viviendas 1991*. <https://www.ine.es/censo91/es/inicio.jsp>; INE. *Censo de Población y Viviendas 2011*. [https://www.ine.es/censos2011\\_datos/cen11\\_datos\\_resultados.htm#](https://www.ine.es/censos2011_datos/cen11_datos_resultados.htm#); and Department of Public Works, Transport and Environment. *Informe Nacional de España Hábitat II*. Madrid, 1997. <http://habitat.aq.upm.es/in/>.

<sup>14</sup> Percentage of disposable income used to pay for housing (rent and mortgage, as well as mortgage interest). Disposable income measures the net income of households (net of taxes and social contributions and accounting for net interest and dividends received). Data for the EU-27 and EU-8 are simple averages of the individual countries. See: OECD. *Housing costs over income [HCI.2]*. <http://www.oecd.org/housing/data/affordable-housing-database/housing-conditions.htm>.

<sup>15</sup> Porcentaje de población que vive en hogares en los que el gasto en vivienda representa al menos el 40% de la renta disponible total del hogar. Data for the EU-27 and EU-8 are simple averages of the individual countries. Refer to: Eurostat. *European Union Statistics on*

*Income and Living Conditions. Housing cost overburden rate by tenure status - EU-SILC survey [ilc\_lvho07c].* <https://ec.europa.eu/eurostat/data/database>.

<sup>16</sup> For further details on the construction of the EU-8, see the *Apunte metodológico* número I.

<sup>17</sup> Mingorance Jiménez, Alfredo. *Sociedad y empleo en Vallecas*. Madrid: Universidad Complutense de Madrid, Servicio de Publicaciones, 1993. <https://eprints.ucm.es/2411/1/AH0024001.pdf>; and Valenzuela Rubio, Manuel. “La pervivencia del chabolismo en Madrid”. *Temas de Madrid*, n.º 1. *Departamento de Geografía*. Universidad Autónoma de Madrid, 1975. 35-43.

<sup>18</sup> These official data do not take into account the situation of Cañada Real (divided among four municipalities and where shanty towns alternate with housing built on undeveloped land, but which would not be considered substandard housing due to its characteristics). With regard to the notable decrease in the number of people living in horizontal substandard housing, UN Habitat highlighted as a good practice the “Neighbourhood Reshaping” initiated in 1979 in Madrid. In this regard, see: Agencia de vivienda social. *Informe de gestión y actividades*. Madrid: Comunidad de Madrid, 2018. [https://www.comunidad.madrid/sites/default/files/doc/vivienda/informe\\_gestion\\_2018.pdf](https://www.comunidad.madrid/sites/default/files/doc/vivienda/informe_gestion_2018.pdf); and Castro, Prisciliano, José Molina, and Belén Bada. “Un ejemplo de participación y renovación urbana: la remodelación de barrios en Madrid (España).” *Ciudades para un Futuro más Sostenible*, 1996. <http://habitat.aq.upm.es/bpes/onu/bp258.html>.

<sup>19</sup> It is defined as the percentage of the population suffering from overcrowding in addition to at least one of the measures of housing deprivation (leaking roof, no bath/shower, no indoor toilet, too dark). The at-risk-of-poverty threshold is 60% of the national median of the equivalent disposable income. EU-27 and EU-8 data are simple averages for the individual countries. See: Eurostat. *European Union Statistics on Income and Living Conditions. Severe housing deprivation rate by age, sex and poverty status - EU-SILC survey [ilc\_mdho06a]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>20</sup> The indicator measures the proportion of people living in overcrowded conditions (overcrowded dwellings). This overcrowding rate is calculated by taking into account the ratio between the number of rooms in the dwelling and the number of household members. Eurostat considers as minimums: one common living room for the household; one bedroom per couple; one bedroom for each single person aged 18 and over; one bedroom for each single same-sex couple aged 12 to 17; one bedroom for each single person aged 12 to 17, not included in the previous category; one room for each couple of children under the age of 12. The at-risk-of-poverty threshold is 60% of the national median of the equivalent disposable income. EU-27 and EU-8 data are simple averages for the individual countries. In this regard, see: Eurostat. *European Union Statistics on Income and Living Conditions. Overcrowding rate by poverty status - EU-SILC survey [TESS1172]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>21</sup> Some relevant examples are *Agenda 21 local, Estrategia española de sostenibilidad urbana y local* for 2011, *Agenda Urbana Española* for 2019, and initiatives such as the *Pacto de los Alcaldes para el Clima y la Energía Europa (Global Covenant of Mayors)*, Red C40, or Red Española de Ciudades por el Clima. In this regard, see: Aguado, Itziar, *et al.* “La Agenda 21 Local en España.” *Ekonomiaz: Revista vasca de economía*

64, 2007. <https://dialnet.unirioja.es/servlet/articulo?codigo=2350127>; Eurostat. *Population covered by the Covenant of Mayors for Climate & Energy signatories [SDG\_13\_60]*. <https://ec.europa.eu/eurostat/data/database>; Department for Environment. *Estrategia Española de Sostenibilidad urbana y local*, 2011. Madrid, 2011. [https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/medio-ambiente-urbano/EESUL-290311-web\\_tcm30-181850.pdf](https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/medio-ambiente-urbano/EESUL-290311-web_tcm30-181850.pdf); Department of Transport, Mobility and Urban Agenda. *Agenda Urbana Española*. Madrid, 2019. [www.aue.gob.es](http://www.aue.gob.es); Olazabal, Marta, *et al.* “How are Italian and Spanish Cities tackling climate change? A local comparative study.” *BC3 Working paper series*, n.º 2014-03, 2014. <https://ideas.repec.org/p/bcc/wpaper/2014-03.html>; and Reckien, Diana, *et al.* “How are cities planning to respond to climate change? Assessment of local climate plans from 885 cities in the EU-28.” *Journal of Family Studies* 191, 2018. <https://doi.org/10.1016/j.jclepro.2018.03.220>.

<sup>22</sup> The percentage of the population reporting noise problems has also halved from 24.9% in 2004 to 14.1% in 2019. For further details, see: Eurostat. *Noise from neighbors or from the street - EU-SILC survey [ILC\_MDDW01]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>23</sup> The data series in the figure have been constructed from the reports of the European Environment Agency, taking into account the percentage of the population exposed to annual average concentrations of particulate matter (PM10) above 20 micrograms per cubic metre (WHO recommended limit). See: European Environment Agency. “ECT/ATNI reports.” *European Topic Centre on Air Pollution, transport, noise and industrial pollution*, <https://www.eionet.europa.eu/etcs/etc-atni/products/etc-atni-reports>; and WHO. *Air quality guidelines for particulate matters, ozone, nitrogen dioxide and sulphur dioxide. Global update 2005*. Geneva, 2005. [http://www.who.int/phe/health\\_topics/outdoorair/outdoorair\\_aqg/en/index.html](http://www.who.int/phe/health_topics/outdoorair/outdoorair_aqg/en/index.html).

<sup>24</sup> EU-27 and EU-8 data are simple averages for the individual countries. See: Eurostat. *Pollution, grime or other environmental problems - EU-SILC survey [ILC\_MDDW02]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>25</sup> See: Centro de Innovación del Sector Público de PwC and IE Business School. *Smart Cities: La ciudad como plataforma de transformación digital*. 2015. <https://docplayer.es/12056595-Centro-de-innovacion-del-sector-publico-de-pwc-e-ie-business-school-smart-cities-la-transformacion-digital-de-las-ciudades-en-colaboracion-con.html>; and the Spanish Network of Smart Cities (RECI). <https://reddeciudadesinteligentes.es/mapa-de-ciudades/>.

<sup>26</sup> 93,1 hab./km<sup>2</sup> and 108,8 hab./km<sup>2</sup>, respectively in 2018. The average density in Spain in 1990 was 77 inhabitants/km<sup>2</sup>. For further details, see: Eurostat. *Population Density [TPS00003]*. <https://ec.europa.eu/eurostat/data/database>; INE. *Cifras de población. Principales cifras desde 1971*. <https://www.ine.es/jaxiT3/Tabla.htm?t=31304>; and INE. *Anuario estadístico de España, 1996. Superficie y altimetría*. <https://www.ine.es/inebaseweb/pdfDispatcher.do?td=145936&ext=.pdf>.

<sup>27</sup> INE. *Cifras de población. Principales cifras desde 1971*. <https://www.ine.es/jaxiT3/Tabla.htm?t=31304>; and INE. *Anuario estadístico de España, 1996. Superficie y altimetría*. <https://www.ine.es/inebaseweb/pdfDispatcher.do?td=145936&ext=.pdf>.

<sup>28</sup> Ayuda, María Isabel, Fernando Collantes, and Vicente Pinilla. “From locational fundamentals to increasing returns: the spatial concentration

of population in Spain, 1787–2000.” *Journal of Educational studies*, 12, 2010. <https://doi.org/10.1007/s10109-009-0092-x>.

<sup>29</sup> There are different definitions of medium-sized cities, although most studies tend to consider those cities with between 50,000 and 300,000 inhabitants. Provincial capitals should be added to these, even if they have a smaller population, and cities that, despite having between 50,000 and 300,000 inhabitants, are integrated into the metropolitan areas of cities of a higher rank or form metropolitan areas of their own that are larger than 400,000 inhabitants. On this question, see, among others: Ganau, Joan, and Joan Vilagrassa. “Ciudades medias en España: posición en la red urbana y procesos urbanos recientes.” *Colección Mediterráneo Económico: “Ciudades, Arquitectura y Espacio Urbano*, n.º 3, 2020. <https://www.publicacionescajamar.es/publicacionescajamar/public/pdf/publicaciones-periodicas/mediterraneo-economico/3/3-20.pdf>; Martínez Navarro, José María, Juan Antonio García González, and Luis Alfonso Escudero. “Las ciudades medias de España y sus coronas en el siglo XXI (2000-2017): dinámica demográfica y desarrollo inmobiliario.” *Urbe Revista Brasileira de Gestão Urbana* 12, 2020. <https://doi.org/10.1590/2175-3369.012.e20190202>.

<sup>30</sup> De la Roca Cladera, Josep, Blanca Arellano Ramos, and Montserrat Moix Bergadà. “Estructura urbana, policentrismo y sprawl: los ejemplos de Madrid y Barcelona.” *Ciudad y territorio, estudios territoriales*, 43, n.º 168, 2011. [https://upcommons.upc.edu/bitstream/handle/2117/13579/04\\_CyTET\\_168web.pdf](https://upcommons.upc.edu/bitstream/handle/2117/13579/04_CyTET_168web.pdf); and Department of Development; DG for Architecture, Housing and Land; SG for Land, Information and Evaluation. *Áreas urbanas en España 2018. Constitución. Cuarenta años de las ciudades españolas*. Madrid, 2018. <https://apps.fomento.gob.es/CVP/handlers/pdfhandler.ashx?idpub=BAW058>.

<sup>31</sup> Ganau, Joan, and Joan Vilagrassa. “Ciudades medias en España: posición en la red urbana y procesos urbanos recientes.” *Colección Mediterráneo Económico: “Ciudades, Arquitectura y Espacio Urbano*”, n.º 3, 2020. <https://www.publicacionescajamar.es/publicacionescajamar/public/pdf/publicaciones-periodicas/mediterraneo-economico/3/3-20.pdf>.

<sup>32</sup> *Ibid.*

<sup>33</sup> See, among others: Pérez, Francisco and Ernest Reig (dirs.). *Madrid: capitalidad, economía del conocimiento y competencia fiscal*. Valencia: Generalitat Valenciana, 2020. [https://www.ivie.es/es\\_ES/ptproyecto/ivielab-madrid-capitalidad-economia-del-conocimiento-competencia-fiscal/](https://www.ivie.es/es_ES/ptproyecto/ivielab-madrid-capitalidad-economia-del-conocimiento-competencia-fiscal/); and Sánchez, Joan-Eugeni. “Pautas de localización de las sedes de las grandes empresas y entornos metropolitanos.” *EURE (Santiago)*. 2007. <http://dx.doi.org/10.4067/S0250-71612007000300005>.

<sup>34</sup> Ganau, Joan, and Joan Vilagrassa. “Ciudades medias en España: posición en la red urbana y procesos urbanos recientes.” *Colección Mediterráneo Económico: “Ciudades, Arquitectura y Espacio Urbano*”, n.º 3, 2020. <https://www.publicacionescajamar.es/publicacionescajamar/public/pdf/publicaciones-periodicas/mediterraneo-economico/3/3-20.pdf>.

<sup>35</sup> The size of the bubbles represents the percentage of decrease (grey) or increase (blue) in population in each of the Spanish provincial capitals between 2010 and 2019. For further details, see: INE. *Cifras oficiales de población resultantes de la revisión del Padrón municipal a 1 de enero. Resumen por capitales de provincia. Población por capitales de provincia*

y sexo. <https://www.ine.es/jaxiT3/Tabla.htm?t=2911&L=0>.

<sup>36</sup> On this question, see, among others: Collantes, Fernando, and Vicente Pinilla. *¿Lugares que no importan? La despoblación de la España rural desde 1900 hasta el presente*. Zaragoza: Sociedad Española de Historia Agraria, 2019. <https://puz.unizar.es/2156-lugares-que-no-importan-la-despoblacion-de-la-espana-rural-desde-1900-hasta-el-presente.html>; and Pinilla, Vicente, and Luis Antonio Sáez. *La despoblación rural en España: génesis de un problema y políticas innovadoras*. Zaragoza: Informes Centro de Estudios sobre la Despoblación y Desarrollo de Áreas Rurales, 2017. <http://sspa-network.eu/wp-content/uploads/Informe-CEDDAR-def-logo.pdf>.

<sup>37</sup> Collantes, Fernando, and Vicente Pinilla. *¿Lugares que no importan? La despoblación de la España rural desde 1900 hasta el presente*. Zaragoza: Sociedad Española de Historia Agraria, 2019. <https://puz.unizar.es/2156-lugares-que-no-importan-la-despoblacion-de-la-espana-rural-desde-1900-hasta-el-presente.html>.

<sup>38</sup> Pinilla, Vicente, and Luis Antonio Sáez. *La despoblación rural en España: génesis de un problema y políticas innovadoras*. Zaragoza: Informes Centro de Estudios sobre la Despoblación y Desarrollo de Áreas Rurales, 2017. <http://sspa-network.eu/wp-content/uploads/Informe-CEDDAR-def-logo.pdf>.

