

From collision to collaboration – Integrating informal recyclers and re-use operators in Europe: A review

Waste Management & Research
1–20
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sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/0734242X16657608
wmr.sagepub.com


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Abstract

The European Union hosts some of the world's most developed waste management systems and an ambitious policy commitment to the circular economy. The existence of informal recycling and re-use activities in Europe has been vigorously denied until quite recently, and remains a very challenging subject for the European solid waste management sector, as well as for European government and private institutions. In countries ranging from Malta to Macedonia and from France to Turkey, informal recyclers excluded from legal recycling niches increasingly collide with formalised and controlled European Union approaches to urban waste management, packaging recovery schemes, formal re-use enterprises, and extended producer responsibility systems.

This review focuses on the period from 2004 through the first half of 2016. The 78 sources on European (and neighbouring) informal recycling and re-use are contextualised with global sources and experience. The articles focus on informal recovery in and at the borders of the European Union, document the conflicts and collisions, and elaborate some constructive approaches towards legalisation, integration, and reconciliation. The overarching recommendation, to locate the issue of informal recovery and integration in the framework of the European circular economy package, is supported by four specific pillars of an integration strategy: Documentation, legalisation, occupational and enterprise recognition, and preparation for structural integration.

Keywords

Informal recycling and re-use, Europe, circular economy, Balkans and new EU, informal integration, extended producer responsibility

Introduction

Within and at the borders of the European Union (EU), home to the world's most developed and institutionalised waste management systems, and with an ambitious policy commitment to the circular economy, there are thousands, possibly millions of informal recyclers and re-use operators. The existence of informal recovery activities in Europe, and the corresponding need for informal sector legalisation and integration in Europe, has been vigorously denied until quite recently, and remains a very challenging subject for the European solid waste management sector. European government and private institutions, in charge of municipal cleansing and hygiene, see the informal sector as undermining their work and creating dangerous risks for public health and safety. Informal recyclers and re-use operators seldom have a legal status, and they themselves feel that the economic niches that support them and their families are being eliminated without offering them an alternative. Clashes and conflicts are growing, and some form of co-ordinated action will be necessary if the European ambitions for resource efficiency are to become a reality (European Commission, 2016a, 2016b; European Environmental Agency, 2009; Eurostat, 2015; Len, 2014).

The context: Recycling in the EU and the Balkans

In Europe, the general approach to re-use and recycling is that they are part of the waste management sector, they are priorities in EU policy, and that they 'belong' to governmental institutions who rely on them to achieve policy targets. Service chain institutions in Europe see their responsibilities as covering separation rules for households, set-out of waste and recycling, collection, transfer and storage, and processing, recycling, recovery, and disposal of waste, bio-waste re-usables, and recyclables. Renewed focus on waste prevention takes this responsibility 'upstream', to include influencing packaging and consumption choices.

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The modernised European waste collection system is regulated by the Waste Framework Directive 2008/98/EC (European Commission, 2008). All EU member states and pre-accession countries use the directive as a guide. Higher levels of the solid waste hierarchy – such as waste prevention, re-use, and recycling – have a higher priority in policy, but are outside of the purview of municipal cleansing institutions, and as a result are implemented unevenly. Important changes approved in April 2016 in the framework of the European circular economy package introduce a robust set of reforms that give even more priority to reducing the production of waste, redesigning and diverting products and packages from disposal (ACR+, 2009; European Commission, 2016a, 2016b; European Environmental Agency, 2009; Eurostat, 2015; Len, 2014; Luppi and Sole, 2015; Zambryzcki, 2013).

The EU waste and materials policy framework – and the new requirements of the circular economy package – require producers to manage the end of life of their products and packages. The three principal directives for packaging waste, chemicals, and electronics, regulate the management of the end of life of products and packages in a sustainable way, largely through ensuring recycling and safe disposal. This highly developed, dynamic, and institutionalised approach to waste and materials management creates an entirely different context for informal re-use and recycling in Europe than for similar activities in Asia, Latin America, and Africa (ACR+, 2009; European Commission, 2016a, 2016b; European Environmental Agency, 2009; Ramusch et al., 2015; Scheinberg and Nesić, 2014; Zero Waste Europe, 2015; European Commission, 2015).

Most of the countries at the borders of the EU are in the process of becoming member states or of affiliating with the EU at some institutional level. The process of ‘accession’ to the EU requires wide-ranging measures to ‘harmonise’ governance, legal and regulatory systems, and bureaucratic culture with the requirements for EU member states. Solid waste systems in Macedonia, Serbia, Bosnia-Herzegovina, Montenegro, Turkey, and Kosovo, are all being modernised in the framework of the EU accession and harmonisation process, just as occurred previously in Slovenia, Croatia, Bulgaria, and Romania. Formal institutions in the waste management sector in Europe have been increasingly required to take responsibility for the entire waste cycle, including prevention and recycling. This has taken 30 years in the ‘old EU’, but must occur rapidly in countries seeking accession to the EU. This brings far-reaching changes to three main institutional landscapes: The *service chain* businesses and public institutions responsible for city cleaning and waste collection; the *value chain* of recycling traders and processors that are closely connected to global materials chains in Asia and elsewhere; and producers, importers, wholesalers, distributors, and retailers of consumer goods and packaging (ACR+, 2009; Belghazi, 2008; Doychinov, 2008; Doychinov and Whiteman, 2013; Democratic Transitions Initiative, 2013; European Commission, 2016a, 2016b; Newman, 2015; Scheinberg and Mol, 2010; Scheinberg and Savain, 2015; Schmied et al., 2011; Soos and Popovići, 2008).

As the pre-accession period progresses, cities and national ministries in South-eastern Europe, Turkey, Tunisia, and other countries under EU policy influence, come to understand that they are now required to take responsibility for organising recycling and promoting prevention and re-use. With some exceptions, ‘recycling’ is something that is new – and uncomfortable – for municipal authorities, whose public cleansing companies have focused on removing waste and cleaning streets. They seldom realise that ‘recycling’ is above all a private value chain activity. They lack experience, contacts, expertise – and above all interest – in entering the complex and highly commercialised world of trading materials in the value chain. And they do not realise that the informal street pickers and re-use entrepreneurs who work the streets at 6 am, are the primary suppliers to a globalised recycling system. Nor does it occur to these public actors, that informal activities may already be meeting or exceeding the goals set by EU directives for recycling and recovery (Belghazi, 2008; Chikarmane and Narayan, 2009; Democratic Transitions Initiative, 2013; European Environmental Agency, 2011; Günsilius et al., 2011; Luppi and Sole, 2015; Ramusch et al., 2015; Scheinberg and Mol, 2010; Scheinberg et al., 2007, 2010b; Simpson-Hébert et al., 2005; Toska and Lazarov, 2007; Toska et al., 2012; Vaccari et al., 2013; Wilson et al., 2006).

The situation for producers of products and packages is also uncomfortable. For them, the responsibility for end-of-life management is new. Until relatively recently, they were responsible only for the ‘front end’ of the life cycle, producing and selling, and not for the ‘back end’, collection, processing, and recycling or end-of-life management. Especially in the new EU (Romania, Bulgaria, Croatia, Slovenia) and in pre-accession countries, such as Turkey and former Yugoslav republics, producers are under pressure to organise packaging recovery systems. Even though producers active in these countries know how the value chains work, they often do not ‘see’ informal recyclers and re-use operators as being critical to the entire recycling system (EXPRO, 2014; Organisation for Economic Cooperation and Development, 2016; Zero Waste Europe, 2015; see also Boxes 3 and 4 detailed later in this article).

Historical overview: Scholarship and practice on informal recycling, re-use, and waste management outside of Europe

Table 1 describes how informal recycling came to the attention of the international community. The push came from some European development co-operation organisations, especially those of Germany and the Netherlands, the Collaborative Working Group on Solid Waste Management in Low- and Middle-income Countries (the CWG), the World Bank, social development initiatives in Egypt and India, the child labour elimination initiatives of the International Labor Organization (ILO), and the focus on member-based organisations of waste pickers by WIEGO (Women in the Informal Economy, Globalising, Organising)

Table 1. Insights from international sources on informal recycling.

Insights	First wave – 1990s	Second wave – 2000s
Informal Recyclers and their activities	<ul style="list-style-type: none"> • Informal recyclers choose activity owing to lack of formal education or paperwork • Eliminating children's participation requires parental and community involvement in decision making • They are often more interested in improving their business model than in 'better work' • Either waste pickers do the activity for less than 6 months or a lifetime, involving multiple generations 	<ul style="list-style-type: none"> • Informal recyclers make up as much as 1% of the world population – large numbers are in Asian, Latin American, and North American cities • Formalisation trends favour men • Informal recyclers perform environmental services for their cities, some of which can be quantified and generate value that cities do not pay for or support
Informal Recycling Systems	<ul style="list-style-type: none"> • Earnings often surpass minimum wage • Privatised landfills and waste collection disrupt informal livelihoods • International and charity efforts to move waste pickers out of the system fall short because the income they offer is not comparable 	<ul style="list-style-type: none"> • In most developing country cities the majority of recycling happens informally • More people work in the informal waste sector than the formal • European cities have active informal systems • Pro-forma costs of informal recycling and waste collection are lower than formal service costs. • Formalising and legalising informal recycling depends on social and governance factors, including the establishment of identity of internal or cross-border migrants

Sources: Abarca et al., 2002; Chikarmane et al., 2001; Conseil De L'Europe, 2013; Dias, 2006; Gunsilius et al., 2011; International Labor Organization, 2004; Iskandar, 1994; Medina, 1997; Medina, 2009; Porter, 2012; Scheinberg et al., 2010a; 2010b; Simpson, 1993; Wilson et al., 2006, 2009, 2010; WIEGO, 2009.

