
“To recycle is to win!” The recovery of materials for war industry and institutional responses in Catalonia during the Spanish Civil War, 1936-1939

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ABSTRACT

Recycling is considered an essential piece of environmental action. Moreover, in recent decades, it has gained significant prominence as a determining factor of the so-called circular economy, which is a new paradigm of sustainability within the capitalist framework. However, the reuse of resources has existed since the beginning of humanity. The processes of industrialization and urbanization reduced its previous visibility, although with important exceptions: the two world wars, which, due to their industrial character, made recycling a national priority for the belligerent countries. This article analyzes the case of Catalonia during the Spanish Civil War and the recovery policies that sought to supply its war industry. The similarities with other cases and the peculiarities of Catalonia are raised; institutional responses and relations of cooperation and conflict with the Spanish Republican Government in the face of material scarcity. Finally, the know-how generated during the war and subsequent decades of scarcity and how this could affect our current environmental awareness is highlighted.

KEYWORDS: recycling, war industry, Spanish Civil War, Catalonia.

JEL CODES: N4, N9, L23, Q33.

1. Introduction

The circular economy, as opposed to the predominant linear economy of “extract, use, and discard”, is one of the results of the evolution of the concept of sustainability within the current capitalist framework. It starts from the premise that if the planet is a closed system, the economy must also be closed when considering inputs and outputs. It aims not only to preserve na-

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tural capital¹ but also to improve it, minimizing the extraction of non-renewable resources, reducing polluting emissions of all kinds, the loss of materials and waste, and maintaining the value of products, components, and materials in the economy (Cerantola 2016; Cerdà and Khalilova 2016; Korhonen et al. 2018; Prieto et al. 2017). To this end, it is proposed to establish cyclical flows for the extraction, transformation, distribution, use, and recovery of materials and resources, based on what is known as the “6 Rs”: reuse, recycle, redesign, remanufacture, reduce and recover (Jawahir and Bradley 2016). As for the energy needed in a circular production, distribution, and consumption system, it must come only from sustainable sources such as solar, wind, and biomass if this does not harm the environment or produce carbon emissions (Haas et al. 2015). The success of the concept is evidenced by reviewing the literature, which has achieved remarkable growth in the last decade, mainly from disciplines such as ecological economics and industrial engineering (Ghisellini et al. 2016; Prieto et al. 2017; Reike et al. 2018).

From a historical perspective, a large number of quantitative papers related to the circular economy have been published in recent years, many of which use the social metabolism approach (Infante et al. 2017). These investigations provide information on aspects such as efficiency in the use of energy and materials, the degree of reuse of these, or the flows of international trade in natural resources. Alternately, there are numerous studies of a qualitative nature from disciplines such as archaeology, anthropology, sociology, cultural studies, or economic geography. These focus on the recycling or reuse of resources after their initial useful life, whose origins are lost at the dawn of humanity. Some examples would be studies on the repair of stone tools during the Middle Pleistocene and Paleolithic (Parush et al. 2014; Vaquero et al. 2012; Kuypers 2019), or the operation of second-hand markets, especially in the textile sector (Tranberg and Le Zotte 2019; Lambert 2004; López and Nieto 2010). Although the circular economy is a broader concept than recycling, since it aims, among other purposes, to reduce the resources used; without a doubt this is one of its most relevant instruments, as the use of renewable energies is essential. For this reason, historical studies on recycling may be relevant for the analysis of the circular economy in the long term.

With the processes of industrialization and urbanization, the economy increased the consumption of resources and the generation of waste. This trend has further increased during the second half of the 20th century, with the appe-

¹ Natural capital is a broad and abstract concept and its value, as in the case of capital as a productive factor, presents serious difficulties to be estimated. For this reason, it can be interpreted erroneously or in a self-interested way by economic agents and lead to decisions that are harmful to the environment to obtain economic benefit (Nadal 2019). To avoid this, it would be convenient to dispense with the excessively simplified analyses typical of neoclassical economics and create a regulatory framework that defines, with objective criteria, the limits of its exploitation.

arance of the mass consumption society (Haberl et al. 2011). Faced with this idea, an important qualification has been raised: the reuse or recycling of waste and by-products has always been a key activity, although with little economic visibility until a few decades ago, except in very specific contexts such as the two world wars, whose characteristics were different from previous conflicts (Cooper 2008). Both – the second on a larger scale – involved the application of the technologies of the Technological Revolution to warfare. Material needs and complexity grew exponentially, forcing greater State planning and the involvement of economic agents – public administrations, companies, and society – for the maximum reuse of available resources, especially those useful for war (Marwick 1980). There is a large bibliography on the economic aspects during periods of war; Broadberry and Harrison (2005) analyze the economic factors in the case of the First World War, Harrison (1988; 1998) during the Second. On the needs for raw materials and the relations of cooperation and conflict that these generated, see Hediger (1942); Calvo et al. (2019); Catalan (1995), and on the growing importance that countries at war have given to the recovery of materials see Denton and Weber (2021); Weber (2013; 2021); Cooper (2008); Irving (2019); Thorsheim (2015), and Berg (2015).

The research proposed here focuses on the institutional responses in the Spanish region of Catalonia regarding the reuse of resources destined for the military industry during the Civil War (1936–1939), which was the first (and only) industrial war on the Peninsula (Bricall 1985; Palafox 1996; Martin and Martinez 2013; Martínez 2006; Barciela and López 2014). I show that the Catalan model had similarities with those applied in belligerent countries – the British and German cases will be considered – in the two world wars, including: market intervention; requisitioning in specific cases; the creation of institutions to control production, trade, and the recovery of materials, and mobilizing the active participation of large sectors of society (especially women and children, who were involved in this way in their respective war efforts).

