

Executive summary

1. Introduction

The **SUBTRACT** project, in which the Waste Agency of Catalonia (ARC, following Catalan initials) participates, developed within the framework of the European INTERREG program, aims to increase the economic sustainability and competitiveness of reuse (R) and preparation for reuse (PfR) centers through eco-innovative solutions that make them more functional, attractive, economically and environmentally sustainable, while offering stable jobs to those groups that are at risk of exclusion from the labor market.

This executive summary includes the main conclusions of the diagnosis of the reuse sector in Catalonia, made in collaboration with the Catalan Stakeholder Committee (CEC, following Catalan initials). CEC is made up of public and private agents working and with an impact in reuse sector in Catalonia. This diagnosis is one of the results of the first phase of the project and will serve as the basis for continuing the process of learning and sharing experiences between the partners. This process will end with the approval of a specific Action Plan to improve R and PfR, as well as the environmental sustainability and competitiveness of R and PfR centers.

2. Field of study

Dealing with SUBTRACT project objectives and with available information, the analyzed R and PfR routes were those channeled through public collection centers, the waste collection services through containers on the public space or other municipal services, as well as donations to entities from the third sector or other ways to obtain reusable objects.

To make this diagnosis, a first qualitative questionnaire (Q1) was sent to the members of CEC (Q1 is the same for all European partners of SUBTRACT project to enable comparison). A full analysis of the results of this qualitative questionnaire is given in Appendix I of the full document, while only the most outstanding results are mentioned throughout the diagnosis report.

In addition, a second quantitative questionnaire (Q2) was compiled, in order to gather quantitative data associated with reuse centers, stores and collection centers performing some R or PfR activities. Data requested in Q2 is about the amount of objects and / or waste reused or prepared for reuse both in and out, number and profile of workers, as well as sources of income and expenses.

3. Territorial scope

The territorial scope of this diagnosis is Catalonia, one of the 17 autonomous communities in which the Spanish state is organized. Catalonia has an extension of 32.108 km² and 7.543.825 inhabitants (as of January 1, 2018) distributed in 947 municipalities and 42 counties.

4. Regulatory framework

In Catalonia, the regulatory framework in the field of R and PfR is defined by **Law 22/2011, of July 28, of waste and polluted soils**, which involves the transposition to the

Spanish legal system of **Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste.** 6666666646

On the other hand, **Royal Decree 110/2015, of February 20, on Waste Electrical and Electronic Equipment (WEEE)** establishes the PfR of WEEE as one of the priority areas of work. Specifically, 1) it states the obligation to include WEEE-enabled spaces that can be used for preparation for reuse at collection facilities, as well as their requirements and their operation; 2) specifically establishes PfR as a priority treatment of WEEE and determines the specific technical requirements for carrying out the activity; and 3) incorporates the technical requirements for PfR, such as the criteria for their classification, the requirements of the centers for PfR and the procedures.

In addition to state-level regulations, **Legislative Decree 1/2009, of July 21, which approves the revised text of the Waste Regulatory Law**, aims to regulate waste management in Catalan territory. It establishes that municipal waste management is a responsibility of the municipality, and that «municipalities with more than five thousand inhabitants ... » «must establish the waste service by means of the installation of the center or centers required for the collection of waste detailed in the annex to this law». At the same time, the **Technical Standard of Collection Centers 2019**, a document that defines the technical requirements that collection centers must fulfill, recognizes the waste collection centers as possible R and PfR centers and establishes recommendations for their design and operation as the provision of an area of reusable elements, its inclusion in municipal ordinances, the need for the owner of the object to show his/her will to donate it for reuse purposes, and the minimum surfaces and requirements of spaces required for the different initiatives of R and PfR.

The regulatory framework is complemented by a number of strategic planning instruments, such as the **General Programme of Prevention and Management of Waste and Resources of Catalonia 2013-2020 (PRECAT20)**¹. The promotion of R and PfR are strategic objectives of PRECAT20, proposing activities such as the promotion of reuse centers, the preservation and promotion of businesses and associations linked to R and PfR, and commercialization of reconditioned goods.

5. Waste collection and treatment in Catalonia

In Catalonia, the main ways of collecting the potentially reusable items are summarized in Table 1. However, the ease and anonymity of disposing mixed waste in the residual fraction container, among other barriers to the promotion of good habits, result in a large part of the potential reusable waste generated ending up in the wrong place. In this sense, new waste collection models allowing the identification of the users or even rejecting to collect their waste in the event of an incorrect separation (such as door-to-door collection systems), promote better waste separation. Therefore, these systems guarantee a better quality of both separation and maintenance of the characteristics that make them still viable for reuse. At the same time these systems favor a greater use of collection centers and consequently a potential increase of R and / or PfR.

¹ARC (2013). *General programme of prevention and management of waste and resources of Catalonia 2020 (PRECAT20)*. Institut Cerdà i Agència de Residus de Catalunya, Departament de Territori i Sostenibilitat.

On the other hand, the collection system of some fractions (e.g. furniture, household appliances, etc.) that are leaved on the streets, or the abandonment of reusable waste on the streets, reduces their potential for reuse due to their deterioration subjected to climatic factors and especially to uncontrolled scrapping (**Table 1**).

Table 1. Common collection schemes for reusable fractions and pathways that do not enhance the R or PfR of these fractions.

Fraction	Main collection scheme that allows R or PfR	Pathways that do not enhance R or PfR
Textiles and clothing	Containers for the collection of used clothing and textiles on public roads. Containers for the collection of used textiles and linen at collection centers or other equipment. Mobile collection centers.	Containers of the residual fraction on the public space. Abandonment on the public space.
Electrical and Electronic Equipment	Collection centers. Mobile collection centers (except for large appliances). Household EEE collection previously arranged* Reverse logistics*	Abandonment on the public space. Uncontrolled scrapping on the public space.
Books, CDs, DVDs, antiques or collectables	Collection centers. Mobile collection centers.	Containers of the residual fraction. Containers of Paper and Cardboard fraction. Abandonment on the public space.
Furniture	Collection centers Furniture collection*	Abandonment on the public space Uncontrolled scrapping on the public space
Homeware	Collection centers Mobile collection centers	Containers of the residual fraction Abandonment on the public space
Building material	Big bags and metal containers from private managers for debris collection * Collection centers Mobile collection centers	Containers of the residual fraction Abandonment on the public space

* Depending on how the collection is organized and the purpose of the collection system.

Although still a marginal option, some local authorities have recently started offering furniture and bulky items collection services either inside the building hall or directly at homes. Both systems facilitate the re-use and improve public space. Beside these services provided by local authorities, there are also some social enterprises that offer for free or with a low fee the home delivery service for clothes, WEEE, homeware and furniture. However, these services are not offered in the whole of Catalonia but in some areas or specific municipalities, such as in Barcelona. According to various data

published by these companies, the degree of reuse of furniture collected at home is between 65%² and 80%³, whereas when collected on the streets the reuse can represent only 1% of all furniture collected⁴.