<sup>39</sup> Camarero, Luis, and Rosario Sampedro. “La inmigración dinamiza la España rural.” *Observatorio Social. Fundación La Caixa*, 2020. [https://observatoriosociallacaixa.org/es/-/la-inmigracion-dinamiza-la-espana-rural?utm\\_source=newsletter&utm\\_medium=email&utm\\_campaign=3951\\_OBS\\_Email%20&utm\\_content=ES&utm\\_term=Ciencias-Sociales&crm\\_i=CIESOC\\_2\\_GEN](https://observatoriosociallacaixa.org/es/-/la-inmigracion-dinamiza-la-espana-rural?utm_source=newsletter&utm_medium=email&utm_campaign=3951_OBS_Email%20&utm_content=ES&utm_term=Ciencias-Sociales&crm_i=CIESOC_2_GEN).

<sup>40</sup> The EU classifies municipalities with a population density of less than 12.5 inhabitants per km<sup>2</sup> as “at risk of depopulation”. In January 2020, 5,007 Spanish municipalities had fewer than 1,000 inhabitants. However, this situation is not unique to Spain, but affects all European countries to a greater or lesser extent, and the fight against depopulation is one of the main priorities of the Vice-Presidency for Democracy and Demography of the European Commission. For further details, refer to: Čipin, Ivan, *et al.* “A Long-Term Vision for the Development of Rural Areas in Europe.” *Population and Policy Compact 27*. Berlin: Max Planck Society/Population Europe, 2020. <https://population-europe.eu/policy-brief/long-term-vision-development-rural-areas-europe>; Comisionado del Gobierno frente al Reto Demográfico. *Diagnóstico estrategia nacional frente al reto demográfico. Eje despoblación*. Department of Territorial Policy and Public Function, 2020. [https://www.mptfp.gob.es/dam/es/portal/reto\\_demografico/Indicadores\\_cartografia/Diagnostico\\_Despoblacion.pdf](https://www.mptfp.gob.es/dam/es/portal/reto_demografico/Indicadores_cartografia/Diagnostico_Despoblacion.pdf); and INE. *España municipal 2020*. [https://www.ine.es/infografias/infografia\\_padron.pdf](https://www.ine.es/infografias/infografia_padron.pdf).

<sup>41</sup> Despite the fact that the Spanish population has increased by 16% between 2000 and 2019, the rural population residing in municipalities of less than 5,000 inhabitants has been reduced by 8%. Over the same period, an estimated 5,110 municipalities have lost population. In half of them, the number of inhabitants has fallen by more than 25% in the last two years, a phenomenon that has affected practically all of the country's autonomous communities. On this question, see: INE. *Estadística del Padrón Continuo. Datos de municipios por tramos*. <https://www.ine.es/dynt3/inebase/index.htm?type=pcaxis&path=/t20/e245/p04/provi&file=pcaxis&dh=0&capsel=0>; and General Secretariat for Demographic Challenge. *El reto demográfico y la despoblación en cifras*.



Department for Ecological Transition and Demographic Challenge, 2020. <https://www.lamoncloa.gob.es/presidente/actividades/Documents/2020/280220-despoblacion-en-cifras.pdf>.

<sup>42</sup> Economic and Social Council. “El medio rural y su vertebración social y territorial.” *Colección informes*, n.º1. Madrid: Economic and Social Council, 2018. <http://www.ces.es/documents/10180/5182488/Inf0118.pdf/6d616668-0cb8-f58c-075b-2251f05dad9f>.

<sup>43</sup> Data for 1981 and 1991 are from the Population and Housing Census. The rest comes from the municipal census. For further details, see: INE. *Censo de Población y Viviendas 1981 1991. Tamaño del municipio de residencia*. [https://www.ine.es/censos2011\\_datos/cen11\\_datos\\_resultados1.htm](https://www.ine.es/censos2011_datos/cen11_datos_resultados1.htm); and *Cifras oficiales de población resultantes de la revisión del Padrón municipal a 1 de enero. Población por comunidades y ciudades autónomas y tamaño de los municipios*. <https://www.ine.es/jaxiT3/Tabla.htm?t=2915>.

<sup>44</sup> General Secretariat for Demographic Challenge. *El reto demográfico y la despoblación en cifras*. Department for Ecological Transition and Demographic Challenge, 2020. <https://www.lamoncloa.gob.es/presidente/actividades/Documents/2020/280220-despoblacion-en-cifras.pdf>.

<sup>45</sup> Ayala García, Alba, and Antonio Abellán García. “La España rural se vacía.” *Envejecimiento en red*, <http://envejecimientoenred.es/la-espana-rural-se-vacia/>.

<sup>46</sup> Fundación BBVA and Ivie. *Despoblación de las provincias españolas*. Fundación BBVA, Esenciales n.º 37, 2019. [https://www.fbbva.es/wp-content/uploads/2019/07/FBBVA\\_Esenciales\\_37\\_Despoblacion.pdf](https://www.fbbva.es/wp-content/uploads/2019/07/FBBVA_Esenciales_37_Despoblacion.pdf).

<sup>47</sup> Economic and Social Council. “El medio rural y su vertebración social y territorial.” *Colección informes*, n.º1. Madrid: Economic and Social Council, 2018. <http://www.ces.es/documents/10180/5182488/Inf0118.pdf/6d616668-0cb8-f58c-075b-2251f05dad9f>.

<sup>48</sup> INE. *Estadística del Padrón Continuo. Datos de municipios por tramos*. <https://www.ine.es/dynt3/inebase/es/index.htm?type=pcaxis&file=pcaxis&path=%2Ft20%2Fe245%2Fp05%2F%2Fa2019>.

<sup>49</sup> It should be recalled that Spain is one of the EU countries with the lowest fertility rate. For further details, refer to: Eurostat. *Total Fertility Rate, 1960- 2018 (live births per woman) [demo\_frate]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>50</sup> Pinilla, Vicente, and Luis Antonio Sáez. “La despoblación rural en España: génesis de un problema y políticas innovadoras.” *Informes CEDDAR 2*, 2017. <http://sspa-network.eu/wp-content/uploads/Informe-CEDDAR-def-logo.pdf>.

<sup>51</sup> INE. *Estadística del Padrón Continuo. Datos de municipios por tramos*. <https://www.ine.es/dynt3/inebase/index.htm?type=pcaxis&path=t20/e245/p04/provi&file=pcaxis&dh=0&capsel=0>.

<sup>52</sup> Noguera Tur, Joan, and Adrián Ferrandis Martínez. “Accesibilidad y provisión de Servicios de Interés General en las áreas rurales de la Unión Europea: un análisis a partir del Eurobarómetro.” *Boletín de la Asociación de Geógrafos Españoles*, n.º 64, 2014. <https://doi.org/10.21138/bage.1703>.

<sup>53</sup> See, among others: Pérez, Francisco and Ernest Reig (dirs.). *Madrid: capitalidad, economía del conocimiento y competencia fiscal*. Valencia: Generalitat Valenciana, 2020. [https://www.ivie.es/es\\_ES/ptproyecto/](https://www.ivie.es/es_ES/ptproyecto/)

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<sup>54</sup> De la Roca, Jorge, and Diego Puga. “Learning by working in big cities.” *The Review of Financial Studies*, 84, n.º 1, 2017. <https://doi.org/10.1093/restud/rdw031>.

<sup>55</sup> Eurostat. *Mean and median income by degree of urbanization [ilc\_di17]*. [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc\\_di17&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di17&lang=en).

<sup>56</sup> Economic and Social Council. “El medio rural y su vertebración social y territorial.” *Colección informes*, n.º1. Madrid: Economic and Social Council, 2018. <http://www.ces.es/documents/10180/5182488/Inf0118.pdf/6d616668-0cb8-f58c-075b-2251f05dad9f>.

<sup>57</sup> The differences between the percentage of Social Security affiliates in rural areas (<10,000 inhabitants) and urban area (>10,000 inhabitants) in each province for the average of the period 2015-2018 are represented. For further details, see: Department of Transport, Mobility and Urban Agenda. *Atlas Digital de las Áreas Urbanas de España 2015-2018*. <http://atlasau.fomento.gob.es/#s=2018;z=-524368,4884263,1802784,1115743;l=es;i=pobevo.pobevo001;v=map5>.

<sup>58</sup> Beltrán Tapia, Francisco, Alfonso Díez-Minguela, and Julio Martínez-Galarraga. “The Shadow of Cities: Size, Location and the Spatial Distribution of Population in Spain.” *Cambridge Working Paper Economics*, n.º 1749, 2017. <http://www.econ.cam.ac.uk/research-files/repec/cam/pdf/cwpe1749.pdf>.

<sup>59</sup> The EU-28 figure is the value reported by the OECD. On this question, see: OECD. *How's Life? 2020: Measuring Well-being*. Paris: OECD Publishing, 2020. <https://doi.org/10.1787/9870c393-en>; and OECD. *ICT Access and Usage by Households and Individuals [ICT HH2]*. <https://stats.oecd.org/>.

<sup>60</sup> It is calculated by dividing the total number of kilometres of motorways and dual carriageways for each province by its surface area (in km<sup>2</sup>). See: INE. *Anuario estadístico de España, 1996. Superficie y altimetría*. <https://www.ine.es/inebaseweb/pdfDispatcher.do?td=145936&ext=.pdf>; and Department of Transport, Mobility and Urban Agenda. *Anuario Estadísticas 2018. Chapter 7: Carreteras*. Madrid, 2018. [https://www.mitma.gob.es/recursos\\_mfom/paginabasica/recursos/07carreteras\\_18.pdf](https://www.mitma.gob.es/recursos_mfom/paginabasica/recursos/07carreteras_18.pdf).

<sup>61</sup> Department of Transport, Mobility and Urban Agenda. *Agenda Urbana Española*. Madrid, 2019. [www.aue.gob.es](http://www.aue.gob.es).

<sup>62</sup> Nieuwenhuijsen, Mark J. “Urban and transport planning pathways to carbon neutral, liveable and healthy cities; A review of the current evidence.” *Environment International*, 140, 2020. <https://doi.org/10.1016/j.envint.2020.105661>.

<sup>63</sup> Ten Brink, Patrick, et al. *The Health and Social Benefits of Nature and Biodiversity Protection –Executive summary*. Institute for European Environmental Policy, 2016. <https://ec.europa.eu/environment/nature/biodiversity/intro/docs/Health%20and%20Social%20Benefits%20of%20Nature%20-%20Final%20Report%20Executive%20Summary%20sent.pdf>.

<sup>64</sup> Susino, Joaquín, and Ricardo Duque Calvache. "Veinte años de suburbanización en España (1981-2001). El perfil de sus protagonistas." *Documents d'anàlisi geogràfica*, 2013. <https://doi.org/10.5565/rev/dag.31>.

<sup>65</sup> In order to understand the evolution of the concept of *urban sprawl* the measures that approximate it and the debate on its positive and negative effects, see, among others: Frenkel, Amnon, and Maya Ashkenazi. "Measuring Urban Sprawl: How can we deal with it?" *Environment and Planning B: Urban Analytics and City Science* 35, 2008. <https://doi.org/10.1068/b32155>; and Harvey, Robert O., and W. A. V. Clark. "The Nature and Economics of Urban Sprawl." *Land Economics* 41, n.º 1, 1965. <https://www.jstor.org/stable/3144884>.

<sup>66</sup> Sanabria Artunduaga, Tadeo Humberto, and John Fredy Ramírez Ríos. "Ciudad compacta vs. ciudad difusa. Ecos antiguos y recientes para las políticas de planeación territorial y espacial." *Cuaderno urbano. Espacio, cultura y sociedad* 22, n.º 22, 2017. <https://www.redalyc.org/pdf/3692/369251998002.pdf>.

<sup>67</sup> Vázquez Varela, Carmen, and José María Martínez Navarro. "Capítulo III. Ciudades medias de interior y desarrollo territorial: entre la vertebración de nuevas estructuras urbano-territoriales y el despoblamiento de sus entornos provinciales." In: Cebrián Abellán, Francisco (coord.). *Dinámicas de urbanización en ciudades medias interiores: ¿hacia un urbanismo más urbano?* Valencia: Tirant Humanidades, 2020.

<sup>68</sup> Medium-sized cities and their areas of influence experienced the highest relative growth, well above that observed in large cities. In this regard, see: Bellet, Carme and Eduardo Olazábal "Las ciudades intermedias en España: dinámicas y procesos de urbanización recientes". In: Maturana, Francisco, et al. (eds.). *Sistemas urbanos y ciudades medias en Iberoamérica*. Santiago de Chile: GEOlibros, 2017. 146-85; and Vázquez Varela, Carmen, and José María Martínez Navarro. "Capítulo III. Ciudades medias de interior y desarrollo territorial: entre la vertebración de nuevas estructuras urbano-territoriales y el despoblamiento de sus entornos provinciales." In: Cebrián Abellán, Francisco (coord.). *Dinámicas de urbanización en ciudades medias interiores: ¿hacia un urbanismo más urbano?* Valencia: Tirant Humanidades, 2020. 95-146.

<sup>69</sup> López Villanueva, Cristina, and Isabel Pujades Rubies. "Transformaciones espaciales y demográficas en las regiones metropolitanas de Madrid y Barcelona." In: Marta Domínguez Pérez, and Cristina López Villanueva, (eds.). *Barcelona y Madrid: procesos urbanos y dinámicas sociales*. Madrid: Síntesis, 2015. 71-105. <https://dialnet.unirioja.es/servlet/articulo?codigo=7256907>.

<sup>70</sup> Non-residential uses (industrial, office, logistics and commercial) increased from 27% of the artificial surface of the territory to 42% in the period 1987-2011. On this question, see: Olazabal Salgado, Eduardo, and Carme Bellet Sanfeliu. "Procesos de urbanización y artificialización del suelo en las aglomeraciones urbanas españolas (1987-2011)." *Cuadernos geográficos de la Universidad de Granada* 57.2, 2018. <http://dx.doi.org/10.30827/cuadgeo.v57i2.5920>.

<sup>71</sup> On this question, see, among others: Del Pino Artacho, Julio A. "Movilidad residencial regional, migraciones y balance territorial en la Comunidad de Madrid durante la crisis económica." *Papers: revista de sociología*, 102, 2017. <https://papers.uab.cat/article/view/v102-n4-del-pino-artacho/2421-pdf-es>; Domingo i Valls, Andreu, Jordi Bayona, and

Antonio López Gay. "Impacto demoespacial de la internacionalización de los flujos migratorios en la ciudad de Barcelona." *Migraciones. Publicación del Instituto Universitario de Estudios sobre Migraciones* 16, 2004. <https://revistas.comillas.edu/index.php/revistamigraciones/article/view/4241>; Goerlich Gisbert, Francisco J., and Ernest Reig Martínez (dirs.). *Las Áreas urbanas funcionales en España: Economía y Calidad de Vida*. Bilbao: Fundación BBVA, 2020. [https://www.fbbva.es/wp-content/uploads/2020/06/DE2020\\_areas-urbanas-funcionales\\_ivie\\_web.pdf](https://www.fbbva.es/wp-content/uploads/2020/06/DE2020_areas-urbanas-funcionales_ivie_web.pdf); and Susino, Joaquín, and Ricardo Duque. "Veinte años de suburbanización en España (1981-2001). El perfil de sus protagonistas." *Documents d'anàlisi geogràfica*, 2013. <https://doi.org/10.5565/rev/dag.31>.

