

***STATISTICAL ANALYSIS OF THE
BUILDING ELEMENTS RECLAMATION
TRADE IN THE BENELUX,
FRANCE, THE UK AND IRELAND***

Interreg NWE 739 - FCRBE

Authors

Frédéric Bougrain, Mathilde Doutreleau

Link with project

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University of Brighton



Contributors

This report would not have existed without the contribution of partners (Rotor, Bellastock and Salvo) who carried out the visits to reclamation and salvage dealers. These visits were part of a more general effort to document the activity of existing reclamation dealers. All the people involved in this activity gathered information from these dealers and provided the survey with detailed information (particularly on the characteristics of the stock owned and managed by the dealers).

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Introduction

1.1. Objectives

Today in NW-Europe, only 1% of building elements are reused following their first application. Although a large number of elements are technically reusable, they end up being recycled by crushing or melting, or disposed as waste. This project aims to increase by more than 50% by 2032 the amount of reclaimed building elements being circulated in Belgium, the Netherlands, France, Ireland and the UK. However, the building elements reclamation trade in Europe is not well documented in terms of quantitative data.

The aim of the statistical survey is to fill this gap and to enhance the visibility of the economic activities specialised in the reclamation and supply of reusable building elements. They tend to be overlooked by official statistics and, by consequence, by public authorities. This survey seeks to give a comprehensive overview of the activities of this trade, backed up with quantitative data. It provides a description of the main activities carried out by reclamation and salvage dealers, and an estimation of the type and quantities of materials they reclaim, their turnover and the amount jobs associated to these activities. The result will serve as a baseline for future studies aiming at measuring the evolutions in the business trends in the next decade.

1.2 Methodology and limits

This statistical analysis of the profile of dealers and the volumes of materials being circulated by the reclaimed sector in the BENELUX, France, Ireland and the UK was based on field data collected during visits to dealers in reclaimed building elements. The methodology was to gather data through two data sources:

1. Data from a questionnaire filled in by the partners who carried out the visits or had direct contact by phone (Rotor, Bellastock and Salvo).
2. Data from a second questionnaire (online) sent to the dealers not visited by FCRBE partners.

No data was obtained from the second channel. It appeared that this passive approach based

on the goodwill of people was not adapted to the characteristics of the population surveyed. Face to face contacts are necessary to get information and, therefore, direct contact proved to be more adapted to gather reliable information.

In the Netherlands and France, direct contact happened under the form of a visit of the stock, which was needed to document these dealers on OPALIS. In Belgium and the UK/Ireland, since most of the reclamation sector had already been documented by Rotor and Salvo respectively, contact was established by means of telephone conversations as well.

These visits were an opportunity to ask a few questions about the identity and activities of dealers but also to assess the nature and the quantity of the materials of these stockholders, according to a list established with the partners (see Annex 1). Some questions also addressed the distances travelled by materials, the origin of the stock and the type of customers.

The visits were carried out by partners. Some of them had a bigger degree of 'familiarity' with the visited dealers than others. For example, the Netherlands dealers visited by ROTOR were a discovery and, for most of them, it was the first contact. Those visits concerned a wide range of dealers who were interviewed but not selected randomly (this might have led to a selection bias). However, they can be considered to be representative of the diversity of the sector. Moreover, each partner checked that the panel was large enough to represent all types of dealers and that all types of dealers were correctly represented in the panel.

Despite the methodology proposed, some issues emerged during the project:

- The sanitary crisis hindered the visits pace and, in some case, prevented the partners from carrying them out for more than three months.
- The stock data and the characteristics of the materials sold by the dealers in different countries were difficult to appreciate and compare. The questionnaire was designed in order to easily estimate the quantity of stock during visits. Consequently, the choice of the unit for each material was free. However, it appeared

that some materials were estimated with different units such as weight, quantity or surface. As a result, a conversion table had to be developed to find a common representation of the stock. These conversions using average coefficients can lead to over and under estimations. Partners used two approaches to categorise materials:

Salvo for the UK and Ireland uses a loose value hierarchy:

1. *Architectural salvage, decorative salvage, garden antiques and architectural antiques are top of the value hierarchy and comprise mainly of fixtures, fittings, and large complete elements of structure, usually more than fifty years old, such as doors, fireplaces and staircases. Ornamental items are usually antique or retro products which are old or high-quality design and durable high quality materials.*
2. *Reclaimed building materials are usually, but not always, older than fifty years and consist of multiples of products disassembled from an old building back into their original form. They are reused to create the fabric of building, such as bricks and floorboards.*
3. *Salvaged items and materials are of low value, and modern, cheaper, scrap and often damaged. This category has the lowest ratio of financial value to volume or mass.*

Bellastock for France and **Rotor** for BENELUX used the list of materials types composed by 24 items defined in a protocol (see in Annex 1) and

covering six broad families: landscaping and paving, structure and shell, woodwork, interior finishings, equipment, decoration.

The questionnaire also distinguishes 'reclaimed building materials' and 'antique materials'. The category 'reclaimed building materials' gathers both reclaimed and salvaged items in Salvo's definition. In the analysis, these two categories are presented. With a limited sample, it appears also better to reduce the number of variables.

Rotor distinguished materials based on Salvo's definition of antiques vs. reclaimed/salvaged but also on the way the dealers themselves advertise their materials. It is important to note that these different interpretations may impact the results presented below. In France, **Bellastock** followed a different approach to characterise materials. French dealers consider that it is complex to differentiate antic and reclaimed materials (by following Salvo's definition). Thus, these categories tended to be gathered. Conversely, during the visits, it appeared easy to distinguish antic/reclaimed materials from salvaged materials. This situation could explain the high quantity of 'antiques' dealers in France (Figure 9).

The final sample is composed of 290 questionnaires filled in and based on the visits which have been completed by the partners. This amount is lower than expected. However, this survey raised a massive involvement of the partners on the field and generated the largest survey ever done in Europe on the reclaimed sector.

2. Structural profile of the enterprises

The 290 observations of the database are not distributed evenly among countries: 78 concern the UK and Ireland, 100 France, 68 the Netherlands and 44 Belgium. It is important to notice that the smaller number of observations for Belgium can reduce the significance of the results. Indeed, sampling errors decrease when sample size increases.

2.1. Size of the enterprises

The size of the enterprises in the panel was studied using the four categories defined by Eurostat: micro (less than 10 employees), small (from 10 to 49 employees), medium (from 50 to 249 employees), and large enterprises (more than 250 employees).

This graph clearly shows a large majority of micro-enterprises in the sample while there is less than 1% of large enterprises.

However, this result is not specific to the reclaimed material businesses. Indeed, according to Eurostat, very small enterprises dominate the enterprise size structure of building sector in Europe. *"Almost 95 % of all enterprises were categorized as micro enterprises, they employed 46.2 % of the persons employed in the EU-27's construction of buildings sector in 2017 and accounted for 36.2 % of its value added."*¹

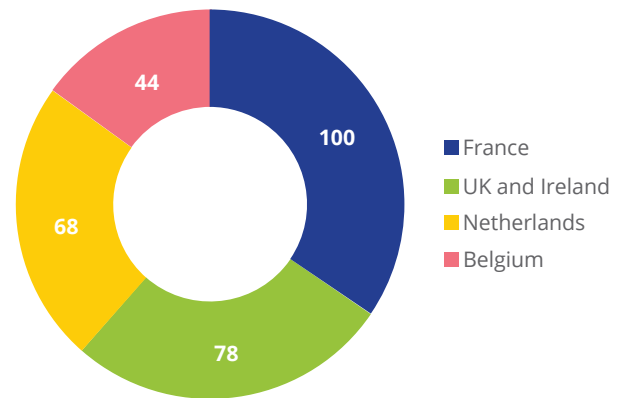


Figure 1: Distribution of observations in our sample.

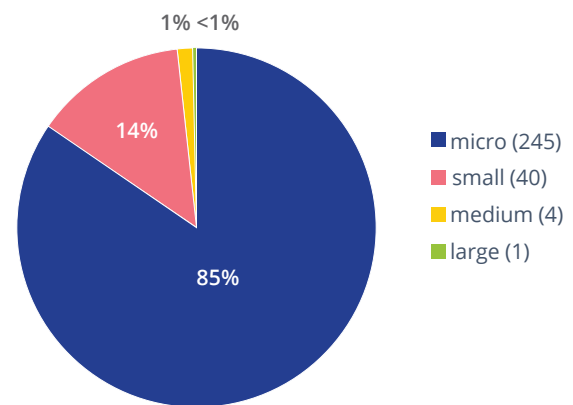


Figure 2: Distribution of company size by number of employees.

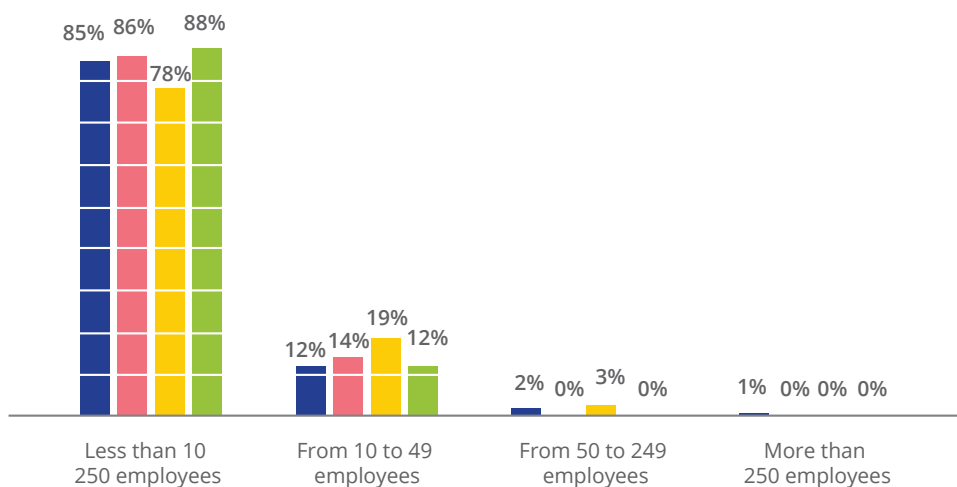


Figure 3: Distribution of company size in each country.

¹ https://ec.europa.eu/eurostat/statistics-explained/index.php/Construction_of_buildings_statistics_-_NACE_Rev._2#Structural_profile

Figure 3 shows the distribution of company sizes in each country. The enterprises have approximately the same distribution among countries.

