SB&WRC Project

Analysis of constructive systems, building typology and proposition of innovative conceptions

November 2017
Abstract of the project

The SB&WRC (Sustainable Bio&Waste Resources for Construction) project, an undertaking of more than two years, aims to conceive, produce and test three innovative, low-carbon, thermal insulation materials from agricultural co-products and recycled waste. The project is supported by the development program Interreg VA France (Channel) England and its budget, estimated to be 1.8M€, is co-financed by the ERDF (European Regional Development Fund) for 69% (1.26M€ contribution).

This project, led by Nomadéis, is carried out by a cross-channel partnership which gathers academic research laboratories, private research and consulting companies, manufacturers and professional non-profit organisation of the building sector:

- Nomadéis;
- Veolia Propreté Nord Normandie;
- University of Bath;
- Ecole Supérieure d’Ingénieurs des Travaux de la Construction de Caen (ESITC Caen);
- Construction21;
- UniLaSalle;
- University of Brighton;
- Alliance for Sustainable Building Products.
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Acronyms

ADEME : Agence de l’Environnement et de la Maîtrise de l’Energie
BRE : Building Research Establishment
CGET : Commissariat Général à l’Égalité des Territoires
DPE : Diagnostic Performance Énergétique
EPCI : Établissement Public de Coopération Intercommunale
INSEE : Institut national de la statistique et des études économiques
INTERREG FMA : Programme Interreg France (Manche) Angleterre
MTES : Ministère de la Transition Écologique et Solidaire
NUTS : Nomenclature des Unités Territoriales Statistiques (découpage territorial)
ONS : Office for National Statistics
PACTE : Programme d’Action pour la qualité de la Construction et la Transition Énergétique
RP : Recensement de la population
SOeS : Service de l’Observation et des Statistiques
UA : Unité Autoritaire (statut administratif anglais)
1. **Presentation of the objectives of the Activity 3.4**

The partners wish to design and produce 3 sustainable thermal insulation prototypes presenting a real development potential. The partners therefore want to analyse the built environment of the INTERREG FMA zone in order to fuel the reflexion concerning the conception of the prototypes, to design materials specifically adapted to the characteristics of the INTERREG FMA zone, in order to facilitate the subsequent massification of the products.

2. **Methodology**

2.1 **Geographic perimeter considered**

The analyses were performed on the scale of the Interreg France-England perimeter, as shown in Figure 1.

![Figure 1. Geographic perimeter of the analysis](image)

*Source: France – England Interreg Program*
More precisely, the following counties and departments enter the field of the analysis:

### Perimeter Interreg England:

<table>
<thead>
<tr>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bournemouth</td>
</tr>
<tr>
<td>Brighton and Hove</td>
</tr>
<tr>
<td>Cambridgeshire</td>
</tr>
<tr>
<td>Cornwall</td>
</tr>
<tr>
<td>Devon</td>
</tr>
<tr>
<td>Dorset</td>
</tr>
<tr>
<td>East Sussex</td>
</tr>
<tr>
<td>Essex</td>
</tr>
<tr>
<td>Hampshire</td>
</tr>
<tr>
<td>Isle of Wight</td>
</tr>
<tr>
<td>Isles of Scilly</td>
</tr>
<tr>
<td>Kent</td>
</tr>
<tr>
<td>Medway</td>
</tr>
<tr>
<td>Norfolk</td>
</tr>
<tr>
<td>Peterborough</td>
</tr>
<tr>
<td>Plymouth</td>
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<tr>
<td>Poole</td>
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<tr>
<td>Portsmouth</td>
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<tr>
<td>Somerset</td>
</tr>
<tr>
<td>Southampton</td>
</tr>
<tr>
<td>Southend-on-Sea</td>
</tr>
<tr>
<td>Suffolk</td>
</tr>
<tr>
<td>Surrey</td>
</tr>
<tr>
<td>Swindon</td>
</tr>
<tr>
<td>Thurrock</td>
</tr>
<tr>
<td>Torbay</td>
</tr>
<tr>
<td>West Sussex</td>
</tr>
<tr>
<td>Wiltshire</td>
</tr>
</tbody>
</table>

### Perimeter of Interreg France:

<table>
<thead>
<tr>
<th>Department number</th>
<th>Department name</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Calvados</td>
</tr>
<tr>
<td>22</td>
<td>Côtes-d’Armor</td>
</tr>
<tr>
<td>27</td>
<td>Eure</td>
</tr>
<tr>
<td>29</td>
<td>Finistère</td>
</tr>
<tr>
<td>35</td>
<td>Ille-et-Vilaine</td>
</tr>
<tr>
<td>50</td>
<td>Manche</td>
</tr>
<tr>
<td>56</td>
<td>Morbihan</td>
</tr>
<tr>
<td>60</td>
<td>Oise</td>
</tr>
<tr>
<td>61</td>
<td>Orne</td>
</tr>
<tr>
<td>62</td>
<td>Pas-de-Calais</td>
</tr>
<tr>
<td>76</td>
<td>Seine-Maritime</td>
</tr>
<tr>
<td>80</td>
<td>Somme</td>
</tr>
</tbody>
</table>

### 2.2 General procedure

#### 2.2.1 Source of information

The information provided in this report is based on a thorough bibliographic review (institutional reports, scientific articles and grey literature: see the list of bibliographic sources on page 56).

#### 2.2.2 Structure of the study report

This report is organized in three parts:

- The first part provides an overview of the France-England Interreg zone: population count, population density analysis on the scale of the two zones, identification of the principal urban poles, analysis of the demographic evolution (population growth, dynamic of the evolution of the age pyramid and the household structure, etc.). This part aims both to highlight the specificities of the Interreg zone in terms of spatial organization, and to analyze the trends likely to have a long-term
impact on building activity (evolution of the population, household end of cohabitation dynamics, etc.), and thus the demand in building materials;

- The second part draws an inventory of the residential park at the scale of the France-England Interreg zone, through the analysis of the structure of the residential park and its recent evolution and of the typology of the buildings (profile of the accommodations, their size, the energy efficiency, etc.);

- Finally, the third part presents an analysis of the recent new construction dynamic at the scale of the France-England Interreg zone.
3. **Presentation of the France-England Interreg zone**

3.1 **A majority of rural territories in France and urban territories in England**

The France Interreg zone counts **6 500 communes**, belonging to 12 departments, representing **9 721 171 habitants** for an area of **75 816,4 km²**. The density of the population of the zone is therefore of **128,2 habitants/km²** (against 105,3 habitants / km² average on the national scale in 2015 according to the Eurostat figures¹).

**Chart 1. Perimeter of the France Interreg zone**


<table>
<thead>
<tr>
<th>Department number</th>
<th>Department name</th>
<th>Number of communes</th>
<th>Number of habitants</th>
<th>Surface (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Calvados</td>
<td>621</td>
<td>708 407</td>
<td>5 547,9</td>
</tr>
<tr>
<td>22</td>
<td>Côtes-d'Armor</td>
<td>362</td>
<td>617 413</td>
<td>6 877,6</td>
</tr>
<tr>
<td>27</td>
<td>Eure</td>
<td>617</td>
<td>616 076</td>
<td>6 039,9</td>
</tr>
<tr>
<td>29</td>
<td>Finistère</td>
<td>281</td>
<td>935 393</td>
<td>6 733,0</td>
</tr>
<tr>
<td>35</td>
<td>Ille-et-Vilaine</td>
<td>351</td>
<td>1 060 051</td>
<td>6 774,7</td>
</tr>
<tr>
<td>50</td>
<td>Manche</td>
<td>516</td>
<td>518 322</td>
<td>5 938,0</td>
</tr>
<tr>
<td>56</td>
<td>Morbihan</td>
<td>256</td>
<td>764 338</td>
<td>6 822,6</td>
</tr>
<tr>
<td>60</td>
<td>Oise</td>
<td>690</td>
<td>838 646</td>
<td>5 860,2</td>
</tr>
<tr>
<td>61</td>
<td>Orne</td>
<td>413</td>
<td>297 109</td>
<td>6 103,4</td>
</tr>
<tr>
<td>62</td>
<td>Pas-de-Calais</td>
<td>893</td>
<td>1 497 668</td>
<td>6 671,4</td>
</tr>
<tr>
<td>76</td>
<td>Seine-Maritime</td>
<td>718</td>
<td>1 284 107</td>
<td>6 277,6</td>
</tr>
<tr>
<td>80</td>
<td>Somme</td>
<td>782</td>
<td>583 641</td>
<td>6 170,1</td>
</tr>
</tbody>
</table>

The principal urban poles of the France Interreg zone are the communes of **Rennes** (213 454 habitants), **Amiens** (132 479 habitants), **Rouen** (110 618 habitants), **Caen** (106 538 habitants), **Quimper** (63 513 habitants), **Vannes** (53 036 habitants), **Evreux** (49 461 habitants), **Arras** (40 970 habitants), **Alençon** (26 028 habitants) and **Saint-Lô** (19 426 habitants).

Figure 2. Identification urban areas of the France Interreg zone in 2010

Source: INSEE, Urban areas, 2010.