<sup>72</sup> European Environment Agency. *Urban Sprawl in Europe. Joint EEA-FOEN report. n.º 11/2016*. Luxembourg: Publications Office of the European Union, 2016. <https://www.eea.europa.eu/publications/urban-sprawl-in-europe>.

<sup>73</sup> Vázquez Varela, Carmen, and José María Martínez Navarro. "Capítulo III. Ciudades medias de interior y desarrollo territorial: entre la vertebración de nuevas estructuras urbano-territoriales y el despoblamiento de sus entornos provinciales." In: Cebrián Abellán, Francisco (coord.). *Dinámicas de urbanización en ciudades medias interiores: ¿hacia un urbanismo más urbano?* Valencia: Tirant Humanidades, 2020, p. 95 - 146.

<sup>74</sup> 14.6% of the total number of dwellings in our residential stock are for second homes and 13.6% are vacant, according to the INE's 2011 figures. 48% of these second homes are located in inland regions or in the north of Spain. In this regard, see: INE. *Censo de Población y Viviendas 2011*. [https://www.ine.es/censos2011\\_datos/cen11\\_datos\\_resultados.htm#](https://www.ine.es/censos2011_datos/cen11_datos_resultados.htm#).

<sup>75</sup> This percentage is extracted by dividing the number of non-mainstream homes by the total number of dwellings, in 2019. While it is true that a proportion of secondary homes in some areas of Spain are owned by foreigners, Spain's housing per capita ratio is one of the highest in the OECD, only behind Portugal and Bulgaria. In this regard, see: OECD. *Affordable Housing Database. Housing market. Housing stock and construction*. <http://www.oecd.org/housing/data/affordable-housing-database/>; and Department of Transport, Mobility and Urban Agenda. *Estimated housing stock Viviendas principales y no principales por comunidades autónomas y provincias*. <https://www.mitma.gob.es/el-ministerio/informacion-estadistica/vivienda-y-actuaciones-urbanas/estadisticas/estimacion-del-parque-de-viviendas>.

<sup>76</sup> In this regard, see: Agrawal, David R., Dirk Foremny, and Clara Martínez-Toledano. "Paraísos Fiscales, Wealth Taxation, and Mobility." SSRN, 2020. <http://dx.doi.org/10.2139/ssrn.3676031>; López Laborda, Julio and Fernando Rodrigo Saucó. "Movilidad de los contribuyentes de rentas altas en respuesta a las diferencias regionales en los impuestos personales." *FEDEA, Studies on the Spanish Economy*. 2017. <https://ideas.repec.org/p/fda/fdaeee/eee2017-28.html>; Martínez Sánchez, César. "El principio de solidaridad interterritorial: desafíos actuales". In Vega Borrego, Félix A., Juan Arrieta Martínez de Pisón, and Juan Zorzona Pérez. *La distribución del poder financiero en España: Homenaje al profesor Juan Ramallo Massanet*. Madrid: Marcial Pons, 2014. 93-113; and Pérez, Francisco, and Ernest Reig (dirs.). *Madrid: capitalidad, economía del conocimiento y competencia fiscal*. Valencia: Generalitat Valenciana, 2020. [538 Spain 2050 ■ Territorial Development](https://www.ivie.es/es_ES/ptproyecto/ivielab-madrid-capitalidad-economia-del-conocimiento-competencia-</a></p></div><div data-bbox=)

fiscal/.

<sup>77</sup> Another factor that was decisive in this increase in urbanisation was the change in land regulation and a strong increase in its artificialisation. In this regard, see: Department of Transport, Mobility and Urban Agenda. *Agenda Urbana Española. Diagnóstico y Síntesis Territorial*. Madrid, 2019. [https://www.aue.gob.es/recursos\\_aue/02\\_00-doc.\\_diagnostico.pdf](https://www.aue.gob.es/recursos_aue/02_00-doc._diagnostico.pdf); and Olazabal Salgado, Eduardo, and Carme Bellet Sanfeliu. "Procesos de urbanización y artificialización del suelo en las aglomeraciones urbanas españolas (1987-2011)." *Cuadernos geográficos de la Universidad de Granada* 57.2, 2018. <http://dx.doi.org/10.30827/cuadgeo.v57i2.5920>.

<sup>78</sup> Legislative plurality (Spain has 19 different legislators, with their respective legal frameworks for urban planning and development) would have limited the creation of synergies in the distribution of infrastructures and resources, thus affecting the distribution of the population in the territory. In this regard, see: Santiago Rodríguez, Eduardo, and Isabel González García. "El estado del planeamiento urbanístico municipal en España: análisis de los instrumentos vigentes y de los municipios sin planeamiento." *Cuadernos de Investigación Urbanística*, n.º 127, 2019. <https://dialnet.unirioja.es/servlet/articulo?codigo=7349960>; and Department of Development. *Estrategia Española de Sostenibilidad Urbana y Local (EESUL)*. Madrid, Department of Development, 2011. <http://www.fomento.gob.es/NR/rdonlyres/1668CD1E-0B11-4C9E-84E2-E664DD3464C1/111503/EESULWEB2011.pdf>.

<sup>79</sup> Department of Transport, Mobility and Urban Agenda. *Agenda Urbana Española. Diagnóstico y Síntesis Territorial*. Madrid, 2019. [https://www.aue.gob.es/recursos\\_aue/02\\_00-doc.\\_diagnostico.pdf](https://www.aue.gob.es/recursos_aue/02_00-doc._diagnostico.pdf).

<sup>80</sup> Municipalities without a General Plan (18.5% of Spanish municipalities do not have their own urban planning and another 15% only have an Urban Land Delimitation Project (PDSU)) are concentrated in unpopulated Spain. For further details, refer to: Santiago Rodríguez, Eduardo, and Isabel González García. "El estado del planeamiento urbanístico municipal en España: análisis de los instrumentos vigentes y de los municipios sin planeamiento." *Cuadernos de Investigación Urbanística*, n.º 127, 2019. <https://dialnet.unirioja.es/servlet/articulo?codigo=7349960>.

<sup>81</sup> Department of Transport, Mobility and Urban Agenda. *Agenda Urbana Española. Diagnóstico y Síntesis Territorial*. Madrid, 2019. [https://www.aue.gob.es/recursos\\_aue/02\\_00-doc.\\_diagnostico.pdf](https://www.aue.gob.es/recursos_aue/02_00-doc._diagnostico.pdf).

<sup>82</sup> These figures were higher in 2007, when they accounted for 80.6% and 48.6%, respectively. For further details, see: Eurostat. *European Union Statistics on Income and Living Conditions. Distribution of population by tenure status, type of household and income group-- EU-SILC survey [ILC\_LVHO02]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>83</sup> Blanco, Roberto (coord.). "El mercado de la vivienda en España entre 2014 y 2019." *Documentos Ocasionales Banco de España n.º 2013*, 2020. <https://www.bde.es/f/webbde/SES/Secciones/Publicaciones/PublicacionesSerias/DocumentosOcasionales/20/Fich/do2013.pdf>.

<sup>84</sup> Over-indebtedness is defined as spending more than 40% of household income on mortgage payments. See: Eurostat. *Glossary: Housing cost overburden rate*. [https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Housing\\_cost\\_overburden\\_rate](https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Housing_cost_overburden_rate).

<sup>85</sup> Eurostat. *European Union Statistics on Income and Living Conditions*.

*Housing cost overburden rate by tenure status - EU-SILC survey [tessi164]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>86</sup> Blanco, Roberto (coord.). "El mercado de la vivienda en España entre 2014 y 2019." *Documentos Ocasionales Banco de España n.º 2013*, 2020. <https://www.bde.es/f/webbde/SES/Secciones/Publicaciones/PublicacionesSerias/DocumentosOcasionales/20/Fich/do2013.pdf>.

<sup>87</sup> The percentage of loans granted with a LTV (loan-to-dwelling value ratio) of more than 80% was above 15% before the 2008 crisis, and has fallen to 9% in 2019. In this regard, see: Banco de España. *Indicadores del mercado de la vivienda*. Madrid, 2020. [https://www.bde.es/webbde/es/estadis/infoest/si\\_1\\_5.pdf](https://www.bde.es/webbde/es/estadis/infoest/si_1_5.pdf).

<sup>88</sup> At the national level, average annual house price growth in Spain, in the period from 2014 to 2019, was around 5% nominal. The autonomous communities with the highest increases were the Community of Madrid and Catalonia, with 8.4% and 7.1%, respectively. See: INE. *Índice de Precios de Vivienda, 2014-2019*. [https://www.ine.es/prensa/ipv\\_prensa.htm](https://www.ine.es/prensa/ipv_prensa.htm).

<sup>89</sup> Blanco, Roberto (coord.). "El mercado de la vivienda en España entre 2014 y 2019." *Documentos Ocasionales Banco de España n.º 2013*, 2020. <https://www.bde.es/f/webbde/SES/Secciones/Publicaciones/PublicacionesSerias/DocumentosOcasionales/20/Fich/do2013.pdf>.

<sup>90</sup> In fact, a recent study for our country shows the importance of having a savings buffer when deciding between buying and renting a house. While approximately 50% of renters in Spain have a sufficient level of income to buy a home, only 13% of them also have the necessary savings to do so. For further details, refer to: Montoriol-Garriga, Judit. "¿Comprar o alquilar? Una cuestión de ingresos, pero sobre todo de capacidad de ahorro." *Caixabank Research*, 2020. <https://www.caixabankresearch.com/es/analisis-sectorial/inmobiliario/comprar-o-alquilar-cuestion-ingresos-sobre-todo-capacidad-ahorro>.

<sup>91</sup> The same process has also occurred in other European cities in recent years. See: European Commission. *Report on the quality of life in European cities*. Luxembourg: Publications Office of the European Union, 2020. [https://ec.europa.eu/regional\\_policy/sources/docgener/work/qol2020/qol\\_presentation.pdf](https://ec.europa.eu/regional_policy/sources/docgener/work/qol2020/qol_presentation.pdf).

<sup>92</sup> Reduced-price dwellings are those dwellings whose price is voluntarily set by the owner below the market rental price. This figure includes the figure considered as "transfer". The EU-27 figure is a simple average of the EU-27 countries. See: Eurostat. *European Union Statistics on Income and Living Conditions. Distribution of population by tenure status, type of household and income group-- EU-SILC survey [ilc\_lvho02]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>93</sup> International Monetary Fund. *Spain selected issues. IMF Country Report No. 20/299*. Washington: IMF, 2020. <https://www.imf.org/en/Publications/CR/Issues/2020/11/12/Spain-Selected-Issues-49884>.

<sup>94</sup> Department of Transport, Mobility and Urban Agenda. *Sistema Estatal de Índices de precios de Alquiler de Vivienda*. Mitma, 2019. [https://www.mitma.gob.es/recursos\\_mfom/comodin/recursos/2020-07-01\\_sintesis-resultado\\_indice-alquiler.pdf](https://www.mitma.gob.es/recursos_mfom/comodin/recursos/2020-07-01_sintesis-resultado_indice-alquiler.pdf).

<sup>95</sup> It includes all housing subject to some type of public protection (social housing and public housing, among others) and different tenure regimes. However, the figure offered by the Observatorio de Vivienda

y Suelo refers to publicly owned housing, destined for social renting or limited renting, using terminology similar to that used in the context of the European Union. In this regard, see: Department of Transport, Mobility and Urban Agenda. *Observatorio de Vivienda y Suelo. Boletín especial Vivienda Social 2020*. Madrid, 2020. <https://apps.fomento.gob.es/CVP/detallepublicacion.aspx?idpub=BAW072>.

<sup>96</sup> Similarly, Spain's public spending on housing accounts for barely 0.2% of total social spending, while the EU average is 2.6%. See: Bosch, Jordi, and Carme Trilla. "Sistema de vivienda y estado del bienestar. El caso español en el marco europeo." *Observatorio Social de la Caixa*, 2019. <https://observatoriosociallacaixa.org/-/sistema-de-vivienda-y-estado-del-bienestar-el-caso-espanol-en-el-marco-europeo>; Department of Transport, Mobility and Urban Agenda. *Observatorio de Vivienda y Suelo. Boletín especial Vivienda Social 2020*. Madrid, 2020. <https://apps.fomento.gob.es/CVP/detallepublicacion.aspx?idpub=BAW072>.

<sup>97</sup> Percentage of population living in households where expenditure on housing represents at least 40% of total household disposable income. According to Eurostat, reduced or free rent would include: rent from social housing; reduced rent from an employer; rent set by law; and accommodation provided free of charge (the latter does not involve the payment of rent as it is part of employment remuneration or provided by a private source, among other options). Data for the EU-27 and EU-8 are simple averages of the individual countries. For further details, refer to: Eurostat. *European Union Statistics on Income and Living Conditions. Housing cost overburden rate by tenure status. EU-SILC survey [ilc\_lvho07c]*. <https://ec.europa.eu/eurostat/data/database>; Eurostat. *Methodological guidelines and description of EU-SILC target variables. 2017*. <https://ec.europa.eu/eurostat/documents/1012329/8658951/Household+data+-+housing.pdf/6c5216f2-b40b-49d6-a0aa-9c2c4bb32348>.

<sup>98</sup> The delay in the age of leaving the nest would be mainly determined by economic and employment-related issues and job insecurity. However, factors such as the lengthening of the formative stage or others of a cultural nature may also be playing a key role. For further details, refer to: Ballesteros, Juan Carlos, and Anna Sanmartín. "Emancipación en tiempos de crisis." *Revista de Estudios de Juventud*, n.º 116, 2017. [http://www.injuve.es/sites/default/files/2018/06/publicaciones/revista116\\_documentos10.pdf](http://www.injuve.es/sites/default/files/2018/06/publicaciones/revista116_documentos10.pdf).

<sup>99</sup> Both weighted and simple average of the EU-27 See: Eurostat. *European Union Statistics on Income and Living Conditions. Share of young adults aged 18-34 living with their parents by age and sex -EU-SILC survey [ilc\_lvps08]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>100</sup> The first data in the series for Spain is 2004. See: *Ibid*.

<sup>101</sup> Gentile, Alessandro. "Emancipación juvenil en tiempos de crisis: Un diagnóstico para impulsar la inserción laboral y la transición residencial." *Fundación Alternativas*, 2013. [https://www.fundacionalternativas.org/public/storage/estudios\\_documentos\\_archivos/1770908f646999961c5b8bf208fdbbb0.pdf](https://www.fundacionalternativas.org/public/storage/estudios_documentos_archivos/1770908f646999961c5b8bf208fdbbb0.pdf).