(Chen, 2012; Cohen et al., 2013; International Labor Organization, 2004; Scheinberg and Anschutz, 2006).

Informal recyclers live by primary extraction of discarded items and materials from disposal sites, streets, containers, and sometimes directly from generators. They valorise these materials and products, and sell them to the value chains. They support themselves and their families with the income from trading.

Informal sector issues began to enter into the mainstream waste management discourse on developing countries starting around 2006, partially stimulated by the periodic workshops of the CWG, and the study '*Economic aspects of the informal sector in solid waste*' financed by GIZ (German International Co-operation, at the time referred to as GTZ, German Technical Co-operation) (Scheinberg et al., 2010b). Since then, there has been a growing literature on informal recycling in developing countries, and a robust body of practice on integrating informal recyclers into formal systems in Latin America, Asia, and North Africa.

According to a number of studies dating back to 2006, this form of work keeps many tonnes of waste out of landfills, saves cities and households money, reduces greenhouse gas formation, and supports millions of families worldwide (Chaturvedi, 2009; Chikarmane and Narayan, 2009; Gunsilius et al., 2011; Linzner, 2012; Linzner and Lange, 2013; Linzner et al., 2011; Medina, 2009; Scheinberg et al., 2010b; Wilson et al., 2009, 2010, 2015).

Outside of Europe, the existence and importance of waste picking is gradually becoming accepted by the waste management industry, forward-looking producers, and a number of multi-lateral institutions including the World Bank, the International Finance Corporation, and the InterAmerican Development Bank. Informal activity has achieved the status of

an uncomfortable but inescapable reality, that has to be considered in plans to upgrade waste management (Cohen et al., 2013; Popovska et al., 2008; Ramusch et al., 2015; Scheinberg and Savain, 2015; Scheinberg et al., 2010a, 2010b; Velis et al., 2012; Wilson et al., 2006; Wilson et al., 2010; Wilson et al., 2009).

In middle-income countries with very large populations of informal recyclers, such as Brazil, South Africa, Colombia, China, Indonesia, and India, conflicts and competition for materials have led to a body of advocacy, research, and projects on integrating the informal sector into processes of modernisation of waste management systems. Legalisation and integration generally depend on a demand for informal recyclers to organise themselves in co-operatives, unions, and/or associations, register, pay taxes, and operate legally within the framework of the service chain (waste collection and disposal) or the value chain (recycling industries). *Informal integration* refers to a situation where recycling is a recognised official occupation, and informal recyclers have a legal identity, are protected by laws and decrees, covered by social protection schemes, and, increasingly, paid for the value of the service they are delivering to the city and the environment (CEMPRE Columbia, 2014; Chaturvedi, 2009; Chikarmane and Narayan, 2009; Dias, 2006; Godfrey, 2014; Gunsilius et al., 2011; Medina, 2009; Rutkowski and Rutkowski, 2015).

But there has been little willingness to acknowledge that informal activities are also affecting solid waste and recycling systems in middle, upper-middle, and high-income countries in North America Oceania, high-income Asia, and in Europe. The EXPRA/RDN/ISWA meeting in Bucharest in 2014 was one of the first international meetings to break that taboo, and to engage in a discussion of conflicts between formal and informal

recycling activities in and at the borders of the EU (Cohen et al., 2013; EXPRA, 2014; Linzner, 2012; Linzner and Lange, 2013; Organisation for Economic Cooperation and Development, 2016; Ramusch et al., 2015; Scheinberg and Savain, 2015; Schmied et al., 2011; Velis et al., 2012; Wilson et al., 2009).

Collisions in the making

There are many more informal recyclers in Europe than is generally acknowledged, and their recovery activities are undermining EU-harmonised recycling, re-use, waste management, and producer responsibility systems. Informal recycling and re-use activities are like a double-edged sword: On the one hand they are seen as the cause of health, safety, and environmental problems, and on the other, they are a significant resource for cities and regions to meet or exceed ambitious EU recovery and diversion targets. Packaging schemes in Turkey and the Balkans are 'losing' target materials, seeing them pass through informal hands and diminishing the value of investments in modern packaging systems (Eröztürk, 2015; EXPRA, 2014; Springloop Cooperatie, 2016).

And the converse is also true: Informal recycling and re-use operators are encountering increasing competition for recyclable and re-usable materials coming from formal recycling and re-use systems, and their spaces for legal operation are closing. Also in the re-use sector, formal or semi-formal second-hand shops, flea markets, and charitable institutions are seeking to de-legitimise informal re-use operators and pop-up flea markets, stimulating a struggle for rights to continue to commercialise re-usables (Democratic Transitions Initiative, 2013; EXPRA, 2014; International Finance Corporation, 2010; Kozák, 2012; Len, 2014; Linzner, 2012; Luppi and Sole, 2015; BOKU University, 2012; Soos and Popovići, 2008; Zero Waste Europe, 2015).

Conflicts are emerging in interactions between informal re-use and recycling sectors and three sets of formal institutions.

- The service chain, consisting of public and private waste companies, inter-governmental entities, and public sector operators.
- National ministries and institutions in the areas of social affairs, economics, migration, labour, and commerce.
- Producers of consumer goods and packaging, and the extended producer responsibility (EPR) institutions and organisations that represent them.

Waste management companies have difficulty with the fact that street pickers 'make a mess' when extracting valuable materials from waste set-outs or containers, making their work more difficult. Conflicts with private waste companies arise in countries like Austria or Colombia, where private waste collection is paid by the tonne and then the companies say that waste pickers are 'stealing the waste', even when the households make a decision to give their washing machines or old clothes to an informal re-use entrepreneur or to someone collecting to sell at the flea market. Waste industry trade associations also note that 'invasion' of landfills by dump pickers makes these landfills unsafe and unsanitary (Newman, 2015; Scheinberg, 2011; Schmied et al., 2011).

The collision with governmental and para-statal institutions is based on the governance of social norms and labour protections. United Nations organisations, such as the ILO and the International Trade Union Confederation (ITUC), have well-documented objections to the presence of children picking waste on landfills or in containers, but they have a more nuanced view of the position of adult independent recyclers. These and other organisations work to create social and health protections, reduce the risk of disease and injury in the recycling sector, and organise pickers in solidarity institutions such as labour unions or co-operatives. They also generally support the professionalisation and occupational recognition of waste picking (Chikarmane et al., 2008; International Labour Organization, 2004; International Trade Union Confederation, 2014; Scheinberg and Anshütz, 2006).

The third, and perhaps the most dramatic set of confrontations, comes when waste pickers harvest discarded packaging wastes and wastes from electric and electronic equipment (WEEE), which are covered by packaging or e-waste collection and EPR schemes. These systems enjoy robust levels of capitalisation and political support, but, owing to large and active groups of informal recyclers and reuse operators, have been documented to capture less than 10% of total recyclables collected in countries like Bulgaria, Slovenia, Turkey, Malta, and Greece (EXPRA, 2014; Organisation for Economic Cooperation and Development, 2016; Scheinberg and Nesić, 2014).

Discomfort also characterises relations between informal re-use operators and recyclers and two additional sets of (semi-) formal stakeholders (Len, 2012; Luppi and Sole, 2015):

- the value chains, that is, private recycling and re-use firms, who buy the materials; and
- civil society, including social enterprises, community-based organisations, environmental non-governmental organisations (NGOs), and charitable institutions.

Waste pickers and informal recyclers and re-use operators sell their materials to small and medium-sized junk shops, antique and second-hand shops, and sometimes also larger dealers, exporters, and end-users. Waste pickers depend on these enterprises, but often express a view that the prices are less than fair. There is clear need for improving existing co-operation, rather than a collision. Improving waste picker relationships and recycling performance through interventions in value chains have been studied in detail in a number of countries, most recently in Central America and North Africa, but also in the Balkans (Lobo Ugalde et al. 2016, Popovska et al. 2008, Scheinberg et al. 2007, Soos et al. 2014).

There is frequently a disconnect between informal recyclers and re-use operators in Europe, and NGOs involved in charitable re-use shops, social enterprises, community development, and environmental activism. Social enterprises dominate the European re-use sector, and community development and environmental NGOs are abundantly present in some countries like the UK, in the area of packaging and recycling. These organisations have an uncomfortable relationship with the informal sector, which they

would prefer to eliminate, but often settle for focusing on social entrepreneurship and/or ‘recycling projects’ (Len, 2012; Oyake-Ombis, 2012; Rutkowski and Rutkowski, 2015).

Structure of this article

This introduction provides an orientation to the body of work – scholarship, policy advocacy, and practice – on informal recycling and re-use in Europe, lightly contextualised with historical and global information. The following section reviews sources that document and characterise informal recycling and re-use activities in Europe, as well as projects, initiatives, and structural interventions ranging from traceability requirements to union organising. The third and final section does some light classification of the sources, draws out some insights from the review, and suggests conclusions and courses of action that can be derived from these sources.

European informal recycling and re-use: A review

This section of the article reviews the state of informal recycling in Europe using the approaches and (evolving) vocabulary that has characterised work in low- and middle-income countries outside of Europe. This review focuses on the 78 entries in the reference list that make a specific reference to European informal re-use and recycling.