On the other hand, more and more collection centers are not only centers for collecting potentially reusable objects and materials, but also to perform some type of R and / or PfR activity. According to information available from the Waste Agency of Catalonia, 110 (30,81%) out of the 357 collection centers in service in 2018 perform some kind of R or PfR operation. At the end of 2013, the number of collection centers declaring to perform R and / or PfR was 73 (19,11%) out of 382⁵. It is worth mentioning that there is still considerable confusion about how to classify related activities and probably many more facilities do some R and PfR activity and have not stated so yet. However, it is interesting to review the main actions currently performed at public collection centers: most organize second-hand markets and exchange spaces (39,62%), as well as donations through the municipal social services or delivery to social enterprises (30,19%). In the latter case, these companies are the responsible for performing the necessary PfR actions.

In cases where a flow of materials is collected separately in order to be subjected to specific recovery or treatment, the destination of fractions under study is indicated in **Table 2**.

Table 2. Destination of reusable waste fractions when they are not R or PfR objects

Fraction	Destination (recovery)
Textiles	Clothing Textile waste management plant
Electrical and Electronic Equipment	WEE treatment plant
Books, CDs, DVDs, antiques or collectables	Paper and cardboard recovery plant (in the case of books) CD and DVD treatment plant (in the case of CDs and DVDs) Various destinations depending on the composition of antiques and collectables
Furniture	Bulky waste treatment plant Scrap at the collection center

²AMB (2018). *El potencial de la reutilització a l'Àrea Metropolitana de Barcelona*. PREMETS25 Programa metropolità de prevenció i gestió de recursos i residus municipals / 2019-2025. Rezero i Àrea Metropolitana de Barcelona.

³Yesares, N. (2019). «La preparació per a la reutilització dels voluminosos, casos d'èxit i requisits per al model de gestió i recollida». [ponència]. A: Els Municipis i la gestió dels residus. Gestió dels recursos i eficiència en els serveis. Barcelona, 18 de novembre de 2019: Espai Francesca Bonemaison. Fundació Fòrum Ambiental i Diputació de Barcelona.

⁴AMB (2016). *La gestió final dels mobles i la reutilització a l'AMB. El potencial de reutilització i l'economia circular*. Àrea Metropolitana de Barcelona.

⁵ARC (2015). *Guia per al desenvolupament d'activitats de reutilització i preparació per a la reutilització a les deixalleries i altres establiments públics de Catalunya*. Agència de Residus de Catalunya, Departament de Territori i Sostenibilitat.

Fraction	Destination (recovery)
	Controlled landfill
Household items	Various destinations depending on their composition
Construction material	Controlled landfill for building and demolition waste

6. Promotion of reuse and circular economy

Governments, in their various fields of competence, can establish the conditions of transition to a circular economy⁶. For that reason, the diagnosis report has compiled a list of the main initiatives related to the circular economy that promote R and PfR from different fields. These initiatives include a broad overview of public policy, from education, the development of framework strategies, the promotion of training and networking, fiscal policies, etc.

6.1 Educational Area

In the educational field, both the initiatives that effectively include the promotion of R & PfR and those that do not directly address this area but have high potential for developing new future initiatives have been considered.

Formal environmental education

There is no specific program on environmental education in the educational system, but there are a number of programs / initiatives aimed at promoting sustainability, increasing the presence of environmental education in the school's educational projects and, above all, increasing the availability of informative, educational and didactic materials and resources. In this case, R and PfR are generally part of more global content promoting the waste management hierarchy or new lifestyles.

Non-formal environmental education

The network of non-formal environmental education entities in Catalonia is quite numerous and active, also emphasizing the networking through entities such as [Catalan Society of Environmental Education](#), [Catalonia Environmental Volunteer Network](#) or the [Table of Third Social Sector Organizations](#).

On the other hand, a significant number of educational resources have been identified, especially those led by public administrations at different levels of competence (for example, those of the [Catalan Waste Agency](#) or [B+S map of Barcelona Town Council](#)), some of which include R and PfR directly.

6.2 Public policies

There have been many interventions in Catalonia that promote the transition to a circular economy, as strategies, roadmaps, or other instruments that serve as drivers to the transition to a circular economy and which would therefore include R and PfR. **Table 3** shows the most relevant initiatives.

⁶<https://www.ellenmacarthurfoundation.org/our-work/activities/circular-economy-in-cities/policy-levers>

Table 3. Initiatives to foster the transition to the circular economy in Catalonia

Strategies and Roadmaps
Strategy for Sustainable Development of Catalonia ⁷ (2010)
Impulse strategy for the green economy and the circular economy ⁸ (2015)
Catalan Strategy of Ecodesign (Ecodiscat 2012-2015) ⁹
Catalonia towards Zero Waste. Current situation and indicators for transition ¹⁰ (2019)
Barcelona Zero Waste Strategy ¹¹ (2016)
Planning
General Programme of Prevention and Management of Waste and Resources of Catalonia 2013-2020 (PRECAT20) ¹²
Territorial Plan for Municipal Waste Management Infrastructures of Catalonia (PINFRECAT20)
Metropolitan Waste Prevention Plans of Barcelona Metropolitan Area
Barcelona Waste Prevention Plan 2012-2020 ¹³
National Plan for the implementation of the 2030 Agenda ¹⁴ (2019)
III Support Plan for the Third Social Sector of Catalonia ¹⁵
Networking, training, raising awareness
Circular Catalonia: Circular Economy Observatory of Catalonia
Circular economy hotspot Catalonia 2020: The annual circular economy European event
Network of cities and towns for sustainability (La Xarxa ¹⁶)
Barcelona + sostenible ¹⁷
Economic promotion and other incentives
Call for grants for prevention, preparation for reuse and recycling of industrial waste projects (Waste Agency of Catalonia).

⁷[Estratègia pel desenvolupament sostenible de Catalunya](#)

⁸http://mediambient.gencat.cat/ca/05_ambits_dactuacio/empresa_i_produccio_sostenible/economia_verda/impuls_economia_verda/

⁹http://mediambient.gencat.cat/ca/05_ambits_dactuacio/empresa_i_produccio_sostenible/estrategia_ecodisseny/

¹⁰ <http://rezero.cat/dm/estudis-de-recerca/342-informe-catalunya-residu-zero/file>

¹¹<https://ajuntament.barcelona.cat/ecologiaurbana/ca/residu-zero/estrategia-residu-zero>

¹²http://residus.gencat.cat/ca/ambits_dactuacio/planificacio/

¹³ <https://ajuntament.barcelona.cat/ecologiaurbana/ca/residu-zero/prevencio/pla>

¹⁴[Pla nacional per a la implementació de l'Agenda 2030](#)

¹⁵https://presidencia.gencat.cat/ca/ambits_dactuacio/coordinacio-interdepartamental/III-pla-suport-tercer-sector-social-catalunya/

¹⁶ <https://www.diba.cat/en/web/xarxasost/xarxa>

¹⁷ <https://www.barcelona.cat/barcelonasostenible/ca/pginabsicaambdesplegables/que-es-barcelona-sostenible>

Announcement of subsidies for projects targeted to prevention and preparation for reuse of municipal waste (Waste Agency of Catalonia)
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Grants for projects promoting circular economy (Waste Agency of Catalonia)
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Circular economy innovation coupons (to apply ecodesign criteria to products, services and processes) and INNOTEC service to support RDI circular economy projects (ACCIO)
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7. Outstanding projects

The most outstanding projects in Catalonia focused on the promotion of R and PfR are listed. The projects chosen are either from the public sector (usually linked to waste collection centers) or from the Third Sector organizations, so most are initiatives with a double focus, that is, social inclusion and environmental sustainability. Interesting initiatives have been described in terms of scope, content and / or innovation, and those projects that stand out as a successful business model have been chosen as best practices, as this is the main objective of the SUBTRACT project.

