

WASTE MANAGEMENT IN SMES: A BARRIER TO THE CIRCULAR ECONOMY

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EXECUTIVE SUMMARY

Small and Medium Enterprises (SMEs) are defined by the European Commission as businesses with less than 250 employees or have a turnover of less than €50 million. SMEs represent more than 90% of global businesses and account, on average, for about 50% of Gross Domestic Product of all countries and for 63% of their employment. In the UK at the start of 2012 SMEs accounted for 99.9% of all private sector businesses, 59.1% of private sector employment and 48.8% of private sector turnover.

Based upon the latest government data 64.4% of the total commercial and industrial waste generated in England originates from SMEs – an estimated 30.7 million tonnes which far exceeds waste generated from households. Whilst England has a well-established system for managing household waste the infrastructure and management for managing waste from SMEs varies significantly across the country. Under current legislation businesses have a Duty of Care to ensure that waste generated as part of their business or within their workplace is handled safely and within the law. It is down to individual businesses to pay a public or private contractor to collect their waste and recycling – in the UK it is illegal for SMEs to use household facilities. Some local authorities offer a service that businesses can pay to use: at present 68% of collection or unitary authorities in England provide a commercial residual waste collection service and 49% provide a commercial recycling collection. In the absence of the local authority providing a service SMEs are reliant on private sector provision.

This paper presents the results from a series of projects looking at how SMEs currently manage their waste. This includes the results from detailed interviews with 100 SMEs to understand how they manage waste and barriers to increased recycling. Data is presented from waste composition analysis evaluating the levels of recyclable material and biowaste SMEs generate. The paper also presents information on how SMEs are currently complying with environmental policy including the Duty of Care regulations.

The results show that the current system for managing waste from SMEs is inadequate. As a result significant quantities of dry recyclables and biowaste are being sent to landfill or for energy recovery. A wide range of contractors are currently used which leads to problems with storage of waste on public highways and increased vehicle movements. Many businesses currently illegally use household services to dispose of their waste. The paper proposes some potential solutions to improve the management of waste from SMEs and considers how the current system is a barrier to the move towards a circular economy.

INTRODUCTION

Despite the focus of policy makers on household waste, in the UK in 2012 only 26.5 million tonnes of household waste was generated compared to 47.6 million tonnes from the commercial and industrial (C&I) sector (Department for Environment, Food and Rural Affairs, 2015). This trend is similar to other countries – for example in Australia 29% of total waste comes from municipal sources compared to 33% from commerce and industry (Australian Bureau of Statistics, 2010). In Canada 34 million tonnes of waste was generated in 2008 of which a third came from households and 2/3 from non-household sources including commercial and industrial, construction and demolition and institutional facilities such as schools, hospitals, care homes and government facilities (Statistics Canada, 2010). This is also not a recent trend - data from the late 1980s showed that commercial and industrial waste generation in Organisation for Economic Co-operation and Development (OECD) countries was 3 times larger than municipal waste (OECD, 1991).

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In the UK whereas much policy and investment has been focused on improving the management of household waste little attention has been paid to SMEs, this is despite research by Calogirou et al (2010) and Hilary (2004) suggesting that collectively SMEs are responsible for 60-70% of all environmental pollution. Many large businesses have well established environmental management systems in place due to corporate responsibility, economic drivers and legislation they need to comply with – this is not necessarily the case in SMEs particularly those classified as micro and small. Oakdene Hollins and Brook Lyndhurst (2011) undertook a review of waste prevention initiatives in business. They concluded that small companies are largely unaware of waste prevention issues and less likely to act compared to medium or large companies.

At present the European economy is wasteful – in 2012 the average European used 16 tonnes of materials and only 40% of discarded materials were recycled or reused (Ellen MacArthur Foundation and the McKinsey Center for Business and Environment, 2015). The circular economy is an industrial system that is restorative or regenerative by intention and design (Ellen MacArthur Foundation, 2013). The idea is to move from a linear to circular model. Ideally waste would be designed out and products designed to be maintained, reused, refurbished or recycled. Currently many waste streams are mixed therefore inhibiting their inclusion in reverse cycles as proposed in the circular economy model leading to resource leakage.