1. Sources documenting and characterising informal recyclers and re-use operators in Europe.
2. Sources introducing the collision course between informal recyclers and re-use operators, and formal stakeholders.
3. Sources presenting initiatives, projects, and approaches to informal legalisation and integration solutions.

The sources fall into four categories, including the following.

1. Scholarly article, action research or student report, conference, project report.
2. Social or labour advocacy and/or organising.

Box 1. Eurostat mentions informal recyclers’ contributions.

‘The informal sector manifests itself in different ways in different countries, different regions within the same country, and even different parts of the same city. It encompasses different kinds of activities, different types of enterprise, and different reasons for participating. Informal activities range from street vending, shoe shining, food processing, and other minor activities requiring little or no capital and skills and with marginal output, to those involving a certain amount of investment in skills and capital and with higher productivity, such as manufacturing, tailoring, car repair, and mechanised transport. While some informal sector activities resemble traditional activities in handicrafts, food processing, or personal services, others such as car repair, **recycling of waste materials** or transport, are new and arise from modernisation.

Reasons for participating in the informal sector range from pure survival strategies undertaken by individuals facing a lack of (adequate) jobs, unemployment insurance, or other forms of income maintenance, to the desire for independence and flexible work arrangements and, in some cases, the prospect of quite profitable income-earning opportunities, or the continuation of traditional activities.

It should be noted that **the vast majority of informal sector activities provide goods and services whose production and distribution are perfectly legal** (in contrast to criminal activities or illegal production). There is also a difference between the concept of the informal sector and that of the hidden or underground economy, because informal sector activities are not necessarily performed with the deliberate intention of evading the payment of taxes or social security, but to reduce production costs.’

Source: Eurostat (2015), emphasis added.

3. Policy documents, laws, government, donor consultant reports, plans.
4. Direct information provided by individuals or organisations working on informal recycling and re-use in Europe.

Documenting informal recyclers and re-use operators in Europe

Practitioners and researchers in the recycling and waste management sectors began researching and documenting Europe’s informal recycling sector between 1998 and 2008. One of the earliest available sources highlighting repair for re-use is a small handbook, *Rubber Recycling*, published in 1996 (Ahmed et al., 1996). This document describes research on informal rubber recycling micro-enterprises in Naples, Italy, called *gommisti*, who operate several levels of re-use, repair, and reprocessing. The earlier literature generally limits itself to the social issues, showing that waste pickers are members of vulnerable groups within the European society. Later articles treat operational questions, and begin the integration discourse by illustrating the practical, operational, social, and environmental benefits created by waste pickers and informal re-users (Ahmed et al., 1996; Conseil De L’Europe, 2013; Fernandez and Ruberto, 2008; Luppi, 2006; Occhio del Riciclone, 2006, 2008; Popovska et al., 2008; Simpson-Hébert et al., 2005; Soos and Popovići, 2008).

Italian informal re-use operators have been a major focus of research, activism, lobbying, and interventions at the Economic and Social Research Centre of Occhio del Riciclone (OdR, in English: *Eye of the Re-cyclone*). This rich source of information and analysis of the Italian re-use sector began with a consultation in 2003 with several hundred informal re-use operators active in the city of Rome, using a survey designed by a group of economists, communication experts, and environmental technology specialists. The City of Rome awarded its Environment and Development prize for the study focusing on Rome, one of a group of cities studied, that included Anguillara, Ciampino, Udine, Vicenza, and Empoli (Luppi, 2006; Occhio del Riciclone, 2006, 2008, 2009). Working with Occhio del Riciclone in 2008, WIEGO co-financed a focused study on informal re-use in Rome (Fernandez and Ruberto, 2008) (Box 1).

Table 2. Global informal occupations as documented in Europe.

Global occupation	Global features found in Europe	Specific variations or characteristics found in Europe
Occupation 1, waste pickers (WPs)	Collect materials on foot or with tricycle or motorcycle with cart from street set-outs, containers, illegal and legal dumps.	European waste pickers pick both recyclables and re-usables, and do not usually specialise.
Occupation 2, itinerant waste buyers/collectors (IWBs/IWCs)	IWBs move along a route and trade directly with household and business waste generators, buying recyclables and offering a private separate collection service.	In Europe, IWCs are more likely to get the materials 'as a donation'. A European variation is also to perform some paid service, like cleaning out an attic or helping with moving house, and have the right to take materials.
Occupation 3, small dealers, or small junk shops	The first level of mobile or stationary traders who buy from waste pickers and IWB/IWCs. Premises are often without permits, and attract fines from zoning officers.	A European variant is second-hand traders, who buy and upgrade or repair materials, evaluate whether they can market them into the upper levels to antique markets, and then sell them.
Occupation 4, second-hand operators	Not considered part of the informal recycling sector in countries like Brazil or India, although picking of re-usables for own use is a common supplement to waste picking for recycling.	In Europe, re-usables are picked by street and container pickers, IWCs, traders, transporters, and merchants, and includes merchants specialised in direct sales of re-usables via pop-up flea markets, stalls in formal markets, and concession shops.
Occupation 5, swill collectors, herders	Collectors of food waste and spent frying oil for animal feeding or soap. A common variant is to graze livestock on official dumpsites or unofficial waste heaps.	Grazing of pigs on village dumps is common. Swill or spent oil collection in Europe is usually an activity of the formal, rather than the informal, sector.

Sources: Chikarmane and Narayan, 2009; Democratic Transitions Initiative, 2013; Gunsilius et al., 2011; International Trade Union Confederation, 2014; Luppi and Sole, 2015; Ramusch et al., 2015; Scheinberg and Mol, 2010; Scheinberg and Nesić, 2014; Scheinberg et al., 2007, 2010b; Schmieid et al., 2011; Simpson-Hébert et al., 2005; Toska and Lazarov, 2007; Toska et al., 2012; Vaccari et al., 2013; Velis et al., 2012; Wilson et al., 2006.

The authors believe that the first focused treatment of informal recycling in Europe was in the ILO desk study in 2004, with contributions by an action research team that worked with Romanian informal recyclers. This study discovered that interventions in what is now called 'social integration' had generally failed to improve lives and livelihoods of waste pickers, and hypothesised that treating informal recyclers as recycling entrepreneurs with important skills and knowledge would lead to the formulation of a different kind of intervention, based on professionalising their recycling activities to improve working conditions and income levels (International Labour Organization, 2004; Scheinberg and Anschutz, 2006).

The definitive monograph on informal recycling in former Yugoslavia, *A Paper Life*, by Mayling Simpson-Hébert, Alexandra Mitrović, Gradimir Zajić, and Milos Petrović (2005), documents waste picking in former Yugoslavia in a period before EU influence began to affect solid waste planning and practice. Available in Serbian and English, this small book provides a clear and immensely valuable baseline on European waste picking in the Balkans in a period when state socialist municipal waste institutions, the 'Čistoća' or 'Javno Komunalno Preduzeće' still had a functional monopoly in the service chain (Simpson-Hébert et al., 2005).

The Belgrade waste pickers interviewed were primarily recycling paper and cardboard, non-ferrous metals, car parts, and re-usables. The monograph documents a state of mutual tolerance and understanding so stable that waste pickers are quoted as saying, in response to questions about legality of waste picking 'So far it has not been prohibited' or 'As long as the dumps exist – that means that this work of ours is allowed'. Waste pickers also reported that before the Vinca Dump in Belgrade was closed,

they were not only tolerated, but garbage truck drivers would let Roma community members ride with them on their way to school or the city (Scheinberg et al., 2007; Simpson-Hébert et al., 2005).

The MIREA (Mainstreaming, Informal Recyclers in Europe and Africa) proposal to Europe-Aid was the occasion for several European organisations working in five EU and pre-accession countries to establish an inventory of waste picking, including an inventory of occupations and an estimate of numbers of informal recyclers and re-use operators, in these countries (Table 2).

The city of Cluj-Napoca in Northern Romania was selected as one of the six cities in the GIZ informal sector study and represents one of the earliest attempts to document 'informal integration' in a European city. The City Report for Cluj-Napoca compared the performance, costs, and capture rates of informal recyclers at the Pata Rat landfill in Cluj-Napoca, with those of the formal EU co-financed EcoRom packaging system, and concluded that informal recyclers were recovering many tonnes of materials at a fraction of the costs per tonne of the EcoRom system. They were providing a substantial positive environmental contribution to the city, but working in very poor and unhealthy conditions. The private waste company operating the landfill was interested in co-operation with the informal recyclers; in contrast, the city authorities, even when they understood that they benefitted from informal activities, were not willing to engage in dialogue (Gunsilius et al., 2011; Popovska et al., 2008; Scheinberg and Mol, 2010; Scheinberg et al., 2010b; Soos and Popovići, 2007, 2008; Tasheva, 2012; Toska et al., 2012; Whiteman et al., 2009).

The 2011 MSc thesis and resulting publication of Natasha Sim, on informal recycling in Bishkek, Kyrgyzstan (considered

Table 3. Numbers of informal recyclers and re-use operators in six European countries.