That said, the Catalan case had two important peculiarities that made it distinctive by comparison. Firstly, the autonomous government of Catalonia, represented by the Generalitat de Catalunya, did not have all the powers of a State, so collaboration with the Government of the Spanish Republic was essential and the struggle between both administrations – initially open to collaboration – became a constant source of conflict. Secondly, Catalonia did not have experience in two important areas: public planning on the recovery of materials for the industry – an aspect that traditionally depended on the market – and military-industrial production itself, with greater technical and material demands compared to the extensive civil metal-mechanical industry in Catalonia. In this way, one of the priorities of the Generalitat was to apply the capacity of Catalan industry to the war effort, through the creation of the *Comissió d'Indústries de Guerra* (War Industries Commission – hereafter

CIG), operational between 1936 and 1938 (Bricall 1970; Tarradellas 2007; Mardariaga 2008; Pagès 2008). Parallel to the reorganization of production, the Catalan authorities began to take measures so that military production received the necessary materials given the shortage of adequate machinery and raw materials. They negotiated with neighboring countries and with the Government of the Republic, but they also appealed to Catalan society and the productive system, using everything from persuasion to confiscation. Lastly, it is worth noting the complex political situation on the loyalist (Republican) side during the first half of the war, where unions and anti-fascist political parties competed for political power, and in which the collectivization of industry and services held greater relevance, as a strong union presence was widespread (Thomas 1976; Garcia 2008; Aguilera 2012; 2013; Pagès 2007).

Section 2 begins with an overview of the British and German cases during the two world wars. Thereafter, I discuss the problem of raw materials on the Republican side during the Civil War. In section 3, firstly, a review of the characteristics, functioning, and organization of the CIG is carried out during its period of activity, between August 1936 and August 1938. Secondly, I address the question of the obtaining the resources necessary to supply the Catalan war industry, and look at the initiatives aimed at making up for the shortage of raw materials, and appeals to companies and Catalan society to promote the recuperation of materials. I highlight the main similarities and differences between the recovery policies under the control of the Generalitat and those under the control of the Republic. In that process, I raise two questions: firstly, how did the two administrations deal with the shortages of materials necessary for the war industry? And secondly, in what ways did the institutional responses reflect aspects of cooperation and conflict between the administrations?

In section 4 – based on the cases of Great Britain and Germany, in which the solid waste generated in households was considered a strategic source of raw materials for war (Cooper 2008; Weber 2013; 2021) – I discuss the role of Fomento de Obras y Construcciones, S. A. (hereafter FOCSA), a concessionary company for garbage collection in the city of Barcelona since 1915. From the beginning of the concession, FOCSA carried out work to recover materials with market value after treating urban garbage. During the conflict, and under union control, it was integrated into the resource supply chain for the war industry. The interest of this case lies in the fact that Barcelona was, until years after the Civil War, the only large Spanish city with an institutionalized system of garbage collection and treatment; in other large cities such as Madrid, treatment was decentralized and fragmented, based on the action of thousands of ragpickers and junk dealers. Given the aforementioned general inexperience of the Spanish public sector in the recovery of materials, it is pertinent to ask how and when FOCSA’s know-how was incorporated into the war effort.

In Section 5, I look more closely at one of the aspects of the Republican policy of obtaining and reusing useful resources for the war in Catalan territory beginning from the summer of 1938, when the Generalitat definitively lost control of the war industry, which passed to the Republican Government. I analyze the activity of the Centro de Reclutamiento, Instrucción y Movilización *Nº 17* (Recruitment, Instruction and Mobilization Center No. 17 – hereafter CRIM-17) in Manresa, an industrial city located 65 km north of Barcelona, which included among its functions the recovery of materials. The cases of FOCSA and CRIM-17 present a comparison between the efforts of an (initially) private company and the organization of a recovery system controlled by the army. I will show how both systems demonstrated their usefulness and complementarity.

Finally, the work closes with the conclusions and research perspectives. I underscore the experiences of the war and the situation of scarcity of the first post-war period, which spread on a scale then unseen (Alegre 2022). Likewise, I highlight not only the know-how about the recovery of materials, but also the awareness of its need, possibly over a longer period than in other European cases, given that Spain entered the mass consumption society decades later. Although the purpose of these actions was not environmental, when concern for sustainability appeared, this know-how could be used. As an example, FOCSA – today Fomento de Construcciones y Contratas (FCC) – is currently a multinational with a relevant part of its business linked to environmental services.

This article is inserted in the framework of the international literature on the recovery of materials in periods of war and constitutes the first approximation of the Spanish case. The proposed approach and its subsequent development can further our understanding of an economic activity that remains to be studied in depth both in Catalonia and in the rest of Spain.

2. The problem of raw materials in war time

In related studies, the particularities of industrial wars are often highlighted, as they are marked by a greater need for materials and organization in comparison with previous conflicts. Mention should be made in this regard of the British and German cases. In the British case, starting in 1914 and given the scarcity and rising prices of some materials, the local authorities promoted their recycling, using women and school-age children as the main collaborating agents within a framework of “people’s war”, which led in 1918 to the creation of the National Salvage Council, responsible for coordinating recycling with local authorities. Already on the eve of the Second World War, in the summer of 1939, the Ministry of Supply was created to control the im-

ports, exports, sales, and consumption of materials considered economically strategic, in contrast to the previously laissez-faire vision. In October of that year, local authorities were called upon to recover paper, ferrous and non-ferrous metals, bones, and other kitchen waste. Salvage and recycling were promoted as a national effort to win the war, as well as a change in mindset towards waste (Cooper 2008; Irving 2019; Stokes et al. 2013). The strategic importance of cellulose paper, dependent in the British case on imports hindered by the submarine blockade imposed by Germany, forced restrictions on its use in the press and publishing houses, as well as the destruction for reuse, in 1943 alone, of some 600 million books from archives, libraries, private and government collections (Thorsheim 2013).²

