

THE ISSUE OF WASTE IN EUROPEAN MANUFACTURING SMES

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SUMMARY: Small and Medium Enterprises (SMEs) cumulatively cause 64% of total industrial pollution, and contribute approximately 60-70% of the total industrial waste in the EU. However, only 24% of SMEs in the EU are currently acting to reduce their environmental impact and only 0.4% of them implement an Environmental Management System (EMS). In contrast, large companies are making great strides towards better waste management practices. This study is focused on this issue of waste in manufacturing-related SMEs. It presents the results of an exploratory survey on a number of SME managers in Europe. It has investigated the waste management practices that these SMEs employ, what motivates SME managers to recycle, and about their relationship with their Waste Service Provider (WSP). This survey has shown good intentions of SME owner-managers to engage in environmental issues. These intentions could be capitalised upon if systems were in place (with their WSP) that would 'nudge' them to transform their intentions into actions, leading to better waste management practices.

1. INTRODUCTION

The goal of this study was to explore the issue of waste in European Small and Medium Enterprises (SMEs). It aimed in particular to investigate the views of SME owner-managers on waste management practices.

The primary objective was to ascertain the reasons why SMEs do, or do not, prevent waste, or reuse, recycle or recover their waste, activities that are commonplace in their larger counterparts. It involved a survey of a number of SMEs in Europe to investigate the waste management practices they employ and their relationship with their waste service provider (WSP).

This study was only interested in the motivations of the owner-managers, who are the major decision makers in the organisation. The survey group consisted of a variety of business sectors, the majority of which were manufacturing-related. The information gathered will contribute to the development of techniques to improve the waste practices of SMEs.

This research is being carried out as part of the FutureSME project (www.futuresme.eu), funded by the European Union under the Seventh Framework Programme (FP7). The primary aim of the project is to develop a set of tools and methodologies for manufacturing SMEs in Europe, which will enable them to adapt to the changing economic environment and will lead them towards a sustainable business model.

2. BACKGROUND

2.1 SMEs

An SME is a business which has less than 250 employees (European Commission, 2005, b). An SME can be involved in the delivery of goods/and or services within a wide variety of enterprises and industry sectors. An SME is typically run by an owner-manager and is usually privately owned. It is a wholly independent enterprise that is managed in a personalised way, often having only a small market share in its own sector. The owner or the part-owners of an SME are usually the major decision makers in the business. There is no highly structured management hierarchy present in an SME, in contrast to the situation in larger companies (Hillary, 2000).

“Small enterprises are the backbone of Europe’s economy and the key to our competitiveness” (European Commission, 2005).

As SMEs represent 99% of all business in Europe, they collectively contribute to 85% of EU GDP (Audretsch, et al., 2009). SMEs are important for social, as well as economic reasons. The SME sector supplies around 250 million jobs in 23 million different businesses, providing high quality and diverse employment opportunities. SMEs also act as incubators of entrepreneurial culture (European Commission, 2005,a).

“A small business is not a little big business” (Welsh & White, 1981). On the contrary, the main difference between large and small companies is the amount of resources available to them. Small companies generally suffer from a shortage of resources. This ‘resource poverty’ means that a small business is not usually managed in the same way as a larger one (Welsh & White, 1981). The business strategy within SMEs is an emergent one, and it fluctuates based on the needs of SMEs to be competitive in the marketplace. Large companies employ formal strategic processes, while the emphasis in SMEs is on the short-term, leading to a narrow view of the business environment (Ates & Bititici, 2009). The fact that SMEs adapt rapidly to the changes around them actually gives them some advantage. However, an emphasis on a short-term perspective can dissuade SME owner-managers from tackling environmental issues.

2.1 SMEs and the environment

The main reasons SMEs do not get involved in positive environmental activity are that they are unaware of their impact on the environment, and of the relevant legislation pertaining to it (NetRegs, 2010). They are also unaware of the importance of sustainability and are cynical of the benefits of self-regulation and environmental management tools. Other issues include a view that environmental issues are not a core part of their business (Ecotec Research & Consulting, 2000) and the perception that green issues only come at a cost and are not a source of competitive advantage (Wooi & Zailani, 2010). SMEs are considered to be difficult to engage with in relation to the environment in general (Hillary, 2000).

Only 24% of SMEs in the EU are currently acting to reduce their environmental impact. This means that the majority of SMEs fail to capitalise on the potential financial savings and opportunities that go with many of these activities (Constantinos, Sørensen, Larsen, & Alexopoulou, 2010). A recent study has indicated that waste is one of the main environmental challenges that European SMEs currently face (Mitchell, O'Dowd, & Dimache, 2010). Another report in the UK has also highlighted that little has been done to improve waste management behaviour in smaller companies and that work needs to be done in this area (Smyth & Lonsdale, 2010).