The England Interreg zone counts **14 698 005 habitants** (2016), on an area of **49 431 km²**. The density of the population of the area therefore is of **297,3 habitants/km²** (against 268,6 habitants/km² in average at the national scale in 2015 according to the Eurostat figures). The England Interreg zone is deployed on 28 administrative units (Chart 2).
Chart 2. Perimeter of the England Interreg zone


<table>
<thead>
<tr>
<th>Counties</th>
<th>Number of habitants (2016)</th>
<th>Surface (km²)</th>
<th>Density (number of habitants / km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kent</td>
<td>1 541 893</td>
<td>3 545</td>
<td>435</td>
</tr>
<tr>
<td>Essex</td>
<td>1 455 340</td>
<td>3 464</td>
<td>420</td>
</tr>
<tr>
<td>Hampshire</td>
<td>1 360 426</td>
<td>3 679</td>
<td>370</td>
</tr>
<tr>
<td>Surrey</td>
<td>1 176 549</td>
<td>1 663</td>
<td>707</td>
</tr>
<tr>
<td>Norfolk</td>
<td>892 870</td>
<td>5 380</td>
<td>166</td>
</tr>
<tr>
<td>West Sussex</td>
<td>843 765</td>
<td>1 991</td>
<td>424</td>
</tr>
<tr>
<td>Devon</td>
<td>779 834</td>
<td>6 564</td>
<td>119</td>
</tr>
<tr>
<td>Suffolk</td>
<td>745 274</td>
<td>3 801</td>
<td>196</td>
</tr>
<tr>
<td>Cambridgeshire</td>
<td>651 940</td>
<td>3 046</td>
<td>214</td>
</tr>
<tr>
<td>Cornwall</td>
<td>553 687</td>
<td>3 546</td>
<td>156</td>
</tr>
<tr>
<td>Somerset</td>
<td>549 447</td>
<td>3 451</td>
<td>159</td>
</tr>
<tr>
<td>East Sussex</td>
<td>547 797</td>
<td>1 709</td>
<td>321</td>
</tr>
<tr>
<td>Wiltshire</td>
<td>488 409</td>
<td>3 255</td>
<td>150</td>
</tr>
<tr>
<td>Dorset</td>
<td>422 727</td>
<td>2 542</td>
<td>166</td>
</tr>
<tr>
<td>Brighton and Hove</td>
<td>289 229</td>
<td>83</td>
<td>3 485</td>
</tr>
<tr>
<td>Medway</td>
<td>278 542</td>
<td>194</td>
<td>1 436</td>
</tr>
<tr>
<td>Plymouth</td>
<td>264 199</td>
<td>80</td>
<td>3 302</td>
</tr>
<tr>
<td>Southampton</td>
<td>254 275</td>
<td>50</td>
<td>5 086</td>
</tr>
<tr>
<td>Swindon</td>
<td>217 905</td>
<td>230</td>
<td>947</td>
</tr>
<tr>
<td>Portsmouth</td>
<td>214 832</td>
<td>40</td>
<td>5 371</td>
</tr>
<tr>
<td>Bournemouth</td>
<td>197 657</td>
<td>46</td>
<td>4 297</td>
</tr>
<tr>
<td>Peterborough</td>
<td>197 095</td>
<td>343</td>
<td>575</td>
</tr>
<tr>
<td>Southend-on-Sea</td>
<td>179 799</td>
<td>42</td>
<td>4 281</td>
</tr>
<tr>
<td>Thurrock</td>
<td>167 025</td>
<td>163</td>
<td>1 025</td>
</tr>
<tr>
<td>Poole</td>
<td>151 500</td>
<td>65</td>
<td>2 331</td>
</tr>
<tr>
<td>Isle of Wight</td>
<td>139 798</td>
<td>380</td>
<td>368</td>
</tr>
<tr>
<td>Torbay</td>
<td>133 883</td>
<td>63</td>
<td>2 125</td>
</tr>
<tr>
<td>Isles of Scilly</td>
<td>2 308</td>
<td>16</td>
<td>144</td>
</tr>
</tbody>
</table>

The Figure 3 allows us to see the distribution of the population of the English zone of the study according to the urban/rural classification established by the Office for National Statistics (Sidebar 1).
The urban/rural 2011 classification established by the Office for National Statistics establishes the classification of the districts as follows:

- **The predominantly rural districts**: it is districts where more than 80% of the population lives in cities of less than 10,000 habitants;
- **The largely rural districts**: it is districts where 50 to 79% of the population lives in cities of less than 10,000 habitants;
- **Urban districts with a significant part of rural zones**: it is districts where 26 to 49% of the population lives in cities with less than 10,000 habitants;
- **Urban districts with the presence of an agglomeration**;
- **Urban districts with the presence of a large conurbation**.

According to this classification, in 2011, more than a third of the population of the England Interreg zone (38.5%) lives in districts qualified as rural (against 18.43% of the population on the national scale in 2011).

**Figure 3. Distribution of the population in the rural and urban zones**


In addition, within the zone, the predominantly rural counties are Dorset (60%), Suffolk (60%), Norfolk (62%), Cambridgeshire (65%), Wiltshire (67%), Devon (70%), Somerset (71%), Cornwall (83%), Isles of Scilly and Isles of Wight (100%). We can see on Figure 4 that the main urban poles of the Interreg zone are located on the outskirts of Greater London.

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3 http://www.indexmundi.com/facts/united-kingdom/rural-population

4 These are counties where there is a majority of the population living in districts « predominantly » and « largely » rural.

5 The 6 authoritarian units are both a county and a non-metropolitan district. Also, the name « county » will be used to designate all the administrative units to facilitate reading.
SYNTHESIS

In general, at the scale of the France and England Interreg zone, we can see that the territories are intermediate with more rural territories for France and urban territories for England. On another hand, on the whole area, the territories are in majority densely populated.

Figure 4. Identification of urban poles of the England Interreg zone in 2011

Source: Office for National Statistics, 2011
3.2 An increasing population

At the scale of the France Interreg zone, the population has increased by 7% on the 2000 – 2016 period, against 10% at the national scale on the same period. The Figure 7 represents graphically the demographic evolution of the France Interreg zone between 2000 and 2016. In this zone, it should be noted that:

- Most of the departments have known an increase of their population inferior or equal to the average of the zone: This concerns Calvados (7%), the Finistère (6%), the English Channel (3%), the Oise (7%), the Pas-de-Calais (2%), the Seine-Maritime (3%) and the Somme (3%);
- Other departments have known a more significative increase, like the Côtes-d’Armor (10%), the Eure (11%), the Ille-et-Vilaine (15%) and the Morbihan (20%);
- The Orne is the only department that suffered a decline in its population, of the order of 3%.

For the 2009 – 2014 period, the noted evolutions in the departments of the France Interreg zone can be attributed:

- **To the variation of the natural balance**, which rises in average every year of 0,3% for the Calvados, 0,4% for the Eure, the Pas-de-Calais and the Seine-Maritime and 0,6% for Oise;
- **To the variation of the migratory balance**, whether it is positive as it is the case for the English Channel (0,1% average per year), the Finistère (0,3%), the Côtes d’Armor (0,4%) and the Morbihan and Ille-et-Vilaine (0,6%) or negative as it is the case for Orne (-0,3%);
- In the case of the Somme, the natural and migratory balance cancel each other, the first one being +0,2% and the second -0,2% per year, during the period.

---

6 Insee, (2016), « Estimation de population au 1er janvier, par département, sexe et grande classe d’âge »

7 In terms of evolution of natural and migratory balances, the data is not available for the same dates as the counting of the population. Source: Insee, (2016), « RP2009 et RP2014 ». 

At the national scale, it should be noted that the evolution of the population is mainly attributed to the positive evolution of the natural balance (+0.4% per year, during the period).

![Figure 7. Demographic evolution between 2000 and 2016 on the France Interreg zone](image)

Source: Insee - Estimations of the population (provisional results finalized at the end of 2016)

At the scale of the England Interreg zone, the population has increased of 12.7% on the 2000 – 2016 period (against 11% at the national scale for the same period\(^8\)). Within the studied zone, several profiles take shape:

- The majority of the counties have known an increase of their population similar to the average of the Interreg zone; Medway, West Sussex, Suffolk, Essex, Norfolk, East Sussex, Surrey, Somerset, Devon, Cornwall, Hampshire and Southend-On-Sea, which population increase between 2000 and 2016 is between 10 and 12.5%.

- Other counties present a demographic growth inferior to the average of the Interreg zone: Torbay (4.2% growth of its population for the given period), Isles of Wight (6.4%), Dorset (8.5%), Plymouth (9.3%), Poole and Isles of Scilly (9.5% each);

- Finally, Plymouth (14.4%), Brighton and Hove (16.6%), Southampton (17%), Thurrock (18%), Kent (16.4%), Cambridgeshire (18.2%), Swindon (21.3%) and Bournemouth (21.5%) have known a population growth rate superior to the average, and Peterborough is the county which population growth is the most significant with 25% increase for the period.

---

The demographic growth for most of the counties is mainly linked:

- **To the positive intern migratory balance.** This factor is particularly influent for the counties of the East Sussex (115%), Essex (53%), Devon (95%), Somerset (96%), Dorset (134%), West Sussex (66%), Cornwall (114%), Norfolk (62%), Suffolk (89%), Torbay (166%), Wiltshire (99%), Isles of Wight (190%) and of Southend-On-Sea (58%).

- **To the positive international migratory balance.** This factor is particularly influent for the counties of Brighton and Hove (96%), Plymouth (78,8%), Southampton (75,6%), Bournemouth (74%), Cambridgeshire (67%), Peterborough (63%), Portsmouth (61,7%) and of Surrey (60%).

Finally, in the case of Medway, Thurrock and Swindon it is the variation of the natural balance that mainly explains the total demographic variation, up to 71% in the first two cases and 147,5% for Swindon. For Plymouth, Cambridgeshire, Surrey and Peterborough, although it is not the most important factor, it remains determinant, representing respectively 45%, 47,5%, 46% and 54% of the global population growth.

**SYNTHESIS**

At the scale of the global Interreg zone, we can see that the English territories experience a rise in their population on the 2000 – 2016 period greater than the growth of the French territories.