2.2. Turnover of the enterprises

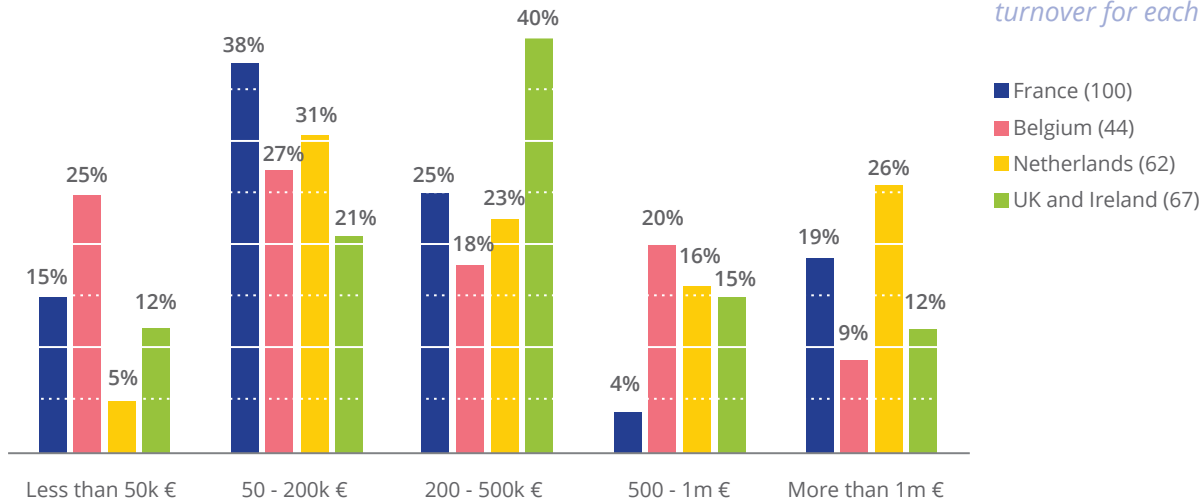


Figure 4: Distribution of turnover for each country.

According to figure 4, the distribution of turnover differs from one country to another.

In the UK and Ireland, 40% of the companies surveyed have a turnover between 200 and 500k€. In Belgium turnovers are equally distributed: between 20 and 27% for each turnover band, except for turnovers higher than 1m € (only 9% of the sample). In the Netherlands, 54% of the reclaimed businesses have a turnover between 50 and 500k €. Turnovers lower than 50k € only count for 5% while turnovers higher than 1m € count for 26%, which is the highest compared to the other countries. The turnover of French enterprises appears relatively smaller than in the other countries. France has the highest percentage of firms with a turnover lower than 200k€ and the smallest percentage above 500k€.

Table 1 represents the average percentage of the sale of reclaimed materials in the dealers' turnover. On average, the sales of reclaimed materials and products represent 80,2% of visited companies' turnover. French companies appear less involved in the reclamation activity while British dealers are more engaged.

COUNTRY	%
FRANCE	75,3
NETHERLANDS	79,8
BELGIUM	79,4
UK AND IRELAND	87,2
AVERAGE	80,2

Table 1: The percentage of reclaimed materials in the turnover of the businesses among countries.

Key facts:

- The size of the companies is the same whatever the country.
- Small businesses represent the large majority of the reclamation trade.
- Companies' turnovers differ from one country to another

3. The core business of the reclamation dealers

3.1. Diversity of activities

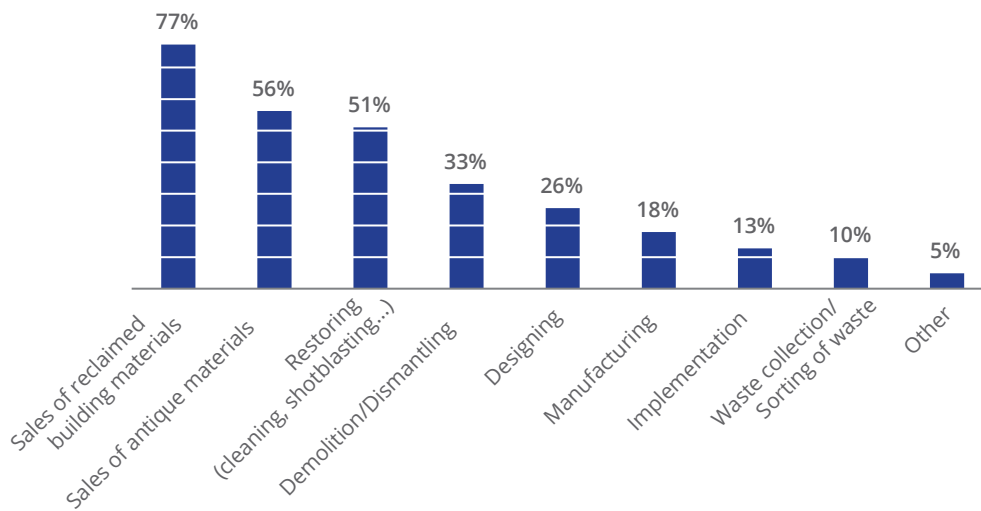


Figure 5: Activities carried out by companies.

Interpretative framework:

77% of the dealers sell at least reclaimed building materials. 33% of them are also involved in demolition.

Dealers were asked to indicate their core activities. Each company can be involved in several activities.

Figure 5 shows that 71% and 52% of the companies sell respectively reclaimed building materials and antique materials. Moreover 50% restore the materials and 30% can perform the dismantling of reusable materials. In addition to the sales of materials, these two activities are the main carried out by reclamation dealers.

In this report, 'Restoring' can be defined as *'all the operations that are performed on the products (cleaning, cutting to dimension, sorting according to different types, etc.) and are indispensable to transform a reclaimed material into a reusable material'*.

In the questionnaire 'Dismantling' and 'Demolition' were considered as a single activity. In practice, however, there is a nuance: while some

reclamation dealers are also active as fully-fledged demolition contractors, others will only undertake the dismantling of specific batches of reusable materials but not carry out a complete demolition. Lastly, some dealers do not dismantle reusable materials themselves. They build up their stock by acquiring materials from third parties.

3.2. Complementarities between activities

Table 2 identifies the most common combinations of activity in which dealers are involved. It shows that dealers are frequently involved in several activities. The main combinations count for only 5 to 10% of all. This reflects the great diversity of possible combinations among the dealers.

There seems to be a correlation between the sale of antique and reclaimed materials and restoration services, as well as between the sale of reclaimed materials and dismantling operations.

To quantify these relationships, table 3 investigates the correlation between each activity¹.

1. Some links and correlation are frequently highlighted in the following sections. However, causality cannot always be specified from the data.

Sales of reclaimed building materials	10 %
Sales of reclaimed building materials; Sales of antique materials; Restoring (cleaning, shotblasting, ..)	8 %
Sales of antique materials	5 %
Sales of reclaimed building materials; Demolition/Dismantling	5 %
Sales of reclaimed building materials; Sales of antique materials; Demolition/Dismantling; Restoring (cleaning, shotblasting, ..)	4 %
Sales of reclaimed building materials; Sales of antique materials	4 %
Sales of reclaimed building materials; Restoring (cleaning, shotblasting, ..)	4 %

Table 2: Main combinations of activities carried out by dealers;

Interpretative framework:

10% of the dealers are only involved in the sales of reclaimed building materials and 8% combine the three following activities: sale of reclaimed building materials, sale of antique materials and restoration..

	Sales of reclaimed building materials	Manufacturing	Designing	Implementation	Demolition/Dismantling	Waste collection/Sorting or waste treatment	Restoring (cleaning, shotblasting...)	Sales of antique materials
Sales of reclaimed building materials	100 %	18 %	26 %	14 %	38 %	11 %	52 %	44 %
Demolition/Dismantling	89 %	15 %	20 %	15 %	100 %	15 %	55 %	49 %
Restoring (cleaning, shotblasting...)	78 %	24 %	34 %	20 %	36 %	7 %	100 %	64 %
Sales of antique materials	61 %	21 %	27 %	10 %	29 %	4 %	58 %	100 %

Table 3: Cross relationships between activities.

Interpretative framework:

52% of dealers selling reclaimed materials (in row) are also restoring them (in column).

Table 3 shows, as indicated by table 2, that the sale of reclaimed and antique materials is often linked to restoration and dismantling. The combination of activities has an influence on the type of materials that are sold by these companies. For instance, 89% of the companies who also active in demolitions deal in reclaimed materials, whereas only 49% of them deal in antiques.

Indeed, these statistics show the link between the sales of materials and the other activities supplied by these companies without specifying the type of materials sold. For example, dealers selling antiques are not differentiated from sellers selling antiques and reclaimed materials.

To clarify the situation, three categories were defined:

- The 'Antiques' category corresponds to the dealers that only sell antiques materials (and no reclaimed ones).
- The 'Reclaimed' category concerns the dealers that only sell reclaimed material (and not antiques).
- The 'Mixed' category is for those selling reclaimed and antiques materials.

The figure 6 shows the representation of each profile in the sample. Dealers of reclaimed materials are twice as numerous as the dealers of antique materials.

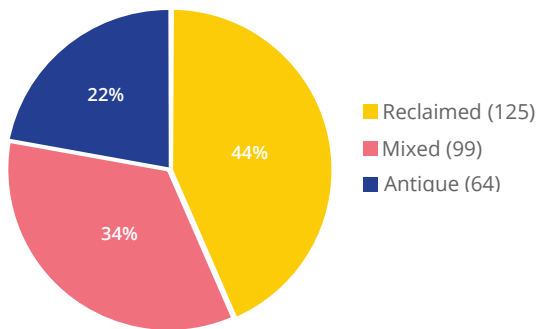


Figure 6: Different type of dealers in the sample.

Figure 7 shows the involvement in restoring and dismantling activities by making the distinction between the different profiles of dealers.

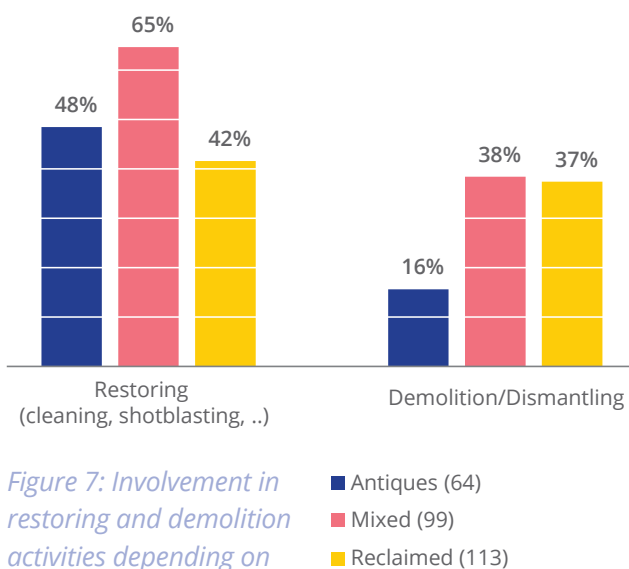


Figure 7: Involvement in restoring and demolition activities depending on the type of materials sold.