AIM AND OBJECTIVES

This paper aims to present an overview of how waste from SMEs is currently being managed and discusses barriers towards moving to a circular economy model. Whilst acknowledging the importance of the entire circular economy cycle this paper focuses specifically on the collection systems within SMEs and considers how current systems relate to the circular economy concept.

The objectives are to:

- Understand how business currently manage their waste, identify barriers to recycling and levels of compliance with Duty of Care regulations
- Evaluate the levels of recyclables and biowaste currently being disposed of by a sample of SMEs
- Identify barriers to the implementation of the circular economy

Primary data collection was conducted in Brighton and Hove City on the south coast of England.

MANAGEMENT OF SME WASTE IN ENGLAND

In England local authorities have a legal obligation to manage household waste but they also have a duty to arrange for the collection of waste from a business if requested – this duty could be delivered in two main ways.

The local authority could offer a business waste collection service – but businesses would have to pay for this service. This system dates back as far as the Public Health Act 1936 where local authorities were empowered, but not obliged to collect trade waste. If they chose to they could make a reasonable charge for this service.

At present 68% of Waste Collection Authorities (these are district and borough councils who have the role of collecting household waste) or Unitary Authorities (typically cities who have the dual function of collecting and disposing of household waste) in England provide a commercial residual waste collection service and 49% provide a commercial recycling collection (Waste Resources Action Programme, 2013). Even though a council might offer a recycling service the range of materials collected could be limited: whereas 97% collect cardboard and 94% paper, only 39% collect plastic bottles and 9% offer a food waste collection. In addition local authorities may also provide drop off facilities where businesses could deliver their waste – these would typically be Household Waste Recycling Centres (HWRC – these are centralised facilities where the public can take household waste/recycling for free – at some sites businesses can pay to use the service), transfer stations or bring banks. Table 1 presents information on the coverage of waste and recycling services provided by local authorities to businesses in England.

Table 1: A summary of the waste and recycling services offered by local authorities in England (WRAP, 2013)

Stream	% of Waste Collection Authorities or Unitary Authorities offering collection service	% of Waste Disposal Authorities and Unitary Authorities offering at least one 'drop off' facility	% of Waste Collection Authorities offering at least one 'drop off' facility
Waste	68	40	9
Recycling	49	34	7

The local authority could alternatively supply local businesses with the details of private waste management contractors (ranging from local companies through to multi-national businesses) or 3rd sector organisations, such as charities or community groups that would collect the waste. According to research by the Federation of Small Businesses (2010) 35% of small businesses are dependent on private waste management companies. The reasons cited for using private companies are that the local authority does not offer a service (45%), private companies meet their needs more efficiently (27%) or that private companies offer a cheaper service (23%).

The situation is similar in other countries where local government mainly manages household waste but the private sector has more control over the C&I waste stream. In the United States of America whilst local authorities have direct involvement in household waste collection the typical arrangement for commercial waste and recycling is free market competition with each business free to contract individually with a licensed waste company (Stevens, 1994).

It is down to the individual businesses to choose how their waste is collected but they have a legal obligation to ensure that the waste they generate is managed responsibly. It is important to note that it is illegal for businesses to use household services to dispose of their waste.

The key piece of legislation regarding the management of C&I waste in England is Duty of Care. Section 34 of the Environmental Protection Act 1990 places a Duty of Care on all businesses to ensure that any controlled wastes produced as part of their business or within their workplace are handled safely and within the law (Great Britain, 1990). Businesses must ensure that they do not leave waste or recycling out on the street without arrangements for its collection. The waste must be contained properly so that it does not spill onto the pavement or could be attacked by vermin.