2.2 Waste

The generation of waste is a major contributor to pollution and environmental damage worldwide. Much of this waste is caused by industry. Up to relatively recently, claims that SMEs in the European Union (EU) were causing a substantial proportion of this environmental damage were only informed estimates (Hillary, 2000) (Daddia, Testaa, & Iraldoa, 2010). A comprehensive new study has now confirmed these figures. SMEs cumulatively cause 64% of total industrial pollution, and contribute approximately 60-70% of the total industrial waste in the EU (Constantinos, Sørensen, Larsen, & Alexopoulou, 2010).

Positive changes in the environmental practices of large companies are occurring. Many global brands are now aspiring to achieve a zero-waste status (Huber-Humer & Lechner, 2011)(Bradbury, 2010). Larger companies commonly employ dedicated human resources to deal with these issues and often use an environmental management system (EMS). However, only 0.4% of SMEs in the EU implement an EMS (Constantinos, Sørensen, Larsen, & Alexopoulou, 2010) and they do not have specific roles for environmental managers.

Waste management in general remains to be an issue that needs addressing in order to attain a more sustainable society. The solution for Europe as a whole is not simple. The levels of waste produced in different European countries vary greatly, ranging from a net contribution of 0kg per inhabitant in Switzerland to 672 kg per inhabitant in Cyprus (Eurostat, 2010). The attitudes of governments also vary from country to country. Wales has recently announced plans to increase recycling to 75% by 2025 and 100% by 2050 (Edie, 2011), whereas the Environmental Protection Agency (EPA) in Ireland has less ambitious expectations of a 1% increase in recycling annually over the next 15 years (CIWM conference, 2011).

2.3 Waste Behaviour

There have been many studies over the last 20 years on what motivates people to manage their waste. There are not that many studies specifically looking at SMEs. Those that have been completed in this area have identified various barriers to good waste management practices such as; the lack of space to manage different waste categories; the lack of good information on recycling services ; not enough waste to warrant recycling; no service available and the cost associated with recycling activities (Parsons & Kriwoken, 2010) (Smyth & Lonsdale, 2010)

In more recent years, waste management in Europe has been focused mainly on diverting waste away from landill, creating an increase in recycling and recovery activities. However, it still remains a larger challenge to motivate individuals as compared with big industry (Huber-Humer & Lechner, 2011). The main motiator of recycling include: the environemental benefits of doing so; financial incentives; convenience; the environmental policy of an organisation; legislation and cost (Parsons & Kriwoken, 2010) (Smyth & Lonsdale, 2010)

2.3.1 The SME owner-manager behavior relation to waste

The key to making changes in the area of sustainability and waste management is changing personal mindsets (Fagan, 2010) (Huber-Humer & Lechner, 2011). Within an SME it is the owner-manager who is the sole decision-maker, such as those related to environmental issues and waste management (Redmond, Walker, & Wang, 2008) (Hillary, 2000). They often do not posses the skills necessary to implement good environemental practices as it is usually outside of their own area of expertise. They also suffer from a shortage of resources to enable them to address the problem. They don't prioritise waste as an issue, or even believe that their environemental footprint is significant. They do, however, perceive environemental management

to be an expensive exercise, a cost that they cannot pass on to their customers. This leads to their not addressing waste management in many cases (Redmond, Walker, & Wang, 2008).

2.3.2 Current good practice in waste management

Since 2008, the Department for Environment, Food and Rural Affairs in the UK (Defra) has altered its strategy to tackle recycling rates within communities. Instead of concentrating solely on the more expensive approach of trying to force change through legislation or by using better technologies, it is now exploring behaviour theory, specifically 'nudge theory'. This is a behavioural theory based on the premise that people do not automatically do the right thing, even with good intentions. When the best option is pointed out to people effectively, they can be 'nudged' to make the better decision (Banga & Freestone, 2011).

Good communication is credited with having played a major role in increasing recycling rates in one UK local authority area. South Oxfordshire District Council has reached a recycling rate as high as 78%, despite the national average being only 40%. The Council claims that the key is simplicity, a good service together with a buy-in from the public. Success has also been attributed to benchmarking different communities against each other (Wood & Prosser, 2011).