In his seminal article about the Organisation of the Industry, Richardson (1972) distinguishes similar and complementary activities. "Activities which require the same capability for their undertaking (can be called) similar activities" (p.888). Complementary activities "represent different phases of a process of production and require in some way or another to be co-ordinated" (p.889). In the reclamation sector, the sales of reclaimed building materials and of antique materials could be considered as similar activities while dismantling and restoring would be complementary activities².

Operating dismantling and selling reclaimed building materials also appear to be strongly complementary. According to the partners who visited the dealers, demolition is the primary activity of some dealers. When the opportunity arises, they also dismantle materials with the view to sell them. These sales can represent only a small share of their turnover. Stopping these activities would probably not jeopardise the survival of their enterprise. If there is a strong complementarity between demolition and reclamation (because the demolition contractors have easy access to buildings slated for demolition, have the equipment and know-hows to carefully dismantle materials...), these activities can also be at odds. When the need for speed and the demand for demolition are high, enterprises tend to focus on their core business and reclaim much less materials³.

Restoring is different. It brings an added value that can be easily integrated into the price of sold items. This is why dealers that are selling antiques and reclaimed materials ('Mixed') are highly involved in restoring activities (65%). As shown in table 2, the sale of mixed materials and restoration activities is the second most represented combination. Indeed, restoring these elements is a way of enhancing their value and selling them at a higher price.

The integration within the same firm of two complementary activities that need to be coordinated increases the competitiveness of the enterprise. Among the 290 dealers surveyed, about half of them (149) sell materials that have restored.

2. Richardson G.B., 1972, The organisation of industry, The Economic Journal, Vol. 82, n°327 (Sep.1972), pp. 883-896.
 3. According to one company interviewed, when the demolition market is very dynamic, the trend is to be less cautious during the dismantling stage and to leave away most of the reclaimed activity. Only very valuable materials are preserved.

3.3 Impact of national elements on the reused sector

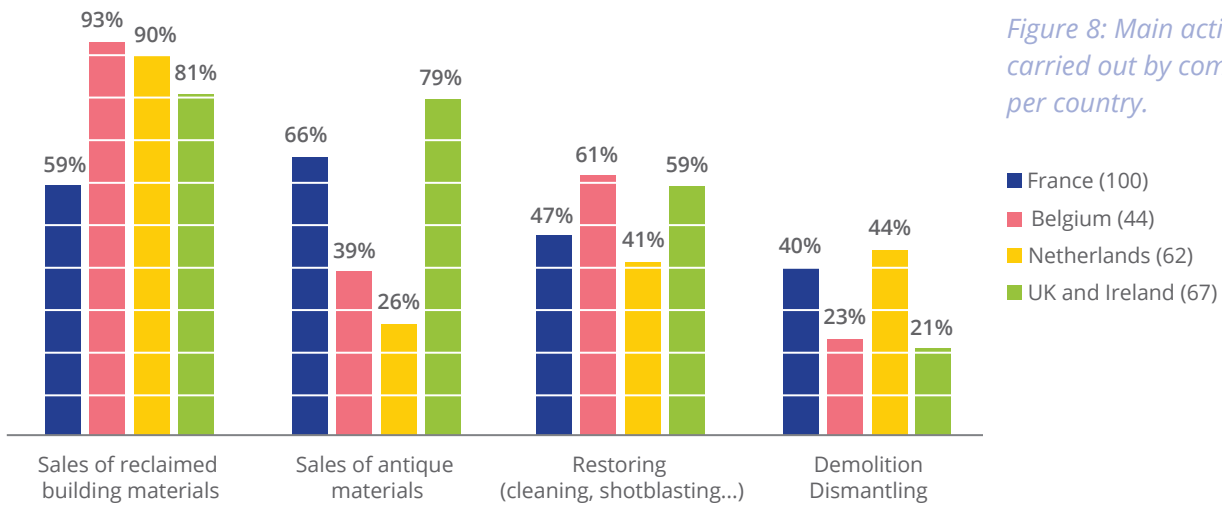


Figure 8: Main activities carried out by companies per country.

Figure 8 focuses on these four main activities covered by the reclamation dealers. Enterprises in the Netherlands and Belgium mainly sell reclaimed building materials (90% and 93% respectively). Sales of antique materials are more limited (26% and 39%). Conversely, firms in the UK and Ireland are the most involved in the sales of antique materials (79%) but are also highly involved in the sales of reclaimed building materials (81%). French companies are also concerned by both materials but to a lesser extent than firms in the UK and Ireland (59 and 66%).

The architectural specificities of each country could explain this specialisation of firms from Belgium and the Netherlands. In France and in the UK and Ireland, heritage buildings represent probably a higher percentage of the building stock

than in the Netherlands and in Belgium. Consequently, the market for antique materials is more developed.

Figure 9 confirms that the type of materials sold by dealers depends on the architectural context of each country.

Reclaimed dealers are dominant in the Netherlands and Belgium whereas, in France, antiques are prevalent.

Most Dutch dealers (74%) are specialised in reclaimed materials while only 16% sell both materials and only 10% antique materials. The profile of the dealers in Belgium is quite similar: dealers in reclaimed materials represent 61% of the population. However, dealers selling both materials are more active on the market (32%).

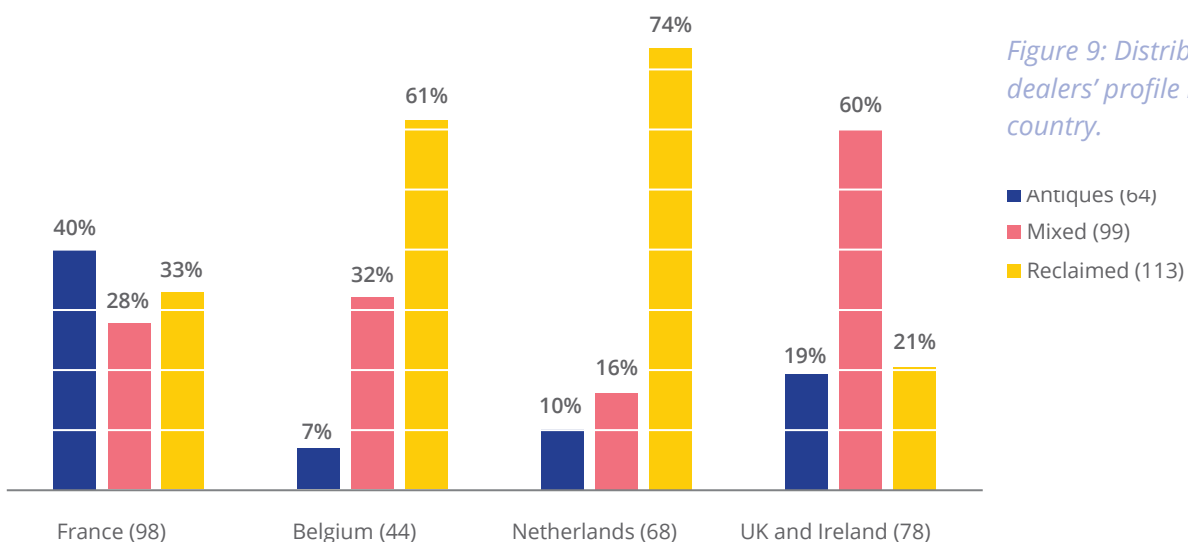


Figure 9: Distribution of dealers' profile in each country.

Conversely, in the UK and Ireland dealers mainly sell the two types of materials (60%). Specialised dealers in only reclaimed materials or only antiques materials are less represented (21% and 19%). In France, the three profiles are almost equally distributed with a slightly higher rate for the antique materials.

This analysis confirms that the business linked to the reclamation and supply of reusable building elements follows different paths in each country. It seems that British dealers who probably started a business based on the sale of antiques materials use their commercial network to diversify their activities and sell more modern materials while Dutch and, to some extent, Belgian companies mainly focus on reclaimed materials.



Key facts:

- Restoring and dismantling are complementary activities to the sales of reclaimed building materials and of antique materials.
- The most common complementary activities also provided by dealers in reclaimed and antique materials are restoration and dismantling.
- For some demolition companies, the business of selling salvaged materials is secondary.
- Half of the dealers of the sample restore the materials before putting them back on the market. This activity is essential to their business.
- The market for antique materials is more developed in France and the UK, which may reflect architectural specificities.
- Dutch and, to a lesser extent, Belgian dealers mainly focus on reclaimed materials.

4. Origin of the stock and customers

The origin of the stock was also investigated during visits⁴. Figure 10 shows the average distribution of the stock according to its origin.

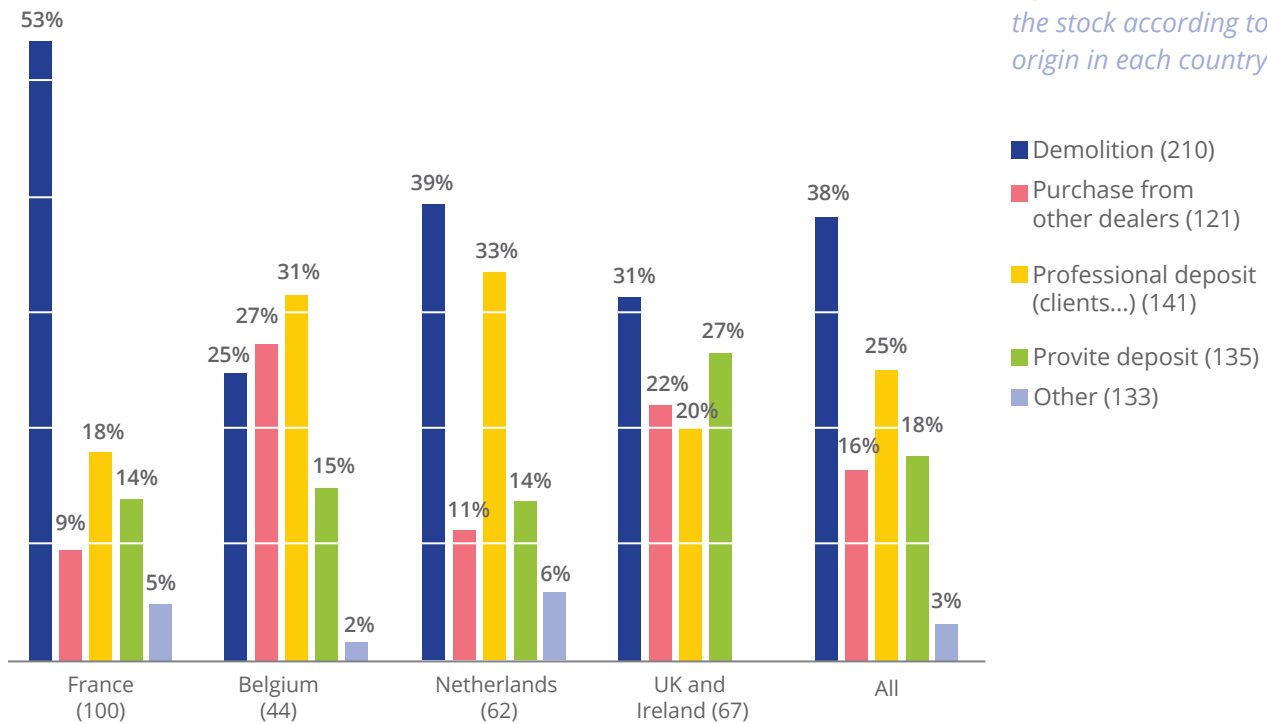


Figure 10: Distribution of the stock according to its origin in each country.