<sup>102</sup> Persons whose income is below 60% of the equivalent annual median income of the country.

<sup>103</sup> In the case of the Spanish population as a whole, the percentages of overcrowding and severe housing deprivation are reduced to 6% and 2%, respectively. Refer to: Eurostat. *European Union Statistics on Income and Living Conditions. Overcrowding rate by age, sex and poverty*

*status-EU-SILC survey [tessi172]*. <https://ec.europa.eu/eurostat/data/database>; Eurostat. *European Union Statistics on Income and Living Conditions. Severe housing deprivation rate by age, sex and poverty status- EU-SILC survey [lc\_mdho06a]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>104</sup> Ubrich, Thomas. *Cuando la casa nos enferma: la vivienda como cuestión de salud pública*. Madrid: Provivienda, 2018. <https://www.provivienda.org/wp-content/uploads/INFORME-CUANDO-LA-CASA-NOS-ENFERMA-1.pdf>.

<sup>105</sup> The European Observatory on Fuel Poverty identifies as proofs of fuel poverty the inability to maintain an adequate temperature in the home, late payment of bills, excessively low energy expenditure or expenditure on energy supplies that is disproportionate to the level of income. For further details, see: Department for Ecological Transition and Demographic Challenge *Actualización de indicadores de la Estrategia Nacional contra la Pobreza Energética*. Madrid, 2020. [https://www.miteco.gob.es/es/prensa/20201106\\_actualizaciondeindicadores2020\\_final\\_\\_tcm30-516466.pdf](https://www.miteco.gob.es/es/prensa/20201106_actualizaciondeindicadores2020_final__tcm30-516466.pdf).

<sup>106</sup> Fuel poverty particularly affects female-headed single-parent households and households of people over 65 years of age, also more markedly among women. In this regard, see: Tirado Herrero, Sergio, *et al.* *Pobreza energética en España. Hacia un sistema de indicadores y una estrategia de actuación estatales*. Madrid: Asociación de Ciencias Ambientales, 2018. <https://niunhogarsinenergia.org/panel/uploads/documentos/informe%20pobreza%20energ%C3%A9tica%202018.pdf>.

<sup>107</sup> Data for 2019. Percentage of households whose energy expenditure over income is more than twice the national median. In 2015, the latest year for which a European comparison is available, the proportion of households suffering from energy bill overburdening was slightly lower in Spain (14.1%) than in the EU-27 (16.2%) and the EU-8 (18%). For further details, see: Department for Ecological Transition and Demographic Challenge *Actualización de indicadores de la Estrategia Nacional contra la Pobreza Energética*. Madrid, 2020. [https://www.miteco.gob.es/es/prensa/20201106\\_actualizaciondeindicadores2020\\_final\\_\\_tcm30-516466.pdf](https://www.miteco.gob.es/es/prensa/20201106_actualizaciondeindicadores2020_final__tcm30-516466.pdf); and EU Energy Poverty Observatory. *High share of energy expenditure in income (2M)*. <https://www.energy-poverty.eu/indicador?primaryId=1460&type=bar&from=2015&to=2015&countries=EU,AT,BE,BG,CH,CY,CZ,DE,DK,EE,EL,ES,FI,FR,HU,HR,IE,IS,IT,LT,LU,LV,MT,NL,NO,PL,PT,RO,RS,SE,SI,SK,UK&disaggregation=none>.

<sup>108</sup> Data for 2019. Data for the EU-27 and EU-8 are simple averages of the individual countries. In this regard, refer to: Eurostat. *Inability to keep home adequately warm - EU-SILC survey [ILC\_MDES01]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>109</sup> These architectural barriers to accessibility mean that 100,000 people can never leave their homes due to mobility problems. For further details see: INE. *Censo de Población y Viviendas 2011*. [https://www.ine.es/censos2011\\_datos/cen11\\_datos\\_resultados.htm#](https://www.ine.es/censos2011_datos/cen11_datos_resultados.htm#); Fundación Mutua de Propietarios. *Nuevo estudio sobre La accesibilidad de la nueva vivienda en España*. Fundación Mutua de Propietarios, 2020. <https://www.fundacionmdp.org/notice/nuevo-estudio-sobre-la-accesibilidad-de-la-nueva-vivenda-en-espana/>; and Nasarre-Aznar, Sergio, and Héctor Simón-Moreno. "Housing not for all: The lack of universal accessibility to housing in multi-unit buildings in Spain,

Sweden and Germany." *Journal of Property, Planning and Environmental Law* 12, 2019. <https://doi.org/10.1108/JPPPEL-05-2019-0028>.

<sup>110</sup> The solution will require rethinking the current technical and regulatory impediments (minimum building requirements for the installation of lifts, those relating to heritage protection or other urban planning and technical feasibility limitations). In this regard, see: Lebrusán, Irene. *La vivienda en la vejez. Problemas y estrategias para envejecer en sociedad*. Madrid: Politeya: estudios de política y sociedad, Consejo Superior de Investigaciones Científicas, 2019.

<sup>111</sup> Department of Transport, Mobility and Urban Agenda. *Agenda Urbana Española*. Madrid, 2019. [www.aue.gob.es](http://www.aue.gob.es); and Monzón, Andrés, et al. "Observatorio de la Movilidad Metropolitana. Informe OMM-2017." *Centro de Investigación del Transporte Universidad Politécnica de Madrid*, 2019. [http://www.observatoriomovilidad.es/images/stories/05\\_informes/Informe\\_OMM2017\\_web.pdf](http://www.observatoriomovilidad.es/images/stories/05_informes/Informe_OMM2017_web.pdf).

<sup>112</sup> In 2018, the average age of the Spanish vehicle fleet stood at 12.4 years. In France, Germany, Austria, United Kingdom, Ireland and Norway, the average age of the fleet is around 9 years. Vehicles older than 10 years account for almost 40% of energy consumption and transport emissions in Spain. For further details, see: Asociación Española de Fabricantes de Automóviles y Camiones. *Informe Anual 2018. Adelantando el futuro*. Asociación Española de Fabricantes de Automóviles y Camiones, 2018. <https://anfac.com/wp-content/uploads/2019/07/Informe-Anual-ANFAC-2018-ESP.pdf>; y Economics for Energy. *Estrategias para la descarbonización del transporte terrestre en España. Un análisis de escenarios*. Vigo, 2021. [https://eforenergy.org/docpublicaciones/informes/informe\\_transporte.pdf](https://eforenergy.org/docpublicaciones/informes/informe_transporte.pdf).

<sup>113</sup> Instituto por la Diversificación y Ahorro de la Energía. *La Movilidad al Trabajo: Un Reto Pendiente*. Dirección General de Tráfico, Instituto para la Diversificación y Ahorro de Energía, 2019. [https://www.idae.es/sites/default/files/la\\_movilidad\\_al\\_trabajo\\_un\\_reto\\_pendiente\\_dgt\\_idae\\_junio\\_2019.pdf](https://www.idae.es/sites/default/files/la_movilidad_al_trabajo_un_reto_pendiente_dgt_idae_junio_2019.pdf).

<sup>114</sup> Almost all municipalities with over 50,000 inhabitants have a public and non-motorised mobility plan. See: Department of Transport, Mobility and Urban Agenda. *Agenda Urbana Española*. Madrid, 2019. [www.aue.gob.es](http://www.aue.gob.es).

<sup>115</sup> Ecologistas en Acción. *Zonas de Bajas Emisiones, herramienta contra la contaminación y el calentamiento del planeta*. 2019. <https://www.ecologistasenaccion.org/wp-content/uploads/2020/06/informe-calidad-aire-2019.pdf>.

<sup>116</sup> Ecologistas en Acción. *La calidad del aire en el Estado español durante 2019*. 2020. <https://www.ecologistasenaccion.org/wp-content/uploads/2019/06/informe-calidad-aire-2018.pdf>.

<sup>117</sup> European Environment Agency. *Spain noise fact sheet 2019*. European Environment Information and Observation Network, 2020. <https://www.eea.europa.eu/themes/human/noise/noise-fact-sheets/noise-country-fact-sheets-2019/spain>.

<sup>118</sup> Hortas-Rico, Miriam, and Albert Sollé-Ollé. "Does Urban Sprawl Increase the Costs of Providing Local Public Services? Evidence from Spanish Municipalities." *Urban studies* 47, n.º7, 2010. <https://doi.org/10.1177/0042098009353620>; and OECD. *Rethinking Urban Sprawl: Moving Towards Sustainable Cities. Policy highlights*. Paris: OECD Publishing, 2018. <https://www.oecd.org/environment/tools-evaluation/>

[Policy-Highlights-Rethinking-Urban-Sprawl.pdf](#).

<sup>119</sup> Eurostat. *People at risk of poverty or social exclusion by degree of urbanization [ilc\_peps13]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>120</sup> The EU-27 is calculated as the simple average of its individual countries. See: Eurostat. *People at risk of poverty or social exclusion by age and sex [ilc\_peps13]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>121</sup> Hernández Aja, Agustín, et al. *Barrios vulnerables de las grandes ciudades españolas. 1991/ 2001/ 2011*. Madrid: Instituto Juan de Herrera, 2018. <http://oa.upm.es/51015/>.

<sup>122</sup> United Nations. "Siendo un país rico, España vive en la pobreza generalizada, asegura experto de la ONU." United Nations., <https://news.un.org/es/story/2020/02/1469232>.

<sup>123</sup> In Spain, income inequality among the population in densely populated areas reaches a ratio of 6.4, compared to 4.9 in rural areas. For further details, refer to: Andreotti, Alberta, David Benassi, and Yuri Kazepov. "The spatial dimension of poverty." In Alberto Andreotti, David Benassi, and Yuri Kazepov (eds.). *Western Capitalism in Transition: Global processes, local challenges*. Manchester: Manchester University Press, 2018. 239-55. <https://doi.org/10.7765/9781526122407.00009>; and INE. *Encuesta de Condiciones de Vida, Desigualdad (S80/S20) según sexo, edad, nivel de educación, nacionalidad y grado de urbanización*. [https://www.ine.es/ss/Satellite?L=es\\_ES&c=INESeccion\\_C&cid=1259944509412&p=1254735110672&pagename=ProductosYServicios%2FPYSLayoy&param1=PYSDetalleFichaIndicador&param3=1259937499084](https://www.ine.es/ss/Satellite?L=es_ES&c=INESeccion_C&cid=1259944509412&p=1254735110672&pagename=ProductosYServicios%2FPYSLayoy&param1=PYSDetalleFichaIndicador&param3=1259937499084).

<sup>124</sup> Musterd, Sako, et al. "Socioeconomic segregation in European capital cities. Increasing separation between poor and rich." *Urban Geography* 38, n.º 7, 2017. <https://doi.org/10.1080/02723638.2016.1228371>.

<sup>125</sup> Leal, Jesús. "Segregación social y mercados de vivienda en las grandes ciudades." *Revista Española de Sociología*, n.º 2, 2008. <https://recyt.fecyt.es/index.php/res/article/view/64866>.

<sup>126</sup> Gentrification involves the replacement of the users of a neighbourhood by those of a higher socio-economic status. It is often accompanied by heavy investment in housing and the environment. For further details, refer to: Clark, Erik. "The order and simplicity of gentrification: a political challenge." *Lund University Publications*, 2015. <https://lup.lub.lu.se/search/publication/620935>.

<sup>127</sup> Touristification refers to the impact of overcrowded tourism in the commercial and social system of certain neighbourhoods or cities. For further details, refer to: Fundéu. <https://www.fundeu.es/recomendacion/turistificacion-neologismo-valido/>.

<sup>128</sup> Fresnillo, Iolanda. "La Transformación del Comercio de Proximidad en los Barrios." *UAB: Gentrificació i Dret a la ciutat*, 2018. [https://ddd.uab.cat/pub/prmb/prmb\\_a2018m6n60/prmb\\_a2018m6n60p27iSPA.pdf](https://ddd.uab.cat/pub/prmb/prmb_a2018m6n60/prmb_a2018m6n60p27iSPA.pdf).

<sup>129</sup> Social segregation in urban areas tends to be greater where inequality is also greater. To the extent that inequality constrains a country's long-term economic growth, reducing urban segregation is a key factor in improving future economic and social development. Refer to: Musterd, Sako, et al. "Socioeconomic segregation in European capital cities. Increasing separation between poor and rich." *Urban Geography* 38,

n.º 7, 2017. <https://doi.org/10.1080/02723638.2016.1228371>; and OECD. *In it together: Why less inequality benefits all*. Paris: OECD Publishing, 2015. <https://doi.org/10.1787/9789264235120-en>.

<sup>130</sup> On this question, see: Duhau, Emilio. “División social del espacio metropolitano y movilidad residencial.” *Papeles de Población*, 36, 2003. [http://www.scielo.org.mx/scielo.php?pid=S1405-74252003000200008&script=sci\\_arttext](http://www.scielo.org.mx/scielo.php?pid=S1405-74252003000200008&script=sci_arttext); y Vandecasteele Ine, *et al.* *The Future of Cities – Opportunities, challenges and the way forward*. Luxembourg: Publications Office of the European Union, 2019. <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/future-cities>.

<sup>131</sup> European Commission. “Los efectos de la segregación socioeconómica sobre las ciudades europeas.” *CORDIS, Resultados de investigaciones de la UE*, 2017. <https://cordis.europa.eu/article/id/174939-the-effect-of-socioeconomic-segregation-on-european-cities/es>.

<sup>132</sup> Collantes, Fernando, and Vicente Pinilla. *¿Lugares que no importan? La despoblación de la España rural desde 1900 hasta el presente*. Zaragoza: Sociedad Española de Historia Agraria, 2019. <https://puz.unizar.es/2156-lugares-que-no-importan-la-despoblacion-de-la-espana-rural-desde-1900-hasta-el-presente.html>.

<sup>133</sup> Economic and Social Council. *El medio rural y su vertebración social y territorial*. Madrid: CES colección informes, n.º 1, 2018. <http://www.ces.es/documents/10180/5182488/Inf0118.pdf/6d616668-0cb8-f58c-075b-2251f05dad9f>.

<sup>134</sup> For further details, see, among others: de la Roca, Jorge, and Diego Puga. “Learning by working in big cities.” *Review of Economic Studies* 84, 2017. [https://diegopuga.org/papers/DeLaRoca\\_Puga\\_REStud\\_2017.pdf](https://diegopuga.org/papers/DeLaRoca_Puga_REStud_2017.pdf); and Gutiérrez Posada, Diana, and Fernando Rubiera Morollón. “Prima salarial urbana en España y su evolución durante la crisis: un análisis descriptivo.” *Papeles de Economía Española* 153. 2017. <http://www.presidencia.gva.es/documents/166658342/166725114/Ejemplar+153/433dd6ec-1a3f-464f-9894-7c2b39c882ef>.