Otherwise, we can see that for the English territories, the observed demographic variation is mainly due to a positive evolution of the migratory balance. Regarding the French territories, the departments of the region of Britain seem demographically more sensitive to the variation of the migratory balance, whereas for the rest of the France Interreg zone the growth of the natural balance is the main engine of the demographic evolution.
3.3 A structural ageing of the population

The question of the reception of the population should arise under the angle of the age pyramid: at the scale of the France Interreg zone, in 2016, the distribution of the population is balanced among the different age categories. This distribution follows, moreover, the one observed at the national scale.

Chart 3. Comparison board of the population structure by age groups at the Interreg and national scales for France in 2016

<table>
<thead>
<tr>
<th>Geographic zone</th>
<th>% of the population aged 0 to 19 years old</th>
<th>% of the population aged 20 to 39 years old</th>
<th>% of the population aged 40 to 59 years old</th>
<th>% of the population aged 60 to 74 years old</th>
<th>% of the population aged 75 and more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interreg</td>
<td>24,79</td>
<td>22,66</td>
<td>26,65</td>
<td>16,41</td>
<td>9,49</td>
</tr>
<tr>
<td>Metropolitan France and overseas France</td>
<td>24,29</td>
<td>23,96</td>
<td>26,58</td>
<td>15,89</td>
<td>9,27</td>
</tr>
</tbody>
</table>

In terms of evolution of the population structure, we can see that at the scale of the France Interreg zone, the proportion of the population aged over 60 is progressing significantly, going from 21% of the population in 2000 to 26% in 2016. Once more, this tendency is similar to the one observed at the national scale (21% in 2000 against 25% in 2016).

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9 Insee, (2017), « Estimation de population au 1er janvier, par département, sexe et grande classe d’âge »
Figure 11. Structure of the population by age groups on the France Interreg zone, in 2000 and in 2016


For the England interreg zone, in 2016, more than a quarter of the population is aged over 60 (26.6%), against 23% at the national level. The proportion of the population aged over 60 has significantly progressed between 2000 and 2016, going from 23% to 26.6%. This tendency is greater than at the national scale (21% in 2000 then 23% in 2016). For fourteen counties of the Interreg zone, the population over 60 is superior to the average observed in the zone: Hampshire (26.7%), Wiltshire (26.8%), Poole (27.8%), West Sussex (28.4%), Suffolk (28.7%), Norfolk (30%), Somerset (30.4%), Cornwall (31%), Devon (31%), East Sussex (31.6%), Isles of Scilly (32%), Torbay (32.7%), Isles of Wight (34%) and Dorset (35%).

Figure 12. Structure of the population by groups of age for the England Interreg zone, in 2000 and 2016

SYNTHESIS

At the scale of the global Interreg zone, the proportion of population over 60 progresses significantly.

3.4 An increase of small households (1 or 2 persons) strongly impacting the accommodation needs

Between 2001 and 2011, the France Interreg zone has seen the average number of persons per household decrease and the average number of households increase.

The number of households has indeed gone from 3 509 432 households in 2001 to 4 115 107 in 2014, therefore increasing by 17% (against 21% at the national scale). This evolution strongly impacts the accommodation needs on the territory. More specifically, between 2001 and 2014 the Morbihan and l’Ille-et-Vilaine have known an increase greater than that of the zone with respectively 20.76% and 21.64% increase on the period. On the opposite, the Orne is the department which increase of household number is the lowest, reaching 7.78% between 2001 and 2014.
In terms of household composition in the France Interreg zone, we can see that between 2001 and 2014, the proportion of small households has increased while in parallel, the one of the households with more persons has decreased. Indeed, for all the departments of the zone, the proportion of the single-person households has increased in average of 4.9 points, the one of households of 3 or 4 persons has decreased of 4.8 points in average. More precisely, the Figure 16 and the Figure 17 present, by department, the distribution of the households according to their size in 2001 and 2014.

**Figure 15. Evolution of the number of households between 2001 and 2014 in the French departments of the analyzed zone**


**Figure 16. Distribution of the households according to their size in 2001 at the scale of the France Interreg zone.**
A similar dynamic has been observed at the scale of the England Interreg zone, as the number of households went from 5 482 257 in 2001 to 5 941 476 in 2011 (dates of the two last population countings)\(^\text{10}\), therefore an increase of 8,4% (against 8% at the national scale).

The Figure 18 enables to get a detail of this increase per county. We can thus observe that the majority of the counties have experienced an increase of the number of households superior to the average of the zone: Swindon (+17,6%), Peterborough (+13,2%), Cambridgeshire (+12,7%), Bournemouth and Poole (+11,2%), Kent (+10,8%), Suffolk (+10,5%), Wiltshire (+9,9%), Portsmouth (+8,6%), Hampshire (+8,5%) and Norfolk (+8,4%)

In terms of household composition, the Figures 14 and 15 show that at the scale of the England Interreg zone, the proportion of small households has increased between 2001 and 2011, whilst the proportion of households with more habitants has decreased (+0.3 points for single-person households, -0.2 points for two-persons households, +0.1 points for households with 3 or 4 persons and -0.2 points for households with 5 or more habitants).

Thirteen counties have registered a rise higher than average from single-person households: Bournemouth and Poole and Swindon (+1.5 points each), Isle of Wight and Devon (+1.3 points each), Dorset and Hampshire (+1 point each), West Sussex (+0.8 points), Medway, Somerset and Kent (+0.7 points each), Torbay (+0.5 points) and finally Essex and Cambridgeshire (+0.4 points each).

**Figure 18. Evolution of the number of households between 2001 and 2011 for the different counties of the England Interreg zone**

Figure 19. Household distribution according to their size in 2001 at the scale of the England Interreg zone
At the scale of the global Interreg zone, the proportion of small households has increased along the last decades, while the average number of households has increased.
4. **Inventory of the residential park**

4.1 **Structure of the residential park**

4.1.1 A majority of principal residences

**France Interreg zone**

The France Interreg zone includes a total of **4 929 366 housings**, spread out in the following manner:

- **4 084 968 principal residences** (83%), that is, housings habitually occupied and primarily by one or more persons
- **485 805 secondary residences** and **occasional residences** (10%), that are housings used for weekends, leisure or holidays;
- **358 379 vacant residences** (7%) that are unoccupied housings (dilapidated building, for sale or renting for example).

![Figure 21. Structuration of the accommodation park at the scale of the France Interreg zone in 2013](image)

*Source: INSEE, 2013.*

The same distribution can be observed at the national scale, insofar as in France, in 2016, **35 425 000 housings** have been recorded with 82.3% of principal residences, 9.4% of secondary and occasional residences and 8.3% of vacant residences.

The proportion of principal residences is relatively homogeneous at the scale of the France Interreg zone: 6 departments are under the average observed at the scale of the zone (the Calvados, the Côtes-d'Armor, the Finistère, the English Channel, the Morbihan and the Orne), while the 6 others are over it (the Eure, the Ille-et-Vilaine, the Oise, the Pas-de-Calais, the Seine Maritime and the Somme). More precisely, the Calvados presents the lowest proportion of principal residences within its residential park (75.96%), while the Seine-Maritime is the department with the highest rate of principal residences, representing 89.35% of its residential park.

In terms of secondary and occasional residences, three littoral departments with natural amenities are above the average of the Interreg zone and above the French average (9%\(^{11}\)): the Morbihan (18% of secondary residences recorded on the integrity of the residential park). The Calvados (17.8%) and the Côtes-d'Armor (15.7%). On the opposite, the Oise and the Seine-Maritime, departments among the most densely populated of the zone, are under, with respectively 2.5% and 3.5% of their residential park consisting in secondary or occasional residences.

The France Interreg zone is slightly under the national average in terms of vacant housings (7.3% of the park, against 8% of the park in average at the national scale). The distribution of vacant residences partly expresses

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the lack of dynamism and attractivity in certain areas. The vacancy indeed mainly affects the small urban poles and to a smaller extent the isolated communes (Figure 22). The vacancy rate is particularly high in the Orne (10.4%), territory that is characterized by a lack of activity. On the opposite, the vacancy is particularly low on the littorals.

Figure 22. Distribution of the secondary and occasional residences (left) and vacant residences (right) in France, in 2014

England Interreg zone

The England Interreg zone of the study includes a total of 6 932 040 housings. The available data for the zone suggests a different housing typology. Indeed, the Eurostat data enables us to establish a distinction between:

- Occupied residences, defined as habitual residences of one or several persons at the moment of the census. This category is therefore similar to principal residences of the France Interreg zone;
- Unoccupied residences.

Thus, in 2011, for the Interreg zone, the majority of the housings are principal residences (95% of the residential park). This proportion is similar to the one obtained at the national scale at the same date (96%12).

Figure 23. Structuration of the residential park at the scale of the England Interreg zone in 2011
Source: Eurostat, 2015

Within the list, the different counties present as a whole the same trend. However, Cornwall and Isles of Scilly are an exception to the extent that the proportion of principal residences on these territories is weaker (89% of principal residencies for both territories, and the proportion of unoccupied residencies reaches therefore 10,25% of the residential park, this being almost three times more than the national average: 3,6%). Torbay

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12 Eurostat, (data updated in 2015), « Conventional dwellings by occupancy status, type of building at the NUT3 level ». 
and Dorset also present slightly lower proportion, with respectively 91.8 and 92.6% of the residential park consisting of principal residences.

4.1.2 A majority of homeowner occupants

*France Interreg zone*

In 2014, the majority of principal residences (61.5%) were occupied by their homeowners at the scale of the France Interreg zone.