On the other hand, in the German case, both during the First World War and during the period of the Nazi regime (1933–1945), the treatment and recovery of waste were considered key to the national effort, granting the participation of the women and school-age children a decisive role. After the experience of the War, the Nazi regime adopted a “total recycling” policy with top-down control, unlike the previous one, which was more dependent on local initiatives and dominated by women (Weber 2013). Recovery campaigns began in 1934, focusing on household waste (rags, paper, bones, household items) as a form of social mobilization and demonstration of loyalty to the regime, using both cooperation and coercion. Municipal recovery services and policies remained under the control of the State, fully inserting themselves into an autarchic and expansionist strategy and the supremacist ideology of the regime. For the recovery of materials, in addition to local authorities, women, and Hitler youth, thousands of volunteers and forced labor from the camps were used, even integrating the extensive network of concentration camps into this initiative. The goal was the full recovery of materials, comparable in some aspects to the current circular economy with one important caveat: the total dependence on fossil fuels (Weber 2022; Berg 2015; Biehl and Staudenmaier 2019). The different British and German political regimes conditioned the application of the materials recovery policies, but in both cases these were used as propaganda reinforcement to raise awareness among the population about the importance of getting involved in the war effort. This phenomenon can also be observed in the case of the USA during the same period (Witkowsky 2003). After the Second World War, both the British and the Germans kept recycling as a source of materials due to the scarcity of resources and foreign currency. It should be remembered that concern for the environment would not have a significant impact until the last quarter of the 20th century, so these actions – both during and after the War – were based on necessity. The subsequent economic growth based on the society of mass consumption and “use

2 For a case study on paper recycling in the USSR, see Pristed (2022).

and discard” caused an unprecedented increase in waste in the following decades (Cooper 2008; Stokes et al. 2013).

In the case of the Spanish Civil War, the two sides in the conflict were fighting to obtain the materials necessary to achieve victory. This effort included the acquisition of both war materials (Howson 2000; Manrique and Molina 2006; Viñas 2010; Molina and Permuy 2017) and raw materials to meet the needs of military production and the population. A distinction must be made between the resources available within the territory of each side and those that had to be imported. After the outbreak of the Civil War, the territory controlled by the Republic had 60% of the Spanish population and a great superiority in industrial capacity compared to the rebel zone. It included the most important industrial and mining areas, including Madrid, Catalonia, Valencia, the Basque Country, Cantabria, and Asturias, although its territory was divided and its agricultural resources – especially cereals – were inferior (Martín 2013). The progressive reduction of the loyalist territory decreased the availability of its resources for the Republic, unlike the rebel, “Nationalist” side, which was not only gaining territory but also had greater foreign support, mainly from Fascist Italy and Nazi Germany (Martínez 1987; Bernecker 1992; Preston 1999; Moradiellos 2006; Barciela and López 2014). As regards the value of metallurgical raw materials extracted through mining in the two territories, in December 1936 production in the Republican zone doubled that of the rebel zone; but a year later the situation had been reversed, and the rebel zone produced roughly 270% that of the Republic (Catalan 2013, p. 177). The turning point was the loss of the northern front – the Basque Country, Cantabria, and Asturias – with its availability of iron and coal, and its industrial capacity, in mid–late 1937.

In addition, foreign trade was seriously affected by the conflict, due to both a maritime blockade by the rebel fleet and the non-intervention policy followed by the main geopolitical powers, causing the consequent drop in imports of basic inputs for the Catalan metallurgical industry (Catalan 1995; 2013). In the second half of 1936, the value of imports in the Republican zone collapsed with respect to that of the first half (before the Civil War, which began in mid July). Minerals and metals fell 72%, while machinery fell 62%. The value of imports in the chemical industry, which was highly dependent on German exports, fell 77% (Martínez 2006, p. 47). Regarding the institutional responses, the Republican Government centralized its material imports (mainly from the USSR) through the public company CAMPSA-GENTIBUS in July 1937 (Martínez 2006; Meseguer and Pérez 1998). This produced an improvement in the commercial situation of the Republic; however, this was limited, as for the first half of 1938 only the import of metals had exceeded pre-war levels by 47%, while minerals were still 13% below and chemical products remained stagnant with a decrease of 76% in comparison with pre-war import figures.

It is worthwhile highlighting, here, some initiatives aimed at the reuse of materials or their recycling as war material. In the Republican zone, as in the rebel one (Egido *et al.* 1989; Sanz-Hernando (2020), calls for the recovery and delivery of materials – mostly scrap – were constant. Numerous initiatives aimed at society in general arose to promote the recovery of materials. As examples of campaigns to obtain materials, we can cite two: one in the rebel zone (Seville) organized by the “Main Commission for Scrap Requisition”,³ and another carried out in the loyal zone by the Unified Socialist Youth of Valencia between August and October 1938.⁴ Numerous initiatives that emerged aimed at involving society in the recovery of materials, but also to reuse resources on the front. The successive Republican defeats provided the rebel army with a large amount of scrap metal, as well as fully operational military equipment abandoned during the combat. Towards the end of the war, 30% of the rebel land army’s material came from the Republican army (Manrique and Molina 2006; González 2013). On the Republican side, in May 1937 a General Order was issued to the 40th Mixed Brigade on the Madrid front regarding the need to collect all spent cartridge cases and send them to the Division ammunition officer for reuse (González *et al.* 2010, p. 137). That same year there are references to the role of the *trepaceros* (literally, “hill-climbers”), who followed the combatants collecting the shell casings and cartridge cases from spent ammunition for later reuse.⁵

That same month, the Republic created the Subsecretaría de Armamento y Municiones (Undersecretary of Armaments and Ammunition), under the Ministry of Defense (Pagès 2008). Its function was to coordinate military production throughout the loyalist territory. It placed orders, provided the raw materials, and paid the salaries of the workers of the collaborating factories, the same functions that the CIG would have. This generated conflict and posed a challenge to the necessary cooperation between the two administrations, as will be seen in the following section.

3. Organization of the Comissió d’Indústries de Guerra (CIG)

In Catalonia, the military rebellion was defeated in the first few days; however, a situation of political and economic instability arose, which caused a significant drop in productive activity (Castells 1993; Pagès 2007). Despite its industrial capacity – with important textile and metal-mechanical sectors – the Catalan economy did not have an arms industry. The need to produce war

3 *La Vanguardia*, December 16, 1937, p. 5.