2.4 Summary

The drivers to complete this study are multi-faceted. Firstly, SMEs are significant contributors to pollution, with waste being one of their major environmental impacts (European Commission, 2000) (Constantinos, Sørensen, Larsen, & Alexopoulou, 2010). Secondly, most of the research on the area of waste management in industry has been carried out in larger organisations (Redmond, Walker, & Wang, 2008). This study contributes to the growing body of knowledge in the area of waste management within SMEs. It is trying to better understand the issues, which will in turn contribute to the solution. Thirdly, it is only owner-managers that been targeted in this study, due to the fact that he or she is the key influencer of environmental behaviour within an organisation (Redmond, Walker, & Wang, 2008). Finally, not only does this study ask what the current waste activities, behaviours, motivations and costs are within SMEs, it also seeks to discover what would encourage them to increase their rates of recycling.

3. METHODOLOGY

This paper presents the views of European SME owner-managers on waste management. It asks specific questions on the waste practices they employ, on their views on the waste services they receive, as well as enquiring about what motivates their actions.

3.1 The approach

This study seeks insights into the actuality of waste management practices in European SMEs, while taking into account the pressures faced by the SME owner-manager and the realities of waste practices from the SME point-of-view. The theoretical perspective is post-positivist because it involves investigating the perspectives of an SME owner-manager as well as measuring, for example, the recycling rates of their organisations.

The methods of analysis used were a literature review followed by a questionnaire, which was based on similar studies carried out on SMEs in the UK (Dye, Emma, 2008) and in Australia

(Redmond, Walker, & Wang, 2008).

3.2 The survey

The survey posed questions in five key areas:

1. The profile of the business and the owner-manager
2. General views on environmental issues
3. Waste practices in which organisations are involved, what drives recycling behaviour or what barriers exist that hinder recycling
4. Awareness of waste practices compared with similar industries
5. Attitudes to waste service providers in terms of cost and quality of service.

3.3 Limitations

The most difficult part of carrying out this survey was getting the SME owner-managers to complete it. The FutureSME project has a database of over a thousand contacts throughout Europe who were asked to complete the online survey, or forward it on to SME owner-managers that they knew. This large number of contacts only resulted in 32 fully completed surveys in the time available. The survey was also only available in the English which resulted in over half of the respondents being represented from the UK and Ireland. It is also possible that of the SME owner-managers that did respond were those who had an interest in the area.

4. RESULTS AND DISCUSSION

A sample of 32 SMEs from Ireland, the UK, Turkey, Italy, Sweden, and the Czech Republic were represented in this study.

4.1 Profiles of the SMEs surveyed

The SMEs surveyed were from varying industry sectors, including textiles, food manufacturing, aeronautics and plastics. Some businesses provided consultancy services.

Almost all of the owner-mangers had attended university (88%), 6% held a technical qualification and a further 6% were educated to secondary level. Two thirds of the group were male owner-managers and the median age range was 41-50 years old. 97% of respondents recycled at home.

The majority (63%) of the respondents set up a business to *'have an independent lifestyle'*, while a desire to *'fulfil their passions'* came second (34%), with *'to make more money'* (25%) coming in third. Most (67%) of the SMEs owned, rather than leased, their premises.

4.2 Views on environmental issues

Only one of the respondents claimed not to have time to worry about environmental issues, when questioned. All the remaining responses indicated some general concern. When asked to indicate the main reason behind their interest or concern, the majority were *'concerned about*

environmental issues in general' (84%). '*Having a safe place for their families to live*' was only cited as the main reason by 22% of the respondents. While their personal values indicate concern for environmental issues, previous studies have shown that this concern is not always reflected in the actual behaviours (McCarty & Shrum, 1994).

Furthermore, it was surprising that only 9% of the SME owner-managers claimed that the main reason for their interest in environmental issues was cost, as it is well known that SMEs suffer from resource shortages. Female respondents did not cite cost at all, and were more likely to be concerned about '*having a safe place for their families to live*'.

Almost a third (31%) of the SME owner-managers surveyed believed that their business had little or no impact on the environment, despite the fact that most of these same businesses are involved in manufacturing, with unavoidable energy and resource requirements. However, this study reflected a greater level of awareness than a study completed in the UK in 2010, when the majority of the SMEs surveyed did not believe their business activities caused environmental damage (NetRegs, 2010).

Although the majority of the SMEs (69%) did realise that their business activities contributed to some environmental damage, only 18% actually measured it in some way. Just one company stated that it did not care about environmental issues that its business may contribute to.

The lack of awareness of the environmental impact of SME businesses is not new, but this study indicates a larger proportion of owner-managers being aware than had been reported in previous studies (NetRegs, 2010). The reasons for this are not explored here, but one possible reason could be related to the fact that SMEs are usually part of the supply chain of larger organisations. These larger organisations are addressing environmental issues and are reported to be pressurising their supply chains (which can include many SMEs) to provide more transparency and greener products and services to them (Rx3, 2011). However, research in the area of the environment, such as this study, can be biased, as it can be the case that only those people who are interested who take part.