City and country	Census information/estimates	Occupations and level of organising
Sofia, Bulgaria	Diverse group of at least 2000 pickers in Sofia. Roma men, women, and their young children, wastepick at non-compliant dumpsites near bigger towns.	Most active in Occupations 1 and 2. No organising is reported, although two Roma social development organisations worked on this in the 1990s.
Attica Region (including Athens), Greece, half the country's population	Approximately 25,000–50,000 waste pickers regionally, as many as 100,000 in Greece, including part-time and seasonal pickers. Estimated 40% increase in waste picking since the economic crisis.	The oldest waste pickers association of 1185 persons, that are self-described as 'mostly Muslim Greeks' mainly active in Occupations 1 and 4, with some reporting of occupation.
Rome and other major cities, Italy	60,000–80,000 operators work in the informal re-use trade, in Occupation 4. Their involvement in metal and plastic recycling, usually associated with Occupation 1, is occasional.	1100 are organised reuse traders and members of Rete ONU, primarily in Occupation 4, with some activities associated with Occupations 1 and 2.
Skopje, Macedonia	5000 street and dump pickers active in Occupations 1, 2, and 3 were identified by a USAID project.	A subset was organised into co-operatives between 2005 and 2013.
Bucharest, Romania	1000 street pickers collect aluminium used beverage containers. The collect from apartments, offices, open markets, litter bins, parks. Of these, 10% are regarded as 'professionals' (working longer hours, collecting consistently more materials, having better equipment, etc.); 80% are 'full-timers', and 10% are 'part timers'.	The informal sector is unorganised, and there are no functioning associations, cooperatives, or unions of informal recyclers in Romania and no visible actors within civil society defending their rights. Most waste pickers involved in Occupation 1.
Belgrade and other cities in South Serbia (former Yugoslavia)	5000 to 15,000 disposal site and container pickers 'collectors' – Roma men, many refugees from Kosovo.	Social integration and education for Roma communities supported by UNICEF and a syndicate- (union-)based in the South Serbian city of Niš. Most waste pickers active in Occupations 1, 2, and 3, and wastes from electric and electronic equipment interest growing.

Sources: Democratic Transitions Initiative, 2012, 2013; International Trade Union Confederation, 2014; Occhio di Riciclone, 2008, 2009; Petean and Pop, 2015; Popovska et al., 2008; Scheinberg and Nesić, 2014; Scheinberg et al., 2007; Simpson-Hébert et al., 2005; Soos and Popovići, 2007; Toska et al., 2012; Vaccari et al., 2013; and information from Boxes 2, 4, and 5, detailed later in this article.

Rete ONU: Network of Re-use Operators; USAID: United States Agency for International Development.

as lightly in the EU influence sphere), indicates that Central Asian informal recycling and re-use is similar to that in Europe, and that the formal authorities there are equally hostile to the ideas of integration. The study suggests that the informal sector in that city is recycling 18% of the waste, at no cost to the city, but generating positive financial benefits calculated as annual savings of US\$1 million through savings in collection and disposal of waste (Sim et al., 2013) (Table 3).

The action research project 'Engaging Informal Recyclers in Europe' received seed money from WIEGO in 2012, and was designed around *consultations*, casual meetings with groups of informal recyclers on landfills, in their communities, or, when they are already involved in projects, as is the case in Macedonia and Serbia. Consultations were held in Serbia, Bosnia, Montenegro, Macedonia, Italy, and Greece, with the goal of establishing a base of information and identifying the main issues facing the collectors. In most cases the informal recyclers

expressed their interests in the directions of socio-political integration, value chain optimisation, and inclusive EPR. The general reactions to business-based integration approaches were positive, but there was little interest expressed in forming co-operatives or social enterprises (Conseil de L'Europe, 2013; Scheinberg and Nesić, 2014).

Documenting the collision course between informal and formal recycling stakeholders

The informal recycling operations in Europe seem to be on a collision course with EU approaches, institutions, and professional bodies working in the solid waste sector, in ministries of labour and social affairs, and in relation to EPR organisations and systems. This section focuses in on some of the collisions (Box 2).

Box 2. Resistance: Organising re-use operators at the Porta Portese Market.

In 2009, a large number of the displaced (Roma) operators forced their way into conducting business in the Porta Portese Market, creating new incidents of destabilisation and conflict with the deeply rooted local operators. The leaders of the market went to the levels of individual operators, and calming micro-conflicts, in their commitment to facilitate dialogue, ultimately solving the conflict. The leaders explained to each of the operators that a 'war among the poor' would help no-one and hurt everyone, and they emphasised common interests and the need for everyone to benefit from solutions. This resulted in Italian and Roma itinerant operators jointly advocating a transparent and fair system for giving concessions in public spaces in the city.

(Continued)

Box 2. (Continued)

This experience contributed to the formation of 'Rete ONU', the national network of second-hand operators that unites all of segments of the Italian second-hand sector, and includes Rome and Italian operators. It succeeded in establishing an official dialogue with the national government and is working actively with the national congress to improve legislation.

In 2016, this unified group of re-use operators was able to produce a methodology for valuating re-use activities, based on life cycle assessment (LCA) methods developed by the group Mercatino SRL (Occhio di Riciclone, 2015). On the basis of this method, the Turin city authorities made a formal decision to recognise and support re-use operators with concessions and allowing them to dispose of residues at a reduced price.

Source: Adapted by the authors from Luppi and Sole, 2015; Occhio del Riciclone, 2009; Occhio del Riciclone and Associazione Operatori Porta Portese, 2006; Occhio del Riciclone and Italian Environment Ministry, 2011; Torino City Hall and Rete ONU, 2016.

Collisions between informal recyclers and EU-supported packaging recovery. As the highly transparent, organised, institutionalised, and technology-intensive EU approach to service chain recycling spreads to the new EU, former Yugoslavia, and neighbouring (pre-accession) countries such as Albania, Turkey, and Moldova, spaces for informal activity close, often in parallel with economic reforms that lead to fewer opportunities for formal employment (Conseil de L'Europe, 2013; Soos and Popovići, 2008; Whiteman, 2008; Whiteman et al., 2009). Those whom the labour system cannot absorb, and who are unable to survive in formal economic niches, face loss of livelihood, and have to depend on social welfare systems, at a time when these are also disappearing. This analysis is particularly relevant for understanding informal recycling (and re-use) enterprises in the EU and in the pipeline to join it, and it explains in part why the level of confrontation between waste pickers

and local and national authorities seems higher – and more complex to resolve – than in other parts of the world (Luppi and Veralito, 2013).

Waste picking and informal recovery in Europe have a long history of co-production (as well as co-evolution) with the public cleansing companies; rag-and-bone picking appears in waste management articles about the 19th century; and waste picking was legalised in Paris in the 1200s, only to be forbidden again in the 1960s. The current levels of conflict have emerged gradually, as the EU has financed and supported the modernisation of its member countries and their waste management systems, which pushes local and national authorities to divert increasing amounts of waste from disposal to recovery (de Swaan, 1988; Gutberlet, 2008; Melosi, 1981; Poulussen, 1987; Scheinberg, 2011; Scheinberg and IJgosse, 2004; Velis et al., 2009) (Box 3).

Box 3. Conflicts in Bulgaria on the frontlines of EU packaging systems.

In 2003, the Bulgarian national government, in response to the demands of EU accession and harmonisation, implemented a packaging/product tax designed to feed a single, collective, industry-financed physical compliance scheme with 100% producer responsibility for end-of-life packaging management (Doychinov and Whiteman, 2013: 7, 10–11).

The new system was layered on top of an old one, without consultation and also without bothering to deconstruct the mix of habits, economic instruments, and incentive structures that it sought to replace. The EPR designers did not find it necessary to consult with stakeholders about the design of the system, with the result that many of the private companies were driven into resistance, and without their co-operation and knowledge about the recycling value chain, the resulting system floundered. Meanwhile the old system continued to operate, with informal suppliers selling to the formerly state-run buy-back centres. The packaging industry could not show that it was meeting its targets, but through the informal recovery activities, the actual recovery rates were almost certainly higher than the EU-supported targets. With few tonnes flowing through the EU-supported systems, the costs per tonne for formal recovery were unexpectedly high. The industries in the packaging system found themselves in financial difficulties, since they were not getting materials revenues, and could not cover these high per-tonne operating costs.

The Bulgarian system has been much improved and updated, but the early situation represents a useful illustration of a collision between an exclusive EPR system and the informal sector, and shows how failure to involve all stakeholders and seek resolution can create perverse impacts.

Sources: Doychinov, 2008; Doychinov and Whiteman, 2013; EXPRA, 2014; Organisation for Economic Cooperation and Development, 2016; Scheinberg et al., 2010b; Soos and Popovići, 2008.

In 2008, the CWG held its first meeting in Europe in Cluj-Napoca, Romania. The meeting was hosted by Green Partners, and entitled 'Planning in the Real World'. The 'main lines' of discourse were about the difficulties of planning and implementing EU-mandated solid waste system modernisation, in Balkan countries where real, on the ground situations are completely different from Western Europe. The large numbers of informal recyclers in Romania, Bulgaria, Albania, and former Yugoslavian republics are one of the reasons that EU approaches

and investments fail to produce the desired results, but until this meeting, the taboos around the informal sector had prevented professionals from engaging with the problems, and elaborating new approaches (Soos and Popovići, 2008; Whiteman et al., 2009) (Box 4).

Collisions between informal packaging recyclers and formal EPR packaging schemes in the New EU and pre-accession countries formed the core theme of a regional workshop in Bucharest, Romania, in October 2014, entitled '*Challenges to*

Box 4. Aluminium used beverage containers (UBC) recycling on the streets of Bucharest – the invisible agents.

Bucharest is the capital of Romania, as well as Romania's largest and most developed city, and the sixth largest city in the EU. In 2013 the population of about 1.9 million generated roughly 600,000 tonnes of waste or 0.87 kg capita⁻¹ day⁻¹, under the responsibility of the city authorities, with collection and disposal services outsourced to private companies. Recyclables reach the value chains either through formal packaging compliance schemes, or through transactions based on informal recovery.