![Figure 24. Principal residences by status of occupation for the France Interreg zone, in 2014](image)

Source: INSEE, 2014

More precisely, at the scale of the zone:

- The departments of the Côtes-d’Armor, the Finistère and the Morbihan present a high rate of principal residences occupied by their homeowners (respectively 71%, 69% and 68%);

- On the opposite, the Seine-Maritime, the Pas-de-Calais and the Calvados are three departments that are under the average obtained for the Interreg zone (respectively 53%, 57% and 57%).

If we consider a longer time frame, we can observe that at the national scale the proportion of household owners of their principal residence has increased continuously between 1980 and 2010 before stabilizing to reach 58% in 2016 (Figure 25). More precisely, the buyer owners represent a third of the owners. This proportion has strongly increased in the 1980s before decreasing until the mid-2000s and stabilizing (20.1% in 2016). The rise of the proportion of owners with no refund charge is mainly linked to the structural aging of the population.

Furthermore, the proportion of household tenants of their principal residence maintained itself at 39.7% between 1986 and 2016. The distribution between public and private lessors, for the principal housings of the residential park, is respectively of 17% and 23% in 2016.
The occupying property is the dominant model in almost all of France, its importance is strongly correlated with the degree of urbanization of the areas: it therefore represents a significant part of the principal residences in rural and peri-urban areas (Figure 26).

*Figure 26. Proportion of occupying owners in France, in 2014*

*Sources: CGET, 2017.*

**England Interreg zone**

**Status of ownership and occupation of the housings**

In 2015, at the national scale, the majority of housings was detained by private owners. More precisely, 62.7% of the housings were occupied by their owners.
This data is not available at the scale of counties. Indeed, for the counties, the exploitable data does not allow to distinguish, like in Figure 27 the owner-occupiers and the housings owned by a private owner; these two categories being reunited under the « private owners » category.

In 2016, for the England Interreg zone, the vast majority of housings (86.1% of the residential park of the zone) were owned by private owners\(^\text{13}\).

**Figure 28. Distribution of the housings at the scale of the England Interreg zone, by owner type, in 2016**

*Source: The Office for National Statistics, 2016 (provisional).*

**Status of ownership and occupation of households**

Another distinction can be made, this time in terms of households. We can thus distinguish the households:
- Owners,
- Partial owners\(^\text{14}\);
- Tenants of private housings;
- Tenants of social housings;
- Free accommodation.

---

\(^{13}\) For the England Interreg zone, it is possible to distinguish the housings suggested to renting by (i) private owners, defined as the group of goods non-occupied by the owner; (ii) the public owners, housings suggested by the housing associations for people in need (associations registered to the Housing and Community Agency (HCA), and the Unitary Authorities, that possess housings that can be rented (these are registered to the HCA).

\(^{14}\) Shared ownership system in the United Kingdom that consists for a household to buy a part of a residence, between 25% and 75%, and to rent the rest. The household has exclusive rights of habitation but shares the ownership of the good with another owner. See: ONS, « Affordable home ownership scheme »: [https://www.gov.uk/affordable-home-ownership-schemes/shared-ownership-scheme](https://www.gov.uk/affordable-home-ownership-schemes/shared-ownership-scheme)
In 2011 for the Interreg zone, the majority of households (68%) were owners of their housing (Figure 29). Southampton and Isles of Scilly are figure of exception at the perimeter scale, presenting a relatively low household owners rate (respectively 49.7% and 41.7%).

The available data at the national scale allows us to observe that the strong representation of household owners on the Interreg zone is also observed at the national level. Indeed, in 2016, in the United Kingdom, **63% of the households were owners of their residence**. Between 1980 and 2016, we can note that the proportion of tenant households of social housing has diminished, while the proportion of tenant households of private residences has risen.

In terms of geographic distribution, we can observe that the urban zones densely populated are characterized by a significant rate of tenants, as shown in Figure 31. The map on the left is a projection of the distribution of owners/tenants, at equal population, meaning resized proportionally according to the number of households by geographic zone. The second map shows the same data on a classic map, for comparison.
4.2 Comparison of the residential park structure between 1990 and 2014

4.2.1 A residential park increasing faster than at the national scale

France Interreg zone

At the France Interreg scale, the residential park per habitant has increased by 18,6% between 1991 and 2014, growth superior to that observed at the national scale (+14,8% on the same period). This trend is globally observed for all departments in the zone (the English Channel being the department having experienced the strongest growth, with a rate of 22,8%), only the departments of the Eure, Oise, and Ille-et-Vilaine having recorded a similar growth, or even lower, than that observed at the national scale (these departments have seen their residential park increase respectively by 12,2%, 14,5% and 15% on the period).

England Interreg zone

For the England Interreg zone, the data relative to the residential park at the scale of the county only go back to 2012 and are not available for the county of Wiltshire. However, if we look at the national trend, we find that the residential park per habitant has increased by around 4,4% from 1994 to 2014. At the scale of the Interreg zone (except Wiltshire), the residential park has grown by around 2,87% between 2012 and 2016. All counties for which the data is available, have known a weaker growth; these are Isles of Scilly (0,71%), Southend-on-Sea (0,98%) Portsmouth (1,61%) and Brighton and Hove (1,66%), and to the opposite Cambridgeshire (4,07%) and Peterborough (5,03%) have known a particularly marked growth.

4.2.2 A constant number of principal residences and an increasing number of vacant housings at the scale of the France Interreg zone

France Interreg zone


At the scale of the France Interreg zone, the number of principal residences has remained relatively stable on the 2001 – 2013 period. The Eure and the Oise are the two only departments which proportion of principal residences has increased along the period (+0,4 and +0,82 points of percentage respectively).

In parallel, the number of vacant housings has globally increased during the period (5,4% in 2001 against 7,3% in 2013). This increase has been particularly marked in the departments of the Orne (+3,59 points), the Pas-de-Calais (+2,24 points), the Eure, the Finistère and the English Channel (+2,05 points each).

It should also be noted that the departments of Côtes-d'Armor and Finistère have experienced a slight progression from secondary residences on their territory (+0,10 and +0,65 respectively). It is reminded that these two departments present amongst the highest secondary residences rate in 2013; respectively 15,7% and 13% of their residential park (the highest being the Morbihan with 18%).

![Figure 32. Structuration of the residential park at the scale of the France Interreg zone in 2001](image)

The same trend is observed at the national scale on the 2001 – 2013 period: the proportion of principal residences has remained relatively stable (82,96% in 2001 against 82,86% in 2013), whilst the proportion of vacant residences has increased (6,94% in 2001 against 7,75% in 2013), at the expense of the secondary residences park (10,1% in 2001 against 9,4% in 2013).

**England Interreg zone**

For the England Interreg zone, when we consider the data on the structuration of the residential park in 2001, we notice that the proportion of principal residences was slightly higher (96% in 2001 against 95% in 2011), and that that of unoccupied residences was lower (4,0% in 2001 against 4,5% in 2011).

![Figure 33. Structuration of the residential park at the scale of the England Interreg zone in 2001](image)

Within the zone, we notice that the proportion of principal residences was greater in 2001 for all the counties of the zone, except for Peterborough, that records an increase by 0,8 points (going from 95,6% to 96,4%), Portsmouth (+0,06 points), Bournemouth and Poole (+0,04 points) and Plymouth (+0,03 points).

15 Here, the category « unoccupied residences » groups both the vacant housings and secondary residences.
The counties of Cornwall and Isles of Scilly have recorded a marked decline of their principal residence park: -3.8 points each along the period (89% of the residential park of the territory in 2011, against 92.9% in 2011). The county of Torbay also records a marked drop (-3.25 points).

Regarding the vacant housings, it is difficult the adjudicate on their evolution as far as the data via Eurostat don’t use the same categorizations between 2001 and 2011\(^{16}\).

However, at the scale of England, the Figure 34 shows us that unlike the French territories, the total number of vacant housings tends to diminish since the early 2000s.

\[\text{Figure 34. Evolution of the number of vacant housings in England between 1989 and 2016} \]

Source: Local authority housing statistics returns, 2017.

Therefore, if we consider the Interreg zone, we notice that the French territories have more vacant housings than the English territories, proportionally to their respective residential parks.

\(^{16}\) The distinction between « secondary residences » and « vacant housings », established in 2001, has been modified to the benefit of the unique category « unoccupied residences » in 2011.
4.3 Housing typology

4.3.1 A majority of individual houses

**France Interreg zone**

The proportion of individual houses is of 71% in 2013 at the scale of the France Interreg zone, against 56% at the national scale.

![Figure 36. Typology of the housings at the scale of the France Interreg perimeter](image)

Source: INSEE, 2013

The Figure 37 presents the detail per department. We notice that for all the departments of the zone, more than half of the housings are individual houses. This proportion is particularly significant in the departments of Eure, Pas-de-Calais, English Channel, Somme, Côtes-d’Armor and Orne, where individual houses represent more than three quarters of the residential park.
For the English zone, a further distinction is made. Are therefore distinguished (Figure 38):

- **Individual houses**;
- **Semi-detached houses**: a semi-detached house possesses a common wall with another house;
- **Terraced houses**: a terraced house belongs to a row of similar houses, reunited by lateral walls;
- **Apartments**.

In total, the proportion of houses of the England Interreg zone is slightly superior to that of the France Interreg zone (81% in England, against 71% in France). Within the residential park the individual houses are predominant (38%), in front of the semi-detached houses (34%) and the terraced houses (28%).

**Figure 37. Detail of the typology of the residential buildings at the scale of the France Interreg zone**

Source: Eurostat, Accommodation per type of housing, building and region NUTS 3.