Public initiatives are aimed at promoting new, more sustainable lifestyles, prolonging the lifespan of potentially reusable objects, and enhancing repair, second-hand acceptance and exchange. Public initiatives also include donations, especially for the most vulnerable.

On the other hand, the activities of social entities mainly include R and PfR with the aim of selling the reconditioned materials, with particular importance of the textile fraction for the treated volume. It also includes the first authorized PfR center in Catalonia with social impact (i.e. Solidança) for the re-conditioning of EEE, still small in quantity but in expansion. It is interesting to emphasize that more and more of these entities are incorporating the collection service management to ensure the flow of materials to their centers, while also being another source of business when this service is carried out on behalf of a local entity such as the municipal service. Finally, a third way is also highlighted, that is private donations (from companies mostly) to other entities (especially to the third sector organizations or vulnerable groups).

Some of the most interesting projects (without being exhaustive as there are many initiatives and many visions) are:

- [Millor que nou!](#) (AMB). Public initiative to promote repair, secondhand and exchange.
- [Ambiteca](#), [Viladecans repara](#) or [Recuprat](#) as examples of public waste collection centers with R and / or PfR services.
- [Donalo.org](#) or [Pont Solidari](#) as examples of a meeting point between surpluses of companies and social entities or vulnerable groups.
- [Roba Amiga](#) as a cooperative for more efficient textile management, or [Humana - Fundacion Pueblo para Pueblo](#) as a specialized foundation on textiles recovery.
- [Solidança](#), [FiT](#) or [Andròmines](#) as entities with a diversified business model that promotes R and PfR of different material flows while generating a significant number of jobs.

8. Circular economy stakeholders

The full implementation of a circular economy requires the participation of all types of economic and social agents who establish new trust relationships aimed at generating shared value, making better use of resources in a stable and favorable territorial and economic framework. In this regard, it outstands the Observatory #Catalunyacircular as an agglutinating node aimed at the various actors involved in the green and circular economy: citizens, companies, institutions, research and technology centers, educational centers - schools and universities -, the various administrations, the third sector and the Government.

8.1 Public sector

The Government of Catalonia has made a clear commitment to promote green and circular economy, both at the planning level and with the implementation of specific initiatives, whether aimed at the business community or other public administrations. Also at the local level, in the area of their competence, initiatives in this regard are growing, especially through the municipal waste collection centers or new municipal services.

8.2 Third sector

This is where we find the majority of agents operating in the field of R and PfR in Catalonia. Most of recovery companies are work integration social enterprises. 21 of them have been described, although the list is not exhaustive. Two strategies are clearly differentiated: specialization (for example, in the textile industry) or diversification of services and objectives, whether they are related to waste or not.

8.3 Private sector

In this area there is a diversity and multiplicity of different profiles, highlighting:

- The exchange or sale between private parties, either directly, in real or virtual exchange markets, or through platforms such as Wallapop, Vibbo, milanuncios, etc.
- Companies that are beginning to implement reverse logistics projects within their corporate social responsibility programs. It would be the example of IKEA or the collaboration between Veritas and Humana to collect textiles from home when delivering orders at home.
- Traders and traditional second-hand stores.
- Reuse centers, whether entities or private companies that carry out reconditioning of WEEE (it will be necessary to see how they will be linked with possible financing of the corresponding Extended Producer Responsibility community systems).

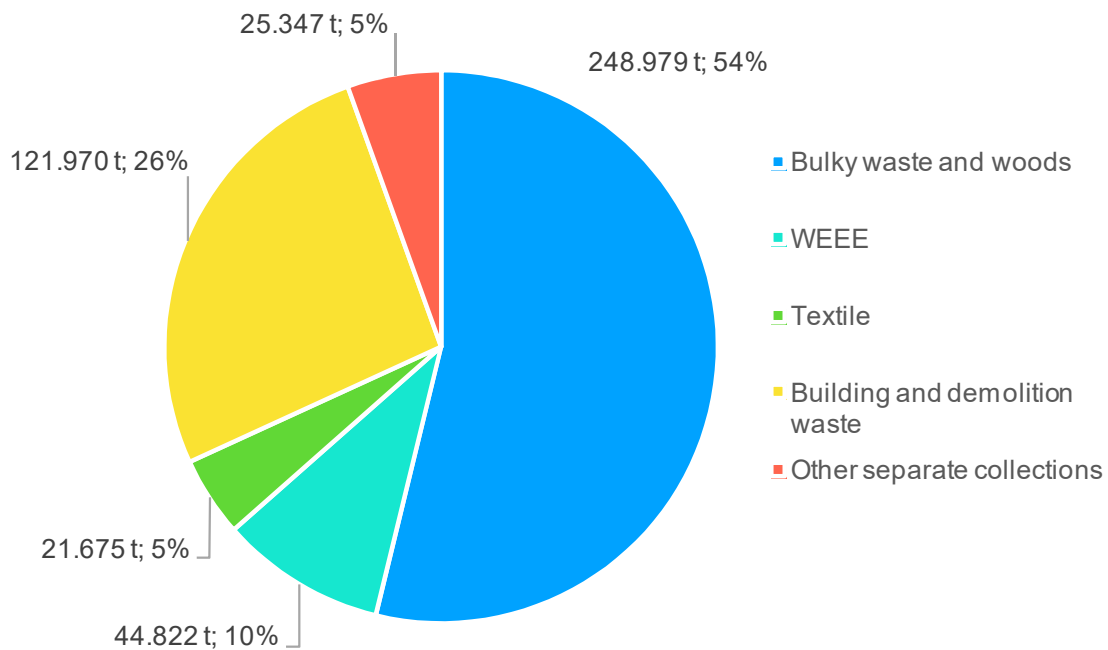
8.4 Informal sector

It is a sector that has grown significantly with the economic crisis. There has also been a significant increase in vandalism at waste collection centers, with theft of the most traded materials on the market.