In most countries, the stock of the dealers comes directly from demolition sites. It represents by far (54%) the main source of materials for the French stockholders. In the Netherlands, Belgium and the UK/Ireland, stockholders also rely on this source (which contributes to 39%, 25% and 31% of their stock respectively) but combine it with a more diverse range of sources. In the UK/Ireland, private deposits are as important as demolition sites and more than 20% of the stock come either from professional deposits or purchases from other dealers. In Belgium, the origin of stocks is equally distributed between demolition sites, purchases from other dealers and professional deposits (between 31 and 25% each). In the Netherlands, professional deposits play a significant role.

These results show that dealers in Belgium and the UK/Ireland build up their stock from a larger variety of channels. French dealers build up

theirs mainly from demolition sites, while Dutch dealers are somewhere in between and use different channels.

These results suggest two slightly different models of the reclamation supply chains. On one hand, there would be 'short' chains, with few transactions between the original use and the new use of the materials. Typically, reclamation dealers would acquire building materials directly from the demolition sites (sometimes performing the dismantling themselves) and sell them to their new users. This model seems to be predominant in France. On the other hand, there would be 'long' chains, with more intermediate transactions. Typically, reclamation dealers would acquire their materials from other dealers, professionals brokers, demolition contractors, or even a combination of all these. This model seems to be predominant in Belgium and the UK.

4. The questions related to the origin of the stock was associated with a range of options distributed as a percentage.

Interestingly, these two models also seem to have an impact on the geographical scope of the dealers' activities. In the former, materials tend to be reused close to where they have been reclaimed. In the latter, they travel more and further away before being reused. This will be discussed infra, in section 5.4.

From a commercial point of view, these results also suggest that dealers located in Belgium and the UK have more opportunities than in France when it comes to find specific materials. One can indeed infer that a more important diversity of sources increases the opportunities for reuse.

Obviously, the nature of the materials also plays an important role on these aspects.

According to figure 11, Antique dealers sell 60% of their stock to private buyers and only 25% to building companies. It seems that building companies mainly buy reclaimed materials and are less concerned by antiques. We can assume that building companies are involved in bigger projects that require larger quantity of materials. Antiques are seldom available in large batches and they better fit the customised needs of private buyers.

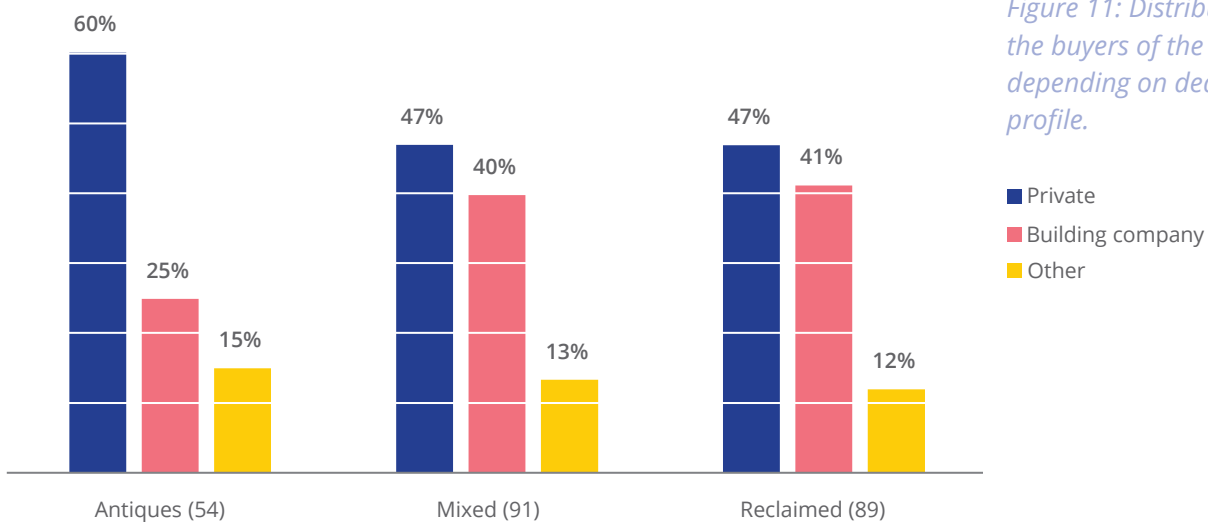


Figure 11: Distribution of the buyers of the stock depending on dealers' profile.

Key facts:

- More than half of the stock of French dealers comes directly from demolition sites.
- Dutch, Belgian, and British dealers use different channels to build up their stock.
- The diversity of origins could be considered as an indicator of different business models.

5. Details about the stock

5.1. The materials hierarchy

This section investigates what type of materials the surveyed dealers are stockholding.

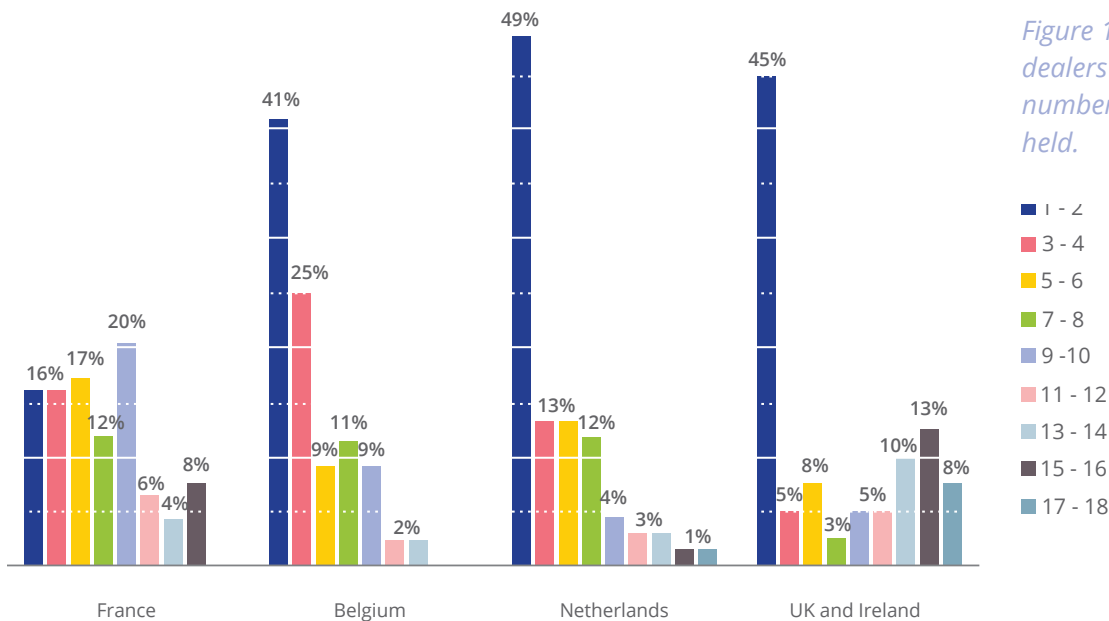


Figure 12: Distribution of dealers depending on the number of materials types held.

Figure 12 indicates the degree of specialisation of the dealers of the sample (the list of the 24 categories of materials is presented in Annex 1). It appears that dealer's profiles are very distinct among countries. The stock of materials hold by French dealers is diverse, reflecting its main origin: the demolition companies. In Belgium, the Netherlands, and the UK/Ireland, between 40 and 46% of dealers hold a maximum of two materials. This specialisation contrasts with France and confirms a certain form of maturity of their market. In these three countries, the demolition site is an important source for the stock. However, as shown by figure 10, private and professional deposits and/or other dealers also provide dealers with materials. These professional networks, which seem well developed in these three countries, allow dealers to focus their activity on a limited number of items.

The type of products and materials sold by the dealers varies according to their core business:

The five main materials owned by **dealers in antique materials (56)**⁵:

1. Architectural antiques (55%)
2. Metal work (51%)
3. Floor in natural stone; Steps in stone; Tiles (49%)
4. Doors (47%)
5. Cobble stone and pavers; Slate, roof tiles and wall covers; Fireplaces (45%)

The five main materials owned by **dealers in reclaimed materials (113)**:

1. Doors; Timber framing (39%)
2. Slate, roof tiles and wall covers (34%)
3. Windows (32%)
4. Bricks (25%)
5. Parquet and wooden floors (24%)

5. This was defined according to the presence of these materials in their stock, not in terms of quantity.

The five main materials owned by **dealers in mixed materials (86)**:

1. Doors (57%)
2. Slate, roof tiles and wall covers (50%)
3. Metal work (47%)
4. Bricks; Parquet and wooden floors (46%)
5. Architectural antiques (45%)

This hierarchy indicates that some materials like “Doors” and “Slate, roof tiles and wall covers” are traded by all dealers. “Fireplaces” concern mainly dealers specialised in antique materials while “timber framing” concerns dealers of reclaimed materials. It confirms that dealers build up their stock by focusing first on products and materials which are linked with their core competences (e.g., the link between architectural antiques and dealer of antique materials is almost tautological) and second on items relatively easy to sell. These materials are probably economically viable and stocking them is not so risky.

Some materials are less frequently held by dealers: partition walls, suspended ceilings, insulation panels, or technical installations. These materials are probably more difficult to sell. Firstly, they do not benefit from a major competitive advantage with new materials. For example, the performance of ‘insulation panels’ could be questioned by potential buyers who may prefer to opt for new ones. Secondly, dealers prefer not to store these materials because there is a low demand. This situation has a self-reinforcing effect. The lack of supply prevents buyers to ask for these materials and dealers prefer to avoid stocking them (even though such materials are made available during demolitions). Moreover, it seems that there is a gap between the “quality” defined by construction professionals (through statistical testing, evaluation of the process, performance measured, external expertise, ...) and the reclamation actors. Their appreciation of quality is based on analogy with the original application, embodied know-how, oral transmission...