<sup>135</sup> On this question, see, among others: Camarero, Luis, and Jesús Oliva. “Thinking in rural gap: mobility and social inequalities.” *Palgrave Communications*, n.º 95, 2019. <https://www.nature.com/articles/s41599-019-0306-x>; and Kompil, M. *et al.* “Mapping accessibility to generic services in Europe: A market-potential based approach.” *Sustainable Cities and Society* 47, 2019. <https://doi.org/10.1016/j.scs.2018.11.047>.

<sup>136</sup> Sáez Pérez, Luis Antonio, María-Isabel Ayuda, and Vicente Pinilla. “Pasividad autonómica y activismo local frente a la despoblación en España: el caso de Aragón analizado desde la Economía Política.” *Ager. Revista de estudios sobre despoblación y desarrollo rural*, n.º 21, 2016. [http://ruralager.org/wp-content/uploads/Ager-21\\_1\\_10\\_4422\\_ager\\_2016\\_04.pdf](http://ruralager.org/wp-content/uploads/Ager-21_1_10_4422_ager_2016_04.pdf).

<sup>137</sup> Land transactions for agricultural or livestock use are rare; only 0.25% of the total land area changes hands annually. This low mobility of ownership, coupled with high market prices, limits access to land and responds to various economic, legal and cultural factors. On this issue, see: Grupo Focal de Acceso a la Tierra. *Estudio sobre el acceso a la tierra*. Madrid: Department of Agriculture, Fisheries and Food, 2021. [https://www.mapa.gob.es/es/desarrollo-rural/temas/jovenes-rurales/grupo\\_focal\\_digital\\_\\_tcm30-555421.pdf](https://www.mapa.gob.es/es/desarrollo-rural/temas/jovenes-rurales/grupo_focal_digital__tcm30-555421.pdf).

<sup>138</sup> On this question, see, among others: Afán de Ribera Ibarra, Miguel. “Análisis teórico. Consecuencias ambientales de la despoblación rural II.” CONAMA, 2006. <https://www.age-geografia.es/site/wp-content/uploads/2017/10/Consecuencias-ambientales-de-la-despoblaci%C3%B3n-rural-Ponencia-de-Miguel-Af%C3%A1n.pdf>; Greenpeace Spain. *Proteger el medio rural es protegernos del fuego*. Greenpeace, 2020. <https://storage.googleapis.com/gpes-static/protege-el-bosque/PROTEGE-EL-BOSQUE-v5.pdf>; and WWF. *Fuego a las puertas: Cómo los incendios afectan cada vez más a la población en España*. Madrid: WWF/Adena, 2017. [http://awsassets.wwf.es/downloads/Fuego\\_a\\_las\\_puertas\\_20171.pdf?\\_ga=2.227547101.1154487364.1534832701-308208004.1534832701](http://awsassets.wwf.es/downloads/Fuego_a_las_puertas_20171.pdf?_ga=2.227547101.1154487364.1534832701-308208004.1534832701).

<sup>139</sup> Fundación BBVA and Ivie. “Despoblación de las provincias españolas”. *Esenciales* n.º 37, 2019. [https://www.fbbva.es/wp-content/uploads/2019/07/FBBVA\\_Esenciales\\_37\\_Despoblacion.pdf](https://www.fbbva.es/wp-content/uploads/2019/07/FBBVA_Esenciales_37_Despoblacion.pdf).

<sup>140</sup> In this regard, see: Lull Peñalba, Josué. “Evolución del concepto y de la significación social del patrimonio cultural.” *Arte, Individuo y Sociedad* 17, 2005. <https://revistas.ucm.es/index.php/ARIS/article/view/ARIS0505110177A>; Moreno Arriba, Jesús. “Despoblación rural y tradiciones populares: los ramos cantados en Valdebeccas (Ávila, España).” *Opción* 31. 2015. <https://www.redalyc.org/pdf/310/31043005027.pdf>; and UNESCO. *Convention for the safeguarding of the intangible cultural heritage*. Paris, 2003. <https://unesdoc.unesco.org/ark:/48223/pf0000132540>.

<sup>141</sup> On this question, see, among others: Marí-Dell’Olmo, Marc *et al.* “Socioeconomic Inequalities in COVID-19 in a European Urban Area: Two Waves, Two Patterns”. *International Journal of Environmental Research and Public Health* 18, 2021. <https://doi.org/10.3390/ijerph18031256>; and Ruiz Azarola, Ainhoa, *et al.* “Repercusiones del coronavirus en poblaciones en situación de vulnerabilidad social: personas migrantes y minorías étnicas.” *Escuela Andaluza de Salud Pública*, 2020. <https://www.easp.es/web/coronavirusysaludpublica/repercusiones-del-coronavirus-en-poblaciones-en-situacion-de-vulnerabilidad-social-personas-migrantes-y-minorias-etnicas/>.

<sup>142</sup> UN Habitat. *Cities and Pandemics: Towards a More Just, Green and Healthy Future*. Kenia: United Nations Human Settlements Programme, 2021. [https://unhabitat.org/sites/default/files/2021/03/cities\\_and\\_pandemics-towards\\_a\\_more\\_just\\_green\\_and\\_healthy\\_future\\_un-habitat\\_2021.pdf](https://unhabitat.org/sites/default/files/2021/03/cities_and_pandemics-towards_a_more_just_green_and_healthy_future_un-habitat_2021.pdf).

<sup>143</sup> Subdirección General de Aire Limpio y Sostenibilidad Industrial. *Informe de indicadores de calidad del aire durante el estado de alarma debido al COVID-19*. Madrid: Department for Ecological Transition and Demographic Challenge, 2020. [https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/atmosfera-y-calidad-del-aire/indicadores\\_covid\\_tcm30-510603.pdf](https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/atmosfera-y-calidad-del-aire/indicadores_covid_tcm30-510603.pdf).

<sup>144</sup> In this chapter, the INE’s demographic projections are considered as they provide a provincial level breakdown and forecasts for the evolution of the number of households (see methodological note). Si bien los datos pronosticados de población total para el rango de años entre 2021 y 2050 difiere de la ofrecida por Eurostat en su escenario base, la población proyectada para 2050 y el ritmo de crecimiento respecto a 2021 son relativamente similares. For further details, see: INE. *Proyecciones de población de España. Serie 2020 - 2070*. <https://www.ine.es/dynt3/inebase/index.htm?padre=6671&capsel=6672>.

<sup>145</sup> In 2035, the over-65s will account for 26.5% of the population compared to the loss in other age groups: the under-15s will be 1.5 million fewer than in 2020 (a 20.5% loss), and there will be 2.7 million fewer people (almost 20%) aged 30-49 by the same period. For further details see: INE. *Proyecciones de población de España. Serie 2020 - 2070*. <https://www.ine.es/dynt3/inebase/index.htm?padre=6671&capsel=6672>.

<sup>146</sup> INE. *Proyecciones de población de España. Serie 2020 - 2070*. <https://www.ine.es/dynt3/inebase/index.htm?padre=6671&capsel=6672>.

<sup>147</sup> Latest year for which projections disaggregated by Autonomous Community are available.

<sup>148</sup> The largest relative losses will be in Asturias (-10.0%), Castille and León (-10.0%) and Extremadura (-8.3%). Respecto a la pérdida total de población del país, Castilla y León y Galicia acumularán el 31,5% y el 23,5%, respectivamente. For further details, see: INE. *Proyecciones de población de España. Serie 2020 - 2035*. <https://www.ine.es/dynt3/inebase/index.htm?padre=6671&capsel=6672>.

<sup>149</sup> Among the communities that will register a positive balance, the Community of Madrid and Catalonia will account for more than 60% of total population growth until 2035. For further details, see: INE. *Proyecciones de población de España. Serie 2020 - 2035*. <https://www.ine.es/dynt3/inebase/index.htm?padre=6671&capsel=6672>.

<sup>150</sup> The Canary Islands, the Balearic Islands, Catalonia and the Community of Madrid will have a higher migration balance abroad (projections per thousand inhabitants) than the rest of the communities, and the Balearic Islands will register the highest inter-Autonomous Community migration balance. For further details, see: INE. *Nota de prensa: Proyecciones de Población 2020-2070*, 2020. [https://www.ine.es/prensa/pp\\_2020\\_2070.pdf](https://www.ine.es/prensa/pp_2020_2070.pdf).

<sup>151</sup> INE. *Proyecciones de población de España. Serie 2020 - 2035*. <https://www.ine.es/dynt3/inebase/index.htm?padre=6671&capsel=6672>.

<sup>152</sup> Comisionado del Gobierno frente al Reto Demográfico. *Diagnóstico estrategia nacional frente al reto demográfico. Eje despoblación*. Department of Territorial Policy and Public Function, 2020. [https://www.mptfp.gob.es/dam/es/portal/reto\\_demografico/Indicadores\\_cartografia/Diagnostico\\_Despoblacion.pdf.pdf](https://www.mptfp.gob.es/dam/es/portal/reto_demografico/Indicadores_cartografia/Diagnostico_Despoblacion.pdf.pdf).

<sup>153</sup> United Nations. *World Urbanization Prospects 2018. Percentage of population in urban and rural areas*. <https://population.un.org/wup/Country-Profiles/>.

<sup>154</sup> The EU-27 is calculated as the simple average of its individual countries. In this regard: United Nations. *World Urbanization Prospects 2018. Percentage of population in urban and rural areas*. <https://population.un.org/wup/Country-Profiles/>.

<sup>155</sup> The municipality of Madrid, with nearly 7 million inhabitants, could potentially absorb nearby cities such as Guadalajara or Toledo.

<sup>156</sup> Vandecasteele Ine, et al. *The Future of Cities – Opportunities, challenges and the way forward*. Luxembourg: Publications Office of the European Union, 2019. <https://ec.europa.eu/jrc/en/publication/euro-scientific-and-technical-research-reports/future-cities>.

<sup>157</sup> These processes will also be influenced by a continuity in the relocation of companies to municipalities with sufficient land available and lower prices. For further details, refer to: United Nations. *Urban*

*Agglomerations, 1950-2035*. WUP2018-F15-Percentage\_Urban\_in\_Cities. <https://population.un.org/wup/Download/>.

<sup>158</sup> On this question, see, among others: Ganau, Joan, and Joan Vilagrassa. "Ciudades medias en España: posición en la red urbana y procesos urbanos recientes." *Colección Mediterráneo Económico: "Ciudades, Arquitectura y Espacio Urbano"*, n.º 3, 2020. <https://www.publicacionescajamar.es/publicacionescajamar/public/pdf/publicaciones-periodicas/mediterraneo-economico/3/3-20.pdf>; y Pasciaroni, Carolina. "Ciudades medias: Aproximación Metodológica, Funcionalidades y Estructura Productiva." *Revista de Ciencias Económicas*, 30, 2012. <https://dialnet.unirioja.es/servlet/articulo?codigo=4040664>.

<sup>159</sup> United Nations. *World Urbanization Prospects 2018. Percentage of population in urban and rural areas. Annual Urban Population at Mid-Year by Region, Subregion, Country and Area, 1950-2050 (thousands); and Annual Rural Population at Mid-Year by Region, Subregion, Country and Area, 1950-2050 (thousands)*. <https://population.un.org/wup/Country-Profiles/>.

<sup>160</sup> Their classification as rural could even change if they exceed 10,000 inhabitants, the threshold above which it would be considered an urban nucleus.

<sup>161</sup> In this respect, there could be a differentiated behaviour among the 23 provinces that make up depopulated Spain, according to the current trends verified by Bandrés and Azón: a group of provinces characterised by depopulation, ageing above the national average and a rate of economic growth below the country's average ("Depopulated Spain that is decreasing": Ávila, Cuenca, León, Zamora, Salamanca, Lugo, Ourense, Segovia, Palencia, Soria and Teruel); a second group made up of provinces with a younger demographic pyramid, with considerable importance of agriculture and reduced industrial weight, high unemployment rates and per capita income well below the Spanish average ("Depopulated Spain that is stagnating": Albacete, Ciudad Real, Badajoz, Cáceres, Córdoba and Jaén); and a final group of provinces with a high share of industry, low unemployment rates and acceptable economic growth, thanks to the presence of dynamic capitals that have a positive influence on the demographic recovery of the surrounding area ("Depopulated Spain that is going up again": Guadalajara, Burgos, Huesca, La Rioja, Valladolid y Zaragoza). In this regard, see: Bandrés, Eduardo, and Azón, Vanessa. *La despoblación de la España interior*. Madrid: Funcas, 2020. <https://www.funcas.es/publicaciones/documentos-de-trabajo-y-notas-tecnicas/>; and Collantes, Fernando, and Vicente Pinilla. *¿Lugares que no importan? La despoblación de la España rural desde 1900 hasta el presente*. Zaragoza: Sociedad Española de Historia Agraria, 2019. <https://puz.unizar.es/2156-lugares-que-no-importan-la-despoblacion-de-la-espana-rural-desde-1900-hasta-el-presente.html>.

<sup>162</sup> The existence of permanent rain-fed crops in areas with difficult topography helps to prevent erosion, maintain the landscape and biodiversity. It is therefore necessary to maintain these crops and promote conservation agriculture in order to prevent fires and the loss of vegetation cover, as well as the degradation of landscapes and the destruction of agricultural environments. For further details, refer to: Afán de Ribera Ibarra, Miguel. "Análisis teórico. Consecuencias ambientales de la despoblación rural II." CONAMA, 2006. <https://www.age-geografia.es/site/wp-content/uploads/2017/10/Consecuencias-ambientales-de-la-despoblaci%C3%B3n-rural-Ponencia-de-Miguel>

Af%C3%A1n.pdf.

<sup>163</sup> On this question, see, among others: Beard, John., and Charles Petitot. "Ageing and Urbanization: Can cities be designed to foster Active Ageing?" *Public Health Reviews* 32, n.º 2, 2010. <https://doi.org/10.1007/BF03391610>; WHO. *La Red Mundial de Ciudades y Comunidades Adaptadas a las Personas Mayores: Revisar el último decenio y mirar con optimismo hacia el siguiente*. Geneva: World Health Organisation, 2018. <https://apps.who.int/iris/bitstream/handle/10665/278981/WHO-FWC-ALC-18.4-spa.pdf?ua=1>; and Vandecasteele Ine, et al. *The Future of Cities – Opportunities, challenges and the way forward*. Luxembourg: Publications Office of the European Union, 2019. <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/future-cities>.

<sup>164</sup> Olazabal, Marta, and María Ruiz de Gopegui. "¿Para qué impactos climáticos se preparan las ciudades españolas?". *Economiaz* n.º 97, 2020. <https://dialnet.unirioja.es/servlet/articulo?codigo=7536543>.