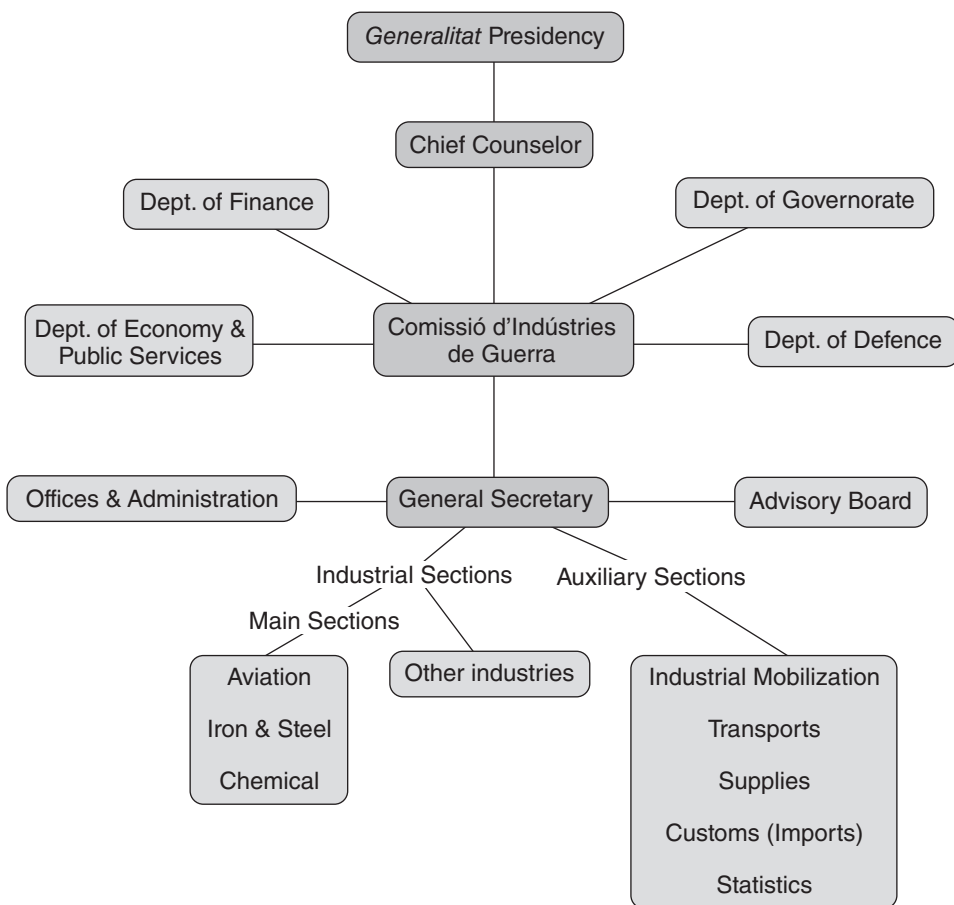
4 *La Vanguardia*, October 26, 1938, p. 5

5 *Periódico de la CNT*, August 24, 1937.

material and thus supply the front was to become evident. Unions and political parties began to readapt production in collectivized factories and workshops, albeit in an uncoordinated manner. The urgent need of greater organization led to the constitution of the CIG on August 7, 1936. The CIG was based on the participation of the Conselleria d'Economia (Department of Economy) of the Generalitat (Josep Tarradellas, Counselor of Economy and after September 1936 Chief Counselor of the Generalitat led the CIG as its Secretary General throughout the entity's existence) and the Committee of Anti-fascist Militias of Catalonia – where the CNT, an anarcho-sindicalist union, played a predominant role, along with other union and political forces in defense of the Republic. The new body tried to control all the production of war material in Catalonia. The CIG was organized along three sections: Iron and Steel, Chemicals, and Aviation (the latter became controlled by the Republic in February 1937). The Commission would encompass three types of companies spread throughout the Catalan territory: those of mixed production – partially dedicated to manufacturing war material but which would also maintain other production lines; those created from scratch by the Commission itself, or that took advantage of pre-existing facilities and that would depend exclusively on it (the 15 “Fs” – Factories, called thus for security reasons, as well as warehouses, laboratories and various facilities); and, lastly, complementary auxiliary companies that would not enter the definition of war industries but could play a role in it, such as textile industries. On the same day, a second decree established seizure, intervention, or occupation depending on whether it came from companies such as Pirelli, Maquinista Terrestre y Marítima, Hispano Suiza, Elizalde or the Sociedad Electroquímica de Flix. By the end of September, there were hundreds of intervened companies from different sectors, from transport to coffee production. In terms of operations, the management of the CIG was carried out by civil servants of the Generalitat, and each collectivized company dependent on the Commission had an inspector delegate who coordinated with the workers' control committees. Figure 1 shows the configuration of the CIG and the Catalan departments linked by September 1936.

The Commission, with the collaboration of the Spanish Ministry of Defense, placed the orders, provided the raw materials, paid the salaries, and allocated the material produced according to the needs of the front and the requests of the Republic. Production was organized in an atomized way, centralizing only the final coupling of the pieces or the loading of the bombs. An example would be the manufacture of the Mauser-style rifle, in which twenty companies collaborated. Its forty-seven components were brought together by F14 (Factory number 14) and assembled in the old premises of a collectivized Catholic school: the Salesian Professional Schools in the Barcelona neighborhood of Sarrià.

FIGURE 1 • Organizational chart of the *Comissió d'Indústries de Guerra* (CIG)



Source: Madariaga (2003); Hurtado et al. (2010, p. 372).