Businesses are responsible for their waste until it has been collected and they must ensure that their waste contractor is a licensed waste carrier registered with the Environment Agency, the organisation in the UK responsible for regulating the waste management industry. A waste carriers license means the contractor is legally allowed to collect and transport waste. Throughout the management of waste there is a system of transfer notes that records the transfer of responsibility for managing waste from one party to another. The transfer note contains information on the origin of the waste, date and time of transfer, parties involved, license number of the contractor collecting the waste and description of the waste based on the European Waste Catalogue and quantity. Under amendments to the Waste (England and Wales) Regulations introduced in September 2011 businesses that generate waste are also now required to apply all possible measure to implement the waste hierarchy by prevention, reuse and recycling followed by recovery and disposal and there is now a requirement to include a declaration that the waste hierarchy has been adhered to on the transfer note.

The normal practice is for the party receiving the waste to produce a transfer note and businesses are legally required to keep them for two years. Transfer notes are issued every time waste is collected however in many instances where collection arrangements are the same a single transfer note might be issued to cover the year. There is currently a drive to move away from paper based transfer notes to an electronic system called Edoc (Electronic Duty of Care).

Failure for a business to comply with Duty of Care could have a range of implications. Firstly there is no evidence that the business is managing its waste responsibly. The business could illegally be using the household waste service at the expense of Council Tax payers (in England households pay a Council Tax and some of that money is used to cover the costs of waste services but only for household waste). Under section 34 A (2) of the Environmental Protection Act 1990 (Great Britain, 1990) businesses can be issued with a Fixed Penalty Notice of £300 (€422) if they fail to produce a Waste Transfer Note.

If a business is not having its waste collected they could also be illegally dumping the waste, this is known as fly tipping. The businesses could either dump the waste themselves or pay to have their waste collected by an unlicensed contractor who may then dump the material in a public space or at an illegal site. Fly tipping is a significant problem in England with 852,000 incidents in 2013/14 costing local authorities £45.2 million (€63.6 million) to clear up. Whilst the majority of cases involved household waste some 68,160 incidents involved C&I waste, a 62% increase from 2012/13 (DEFRA, 2015). Under the Environmental Protection Act 1990 fly tipping prosecutions can result in fines up to £50,000 (€70,351) and/or up to five years imprisonment (Great Britain, 1990).

HOW DO SMEs MANAGE THEIR WASTE?

100 SMEs in Brighton & Hove City were interviewed to understand how they were currently managing their waste, barriers to recycling and levels of compliance with Duty of Care regulations. All businesses were SMEs and were recruited by invites submitted through business networks in the city or cold calling. To ensure data was collected to provide a true reflection of how the businesses was managing its waste there was no discussion in regards Duty of Care and their legal obligations. Also all data was collected in confidence and analysed anonymously with researchers complying with Data Protection Act guidelines.

Table 2 provides an overview of key findings on how they manage waste and contractors used. The results support findings from previous research that businesses are failing to meet their legal Duty of Care requirements and that there is widespread abuse of household services. Only 70% of businesses had a contractor in place for residual waste and 50% a contractor for recycling. 27% of businesses openly stated that they used household services for residual waste and 38% for recycling. In total 27 different contractors were named for handling waste, recycling or specialist waste streams such as cooking oil – this excludes those with internal systems or who did not want to name their contractor. Only 17% of businesses used the same contractor for waste and recycling.

33% of businesses stated they were involved in take back schemes to suppliers or had internal systems for reuse – this included waste oil, cartridges, cardboard, packaging from carpets, kegs and gas canisters, water filters, bread and grocery crates.

Businesses were given the opportunity to set out barriers to recycling (see Figure 1). Cost (34%), lack of suitable services (25%) and lack of space (20%) were cited as the main barriers. Only 3% of businesses stated that they didn't produce enough recyclables to warrant a collection.