9. Quantitative evaluation

In 2018, 3,98 million tonnes of municipal waste were generated in Catalonia (523 kg / inhabitant / year¹⁸). That same year, a gross separate collection of 41,8% was achieved. In total, 462.793,47 tonnes of potentially reusable objects and materials were collected separately, bulky waste + wood being the most abundant (**Figure 1**).

Figure 1. Gross separate collection of different fractions of potentially reusable municipal waste (tonnes and %)¹⁹



SOURCE: Municipal waste statistics. Catalonia Waste Agency (<http://estadistiques.arc.cat>).

9.1 R and PfR at municipal waste collection centers and reuse centers

The following sources of information were used to obtain an approximate quantitative data on the total number of tonnes that have been R and PfR via collection centers or reuse centers in Catalonia in 2018:

- Quantitative questionnaires (Q2) from R and PfR activities associated exclusively with municipal collection centers.
- Quantitative questionnaires (Q2) from public or private entities and not exclusively associated with municipal collection centers.
- Annual declarations of textile waste and WEEE managers (so called DARIG, following initials of Catalan words).

In total, 12 local authorities have contributed with quantitative information with data from 25 municipal collection centers where R and PfR activities are carried out. These collection centers served a population of 1.874.505 inhabitants in 2018 (24,8% of the

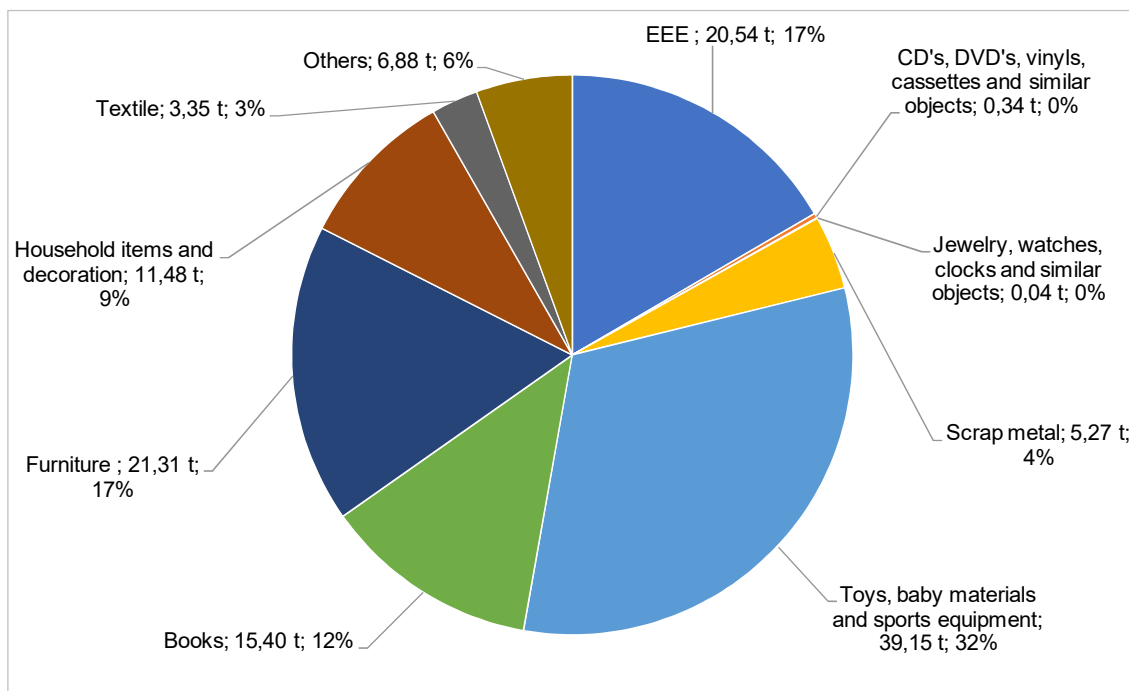
¹⁸ In Catalonia figures of municipal waste generated includes both household and commercial waste

¹⁹ The category "Building and demolition waste" includes construction materials, while "Other Separate Collections" includes books, CDs, DVDs, toys and trinkets.

population of Catalonia and 22,7% of municipal collection centers that declare to carry out R and / or PfR). The contribution from another 13 public or private initiatives that carry out R and PfR was also gathered. The fact that the recording methodology used by each of the experiences is not uniform (for example, each experience register different categories of objects, and even these may be recorded in units or by weight depending on the category of object), make it difficult to compare results and to obtain total values. However, when the information received is in units, conversion factors²⁰ were applied to allow this comparison.

Data reported by local authorities responsible for municipal collection centers sum up an amount of 123,75 tonnes (99,86 tonnes excluding WEEE and Textiles) for R and PfR, being toys, baby equipment and sports equipment (31,6%) the category of objects with higher collected weight (**Figure 2**). When data is converted to units the total amount is 85.680 units, being books (43,6%) the largest category of objects (**Figure 3**). Considering that the total population linked to the 110 collection centers that declare to perform R and / or PfR is 3.029.800 inhabitants (as of January 1, 2018), and the population linked to collection centers that have provided information is 1.874.505 inhabitants (61,87%), it can be extrapolated that the amount of objects and materials destined for R and PfR through the reuse centers in Catalonia is **161,41 tonnes** (excluding WEEE and Textile).

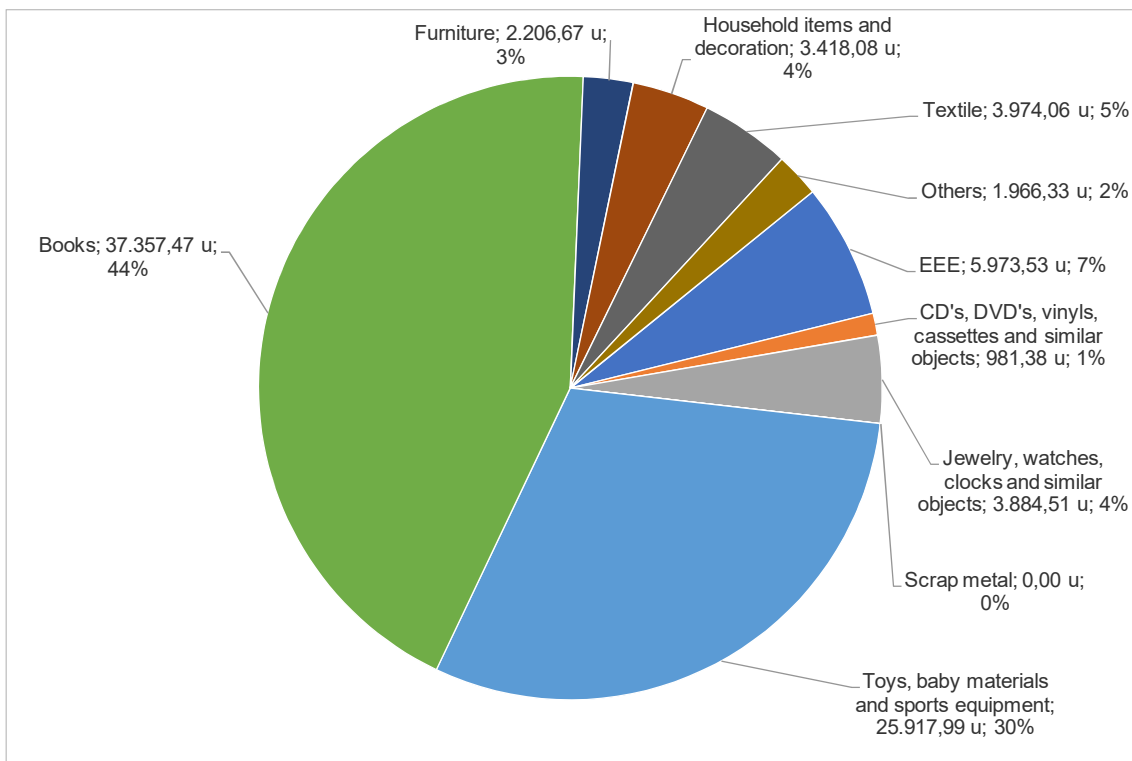
Figure 2. Main objects and materials (in tones) for R and PfR at municipal collection centers.