During the first months of the conflict, many of the factories had problems adapting to war production: the scarcity of raw materials, management problems, indiscipline, and little technical knowledge about military production created serious limitations in industrial readaptation and production (Catalan 2013). Despite difficulties of all kinds, the Catalan productive system under the control of the CIG was able in just two years (mid 1936 to mid 1938) to implement industrial processes and materials not previously seen in Catalonia. A report from October 1937 offers partial production data for the 15Fs, eight of which were located in the Barcelona metropolitan area (Tarradellas 2007). These factories were used to manufacture chemical products (fuels suitable for aviation, explosives, toxic gases), ammunition, and different types of bombs, small arms, and light weapons. Although five of them were still in the installation process, the Catalan war industry had produced, among other

materials: 20 tons of gunpowder, 2 million hand bombs of different kinds, 52,746 aviation bombs, 1,115 trucks and armored vehicles for various uses, 100,000 gas masks, and more than 71 million rounds for Mauser rifles. The report indicates that the CIG managed a total of 500 factories with 50,000 workers, in addition to another 30,000 in auxiliary factories and workshops.

To supply this war industry, an enormous quantity and variety of materials were necessary: machinery, chemical products, minerals, metals, fuel, cellulose, and fabrics, to name a few of the most relevant. The CIG had direct access to raw materials in Catalan territory, although it had limited access to imported ones – mainly due to the scarcity of foreign currency. The Republican Government also provided materials to the Catalan industry in coordination with the CIG, but it was increasingly difficult to satisfy all the demand, and production suffered continuous interruptions.

In this context, the Generalitat took a series of measures from the beginning of the conflict to meet the needs of the front. With difficulties and sometimes evading the restrictions not only of the Non-Intervention Pact signed by the main powers but also of Spanish legislation itself, the CIG acquired raw materials, ammunition manufacturing machinery, light weapons, and even planes, mainly from France and Belgium (the Commission had a commercial office in Paris). The list of war material acquired by the Generalitat abroad up to March 17, 1937 included: 141,150 rifles, 3,917 machine guns, 179 cannons, 339,701,000 cartridges for rifles/machine guns, and 233 aircraft (Pagès 2008). In August 1936, the Barcelona office of the Centro Oficial de Contratación de Moneda (Official Currency Contracting Center) was intervened with, facilitating access to the foreign currency necessary to import material, and on October 15, a Foreign Trade Office was created to promote exports and thus obtain foreign currency. Even so, foreign currency was always in short supply and the demands to the Undersecretary of Armaments and Ammunition of the Republic were constant (Catalan 2013).

Additionally, at the beginning of September 1936, the Generalitat requested exhaustive information from industrial companies on raw materials, machinery, and manufactured products in storage, intending to carry out an economic census of Catalonia.⁶ All metallurgical industrialists and merchants holding stocks of cast iron, steel, copper, brass, lead, tin, mercury, cobalt, nickel, cadmium, and other metals and alloys were also prohibited from exchanging or moving these metals without express authorization. In this way, the Catalan government intended to control the necessary metals, lest they be used for less-urgent purposes.⁷ In September 1938, the government prohibit-

6 *Diari Oficial de la Generalitat de Catalunya* (DOGC), 247, September 3, 1936, p. 1316.

7 *DOGC*, 249, September 5, 1936, p. 1350.

ed exports of raw materials necessary for the war industry.⁸ At the same time, a great effort was made to exploit the mineral resources accessible to Catalonia, putting some abandoned deposits back into operation due to their low profitability. An example would be the Estopiñán mines, which reopened in November 1936 and from which, by October 1937, 700 tons of manganese – key to the chemical industry and the manufacture of steel – had already been extracted (Tarradellas 2007, p. 191).

The CIG’s Supplies Section (Secció de Proveïments) was in charge of satisfying the need for materials necessary for the war. This included making purchases abroad (raw materials, weapons, equipment), and coordinating with the Spanish Undersecretary of Armaments and Ammunition in terms of orders from companies and the need for raw materials. Also, this section made requests to companies and individuals for specific material to meet the needs of the front (warm clothing, tools, etc.) using advertisements in the press and the collaboration of the different Republican organizations.⁹ The parties and unions resorted to their periodicals, general press, and billboards as a method of raising awareness to promote the delivery of material that could be useful on the front, as well as more efficient use of resources and more productive work. As in other cases of conflict, these initiatives were intended to keep society mobilized, giving a sense of participation in the struggle to those groups (women, children, and the disabled) who were not on the front lines.

As has been shown in this point and the previous one, the two administrations faced the needs of war similarly, in that both created *ad hoc* institutions and had the collaboration of unions and political parties. Naturally, when comparing the Republican Government with the Generalitat, important differences appear that influenced the capacity for action of both authorities and generated conflict. During the first months of the war, the Generalitat far exceeded its previous constitutional powers. To cite an example, in the first days of the war, a Catalan Department of Defense was created – an area in which the Republic should have sole legal domain. Given the exceptionality of the situation, the Republic could do little, and tried to establish a cooperation framework with Catalonia because of its strategic industrial capacity. The CIG and the Undersecretary for Armaments and Ammunition collaborated, although there were frequent actions by both parties that were undermining the already scant mutual trust. Among the conflicts that arose between the two administrations, it is worth noting the initiative of the Republic to establish contracts directly with companies such as Hispano-Suiza, something prohibited under Catalan law, which gave the CIG exclusive control of production

8 *La Vanguardia*, September 14, 1938, p. 8.

9 Arxiu Montserrat Tarradellas i Macià (AMTM), Monestir de Poblet - Fons President Josep Tarradellas i Joan (Indústries de Guerra 1936–1939), *Secció Proveïments* 18.7 IG-53 84.

in Catalonia. In contrast, from the Republican Government some voices accused the CIG of giving preference to the needs of the Aragon front, adjacent to the Catalan region.