5.2. The quality of the stock

The actors of a construction project need access to reliable information in order to select the most suitable products/materials. On the recla-

mation market, products are not identical and homogeneous, and buyers are not equally informed about the quality of the products sold by the dealers. This situation favours opportunistic behaviours and may impede the development of the market for reclaimed products. Buyers and also insurers need adequate information in order to evaluate the risk that they bear.

The materials hierarchy does not provide any information about the quality of the stock. Dealers involved in restoring are probably conscious that this complementary activity brings the quality expected by the market. A certification process would also contribute to reduce information asymmetry between buyers and sellers, help identifying the quality of reclaimed products, and promote reuse.

The creation of ‘Truly Reclaimed’ label for specifiers, buyers, reclaimers, and consumers for reclaimed wood (and other reclaimed materials) would be an example of a quality sign used to enhance trust between the stakeholders of a construction project. On this niche, consumers are probably attached to the quality of the products and a label may contribute to reinforce the demand around these products. **96%** of the companies visited in the UK/Ireland were in favour of this label.

5.3. Size of the storage place

The storage space is a key issue for the development of the reclamation sector. It is already recognised that opportunities for same-site reuse depends on the availability of large spaces around the deconstruction site to temporarily store reclaimed materials. Similarly, large storage spaces are key for the development of the reclamation sector⁶. Therefore, assessing the size of the storage space in the different countries brings supplementary information about the market.

Looking at the mean of the stocking space can conduct to misinterpretation (table 4). As the mean is weighted by the min and max values, it is sensitive to extreme values. The median⁷ value of storage spaces per square meter is the same in France and Belgium and a bit smaller in the Netherlands and the UK/Ireland.

6. In the e-commerce, the development of a company such as Amazon is based on the construction of huge warehouse to offer rapidly a large variety of products. While the average of logistics platform in France is around 17 500 m², most of its French warehouses have a floor area above 100 000m², the largest being 142 000 m².

7. The median shows the central value of the distribution.

	Min	1 st quartile	Median	3 rd quartile	Max	Mean
Belgium	200	1 500	3 000	7 500	120 000	11 344
France	200	1 000	3 000	7 250	150 000	10 086
Netherlands	25	1 037.5	2 250	6 350	150 000	8 635
Uk / Ireland	4	612.5	2 675	6 864.5	56 656	6 016

Table 4: Distribution of the size of the storage place (in m²) in France, Belgium, the Netherlands, the UK and Ireland.

In the UK / Ireland, this situation could result from constraining planning laws in the UK whereas in France there is no real regulation for empty fields. Consequently, storing materials is more difficult in the UK.

The number of materials sold by the dealers also probably influences the storage place. The diversity of materials requires more space as shown in table 5. The stats (quartiles and medians) indicate that storing more than 6 materials requires more space than storing 6 or less materials. The diversity of materials hold by French dealers explains why the storage space is higher than in the Netherlands and the UK/Ireland. However, according to this logic, Belgium's position seems contradictory. The big median size of the plots might be explained by other factors such as the fact that popular reclamation materials in Belgium like bricks or cobble stones necessitate large storage facilities.

	1 st quartile	Median	Mean	3 rd quartile
Up to 6 materials	1 000	2 400	8 618	6 000
More than 6 materials	1 500	4 000	9 806	10 000

Table 5: Link between the size of the storage place (in m²) and the number of traded materials.

This issue of the storage place is central for public authorities who intend to promote circular economy. Indeed, reclaimed and antique materials require space to be stored. Same-site reuse and site-to-site reuse are two options, but even these pathways may require temporary storage place. More largely, these places are necessary for the creation of a visible and recognised reclamation market. Large cities which apparently offer the largest opportunities for deconstruction projects usually suffer from a high density. Consequently, they are not able to offer spaces to store materials

that will be cleaned and prepared for their 'second life' and when a piece of land is available, prices are usually high. Without public support, this situation could impede the economic development of the reuse sector.

5.4. Distance travelled

The travel of antique and reclaimed materials is an important issue if the goal is to evaluate the environmental impact of this activity. The main benefits from reuse are environmental. The CO₂ emissions arising from the manufacture of new building materials and products are usually high. Reusing materials avoid these impacts. However, this gain could be partially offset by the distance travelled (by taking into account the distance travelled by new materials).

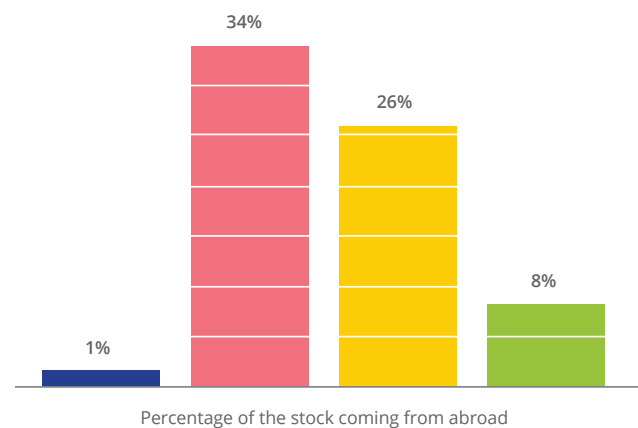


Figure 13: Proportion of the stock coming from abroad in each country. ■ France (100) ■ Belgium (44) ■ Netherlands (68) ■ UK and Ireland (78)

According to figure 13, about one third of reused materials and products sold by the Dutch and Belgians companies of the sample come from abroad. Conversely, in France, the business appears limited to the borders of the country. This situation results from three factors:

- The traditions: historically France is less a trading country than the Netherlands.
- The size of the country: The Netherlands and Belgium are smaller than France or the UK and Ireland which lead dealers to go abroad to get material stocks. For the UK the physical borders like seas can also be a limit to the foreign trading.
- The relatively short supply chains of the French reclamation market: as indicated before, French dealers get most of their stock from the demolition sites which is always in the vicinity of the storage place. Other dealers and professional/private deposits are less involved than in the three other countries. Commercial networks being less developed, it offers less opportunities to get materials from abroad.

Since the size of the country has an influence, it is necessary to look at the distances that materials have travelled from the place they were collected (deconstruction site, dealer’s shop, etc.) to the point of sale.

Resellers were asked to give a rough breakdown of the distances that reclaimed materials have travelled. The options were the following:

Less than 10 km	... %
Between 10 and 50 km	... %
Between 50 and 100 km	... %
Between 100 and 500 km	... %
Between 500 and 2000 km	... %
More than 2000 km	... %

Table 6: Distances travelled by antique and reclaimed materials.

Figure 14 shows the average dispersion of these percentages within each distance ranges (table 6).

In the Netherlands and in the UK and Ireland, the average distribution of the distance travelled is concentrated around the medium distance range which is between 10 and 500 km. In France it seems more concentrated around 10 to 100 km. Moreover, almost no material goes further than 500 km while this situation is more frequent in Belgium and the Netherlands (respectively 21% and 16% of the cases). This confirms that the trade in France is mainly local or regional.

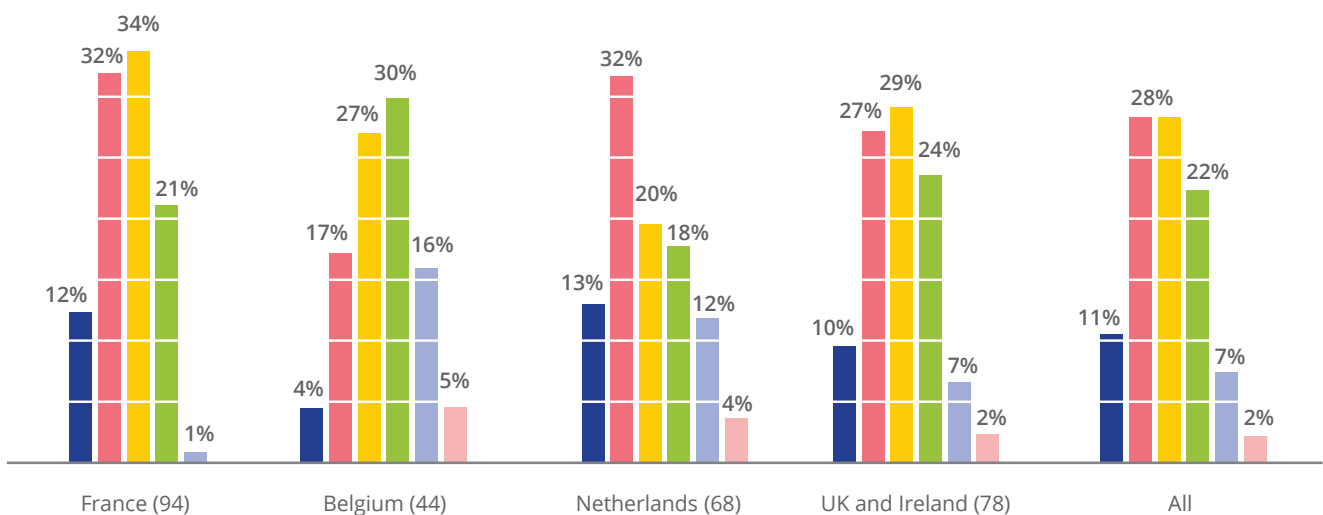


Figure 14: Average distribution of the variables related to the distances travelled by materials in each country.

- Less than 10 km
- Between 10 and 50 km
- Between 50 and 100 km
- Between 100 and 500 km
- Between 500 and 2000 km
- More than 2000 km

In order to have a clearer view of the repartition of distances travelled, the sample was separated in two parts (figure 15): the average percentage of materials travelling more or less than 100km.

With less than two thirds of the stock of materials travelling less than 100km, the situation of France appears specific. The fact that dealers get most of their stock from demolition has a strong

impact on this situation. In the three other countries, different commercial channels (other dealers, professional and private deposit) are activated and will result in longer travelling distances.

As shown in these graphs the idea that reuse allows a nearby supply is not always true. In the future, it will be interesting to consider the loss of environmental benefit from the transportation of materials⁸.