<sup>165</sup> They are estimated to be directly responsible for 21% of total greenhouse gas emissions and for almost 70% when the production of all the goods and services they produce is incorporated. For further details, refer to: Deloitte Monitor. *Ciudades energéticamente sostenibles: la transición energética urbana a 2030*. Deloitte, 2019. <https://perspectivas.deloitte.com/hubs/Deloitte/Campaigns/Descarbonizaci%C3%B3n/Descarbonizacion-2019/Deloitte-ES-ciudades-energeticamente-sostenibles.pdf?hsCtaTracking=1ea0cfbe-140c-4eaf-932c-5bd030c89f82%7C3af97a08-eed1-4758-af17-155e9c47304a>.

<sup>166</sup> On this question, see, among others: PWC Spain. *Bots, Machine Learning, Servicios Cognitivos. Realidad y perspectivas de la Inteligencia Artificial en España*. PWC Publications, 2018. <https://www.pwc.es/es/publicaciones/tecnologia/assets/pwc-ia-en-espana-2018.pdf>; and Vandecasteele Ine, et al. *The Future of Cities – Opportunities, challenges and the way forward*. Luxembourg: Publications Office of the European Union, 2019. <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/future-cities>.

<sup>167</sup> Innovation districts have an innovation intensity of 30% or higher, geographically concentrated in urban areas, and produce 3.5 times more innovation per employee and 20 times more wealth per capita than the national average, further demonstrating the capacity of these actions to attract talent and generate stable, quality employment. The most successful worldwide such as *Kendall Square*, the *Microsoft Software Cluster* in Redmond, *North Carolina Research Triangle Park*, or the *Pittsburgh Innovation District* have reached 70-90% innovation intensity. On this question, see, among others: Burke, Jeremy, and Ramón Gras. *Atlas of Innovation Districts*. ARETIAN Urban Analytics and Design, 2019. <https://www.aretian.com/atlas>; Burke, Jeremy, and Ramón Gras. "Hacia una nueva ciencia para entender y diseñar mejor las ciudades." *MIT Technology Review*, 2019. <https://www.technologyreview.es/s/11355/hacia-una-nueva-ciencia-para-entender-y-disenar-mejor-las-ciudades>; and Florida, Richard. "Maps Reveal Where the Creative Class Is Growing." *Bloomberg CityLab*, 2019. <https://www.bloomberg.com/news/articles/2019-04-18/small-city-tech-hubs-gain-on-silicon-valley>. In Spain, the experience of Barcelona, with the creation of 22@ in Poblenou, is worth mentioning. As Burke and Gras (2019) point out, between 2004 and 2019, the neighbourhood grew from 36,000 employees to 90,000, 60% of whom worked in knowledge-intensive activities. On this question, see: Burke, Jeremy, and Ramón Gras.

*Innovation districts and industrial clusters in the Barcelona metropolitan region*. ARETIAN Urban Analytics and Design, 2019. [https://pemb.cat/public/docs/102\\_iw\\_barcelona\\_metropolitan\\_region\\_\\_final\\_report.pdf](https://pemb.cat/public/docs/102_iw_barcelona_metropolitan_region__final_report.pdf).

<sup>168</sup> This has already happened in the US. . Strengthening synergies among companies, universities and related research centres will be key to the success of these districts. See: Florida, Richard. "Maps Reveal Where the Creative Class Is Growing." *Bloomberg CityLab*, 2019. <https://www.bloomberg.com/news/articles/2019-04-18/small-city-tech-hubs-gain-on-silicon-valley>.

<sup>169</sup> As the European Commission points out, a smart city is a place where traditional networks and services are made more efficient through the use of digital and telecommunications technologies for the benefit of its inhabitants and businesses. For further details, refer to: European Commission. "Smart Cities." [https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities\\_en](https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en).

<sup>170</sup> Mashariki, Amen Ra, and Nicolas Diaz. *The Analytics Playbook for Cities. A Navigational Tool for Understanding Data Analytics in Local Government, Confronting Trade-Offs, and Implementing Effectively*. Ash Center for Democratic Governance and Innovation, 2020. <https://datasmart.ash.harvard.edu/news/article/analytics-playbook-cities-0>.

<sup>171</sup> On this question, see, among others: McKinsey Global Institute. *Smart cities: digital solutions for a more livable future*. McKinsey&Company, 2018. <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/smart-cities-digital-solutions-for-a-more-livable-future>; and World Economic Forum. *Industrial Internet of Things Unleashing the Potential of Connected Products and Services*, 2015. <http://reports.weforum.org/industrial-internet-of-things/>.

<sup>172</sup> This could lead, among other things, to the emergence of new administrative entities, broader and more functional than the current municipal demarcations, defined by productive activity or ecological processes, such as functional urban areas or bio-regions. On this question, see, among others: Alonso Morán, Nerea. "Planificar la biorregión, hacia un modelo enraizado en el territorio." In Prats, Fernando, Yayo Herrero, and Alicia Torrego (coords.). *La gran encrucijada: sobre la crisis ecosocial y el cambio de ciclo histórico*. Madrid: Libros en Acción, 2017. 257-265. [https://www.fuhem.es/Landing\\_LaGranEncrucijada/lan\\_LaGranEncrucijada.html](https://www.fuhem.es/Landing_LaGranEncrucijada/lan_LaGranEncrucijada.html); Eurostat. "Functional urban area." *Eurostat. Statistics Explained*, [https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Functional\\_urban\\_area](https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Functional_urban_area); and Monnet, Jérôme. "La urbanización contemporánea: los desafíos de un mundo fluido y difuso." *Papeles de relaciones ecosociales y cambio global*, 106, 2009. [https://www.fuhem.es/papeles\\_articulo/la-urbanizacion-contemporanea-los-desafios-de-un-mundo-fluido-y-difuso/](https://www.fuhem.es/papeles_articulo/la-urbanizacion-contemporanea-los-desafios-de-un-mundo-fluido-y-difuso/).

<sup>173</sup> This has implications for the availability of public space, urban health and quality of life. For further details see: Nieuwenhuijsen, Mark J., and Haneen Khreis. "Car free cities: Pathway to healthy urban living." *Environment International*, 94, 2016. <https://doi.org/10.1016/j.envint.2016.05.032>.

<sup>174</sup> Hudomiet, Péter, et al. "How can we spot future areas of gentrification?" *World Economic Forum*. <https://www.weforum.org/agenda/2019/02/gentrification-and-businesses/>.

<sup>175</sup> Mansilla López, José A. "Vecinos en peligro de extinción. Turismo urbano, movimientos sociales y exclusión socioespacial en



Barcelona." *Revista de Turismo y Patrimonio Cultural*, 2018. <https://doi.org/10.25145/j.pasos.2018.16.020>.

<sup>176</sup> En el periodo 2013-2019, la formación neta de hogares fue de alrededor de 68.000 al año. For further details, refer to: INE. *Encuesta continua de hogares. Series desde 2013*. [https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica\\_C&cid=1254736176952&menu=resultados&idp=1254735572981#!tabs-1254736195199](https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176952&menu=resultados&idp=1254735572981#!tabs-1254736195199); and INE. *Proyección de hogares. Serie 2020 -2035*. [https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica\\_C&cid=1254736176954&menu=ultiDatos&idp=1254735572981](https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176954&menu=ultiDatos&idp=1254735572981).

<sup>177</sup> The average size is projected to be 2.41 in 2035 compared to 2.51 in 2020 For further details, refer to: INE. *Proyección de hogares. Serie 2020-2035*. <https://www.ine.es/jaxi/Tabla.htm?path=/t20/p276/2020-2035/10/&file=01001.px&L=0>.

<sup>178</sup> *Ibid.*

<sup>179</sup> *Ibid.*

<sup>180</sup> *Ibid.*

<sup>181</sup> Whereas in 2008, 54% of households whose reference person was a young person aged 16-29 lived in a home they owned, in 2017 almost 49% lived in rented accommodation. For further details, refer to: Muñoz Fernández, Guzmán Antonio. "¿Por qué los jóvenes no pueden acceder a una vivienda en propiedad?" *Observatorio Social de La Caixa*, 2019. <https://observatoriosociallacaixa.org/-/por-que-los-jovenes-no-pueden-acceder-a-una-vivienda-en-propiedad>.

<sup>182</sup> This form of tenure has been implemented in Catalonia, which establishes the same rights and obligations as an owner, but for a limited period of time. For further details, refer to: Official State Gazette. *Ley 19/2015, de 29 de julio, de incorporación de la propiedad temporal y de la propiedad compartida al libro quinto del Código civil de Cataluña*. Madrid, 2015. [https://www.boe.es/diario\\_boe/txt.php?id=BOE-A-2015-9678](https://www.boe.es/diario_boe/txt.php?id=BOE-A-2015-9678).

<sup>183</sup> Joint ownership confers on one of the two owners, called the material owner, a share of the ownership, possession, use and exclusive enjoyment of the property (e.g. he lives in it, he can rent it out) and the right to acquire, gradually, the remaining share from the other owner, called a formal owner. An example would be the English *shared-ownership*. It has also been applied in Catalonia. For further details, refer to: Government of the United Kingdom. "Shared Ownership." Government of the United Kingdom. <https://www.help2obuy.gov.uk/shared-ownership/>; and *Ley 5/2006, de 10 de mayo, del libro quinto del Código Civil de Cataluña, relativo a los derechos reales*. Madrid, 2006. <https://www.boe.es/buscar/act.php?id=BOE-A-2006-11130>.

<sup>184</sup> It is important to note that the actual number of public and social housing units currently existing in Spain is unknown. 1.5 million is an estimate of the number of social housing units needed in our country, according to some studies. For further details, see: OECD. *Social housing: A key part of past and future housing policy. Employment, Labour and Social Affairs Policy Briefs*. Paris: OECD publishing, 2020. <http://oe.cd/social-housing-2020>; and Trilla, Carme, and Jordi Bosch. *El parque público y protegido de viviendas en España: Un análisis desde el contexto europeo*. Madrid: Fundación Alternativas, 2018. [\[en-espana-un-analisis-desde-el-contexto-europeo\]\(https://www.fundacionalternativas.org/laboratorio/documentos/documentos-de-trabajo/el-parque-publico-y-protegido-de-viviendas-en-espana-un-analisis-desde-el-contexto-europeo\).](https://www.fundacionalternativas.org/laboratorio/documentos/documentos-de-trabajo/el-parque-publico-y-protegido-de-viviendas-</a></p></div><div data-bbox=)

<sup>185</sup> Nasarre Aznar, Sergio. *Los Años de la Crisis de la Vivienda*. Tirant lo Blanc, 2020. <https://editorial.tirant.com/es/libro/los-anos-de-la-crisis-de-la-vivienda-sergio-nasarre-aznar-9788413364827>.

<sup>186</sup> On this question, see, among others: Johansson, Christer, *et al.* "Impacts on air pollution and health by changing commuting from car to bicycle." *Science of the total environment* 584, 2017. <https://doi.org/10.1016/j.scitotenv.2017.01.145>; Department of Transport, Mobility and Urban Agenda. *Agenda Urbana Española*. 2019. [www.aue.gob.es](http://www.aue.gob.es); OECD. *Rethinking Urban Sprawl: Moving Towards Sustainable Cities. Policy highlights*. Paris: OECD Publishing, 2018. <https://www.oecd.org/environment/tools-evaluation/Policy-Highlights-Rethinking-Urban-Sprawl.pdf>; and Office for National Statistics. *Commuting and personal wellbeing*. United Kingdom, 2014. [http://www.ons.gov.uk/ons/dcp171766\\_351954.pdf](http://www.ons.gov.uk/ons/dcp171766_351954.pdf).

<sup>187</sup> Liu, Jenny H., and Wei Shi. "Understanding Economic and Business Impacts of Street Improvements for Bicycle and Pedestrian Mobility – A Multicity Multiapproach Exploration." *Transportation Research and Education Center (TREC)* 2020. [https://ppms.trec.pdx.edu/media/project\\_files/1031-1161\\_Project\\_Brief\\_-\\_Economic\\_Impacts\\_of\\_Bike\\_Ped\\_Street\\_Improvements\\_K9JeQsd.pdf](https://ppms.trec.pdx.edu/media/project_files/1031-1161_Project_Brief_-_Economic_Impacts_of_Bike_Ped_Street_Improvements_K9JeQsd.pdf).

<sup>188</sup> Mueller, Natalie, *et al.* "Changing the urban design of cities for health: The Superblock model." *Environment International*, 134, 2019. <https://doi.org/10.1016/j.envint.2019.105132>.

<sup>189</sup> In line with the "Safe, Sustainable and Connected Mobility Strategy 2030". See: Department of Transport, Mobility and Urban Agenda. "Estrategia de movilidad." Department of Transport, Mobility and Urban Agenda, 2020 <https://esmovilidad.mitma.es/ejes-estrategicos>.

<sup>190</sup> Alonso Raposo, Maria, and Biagio Ciuffo. *The future of road transport - Implications of automated, connected, low-carbon and shared mobility. Executive summary*. Luxembourg: Publications Office of the European Union, 2019. [https://publications.jrc.ec.europa.eu/repository/bitstream/JRC116644/fort\\_exec-summary\\_online.pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC116644/fort_exec-summary_online.pdf).

<sup>191</sup> The so-called sharing economy, with "shared mobility" in particular represented, will grow from USD 15 billion in 2015 to USD 335 billion in 2025, at a global level. To be effective, mobility planning and transport demand management will be necessary to prevent carpooling from resulting in lower occupancy trips and a shift away from public transport. For further details, refer to: Beltrán, Albert. *Plataformas de economía colaborativa: una mirada global*. The Ostela School of Tourism & Hospitality, 2018. [http://www.aept.org/archivos/documentos/ostelea\\_informe\\_economia\\_colaborativa.pdf](http://www.aept.org/archivos/documentos/ostelea_informe_economia_colaborativa.pdf).

<sup>192</sup> In European cities such as Copenhagen, Helsinki or Vienna, more than 40% of journeys are already made on foot or by bike For further details, refer to: Vandecasteele Ine, *et al.* "The Future of Cities – Opportunities, challenges and the way forward." Luxembourg: Publications Office of the European Union, 2019. <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/future-cities>.

<sup>193</sup> A recent example of intelligent transport systems is the *Smart Bus* pilot project in Madrid. For further details, see: López de Benito, Javier. "Madrid estrena Smart Bus Madrid, el nuevo servicio de bus a demanda." *Movilidad Eléctrica*, <https://movilidadelectronica.com/smart-bus-madrid-bus-a-demanda/>.

<sup>194</sup>World Economic Forum. *The future of the last-mile ecosystem*. World Economic Forum, 2020. [http://www3.weforum.org/docs/WEF\\_Future\\_of\\_the\\_last\\_mile\\_ecosystem.pdf](http://www3.weforum.org/docs/WEF_Future_of_the_last_mile_ecosystem.pdf).