Tensions were constant and the situation further deteriorated after the events of May 1937 (Viñas 2010; Aguilera 2013), and the formation of a new Government in Valencia more dependent on the USSR. In June 1937, the Undersecretary for Armaments and Ammunition created a delegation in Catalonia, whose functions conflicted with the CIG, and in September of that same year, the Ministry of Defense established its own War Industries Commission of Catalonia, which a month later would come to control all the private companies previously intervened with, leaving the Generalitat in control of only the 15F. In August 1938, and already with its capital in Barcelona, the Republic would seize the rest of the CIG factories, leaving the Catalan administration without powers, within a process of centralization of production throughout the loyalist territory that would, hopefully, lead to greater efficiency in the allocation of resources. The literature on the CIG is critical of this centralizing movement of the Republic, but given the scarcity of data, various sources show that centralized control was able to keep production running until shortly before the end of the Civil War (Madariaga 2003; Catalan 2013).

4. FOCSA and the know-how of urban waste treatment

Traditionally, the collection of urban solid waste had been carried out by farmers. Given the large percentage of organic matter in the garbage, it was used as animal feed and fertilizer after a selection process in which other materials capable of being reused were separated. Starting in the central decades of the 19th century, sanitary reforms in different European countries promoted a more orderly management of urban solid waste or garbage (Strasser 1999; Melosi 2005; Jones and Spadafora 2018; Herment and Leroux 2017). In the Spanish case, during the second half of the 19th century, the collection, transport, and reuse of garbage used to be the responsibility of ragpickers and farmers, and this was the case for the most part until well into the 20th century. Living in an informal sector, contracts between small businesses or individuals and the town halls for garbage collection and cleaning certain streets were common. For carrying out these tasks, the contractors on many occasions not only did not charge but even paid in exchange for keeping the waste they estimated for resale (López et al. 1980). In this sense, Barcelona was a pioneer in Spain, and in 1915 awarded through tender the cleaning, street washing, and household waste collection services for an initial period of 25 years to Fomento de Obras y Construcciones, S. A. (FOCSA). FOCSA was a construction company that aspired to a higher position in the field of urban ser-

vices, and in its early years stood out in the fields of public works and housing construction, key sectors in a growing city such as the Catalan capital. In 1992, it would merge with Construcciones y Contratas, S. A., changing its name to Fomento de Construcciones y Contratas, S. A. (FCC) (González 1999). The contract stipulated that the company would be responsible for sweeping and cleaning the streets, collection of household garbage, hospital, and clinic debris, objects abandoned by neighbors, and waste from markets, slaughterhouses, laboratories, zoos, and the like. It had to have at least two premises far from the urban area, for incineration ovens for dangerous or non-usable products, as well as premises more than 500 meters from the urban area for waste storage and handling. In these premises, the collected items had to be selected and prepared for subsequent use, in such a way that this did not present a danger to public health. As in the contracts with the former ragpickers, the substances resulting from the handling of garbage, manure, and dead animals remained the property of the contractor as part of the remuneration for the service.¹⁰

Within a short period FOCSA was endowed with the required infrastructure and maintained the contract continuously (FOCSA 1924).¹¹ In 1936, the company had more than 1,000 workers dedicated exclusively to public cleaning and street sweeping.¹² With the outbreak of the Civil War, many of those on the board of directors fled for fear of reprisals, settling in the rebel zone.¹³ The company was collectivized and a few months later, as a result of an agreement between CNT and the socialist union UGT in February 1937, it was integrated into the Barcelona Construction Association, with its headquarters on Balmes street as the main building. In that context, it was decided not to alter the cleaning service, considering that changes would make its operation worse. Thus, personnel, materials, and activities were maintained, although the name of the section did change to Public Cleaning, Street Sweeping and Sewerage of Barcelona C. C. (Collectivized Company).¹⁴ Organizationally, it came to depend on two union branches within the framework of the collectivization: garbage collection would depend on the Health, Social Assistance, and Hygiene branch, and the use of garbage was integrated into the Agriculture branch.¹⁵

10 Contrato para los servicios de limpieza pública y domiciliaria y riegos de esta ciudad. *Gaceta Municipal de Barcelona*, 1915 (Arxiu Històric de la Ciutat de Barcelona - AHCB).

11 *La Vanguardia*, April 3, 1917, p. 4.

12 *Aumentos y rectificaciones en el servicio de limpieza pública*, junio 1936 (Arxiu Municipal de Barcelona - AMB).

13 FOCSA, Memoria y Balance presentados a la aprobación de la Junta General Ordinaria de 1940.

14 *Informe de la Junta de Caps sobre la vigència del contracte de neteja*, October 1936 (AMB).

15 Informe aprobado en el Congreso Regional de Sindicatos para la nueva ordenación sindical de la CNT (*La Vanguardia*, March 4, 1937, p. 5). A study on collectivized urban agriculture in Barcelona can be seen in Camps et al. (2021).

The collectivized company remained operational throughout the conflict. The sources consulted for this research do not provide data on the results of the use of garbage either before or during the Civil War. However, considering that at the end of the twenties in Spanish cities, approximately 500 grams of domestic garbage were generated per person per day, and that Barcelona exceeded one million inhabitants, the volume of waste must have been very high (Paz 1927). Regarding the percentages of the different components of the garbage, these varied due to socioeconomic factors even within the same city, so it is difficult to obtain this information (Serra 1908). An estimate of household waste in Paris in 1932 indicates that it was made up mainly of vegetables and putrescible (38%), fine materials (27.9%), and paper and cardboard (21.7%). Estimating that in Barcelona there were similar percentages, something around 100 tons of paper and cardboard waste could be obtained daily from the city's garbage (Ros 1969, p. 5).

The evidence shows that, from the beginning of the conflict, collected garbage was treated and sorted, and a part was sold to give it new uses since it still held economic value. The hypothesis follows, then, that during the collectivization period, the organic components would be separated and reused in agriculture; while paper, containers, cans, other small metal objects, and rags would be destined for the war industry. In the case of bones, glycerin could be obtained from them, which after a nitration process was used to produce nitroglycerin, a powerful explosive. Although numerous references to cellulose – from cotton and esparto grass – have been found in the manufacture of explosives (trilite, tetralite, natamite, and gunpowder) by the CIG, no information has been found on the use of glycerin in the war industry, possibly due to its greater instability and danger in its manufacture and handling (Madañaga 2003). It is important to note that this process was in the hands of unions fully committed to the war effort, as organized through the CIG. In this way, the company would contribute its experience to the recovery of materials for the war effort from the first months of the conflict.