Current research estimates that the informal sector in Bucharest includes at least 1000 street pickers involved in aluminium used beverage containers (UBC) collection. They collect from apartment and office buildings, open markets, shops, street litterbins, parks, and green areas. Of these, 10% are regarded as 'professionals' (working longer hours, collecting consistently more materials, having better equipment, etc.) 80% are 'full-timers', and 10% are 'part timers'. The professionals earn minimum wage (200–300 euro per month), while the remaining great majority works to supplement other income or to provide themselves and their families with basic subsistence. The formal recycling landscape includes approximately 1000 neighbourhood packaging recycling collection points, operated under the national EPR scheme by the largest EPR organisation, EcoRom. There are also six private sorting stations and approximately 80 private scrap yards buying aluminium UBC. According to an interview with EcoRom, the packaging system recovers 10% via the formal neighbourhood collection system and 90% from scrap yards buying 90% of their materials from street pickers, container pickers, and other private suppliers.

Up until the present, there are no channels of communication between informal suppliers and the EPR system: Formal stakeholders see the informal recyclers as thieves of 'our materials', but have done little to measure or report the benefits contributed by private informal recyclers, nor to reduce tensions (Figures 1 and 2).

Sources: Elaborated by the authors, based on information from Petean and Pop, 2015; supplemented by Bucharest Municipal Council, 2006; Ministry of Environment and Climate Changes of Romania and The National Environmental Protection Agency, 2014; Romanian Ministry of Environment and Forests, 2013; Scheinberg et al., 2010b; Soos and Popoviçi, 2007.



Figure 1. Recyclers queuing up at the recycling centre to valorise their harvest of materials. 8–9 am is the peak time at the scrap yard, since people start collecting early in the morning and also bring the materials collected the previous day. Source: Green Partners.



Figure 2. The quantity collected by a family of three (husband and wife and their daughter) in 6 hours. Mostly plastic, but also 1.5 kg of aluminium cans. Source: Green Partners.

separate collection systems for different waste streams - barriers and opportunities'. Representatives of EPR schemes in 10 Balkan and Mediterranean countries, including Greece, Turkey, Malta, Tunisia, Romania, Bulgaria, and Macedonia, presented their 'challenges', which were mainly about the difficulties of competing – largely unsuccessfully – with established informal sector recycling. Across the wide variety of countries, the following composite picture emerged (EXPRA, 2014; Organisation for Economic Cooperation and Development, 2016; Scheinberg et al., 2010b; Soos and Popoviçi, 2008).

1. Formal EPR packaging recycling systems in the region are having a very difficult time securing materials and documenting their flows to the EU or meeting agreed-upon targets.
2. In some countries, the EU-conform recycling targets for packaging recovery are actually beneath the recovery rate at the time that the systems were implemented.
3. The level of both overt and covert conflict is high, as formal systems are routinely vandalised. The formal actors blame the informal sector for 'stealing' their materials, destroying their infrastructure, and undermining revenues and economies of scale.
4. There are some instances of EPR operators entering into dialogue with the informal recyclers, but they are the exception rather than the rule.

Collisions in the re-use sector. Whereas collisions in recycling are often with service chain institutions, those in the re-use sector are more likely to relate to allocation of space and fair treatment of second-hand traders. Issues of urban cleanliness play a role, but there are additional complexities of competition between Roma and non-Roma second-hand operators, and between lower and upper levels of the second-hand value chains (Box 5).

Box 5. Conflicts with local authorities around the Porta Portese Market in Rome.

In 2015, the second-hand and re-use sectors in Rome were documented to include 3500 itinerant second-hand re-use traders, dozens of second-hand shops, 'rigattieri', and 90 consignment shops (Occhio del Riciclone, 2015). More than 70% of these *reuse operators* are informal traders, selling their wares in the streets, at fairs, in antique and historical markets, and at pop-up flea markets ('gypsy markets'). Occhio del Riciclone, an Italian political and social development association, estimates annual re-use sector revenues of 65 million euro, attributable to the informal operations in the sector in Rome. Yet despite this economic contribution, the sector enjoys neither recognition nor support from City Hall; there is continuous tension between the city and the operators, and there are numerous instances of small- and large-scale conflicts.

Since 2000, organised reuse operators have offered local authorities numerous proposals to formalise and regularise their activities. Act 45 of Rome City Hall Council (2005) created the legal basis to regularise the supply chains for re-usable waste, but up to the present, none of its recommendations have been achieved. The situation deteriorated further in 2007 when City Hall and its sub-territorial entities introduced an all-out war on informal re-use operators to 'clean' the city.

In 2009, 1000 operators in the historic Porta Portese Market place succeeded in defending their interests through demonstrations and blocking traffic. Six 'gypsy markets' were shut down one by one. Each closing increased uncontrolled activity and infractions at the margins of the others, which ultimately caused them all to be closed. In 2009, a large number of the displaced Roma operators forced their way into the Porta Portese Market, creating destabilisation and conflict with the deeply rooted local (non-Rom) operators.

Luckily, the forward-thinking directors of the Association at Porta Portese succeeded in micro-interventions that resulted in a dialogue, reducing tensions, creating space for communication, and ultimately solving the conflict. The leaders explained that a 'war among the poor' would help no one.

Later in 2009, Italian and Roma itinerant operators co-operated in negotiating with City Hall for a transparent and fair system for use of public spaces to sell used goods. This co-operation contributed to the formation of 'Rete ONU', the national network of second-hand operators. Rete ONU has succeeded in establishing an official dialogue with the national government and work actively with the national congress to obtain occupational recognition. One of their key proposals is for the government to establish a second-hand-friendly national EPR system, and a used durable goods distribution system that is fairer, safer, and more reliable than their current strategy of micro-negotiations with a mix of municipal systems. With this in mind, one member of Rete ONU, Mercatini Srl, is working on a measurement instrument for LCA currently being piloted in Turin, that quantifies and values the impacts of re-use incentives in the second-hand sector and the host municipalities. This approach would greatly facilitate traceability, which is the core demand made of EU EPR systems for e-waste and other durable goods (Figures 3 and 4).

Source: Elaborated by the authors based in part on information from Battisti et al., 2013; Carabellese et al., 2013; Luppi and Sole, 2015; Occhio di Riciclone, 2008, 2009, 2015; Occhio di Riciclone and Associazione Operatori Porta Portese, 2006; Rome City Hall Council, 2005.



Figure 3. Porta Portese Flea Market: Detail.
Photo credit Sebastiano Lauro.



Figure 4. Porta Portese Flea Market: Detail.
Photo credit Sebastiano Lauro.

Project-based analysis and activism

Earlier work distinguishes between three, four, or sometimes six forms of interventions to bring informal actors in the re-use, recycling, and waste sector into a regularised, stable, and legal relationship with the service and value chains, national social and economic policies, and the activities of local authorities (International Trade Union Confederation, 2014; Scheinberg and Savain, 2015; Soos et al., 2014; Velis et al., 2012).

Roland Ramusch used his PhD thesis to propose a variety of approaches for modelling the contribution of the informal sector contribution to recycling. His cumulative approach deals with the

elaboration of methodological approaches in order to obtain data on the performance of informal systems directly at the level of informal stakeholders. But in many cases there will be only estimates, no clear data. The concept of triangulation enables a cross-verification of the estimates to quantify informally diverted recyclables. The result is a methodological framework for practitioners to estimate the contribution of informal systems to waste collection and recycling (Ramusch, 2015).

Between 2007 and 2008, the International Finance Corporation Recycling Linkages programme financed the 'TA-Roma' project, which produced recommendations about the need for professionalisation, occupational recognition, and

access to bank services credit for informal recyclers, a mix of socio-political and value chain integration. The recommendation about access to credit was taken into the design of the subsequent MATRA 'Fair Waste Practices' programme (Scheinberg et al., 2012; Whiteman et al., 2009).

The United States Agency for International Development (USAID), funded informal recycling integration projects in Macedonia from 2005 to 2013. The goal was to create sustainable livelihoods through small business service chain integration via the municipal waste companies, and the project succeeded to create direct employment for at least 5000 people in waste collection schemes in 24 rural municipalities. Primary waste collection schemes were established throughout Macedonia, serviced by informal recyclers, who also gained access to small grants for equipment and working capital for establishment of recycling shops.

Project partners participated in drafting the Law on Packaging and Waste Packaging, thereby taking the first steps toward inclusive EPR. A pilot group of 19 collectors formed the Association of Informal Collectors, with a goal of strengthening the role of the informal waste collectors in EPR systems for packaging waste, as well as promoting their inclusion in the public service chain and the improvement of their economic performance in value chain transactions (Toska and Lazarov, 2007; Toska et al., 2012).

In 2006–2008 the International Finance Corporation financed capacity development in the recycling sector in Albania, Bosnia-Herzegovina, Macedonia (then FYR Macedonia), and Serbia. The Recycling Linkages Programme had an overall focus on facilitating better business, and trained a number of informal recyclers in the four focus countries, with the aim to improve the functioning (and job-creation potential) of paper, metal, and plastic value chains in post-Socialist and post-war former Yugoslavia (International Finance Corporation, 2008, 2010; Popovska et al., 2008; Whiteman et al., 2009).