**England Interreg zone**

For the English zone, a further distinction is made. Are therefore distinguished (Figure 38):

- **Individual houses**;
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- **Terraced houses**: a terraced house belongs to a row of similar houses, reunited by lateral walls;
- **Apartments**.

In total, the proportion of houses of the England Interreg zone is slightly superior to that of the France Interreg zone (81% in England, against 71% in France). Within the residential park the individual houses are predominant (38%), in front of the semi-detached houses (34%) and the terraced houses (28%).

**Figure 38. Typology of the housings at the scale of the England Interreg perimeter**

The detail of the composition of the residential park per counties is presented in Chart 4. Only the counties of Bournemouth et Brighton & Hove have residential parks evenly distributed between houses and apartments. For all the other counties, the proportion of houses is significantly greater: it represents almost two thirds of the residential park in the case of the county of Southampton (60%), near three quarters or more in the other counties (71% for Isles of Scilly and up to 89% for the county of Wiltshire).

**Chart 4. Detail of the typology of principal residences at the scale of the France Interreg perimeter**


<table>
<thead>
<tr>
<th>Administrative authority</th>
<th>Houses</th>
<th>Apartments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Individual houses (or bungalow)</td>
<td>Semi-detached houses (or bungalow)</td>
</tr>
<tr>
<td>Bournemouth</td>
<td>26,989</td>
<td>31,0%</td>
</tr>
<tr>
<td>Brighton and Hove</td>
<td>12,897</td>
<td>10,2%</td>
</tr>
<tr>
<td>Cambridgeshire</td>
<td>93,644</td>
<td>36,0%</td>
</tr>
<tr>
<td>Cornwall</td>
<td>97,594</td>
<td>37,6%</td>
</tr>
<tr>
<td>Devon</td>
<td>123,207</td>
<td>35,2%</td>
</tr>
<tr>
<td>Dorset</td>
<td>79,079</td>
<td>40,5%</td>
</tr>
<tr>
<td>East Sussex</td>
<td>78,428</td>
<td>32,1%</td>
</tr>
<tr>
<td>Essex</td>
<td>183,880</td>
<td>30,4%</td>
</tr>
<tr>
<td>Hampshire</td>
<td>193,666</td>
<td>34,3%</td>
</tr>
<tr>
<td>Isle of Wight</td>
<td>23,164</td>
<td>34,2%</td>
</tr>
<tr>
<td>Isles of Scilly</td>
<td>442</td>
<td>31,8%</td>
</tr>
<tr>
<td>Kent</td>
<td>159,426</td>
<td>25,1%</td>
</tr>
<tr>
<td>Medway</td>
<td>15,031</td>
<td>13,6%</td>
</tr>
<tr>
<td>Norfolk</td>
<td>154,210</td>
<td>38,3%</td>
</tr>
<tr>
<td>Peterborough</td>
<td>20,851</td>
<td>27,1%</td>
</tr>
<tr>
<td>Plymouth</td>
<td>12,220</td>
<td>10,8%</td>
</tr>
<tr>
<td>Poole</td>
<td>26,101</td>
<td>39,2%</td>
</tr>
<tr>
<td>Portsmouth</td>
<td>3,667</td>
<td>4,1%</td>
</tr>
<tr>
<td>Somerset</td>
<td>77,435</td>
<td>32,3%</td>
</tr>
<tr>
<td>Southampton</td>
<td>13,336</td>
<td>13,2%</td>
</tr>
<tr>
<td>Southend-on-Sea</td>
<td>12,512</td>
<td>15,8%</td>
</tr>
<tr>
<td>Suffolk</td>
<td>114,335</td>
<td>34,8%</td>
</tr>
<tr>
<td>Surrey</td>
<td>155,969</td>
<td>32,9%</td>
</tr>
<tr>
<td>Swindon</td>
<td>19,273</td>
<td>21,1%</td>
</tr>
<tr>
<td>Thurrock</td>
<td>7,609</td>
<td>11,9%</td>
</tr>
<tr>
<td>Torbay</td>
<td>14,088</td>
<td>21,9%</td>
</tr>
<tr>
<td>West Sussex</td>
<td>107,608</td>
<td>29,9%</td>
</tr>
<tr>
<td>Wiltshire</td>
<td>70,890</td>
<td>35,1%</td>
</tr>
</tbody>
</table>

### 4.3.2 A majority of large houses

**France Interreg zone**

The France Interreg zone has a large park of large houses: Near half of the housings (44%) has indeed at least five rooms (the proportion of large houses varies from 35% in Seine-Maritime to 50% for the Côtes-d’Armor and the Finistère).
The average size of the households of the territories is located around 2.4, and this average tends to decrease over time, the housing supply seems relatively disconnected from the needs and characteristics of the population. This gap is not specific to the territory but is a real problem at the national scale, linked to the reduction of the size of the households under the combined effect of the aging of the population and the decohabitation (celibacy, divorce, single parent families, etc.).

**England Interreg zone**

For the English zone, the distinction is made in terms of number of rooms per residence. The **England Interreg zone is also characterized by a park of large houses**, while more than a third of the housing (40%) have 3 rooms or more. This fact is observed for all counties of the zone, except the counties of Brighton and Hove and Bournemouth, where the majority of the households have a house with 2 rooms (respectively 32.2% and 35.8%).

It should be noted that the average size of the households of the territory was around 2.3 persons in 2011\(^{17}\).

**Figure 39. Number of principal residences according to the living area at the scale of the France Interreg zone**

Source: INSEE, 2014.

**Figure 40. Distribution of households according to the number of rooms per housing at the scale of the England Interreg zone**


**4.3.3 A majority of old houses**

**France Interreg zone**

More than a third of the principal residences of the France Interreg zone (38%) has been constructed before the first 1974 thermal regulation. The proportion of apartments constructed before 1970 is particularly high at the scale of the zone (42%).

\(^{17}\) Office for National Statistics, 2011.
**Figure 41. Proportion of principal residences constructed per period at the scale of the France Interreg zone**

Source: INSEE, 2013.

**England Interreg zone**

The residential park of the United Kingdom is relatively old because the majority of the housings (56%) has been built before 1965, dates of the first thermal regulation.\(^\text{18}\)

**Figure 42. Proportion of the constructed housings per period at the scale of the United Kingdom, in 2015**


The Figure 43 makes us notice that it is particularly true for the private park. Indeed, the majority of homeowner housings have been built before the 1980s. For the residential park of the public sector, we notice that the majority of the housings have been built during the 1945-1980 period.

\(^{18}\) Department of Energy & Climate Change; United Kingdom housing energy fact file: 2013.
It is now interesting to consider the construction of housing per geographic zone and over time. At the scale of the counties of the Interreg zone, the data on the construction of housing only goes back to 2005. However, it is possible to analyze the data at the scale of England as a whole, and the Chart 5 highlights that the majority of the housing built in an urban area are old buildings, and therefore likely to be less energy efficient; 43.5% have been built before 1919. The same goes for those built in a rural area (57.8% built before 1919). In these areas, a smaller proportion of housing has been built after 1965 (31.6% in an urban area and 20.6% in a rural area). On the other hand, for the peri-urban areas, the strongest construction period concerns the 1945-1980 period (70% of the constructions of the period have been lead in these zones).

**Chart 5. Number of housing in England according to their construction date and their location**

Source: BRE, the age and construction of English homes: a guide to ageing the English housing stock, 2014.

<table>
<thead>
<tr>
<th>Year of construction</th>
<th>In a urban area</th>
<th>In a peri-urban area</th>
<th>Village</th>
<th>In an isolated rural area</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 1850</td>
<td>135</td>
<td>96</td>
<td>322</td>
<td>192</td>
<td>744</td>
</tr>
<tr>
<td>1850–1899</td>
<td>953</td>
<td>785</td>
<td>281</td>
<td>134</td>
<td>2153</td>
</tr>
<tr>
<td>1900–1918</td>
<td>971</td>
<td>775</td>
<td>158</td>
<td>63</td>
<td>1967</td>
</tr>
<tr>
<td>1919–1944</td>
<td>658</td>
<td>2670</td>
<td>332</td>
<td>61</td>
<td>3751</td>
</tr>
<tr>
<td>1945–1964</td>
<td>511</td>
<td>3168</td>
<td>634</td>
<td>84</td>
<td>4397</td>
</tr>
<tr>
<td>1965–1980</td>
<td>690</td>
<td>3144</td>
<td>714</td>
<td>54</td>
<td>4602</td>
</tr>
<tr>
<td>1981–2002</td>
<td>532</td>
<td>2407</td>
<td>645</td>
<td>66</td>
<td>3650</td>
</tr>
<tr>
<td>2003–2010</td>
<td>274</td>
<td>636</td>
<td>192</td>
<td>19</td>
<td>1122</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4724</td>
<td>13710</td>
<td>3278</td>
<td>673</td>
<td>22386</td>
</tr>
</tbody>
</table>
4.3.4 A majority of housing relatively inefficient on an energetic level

France Interreg zone

The residential park of the France Interreg zone is relatively inefficient: 83% of the individual houses, 81% of the apartments and 55% of the collective houses\(^{19}\) have an energy efficiency label inferior or equal to the class D (229\(\text{kWh}_{\text{ep}}/\text{m}^2/\text{year} > \text{class D} > 150\text{kWh}_{\text{ep}}/\text{m}^2/\text{year})$.