²⁰ARC (2020). *Table to quantify the weight of reused / repaired objects.*

<<http://www.compromesewwr.cat/wp-content/uploads/2016/09/Full-de-seguiment-dels-mercats-i-Taules-de-conversio.xlsx>> [Accessed: 20 January 2020]

Figure 3. Main objects and materials (in units) for R and PfR at municipal collection centers.



With regard to the data provided by public or private agents carrying out R and PfR initiatives, the majority of the 9.354,70 tonnes reported (equivalent to about 10.527.577 units) for R and PfR belong to the textile fraction, whether the data is reported by weight or units (**Table 4**).

Table 4. Major R & PfR objects and materials by public or private agents conducting other R & PfR initiatives

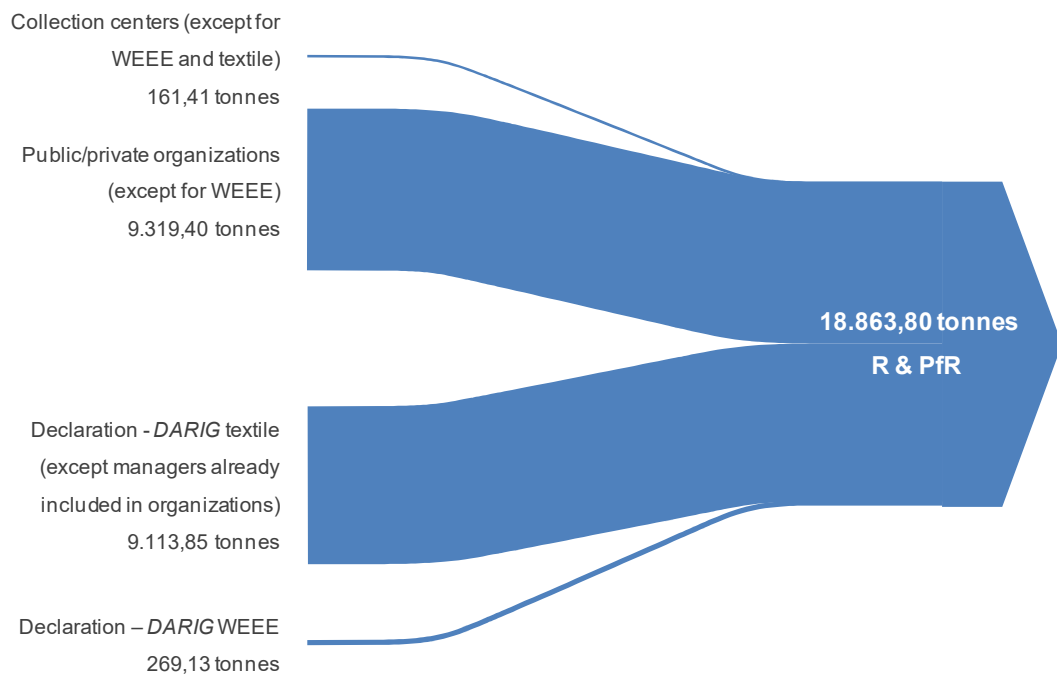
Fraction	Tonnes	% weight	units	% units
EEE	35,30	0,38%	10.265,99	0,10%
Jewelry, watches, clocks and similar products	0,00	0,00%	0,00	0,00%
DIY bikes	2,11	0,02%	603,45	0,01%
CDs, DVDs, Vinyls, Cassettes and similar products	0,01	0,00%	154,64	0,00%
Toys, baby equipment and sports equipment	0,07	0,00%	46,94	0,00%
Books	0,00	0,00%	0,00	0,00%
Furniture	464,17	4,96%	48.074,93	0,46%
Household items and decoration	1,91	0,02%	570,05	0,01%
Textile	8.815,93	94,24%	10.457.802,13	99,34%
Other	35,20	0,38%	10.058,59	0,10%
TOTAL	9.354,70	100%	10.527.576,73	100%

Apart from the information provided by local entities or entities in the third social and environmental sector, and according to Decree 88/2010, waste managers are required to transfer an annual waste declaration (known as DARIG) to the Catalan Waste Agency. From these declarations the total amount of WEEE and textile fractions destined to PfR is known. Regarding the amount of WEEE, in 2018 there were 269,13 tonnes prepared for reuse (259,81 tonnes from Extended Producer Responsibility community systems, and 9,32 tonnes from other R and PfR pathways), while for the textile fraction the figure was 17.738,47 tonnes.

Given the available data and in order to avoid duplications as far as possible, and to obtain the maximum reliable data on the amount of R and PfR for these abovementioned routes in Catalonia in 2018, the following calculation methodology has been considered (**Figure 4**):

$$\begin{aligned}
 \text{Qty. R \& PfR} = & \text{Qty. R \& PfR collection centers (except for WEEE and textile)} \\
 & + \text{Qty. public entities and proved (except for WEEE)} \\
 & + \text{Qty. DARIG textile (except for waste managers already included in entities)} \\
 & + \text{Qty. DARIG WEEE}
 \end{aligned}$$

Figure 4. Quantities of products / waste destined for R and / or PfR in the analyzed routes (t)