5. CRIM-17 of Manresa

The Republican Ministry of Defense institutionalized the recovery of resources during the second half of the war using the Centros de Reclutamiento, Instrucción y Movilización (CRIM – Recruitment, Instruction, and Mobilization Centers), which were created in September 1937 based on the old Recruitment Funds (Matthews 2006).¹⁶ Initially, there were sixteen, one for each provincial demarcation in the Republican zone “plus those necessary for the

16 *Diario Oficial del Ministerio de Defensa Nacional* (DOMDN), 217, September 9, 1937.

Catalan territory” (six in 1938).¹⁷ They had five sections: Recruitment (voluntary and forced, for the front), Mobilization (of personnel, livestock, and material), Recovery (of non-combatant labor and material), Instruction, and Accounting. For their operations, they were fed by the Rearguard Battalions, made up of men “of proven affection for the Republican regime” who, after at least three months as front-line combatants, considered themselves useless for service on the front.¹⁸

The Recovery Unit of CRIM-17,¹⁹ based in the Catalan town of Manresa, was made up of three officers, fifteen non-commissioned officers, and 175 soldiers divided into two detachments. It had a warehouse, transport, and organizational structure (clerks, orderlies, drivers). The Recovery Unit collaborated with the municipalities and companies within its area of influence to collect materials considered useless, which were later classified and conditioned for reuse. The municipalities that collaborated were the following: Manresa, Piera, Torregrosa, Moyá, Monistrol, Copons, Vilanova del Camí, Pobla de Claramunt, La Torre del Claramunt, Jorba, La Llacuna, El Bruch, Veciana, Aigüesbones de Montbuy, Castellolí, Carme, Castellbell i el Vilar, Castellet de Llobregat, Masquefa, Hostalets de Pierola, Capellades, and Vallbona d’Anoia. Among the companies, the following stood out: Industrias y Almacenes Jorba, Colectivizados, and Fábricas del Alto Llobregat y Cardoner, as well as the family business empires of the leading families of Barcelona: Miró, Soler, Vilaseca, Tort, Boixeda, and Torra, all of them located in Manresa.

Based on an order from the Spanish Ministry of Defense, the municipalities were required to collaborate with the CRIMs in “the recovery of all the papers, tin cans, espadrilles, shoes, shirts, pants, blankets, old jackets, irons of all kinds and metals, etc., to be transformed by our war industry”.²⁰ The town councils had to disseminate the call among the population for the delivery of materials, and provide a location for their storage until the Unit’s staff collected it. In addition, the CRIM itself carried out important propaganda work by distributing leaflets and showing advertisements in cinemas. Its members searched for materials on roads and in houses, to later classify them. In the case of the collected metals, these were divided into iron, copper, steel, aluminum, and tin, melted into bars at the facilities themselves, and sent to designated industries for reuse as raw materials. As can be seen in Table 1, between

17 Centro Documental de Memoria Histórica (Salamanca), <http://pares.mcu.es/ParesBusquedas20/catalogo/description/2574321>.

18 DOMDN, 170, July 14, 1937.

19 C.R.I.M., n° 17: *Memorial de Recuperación. 1.058.147 Kg. de material recuperado. October 5, 1938; Movilización. Revista del Comisariado de la Inspección General de Reclutamiento, Instrucción, Movilización y Batallones de Retaguardia*, January 1939 (AHCB).

20 Circular addressed to all the mayors of the municipalities collaborating with CRIM-17, July 31, 1938. Reproduced in *Memorial de Recuperación*.

August and November 1938, CRIM-17 collected a significant quantity of materials. Apart from the data shown in the table, the report mentions the recovery of more than 9,300 bottles, 123 scrap cars, and 216 kg of pure tin.

TABLE 1 ▪ *Material recovered between August 6 and November 30, 1938*

Months of 1938	Expression in kg (cumulative) of the various materials				
	Metals	Iron	Paper	Fabric	Total (kg)
August	7,887	218,601	9,590	178,867	414,945
September	14,717	548,983	14,041	288,191	865,932
October	36,418	932,540	26,822	381,104	1,376,884
November	49,376	1,084,045	29,629	395,526	1,558,576

Source: CRIM-17 *Memorial de Recuperación*, October 5, 1938.

No other statistical information has been located besides that of the 1938 report referenced; and the fact that these data are also mentioned in other publications of the time leads one to think that CRIM-17 was an exception when collecting statistical information. Even so, this case confirms that until very close to the end of the Civil War – Manresa would be occupied by Franco’s troops on January 24, 1939 – the recovery of materials was a key aspect for the Republic which, despite its commitment to importing material and weapons from the USSR, strove to maintain the production of the military industry for as long as possible, to take advantage of its resources and to save on foreign currency and gold reserves. The collaboration of local authorities and civil society was sought, assigning part of the rearguard brigades to work on scrap metal and ragpickers to obtain the necessary materials.

6. Conclusions

Even though concepts such as the circular economy and recycling are experiencing increasing diffusion in recent decades, materials have been reused since the beginning of humanity, whether as by-products or waste. With industrialization and urbanization processes, productive activity increased the consumption of resources and energy to an extent never observed before. Within this context, a large number of by-products and residues were treated and partially reused, but such tasks took place outside the focus of modern capitalism. Scrap dealers, ragpickers, farmers, or informal workers made it possible for rusty metal, old rags, and discarded paper to return to the economic cycle. Countering the low visibility of this recovery of materials became a national priority for the countries involved in the two world wars, given the industrial nature and magnitude of both conflicts.