Table 2: A summary of the key findings

Stream	Compliant with Duty of Care	Using household services	Number of contractors
Residual waste	70% of businesses had contractors for residual waste collection with 1% taking waste to dedicated trade waste sites for businesses.	27% stated that they used household services to manage their residual waste with 15% using Household Waste Recycling Centres or public bins and 13% taking waste home and put out in household collections.	12 waste contractors were named by 65 businesses surveyed – the other businesses were unable to name their contractor or did not want to disclose this information due to confidentiality.
Recycling	81% of the businesses surveyed claimed to recycle though only 50% had a contractor in place for collecting recycling. 5% took recycling to dedicated trade waste facilities.	38% stated that they used household recycling services with 24% using bring banks or HWRC and 24% taking recycling home to place in kerbside collections.	23 contractors were named by the companies surveyed with 5% having internal services to handle recycling (this could be recycling returned to suppliers or collected and recycled at another store within the chain).



Figure 1: Barriers cited to increased recycling

WASTE COMPOSITION OF THE SME STREAM

Data was collected on the composition of residual waste from 62 different SMEs in Brighton and Hove City - the aim was to include businesses from a range of sectors. The waste for each business was systematically sorted into categories based upon European Waste Codes and weighed. For most businesses a weeks worth of waste was taken for analysis, where this wasn't practicable a sample was taken and data extrapolated to produce a weeks samples.

In total 2.8 tonnes of waste/week was generated from the 62 businesses sampled – there was significant variation in waste levels from 0.6-267 kg – median 16.7 kg per week. Table 3 shows the breakdown of the composition. Overall 31.14% would have been recyclable within the local services for household waste (kerbside or bring banks) and 55.83% classified as biowaste (food waste, garden waste, card, paper and wooden products).

Table 3: Breakdown of composition of residual waste from businesses sampled.

Material	Kg	% of sample	% Recyclable in council services	% Biowaste	% Trade associated waste
Food waste	521.98	18.16		18.16	
Corrugated cardboard	430.01	14.96	14.96	14.96	
Plumbing waste	402.56	14.01			14.01
Carpet and similar	253.25	8.81			8.81
Wooden items	189.05	6.58		6.58	6.58
Miscellaneous	168.46	5.86			
Paper towels/kitchen paper	119.87	4.17		4.17	
Office paper	93.17	3.24	3.24	3.24	
Plastic film	91.29	3.18			
Mixed paper	82.96	2.89	2.89	2.89	
Garden waste	65.23	2.27		2.27	
Glass bottles and jars	59.10	2.06	2.06		
WEEE and cabling	47.44	1.65	1.65		
Cardboard packaging	46.24	1.61	1.61	1.61	
Dense plastics	37.32	1.30			
Plastic bottles	34.32	1.19	1.19		
Cans, foil and aerosols	31.08	1.08	1.08		
Newspapers and magazines	28.16	0.98	0.98	0.98	
Automotive waste	26.74	0.93			0.93
Plastic bags	26.53	0.92			
Fire extinguisher	23.10	0.80			
Fines and hair	21.01	0.73			
Catalogues/brochures	20.50	0.71	0.71	0.71	
Textiles and shoes	19.56	0.68	0.68		
Other metals	12.82	0.45			
Polystyrene	8.57	0.30			
Shredded paper	7.38	0.26		0.26	
Coffee cups	3.99	0.14			
Cartons	2.16	0.08	0.08		
Batteries	0.35	0.01	0.01		
Total	2874.19	100.00	31.14	55.83	30.33

DISCUSSION

The results strongly suggest inefficiencies in how the SME waste stream is currently being managed with significant material leakages. One of the key characteristics of the circular economy is capturing materials for recycling and under the existing arrangement valuable resources are being wasted.

The results of the survey support findings from previous research that businesses are failing to meet their legal Duty of Care requirements and that there is widespread abuse of household services. Only 70% of businesses had a contractor in place for residual waste and 50% a contractor for recycling. 27% of businesses openly stated that they used household services for residual waste and 38% for recycling.

The use of household waste services by businesses has significant implications. Firstly businesses using household services are having their waste collection costs subsidised by tax payers. An estimated £913 million (€1,284 million) will be spent by local authorities on waste collection and a further £2.1 billion (€2.95 billion) on waste disposal in 2014/15 (Department for Communities and Local Government, 2014). Even if trade waste was 1% of the household waste stream significant savings could be made to the local authorities with money redirect to priority areas such as health care and education.