\(^{19}\) The « Grenelle 2 » law has introduced the collective DPE concept, replacing the individual DPE for buildings equipped with collective heating. The collective DPE can replace an individual DPE in the case of a sale or rental; there is therefore only one DPE for condominiums, instead of a DPE per housing. Source: « DPE collectif et audit énergétique obligatoire », See: [http://www.coproprieterre.org/comprendre/la-reglementation/copropriete/](http://www.coproprieterre.org/comprendre/la-reglementation/copropriete/)
Figure 45. Energetic efficiency of residential parks at the Interreg and national scales, in the view of the collected DPE, in 2015


England Interreg zone

The United Kingdom has a residential park amongst the least efficient of Europe\textsuperscript{20}: more than 82\% of the housings display energy efficiency equivalent to class D, or lower efficiency (> 230kWhep/m\textsuperscript{2}/year).

The relative seniority of the residential park has repercussions in terms energy efficiency. We notice thanks to the Figure 46 that the housings concerned by a lower energy efficiency are mainly homeowners or private rental residences, that are principally built before 1980 (Figure 43), while the proportion of social housings labelled A, B or C is greater than for the other housing categories.

\textsuperscript{20} IDDRI, 2014. \textit{The British Green Deal: What teachings for the renovation policy of the housings in France}
At the scale of the England Interreg zone, we notice that in 2015 near a third (31.9%) of the housings were noted D (Figure 47). Only 13.1% of the housings are noted A or B, corresponding to almost the same proportion than for the very low performance housings noted F and G (11.4%).

More specifically, during the first trimester of 2017, the average energy consumption reached 261.11 kWh/m², corresponding to an E label. We can find a similar energy performance for the houses (250.14 kWh/m², being...
also an E label), and lower for the apartments (433.13 kWh/m², that is a F label). Thus, the residential park of the Interreg zone seems representative of the low performance observed at the national scale.

4.3.5 A park of social accommodation relatively constant over time

France Interreg zone

At the scale of the France Interreg zone, the social housings park represented 14.4% of the residential park in 2014, a relatively constant number since 2012. This number was then above the national French average (13.7%).

Within the zone, we can notice that:

- **Three departments have a relatively small social housings park**: in the Côtes-d’Armor, the Finistère and the Morbihan, the social housings park represented respectively 6%, 8.6% and 7.7% of the residential park in 2014;

- **Three departments had a social housings park greater than the average**: in the Oise, the Pas-de-Calais and the Seine-Maritime, the social housings park represented respectively 17.5%, 22.7% and 21.9% of the residential park in 2014.

**Figure 48. Comparisons of the number of social housings in the French departments**

Source: Minister in charge of housing, Repertoire of rental housing of social lessors, INSEE – Population estimations, 2015

In 2014, at the scale of the zone, the majority of the social housings (69%) were collective housings, a weaker proportion than at the national scale (84%). Only the Pas-de-Calais department is characterized by a predominance of individual social housings (57.2%).

At the end of 2015, more than 1.8 million of housing demands were recorded in France. For the Interreg zone, this figure reaches 209 301 demands²¹. **Three departments capitalize near half of the social housing demands in the Interreg zone**: the Ille-et-Vilaine (10.8%), the Pas-de-Calais (19%) and the Seine-Maritime (17.6%).

²¹ Ministère de la cohésion des territoires, (2017), « Chiffres clés sur la demande de logement social ». 
In 2015, 84,406 households were accommodated in social housings at the scale of the Interreg zone (representing 40% of the recorded demands). Furthermore, in 2015, the satisfied demands were demands which average age was 9 months (against 13 months at the national scale). This number was more significant for the departments of the Calvados (13 months), the Somme and l’Ille-et-Vilaine (11 months) and finally the Morbihan (10 months).

**England Interreg zone**

The data relative to the number of households accommodated in social housings is not available at the scale of the county.

At the national scale, the percentage of the population living in social housings has diminished since the 1980s, going from near 35% in the 1980s to 16% in 2011.

![Figure 49. Proportion of the English population living in social housings](source)

Otherwise, in 2014, the social housing tenants in the United Kingdom are mainly households with low incomes, inferior to half of the national average, namely because of a high unemployment rate characteristic to these households. Furthermore, it concerns mainly single people or single parent families.

### 4.4 Profile of the housings: typological matrices available on national scales

No typological analysis of building has been identified in the literature at a local scale. In fact, the typological analysis of the built park is available on a national scale, for France and England.

**France**

The study of the PACTE program offers a typology of the detached French houses (Figure 50). The park of detached houses has been split in three big construction periods, a separation that is explained both by the evolution of the construction modes and by the evolution of the thermal regulations. The energy weight of the buildings built after 2000 has been considered not a priority in the PACTE study, that does not offer a characterization for this profile of housing.

The « old » houses (i.e. built before 1948) represent 39% of the park of French detached houses. Within this category, the town houses are more strongly represented, just ahead the rural houses and the suburban pavilions. The pavilions « recent and non-isolated » built between 1948 and 1947 represent 23% of the park.
of French detached houses. The « recent and isolated » pavilions, built after 1974, represent 37% of the detached houses.

Figure 50. Identification of the types of detached houses present in the residential French park
Source: PACTE Program - Detailed analysis of the residential park existing July 2017 – 2.0 Version

The different types of detached houses are presented as follows:

- **« Old » - before 1948:**
  - **Rural house**: Built before 1914, the rural houses are located in rural zones (outside rural villages);
  - **Burgher house**: Built before 1914, the burgher houses are located in rural villages and urban areas (center of medium or big towns);
  - **Town house**: Built before 1914, the town houses are located in the rural villages and urban areas (old center of small, medium and large towns);
  - **Eclectic villa**: Built before 1948, the eclectic villas are located in rural towns and urban areas (old center of small, medium and large towns);
  - **Suburban pavilion**: built before 1948, the suburban pavilions are located in rural villages or in urban areas (medium or large towns). The suburban pavilions have an average surface of 50m²;

- **« Recent and non-isolated » 1948 – 1974:**
  - **Reconstruction pavilion**: Built between 1948 and 1967, the reconstruction pavilions are located in urban and rural areas (outside the old center). The reconstruction pavilions have an average surface of 75 to 94 m²;
  - **1968 – 1974 pavilion**: These pavilions are located in rural areas or on the outskirts of urban areas. These pavilions have a surface of at least 95m².

- **« Recent and isolated »:**
  - **Pavilions**: The pavilions are located in rural areas or on the outskirts of urban areas. The pavilions built from 1975 are characterised by the existence of thermal insulation, unlike other buildings:
    - Pavilion 1975-1981: R=2,3 for vertical walls; R=4,8 insulation under inclined surfaces
    - Pavilion 1982-1989: R=2,4 for vertical walls; R=4,8 insulation under inclined surfaces
    - Pavilion 1990-2000: R = 3,0 for vertical walls; R=6,0 Insulation under woodwork, inclined surfaces or on high floor
The same segmentation exercise has been carried out for the buildings of collective housings (Figure 51). The « old » buildings (i.e. built before 1948) represent 29% of the French collective buildings park. Within this category, the town building and the Haussmann or assimilated type buildings are the most strongly represented. The « recent and non-isolated » buildings, built between 1948 and 1947, represent 41% of the French collective buildings park. The « recent and isolated » buildings built after 1974 represent 32% of the French collective buildings park.

Figure 51. Identification of the families of collective building present in the residential park

Source: PACTE Program – Detailed analysis of the residential park existing July 2017 – 2.0 Version

The different types of collective buildings are represented as follows:

- **« Old » - before 1948:**
  - **Town building:** Built before 1914, the town buildings are present in rural villages and in historic centers of small, medium and large towns
  - **Haussmann and assimilated building:** built before 1948, the Haussmann and assimilated buildings are present in the center of large cities
  - **Eclectic building:** Built before 1948, the eclectic buildings are present in small, medium and large towns
  - **Low-cost housing type building:** Built before 1948, the low-cost housing type buildings are present in large towns.

- **« Recent and non-isolated » - 1948 – 1974:**
  - **Pastiche building:** built between 1948 and 1967, the pastiche buildings are present in the city centers and in small towns;
  - **Building « bourgeois »:** Built between 1948 and 1967, the « bourgeois » buildings are present in large towns;
  - **1968 – 1974 Intermediate housing:** The intermediate housings are present in urban areas;
  - **1948 – 1974 Small diverse collectives:** the diverse « small collectives » are principally present in urban areas;
  - **1948 – 1974 « Bar »:** These « bars » are only present in Priority Urban Development Zones of very large cities;
  - **1948 – 1974 towers:** The towers are punctually present in very large cities.
• « Recent and isolated »:
  o 1975 – 1981 intermediate habitat: The intermediate buildings are present in urban areas. The ones built between 1975 and 1981 are characterized by a thermal insulation corresponding to R=2,3 for vertical walls, R=2,3 for the lofts and 1,4 for the terraced roofs;
  o 1975 – 1981 Small diverse collectives: These small collectives are mainly present in urban areas. The small collectives built between 1975 and 1981 are characterized by a thermal insulation equivalent to R=2,3 for vertical walls, R=3,2 for lofts and 1,4 for terraced roofs;
  o 1975 – 1981 « Bars »: These « bars » are only present in Priority Urban Development Zones of very large cities. The « bars » built between 1975 and 1981 are characterized by a thermal insulation equivalent to R=2,3 for vertical walls and 1,4 for terraced roofs;
  o 1975 – 1981 Towers: The towers are punctually present in very large towns. The towers built between 1975 and 1981 are characterized by a thermal insulation equivalent to R=2,3 for vertical walls, and 1,4 for terraced roofs;
  o 1982 – 1989 Buildings: These buildings are located in urban or little urbanized areas. The buildings built between 1982 and 1989 are characterized by a thermal insulation equivalent to R=2,4 for vertical walls, R=4,8 for lofts and 1,7 for terraced roofs;
  o 1990 – 2000 Buildings: These buildings are located in urban or little urbanized areas. The buildings built between 1990 and 200 are characterized by thermal insulation equivalent to R=3,0 for vertical walls and R=6,0 for high floors and roofs.