<sup>195</sup> According to the 2011 Population and Housing Census (INE), more than 55% of primary dwellings were built before 1980. 0% of the total residential stock was built before the 1940s. For further details, refer to: INE. *Censo de Población y Viviendas 2011. Tablas predefinidas. Viviendas según tipo y año de tenencia*. [https://www.ine.es/censos2011\\_datos/cen11\\_datos\\_resultados.htm](https://www.ine.es/censos2011_datos/cen11_datos_resultados.htm).

<sup>196</sup> By the end of 2018, around 3.6 million buildings had an energy certificate. Of these, the majority were classified with the least efficient categories. For further details, refer to: Instituto para la Diversificación y Ahorro de la Energía. *Estado de la Certificación Energética de los Edificio*. Department for Ecological Transition, 2018. <https://energia.gob.es/ desarrollo/EficienciaEnergetica/CertificacionEnergetica/Documentos/Documentos%20informativos/informe-seguimiento-certificacion-energetica.pdf>.

<sup>197</sup> Average of the years between 2015 and 2019. For further details, refer to: Department of Transport, Mobility and Urban Agenda. *Número de visados en reforma o restauración de edificios. Datos anuales de 2015 a 2019*. <https://www.fomento.gob.es/BE/?nivel=2&orden=09000000>.

<sup>198</sup> For further details on methodology, comparability and data, see: Zebra2020. *Data Tool. Energy efficiency trends in buildings*. <https://zebra-monitoring.enerdata.net/overall-building-activities/share-of-new-dwellings-in-residential-stock.html#equivalent-major-renovation-rate.html>.

<sup>199</sup> Almost 60% of Spanish dwellings (some 13.8 million, of which 9.8 million are primary and another 4 million are secondary and vacant) were built before the first Spanish regulations requiring minimum energy efficiency standards. The volume of dwellings over 50 years old will reach 6.7 million in the decade 2020-2030; almost 8.4 million in 2030-2040; 10.4 million in 2040-2050 and 12.4 million between 2050 and 2060. For further details, see: Department of Transport, Mobility and Urban Agenda. *Long-Term Strategy for energy renovations in the building sector in Spain*. Madrid, 2020. [https://ec.europa.eu/energy/sites/ener/files/documents/es\\_ltrs\\_2020.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/es_ltrs_2020.pdf).

<sup>200</sup> Department for Ecological Transition and Demographic Challenge *Integrated National Energy and Climate Plan (PNIEC) 2021-2030*. Madrid, 2020. [https://www.miteco.gob.es/images/es/pnieccompleto\\_tcm30-508410.pdf](https://www.miteco.gob.es/images/es/pnieccompleto_tcm30-508410.pdf).

<sup>201</sup> This is relevant, as energy efficiency measures have sometimes been to the detriment of proper ventilation, resulting in poor indoor air quality. On this question, see: Kephelopoulou, S., et al. *Promoting healthy and energy efficient buildings in the European Union: National implementation of related requirements of the Energy Performance Buildings Directive (2010/31/EU)*. Luxembourg: Publications Office of the European Union, 2017. <https://doi.org/10.2760/73595>.

<sup>202</sup> The installed capacity of photovoltaic self-consumption in our country has increased from 22MW in 2014 to 460MW in 2019. For further details, refer to: Unión Española Fotovoltaica. *El Sector Fotovoltaico. Hacia una nueva era. Informe Anual 2020*. 2020. <https://unef.es/informacion-sectorial/informe-anual-uneff>.

<sup>203</sup> Department for Ecological Transition and Demographic Challenge

*Estrategia de almacenamiento energético*. Madrid, 2021. [https://www.miteco.gob.es/es/prensa/estrategiadealmacenamientoenergetico\\_tcm30-522655.pdf](https://www.miteco.gob.es/es/prensa/estrategiadealmacenamientoenergetico_tcm30-522655.pdf).

<sup>204</sup> Department for Ecological Transition and Demographic Challenge *Integrated National Energy and Climate Plan (PNIEC) 2021-2030*. Madrid, 2020. [https://www.miteco.gob.es/images/es/pnieccompleto\\_tcm30-508410.pdf](https://www.miteco.gob.es/images/es/pnieccompleto_tcm30-508410.pdf).

<sup>205</sup> Our cities have fewer km<sup>2</sup> of green space than many European cities. In this regard, see: Fuller, Richard A, and Kevin J Gaston. "The scaling of green space coverage in European cities." *Biology letters* 5, n.º 3, 2009. <https://doi.org/10.1098/rsbl.2009.0010>.

<sup>206</sup> These infrastructures improve the insulation and efficiency of buildings, contribute to the improvement of air quality, reduce noise and lower the ambient temperature. On this question, see, among others: Briz Escribano, Julian, Manfred Köhler, and Isabel de Felipe. *Multi-functional urban green infrastructure*. Salzweg, Germany: Waging and Pronatur, 2019; Olivieiri, Francesca, Lorenzo Olivieiri and Javier Neila. "Experimental study of the thermal-energy performance of an insulated vegetal façade under summer conditions in a continental Mediterranean climate." *Building and Environment* 77, 2014. <https://doi.org/10.1016/j.buildenv.2014.03.019>.

<sup>207</sup> There are currently more than 15,000 urban gardens in Spain, spread over 300 municipalities. In this regard, see: Urbano, Beatriz. "Huertos urbanos, la despensa sostenible de las ciudades." *The Conversation*, 2019. <https://theconversation.com/huertos-urbanos-la-despensa-sostenible-de-las-ciudades-126371>.

<sup>208</sup> It refers to the methods used to cultivate plants using mineral solutions or aerial environments instead of soil. See: Vandecasteele, Ine, et al. (eds.). *The Future of Cities – Opportunities, challenges and the way forward*. Luxembourg: Publications Office of the European Union, 2019. <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/future-cities>.

<sup>209</sup> Rising temperatures and heat waves will have a greater impact on cities due to the urban heat island effect. The concentration of heat-emitting elements (air conditioning and vehicles, among others) and the presence of materials such as concrete or asphalt mean that urban centres are hotter than the surrounding areas, especially at night. For further details, refer to: Revi, Aromar, and David Satterthwaite (coords.). "Urban areas." In: Field, Christopher B., et al. (eds.). *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge and Nueva York: Cambridge University Press, 2014. [https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap8\\_FINAL.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap8_FINAL.pdf).

<sup>210</sup> The potential discrimination suffered by the population of migrant origin in access to housing, especially rental housing, has an impact on the perpetuation of unequal residential conditions, with access to poorer quality housing in urban parks and their concentration in neighbourhoods with high levels of vulnerability. On residential discrimination, see: Asociación Provienda. *¿Se alquila? Racismo y xenofobia en el mercado del alquiler*. 2020. <https://www.provienda.org/wp-content/uploads/Se-alquila.-Racismo-y-xenofobia-en-el-mercado-del-alquiler.pdf>.

<sup>211</sup> OECD. *Rural Well-being. Geography of Opportunities*. OECD Rural Studies, 2020. <https://doi.org/10.1787/499ed299-en>.

<sup>212</sup> According to the WHO, the term digital health includes telemedicine (remote medical services supported by technology, from simple phone calls with health professionals to complex surgical operations with remotely controlled robots), telecare (the use of technology to treat patients remotely not only from a medical but also from a socio-health point of view, with a preventive and follow-up perspective), electronic health management (*eHealth*) or via mobile phones (*mHealth*), the advanced use of computer science for the management of massive volumes of health data (*Big Data*), the application of genomics, the application of robotics through internet connectivity between devices (IoT) and the application of artificial intelligence (AI) in medicine. On this question, see: Bigorra, Joan, and Laura Sampietro. "Salud digital: una oportunidad y un imperativo ético." *Revista DIECISIETE* n.º 4. 2021. Madrid. [https://doi.org/10.36852/2695-4427\\_2021\\_04.13](https://doi.org/10.36852/2695-4427_2021_04.13).

<sup>213</sup> Pinilla, Vicente, and Luis - Antonio Sáez. "Searching for a Depopulation Dividend in the 21st Century: Perspectives from Japan, Spain and New Zealand." *Journal of the Japanese Institute of Landscape Architecture* 83, 2019. <https://www.jila-zouen.org/wp-content/uploads/2019/05/Matanle-Saez-Perez-EN.pdf>.

<sup>214</sup> The European Commission has proposed the strategy "A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives", with the Goal of at least doubling the annual rate of energy renovation of both residential and non-residential buildings by 2030. As a result, 35 million buildings in the EU could be renovated over the next decade, creating up to 160,000 associated jobs. From 2030 to 2050, the aim is to further strengthen energy rehabilitation. In Spain, we have a long-term strategy for energy rehabilitation in the building sector in Spain, which provides a strategic vision and targets for 2030, 2040 and 2050. A boost from European recovery funds can also be key. Component 2 of the "Recovery, Transformation and Resilience Plan" project, named the "Housing Rehabilitation and Urban Regeneration Plan", which amounts to 6 billion euros, focuses on energy-efficient housing rehabilitation. For further details, refer to: European Commission. *A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives*. Brussels: European Commission, 2020. <https://static.construible.es/media/2020/10/20201014-estrategia-europea-renovation-wave.pdf>; Government of Spain. *Recovery, Transformation and Resilience Plan*. Madrid, 2021. <https://www.lamoncloa.gob.es/presidente/actividades/Documents/2021/130421-%20Plan%20de%20recuperacion%2C%20Transformacion%20y%20Resiliencia.pdf>; and Department of Transport, Mobility and Urban Agenda. *Long-Term Strategy for energy renovations in the building sector in Spain*. Madrid, 2020. [https://ec.europa.eu/energy/sites/ener/files/documents/es\\_ltrs\\_2020.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/es_ltrs_2020.pdf).

<sup>215</sup> Spain still takes over 50% of waste to landfill, compared to 0% in countries such as Switzerland. For further details, refer to: European Environment Agency. *Municipal waste landfill rates in Europe by country 2017*. 2019. <https://www.eea.europa.eu/data-and-maps/indicators/diversion-from-landfill/assessment>; and Department for Ecological Transition and Demographic Challenge. *Memoria anual de generación y gestión de residuos. Residuos de competencia municipal 2018*. Madrid, 2018. [https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/publicaciones/memoriareiduosmunicipales2018\\_tcm30-521965.pdf](https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/publicaciones/memoriareiduosmunicipales2018_tcm30-521965.pdf).

<sup>216</sup> European Commission. *Proposal for a directive of the European Parliament and of the Council amending Directive 1999/31/EC on*

*the landfill of waste*. Brussels, 2015. <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1452152827375&uri=CELEX:52015PC0594>.

<sup>217</sup> For further details, see: Comité Europeo de las Regiones. *Dictamen: Multilevel governance and cross-sectoral cooperation to fight energy poverty*. Brussels: European Commission, 2019. <https://cor.europa.eu/ES/our-work/Pages/OpinionTimeline.aspx?opId=CDR-5877-2018>.

<sup>218</sup> It is defined as the percentage of population living in households where expenditure on housing represents at least 40% of total household disposable income. Data for the EU-27 and EU-8 are simple averages of the individual countries. Refer to: Eurostat. *European Union Statistics on Income and Living Conditions. Housing cost overburden rate by tenure status - EU-SILC survey [ilc\_lvho07c]*. <https://ec.europa.eu/eurostat/data/database>.

<sup>219</sup> Today, several European countries such as Ireland, Finland, Slovenia or Estonia have similar levels. Assuming a halving of the proportion of the population experiencing rent overburden, recent values of overburden in the case of home ownership and a progressive change in tenure status (greater importance of renting as opposed to owning), the aggregate overburden target of 4.5% of the population for 2050 is feasible.. Today, several European countries such as Ireland, Finland, Slovenia or Estonia have similar levels. Assuming a halving of the proportion of the population experiencing rent overburden, recent values of overburden in the case of home ownership and a progressive change in tenure status (greater importance of renting as opposed to owning), the aggregate overburden target of 4.5% of the population for 2050 is feasible.

<sup>220</sup> The proportion of dwellings refurbished per year is estimated by dividing the number of building management permits for the refurbishment and/or restoration of dwellings (Building management permits of the Technical Architects' Associations. Building work in progress) (average 2015-2019), by the total number of dwellings from the estimated housing stock (average 2015-2019). See: Department of Transport, Mobility and Urban Agenda. *Estimated housing stock Total de viviendas por comunidades autónomas y provincias*. <https://apps.fomento.gob.es/BoletinOnline2/?nivel=2&orden=33000000>; and Department of Transport, Mobility and Urban Agenda. *Building management permits Obra nueva, ampliación y/o reforma de viviendas. Número de viviendas a reformar y/o restaurar*. <https://www.fomento.gob.es/BE/?nivel=2&orden=09000000>. The proportion of dwellings refurbished per year is estimated by dividing the number of building management permits for the refurbishment and/or restoration of dwellings (Building management permits of the Technical Architects' Associations. Building work in progress) (average 2015-2019), by the total number of dwellings from the estimated housing stock (average 2015-2019). See: Department of Transport, Mobility and Urban Agenda. *Estimated housing stock Total de viviendas por comunidades autónomas y provincias*. <https://apps.fomento.gob.es/BoletinOnline2/?nivel=2&orden=33000000>; and Department of Transport, Mobility and Urban Agenda. *Building management permits Obra nueva, ampliación y/o reforma de viviendas. Número de viviendas a reformar y/o restaurar*. <https://www.fomento.gob.es/BE/?nivel=2&orden=09000000>.

<sup>221</sup> The percentage of municipal waste sent to landfill has been calculated from the annual per capita kilograms of municipal waste sent to landfill and the annual per capita kilograms of municipal waste generated. The

EU-27 is the aggregate indicator reported by Eurostat and the EU-8 is obtained as the simple average of the values of the individual countries. See: Eurostat. *Municipal waste by waste management operations [ENV\_WASMUN]. Disposal - landfill and other (D1-D7, D12), Kilograms per capita. Waste generated, kilograms per capita.* <https://ec.europa.eu/eurostat/data/database>.