Between 2009 and 2011 the Dutch NGO WASTE, Advisers on Urban Environment and Development, together with eight Dutch and Serbian partners, implemented the 'Fair Waste Practices' programme, financed by MATRA, a Dutch bilateral development support programme. The focus was strongly on service chain and political integration, with a subset of activities focusing on creating options for technical and operational integration of the informal sector in eight South Serbian municipalities. The multi-stakeholder National Recycling Platform brought many public and private sector stakeholders together and created a safe space for dialogue about informal recycling.

- Serbian waste pickers received national occupational recognition through direct action of YuRom Centar.
- A model for legalising informal recycling through co-operative-based integration was developed and proposed in several cities, but not implemented in the project period.
- Some municipal public service companies stated their intention to co-operate with informal recyclers cooperatives via sub-contracts.

- Informal sector inclusion in packaging waste recycling was fully endorsed and partially operationalised by two EPR packaging compliance organisations.
- The first European micro-credit scheme to support equipment loans for informal recyclers was implemented by the Serbian micro-credit organisation MicroFins.

The programme closing meeting, held in October 2011 in Kopaonik, Serbia, was also the first formal recycling conference in the Balkans where fully half the participation was by informal recyclers (Democratic Transitions Initiative, 2012), supported by the YuRom Centar, one of the few European organisations with a focus on informal integration and legalisation, whose website describes their mission as follows.

Providing innovative employment solutions for Roma people excluded from the formal labour market through a sustainable waste management initiative, and assisting these persons in obtaining identity cards and their full enjoyment of citizenship rights, while also addressing environmental protection issues related to waste. (Balić, 2014).

One of the first events specifically to focus on formalisation of entrepreneurs in the European informal re-use (and recycling) sectors occurred as a closing event of the TransWaste project in September 2012. Many of the sources in this review were developed for that conference as presentations, and later published.

The TransWaste project produced a socio-economic integration approach for a number of Hungarian, Slovakian, and Polish re-use enterprises. Three distinct strategies were identified, which are coherent with the global ideas about integration, as shown in Table 4.

Under leadership of a patriarch of a second-hand goods trading family, Mr Janos Kozák, the TransWaste project supported the formation of ISHS (International Second Hand Service), a traders' association. The project pioneered a legal export procedure for traders, based on a listed load manifest, that allowed traders to show that their vans contained legally procured items. The mayor of the city of Devecser, the Western Hungarian hub of the trans-boundary second-hand trade in Europe, supported the organisation and provided an unused military complex for the traders to sort and store their items. Unfortunately the gains made by ISHS were not anchored in new laws or regulations. At the Antwerp meeting in 2015, Mr Kozák reported that the new mayor of Devecser withdrew public support for ISHS, and the situation deteriorated after the close of the project (Kozák 2012; Schmied et al., 2011).

Constructive approaches to co-operation in Europe

Occhio del Riciclone coordinated and incubated the development of Rete ONU (Italian National Network of Re-use Operators), the largest association in Europe of informal workers and enterprises in the re-use and recycling sector, with 1100 members and many more affiliates. More than 70% of re-use enterprises in Rome are

Table 4. Three types of integration for the European re-use sector in the global context.

Integration approach	Description	Corresponding global approach
WISE	Integration of the informal sector into the establishment of re-use and repair networks in cooperation with WISE	Social enterprises (Ishengoma, 2006; Iskandar and Shaker, 2007; Oyake-Ombis, 2012; Scheinberg et al., 2010a)
Used product corner	Implementation of a used product corner in waste collection centres	Legal access to materials via newly created legal channels; North American 'take it or leave it' at rural transfer stations (Chikarmane et al., 2008; Scheinberg, 2011; Scheinberg and Savain, 2015)
Collector association	Forming of a used item collector and retailer association in the home countries of the informal waste collectors	Social integration and the solidarity economy (Godfrey, 2014; Gutberlet, 2008; Rutkowski and Rutkowski, 2015; Soos et al., 2014; Velis et al., 2012)

Source: Elaborated by the authors based on Schmied et al. (2011).
 WISE: Work Integration Social Enterprises.

informal, and are jointly responsible for a total revenue estimated at €65 million per year. They are working with one of their members, Mercatini SRL, on a methodology based on LCAs, to document the interactions between incentives for re-use and the system-level benefits of optimising the life cycle of products. In the TransWaste Project, LCAs were also used to model the environmental benefits of the trade in second-hand white goods (kitchen appliances). Outside of Europe, there is an increasing literature on the contribution of informal recyclers to reducing CO₂ emissions (Chaturvedi, 2009; International Labour Organization, 2013; King and Gutberlet, 2013; Occhio del Riciclone 2008, 2015; Ramusch et al., 2015; Scheinberg et al., 2010b; Sim et al., 2013; Soos and Popovići, 2007; Soos and Popovići, 2008).

Session 2 of the final conference of the project 'TransWaste' was dedicated to the topic of organising waste pickers in Europe and included representatives from Hungary, Romania, Bulgaria, Serbia, Macedonia, and Italy. After the main meeting there was a second 'private' session where the European re-use operators and informal recyclers and their allies could exchange with each other. It was a first step of bringing informal recyclers and advocating institutions together at a European level in order to discuss local peculiarities and problems related to informal activities (Kozák, 2012; Linzner, 2012; Linzner and Lange, 2013; BOKU University, 2012; Ramusch, 2015; Ramusch and Obersteiner, 2012; Ramusch et al., 2015; Schmied et al., 2011).

The ISWA 2015 World Congress in Antwerp, Belgium, approved a related side event, a first meeting for European recycling and re-use operators and their advocates and allies, to share experiences, challenges, and strategies.

Mr Alphan Eröztürk of the Turkish Environmental Protection and Packaging Waste Recovery Trust (CEVKO) and Chairman of the Board of EXPRA, the Extended Producer Responsibility Alliance, participated in the meeting. His presentation began with a quick Republic of Turkey recycling status report: 77,695,904 people, 31,762,085 tonnes of waste per year, 409 kg per person, a single digit recycling rate, and an estimated 71,000 street pickers. Recyclables from households and street set-outs are mostly collected by the informal sector (Eröztürk, 2015).

Up until 1991, recyclables in Turkey were collected by waste pickers or simply left in the waste going to a local dumpsite. In

1991 the separate collection of wastes became a legal obligation and most municipalities stopped allowing dumpsite sorting. In the early 2000s, as the Turkish government began to regulate waste management, picker legality became an issue. In 2005, packaging producers became legally responsible for the capture, safe management, and recycling of all packaging. Clash! Most of the knowledge and activity were in the informal sector, but the investment funds were all on the formal side.

In response, the EXPRA Street Collector Initiative was designed to study these issues and learn more about the informal sector (demographics, infrastructure needs, preferences, and best practices) and then to develop win-win solutions especially in terms of social integration (fair wages, housing, social rights, legality, and stability). CEVKO, working in cooperation with NGOs and municipalities, has organised three meetings with Turkish street collectors (Eröztürk, 2015).

Informal re-use operators and recyclers at the Antwerp meeting were amazed that a producer's organisation would actively seek ways to co-operate. What Mr Eröztürk described sounded like a fairy tale; they had questions about self-employment, markets, price protections, and exporting. Some stated that it should not be required to have a permit to accept recyclables that are donated to the informal sector by the households. There was approval but also broad concern that many pickers are not eligible for formalisation and that this approach would take away access to materials and markets, and they would lose livelihoods and their only way to support their families.

Summary, discussion, and conclusions

Summary of the review

The literature, a mix of scholarship, conference papers, initiatives, and projects, provides a surprisingly rich mix of information and experience on the European informal re-use and recycling sector. The core of the review is 78 sources, which have a clear and/or exclusive focus on informal re-use or recycling in Europe. In this case, Europe is defined as including EU member states, countries in the process of acceding to the EU, or in the pipeline to start negotiations, and countries that are direct or regional neighbours and in some sense fall under the EU sphere

of influence (Gutberlet, 2008; Rutkowski and Rutkowski, 2015; Schmied et al., 2011).

These 78 sources have been classified into four types of work.

1. Scholarly article, scholarly, student, or action research, conference, project report.
2. Social or labour advocacy and/or organising.
3. Policy documents, laws, government, donor consultant reports, plans.
4. Direct information provided by individuals or organisations working on informal recycling and re-use in Europe, or from their websites, including those who prepared the text boxes in the article.

The types of sources were then classified by the status of the country they refer to (Figure 5).

1. EU member, Italy, Belgium, etc.
2. Pre-accession and/or accession pipeline country, for example Turkey or Serbia.
3. EU neighbour and ‘sphere of influence’ country, such as Albania, Morocco, Tunisia, or Kirgizstan.

Perhaps the most interesting insight is that 70% of the sources focused on the informal sector in countries that are currently members of the EU, as opposed to countries seeking to join the EU. Informal recyclers and re-use operators exist in Europe, and

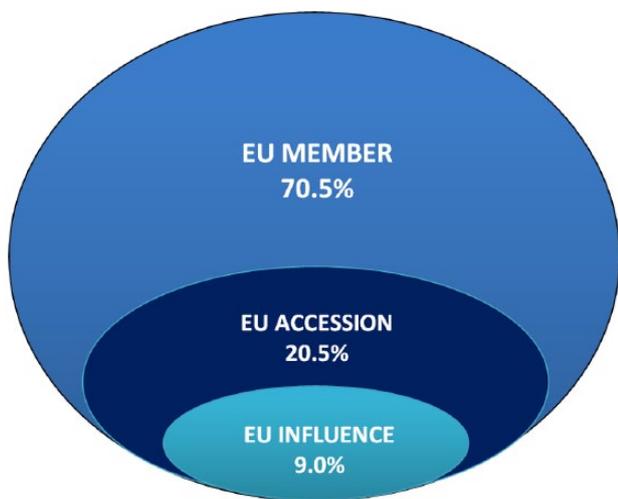


Figure 5. Review of literature by type of country.

are a part of the landscape of recycling and re-use within the EU, and there is therefore little to be gained by denying their existence.