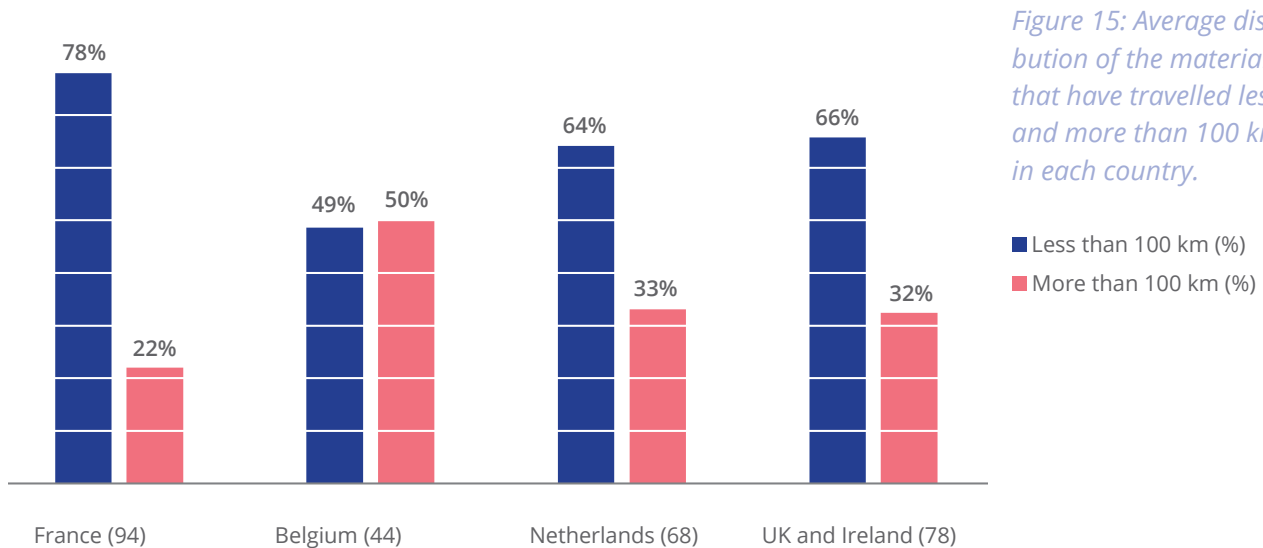


Figure 15: Average distribution of the materials that have travelled less and more than 100 km in each country.

Key facts:

- Dealers build up their stock by focusing first, on products and materials which are linked with their core competences and second, on items relatively easy to sell.
- The size of the storage place is affected by contextual factors (e.g., more constraining planning laws in the UK than in France), but also by the diversity of materials.
- Materials travelled frequently over long distances before being stored by the dealers. These distances are influenced by national traditions and the density of the national transportation network.

8. In today's economy, 500 kilometres is almost local. But today's economy is based on linear principles. When circular economy principles will be adopted again, we could assume that 500 kilometers will not be considered anymore as local.

6. Business trend

6.1. Ceased trading

The question of the cessation or transmission of a company is rarely addressed in the literature. It is the same in political debates: innovation and start-ups get much more attention than the issue of the transmission and take-over of businesses.

In France, there are almost four times more companies that stopped because they were unable to find someone to take over the activities than bankruptcies (132 360 versus 31 516 in 2016)⁹. The size of a business plays an important role in its transmission (more than the age of the manager): the bigger companies are, the more likely they are to be taken over than smaller ones.

The building sector is particularly vulnerable since it gathers mainly very small enterprises. Similarly, small businesses represent the large majority of the reclamation trade examined in this survey. Consequently, it is very likely that the taken over of reclamation companies is complicated due to their very small size.

Figure 16 confirms this assumption. 17 of the 20 managers who intend to retire soon did not find someone to take-over¹⁰. These companies employ between one and six people and for ten of them, the turnover ranges between 50 000 and 200 000 €. Companies selling antiques are relatively more affected by this situation (figure 17).

This situation is paradoxical: there are a lot of ongoing debates on the development of a circular economy, while the main allies to implement actual reuse strategies are struggling to maintain their businesses¹¹.

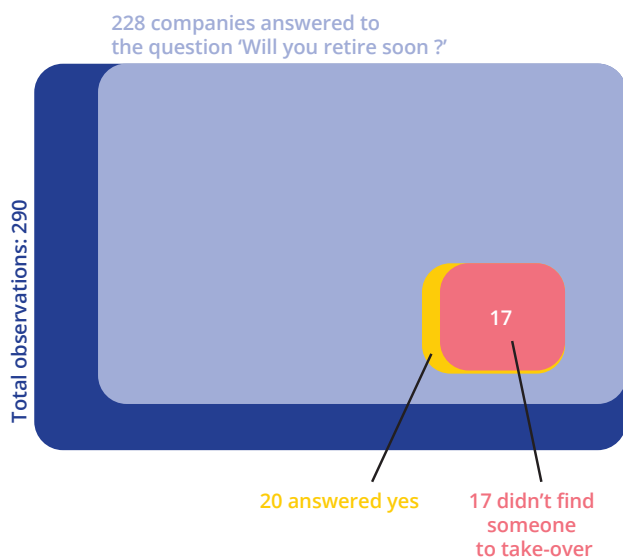


Figure 16: Activity of the ceasing trade

	Selling only antiques materials	Selling only reclaimed materials	Selling both materials
Total population (142)	22 %	43 %	34 %
Sample considered (17)	53 %	18 %	29 %

Table 7: Activity of the ceasing trade.

9. Tourdjman A. et Le Dret T., 2019, « La cession transmission des entreprises en France », Les carnets de l'observatoire – Etudes des comportements financiers, Groupe BPCE, Mai 2019. Available at: <https://groupebpce.com/etudes-economiques/les-carnets-de-bpce-l-observatoire-2019>

10. 5 in Belgium, 3 in the UK and 9 in France. Most Dutch managers did not answer to this question.

11. According to BELLASTOCK, between 2019 and 2021, 56 French dealers ceased their activity.

6.2. Past and future of the activity

The survey examines how dealers perceive their current activity and the evolution of their businesses.

	Yes (%)	No (%)
France	66	34
Netherlands	63	38
UK/Ireland	57	43
Belgium	43	57
Total	59	41

Table 8: Increase of the reuse business since 2015.

Figure 17 indicates that for the last five years, the French market was the most dynamic. Many French dealers were active since years and years but with a focus on antiques and 'classical' reclaimed materials. However, the development of the market for modern salvaged materials is more recent. Circular economy in the building sector became a national concern in 2015. The results for Belgium are surprising. It might result from an earlier take-off of the market which is followed by a more stable period.

To get an idea about the future trends of the market, dealers were questioned about their expectations. Figures 18 and 19 shows that the expectations for the business are probably influenced by a mix of national considerations and type of activity. Dutch dealers appear quite optimistic (58% expect to benefit from an increase of sales for 2019 and 2020 and only 3% think about a decrease in their sales). This relative optimism results also from the core activity of the dealers. Those selling reclaimed materials have the highest expectations. As explained before, (figure 9), Dutch dealers (74%) are specialised in the sale of reclaimed materials which may represent a dynamic part of the market.

Conversely, in the UK/Ireland only 7% of the companies expect an increase and 61% thinks that their business will not change in the coming years. Events such as the Brexit may explain this gap between countries. In the UK/Ireland, dealers sell mainly two materials (60%). Beside the Brexit, which brings uncertainty, it might also explain the overwhelming numbers of dealers thinking that the market will not grow in the future.

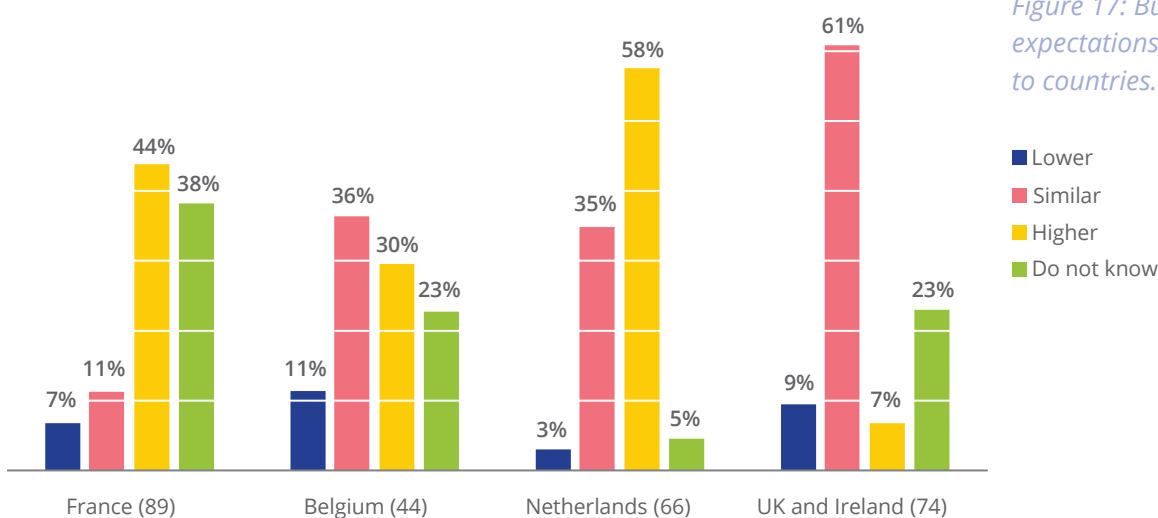
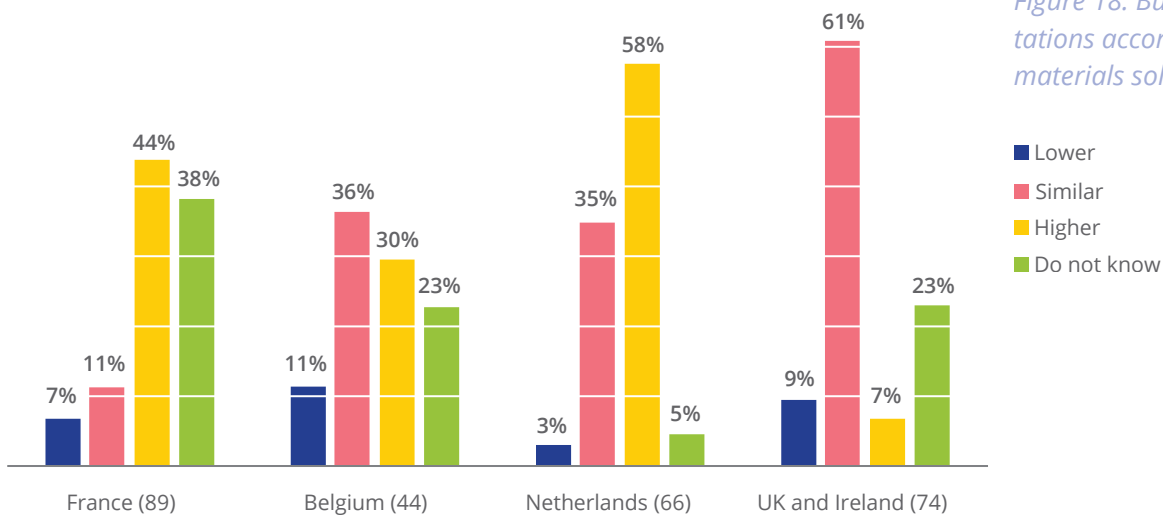


Figure 17: Business expectations according to countries.