Those businesses that use household services have a financial advantage over business competitors who are being responsible and fulfilling their Duty of Care obligations. 11% of businesses surveyed (21% of those that supplied cost data) spent over £2,000 (€2,813) per year on waste and recycling services – this is significant expenditure for SMEs.

The existing system for managing waste from SMEs is a significant barrier to the implementation of the circular economy - under the current system valuable resources are being wasted. Of the 2.8 tonnes of residual waste generated by the business sampled, 31.14% could have been recycled if SMEs were allowed to use the local household kerbside and bring bank service. In addition 55.83% of the waste sampled was organic and capable of being composted or treated via anaerobic digestion.

Under the current system each business appoints a contractor for managing waste and recycling. In total of the 100 SMEs surveyed 27 different contractors were named for handling waste, recycling or specialist waste streams. Only 17% of businesses used the same contractor for waste and recycling. On residual waste collections alone 12 different contractors were named. Maynard & Cherrett (2009) had similar results with 76 businesses in Winchester using 19 organisations to collect waste. The system means that neighbouring businesses have different contractors even though the waste and recyclables quite often end up at the same waste facility. This system leads to more vehicles movements and in turn emissions. In addition often businesses have residential accommodation in close proximity (in many cases there are flats above the shop). This which is collected by the municipality and again will often be sent to exactly the same facility for processing as that from the business below/next door.

POTENTIAL SOLUTIONS

The current system for managing waste from SMEs is inefficient and does not adhere to the principles of the circular economy. Significant quantities of reusable, recyclable materials and biowaste are currently entering the residual waste stream and promote increased vehicle movements. There are a wide range of possible options to improve the management of waste from SMEs – three are discussed below.

Enforcement - throughout the country enforcement of Duty of Care by local authorities varies greatly. At present, somewhat surprisingly, there is no universal Duty of Care register that collates information on those companies that do fulfil their legal obligation. Development of such a register

would have several key benefits. It would provide local authorities with knowledge of which businesses are managing their waste responsibly with registered contractors. Conversely the register could be used to identify businesses that are potentially not complying with Duty of Care and who the local authority could target to check on how their waste is being managed. At present businesses are aware there is a lack of enforcement and some are illegally managing their waste through using household services or fly tipping giving them a clear financial advantage over competing businesses that are fulfilling their Duty of Care obligations. In 2013/14 there were 68,160 incidents involving C&I waste (this figure is just reported cases and in reality the number of cases is higher). The Duty of Care register would immediately act as a deterrent. Businesses are required to pay business rates and they could be legally required to annually include a copy of their Duty of Care certificate when returning relevant paperwork. Whilst this would require administration from the local authority the costs would be offset from savings.

It is interesting to note that in addition to Duty of Care there are other regulations relevant to how businesses manage waste. For example from January 1st 2015, in England, businesses have been required to separate out paper, plastics, metal and glass for recycling (The Waste (England and Wales) Regulations 2011). However similarly to Duty of Care anecdotal evidence suggests there has been little to no enforcement of these regulations.

With the economic crisis which began in 2007/08, resources are becoming scarcer - in 2010 the government announced public spending cuts of £81 billion by 2014/15 (HM Treasury, 2010). The Chartered Institution of Waste Management (CIWM) and Ricardo-AEA (2015) published the results of research looking at the impact of austerity across local authority waste, recycling and street cleansing services. 24% of local authorities responding stated they had made cuts to enforcement activities – therefore the inadequate enforcement of existing regulations is going to deteriorate further.

Improved services - if services could be made more accessible to SMEs it is likely that more businesses would successfully comply with Duty of Care regulations. The Federation of Small Businesses has been lobbying government to improve the waste and recycling services that are available to SMEs. For example they have proposed a range of solutions including better access to HWRC to businesses, better education of SMEs and clearer contract terms (Federation of Small Businesses, 2011).