We refer to the third classification as the “locus” of the research or the initiative. By this we mean the institutional site of research, project, or intervention.

1. The service chains.
2. Social and labour ministries, occupational recognition, advocacy, union organising.
3. EPR and Product Stewardship (PS) systems.
4. The value chains, including both recycling and re-use value chains and end-use markets.
5. Projects or interventions that are associated with civil society, for example, NGOs, social entrepreneurship, faith-based charities, community development, or similar.

Table 5 analyses the distribution of articles across these five focus areas of conflict and integration.

Contrary to the initial assumptions of the authors of this article, more than half of the sources were published scholarly works. This suggests that while the topic is still quite new, there is robust activity to research issues and establish base-lines. Scholarship is leading advocacy by quite a lot, and there is also more scholarship than policy formulation. This also suggests that the researchers could become a resource to the policy-makers (Figure 6).

There is another important finding coming from this information. The fact that only 16% of literature sources comes from advocacy papers and direct information suggests that the work of the informals, as well as initiatives to reduce conflict or stimulate co-operation, might not yet be adequately supported by civil society organisations able to document what

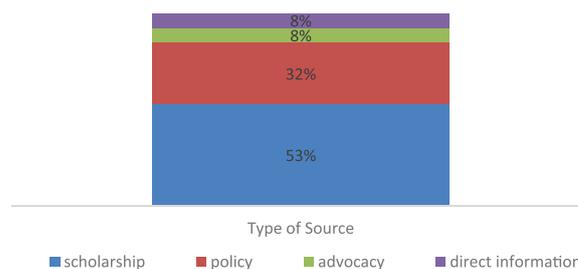


Figure 6. Review of the literature by types of sources. Source: Elaborated by the authors.

Table 5. Locus of conflict and/or integration.

The service chains	40	51.3%
Social and labour ministries, occupational recognition, advocacy, union organising	8	10.3%
EPR and PS (Product Stewardship) systems	7	9.0%
The value chains, including both recycling and re-use value chains and end-use markets	21	26.9%
Projects or interventions that are associated with civil society, for example, NGOs, social entrepreneurship, faith-based charities, community development, or similar.	2	2.6%

Source: elaborated by the authors.

EPR: extended producer responsibility; NGOs: non-governmental organisations; PS; Product Stewardship.

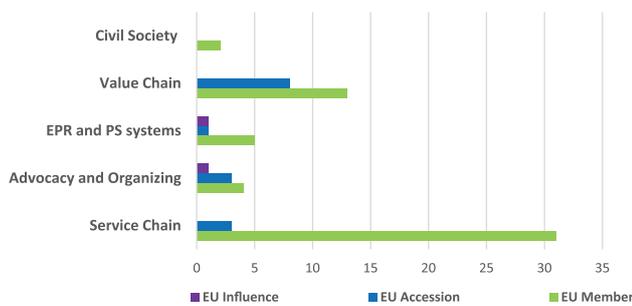


Figure 7. Locus of conflict and/or integration by type of country.

Source: Elaborated by the authors.

EPR: extended producer responsibility; EU: European Union; PS: Product Stewardship.

happens on the ground. These organisations are either too engaged in implementation to document, or lack resources or a culture of reporting that would result in them documenting the process and results (Figure 7).

This figure highlights the sectors engaged in creating integration opportunities and therefore is an indicator of where conflict is likely to be found. Sources with their main focus on EU accession countries show the most robust focus on the value chain. Lack of civil society sources suggests that although there may be initiatives run by civil society, there is no culture of documentation – or too many language barriers – to have produced sources that would come to the attention of a (primarily) English-language review.

Sources on EU influence countries show examples of EPR and PS systems and advocacy and organising, while there are no documents indicating issues with either service or value chains, nor civil society.

By far the most sources focus on EU member states with emphasis on conflicts, co-operation, and co-production in the service and value chains. Demonstrated interest in advocacy, civil society, and EPR and PS systems are much lower. This suggests that in these countries, research and practice are more directed towards improving practical results. The lack of civil society activity may suggest that there is little activity on culture change or in shifting stakeholders' opinions in relation to informal activity.

Moving towards a census on informal recyclers and re-use operators in Europe. The review did not find evidence of a source of reliable and verifiable census numbers for European recyclers, but it does provide some indicative numbers and descriptive factors. To start, most waste pickers in the EU belong to one or more of three vulnerable groups.

1. Persons of Roma ethnicity, who have very low educational levels and are the targets – especially in Italy – of a range of social exclusion measures.
2. Internal and cross-border migrants and refugees without legal status or lacking formal identity papers.
3. Young persons, the elderly, women heads-of-household, homeless persons, and others who are excluded from the labour market.

An accumulation of research results and estimates by practitioners suggests that the numbers are large. Estimates of numbers of informal re-users and recyclers in Europe, from the review, suggest that there might be as many as one million active:

- 80,000 second-hand and re-use operators in Italy;
- 71,000 in Turkey;
- up to 50,000 in Serbia;
- 20,000 in Greece;
- 20,000 in Paris;
- 5000 in the Western Hungarian city of Devecser; and
- 5000 in Skopje, Macedonia.

(Democratic Transitions Initiative, 2013; Eröztürk, 2015; Kozák, 2012; Luppi and Sole, 2015; Ramusch et al., 2015; Scheinberg and Nesić, 2014; Schmied et al., 2011; Simpson-Hébert et al., 2005; Springloop Cooperatie, 2016).

European waste pickers have many of the same vulnerabilities as waste pickers elsewhere, but they have also some unique challenges. Some significant similarities and differences between European informal recycling and similar situations in middle-income countries in Asia, Africa, and Latin America emerge (Table 6).

European waste picking in the recycling and re-use sectors has both challenges and benefits. European waste pickers share with their counterparts in other emerging economies, some core features and attributes. A brief SWOT (strengths, weaknesses, opportunities, threats) analysis is illustrated in Table 7.

New insights coming from the review

Experiences with informal integration and formalisation in Europe have mostly been project-based and formulated in response to financing opportunities, and without (much) consultation with the informal actors themselves. When considered together, and in contrast to recycling experience in civil society, this body of work advances the knowledge base by clearly disqualifying project-based integration experiments as unproductive and unsustainable.

Service- and value-chain integration projects in Hungary, Macedonia, and Serbia made substantial gains during the project period, and opened up the spaces for dialogue. Despite positive results, none of these projects succeeded to make structural change, and gains made in these initiatives appear to have faded out after the closing of the projects. This may be owing to the fact that European waste pickers, in contrast to their counterparts in Asia or Latin America, are more likely to identify themselves as individual or micro entrepreneurs, and are less interested in solidarity and more in pure economic performance.

The post-project critique of YuRom Centar's Osman Balić about the Serbian Fair Waste Practices project is more generally applicable to European informal integration and organising projects: they do not succeed to make informal recyclers better

Table 6. Summary of differences between European and non-European informality in the re-use and recycling sectors.

Parameter	Outside Europe	Europe
Existence and status	Waste picking occurs widely in large cities and where there is growing welfare; numbers in Africa are small, in emerging economies in Asia and Latin America very large	European informal recycling well established, and the numbers in south-east Europe are moderate to large
Social identifiers	Internal (rural-urban) migrants, unemployed and homeless persons, women heads-of-household, ethnic and religious minorities	Young men of Roma ethnicity dominate among 'full-time' waste pickers
Full-time/part time	Colombian researchers divide waste pickers into 'authorised', 'unaffiliated', and 'street persons'	Many European informal recyclers see waste picking as a part-time or seasonal alternative to other forms of work
Occupational recognition	Occupational recognition for 'full-time' waste pickers is growing	Occupational recognition is extremely rare and outside of European statistics
Informality in the service chain	Informal service provision (micro-privatisation of waste collection, is common in the service chain in sub-Saharan Africa and growing in Asia	Service chain informality is limited to under-served rural areas, or to 'side' jobs such as cleaning out attics or removing bulky waste
Barriers to legalisation	Experiences in Asia and Latin America have produced progress in legalising and integrating informal recyclers in the framework of municipal waste management (and the service chain)	There are a few fragile examples of legalisation of re-use operators, and some intentions to legalise and integrate recyclers of packaging, but the taboos and resistance are very strong
Potentials for integration	Integration in the service chain as official recyclers has a good basis and potential to expand; the introduction of EPR systems for packaging in countries like South Africa and Indonesia appears to offer interesting new opportunities	Integration in the service chain appears to be extremely difficult; better potential exists in relation to EPR systems new EU directives on waste prevention and re-use

Source: Elaborated by the authors based on Dias, 2006; Gutberlet et al., 2016; International Labour Organization, 2004; International Trade Union Confederation, 2014; Linzner et al., 2011; Mendonça, 2015; Ramusch and Obersteiner, 2012; Scheinberg, 2011; Scheinberg and An-schütz, 2006; Scheinberg and Nesić, 2014; Schmied et al., 2011; Sim et al., 2013; Vaccari et al., 2013.