Figure 18: Business expectations according to the materials sold.



French dealers are more selling antiques than reclaimed materials. Despite this situation, 44% of them are optimistic for the future. As in the Netherlands, it indicates that most companies believe that the growth observed for the last five years will not stop.

In Belgium as in the Netherlands, dealers sell also mainly reclaimed materials (figure 9). However, the majority of them faced a decline of their business in the last five years. This situation affects their expectations.

Figure 20 offers a complementary view and indicates that bigger companies (in terms of employees) have better business expectations¹². These dealers have probably already benefited from the growth of the market in recent years, and they consider that this trend will continue. It also seems that above a critical size (10 employees), dealers can rely on a diversity of competences and are more able to benefit from new opportunities for the reclamation market.

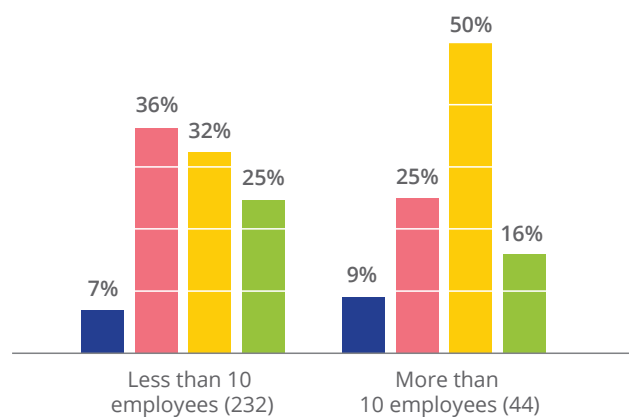


Figure 19: Business expectations depending on the size of the company.

■ Lower
■ Similar
■ Higher
■ Do not know

Key facts:

- Most managers who intend to retire soon did not find someone to take-over.
- In all countries except Belgium, dealers saw their business increasing in the past five years.
- Expectations for the future mostly depends on past evolutions.
- The size of a company impacts its expectations.

12. The distribution of company sizes among countries being about the same, there is no national influence on this aspect.

7. Materials volume

7.1. Data processing and potential bias

The stock assessment was made by the project's partners in charge of the visits. They either looked at the stock during their visits (in France, Belgium and in the Netherlands) or evaluate it from pictures taken during the visits (in the UK) or was based on information provided by the dealers during a phone interview (Belgium). Different methodological approaches can lead to a bias in the results.

The units chosen to quantify the materials in the questionnaire were left free. This led to a variety of units being used in the questionnaire (m², m³, pieces, tonnes...). One of the main tasks was to convert all these units in a same and common unit by using coefficients. These coefficients were established with the cooperation of Rotor, Salvo and Bellastock. It enabled to create a conversion table (between m², m³, pc, and tonnes) for each material (depending on the units initially entered in the questionnaire). All materials were converted into tonnes. This choice was motivated by the aim to compute the embodied carbon.

For each section, the material categories gathered different type of products (e.g., the section 'Sanitary' can group bathrooms, basins, toilets...). The use of a unique average coefficient for each category can lead to an under and over estimation of the stock.

7.2. Extrapolation

The estimation of the economic value and the mass of each material were extrapolated to the entire country. Extrapolation coefficients were obtained by developing ratios based on the sample and the population sizes.

To get this last information, it was decided to rely on the expertise of the partners who did the visits. Indeed, the partners in charge of the visits have developed a good knowledge of the reclamation sector in their country, thanks to field visit, regular interactions and a constant watch over its

evolutions. They provided the analysis with estimations concerning the number of national companies active in the reclamation sector and validated that the characteristics of the dealers (such as size of the companies, the distribution of turnovers' range or activities) of dealers listed in the sample corresponding to the whole population.

This approach allowed to calculate the extrapolation coefficients (table 8) and to get the total amount of materials traded and stored in each country.

	Sample size	Population size	Extrapolation coefficient
France	100	344	3,44
Belgium	44	125	2,84
Netherlands	68	250	3,68
UK/Ireland	78 ¹³	988	12,66

Table 9: Extrapolation coefficients.

7.3. Economic values of the stock

National turnovers related to the sales of reclaimed materials were obtained by crossing the average turnovers of the dealers with the percentage related to the sales of materials in their turnovers. In the questionnaire turnover figures were requested by range. Thus, the average turnover of each company is the mean value of each range as shown in table 9. This simplification is necessary for the calculation but brings uncertainty as the actual turnover can be over or underestimated.

Sales Band	Average sales
less than 50 k€	Average 30 k€
50 to 200 k€	Average 125 k€
200 to 500 k€	Average 350 k€
500 to 1M€	Average 750 k€
More than 1M€	1,5 M€

Table 10: Annual sales band and averages.

13. On several occasions, data (such as the quantity of materials) are missing. Thus, the sample size is lower than 78. The extrapolation coefficient was frequently modified to take into account this situation.

The extrapolation gives an economic volume of 511,3 million € of turnover, 6 940 Full Time Employees and 615 900 of tonnes of stored materials in the BENELUX, France, Ireland and the UK.

Table 10 shows the details for the extrapolated results.

	Turnover related to the sales of reclaimed materials (€)	Full time Employees (FTE)
France	68 628 374	973,76
Belgium	40 145 089	421,31
Netherlands	88 625 992	1 401,69
UK/Ireland	313 944 968	4 142,63
Total	511 344 423	6 939,39

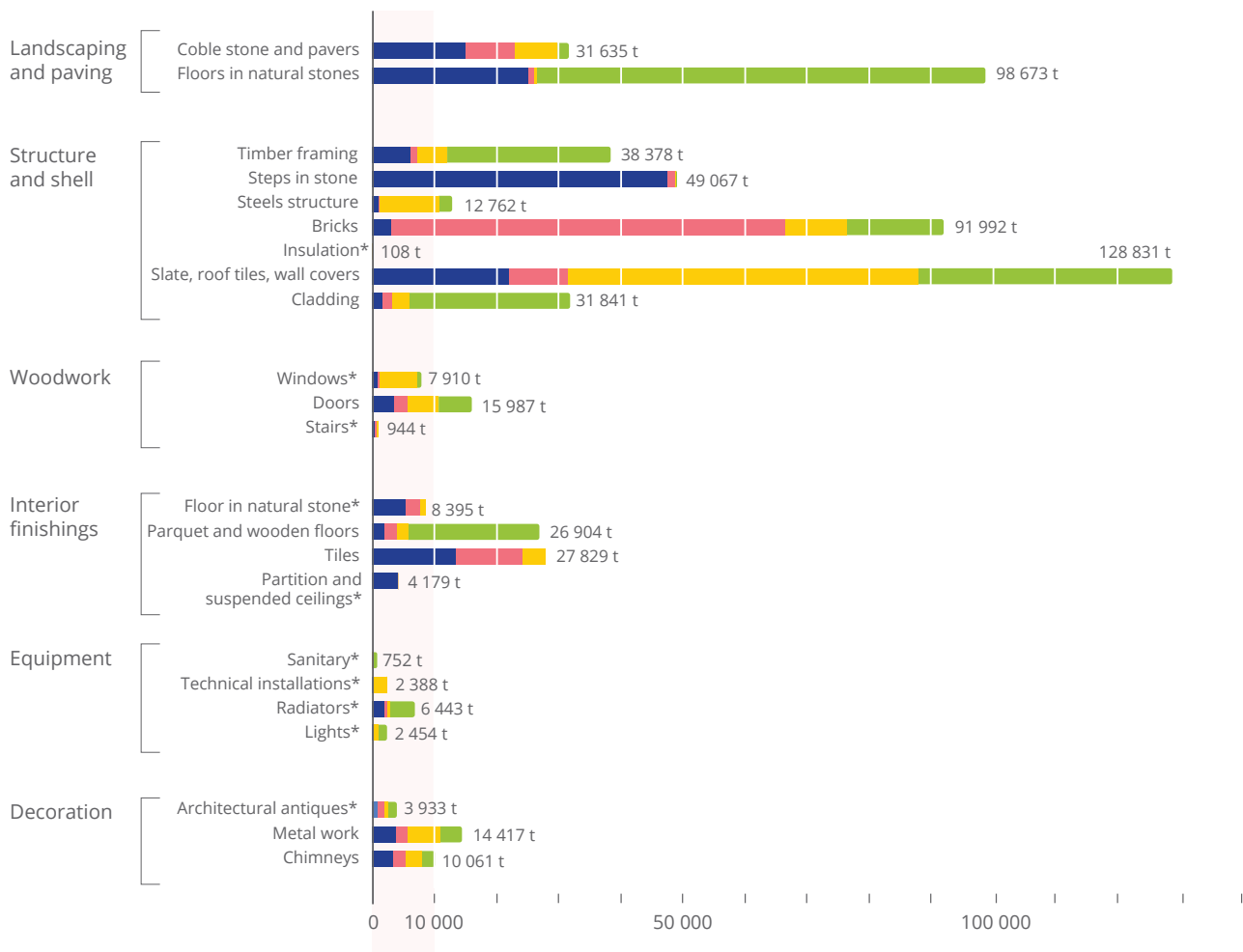
Table 11: Turnovers and FTE results per country.

7.4. Materials quantities in the sample

Materials quantities have been extrapolated using other coefficients than those in table 8 since not all the dealers have a declared stock. For 62 dealers, stock data were not available. The three most represented materials in terms of mass are:

- In France: Steps in stone; Floor in natural stone and Slate, roof tiles and wall covers.
- In Belgium: Bricks; Tiles and Slate, roof tiles and wall covers.
- In the Netherlands: Slate, roof tiles and wall covers; Steel structure; Bricks and Windows.
- In the UK / Ireland: Floors in natural stone; Slate, roof tiles and wall covers; Timber framing; Cladding and Parquet and wooden floors.

Architectural specificities fit with the different materials found in each country. Indeed, Belgium and the Netherlands have a massive quantity of bricks in stock while, in France, steps in stone and floor in natural stone are more represented. In the UK, reclaimed wood is more represented than in the other countries.