There are a number of projects under development which aim to facilitate more efficient collections. For example in Bath 20% of trade waste was being recycled with 80% being sent to landfill – but a project is underway to incentivise businesses to use the same contractor for recycling and waste (Roberts, 2012).

Historically HWRC have been used for household waste only but an increasing number of local authorities are looking at opening up HWRC to businesses to use for a charge. An alternative is providing localized bring facilities that are accessible to shops – this was a finding from Radwan et al (2011). Some local authorities are now making HWRC accessible to traders – however minimum charges apply which might be prohibitive to some SMEs.

An example is in Northumberland where 3 transfer stations were opened up to small businesses to take waste and recycling. Initially the bring sites worked with a minimum charge of £20 (€28) for segregated recyclables and £40 (€56) for co-mingled but these charges were seen as prohibitive to small businesses as they did not generate such significant quantities of waste. Therefore minimum charges were reduced down to 0.2 tonnes and £4 (€5.62) for segregated and £8 (€11.25) for mixed co-mingled respectively (BREW, 2009).

Merger of C&I and municipal waste streams - historically local authorities have managed the household waste stream and private companies the C&I waste stream. However if the UK is serious in implementing the circular economy this separation of waste streams is a significant barrier and a radical change of approach is needed. The results of this study show that 27 different contractors collect waste and recycling from the 100 businesses surveyed.

Some previous research has looked at the potential benefits through implementing a more 'intelligent' waste collection system. McLeod and Cherrett (2007) suggested that where commercial properties are located close to residential properties it makes logical sense to have joint collections and they undertook modelling to assess the impact of combining collections in Hart and Rushmoor, Hampshire. They developed this work further and modelled the joint collection of waste from 25,600 households and 577 commercial properties and found reduced mileage savings of 9.8% per annum equating to cost savings of £36,000 (€50,642) and carbon savings of 2,688kg (McLeod et al, 2011). In addition there are added benefits of less vehicle movements and road safety.

In their latest report on the circular economy the Ellen MacArthur Foundation (2015) pose the question '*what should an ideal European recycling system look like?*'. The current system in England is certainly far from '*ideal*'. One possible option could be the formal combination of C&I collection with the household collection services. In any case it is becoming increasingly common for both household and commercial waste to end up at the same waste facility so what is the sense in collecting it separately? The Associate Parliamentary Sustainable Resource Group (2011) have recommended that local authorities who have not committed their waste stream to a contract could use this waste as an anchor to help joint facilities for household and C&I waste. Companies tendering for the contract would propose a facility sized to deal with household and C&I waste in the area.

A further option is setting a threshold at which businesses can use the municipal services. As has been explored many large businesses have effective systems in place for managing their waste but it is the SMEs that struggle. A threshold could be set that any business generating less than a certain weight per annum could use household services with a financial contribution (e.g. a levy in the business rates that funds the service). At present it is common for each business to have their own bin and this can cause problems in blocking pavements and aesthetics – therefore an added benefit would be improvements to the urban areas with less bins.

Note that the C&I waste stream is complex with a diverse range of materials – 30% was waste linked to specific trade such as plumbing and it may not be feasible to integrate this into the household service. However many for other businesses the majority of the waste they generated could be recycled in the existing recycling service.

LIMITATIONS

Due to the limited budgets and the logistical complications of undertaking waste composition the sample sizes for both studies were small. The types of business sampled will also influence the composition of the waste.

CONCLUSION

This research has highlighted some of the inefficiencies in the current management of waste from SMEs. There is currently a lack of compliance with Duty of Care regulations with many businesses illegally using household services. In general existing regulations are not enforced and with further cuts there will be further reductions in local authority enforcement.

The existing system results in significant materials leakage with recyclables and biowaste entering the residual waste stream. For the principles of the circular economy to be met a radical change is needed in how we collect and manage SME waste – policy makers need to consider merging collection and processing of the household and SME stream. The development of a more intelligent system befitting of the 21st century would lead to higher collection yields of recycling and biowaste and more efficient collection systems. In turn this would lead to improvements in the local environment through reduced vehicle movements and reduced bins on our highways.

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