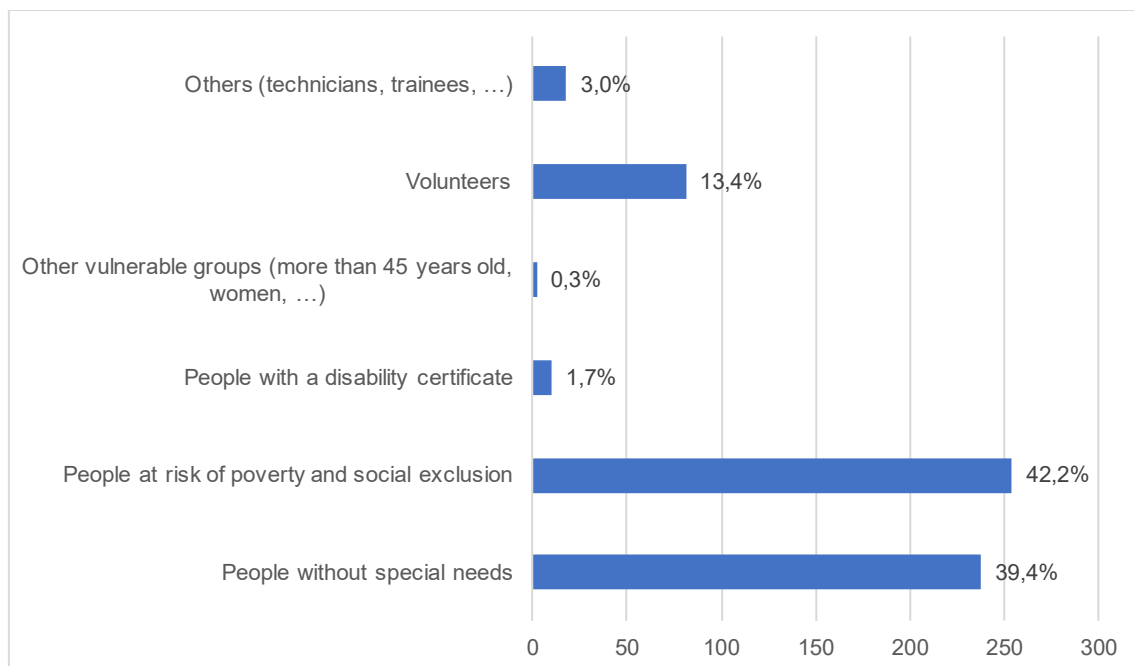
Therefore, with the available data, we can estimate that in 2018 about **18.863,80 tonnes** were used to R and PfR by these routes.

10. Labor market

The results of the qualitative questionnaire (Q1) allow us to make a first approximation to the labor market associated with reuse centers. According to participants, the majority of reuse centers have from 3 to 10 workers (37% of responses) or more than 10 workers (42% of responses, most below 50 workers). In addition, they say that 52.9% of workers are conventional workers with part-time or full-time contracts, 33.2% are members of cooperatives or social enterprises, and only 13.9% are volunteers.

Additionally, according to the quantitative questionnaire (Q2) answered by a total of 13 public or private agents that together have a total of 602 workers, 39.4% of the workers are conventional workers without special difficulties, 42.2% are people at risk of social exclusion, 1.7% are people with a disability certificate, 0.3% belong to other groups (over 45 years old, women, etc.), 13.4% are volunteers, and 3.0% are technicians or trainees (**Figure 5**). Only entities that responded to Q2 reported 266 workers from vulnerable groups (at risk of exclusion, with a type of disability or over 45 years old and women).

Figure 5. Types of workers in the reuse centers of Catalonia according to the participants in the questionnaire



The social balance of work integration social enterprises for 2018 in Catalonia shows that there were 59 registered ones and employed 3.544 people, of which 2.084 were in a labor integration itinerary. On the other hand, R and PfR activities are known to have great potential for job creation, as they require a large number of manual operations. In this sense, it is estimated that for every 10.000 tonnes of waste, 1 job is generated with incineration, 6 jobs in landfill management, 36 jobs in recycling and 296 in the case of repair and reuse²¹. As illustrated by the good practices presented by CEC members, this is a sector that promotes especially green employment. In addition, the majority of

²¹AERESS (2017). La economía social y circular como generadora de empleo y cohesión social. Asociación Española de Recuperadores de Economía Social y Solidaria.

entities that perform R and PfR activities are work integration social enterprises whose main goal is to occupy people at risk of social exclusion and poverty. Hence they have both a social and environmental aim.

11. Economic aspects

Regarding the **economic costs** of the main **municipal waste collection systems** in Catalonia, it is known that the cost per capita of door-to-door systems is higher (59,92€ in 2017) than that of the collection through containers of rear loading (40,45€) or lateral or bilateral loading (40,60€)²². However, door-to-door collection allows for higher percentages of separate collection (and therefore of associated revenue) and utilization of the collection centers²³, which may result – as a natural deduction – in a higher collection of reusable waste.

In relation to the **costs of municipal services** that allow **the collection of potentially reusable waste** (Table 5), we should highlight the specific case of Santa Coloma de Gramenet. It is a municipality of 118.821 inhabitants (as of January 1, 2018) that in 2018 began to offer for free a bulk collection service in the lobby of buildings. The cost of this bulk collection service is 253€ per tonne collected. This is an almost negligible increase in the cost of the service compared to the cost in the whole of municipalities with more than 50.000 inhabitants (249€ per tonne) and, at the same time, has several benefits, such as make it easier to the citizens by providing this additional service or avoid uncontrolled scrapping in the streets.

Table 5. Cost of bulk collection services and collection centers management in a sample of municipalities in the province of Barcelona

Type of municipality according to inhabitants	Bulk collection service		Collection centers management	
	€/tonne	€/inhabitant	€/tonne	€/inhabitant
< 10.000	78	1,7	78,5	7,7
10.000 – 50.000	71	3,4	80	5,8
> 50.000	249	5,2	89	3,2
Global	237	4,7	84,6	4,0

SOURCE: Vicaria, C. (2019). «La gestió dels voluminosos i els RAEE a debat» [ponència]. A: *Els Municipis i la gestió dels residus. Gestió dels recursos i eficiència en els serveis*. Barcelona, 18 de novembre de 2019: Espai Francesca Bonemaison. Fundació Fòrum Ambiental i Diputació de Barcelona.

Local authorities can invest a variable amount of economic resources in the framework of their competency on waste management. These may come from: 1) the sale of paper and cardboard from household or commercial separate collection and various materials collected at the collection centers; 2) the integrated management systems

²²Diputació de Barcelona (2018). *15a edició del Cercles de comparació intermunicipal de gestió i tractament de residus i neteja viària. Resultats any 2017*. Diputació de Barcelona.

²³Giró, F. (2019). «Introducció. Recollida Selectiva: Per a què?» [ponència]. A: *Jornada de prevenció i gestió de residus municipals*. Barcelona, 2 d'octubre de 2019: Cosmocaixa. Plataforma residus municipals.

such as Ecoembes, in the case of light packaging and paper and cardboard, and Ecovidrio in the case of glass; and 3) the refund tax on the food waste fraction of the municipal solid waste²⁴. As door-to-door collection system allows for more revenue, due to higher percentages of separate collection and use of collection centers, at the end the overall cost of this system is very similar (68,40€ / inhabitant) to that of the collection by sidewalk containers (69,47€ / inhabitant)²⁵.