* For stocks below 10 kt see close-up below

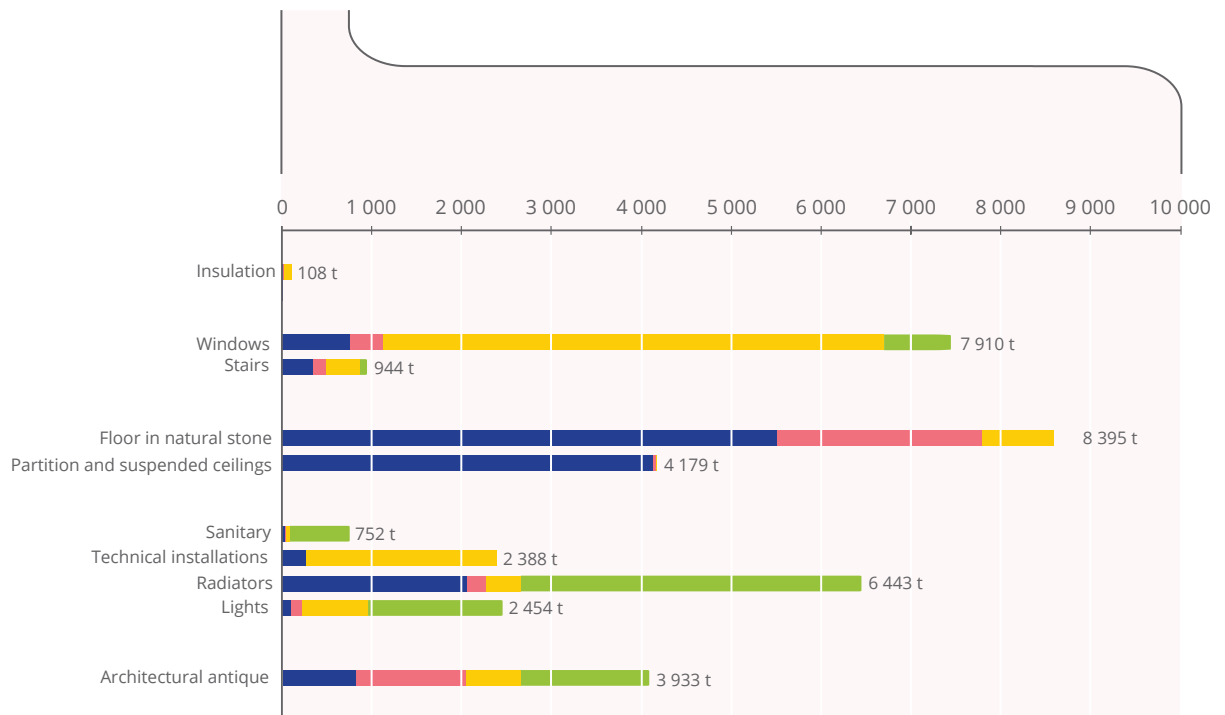


figure 20 : Total quantities (in tonnes) of each reclaimed material.

For more information, refer to the table in annex p.32.

- France
- Belgium
- Netherlands
- UK and Ireland

7.5. Potential bias

These results need to be taken cautiously as there are several sources of uncertainty listed in the table 11.

Results	Degree of validity	Source of uncertainty
Turnover related to the sales of reclaimed materials for each dealer	**	<ul style="list-style-type: none"> Estimated by partners in 65% of the visits Percentage related to the sales in their turnover could be over-estimated Use of an average value for the turnover High percentage of declared turnovers related to the sales of materials probably integrate other activities (as dismantling) that go beyond the sale. This leads to an overestimation of the economic volume of the sales of materials
Quantity of the stock of materials for each dealer	**	<ul style="list-style-type: none"> Quantity may have been under or overestimated by partners during visits Different partners have conducted the visits, the estimation of the stock can vary The conversion into a unique unit may be biased
Full time employees	***	<ul style="list-style-type: none"> The percentage of the turnover related to the dealer sales have been applied to the total number of employees
General values of quantity and turnovers	*	<ul style="list-style-type: none"> The population size may have been misestimated which leads to wrong extrapolation coefficients and wrong total volume The sample might be not representative of all the companies

Table 12: Data reliability.

7.6. From the stock to the flow

The visits allow to estimate the stock of materials owned by businesses. One of the objectives of this project was to estimate the volume of reclaimed elements being circulated in the project area. It was necessary to find a way to convert the stock into flows. Some methods listed below have been considered. However, due to the data available it was not possible to do it.

A first approach would have been to determine the quantity sold by applying a turnover rate to the stock. However, this method was abandoned:

- Turnover rate needed for the computation depends on the development of the

dealers' activity (popular or not), on the attractiveness of each material type (high or low demand) and on the size of the stock (large or small). The data related to these factors were not available since the questionnaire did not cover this issue.

- Moreover, even if those turnover rates would have been available the estimated stock is not the annual stock but the stock at a time t. Using a turnover rate related to the annual stock for only a part of the stock would have led to mistakes and certainly to underestimations.

Another approach would have been to obtain a rate based on the ratio between the economic value of the stock at time t and the economic value of the sales. Then to apply this rate to the total quantity of materials stored to obtain the materials flow.

But this method is biased for several reasons:

- The economic volume of the stock was not given in the questionnaire and thus had to be estimated by assigning an average price per materials. The results can be biased as prices for each material can differ by a factor of 4. Indeed, the aesthetic of the batch, the way in which the materials were salvaged (by the company itself or by someone else), the operations conducted on the material before sale, additional services, etc affect the prices on the market.

- For a lot of dealers, the value of the stock was much lower than the value of the sales. It was the case for 217 dealers out of 293 and in some cases the value of the stock was ten times smaller than the annual sales. This can be due to an underestimation of the value of the stock or to an overestimation of the turnover of dealers.
- In addition, applying an economic turnover rate to a stock expressed in mass is not relevant as heavy materials can be cheap and lighter material can be expensive. The economic turnover rate therefore does not reflect the mass turnover rate.

Due to lack of data and to the bias none of these approaches were rigorous enough to be adopted and at this point fair value of flow cannot be reliably determined.

8. Conclusion

This study was the first to shed lights on the invisible activity of existing reclamation dealers in a large part of North West Europe. It provides a detailed picture of the reclaimed sector in Belgium, France, the UK/Ireland and the Netherlands.

Companies involved in the reclaimed building materials trade are mostly very small and employ less than 10 employees. They cover several activities of the value chain (dismantling, restoring, manufacturing, etc.). The integration within the same firm of two complementary activities such as dismantling and restoring increases the competitiveness of the enterprise. It allows them to better capture the added value which is essential to the sale activity.

The analysis also revealed that the products and equipment sold by the dealers follows national specificities. The stock of materials hold by French dealers concerns mainly stone (flooring, steps, etc.) while Belgium has a large share of bricks and tiles. Dutch dealers focus on slate, roof tiles and wall coverings, while the UK and Ireland offer natural stone and wood.

The origin of the stock was also diverse among countries. The Netherlands, Belgium and the UK/Ireland differentiate themselves from France by the variety of sources used by dealers. Demolition, purchases from other dealers and professional deposits contribute to the origin of the stock In Belgium and the UK and to a lesser extent in the Netherlands while it comes mainly from demolition in France. Thus, French dealers have less opportunities when they look for specific materials. Intuitively, we can assume that this situation limits the opportunities for reuse.

Materials travelled frequently over long distances before being stored by the dealers. These distances are influenced by national traditions and the density of the national transportation network. With two thirds of the stock of materials travelling less than 100km, the situation of France appears specific. The fact that dealers get most of their stock from demolition has a strong impact on this situation. In the three other countries, different commercial channels (other dealers, professional and private deposit) are activated and will result in longer travelling distances.

Finally, some statistics relating to the economic activity and the stock of materials have been estimated giving an average turnover of **511,3 million €** and a quantity of materials stored of **615,9 thousand tonnes**.

However, some questions remain and need to be addressed in future studies:

- To get more accurate indicators on the trade to communicate the state of play to public authorities
- To switch from stock to flow of materials building elements
- To examine the embodied carbon issue
- To identify the nature of jobs related to these activities (qualified or not)

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Annex 1: Materials list for the stock assessment

Landscaping and paving

Cobble stone and pavers	Floors in natural stone
-------------------------	-------------------------

Structure and shell

Timber Framing	Insulation
Steps in stone	Slate, roof tiles and wall cover
Steel structure	Cladding
Bricks	

Woodwork

Windows	Stairs
Doors	

Interior finishings

Floors in natural stone	Partition and suspended ceilings
Parquet and wooden floors	Cladding
Tiles	

Equipment

Sanitary	Radiators
Technical installations	Lights

Decoration

Architectural antiques	Chimneys
Metal work	Lights

Annex 2: Total quantities (in tonnes) of each material

MATERIALS, PRODUCTS OR EQUIPMENT	TOTAL	FRANCE	BELGIUM	NETHERLANDS	UK
LANDSCAPING AND PAVING					
Cobble stone and pavers	31 634,56	15 053,37	7 836,03	6 759,60	1 985,56
Floors in natural stone	98 672,88	25 194,75	675,00	597,86	72 205,27
STURCTURE AND SHELL					
Timber framing	38 377,57	6 056,49	987,50	5 042,26	26 291,32
Steps in stone	49 067,14	47 430,87	1 253,57	229,71	152,98
Steels structure	12 762,39	1 012,37	223,21	9 498,41	2 028,40
Bricks	91 992,49	2 933,95	63 506,89	9 988,11	15 563,55
Insulation	107,53	7,63	14,82	85,08	-
Slate, roof tiles and wall covers	128 830,94	22 027,81	9 455,69	56 354,37	40 993,08
Cladding	31 840,88	1 527,58	1 692,56	2 690,83	25 929,90
WOODWORK					
Windows	7 910,48	820,68	316,96	5 905,95	866,89
Doors	15 986,94	3 462,42	2 164,29	5 053,97	5 306,26
Stairs	943,65	342,88	137,50	391,67	71,60
INTERIOR FINISHINGS					
Floor in natural stone	8 394,86	5 268,43	2 507,14	619,29	-
Parquet and wooden floors	26 903,72	1 900,26	2 122,38	1 722,26	21 158,82
Tiles	27 828,73	13 462,07	10 614,29	3 752,38	-
Partition and suspended ceillings	4 179,33	4 146,47	26,50	6,35	-
EQUIPMENT					
Sanitary	752,30	31,76	10,00	44,76	665,78
Technical installations	2 388,40	266,97	-	2 121,43	-
Radiators	6 443,32	2 054,63	208,21	395,48	3 785,00
Lights	2 454,25	92,36	130,95	734,92	1 496,02
DECORATION					
Architectural antiques	3 933,31	713,73	1 150,00	758,73	1 310,85
Metal work	14 416,96	3 769,42	1 931,77	5 218,25	3 497,52
Chimneys	10 061,37	3 389,52	1 906,25	2 688,89	2 076,71
TOTAL	615 884,01	160 966,41	108 871,52	120 660,56	225 385,51