4.3 Waste practices and behaviours

The owner-managers of the SMEs, largely claimed to be personally responsible for waste management and environmental issues (75%). Only 22% of them did not believe waste was an important issue in their business, and 66% indicated that waste was, in fact, *very important*.

Almost half (47%) of the businesses are actively reducing their waste, and 44% are reusing waste to some extent. Recycling takes place in 59% of all the businesses surveyed. Only a small minority (6%) put all of their waste into one bin, which reflects a similar pattern of the majority (97%) of respondents who also recycle at home. Recovery of waste was mentioned in two cases, one using a heat recovery process and another burning a mixture of biomass and dust extracted from the process for heat.

Reuse of waste takes place in 56% of the SMEs surveyed; accounting for a wide range of between 1-50% of total waste produced. 25% of this waste is reused for processes, 19% for products and a further 13% for composting. The materials that are being reused are mainly paper (61%), cardboard (52%) and plastic (26%), while others reuse wood, green waste, textiles and construction waste.

Recycling material is mainly collected (63%), either via a local authority (29%) or a private WSP (34%). However, 38% of the respondents said that they also brought material to a recycling service. Over half (56%) of the SMEs who knew how much recycling waste they created -they produced up to one 'wheelie-bin' sized amount (240 litres) on a weekly basis, with 14% having more than 1100 litres of recycling a week. Recycling accounts for an average range of 1-24% of total waste across the range of companies, and the SME owner-managers claim to recycle typically 6 different types of recyclables, most of them being paper (84%), plastic (69%),

cardboard (59%), batteries (53%), metals (50%) and electrical items (47%).

Over 20% of the companies claim that they recycle all that they can, but the remaining state that on average that there are 2 types of waste they produce which are not recycled, due to the fact that they have no service available to them. These are, in the main, green waste (28%) and plastic (28%), specifically plastic packaging and film.

General waste, or waste going to landfill, is predominantly collected (81%), either by a local authority (47%) or a private WSP (34%). Others report taking their general waste to a collection site (25%) or bringing it home for disposal (9%). General waste represents a range of 1-25% of total waste in a company. The majority (73%) of the SMEs know how much general waste they create and claim to produce 1 wheelie bin (240litres) or less, of general waste per week. Only 10% of them produce greater than 2200 litres (two industrial sized wheelie bins) per week.

4.4 Influencers/motivation to recycle

“Why do you recycle?” was one of the questions posed to the SME owner-managers. They were allowed to give multiple responses, but the most popular response was that *‘it was just the right thing to do’* (63%), followed by *‘it stops waste being buried in landfills’* (48%) and *‘it stops resources being wasted’* (43%). The fact that it costs less was only mentioned by 35% of the respondents.

4.4.1 Primary motivation to recycle

When asked what the *primary* reason was for recycling, the answers were more varied, however, *‘it was just the right thing to do’* was still the most popular reason, mentioned by almost a third of the respondents. The second primary reason was that *‘it cost less to do so’* (10%). There was almost a 50:50 split between environmental reasons and business or cost related reasons. Only one SME owner-manager felt pressure from a supplier to recycle. Two of the respondents had identified new business opportunities from a waste stream.

4.4.1 Drivers to recycle more

When asked why they don’t recycle more than they do, the SME owner-managers (who gave a reason) said that it was mainly because there was *‘not enough recyclable materia’l* to justify addressing it (26%) or that it *‘took up too much time’* (16%). However, a further 22% referred to the lack of, or infrequency of a recycling service in their area.

The main drivers that would encourage respondents to recycle more mostly were: information on the exact environmental benefits of doing so (37%) and a desire to respect their local community (37%), followed by pressure from their customers (21%).

4.4 Waste awareness

Most businesses create waste that will need to be disposed of, so most businesses must comply with waste legislation in some form within the EU, or within the country in which their operations are based (Business Link, 2011). However, the majority of the SME owner-managers (60%) could not name any waste legislation that they must comply to.

Only 10% of the SMEs surveyed knew exactly what waste they generated and 70% were not sure. 20% did not believe that monitoring their waste was important.

The majority (63%) were not sure how their waste practices compared with other similar businesses in their sectors, while the remaining believed they were average. When asked if they

would like to have their recycling rates benchmarked against industries in their sector, the majority (63%) believed that they would not find it useful. However, a more significant number of them (80%) would actually consider addressing their waste practices if they found out that their performance was below average. 10% would only do so if they were well below, and only 10% would not consider addressing the issue no matter how they rated.