Most of the individual or collective housings dating before 1914 are built with local stones, rubble, cut stone, or solid terracotta bricks, hung with aerated lime.

The walls of the residences built until 1948 are mainly heavy continuous (solid bricks or rubble). If the buildings with concrete structure and brick, rubble, millstone filling have appeared in France since the end of the 19th century, these have stayed very marginal until 1948.

Between 1949 and 1962, the construction of heavy walls stays predominant, but the concrete framework (with a filling of rubble or plastered bricks) has progressively developed itself (a study carried out in 1981 estimates that the concrete framework represents 20% of the constructions of the period). The prefabricated systems start to develop themselves, mostly in the collective habitats, with the use of shuttered walls and concrete panels on concrete framework.

The walls of accommodation built until 1962 are not originally insulated.

In the 1981 – 1989 period, the thermal regulation was executed in a more systematic manner, and the reported insulation of walls becomes common. The concrete walls, cement block, hollow brick, with insulated doubling characterize the whole construction of walls, in individual or collective habitat. The use of prefabricated systems knows a strong decline, linked to the diminishment of costs of implementation of cement, shuttered walls or concrete block products.

On the 1990 – 2000 period, the use of concrete (agglomerated or shuttered blocked) is predominant. The hollow bricks (more performant than those developed in mid-century) know a new popularity.

England

As presented in the Figure 52, the majority of the housings dating from before 1850 have been built in solid masonry walls (brick, stone, flint, cob), or have a wooden framework.

At the Victorian time, the industrialization of the brick and carpentry production combined with the rail transport, has standardize the constructive systems and the construction materials used. This period has
been dominated by the construction of solid masonry walls, typically standard bricks manufactured in the factory.

The hollow masonry walls have been introduced after first World War and developed themselves rapidly to become the most common wall construction type. Since the 1990s, the hollow masonry walls have doubled of one insulant layer. The BRE study estimated that about 30% of the masonry walls built before the 1990s have since been insulated.

After the second World War, because of the significant need of reconstruction, new construction techniques have been adopted, namely by the local authorities and other public institutions. These new methods (namely some prefabrication procedures) have however lead to defaults. Following an analysis of these defaults lead in the early 1980s by the Building Research Establishment (BRE), the Government has established in 1984 a support for owners that had involuntarily bought goods identified as « defective » to a public authority (Housing Defects Act). The local authorities have estimated that the owners of more than 30 000 residences were eligible to this device. In February 1994, 90% of the eligible owners have benefited from support from this program.

Concrete (poured, prefabricated) has become the predominant structural material for large buildings after the Second World War. The steel also tends to be more and more used in large buildings. The BRE also notes that the wooden framework construction tends to develop itself again (this one is generally not apparent).

![Figure 52. Housings per age and type of construction, 2010](source: BRE, 2014. The age and construction of English homes. A guide to ageing the English housing stock.)
5. Dynamics of the new construction

France Interreg zone

After a long fallback period, first signs of recovery have been observed in the construction sector in France. In a year, from November 2016 to October 2017, 503 700 housings have been authorized for construction and 418 300 housings have been started, which is an increase by respectively 12,4% and 17,2% compared to the accumulation of the twelve previous months. This growth followed a strong contraction of the activity lead off in 2009. The impact of the crisis remained consequent at the end of 2015, with levels of construction still very far from those observed at the highest point of the sectors activity in 2006-2007 (Figure 53).

![Construction variations in France since 2000](image)

**Figure 53. The construction variations in France since 2000**

Sources: Housing score 2015 according to SOeS estimations Sit@del2, housings started at the real date (situation at the 4th semester); Insee, population estimations on 1st January

The construction index is at its highest mainly for areas of high demographic growth, to absorb the migration flow and answer to the endogenous needs of the population (decohabitation, park renewal, etc.). The level of the construction index is however not systematically correlated to the evolution of the population. In some intercommunities, the growth of the park is mainly justified by the construction of secondary residences destined to vacationers.

At the scale of the France Interreg zone, the construction index is particularly high in most of the intercommunities of the Atlantic littoral (Figure 54). The construction index is quite low in Britain and in the Orne, territories that record a low demographic growth and that are characterized by a lack of attractiveness.

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On the 2014 – 2016 period, the France Interreg zone has recorded a fallback in the number of housings authorized for construction of more than 20% compared to the 2011 – 2013 period. The proportion of individual housings authorized for construction remained relatively stable over these two periods (about 60%).

**Chart 6. Comparison of the number of authorized housings on the 2011 – 2013 and 2014 – 2016 periods**

<table>
<thead>
<tr>
<th></th>
<th>2011 - 2013</th>
<th>2014 - 2016</th>
<th>Evolution Per.1 - Per.2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Individual</td>
<td>Collective</td>
<td>Residence</td>
</tr>
<tr>
<td><strong>Interreg France</strong></td>
<td>100 293</td>
<td>60 080</td>
<td>9 478</td>
</tr>
<tr>
<td><strong>Entire France</strong></td>
<td>587 224</td>
<td>621 291</td>
<td>83 748</td>
</tr>
</tbody>
</table>

The most dynamic departments in terms of authorized housings on the 2011 – 2016 period are the Ille-et-Vilaine, Seine-Maritime and Pas-de-Calais departments (Chart 7).
Chart 7. Number of housings authorized for construction on the 2011 – 2016 period at the scale of the France Interreg perimeter

Source: Sit@del2 – Data relative to the construction of housings

<table>
<thead>
<tr>
<th>Department</th>
<th>Number of authorized housings on the 2011 – 2016 period</th>
<th>Proportion in the France Interreg zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ille-et-Vilaine</td>
<td>50 588</td>
<td>17%</td>
</tr>
<tr>
<td>Seine-Maritime</td>
<td>42 381</td>
<td>14%</td>
</tr>
<tr>
<td>Pas-de-Calais</td>
<td>36 966</td>
<td>12%</td>
</tr>
<tr>
<td>Morbihan</td>
<td>29 760</td>
<td>10%</td>
</tr>
<tr>
<td>Calvados</td>
<td>28 208</td>
<td>9%</td>
</tr>
<tr>
<td>Finistère</td>
<td>27 649</td>
<td>9%</td>
</tr>
<tr>
<td>Oise</td>
<td>20 557</td>
<td>7%</td>
</tr>
<tr>
<td>Côtes-d’Armor</td>
<td>19 301</td>
<td>6%</td>
</tr>
<tr>
<td>Somme</td>
<td>15 949</td>
<td>5%</td>
</tr>
<tr>
<td>Eure</td>
<td>15 802</td>
<td>5%</td>
</tr>
<tr>
<td>Manche</td>
<td>12 379</td>
<td>4%</td>
</tr>
<tr>
<td>Orne</td>
<td>3 967</td>
<td>1%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>303 507</td>
<td></td>
</tr>
</tbody>
</table>

In 2015, 36 774 housings have been started at the scale of the France Interreg zone, that is 4 housings for 1 000 habitants in average (against 5,2 at the national scale). The started housings are mainly pure individual housings (41,2%) and collective housings (40,7%).

The most dynamic departments in terms of start of construction are Ille-et-Vilaine (7 housings started for 1 000 habitants), the Morbihan (4,7 housings), the Calvados (4,6 housings) and the Seine-Maritime (4,4 housings).

Chart 8. Number of housings started per type and per department, in 2015

Source: Sit@del2 – Data relative to the construction of housings

<table>
<thead>
<tr>
<th>Department</th>
<th>Number of pure individual housings started</th>
<th>Number of grouped individual housings started</th>
<th>Number of collective housings started</th>
<th>Number of housings in residence started</th>
<th>Total number of housings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Côtes-d’Armor</td>
<td>1 337</td>
<td>281</td>
<td>415</td>
<td>5</td>
<td>2 038</td>
</tr>
<tr>
<td>Fินistère</td>
<td>1 761</td>
<td>522</td>
<td>1 006</td>
<td>194</td>
<td>3 483</td>
</tr>
<tr>
<td>Ille-et-Vilaine</td>
<td>2 141</td>
<td>530</td>
<td>4 298</td>
<td>417</td>
<td>7 386</td>
</tr>
<tr>
<td>Morbihan</td>
<td>1 832</td>
<td>323</td>
<td>1 142</td>
<td>264</td>
<td>3 561</td>
</tr>
<tr>
<td>Pas-de-Calais</td>
<td>1 547</td>
<td>799</td>
<td>1 196</td>
<td>148</td>
<td>3 690</td>
</tr>
<tr>
<td>Oise</td>
<td>719</td>
<td>289</td>
<td>971</td>
<td>88</td>
<td>2 067</td>
</tr>
<tr>
<td>Somme</td>
<td>744</td>
<td>219</td>
<td>809</td>
<td>401</td>
<td>2 173</td>
</tr>
<tr>
<td>Calvados</td>
<td>1 096</td>
<td>368</td>
<td>1 781</td>
<td>0</td>
<td>3 245</td>
</tr>
<tr>
<td>Manche</td>
<td>1 025</td>
<td>116</td>
<td>135</td>
<td>0</td>
<td>1 276</td>
</tr>
<tr>
<td>Orne</td>
<td>263</td>
<td>26</td>
<td>94</td>
<td>7</td>
<td>390</td>
</tr>
<tr>
<td>Eure</td>
<td>1 038</td>
<td>306</td>
<td>416</td>
<td>60</td>
<td>1 820</td>
</tr>
<tr>
<td>Seine-Maritime</td>
<td>1 650</td>
<td>502</td>
<td>2 717</td>
<td>776</td>
<td>5 645</td>
</tr>
<tr>
<td>TOTAL France Interreg zone</td>
<td><strong>15 153</strong></td>
<td><strong>4 281</strong></td>
<td><strong>14 980</strong></td>
<td><strong>2 360</strong></td>
<td><strong>36 774</strong></td>
</tr>
</tbody>
</table>
The English construction sector has also known a long fallback period consecutive to the 2008 economic and financial crisis. Despite the fluctuations, the number of started and finished housings progressively increases since 2010 (Figure 55).