11.1 Economic situation of R and PfR centers

The results of the qualitative questionnaire (Q1) allow making a first approximation to the current financial situation of the reuse centers. In this regard, 67,7% of participants state that the current financial situation of the centers is extremely fragile (35,3%) or negative (32,4%).

Establishing tax incentives for products or economic activities related to reuse and preparation for reuse (exemption of VAT or reduced VAT for second-hand products, reduction of municipal taxes such as business tax for repairmen, etc.) is the measure that participants consider more urgent in order to improve the economic situation of the centers.

However, the quantitative questionnaire (Q2) carried out by various public or private agents carrying out different R and PfR initiatives at reuse centers, indicates that, in this case, 93,2% of the revenue come from the sale of products and materials, 5,9% come from grants, agreements and aid programs, and 0,9% come from other sources (donations, membership fees, etc.). The results of this questionnaire (Q2) also show that 41,6% of the expenses of these centers are staff costs, 11,0% are depreciation and rent, and the remaining 47,4% are other expenses (administration, logistics, communication, maintenance, transport, etc.).

12. SWOT analysis

The diagnosis of the situation of R and PfR sector in Catalonia provides the information to enable an analysis of the main Strengths, Weaknesses, Opportunities and Threats of the sector (SWOT analysis) and to identify barriers and opportunities for the financing of the reuse centers. This SWOT analysis has been enriched by the contributions of the Catalan Stakeholder Committee members. The factors identified in this analysis, which are presented in **Table 6**, differentiate between Financial (F), Environmental (E), Social (S), Regulatory (R) and Transversal (T) factors, will allow to

²⁴ Waste Disposal Tax with Refund Criteria (Catalan Municipal Solid Waste Disposal Tax): municipal waste disposal taxes are economic instruments that contribute to financing the cost of implementing sustainable municipal waste management. In an effort to divert waste from landfilling and incineration, Catalonia introduced the landfill and incineration taxes (they were 41,30€/t and 20,60€/t in 2019) allowing the return of the revenue to taxpayers, according to their waste performance. Municipal Waste Governing Board annually approves guides containing the criteria for the application of the tax and the refund system. The strategy of Catalan authorities is that the increasing taxes will made possible to decrease the rate of municipal waste disposal and incineration. In the same time, at least 50% of the revenue generated by the disposal tax had to be allocated to biological treatment of bio-waste and mechanical-biological treatment of residual waste, while the remaining revenue is refunded to the local authorities according to their performance regarding separate collection of bio-waste.

²⁵Freire, J., Jofra, M., Puig, I. (coord.), Roca, J. (coord.) (2013) *Balanç econòmic de la recollida de residus porta a porta i en àrea de vorera per als ens locals i propostes d'optimització*. Associació de municipis catalans per a la recollida Porta a Porta.

define, in later stages of the SUBTRACT project, a strategy to reinforce strengths, reduce weaknesses, seize opportunities and combat threats for reuse centers in Catalonia.

Table 6. SWOT analysis of the current situation of R and PfR in Catalonia

Strengths		Weaknesses	
F	<p>Offer of competitive prices in relation to new products.</p> <p>Lower labor cost for certain profiles of workers.</p> <p>Creating job opportunities for vulnerable groups has a number of social and economic benefits, although they are not included in the economic balance of reuse centers (reduction of family allowances, unemployment, etc.)</p>		<p>Low profit margin due to low prices to be able to compete in the market. However, the difference in price may not be enough to make most citizens opt for second-hand products.</p> <p>A fragile or negative financial situation added to the need for specialized profiles, so staff training must be paid internally.</p> <p>Need for the homologation of PfR centers, costing time and money that some small organization cannot overcome. Little diversification of products and services.</p> <p>Motivation of companies to make donations to social entities is mainly due to economic savings; so many donations are not suitable for R, becoming an uncontrolled exit channel that also needs final handling and treatment.</p>
E	<p>Contribution to the achievement of R and PfR targets and to the reduction of waste generated.</p> <p>Saving CO₂ emissions.</p> <p>More than 400 municipal collection centers distributed throughout Catalonia, receiving potentially reusable waste; many could host R and PfR activities.</p>		<p>It lacks a unique/standard methodology for the recording and traceability of R and PfR that quantifies recovered quantities and transfers it to environmental impacts (saved waste, reduction of CO₂ emissions or other environmental parameters).</p>
S	<p>Contribution to the creation of jobs for people at risk of poverty or social exclusion.</p>		<p>The demand for these products is still biased to “environmentalists” or to groups with low purchasing power. More visibility and connection with a generic audience is required.</p> <p>Non-existence of a common marketing strategy promoting a different demand than the current one, with greater social acceptance of the second-hand products or even making second-hand products becoming a trend. Lack of a good marketing strategy focused on “customer experience” rather than products.</p>
R	<p>Existence of obligatory % of PfR for some products, such as FR4 and FR6 of WEEE.</p>		<p>Difficulty in differentiating between residue and product and, therefore, between R and PfR.</p> <p>Consumer rights (guarantees, reimbursement, etc.) for second-hand products are not the same as for new products and this causes reluctance from consumers.</p> <p>Lack of a quality seal promoted by the sector or by the government.</p>

T	<p>Powerful and diverse third social and environmental sectors, with experience in the field of R and PfR.</p> <p>Collaboration and networking between social entities, creating positive synergies between them.</p>	<p>Collection centers are usually located on the outskirts of towns and cities and are not very close to the public.</p> <p>Today's furniture collection service systems do not guarantee the quality of collected bulky items and they often arrive to collection centers in a very poor quality.</p> <p>R and PfR centers do not always have a modern and attractive image for the general public.</p> <p>Lack of data (including the economic balances of R and PfR centers) and poor harmonization of traceability of products and material flows.</p> <p>Greater collaboration between entities and administrations is needed in order to enable the Administration to purchase second-hand products, to promote reserved contracts, etc.</p>
<p>Opportunities Threatens</p>		
F	<p>Increased funding opportunities, whether through grants for specific projects, new services for city councils, etc.</p> <p>Appearance of new business models (service-based businesses, collaborative economy, etc.).</p> <p>Possibility of joint management of certain services (reduction of costs and greater impact).</p> <p>The context of the economic crisis has made prices for second-hand products more interesting.</p>	<p>Low prices for new products.</p> <p>Imbalances between supply and demand.</p> <p>Competition with online buying and selling platforms.</p> <p>Competition with corresponding Extended Producer Responsibility community systems (so called SCRAPs in Catalonia).</p> <p>Lack of tax incentives.</p> <p>Economic model that promotes the ownership of a product rather than its use.</p> <p>High transportation and collection costs.</p> <p>Thefts (mainly at collection centers and containers on public spaces).</p> <p>Need to establish a tax framework that enhances reuse, including tax incentives for R & PfR initiatives.</p>
E	<p>Some of the current separate waste collection systems, such as door-to-door or other new trends, further favor R and PfR.</p>	<p>Most municipalities carry out separate waste collection via containers on the public road, a system that does not encourage the use of collection centers or the separate collection of reusable fractions.</p>
S	<p>Greater environmental awareness, especially among younger people.</p> <p>Increased habits of responsible consumption (organic products, local products, socially responsible ...).</p> <p>Greater social acceptance of the R and increase of buying and selling of second-hand products and stores.</p> <p>Online sales platforms have popularized second-hand products; positive synergies can be created.</p>	<p>A large part of society still links buying or using second-hand products with poverty.</p>