4.5 Waste service providers (WSPs)

Only 14% of companies claimed to know exactly where their waste ended up, leaving 86% of the respondents unsure about what actually happens to their waste once it is collected from them. Many (61%) assumed that it went to the correct place, which indicates a level of trust in their WSP. This is further confirmed by the fact that 86% of the SME owner-managers were at least averagely satisfied by the service that was currently offered to them, with 25% being *'very satisfied'*.

'I have no other choice' was the main reason (46%) for the respondents using their particular WSP, but a large number (39%) valued the service their WSP offered and made their choice based on this. Other reasons given for using a WSP were based on cost (7%) or the fact that the company was local (7%). All of the respondents were planning to continue using the same service provider. However, one of the SME owner-managers would change if a more price competitive offer with a good service became available, and another stated that he had no other choice but to do so.

When asked if they would switch their WSPs for any service, half of them said that they would not. However, the other half would consider switching if additional collection services were offered, mostly paper or print cartridge collections.

Half of the SME owner-managers were not sure whether or not reports on their waste would be useful to them. Of those who did wish to have reports, more of them wanted the report to identify the environmental savings they might have made by diverting waste than to give details on the actual quantities of waste produced. This may be due to the fact that 82% of them stated that they did not know what impact their waste had on the environment.

4.6 Cost of waste

The question "Do you think that managing your waste effectively can save you money?" received a negative response from 36% of the SME owner-managers. On the other hand, 43% were already managing their waste to reduce cost, with a further 21% planning to do so in the near future.

The total cost of waste from this sample of SMEs varied widely from zero direct costs for one company (as it was included with their lease agreement) to the hefty sum of €60,000 per annum for another. However, a quarter of all the respondents did not know how much their waste bill was, and two of them did not give a figure, and stated that it was *'too much'*. Of those who did give a figure, the average cost of waste came to substantial €4,500 on a yearly basis.

The costs given for recycling alone averaged €1,200 a year. However, almost a third of the SME owner-managers did not know the costs of recycling alone. Although almost 20% of the companies stated that recycling did not cost them anything, almost half are expecting recycling services to increase in the cost of in the next 2-3 years.

5. CONCLUSIONS

Recent studies have suggested that recycling rates could be improved through better understanding of behaviours, a good service and good communications between the client and the WSP. However, only a limited number of studies have explored these phenomena in SMEs.

Cost did not emerge as a major factor in this survey, with no female respondents citing it a motivator to recycle. This was surprising because a lack of resources is often cited as one of the main reasons why many SMEs do not engage in positive environmental practices. The average total annual cost of waste for the SMEs came to fairly substantial €4,500 on a yearly basis, with recycling accounting for an average €1,200 of this figure. A study in Finland on industrial SMEs has outlined that the cost of waste collection is relatively small, and that it is more the cost of the raw materials that drives SMEs to tackle the problem of waste (Ilonmäki & Melanen, 2001). The respondents in this survey did report up to a 50% reuse of their waste to utilise in both their products and processes, so it may be that these SMEs have already addressed this issue of raw material costs in some way.

This study has shown that SME owner-managers have good intentions, and wish to behave in an environmentally favourable fashion, but they may need to be 'nudged' somehow to act on these good intentions. SME managers are keen to make a positive impact on their local communities. The SME managers surveyed claimed that they would recycle more if they knew the exact environmental benefits of doing so. Other studies have indicated that SMEs would also like reports on carbon savings or recycling quantities (Smyth & Lonsdale, 2010). Although most of the SME owner-managers at first did not believe that being benchmarked with similar industries would be useful, the majority consequently admitted that they would indeed change their behaviour if they were underperforming.

More than half of this group of SMEs did seem to have a choice of WSP, but none of them were planning to change providers. The services being provided to them were in the main, satisfactory to their needs, and most of them trusted that their WSP treated their waste in the correct manner.

The majority of SMEs could not name any waste legislation that they had to comply to

This study recommends that more research to be completed in this area of waste management in SMEs, to develop optimal systems in order to minimise the environmental damage caused. Any research aimed at identifying potential drivers of change in environmental practices must consider the characteristic behaviour of SME owner-managers and their relationship with their waste service provider.

In response to the difficulties SMEs face when dealing with environmental issues, the FutureSME team has developed a Business Sustainability framework which is intended to support manufacturing SMEs in four key areas: cutting costs, gaining a competitive advantage, being compliant with legislation and finding new business opportunities, whilst improving their environmental performance (Dimache, Mitchell, & O'Dowd, 2011). This methodology, together with the results from this survey will inform the next steps in improving waste management practices in European manufacturing SMEs.

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