![Graph showing started and finished housings per trimester in the United Kingdom]

**Figure 55. Average number of started and finished housings per trimester, in the United Kingdom**


At the scale of the England Interreg zone, **45 140 housings have been started in 2016** (29,3% of the housings started in England), and **40 730 housings have been finished** (28,9% of the finished housings in England). In average, this is 3,1 housings for 1 000 habitants that have been started at the England Interreg zone (against 2,8 in average at the scale of England), and 2,8 housings for 1 000 habitants have been finished (against 2,5 in average at the scale of England).
Chart 9. Number of started housings and finished housings in 2016

Source: Department for Communities and Local Government; August 2017. Live tables on house building: new build dwellings.

<table>
<thead>
<tr>
<th>County</th>
<th>Started housings</th>
<th>Finished housings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kent</td>
<td>5 520</td>
<td>4 660</td>
</tr>
<tr>
<td>Hampshire</td>
<td>4 490</td>
<td>4 220</td>
</tr>
<tr>
<td>Essex</td>
<td>4 210</td>
<td>3 850</td>
</tr>
<tr>
<td>Devon</td>
<td>3 440</td>
<td>3 190</td>
</tr>
<tr>
<td>West Sussex</td>
<td>3 570</td>
<td>2 980</td>
</tr>
<tr>
<td>Norfolk</td>
<td>3 200</td>
<td>2 740</td>
</tr>
<tr>
<td>Surrey</td>
<td>2 390</td>
<td>2 590</td>
</tr>
<tr>
<td>Somerset</td>
<td>1 960</td>
<td>2 110</td>
</tr>
<tr>
<td>Cambridgeshire</td>
<td>2 960</td>
<td>2 080</td>
</tr>
<tr>
<td>Wiltshire UA</td>
<td>2 160</td>
<td>1 930</td>
</tr>
<tr>
<td>Cornwall UA</td>
<td>1 890</td>
<td>1 600</td>
</tr>
<tr>
<td>Suffolk</td>
<td>1 840</td>
<td>1 580</td>
</tr>
<tr>
<td>Dorset</td>
<td>980</td>
<td>990</td>
</tr>
<tr>
<td>Swindon UA</td>
<td>1 120</td>
<td>920</td>
</tr>
<tr>
<td>East Sussex</td>
<td>1 180</td>
<td>920</td>
</tr>
<tr>
<td>Peterborough UA</td>
<td>730</td>
<td>760</td>
</tr>
<tr>
<td>Plymouth UA</td>
<td>670</td>
<td>760</td>
</tr>
<tr>
<td>Thurrock UA</td>
<td>430</td>
<td>680</td>
</tr>
<tr>
<td>Torbay UA</td>
<td>350</td>
<td>290</td>
</tr>
<tr>
<td>Portsmouth UA</td>
<td>290</td>
<td>280</td>
</tr>
<tr>
<td>Isle of Wight UA</td>
<td>250</td>
<td>270</td>
</tr>
<tr>
<td>Poole UA</td>
<td>180</td>
<td>270</td>
</tr>
<tr>
<td>Southend-on-Sea UA</td>
<td>210</td>
<td>240</td>
</tr>
<tr>
<td>Southampton UA</td>
<td>300</td>
<td>240</td>
</tr>
<tr>
<td>Medway UA</td>
<td>430</td>
<td>220</td>
</tr>
<tr>
<td>Bournemouth UA</td>
<td>180</td>
<td>200</td>
</tr>
<tr>
<td>Brighton and Hove UA</td>
<td>210</td>
<td>160</td>
</tr>
<tr>
<td>Isles of Scilly UA</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>England Interreg zone</strong></td>
<td><strong>45 140</strong></td>
<td><strong>40 730</strong></td>
</tr>
<tr>
<td><strong>England</strong></td>
<td><strong>154 280</strong></td>
<td><strong>140 840</strong></td>
</tr>
</tbody>
</table>

The most dynamic counties in terms of start of construction are Swindon (5.1 start of construction for 1 000 habitants), Cambridgeshire (4.5), Wiltshire (4.4), Devon (4.4) and West Sussex (4.2). The most dynamic counties in terms of construction are Swindon (4.2 finished housings for 1 000 habitants), Devon (4.1) and Thurrick (4.1).
Conclusion

6.1 Renovation - rehabilitation

The residences of the France and England Interreg zone are mainly old and rather energy inefficient (these are less performant than the national average).

In France and in England, the building sector represents a significant reservoir of energy economies and constitutes one of the main targets of the public policies of fight against global warming.

In France, various financial devices have been established by the State and several collectivities with the objective to encourage and support the execution of energy efficiency work in the building sector, such as the zero interest eco-loan25 (écop PTZ) or the Energy Transition Tax Credit26. The households can besides be supported in their procedure for the energy efficiency of their building through Energy Info Areas, among the 251 existing in the whole French territory27, and through Territorial Platforms on the Energy Renovation (103 existing in France).

Regulatory dispositions have recently been adopted in order to make some thermal renovation works mandatory. In the collective residential, a decree published on the 30th May 2016 now obliges the condominium trustees to carry out insulation works in case of so-called current work: façade renovation, roof repair, arrangement of premises to make them habitable.

Linked to these different levers, the French Building Federation (FFB) anticipates a slight growth of the maintenance and improvement market in 2015 – 202128.

In the United Kingdom, the Green Deal is a British Government measure integrated in the 2011 Energy Act aiming to promote the energy renovation of the housings. Officially launched in January 2013, the Green Deal is based on a mechanism of third-funding and on the following golden rule: the borrowed funds for the housing renovation are directly reimbursed by the energy economies generated on the bills. Near 25 types of works are eligible to the Green Deal, decomposed in 5 categories: heating, hot water, insulation, doors and windows, micro-generation and renewable energies. In order to fund the more significant renovation works, the Program Energy Company Obligation (ECO)29 intervenes in addition to the Green Deal.

Several specificities of the France and England Interreg zone are to take into account to anticipate the future dynamic in matters of renovation and insulation material needs:

- **The specificity of the high proportion of individual houses in France and England** (Figure 56)
  This proportion is even higher at the scale of the Interreg zone (71% for the France Interreg zone; 81% for the England Interreg zone – of which 38% of pure individual houses30), a feature that directly impacts the need in insulation materials in case of work;

- **The proportion of owner-occupant is also dominant in the two countries.** The high proportion of owner-occupants at the scale of the Interreg zone can promote the realization of renovation works of the habitat. In case of works, the owners directly benefit from the reduction of energy charges and...
the valuation of housing at the sale generated by the works, and are therefore more encouraged to carrying out these works than landlords;

- **The France and England Interreg zones are characterized by a big park of large housings, that seems uncorrelated to the needs and characteristics of the populations.** The adaptation works are thus to be anticipated to take into account the dynamic of reduction of household size under the combined effect of population ageing and decohabitation (celibacy, divorce, single-parent families, etc.);

- **In France and in England, most of the individual or collective residences dating from before 1914 are built in local stone, rubble or large rock, or solid clay bricks.** Several studies have shown the relevance of the use of bio sourced insulation materials for the renovation of old walls, because of their characteristics in terms of management of moisture transfer in the walls.\(^3\)

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**Figure 56. Comparison of the typology the housings at the scale of several European countries**

Source: Constructys / FFB, 2013

### 6.2 New construction

After a long fallback period, the first signs of recovery have been observed in the construction sector, in France and in England.

If the construction index of the France Interreg zone is slightly inferior to the average index calculated at the national scale (4 housings for 1 000 habitants in average have been started in the France Interreg zone against 5,2 at the national scale), some departments are particularly dynamic in terms of start of construction, like the Ille-et-Vilaine (7 started housings for 1 000 habitants), the Morbihan (4,7 housings), the Calvados (4,6 housings) and the Seine-Maritime (4,4 housings).

In France, the French Building Federation (FFB) predicts a recovery of the building activity of 2,1% on the 2015 – 2021 period in the construction sector, more precisely for the new construction.\(^3\)

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\(^3\) Cerema, Octobre 2016. *Synthèse bibliographique des études sur la rénovation thermique du bâti ancien à l’aide de matériaux isolants biosourcés.*

\(^3\) Source: FFB, June 2016. *Prospective Bâtiment à l’horizon 2025.*
several measures taken by the Government as part of the construction boosting plan, adopted in 2014, aiming indeed to respond to the main demand brakes. It is however impossible at this stage to evaluate the possible impacts.

The construction in the England Interreg zone is on the opposite more dynamic than the average observed at the national scale (3.1 housings for 1,000 habitants at the scale of the Interreg zone against 2.5 in average at the scale of England). In 2016, the most dynamic counties in terms of start of construction was Swindon (5.1 start of construction for 1,000 habitants), Cambridgeshire (4.5), Wiltshire (4.4), Devon (4.4) and West Sussex (4.2).

All countries of the European Union have evolved their thermal regulation and application of the 2002 European Energy Performance of Buildings Directive (EPBD), revised in 2010. This one requires the States to develop a series of tools to limit the buildings consumption – by namely establishing minimal requirements for the new constructions. The national thermal regulations thus fix energy efficiency thresholds, expressed in primary energy and in kWh/(m² year).
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