This paper is the first study that analyzes the phenomenon of the reuse of materials destined to the Catalan war industry because of the scarcity caused by the Spanish Civil War. Until 1936, Catalonia had no direct experience in public planning for the recovery of materials or military production. Despite this, it managed to put into operation a significant volume of resources (materials, technicians, and labor) to supply the front. The Catalan institutional response had similarities with other cases of nations in conflict: the Generalitat produced new legislation and created bodies with this aim – such as the Comissió d’Indústries de Guerra (CIG) and its Supplies Section. The purchase of materials abroad, the reactivation of mining operations, the control and requisition of metals in Catalan territory, and the numerous propaganda campaigns, and cooperation with trade unions and parties within the framework of an anti-fascist front, were actions aimed at obtaining the essential raw materials for military production, while keeping an increasingly war-weary population mobilized. It also had peculiarities: since it did not have all the capacities of a state, Catalonia had to cooperate with the Spanish Republic, which, although it had greater resources and capacity to import, took similar measures to obtain materials through the cooperation of the population. I have also shown the importance of the creation of organizations such as the Undersecretary of Armaments and Ammunition. The need for cooperation against a common enemy was not enough to avoid conflicts between the two administrations, whether of an ideological, nationalist (Catalan vs Spanish), or organizational nature. The tension between the two Republican administrations, together with the intention of centralizing decisions by the Republic, would end with the Generalitat’s loss of control over the Catalan war industry in mid 1938.

Likewise, I have highlighted the role of Fomento de Obras y Construcciones, S. A. (FOCSA), the concessionary company for the collection of urban waste in Barcelona. This analysis is relevant because strategic resources for the war industry could be obtained from urban solid waste, and this constitutes a case of continuity between the period before the war and the period after it. After the war, it was decided to make as few changes as possible to maintain the company’s know-how on the recovery of waste from urban cleaning. The materials considered useful for the war industry would undoubtedly be destined for that, due to workers’ control during the period and the commitment of the unions (mainly the CNT) to the CIG.

The waste-management and recovery policy under the control of the Republic during the last months of the war is analyzed through the case study of the Centro de Reclutamiento, Instrucción y Movilización (CRIM-17) in the town of Manresa (a military unit made up of troops unfit for service who carried out tasks typical of scrap metal and ragpickers). Institutions such as CRIMs actively took the lead in recovering materials, particularly towards the end of the war. Based on the historical sources analyzed in the paper, it was

found that the CRIM personnel carried out crucial work, that is, supplying raw materials to strategic companies.

After the conflict ended in March 1939, the shortage of materials continued. The experience gained during the three years of conflict would prove useful to continue with the recovery of materials, promoting habits that would later merit the seal of “sustainable” or “ecological”. The case of FOCSA is paradigmatic in this regard, since it has become a multinational that, among other things, offers environmental services. It is very likely that the know-how of more than a century has been useful for positioning itself in the sector.

Future research can (and should) build on these findings. Firstly, it could provide more quantitative information from archival sources. Secondly, this line of research could contribute to explaining why Spain entered the mass consumption society much later than, for example, Britain or Germany. Finally, additional research may shed light on the reasons that prompted waste management and recovery, for instance, as a matter of hygiene and public health for public authorities’ vs benefits for companies and other actors that were linked to sustainability, thus informing current debates on what can sustain and promote a circular economy.

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«Reciclar és vèncer!» La recuperació de materials per a la indústria de guerra i les respostes institucionals a Catalunya durant la Guerra Civil, 1936-1939

RESUM

El reciclatge es considera una peça clau dins de les accions mediambientals. A més, en les darreres dècades ha guanyat un gran protagonisme com a factor determinant de la denominada «economia circular», nou paradigma de la sostenibilitat en el marc capitalista. Tanmateix, el reaprofitament dels recursos ha existit des de l'inici de la humanitat. Els processos d'industrialització i urbanització hi van restar la visibilitat que va tenir anteriorment, encara que hi ha excepcions importants: les dues guerres mundials, que pel seu caràcter industrial van convertir el reciclatge en prioritat nacional per als països bel·ligerants. Aquest article analitza el cas de Catalunya durant la Guerra Civil i les polítiques de recuperació que buscaven proveir la indústria de guerra. Es plantegen les similituds amb altres casos i les particularitats de Catalunya; les respostes institucionals i les relacions de cooperació i conflicte amb el Govern republicà en un context d'escassetat de materials. Finalment, es destaca el *know how* generat durant la guerra i les dècades d'escassetat posteriors, i com va poder afectar la nostra consciència mediambiental actual.

PARAULES CLAU: reciclatge, indústria militar, Guerra Civil espanyola, Catalunya.

CODIS JEL: N4, N9, L23, Q33.



«¡Reciclar es vencer!» La recuperación de materiales para la industria de guerra y las respuestas institucionales en Cataluña durante la Guerra Civil, 1936-1939

RESUMEN

El reciclaje se considera una pieza clave dentro de las acciones medioambientales. Además, en las últimas décadas ha ganado un gran protagonismo como factor determinante de la denominada «economía circular», nuevo paradigma de la sostenibilidad en el marco capitalista. Sin embargo, el reaprovechamiento de los recursos ha existido desde los inicios de la humanidad. Los procesos de industrialización y urbanización le restaron su visibilidad anterior, aunque con importantes excepciones: las dos guerras mundiales, que, por su carácter industrial, convirtieron el reciclaje en prioridad nacional para los países beligerantes. El presente artículo analiza el caso de Cataluña durante la Guerra Civil y las políticas de recuperación que buscaban abastecer a su industria de guerra. Se plantean las similitudes con otros casos y las particularidades de Cataluña, las respuestas institucionales y las relaciones de cooperación y conflicto con el Gobierno republicano ante la escasez de materiales. Por último, se destaca el *know how* generado durante la guerra y las décadas de escasez posteriores, y cómo este pudo afectar a nuestra conciencia medioambiental actual.

PALABRAS CLAVE: reciclaje, industria militar, Guerra Civil española, Cataluña.

CÓDIGOS JEL: N4, N9, L23, Q33.