<sup>222</sup> Target for 2035 according to the European Parliament and the Council of the European Union. See: European Parliament and the Council of the European Union. *Directiva (UE) 2018/850 del Parlamento Europeo y del Consejo de 30 de mayo de 2018 por la que se modifica la Directiva 1999/31/CE relativa al vertido de residuos.* Brussels, 2018. <https://eur-lex.europa.eu/legal-content/es/TXT/?uri=CELEX%3A32018L0850>

<sup>223</sup> Percentage of population exposed to an annual average concentration of particulate matter (PM<sub>2.5</sub>) above 10 micrograms per cubic metre (WHO recommended limit). The EU-27 and EU-8 are obtained as the simple average of the values of the individual countries. Data observed are from 2018. In this regard: European Environment Agency. “ECT/ATNI reports.” European Topic Centre on Air Pollution, transport, noise and industrial pollution, <https://www.eionet.europa.eu/etcs/etc-atni/products/etc-atni-reports>; and WHO. *Air quality guidelines for particulate matters, ozone, nitrogen dioxide and sulphur dioxide. Global update 2005.* Geneva, 2005. [http://www.who.int/phe/health\\_topics/outdoorair/outdoorair\\_aqg/en/index.html](http://www.who.int/phe/health_topics/outdoorair/outdoorair_aqg/en/index.html)

<sup>224</sup> The Goals for years 2030-2050 are in line with the analyses included in the European Union’s Second Clean Air Outlook, presented in 2021. See: European Commission. *Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.* The Second Clean Air Outlook. Brussels: European Commission, 2021. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2021%3A3%3AFIN>

<sup>225</sup> We establish this indicator to monitor fuel poverty although it is necessary to analyse the joint evolution of the four indicators established by the European Observatory on Fuel Poverty: 1) percentage of the population unable to maintain an adequate temperature at home; 2) percentage of the population in arrears with bill payments; 3) percentage of households whose energy expenditure is excessively low (hidden fuel poverty) and 4) percentage of households whose expenditure on energy supplies is disproportionate to the level of income. The EU-27 and EU-8 are obtained as the simple average of the values of the individual countries. See: Eurostat. *Inability to keep home adequately warm - EU-SILC survey [ILC\_MDES01].* <https://ec.europa.eu/eurostat/data/database>; and Department for Ecological Transition and Demographic Challenge *Actualización de indicadores de la Estrategia Nacional contra la Pobreza Energética.* Madrid, 2020. [https://www.miteco.gob.es/es/prensa/20201106\\_actualizaciondeindicadores2020\\_final\\_tcm30-516466.pdf](https://www.miteco.gob.es/es/prensa/20201106_actualizaciondeindicadores2020_final_tcm30-516466.pdf)

<sup>226</sup> In line with the National Fuel Poverty Strategy, which aims to reduce to at least 6% the percentage of the population unable to keep their homes at an adequate temperature for 2025. For further details, see: Department for Ecological Transition and Demographic Challenge. *National Fuel Poverty Strategy 2019-2024.* Madrid, 2019. [https://www.miteco.gob.es/es/prensa/estrategianacionalcontralapobrezaenergetica2019-2024\\_tcm30-496282.pdf](https://www.miteco.gob.es/es/prensa/estrategianacionalcontralapobrezaenergetica2019-2024_tcm30-496282.pdf)

<sup>227</sup> In line with the European Committee of the Regions proposal. For further details, see: Comité Europeo de las Regiones. Dictamen:

*Multilevel governance and cross-sectoral cooperation to fight energy poverty.* Brussels: European Commission, 2019. <https://cor.europa.eu/ES/our-work/Pages/OpinionTimeline.aspx?opId=CDR-5877-2018>

<sup>228</sup> Urban Agenda. *Agenda Urbana Española.* Mitma, 2019. [www.aue.gob.es](http://www.aue.gob.es).

<sup>229</sup> In this sense, there are already interesting initiatives in our country, both from the public sphere (e.g. the “Madrid Emprende” programme of the Madrid City Council) and from the private sphere (e.g. the social enterprise “El Hueco” in Soria). See: Ayuntamiento de Madrid - Madrid Emprende. “¿Qué son los viveros de empresas?” Madrid Emprende web portal. <https://www.madridemprende.es/es/apoyo-integral-al-emprendimiento/que-son-los-viveros-de-empresas>; and El Hueco. <https://www.elhueco.org/>

<sup>230</sup> Ley 45/2007, de 13 de diciembre, para el desarrollo sostenible del medio rural, <https://www.boe.es/buscar/act.php?id=BOE-A-2007-21493>

<sup>231</sup> Department of Agriculture, Fisheries and Food. “Red Rural Nacional. LEADER.” Department of Agriculture, Fisheries and Food, <http://www.redruralnacional.es/leader1>

<sup>232</sup> Department of Economic Affairs and Digital Transformation. *España Digital 2025.* 2020. [https://www.mineco.gob.es/stfls/mineco/prensa/ficheros/noticias/2018/Agenda\\_Digital\\_2025.pdf](https://www.mineco.gob.es/stfls/mineco/prensa/ficheros/noticias/2018/Agenda_Digital_2025.pdf)

<sup>233</sup> Comisionado del Gobierno frente al Reto Demográfico. *Diagnóstico estrategia nacional frente al reto demográfico. Eje despoblación.* Department of Territorial Policy and Public Function, 2020. [https://www.mptfp.gob.es/dam/es/portal/reto\\_demografico/Indicadores\\_cartografia/Diagnostico\\_Despoblacion.pdf](https://www.mptfp.gob.es/dam/es/portal/reto_demografico/Indicadores_cartografia/Diagnostico_Despoblacion.pdf)

<sup>234</sup> In 2016, through the “Cork Declaration 2.0. A Better Life for Rural Areas”, this Europe-wide mechanism was proposed to ensure that rural communities are heard and their well-being is taken into account, both in the design of policies and budgets and in their implementation. Countries such as the UK have been successfully applying this mechanism for more than a decade, and in Northern Ireland they have a (*Rural Needs Act*). See: Government of the United Kingdom. *A Guide to the Rural Needs Act* (Northern Ireland) 2016 for Public Authorities (Revised). 2018. <https://www.daera-ni.gov.uk/sites/default/files/publications/daera/17.18.249%20Guide%20to%20Rural%20Needs%20Act%20NI%20final%20v2.PDF>; and Pinilla, Vicente, and Luis Sáez. “What do public policies teach us about rural depopulation: the case study of Spain.” *European Countryside* 13, 2021; and European Union. *Declaración de Cork 2.0. “Una vida mejor en el medio rural”.* Luxembourg: Publications Office of the European Union, 2016. [https://enrd.ec.europa.eu/sites/enrd/files/cork-declaration\\_es.pdf](https://enrd.ec.europa.eu/sites/enrd/files/cork-declaration_es.pdf)

<sup>235</sup> ECPA Urban Planning. “Case Study: The Boston Waterfront Innovation District.” *Smart Cities Dive.* <https://www.smartcitiesdive.com/ex/sustainablecitiescollective/case-study-boston-waterfront-innovation-district/27649/>

<sup>236</sup> Zegas, Sam. “Kendall Square, MA: How to analyze an innovation ecosystem.” *ARETIAN Urban Analytics and Design.* <https://www.aretian.com/post/how-to-analyze-an-innovation-ecosystem-kendall-square-ma?lang=es>

<sup>237</sup> In this respect, priority could be given to the acquisition of auctioned homes resulting from foreclosures by the public administration. This

could also help to decrease socio-spatial segregation by increasing social mix. The draft of the “Recovery, Transformation and Resilience Plan” dedicates in its component 2 “Housing Rehabilitation and Urban Regeneration Plan” around 1 billion euros for social rental housing in energy efficient buildings. In this regard, see: Official State Gazette. *Decreto-Ley 1/2015 de 24 de marzo en Cataluña de medidas extraordinarias y urgentes para la movilización de las viviendas provenientes de procesos de ejecución hipotecaria*, Madrid, 2015. <https://www.boe.es/buscar/doc.php?id=BOE-A-2015-6016>; and Government of Spain. *Recovery, Transformation and Resilience Plan*. Madrid, 2021. <https://www.lamoncloa.gob.es/presidente/actividades/Documents/2021/130421-%20Plan%20de%20recuperacion%2C%20Transformacion%20y%20Resiliencia.pdf>

<sup>238</sup> An example of this is the Programa Alquiler of the EMVS, a free municipal service that mediates between those in need of rental housing and landlords who wish to rent it. For further details, refer to: Empresa Municipal de Vivienda y Suelo. “Alquiler entre particulares.” Empresa Municipal de Vivienda y Suelo, <https://www.emvs.es/Alquiler/Paginas/inicio.aspx>

<sup>239</sup> The rental park and its maintenance is managed by a non-profit organisation or a public agency. One example would be that carried out by the UK government. For further details, refer to: Government of the United Kingdom. “Housing Associations Homes.” Government of the United Kingdom, <https://www.gov.uk/housing-association-homes>

<sup>240</sup> Arnth Jensen, Ane. “Danish Mortgages explained – an Ecosystem of Transparency and Digitalisation.” News European Covered Bond Council. <https://hypo.org/ecbc/publication-news/danish-mortgages-explained-ecosystem-transparency-digitalisation/>

<sup>241</sup> Medvedev, Alexey, et al. “Waste Management as an IoT-Enabled Service in Smart Cities.” In: Balandin Sergey, Sergey Andreev, and Yevgeni Koucheryavy (eds.). *Internet of Things, Smart Spaces, and Next Generation Networks and Systems*. Lecture Notes in Computer Science, 9247. 2015. 104-15. [https://doi.org/10.1007/978-3-319-23126-6\\_10](https://doi.org/10.1007/978-3-319-23126-6_10)

<sup>242</sup> SENSE Networks. “5 Smart Cities That Are Leveraging IoT Technology for Efficient Waste Management.” SENSE Networks. <http://www.sensanetworks.com/blog/efficient-waste-management/>

<sup>243</sup> Department for Ecological Transition and Demographic Challenge. *Guías de adaptación al riesgo de inundación: sistemas urbanos de drenaje sostenible*. Madrid, 2019. [https://www.miteco.gob.es/es/agua/temas/gestion-de-los-riesgos-de-inundacion/guia-adaptacion-riesgo-inundacion-sistemas-urbano-drenaje-sostenible\\_tcm30-503726.pdf](https://www.miteco.gob.es/es/agua/temas/gestion-de-los-riesgos-de-inundacion/guia-adaptacion-riesgo-inundacion-sistemas-urbano-drenaje-sostenible_tcm30-503726.pdf)

<sup>244</sup> In the particular case of public buildings, the draft of the “Recovery, Transformation and Resilience Plan” dedicates in its component 2 “Housing Rehabilitation and Urban Regeneration Plan” around 1 billion euros for sustainable rehabilitation of public buildings. See: Government of Spain. *Recovery, Transformation and Resilience Plan*. Madrid, 2021. <https://www.lamoncloa.gob.es/presidente/actividades/Documents/2021/130421-%20Plan%20de%20recuperacion%2C%20Transformacion%20y%20Resiliencia.pdf>

<sup>245</sup> Currently, around 10% of the solar photovoltaic energy generated in Spain comes from distributed generation systems. For further details, see: Unión Española Fotovoltaica. *El Sector Fotovoltaico. Hacia una nueva era. Informe Anual 2020*. 2020. <https://unef.es/informacion-sectorial/informe-anual-unef/>

<sup>246</sup> Department of Transport, Mobility and Urban Agenda. *Long-Term Strategy for energy renovations in the building sector in Spain*. Madrid, 2020. [https://ec.europa.eu/energy/sites/ener/files/documents/es\\_ltrs\\_2020.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/es_ltrs_2020.pdf)

<sup>247</sup> In Spain, 8.1 million people are financially overburdened by energy costs; 5.1 million people suffer from hidden energy poverty; some 3.7 million people are cold in winter and 3.5 million people pay their bills late, with the consequent risk of having their supplies cut off. For further details, refer to: European Commission. *A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives*. Brussels: European Commission, 2020. <https://static.construible.es/media/2020/10/20201014-estrategia-europea-renovation-wave.pdf>; and Department for Ecological Transition and Demographic Challenge. *National Fuel Poverty Strategy 2019-2024*. Madrid, 2019. [https://www.miteco.gob.es/es/prensa/estrategianacionalcontralapobrezaenergetica2019-2024\\_tcm30-496282.pdf](https://www.miteco.gob.es/es/prensa/estrategianacionalcontralapobrezaenergetica2019-2024_tcm30-496282.pdf).

<sup>248</sup> In this line, the draft of the “National Plan for Recovery, Transformation and Resilience” dedicates, in its component 1 “Shock plan for sustainable, safe and connected mobility in urban and metropolitan environments”, an amount of around 3,000 million euros. This item could help, through various incentives, to achieve this Goal. See: *Government of Spain. Recovery, Transformation and Resilience Plan*. Madrid, 2021. <https://www.lamoncloa.gob.es/presidente/actividades/Documents/2021/130421-%20Plan%20de%20recuperacion%2C%20Transformacion%20y%20Resiliencia.pdf>

<sup>249</sup> For further details, see: WHO “Calidad del aire y salud.” World Health Organization, [https://www.who.int/es/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/es/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health); and WHO. *Environmental Noise Guidelines for the European Region*. Copenhagen: Publications World Health Organization Regional Office for Europe, 2018. [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0008/383921/noise-guidelines-eng.pdf](https://www.euro.who.int/__data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf)

<sup>250</sup> Vitoria Gasteiz City Council. *Plan de Movilidad Sostenible y Espacio Público. Plan Vigente*. [https://www.vitoria-gasteiz.org/wb021/was/contenidoAction.do?idioma=es&uid=\\_5e2b2877\\_120d224e518\\_\\_7fe7%E2%80%9D%20\t%20E2%80%9C\\_blank](https://www.vitoria-gasteiz.org/wb021/was/contenidoAction.do?idioma=es&uid=_5e2b2877_120d224e518__7fe7%E2%80%9D%20\t%20E2%80%9C_blank).

<sup>251</sup> Madrid City Council. Proyecto MICOS. *Entornos Escolares Saludables, 2016*. <http://madridsalud.es/wp-content/uploads/2016/04/MICOS-Regeneracion-urbana.pdf>

<sup>252</sup> The creation of an Observatory of urban and territorial dynamics at a national level would facilitate research and knowledge of these realities and thus facilitate decision-making and the assessment of policies. Among the dynamics considered are those that go beyond local administrative spheres (such as mobility), as well as those that occur at the municipal level, be they social, environmental, economic or governance-related. In terms of its functioning, the methodological approach of the European Urban Agenda could be adopted, ensuring that harmonised information is available for all Spanish regions, as well as for EU member states.

<sup>253</sup> WHO. *Health as the pulse of the new urban agenda: United Nations conference on housing and sustainable urban development*. 2016. <https://apps.who.int/iris/bitstream/handle/10665/250367/9789241511445-eng.pdf?sequence=1>

<sup>254</sup> “Global Covenant of Mayors for Climate Energy.” <https://www.globalcovenantofmayors.org/>

<sup>255</sup> “Eurocities.” <https://eurocities.eu/stories/home-sweet-home/>

<sup>256</sup> “Red de Ciudades Españolas por el Clima.” <http://www.redciudadesclima.es/>

<sup>257</sup> Emerging examples in this direction are the “Ciudades y Gobiernos Locales Unidos (CGLU)” or the “*Global Task Force of Local and Regional Governments*.” For further details, see: Global Taskforce of Local and Regional Governments, <https://www.global-taskforce.org/>; and United Cities and Local Governments, <https://www.uclg.org/es>