R	<p>Priority in the European hierarchy of waste management.</p> <p>European regulations on programmed obsolescence.</p> <p>GRI Standards required in company sustainability reports.</p> <p>New waste law of Catalonia.</p>	<p>Incomplete or negative legal framework, depending on the stakeholders involved.</p> <p>There is a lack of regulations governing programmed obsolescence and encouraging product reparability.</p> <p>The RD 110/2015 on WEEE entails obligations to the managers (registration, year of guarantee ...) that hinders the management of small initiatives or makes them unfeasible.</p>
T	<p>A greater collaboration between entities, and between entities and Administration, could generate even more positive synergies.</p>	<p>Planned obsolescence of EEE.</p> <p>Low initial quality of the products (textiles, furniture ...) that make R and PfR difficult.</p> <p>Generally, the higher the quantities collected, the lower the quality of the whole.</p> <p>Low quality of donations from individuals, making them unsuitable for R.</p>

13. CONCLUSIONS

- Public policies.** There is a wide variety of environmental education initiatives, educational programs, public policies and projects in Catalonia that aim to directly or indirectly promote waste reuse and circular economy. Even so, the qualitative questionnaire (Q1) carried out within the framework of the SUBTRACT project (Annex I of the diagnosis report) allows us to draw some conclusions in these areas. First, 85,3% of participants believe that reuse centers are not promoted or properly promoted. 100% agree that public incentives for citizens who practice reuse are needed. In addition, 70,6% believe that the current legal framework for reuse in Catalonia is incomplete (58,8%) or negative (11,8%). According to the participants' responses, the aspect of the legal framework that needs the most and urgent improvement is the establishment of a tax framework to promote reusability (e.g. exemption from VAT or reduced VAT for second-hand products, reduction of municipal taxes such as business tax for repairers, etc.). So according to these results there are several aspects to be improved for the direct or indirect promotion of waste reuse and circular economy.
- R and PfR "Public" centers.** The public collection centers network is a great opportunity in Catalonia to encourage both the receipt of materials susceptible to R and PfR and the generation of activities of this type in the same facilities. The number of collection centers declaring to carry out R or PfR actions is 110 out of a total of 357 (30,81%) in 2019, while this figure was only 73 out of 382 (19,11%) in 2013. Despite the increase in the number of collection centers declaring to be reuse centers, it is considered that many more probably carry out some R and / or PfR activities, even if they do not declare so due to the existing ambiguity in this sector. Therefore, it is necessary to keep improving and increasing the number of collection centers offering these services with the aim to reach the majority of the population and promote the extension of products' lifespan that still have possibilities to serve other people. That is the way to attain the goals set by the current regulatory framework and PRECAT20.

- **Economic balance of the entities.** Generally, the opinion of the sector is that reuse centers are in a fragile or very fragile financial situation. However, entities that have provided specific data have a high percentage of own revenues when they sale materials or other services, especially to the administrations. The percentage of own income falls significantly in other type of organizations more dependent on donations and public funds, especially when this source of income is more than 50% of the total income.
- **Business models.** There is a great diversity, atomization and territoriality of initiatives related to R and PfR. Their economic viability is equally variable. There are initiatives without paid services or sales that are obviously more dependent on private or public support. There are other initiatives clearly conceived as businesses (commonly established as work social integration enterprises), also non for profit organizations, that are less dependent on private or public funds. These enterprises have a double aim: on the one hand create stable jobs and provide training to achieve reintegration of social excluded people into the labor market; on the other, pursue environmental goals through extending the lifespan of objects and waste. These enterprises met also different situations and have different business model strategies. In some cases, the model is based on a super specialization (usually in textiles or linked with the management of a municipal collection center) and in others, the model is based on diversifying activities, not only within the waste sector, but also in other sectors such as restaurant business, catering services, industrial laundry or other facility services. In general, the economic viability of small entities is low and they depend heavily on subsidies or the inlet of collection centers. In bigger and professionalized organizations the economic balance is more positive.
- **The inputs of materials and waste for R and PfR.** The largest reused fraction is textile. It comes mainly from municipal collections made directly by the management entities and also, in a minor stream, directly collected at stores. For the rest of the materials, the main entries are the collection centers and the specific waste collection services (hence the importance of the configuration of these municipal services). Private donations are also relevant, especially donations from private companies or public administration to repairer organizations in order to prepare them and donate afterwards to third sector organizations or people at risk of poverty and social exclusion. However, the potential flow of reusable items is still much higher than the one actually being used for R and PfR.
- **Demand for second-hand products.** Although second-hand products are starting to become fashionable among some young collectives and more sensitized people, the most important target audience is still those with lower purchasing power and therefore the demand for these objects is still very limited. In this sense, it is necessary that the prices are very competitive and, therefore, the economic margin to cover the operations of refurbishment, management, etc. it is still very low.
- **Traceability of data.** Traceability of data shows major differences between the information from private initiatives, which operate as a profit-making activity, and data from local initiatives associated with collection centers, which do not have a financial benefit as a result of the activity. There are also noticeable differences between largest organizations with bigger volume of activity and those smaller

(operational capacity is not the same). While it is true that they all register the total number of inputs and outputs, the smaller ones do not have too much detail in the classification of fractions. One of the main difficulties in being able to process the data and draw conclusions is the low homogenization of the records of materials and products. The classification by fractions is very diverse, with the addition of groupings of some of these fractions, which makes it very difficult to obtain global data and to compare results.

There is a lack of registration of several parameters, among which the inputs and outputs (which should allow to set the actual reuse rate) as well as the differentiation of the R and PfR channels.

- **Labor market.** The activities associated with a transition to the circular economy in waste management, and in particular the activities associated with R and PfR - in front of the last options in the waste hierarchy - generates new job opportunities and labor niches. In this sense, the social balance of Catalan work integration enterprises federation (FEICAT) for 2018 shows that the 59 registered work integration enterprises employed 3.544 people of which 2.084 were in the process of being integrated. Only entities that responded to Q2 reported 266 workers from vulnerable groups (at risk of exclusion, with some type of disability, or young people or women). It is important to be aware that these new labor opportunities are qualified as “green jobs” in a green economy.
- Continuing with the labor market and linking to the economic balance of reuse centers, it should be noted that there are some **positive externalities that are not taken into account** and that have a positive social impact (for example, aids to vulnerable people saved, improvement of the quality of life of people at risk of exclusion, which has a positive impact on health, education and training, etc.).