EPR: extended producer responsibility; EU: European Union.

off over the long term, and they often create expectations and false hopes that are not realised. Even ISHS, the successful TransWaste association of re-use operators in Devecser, Hungary, did not survive the change of mayors of that city. In contrast, Rete ONU, the Italian re-use association, appears more robust and long-lived, perhaps because it was created without project support, by and for re-use operators, and it serves their daily business needs (Democratic Transitions Initiative, 2012).

Recommendations for constructive approaches drawn from the review

The conclusions and recommendations of the recent aluminium UBC study in Bucharest (detailed in Box 4) propose some leading candidates for a constructive approach to working with the issues of informal re-use and recycling in the EU, accession countries, and in the EU sphere of influence.

A first step would be for city and national authorities to initiate a working group and conduct an assessment on the necessary conditions needed to allow natural persons to become legal recycling agents potentially in association with some form of price support from the producers' organizations and the recently introduced landfill tax. There is some merit to considering a preliminary award scheme based on documented and validated recovery performance. Later steps could include promoting

associations or co-operatives, and integrating informal recyclers into new separate collection schemes along the lines advocated in Wilson et al. (2006).

This approach introduces the main insights from the review, in identifying three pillars – legalisation, occupational, and enterprise recognition – and systematic integration of informal re-use and recycling into formal EU recycling and circular economy processes, that are essential to developing a pan-European response to informal valorisation. A fourth pillar, documentation and benchmarking, is logically prior to the others, and is needed as a basis for planning, evaluation, and fine-tuning of the activities and initiatives. The authors thus conclude this review with the following recommendations for pragmatic approaches to foment more co-operation and less conflict.

Overarching recommendation: Bring informal integration into the circular economy package in a structural way. The overarching recommendation is to locate actions in relation to informal re-use and recycling within the framework of the European circular economy package (European Commission, 2016b). This planned package of legal, regulatory, institutional, and technical reforms proposes far-reaching changes to how materials are managed in Europe, and appears to provide a productive institutional home for regularising recycling and re-use activities. Structural change is preferred to project-based integration, since projects have so far generally failed to produce long-term change.

Table 7. SWOT analysis of European waste pickers in recycling and re-use sectors.

Strengths (internal characteristics)	Weaknesses (internal characteristics)
<ul style="list-style-type: none"> Responsible for most of the recycling outside of the 'old EU', even where EPR systems exist Activities contribute to cities achieving re-use and recycling goals Manage substantial volumes of materials, keeping them out of landfills Legally support themselves and their families Deep recycling knowledge and strong commercial connections to the value chains Actively trade in second-hand, flea market, and antique sector Generally interested in improving their situations and legalising their work Have ideas of what they need for legalisation and improvement 	<ul style="list-style-type: none"> Originate from socially disadvantaged groups, have low levels of education, weak social skills, unstable living situations, and little experience with accessing public facilities or claiming their rights Activities exist based on disappearing opportunities, including legal access to materials and tolerance for their activities Little interest in or experience in organising themselves, or creating representation Lack experience navigating necessities of legalisation, such as registering enterprises and working in permitted areas. A substantial number lack legal identity
Opportunities (external influences)	Threats (external influences)
<ul style="list-style-type: none"> New EU commitments to the hierarchy demand higher performance in the re-use and recycling sectors EU circular economy package is likely to increase recyclability of many products and packages Circular economy reporting systems creates an opportunity to register informal recycling transactions and material flow New registration systems can form the basis for meeting new demands for tracking and traceability of packaging and EPR systems, and be a channel for transfer of funds from producers to informal actors Interchange of information between European countries and emerging economies creates a growing understanding of the sector and sets the stage for occupational recognition at the European level, and creates some momentum for engagement 	<ul style="list-style-type: none"> There is entrenched mutual distrust between formal institutions and informal re-use operators and recyclers The European waste management service sector is under increasing pressure to perform, and this translates to an imperative to prevent informal valorisation on landfills and streets. There is increasing economic pressure on the solid waste sector, and formal public and private stakeholders are not so willing to share responsibilities and resources Local authorities do not necessarily want to legalise illegal persons because they will gain access to education and medical facilities that are already under-financed European local authorities may prefer to develop re-use and recycling and circular economy institutions through civil society and the formal private sector

Source: Elaborated by the authors based on Gutberlet, 2008; International Finance Corporation, 2008; Popovska et al., 2008; Rutkowski and Rutkowski, 2015; Samson, 2009; Scheinberg and Mol, 2010; Scheinberg and Nesić, 2014; Scheinberg et al., 2010a, 2010b; Schmied et al., 2011; Simpson-Hébert et al., 2005; Soos and Popovići, 2007, 2008; Wilson et al., 2010.
EPR: extended producer responsibility; EU: European Union.

Within this, the four pillars of a constructive approach can be elaborated as follows.

Pillar 1: Documentation, benchmarking, and statistics. The first recommendation is to assign Eurostat to work within the framework of the EU circular economy package to increase and improve documentation of informal recycling and re-use in all EU, accession, and EU sphere of influence countries, with a focus on the following.

1. Collection and validation of socio-economic numbers: Census, ethnicity, sex, age, location, numbers of people living from informal recycling and re-use, vulnerabilities, and the like.
2. Technical and economic performance and impact numbers: Numbers of tonnes diverted from disposal through informal valorisation activities, and associated with modelling of negative and positive impacts. This should be integrated with traceability approaches for EPR schemes and possibly also linked to a system of incentives or price supports.

3. Occupational and professional characteristics: Occupations by country and city and rural/urban distribution; institutions and enterprises that have a link with the informal sector.
4. Revisiting analysis of aspects of the European waste system where there are large reported 'losses' of hazardous wastes or e-waste to examine the role of informal activity and whether legalisation and integration could improve the effectiveness of tracking and traceability in Europe.
5. Creating specific procedures for reporting, benchmarking, and legalisation at the level of EU Directives in the framework of the circular economy package.

Pillar 2: Legalisation options and opportunities. Informal integration in Europe will have to have a strong focus on legalisation, and this makes it different from integration experience in Colombia, Egypt, or India. Legalisation initiatives (not projects) should be based on exploring and 'stretching' the institutional spaces for experimentation with legalisation and integration in countries like Serbia, Turkey, and Macedonia, where formal institutions in the service chain and/or in EPR systems have shown some

positive interest in the issue (Eröztürk, 2015; Toska et al., 2012). Some steps towards legalisation could include the following.

1. Inviting informal recyclers and re-use operators to co-operate with public institutions in identifying common goals, barriers, and approaches to legalisation.
2. Discovering and creating spaces for legalisation and possibilities for co-operation.
3. Creating a vocabulary of legalisation and integration strategies.
4. Identifying sources of financing and technical support for project-based integration and legalisation where it is latent.
5. Supporting early adopter (non-project) legalisation and integration initiatives that lead to sustainable changes at medium-scale.

Pillar 3: Occupational and enterprise recognition as circular economy agents. Up to now it appears that Serbia might be the only EU country with occupational recognition of “collectors of secondary raw materials.” While the precise mechanism to achieve this is unclear, it appears that the Circular Economy Package could also provide an umbrella for the development of occupational categories in re-use and recycling. Since the International Labor Organisation is already involved with this, perhaps a co-operation between ILO and Eurostat could form the basis to standardise the approach of the labour ministries of individual member and pre-accession states.

Pillar 4: An inclusive European circular economy: Structural and systematic integration of informal re-use operators and recyclers. The authors of this article believe that the long-term vision must include a commitment – within EU legal and regulatory frameworks – to ensure that the waste directives and the circular economy package have a component of economic and social inclusivity. That would mean that re-use operators and recyclers operating in the informal economy in Europe have access to a reliable, fair, and long-term process to legalise their status, stabilise their conditions and position, and participate in the circular economy as economic agents. Getting to this will not be easy, and it will perhaps take quite a long time, but it is important, both to the environment and to the economy of a well-functioning Europe.

Acknowledgements

The authors would like to thank the peer reviewers for their extensive, skillful, and extremely constructive criticism. If this article makes it into the special issue, a substantial amount of the credit goes to those anonymous colleagues.

In addition, the authors, all of whom were involved in the Antwerp meeting, would like to acknowledge and appreciate the positive support of the following European organisations in breaking the taboos around talking about the European Informal sector.

- WIEGO, Women in the Informal Economy, Globalising, Organising, for the collegial support of Lakshmi Narayan, and their financial contribution to Engaging Informal Recyclers in Europe, a predecessor initiative to this Review.
- Occhio di Riciclone and RETE Onu, the network of re-use operators in Italy.

- SKAT, the Swiss Resource Centre and Consultancies for Development, both for the direct support to the Antwerp meeting, and for their long service as the secretariat of the CWG.
- EXPRA, the EXtended Producer Responsibility Alliance, to Joachim Quoden, its director, and Alphan Eröztürk, its Chairman of the Board, and Monika Romenska, long-suffering staff, for being the first European EPR organisation to dare to raise the issue of informal recycling.
- Zero Waste Europe, for letting the informal sector play a modest role in the articulation of their global vision of a waste-free world.
- Roland Ramusch (né Linzner) of BOKU in Vienna, who, together with his TransWaste colleagues, is making a disproportionate but very welcome contribution to the literature by publishing articles based on the rich experience of the TransWaste project, and who is also very fast and very helpful in sharing materials and information.
- Our friends and colleagues in the CWG, who support the work on European Informal Recyclers with energy, inspiration, humour, and a strong commitment to community of practice.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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